ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T19.D Vial: 18
Acq On : 27 Apr 20 17:53 Operator:
Sample : BA10157W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:57 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	529492	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	470524	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	287758	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	147231	25.14	ppb	0.00
Spiked Amount 25.000			Recovery = 100.544%			
48) 1,2-DCA-D4(S)	5.93	65	162750	25.67	ppb	0.00
Spiked Amount 25.000			Recovery = 102.700%			
69) Toluene-D8(S)	8.25	98	523673	24.79	ppb	0.00
Spiked Amount 25.000			Recovery = 99.176%			
77) 4-Bromofluorobenzene(S)	11.13	95	205911	23.91	ppb	0.00
Spiked Amount 25.000			Recovery = 95.652%			

Target Compounds Qvalue

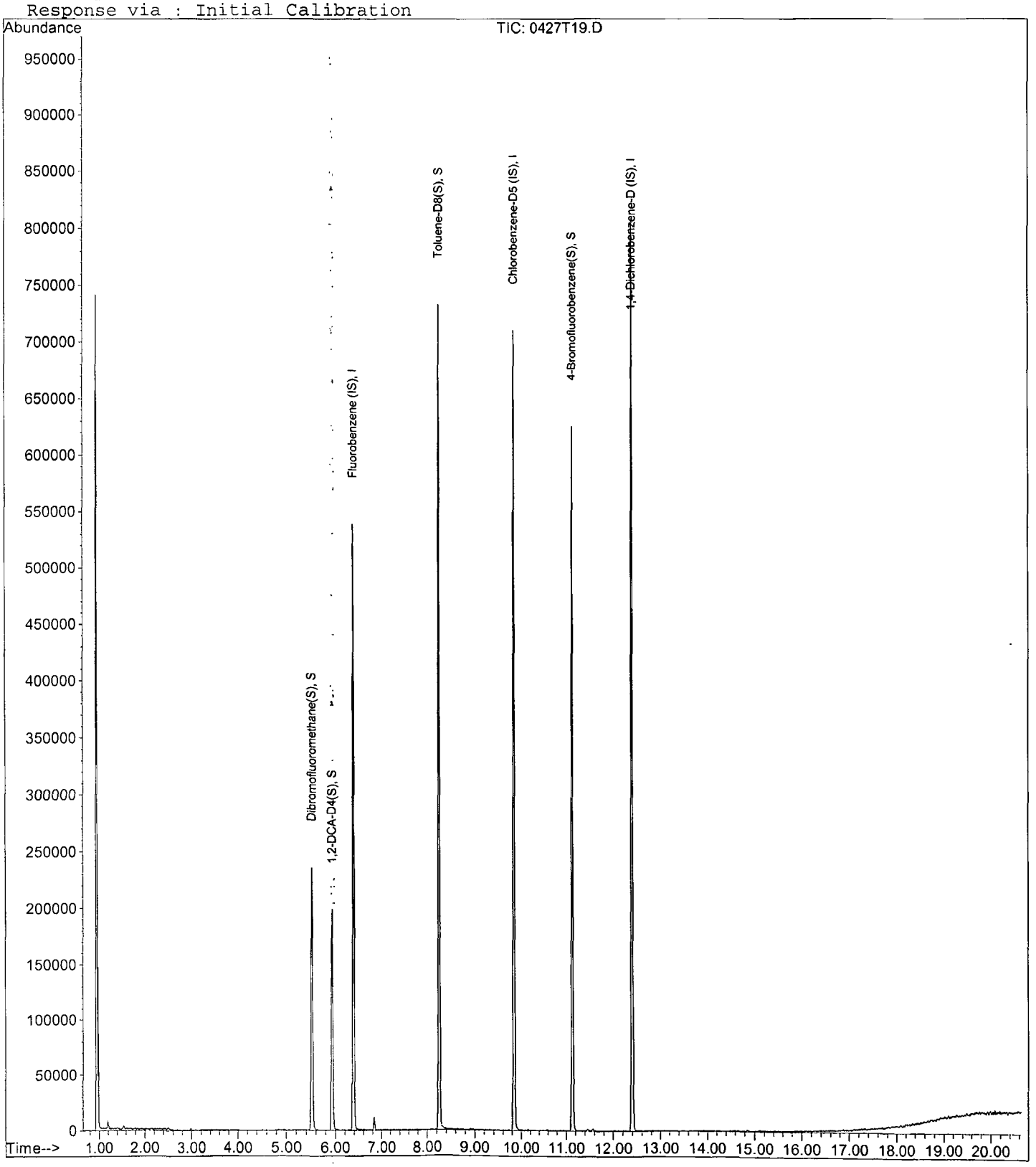
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T19.D Vial: 18
Acq On : 27 Apr 20 17:53 Operator:
Sample : BA10157W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:57 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T20.D Vial: 19
Acq On : 27 Apr 20 18:21 Operator:
Sample : BA10158W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:58 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	523307	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	464291	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	281093	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	150279	25.96	ppb	0.00
Spiked Amount 25.000			Recovery = 103.840%			
48) 1,2-DCA-D4(S)	5.93	65	160080	25.55	ppb	0.00
Spiked Amount 25.000			Recovery = 102.208%			
69) Toluene-D8(S)	8.25	98	524483	25.17	ppb	0.00
Spiked Amount 25.000			Recovery = 100.664%			
77) 4-Bromofluorobenzene(S)	11.13	95	205838	24.22	ppb	0.00
Spiked Amount 25.000			Recovery = 96.900%			

Target Compounds Qvalue

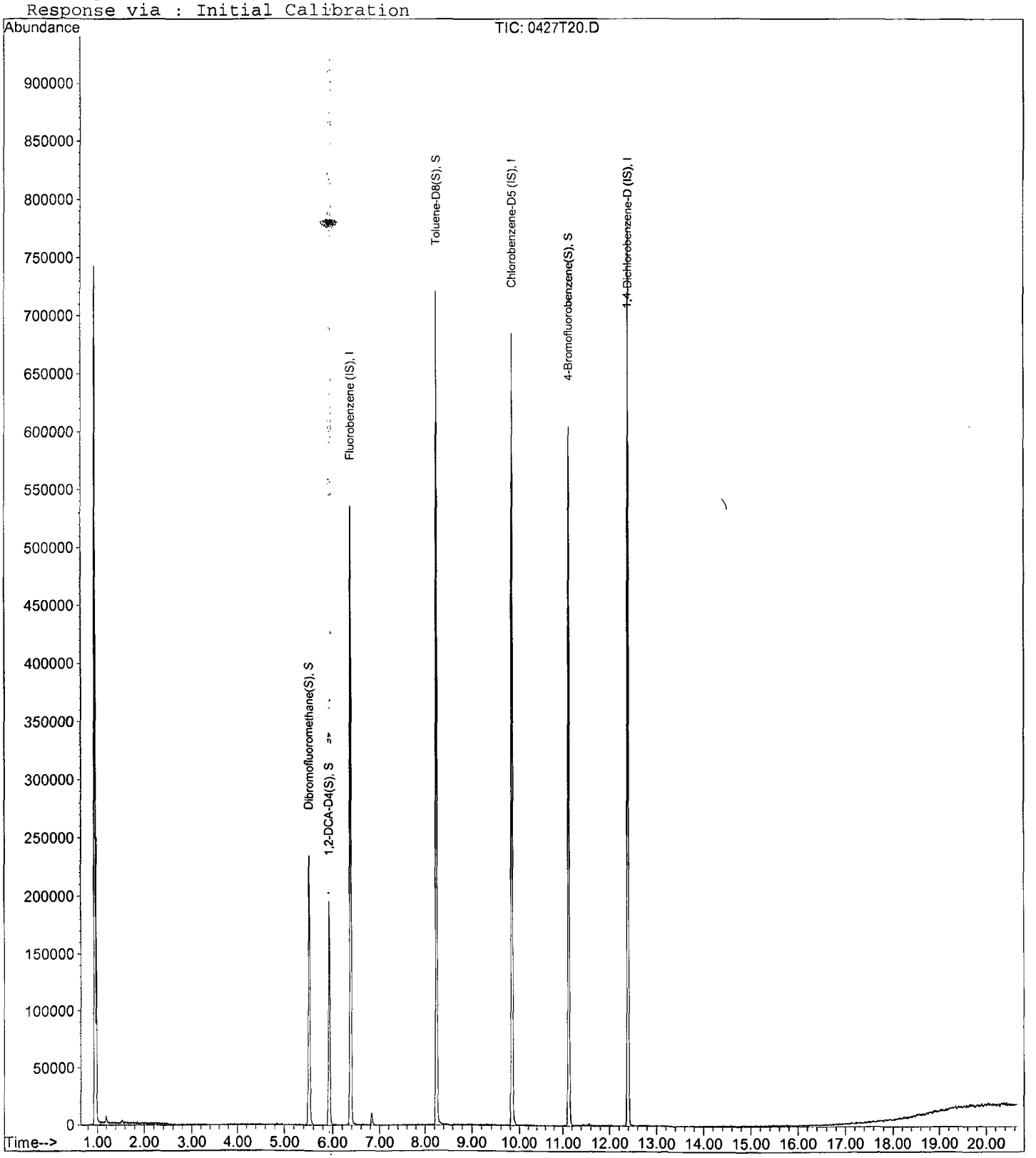
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T20.D Vial: 19
Acq On : 27 Apr 20 18:21 Operator:
Sample : BA10158W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:58 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T21.D Vial: 20
Acq On : 27 Apr 20 18:49 Operator:
Sample : BA10159W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:58 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	521082	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	470277	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	283388	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	148309	25.73	ppb	0.00
Spiked Amount 25.000			Recovery = 102.916%			
48) 1,2-DCA-D4(S)	5.93	65	159769	25.61	ppb	0.00
Spiked Amount 25.000			Recovery = 102.444%			
69) Toluene-D8(S)	8.25	98	516699	24.48	ppb	0.00
Spiked Amount 25.000			Recovery = 97.908%			
77) 4-Bromofluorobenzene(S)	11.13	95	204375	23.75	ppb	0.00
Spiked Amount 25.000			Recovery = 94.988%			

Target Compounds Qvalue

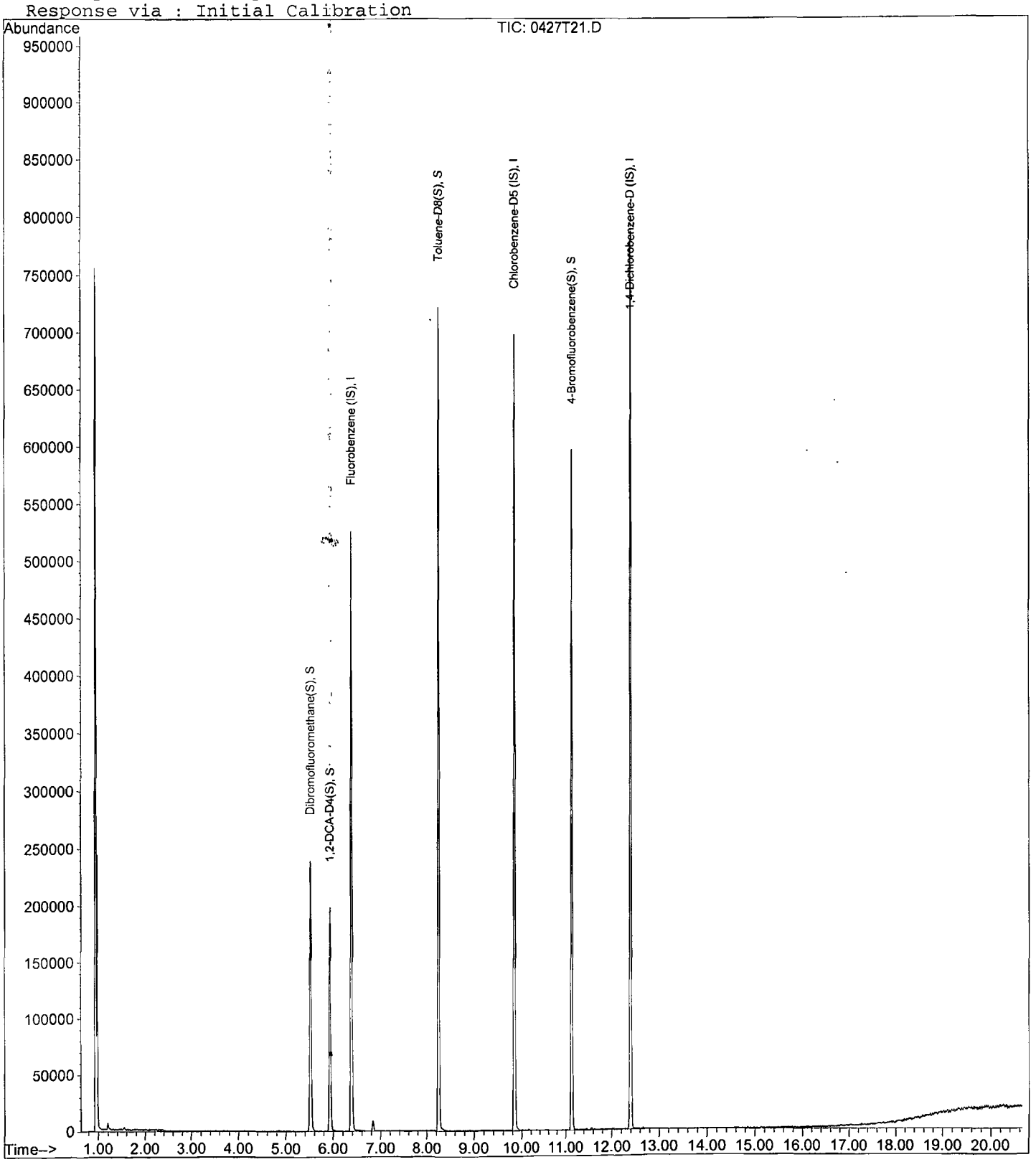
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T21.D Vial: 20
Acq On : 27 Apr 20 18:49 Operator:
Sample : BA10159W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:58 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T22.D Vial: 21
Acq On : 27 Apr 20 19:16 Operator:
Sample : BA10160W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:58 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	517514	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	459299	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	281119	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	144815	25.30	ppb	0.00
Spiked Amount 25.000			Recovery =	101.184%		
48) 1,2-DCA-D4(S)	5.93	65	157668	25.45	ppb	0.00
Spiked Amount 25.000			Recovery =	101.796%		
69) Toluene-D8(S)	8.25	98	502613	24.38	ppb	0.00
Spiked Amount 25.000			Recovery =	97.512%		
77) 4-Bromofluorobenzene(S)	11.13	95	198546	23.62	ppb	0.00
Spiked Amount 25.000			Recovery =	94.484%		

Target Compounds Qvalue

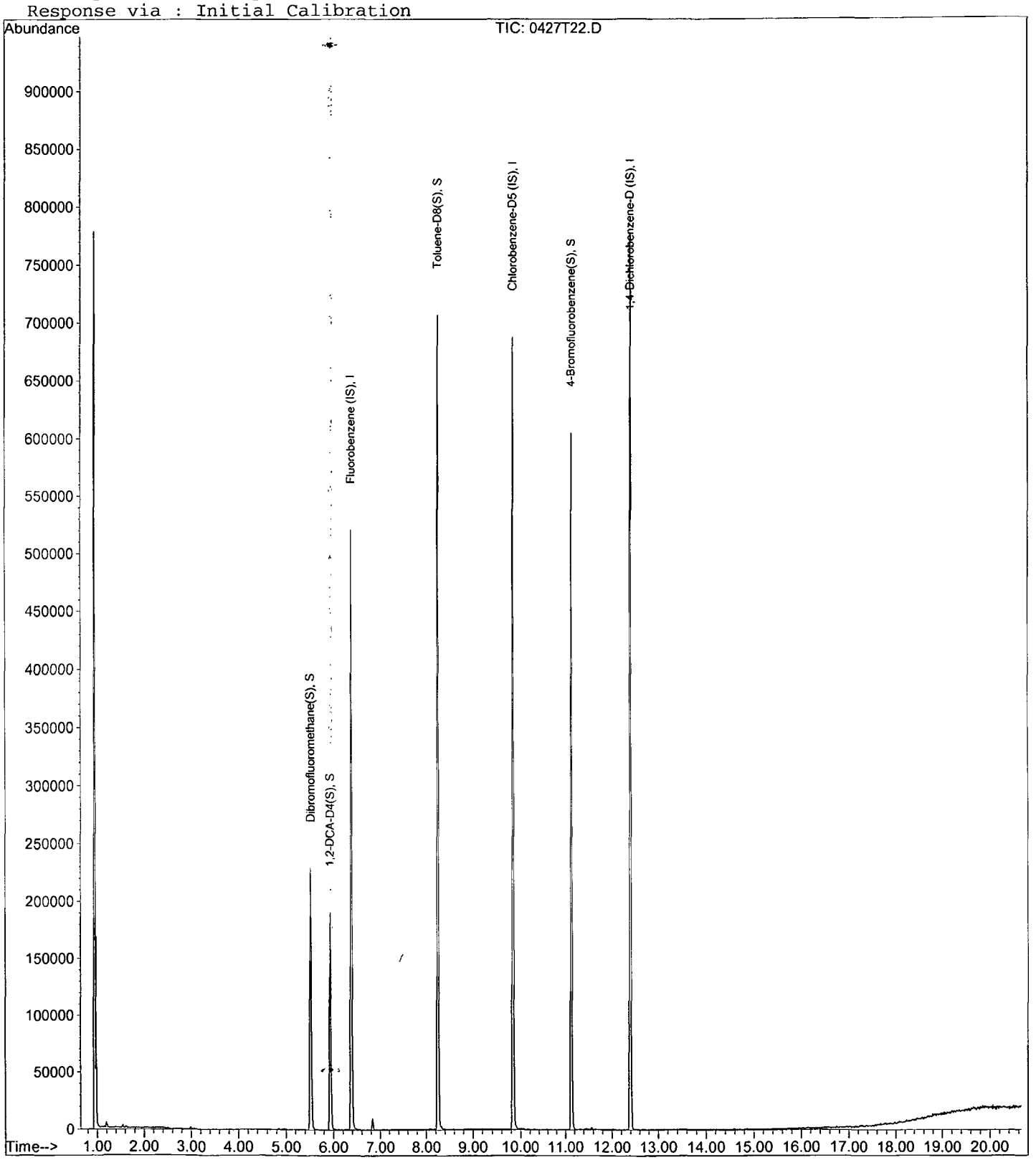
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T22.D Vial: 21
Acq On : 27 Apr 20 19:16 Operator:
Sample : BA10160W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:58 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T23.D Vial: 22
Acq On : 27 Apr 20 19:44 Operator:
Sample : BA10161W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:59 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	517664	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	460495	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	291024	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	148246	25.89	ppb	0.00
Spiked Amount 25.000			Recovery = 103.552%			
48) 1,2-DCA-D4(S)	5.93	65	157632	25.44	ppb	0.00
Spiked Amount 25.000			Recovery = 101.744%			
69) Toluene-D8(S)	8.25	98	513483	24.84	ppb	0.00
Spiked Amount 25.000			Recovery = 99.364%			
77) 4-Bromofluorobenzene(S)	11.13	95	207452	24.62	ppb	0.00
Spiked Amount 25.000			Recovery = 98.464%			
Target Compounds						Qvalue
84) Isopropylbenzene	10.98	105	26866	2.27	ppb	100
89) n-Propylbenzene	11.43	91	46478	3.58	ppb	98
94) Tert-Butylbenzene	11.98	119	5734	0.55	ppb	90
96) Sec-Butylbenzene	12.22	105	31262	2.57	ppb	93
101) n-Butylbenzene	12.83	91	23904	2.72	ppb	100
107) Naphthalene	14.85	127	55739	39.82	ppb	80

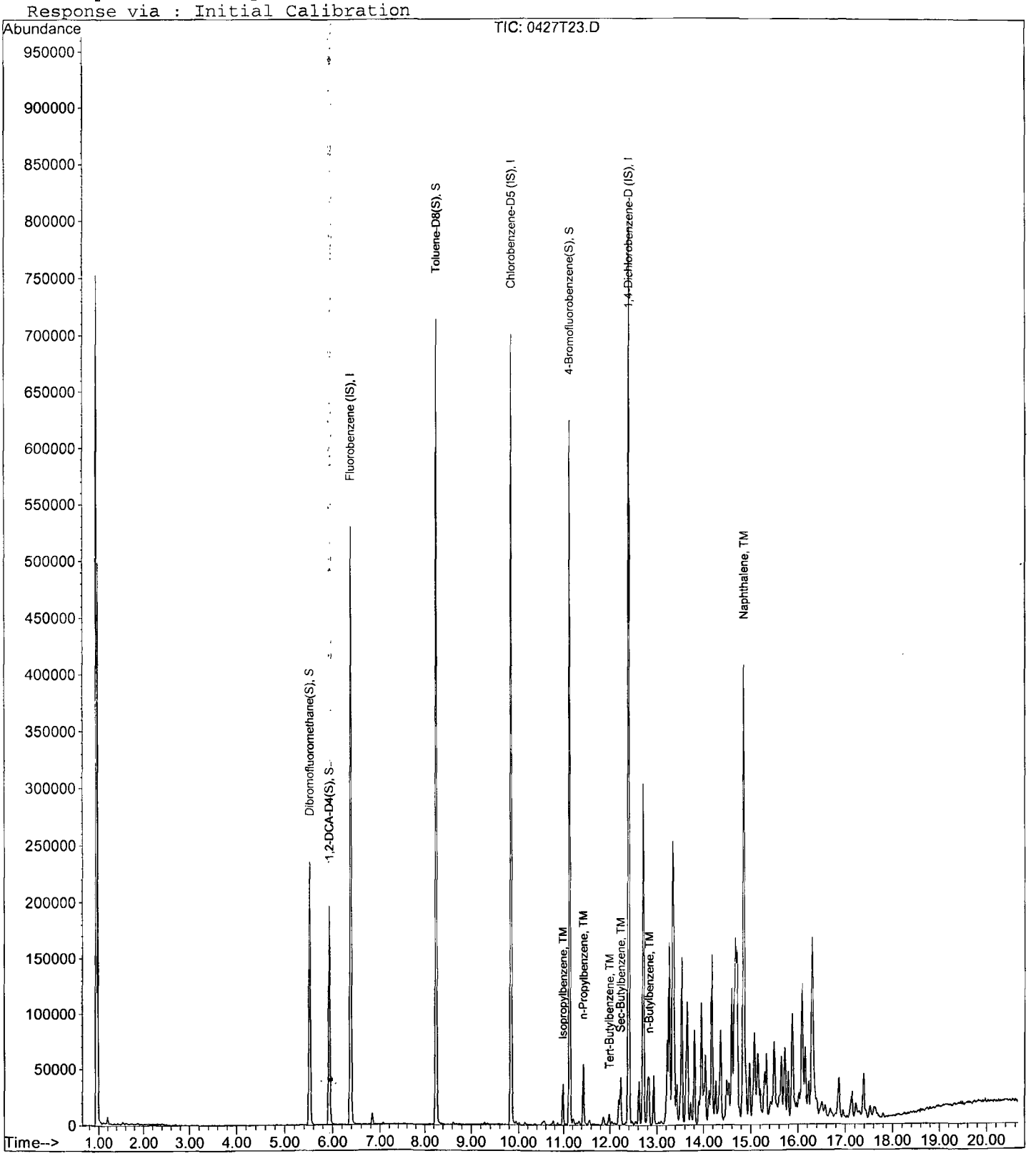
(#) = qualifier out of range (m) = manual integration

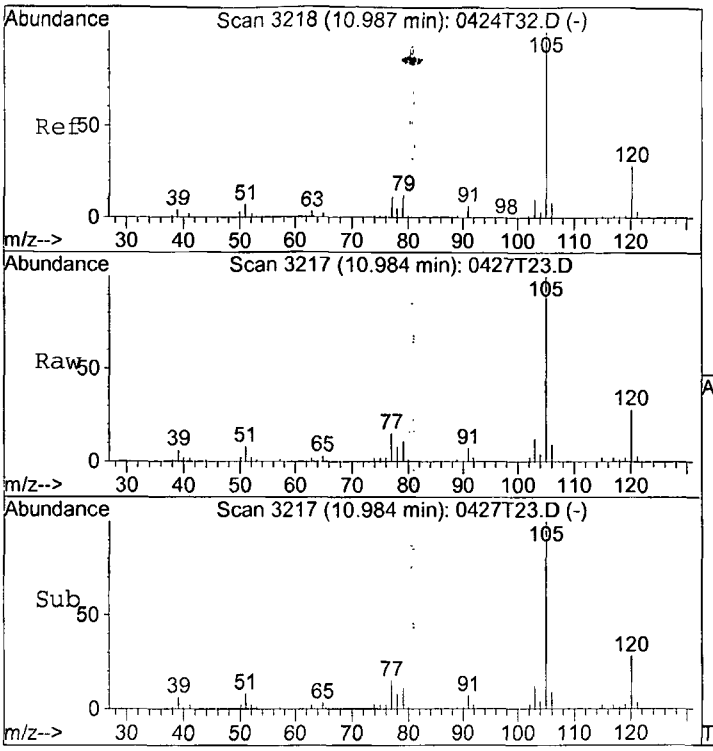
Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T23.D Vial: 22
Acq On : 27 Apr 20 19:44 Operator:
Sample : BA10161W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:59 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration

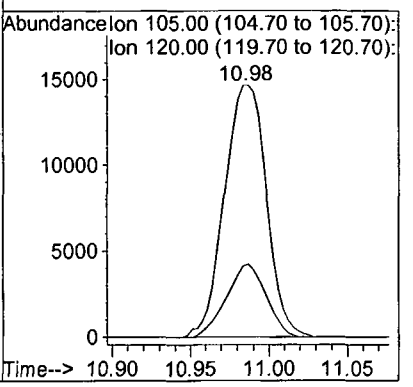


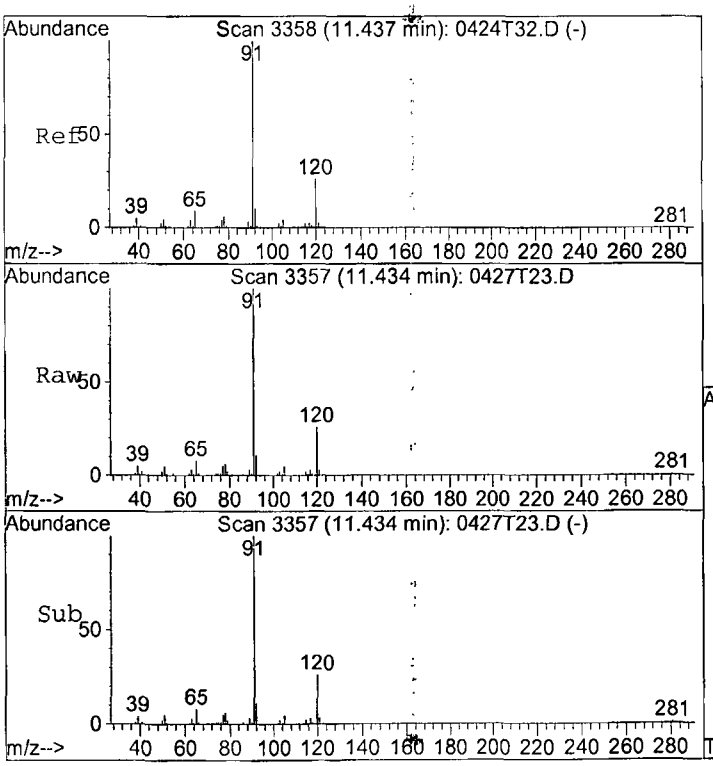


#84
Isopropylbenzene
Concen: 2.27 ppb
RT: 10.98 min Scan# 3217
Delta R.T. -0.00 min
Lab File: 0427T23.D
Acq: 27 Apr 20 19:44

Tgt Ion:105 Resp: 26866

Ion	Ratio	Lower	Upper
105	100		
120	28.1	22.3	33.5

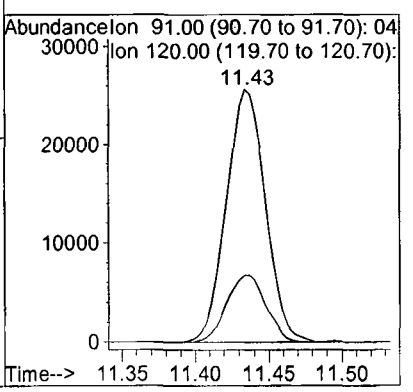


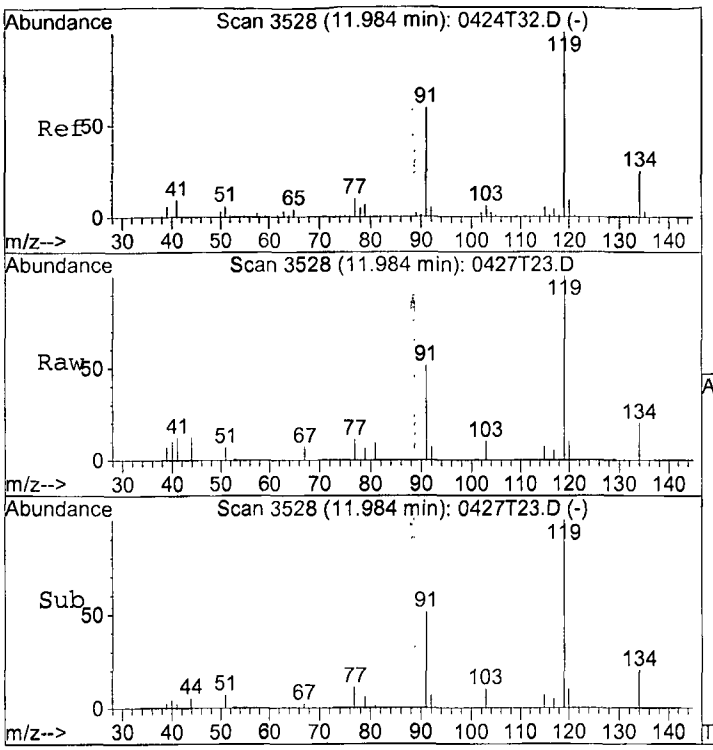


#89
n-Propylbenzene
Concen: 3.58 ppb
RT: 11.43 min Scan# 3357
Delta R.T. -0.00 min
Lab File: 0427T23.D
Acq: 27 Apr 20 19:44

Tgt Ion: 91 Resp: 46478

Ion	Ratio	Lower	Upper
91	100		
120	26.4	20.5	30.7

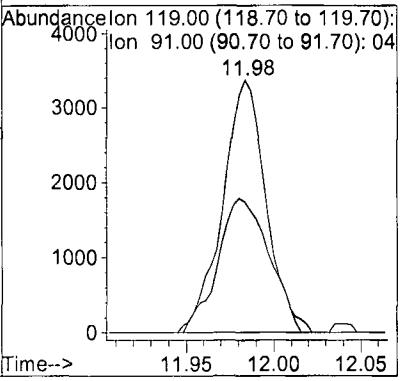


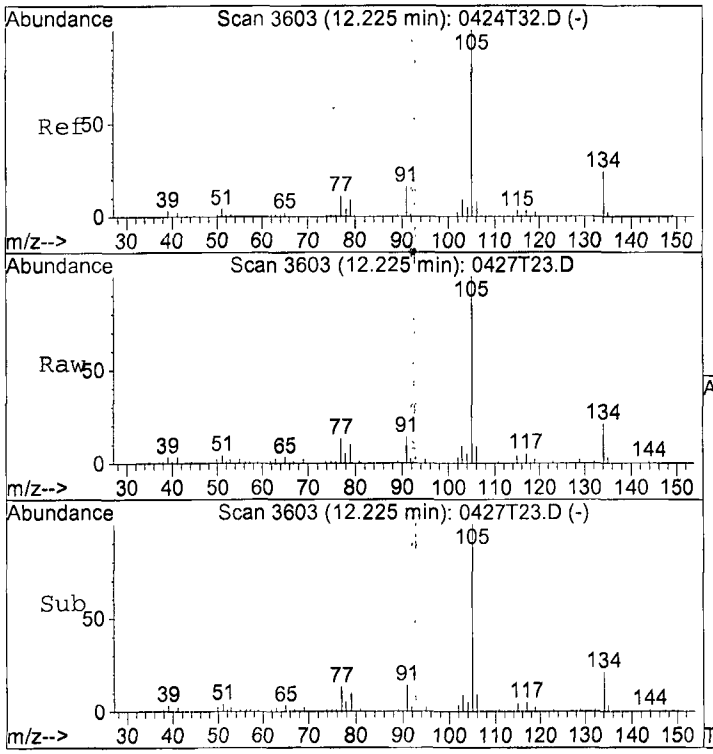


#94
Tert-Butylbenzene
Concen: 0.55 ppb
RT: 11.98 min Scan# 3528
Delta R.T. 0.00 min
Lab File: 0427T23.D
Acq: 27 Apr 20 19:44

Tgt Ion:119 Resp: 5734

Ion	Ratio	Lower	Upper
119	100		
91	51.5	47.3	70.9

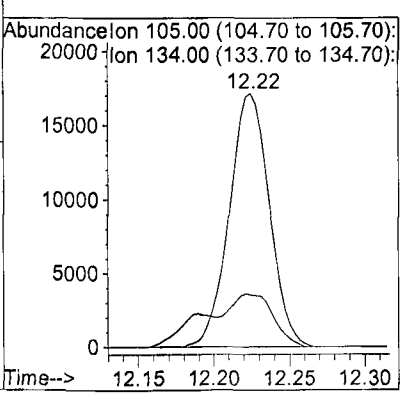


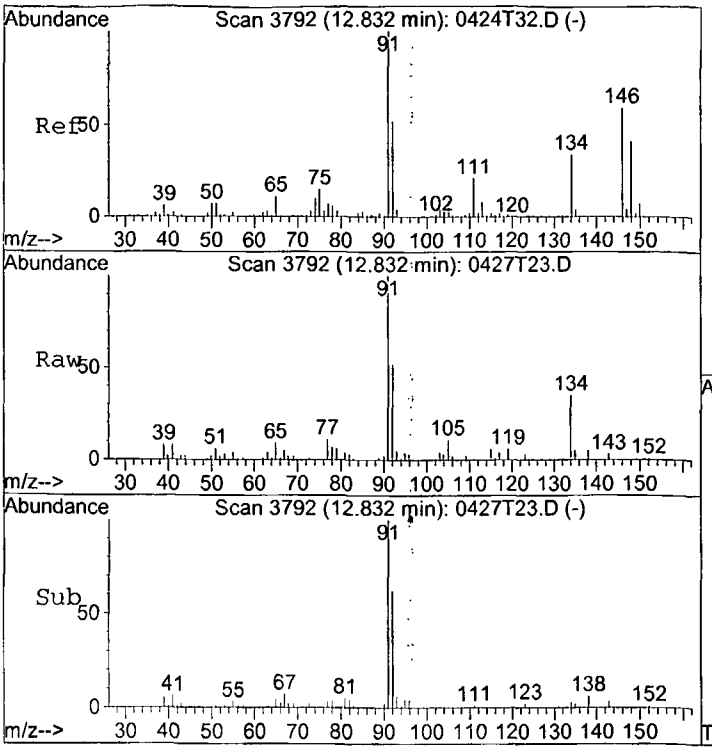


#96
Sec-Butylbenzene
Concen: 2.57 ppb
RT: 12.22 min Scan# 3603
Delta R.T. 0.00 min
Lab File: 0427T23.D
Acq: 27 Apr 20 19:44

Tgt Ion:105 Resp: 31262

Ion	Ratio	Lower	Upper
105	100		
134	20.7	19.2	28.8

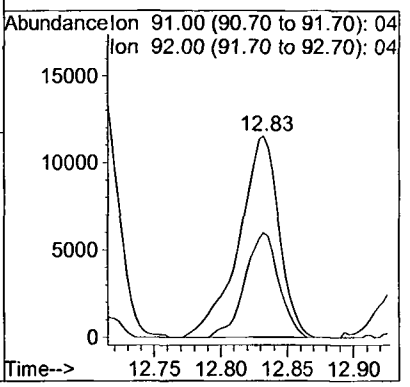


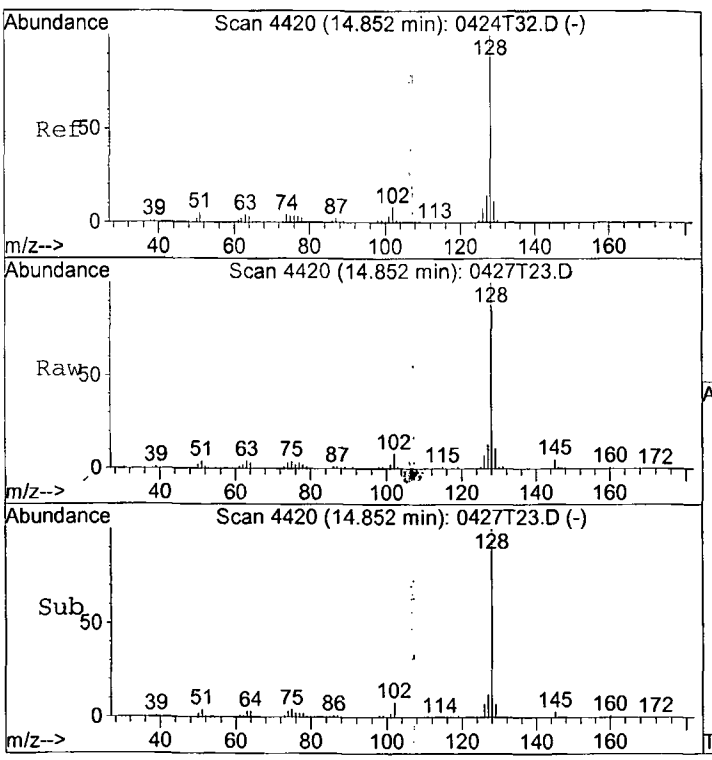


#101
n-Butylbenzene
Concen: 2.72 ppb
RT: 12.83 min Scan# 3792
Delta R.T. 0.00 min
Lab File: 0427T23.D
Acq: 27 Apr 20 19:44

Tgt Ion: 91 Resp: 23904

Ion	Ratio	Lower	Upper
91	100		
92	52.0	41.8	62.6

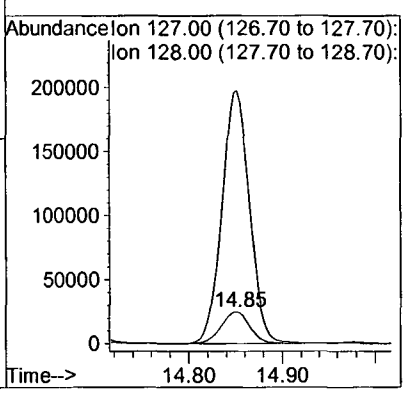




#107
Naphthalene
Concen: 39.82 ppb
RT: 14.85 min Scan# 4420
Delta R.T. 0.00 min
Lab File: 0427T23.D
Acq: 27 Apr 20 19:44

Tgt Ion:127 Resp: 55739

Ion	Ratio	Lower	Upper
127	100		
128	789.5	575.8	863.6



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T24.D Vial: 23
Acq On : 27 Apr 20 20:12 Operator:
Sample : BA10162W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:59 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	515256	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	468921	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	295972	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	146720	25.74	ppb	0.00
Spiked Amount 25.000			Recovery = 102.964%			
48) 1,2-DCA-D4(S)	5.93	65	160081	25.95	ppb	0.00
Spiked Amount 25.000			Recovery = 103.804%			
69) Toluene-D8(S)	8.25	98	513319	24.39	ppb	0.00
Spiked Amount 25.000			Recovery = 97.548%			
77) 4-Bromofluorobenzene(S)	11.13	95	203710	23.74	ppb	0.00
Spiked Amount 25.000			Recovery = 94.952%			
Target Compounds						Qvalue
84) Isopropylbenzene	10.98	105	26869	2.24	ppb	97
89) n-Propylbenzene	11.43	91	48354	3.66	ppb	98
94) Tert-Butylbenzene	11.98	119	6106	0.58	ppb	93
96) Sec-Butylbenzene	12.22	105	33762	2.73	ppb	94
101) n-Butylbenzene	12.83	91	24471	2.74	ppb	98
107) Naphthalene	14.85	127	60465	42.45	ppb	82

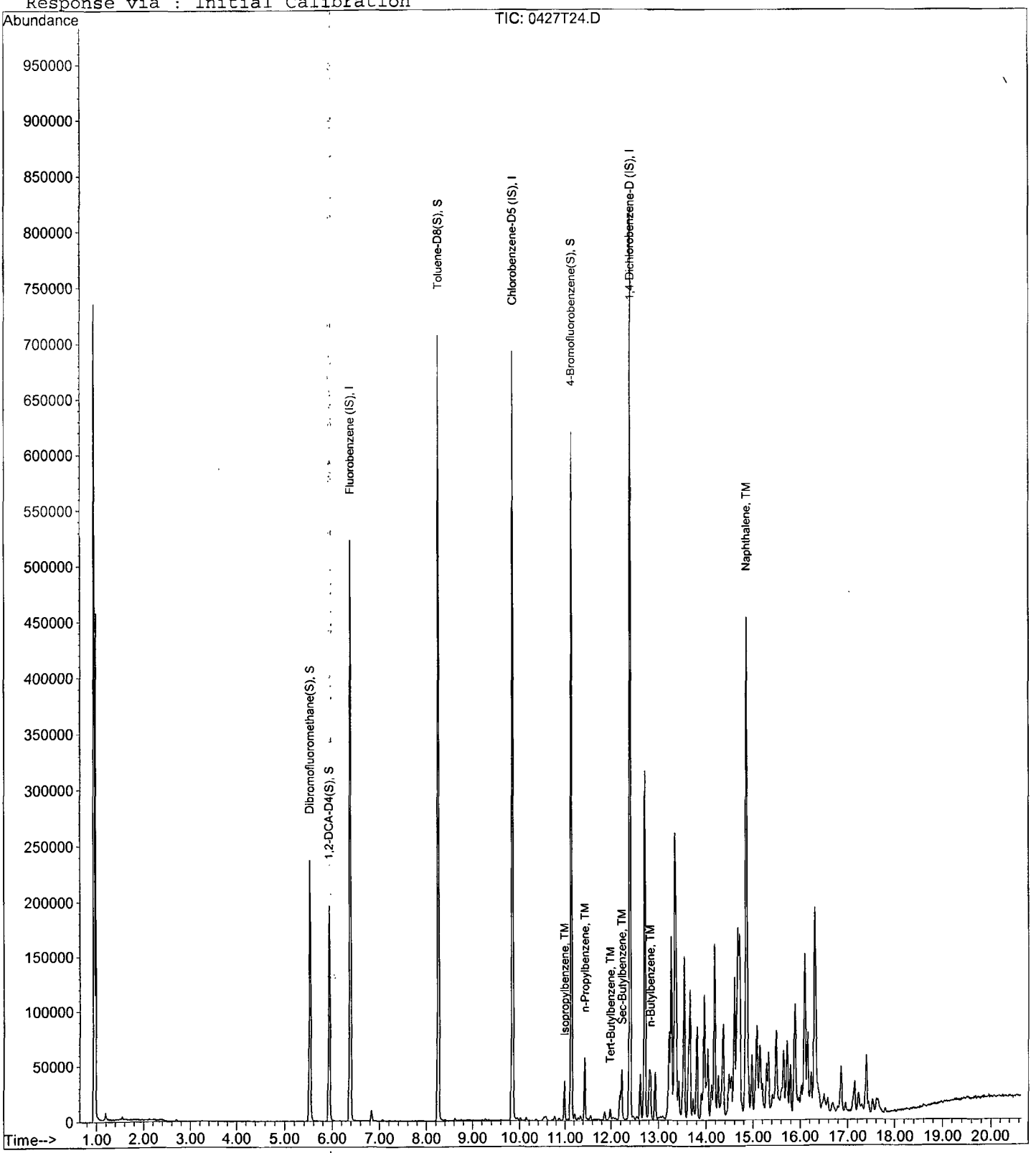
(#) = qualifier out of range (m) = manual integration

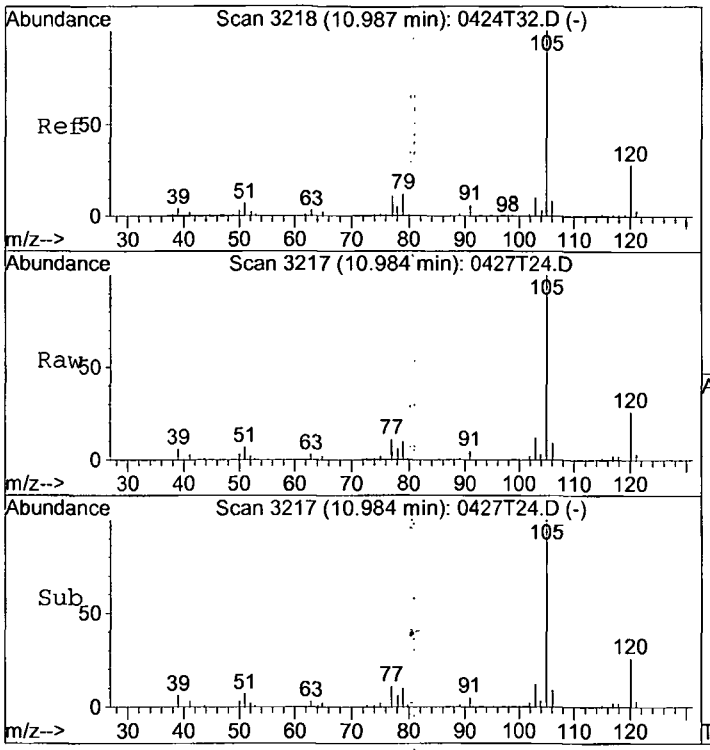
Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T24.D Vial: 23
Acq On : 27 Apr 20 20:12 Operator:
Sample : BA10162W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:59 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration

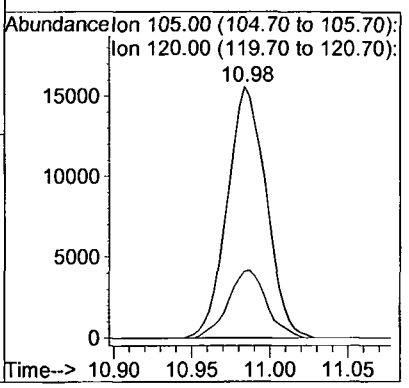


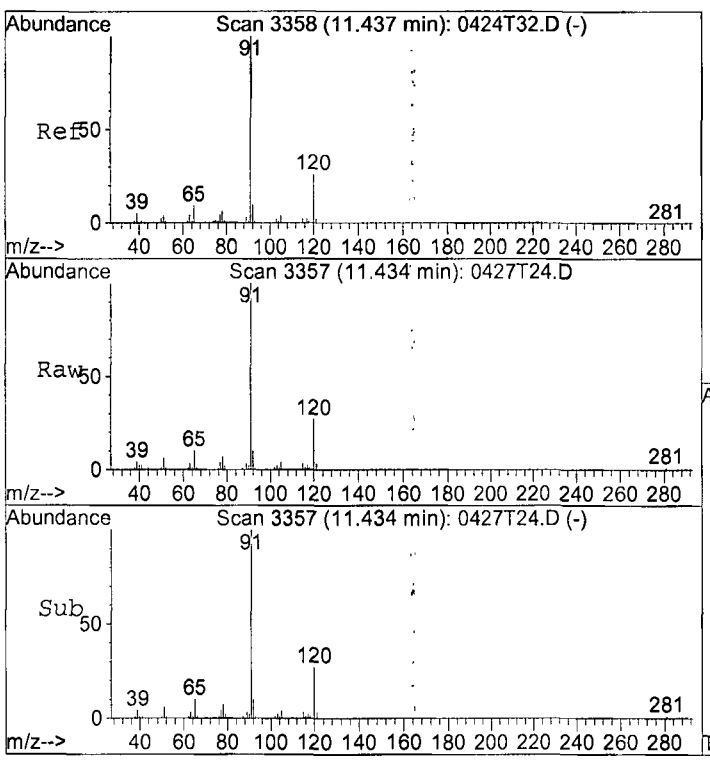


#84
Isopropylbenzene
Concen: 2.24 ppb
RT: 10.98 min Scan# 3217
Delta R.T. -0.00 min
Lab File: 0427T24.D
Acq: 27 Apr 20 20:12

Tgt Ion:105 Resp: 26869

Ion	Ratio	Lower	Upper
105	100		
120	26.4	22.3	33.5

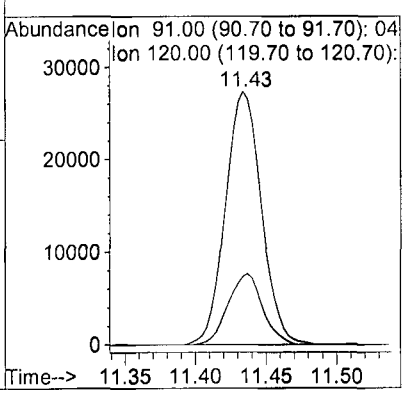


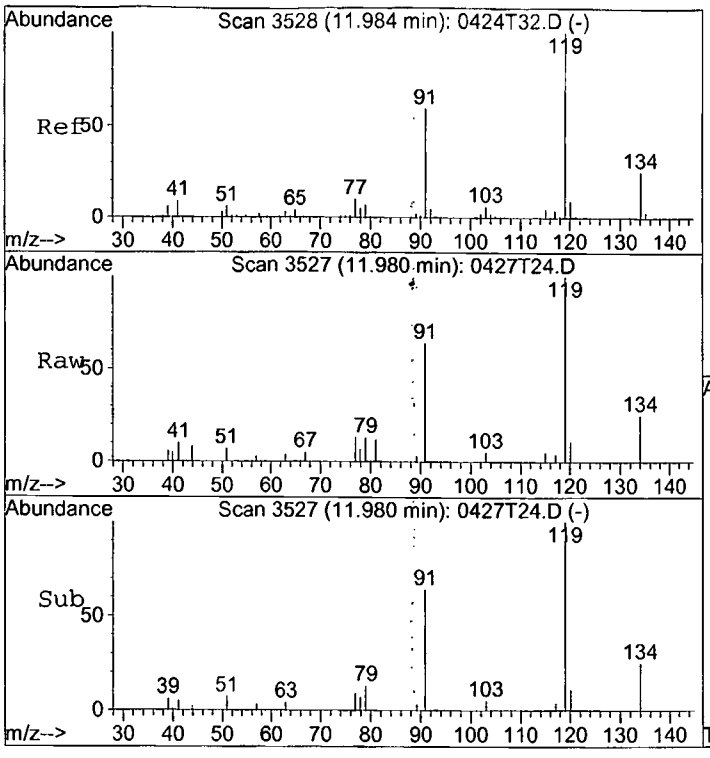


#89
n-Propylbenzene
Concen: 3.66 ppb
RT: 11.43 min Scan# 3357
Delta R.T. -0.00 min
Lab File: 0427T24.D
Acq: 27 Apr 20 20:12

Tgt Ion: 91 Resp: 48354

Ion	Ratio	Lower	Upper
91	100		
120	26.8	20.5	30.7

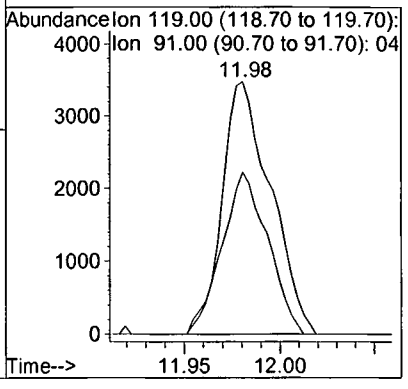


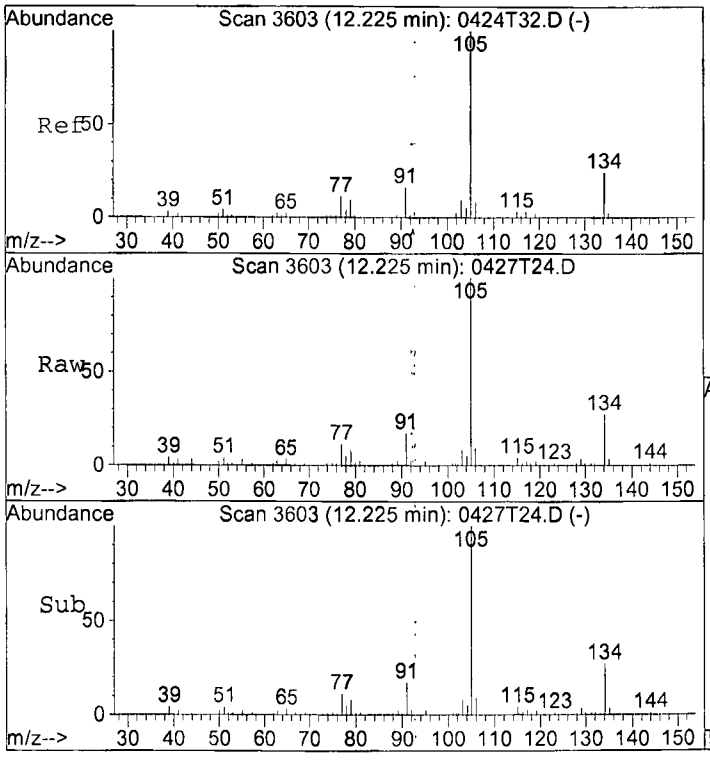


#94
Tert-Butylbenzene
Concen: 0.58 ppb
RT: 11.98 min Scan# 3527
Delta R.T. -0.00 min
Lab File: 0427T24.D
Acq: 27 Apr 20 20:12

Tgt Ion:119 Resp: 6106

Ion	Ratio	Lower	Upper
119	100		
91	64.0	47.3	70.9

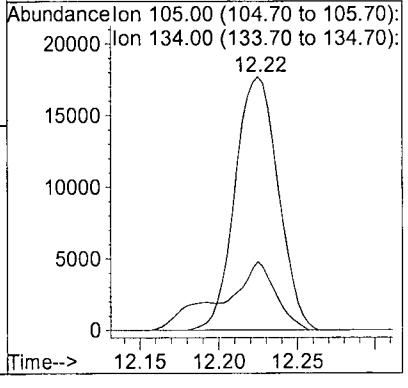


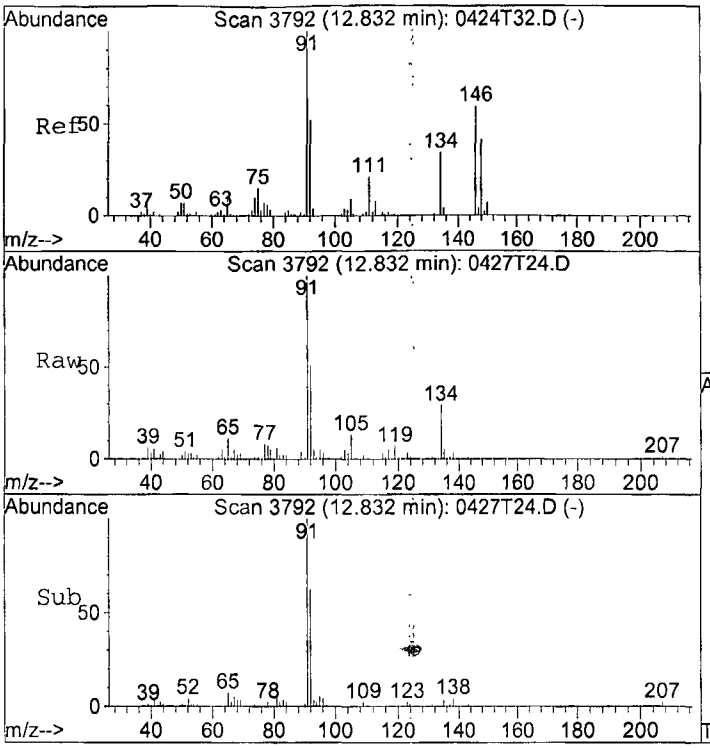


#96
Sec-Butylbenzene
Concen: 2.73 ppb
RT: 12.22 min Scan# 3603
Delta R.T. 0.00 min
Lab File: 0427T24.D
Acq: 27 Apr 20 20:12

Tgt Ion:105 Resp: 33762

Ion	Ratio	Lower	Upper
105	100		
134	27.1	19.2	28.8

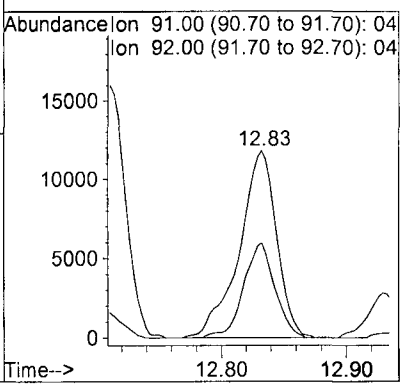


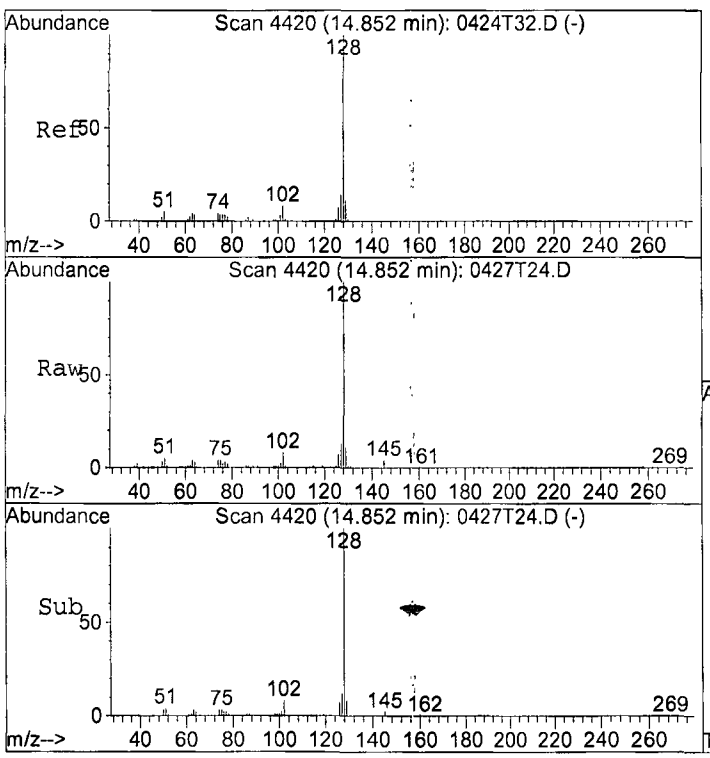


#101
n-Butylbenzene
Concen: 2.74 ppb
RT: 12.83 min Scan# 3792
Delta R.T. 0.00 min
Lab File: 0427T24.D
Acq: 27 Apr 20 20:12

Tgt Ion: 91 Resp: 24471

Ion	Ratio	Lower	Upper
91	100		
92	50.6	41.8	62.6

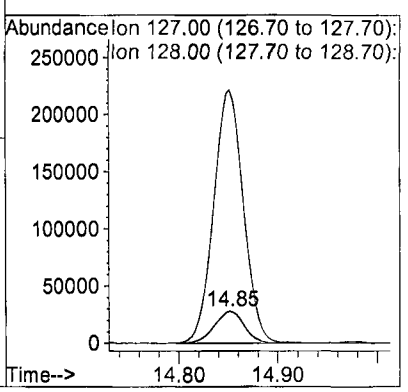




#107
Naphthalene
Concen: 42.45 ppb
RT: 14.85 min Scan# 4420
Delta R.T. 0.00 min
Lab File: 0427T24.D
Acq: 27 Apr 20 20:12

Tgt Ion:127 Resp: 60465

Ion	Ratio	Lower	Upper
127	100		
128	784.0	575.8	863.6



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T25.D Vial: 24
Acq On : 27 Apr 20 20:40 Operator:
Sample : BA10163W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:59 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	523720	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	468043	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	285480	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	149883	25.87	ppb	0.00
Spiked Amount 25.000			Recovery = 103.484%			
48) 1,2-DCA-D4(S)	5.93	65	161810	25.81	ppb	0.00
Spiked Amount 25.000			Recovery = 103.232%			
69) Toluene-D8(S)	8.25	98	521703	24.83	ppb	0.00
Spiked Amount 25.000			Recovery = 99.328%			
77) 4-Bromofluorobenzene(S)	11.13	95	206239	24.08	ppb	0.00
Spiked Amount 25.000			Recovery = 96.312%			
Target Compounds						Qvalue
107) Naphthalene	14.85	127	6108	4.86	ppb	86

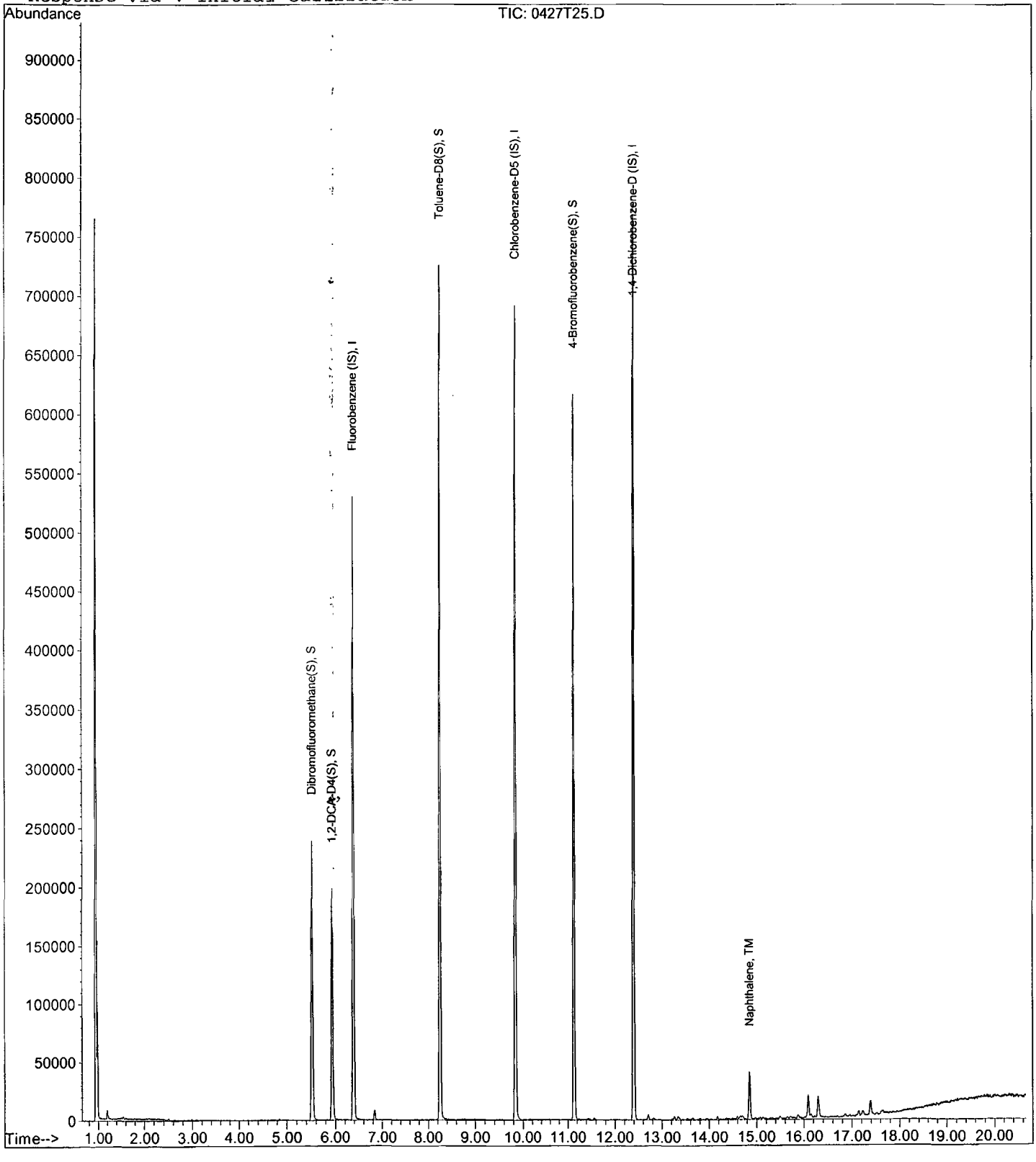
(#) = qualifier out of range (m) = manual integration

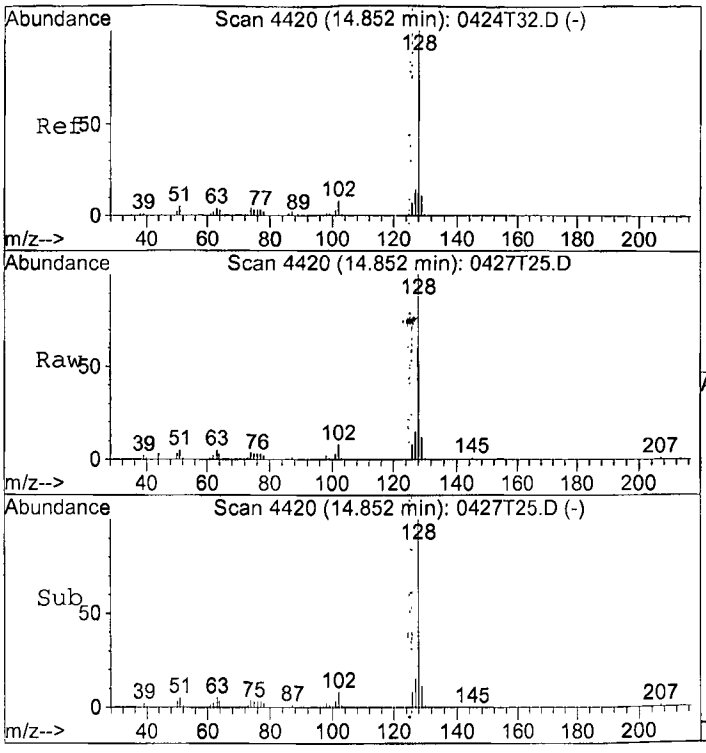
Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T25.D Vial: 24
Acq On : 27 Apr 20 20:40 Operator:
Sample : BA10163W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:59 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration

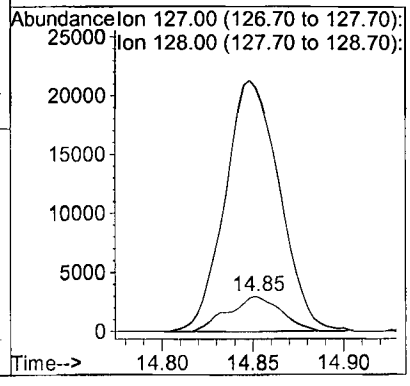




#107
Naphthalene
Concen: 4.86 ppb
RT: 14.85 min Scan# 4420
Delta R.T. 0.00 min
Lab File: 0427T25.D
Acq: 27 Apr 20 20:40

Tgt Ion:127 Resp: 6108

Ion	Ratio	Lower	Upper
127	100		
128	670.6	575.8	863.6



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T26.D Vial: 25
Acq On : 27 Apr 20 21:08 Operator:
Sample : BA10164W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:00 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	513978	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	457552	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	276219	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	145928	25.67	ppb	0.00
Spiked Amount 25.000			Recovery = 102.664%			
48) 1,2-DCA-D4(S)	5.93	65	153972	25.02	ppb	0.00
Spiked Amount 25.000			Recovery = 100.092%			
69) Toluene-D8(S)	8.25	98	503564	24.52	ppb	0.00
Spiked Amount 25.000			Recovery = 98.072%			
77) 4-Bromofluorobenzene(S)	11.13	95	202152	24.14	ppb	0.00
Spiked Amount 25.000			Recovery = 96.568%			

Target Compounds Qvalue

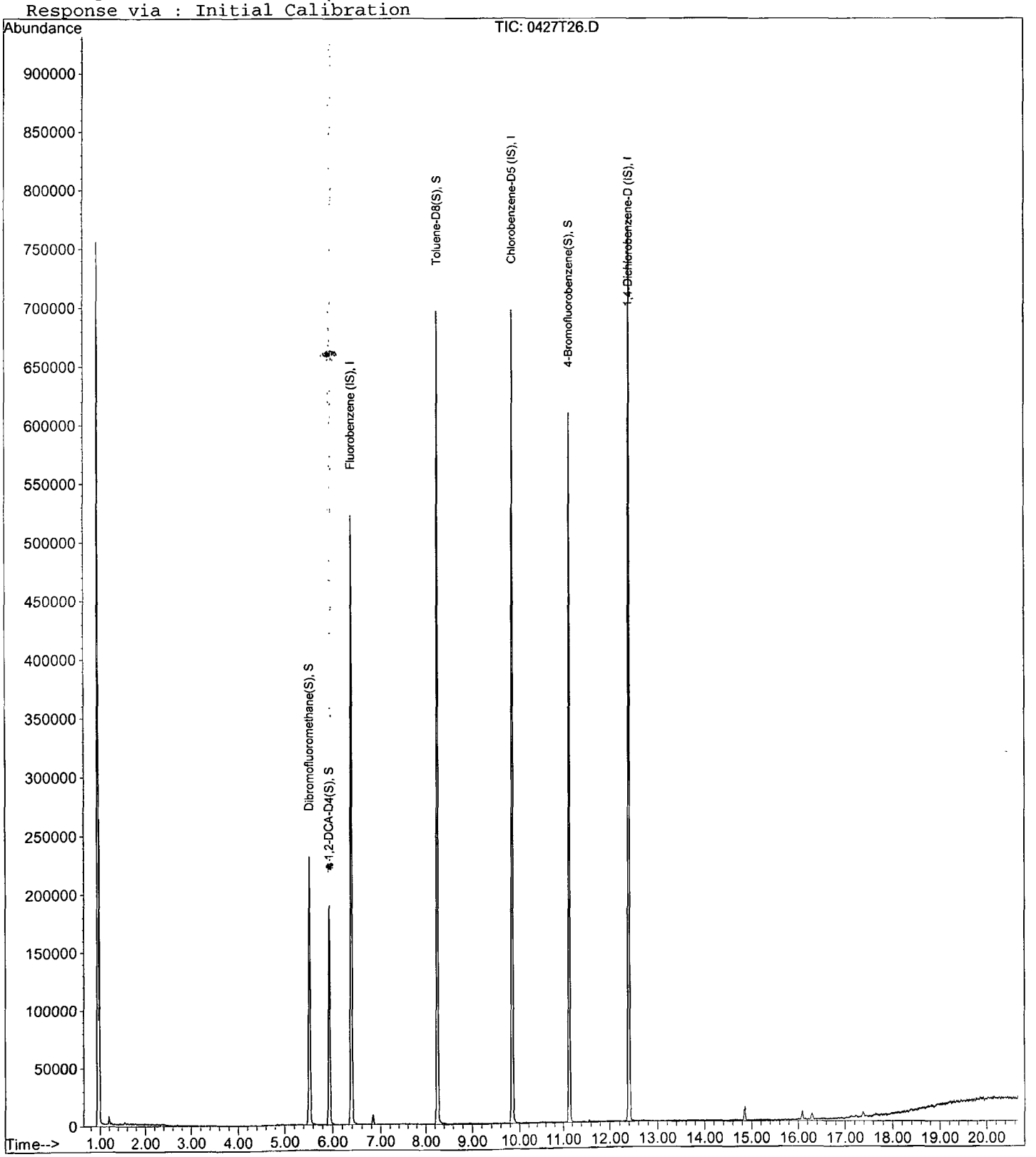
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T26.D Vial: 25
Acq On : 27 Apr 20 21:08 Operator:
Sample : BA10164W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:00 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T27.D Vial: 26
Acq On : 27 Apr 20 21:36 Operator:
Sample : BA10165W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:00 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	515499	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	462877	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	280905	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	145922	25.59	ppb	0.00
Spiked Amount 25.000			Recovery = 102.356%			
48) 1,2-DCA-D4(S)	5.93	65	158577	25.70	ppb	0.00
Spiked Amount 25.000			Recovery = 102.780%			
69) Toluene-D8(S)	8.25	98	497874	23.96	ppb	0.00
Spiked Amount 25.000			Recovery = 95.848%			
77) 4-Bromofluorobenzene(S)	11.13	95	198795	23.47	ppb	0.00
Spiked Amount 25.000			Recovery = 93.872%			

Target Compounds Qvalue

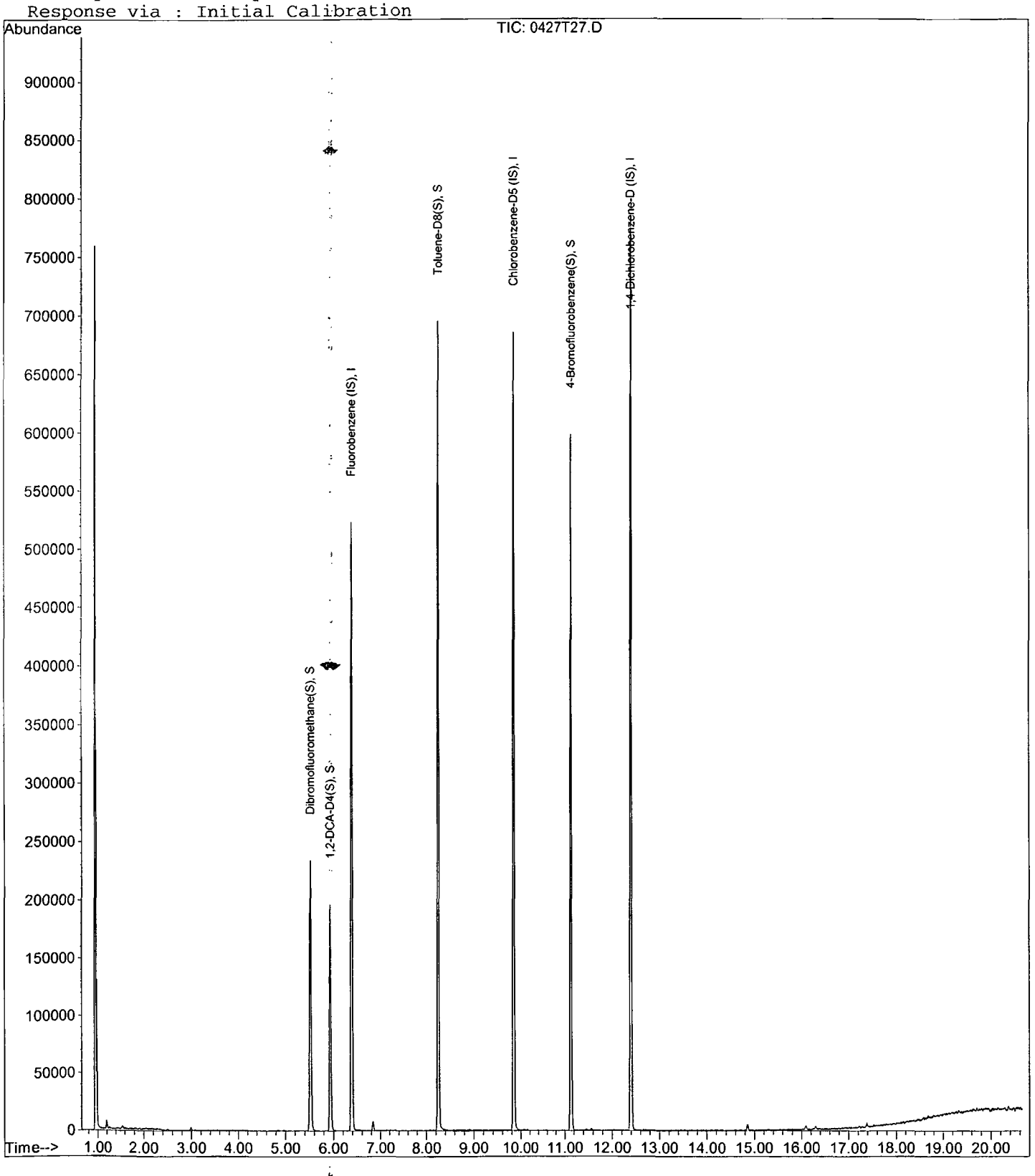
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T27.D Vial: 26
Acq On : 27 Apr 20 21:36 Operator:
Sample : BA10165W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:00 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T28.D Vial: 27
Acq On : 27 Apr 20 22:04 Operator:
Sample : BA10166W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:00 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	506081	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	456747	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	280283	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	143751	25.68	ppb	0.00
Spiked Amount 25.000			Recovery = 102.708%			
48) 1,2-DCA-D4(S)	5.93	65	156002	25.75	ppb	0.00
Spiked Amount 25.000			Recovery = 102.996%			
69) Toluene-D8(S)	8.25	98	501516	24.46	ppb	0.00
Spiked Amount 25.000			Recovery = 97.844%			
77) 4-Bromofluorobenzene(S)	11.13	95	196053	23.45	ppb	0.00
Spiked Amount 25.000			Recovery = 93.816%			

Target Compounds Qvalue

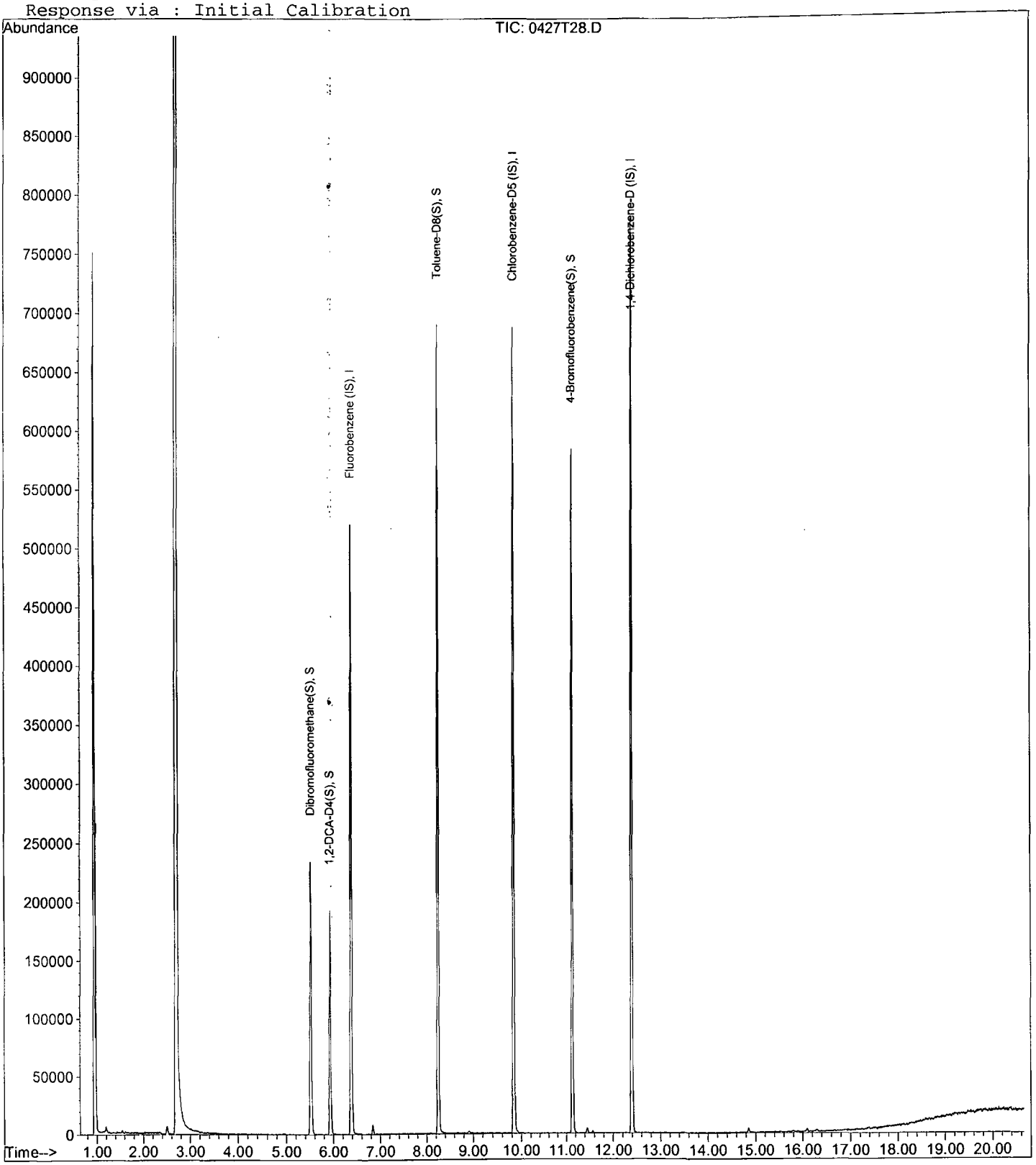
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T28.D Vial: 27
Acq On : 27 Apr 20 22:04 Operator:
Sample : BA10166W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:00 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T29.D Vial: 28
Acq On : 27 Apr 20 22:32 Operator:
Sample : BA10167W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:01 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	503129	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	443159	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	272449	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	144270	25.92	ppb	0.00
Spiked Amount 25.000			Recovery = 103.684%			
48) 1,2-DCA-D4(S)	5.93	65	155256	25.78	ppb	0.00
Spiked Amount 25.000			Recovery = 103.104%			
69) Toluene-D8(S)	8.25	98	486830	24.47	ppb	0.00
Spiked Amount 25.000			Recovery = 97.892%			
77) 4-Bromofluorobenzene(S)	11.13	95	196776	24.26	ppb	0.00
Spiked Amount 25.000			Recovery = 97.052%			

Target Compounds Qvalue

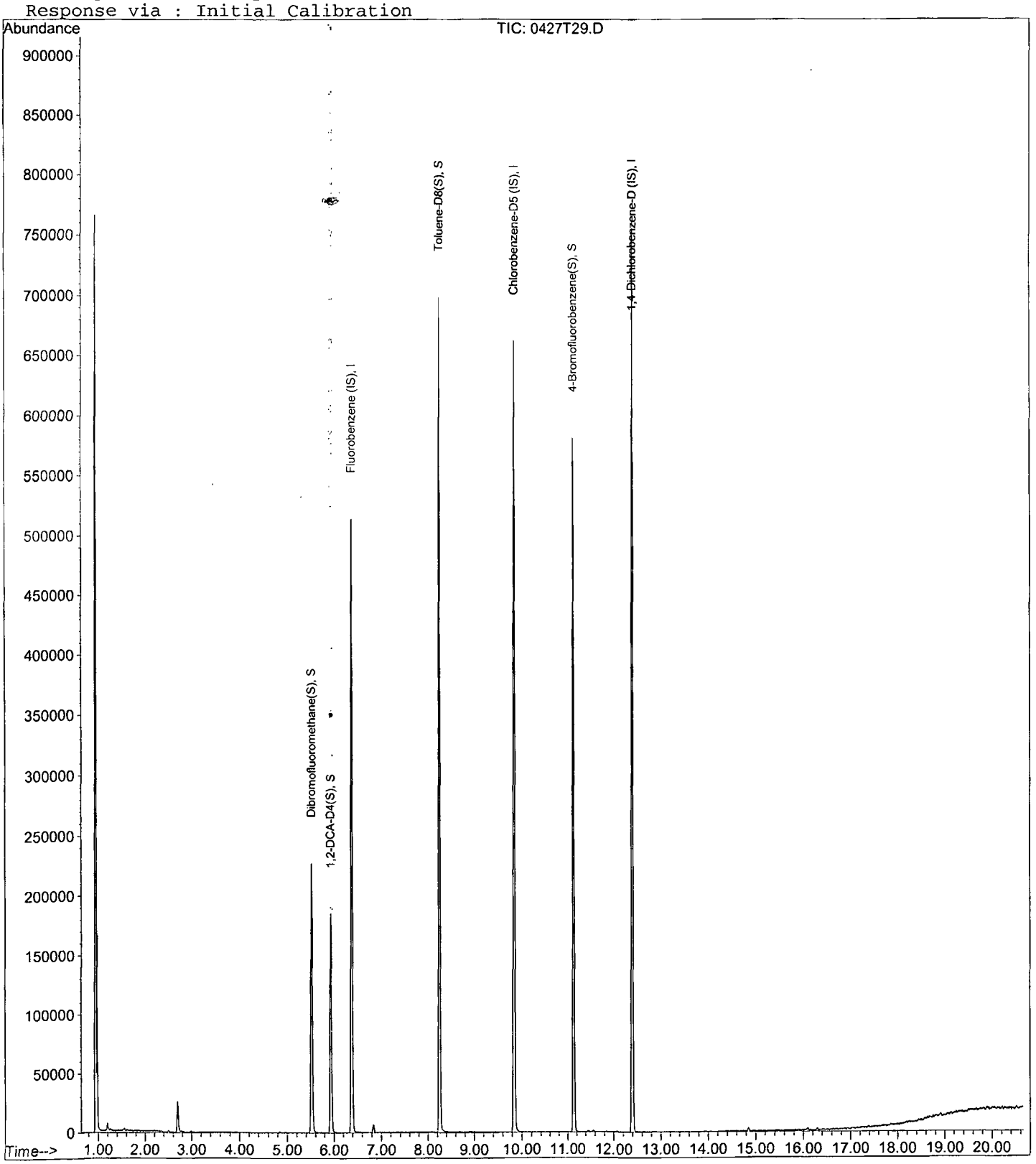
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T29.D Vial: 28
Acq On : 27 Apr 20 22:32 Operator:
Sample : BA10167W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:01 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T30.D Vial: 29
Acq On : 27 Apr 20 23:00 Operator:
Sample : BA10168W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:02 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	504408	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	447985	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	269924	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	140975	25.26	ppb	0.00
Spiked Amount 25.000			Recovery = 101.060%			
48) 1,2-DCA-D4(S)	5.93	65	151238	25.05	ppb	0.00
Spiked Amount 25.000			Recovery = 100.180%			
69) Toluene-D8(S)	8.25	98	485219	24.13	ppb	0.00
Spiked Amount 25.000			Recovery = 96.516%			
77) 4-Bromofluorobenzene(S)	11.13	95	194991	23.78	ppb	0.00
Spiked Amount 25.000			Recovery = 95.136%			

Target Compounds Qvalue

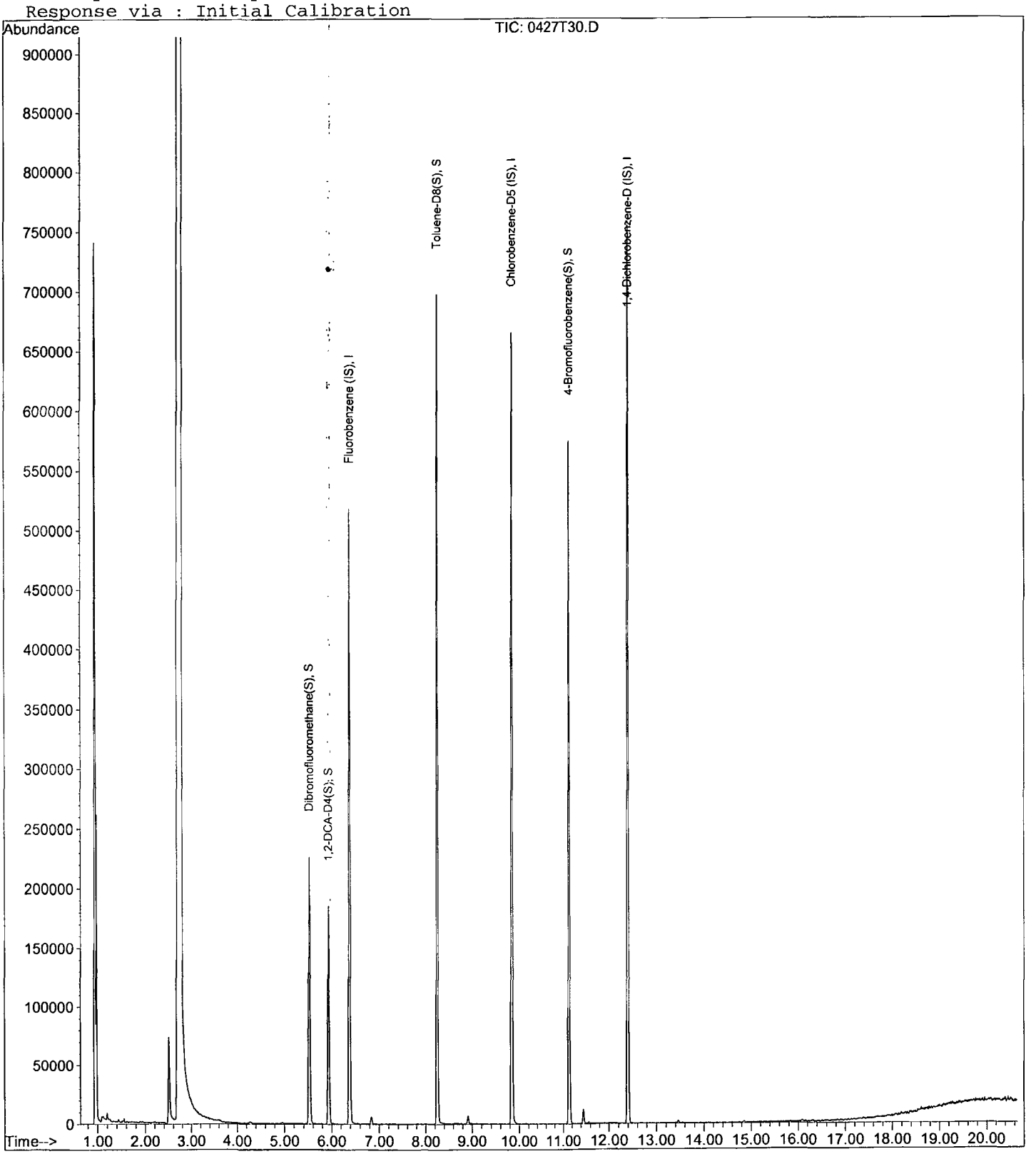
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T30.D Vial: 29
Acq On : 27 Apr 20 23:00 Operator:
Sample : BA10168W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:02 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T18.D Vial: 17
Acq On : 27 Apr 20 17:25 Operator:
Sample : 200427A BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:53 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	530763	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	472413	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	285229	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	148837	25.35	ppb	0.00
Spiked Amount 25.000			Recovery = 101.396%			
48) 1,2-DCA-D4(S)	5.93	65	160199	25.21	ppb	0.00
Spiked Amount 25.000			Recovery = 100.848%			
69) Toluene-D8(S)	8.25	98	515719	24.32	ppb	0.00
Spiked Amount 25.000			Recovery = 97.280%			
77) 4-Bromofluorobenzene(S)	11.13	95	206919	23.93	ppb	0.00
Spiked Amount 25.000			Recovery = 95.736%			

Target Compounds Qvalue

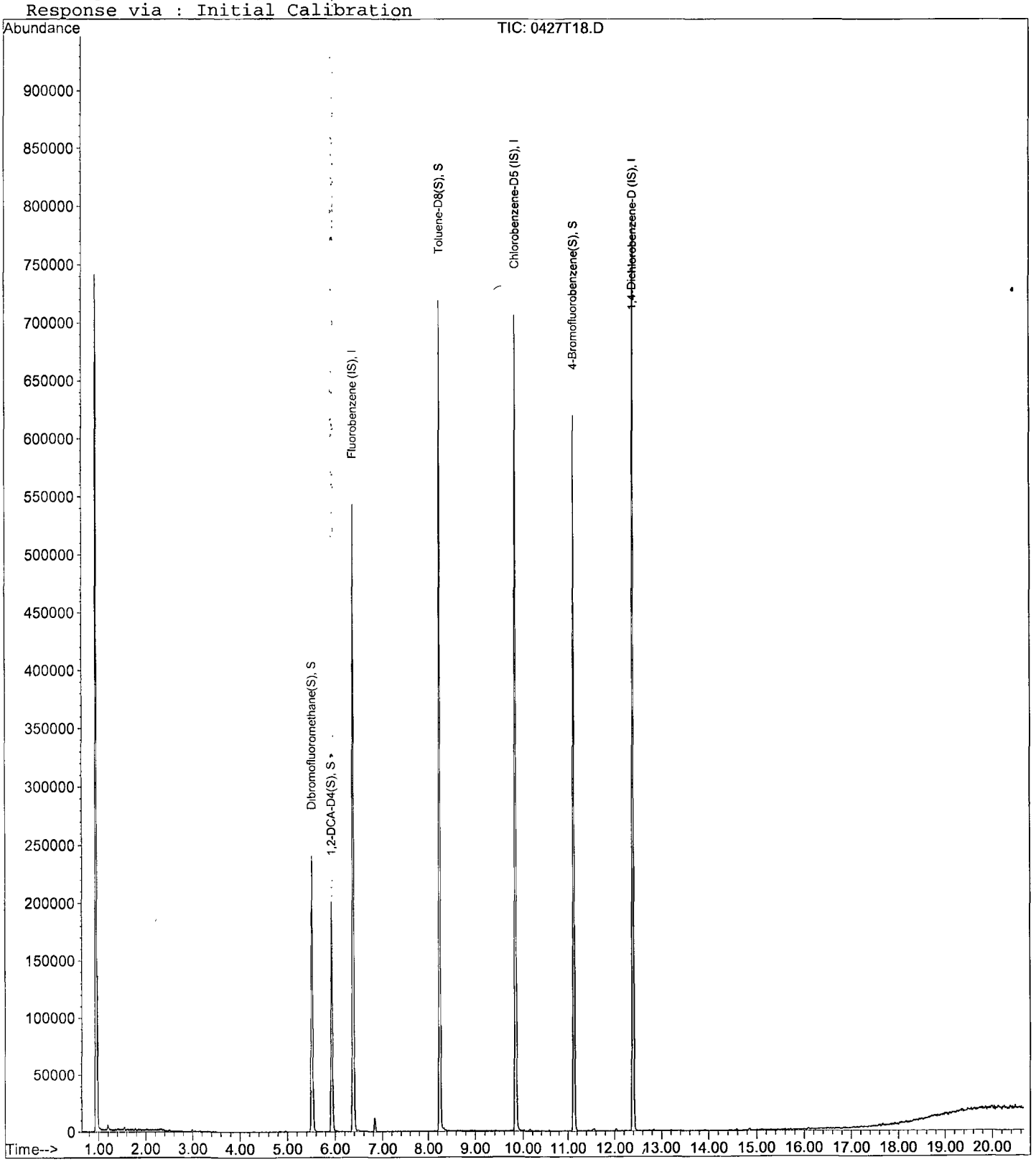
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T18.D Vial: 17
Acq On : 27 Apr 20 17:25 Operator:
Sample : 200427A BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:53 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T13.D Vial: 12
Acq On : 27 Apr 20 15:06 Operator:
Sample : 200427A LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:48 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	556642	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	493140	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	313233	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	152654	24.79	ppb		0.00
Spiked Amount 25.000			Recovery =	99.164%			
48) 1,2-DCA-D4(S)	5.93	65	165369	24.82	ppb		0.00
Spiked Amount 25.000			Recovery =	99.260%			
69) Toluene-D8(S)	8.25	98	541395	24.46	ppb		0.00
Spiked Amount 25.000			Recovery =	97.828%			
77) 4-Bromofluorobenzene(S)	11.13	95	219721	24.35	ppb		0.00
Spiked Amount 25.000			Recovery =	97.384%			
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	18440	8.49	ppb		92
4) Freon 114	1.22	85	13873	9.55	ppb		98
5) Chloromethane	1.25	50	19016	10.92	ppb		99
6) Vinyl chloride	1.34	62	17496	9.43	ppb		96
9) Bromomethane	1.60	94	15655	9.23	ppb		96
10) Chloroethane	1.70	66	3350	11.18	ppb	#	53
11) Dichlorofluoromethane	1.89	67	38551	10.13	ppb		91
12) Trichlorofluoromethane	1.94	101	36574	9.91	ppb		94
16) Acrolein	2.33	56	18192	111.81	ppb	#	100
17) Acetone	2.50	43	3802	10.54	ppb	#	81
18) Freon-113	2.47	101	17249	9.49	ppb		99
19) 1,1-DCE	2.44	61	24949	8.89	ppb		98
21) Acetonitrile	2.79	40	6248	111.77	ppb		88
22) t-Butanol	3.21	59	21821	125.27	ppb	#	82
23) Methyl Acetate	2.90	43	11605	8.95	ppb	#	88
24) Iodomethane	2.58	142	6920	5.51	ppb	#	89
25) Acrylonitrile	3.30	52	5312	9.13	ppb	#	85
26) Methylene chloride	2.98	49	22384	10.01	ppb		98
27) Carbon disulfide	2.64	76	40710	9.81	ppb		98
28) Methyl t-butyl ether (MtBE	3.39	73	57774	9.51	ppb		95
29) Trans-1,2-DCE	3.35	61	24386	9.49	ppb		97
31) Diisopropyl Ether	4.19	45	48057	9.23	ppb		96
33) 1,1-DCA	3.96	63	34101	10.06	ppb		97
34) Vinyl Acetate	4.12	43	20848	7.96	ppb		100
35) Ethyl tert Butyl Ether	4.74	59	57991	9.58	ppb		100
36) MEK (2-Butanone)	4.90	43	7486	9.82	ppb		97
37) Cis-1,2-DCE	4.84	61	32379	9.54	ppb		93
38) 2,2-Dichloropropane	4.84	77	31711	9.36	ppb		98
41) Chloroform	5.31	83	45313	9.97	ppb		98
42) Bromochloromethane	5.16	49	14929	9.31	ppb		97
44) 1,1,1-TCA	5.53	97	39723	9.74	ppb		97
45) Cyclohexane	5.61	56	22017	9.03	ppb		91
46) 1,1-Dichloropropene	5.76	75	25997	8.94	ppb	#	86
47) 2,2,4-Trimethylpentane	6.19	57	37983	8.25	ppb		99
49) Carbon Tetrachloride	5.75	117	36878	10.18	ppb		96
50) Tert Amyl Methyl Ether	6.23	73	60029	9.37	ppb		98
52) 1,2-DCA	6.03	62	36398	9.40	ppb	#	89
53) Benzene	6.01	78	83922	9.40	ppb		96
54) TCE	6.84	130	40386	11.82	ppb		96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T13.D Vial: 12
Acq On : 27 Apr 20 15:06 Operator:
Sample : 200427A LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:48 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.07	43	159252	120.57	ppb		99
56)	1,2-Dichloropropane	7.08	63	20297	9.22	ppb	#	92
57)	Bromodichloromethane	7.42	83	34105	9.53	ppb		91
58)	Methyl Cyclohexane	7.07	83	27070	9.14	ppb		99
59)	Dibromomethane	7.21	174	25418	9.59	ppb		98
60)	MIBK (methyl isobutyl ket	8.14	43	15979	8.52	ppb	#	87
61)	1-Bromo-2-chloroethane	7.75	63	15059	9.60	ppb		100
63)	Cis-1,3-Dichloropropene	7.94	75	36135	9.58	ppb		98
64)	Toluene	8.32	91	104230	9.64	ppb		99
65)	Trans-1,3-Dichloropropene	8.58	75	32733	9.27	ppb		97
66)	1,1,2-TCA	8.77	97	23865	9.45	ppb		96
67)	2-Hexanone	9.08	43	10170	8.90	ppb		92
70)	1,2-EDB	9.30	107	25148	9.66	ppb		95
71)	Tetrachloroethene	8.94	166	37530	9.45	ppb		96
72)	1-Chlorohexane	9.88	91	26137	8.93	ppb		92
73)	1,1,1,2-Tetrachloroethane	9.97	131	33274	10.37	ppb		98
74)	m&p-Xylene	10.14	91	182349	19.19	ppb		99
75)	o-Xylene	10.57	91	97369	9.48	ppb		96
76)	Styrene	10.58	104	79309	9.89	ppb		92
78)	1,3-Dichloropropane	8.95	76	37343	9.54	ppb		100
79)	Dibromochloromethane	9.19	129	31745	9.68	ppb		88
80)	Chlorobenzene	9.87	112	76046	9.38	ppb		95
81)	Ethylbenzene	10.01	91	120288	9.67	ppb		96
82)	Bromoform	10.76	173	27336	10.00	ppb		98
84)	Isopropylbenzene	10.99	105	120080	9.44	ppb		98
85)	1,1,2,2-Tetrachloroethane	11.29	83	25905	9.51	ppb		99
86)	1,2,3-Trichloropropane	11.32	110	11493	9.19	ppb	#	75
87)	t-1,4-Dichloro-2-Butene	11.35	53	5232	10.14	ppb		85
88)	Bromobenzene	11.29	77	56583	9.22	ppb		98
89)	n-Propylbenzene	11.43	91	130675	9.36	ppb		96
90)	4-Ethyltoluene	11.56	105	117041	9.62	ppb		99
91)	2-Chlorotoluene	11.51	91	95641	9.32	ppb		93
92)	1,3,5-Trimethylbenzene	11.63	105	110593	9.94	ppb		95
93)	4-Chlorotoluene	11.63	91	103489	9.83	ppb		98
94)	Tert-Butylbenzene	11.98	119	112009	10.01	ppb		99
95)	1,2,4-Trimethylbenzene	12.03	105	111225	9.65	ppb		98
96)	Sec-Butylbenzene	12.22	105	124984	9.55	ppb		99
97)	p-Isopropyltoluene	12.39	119	120081	9.94	ppb		97
98)	Benzyl Chloride	12.57	91	30778	8.72	ppb		98
99)	1,3-DCB	12.32	146	74980	9.40	ppb		100
100)	1,4-DCB	12.42	146	78572	10.17	ppb		96
101)	n-Butylbenzene	12.83	91	86939	9.19	ppb		98
102)	1,2-DCB	12.82	146	75556	9.39	ppb		96
103)	Hexachloroethane	13.12	201	24427	10.71	ppb		93
104)	1,2-Dibromo-3-chloropropan	13.66	157	8967	10.48	ppb		97
105)	1,2,4-Trichlorobenzene	14.59	180	58225	9.79	ppb		95
106)	Hexachlorobutadiene	14.79	225	29522	9.53	ppb		96
107)	Naphthalene	14.85	127	14338	9.87	ppb		90
108)	1,2,3-Trichlorobenzene	15.12	180	57194	9.75	ppb		97

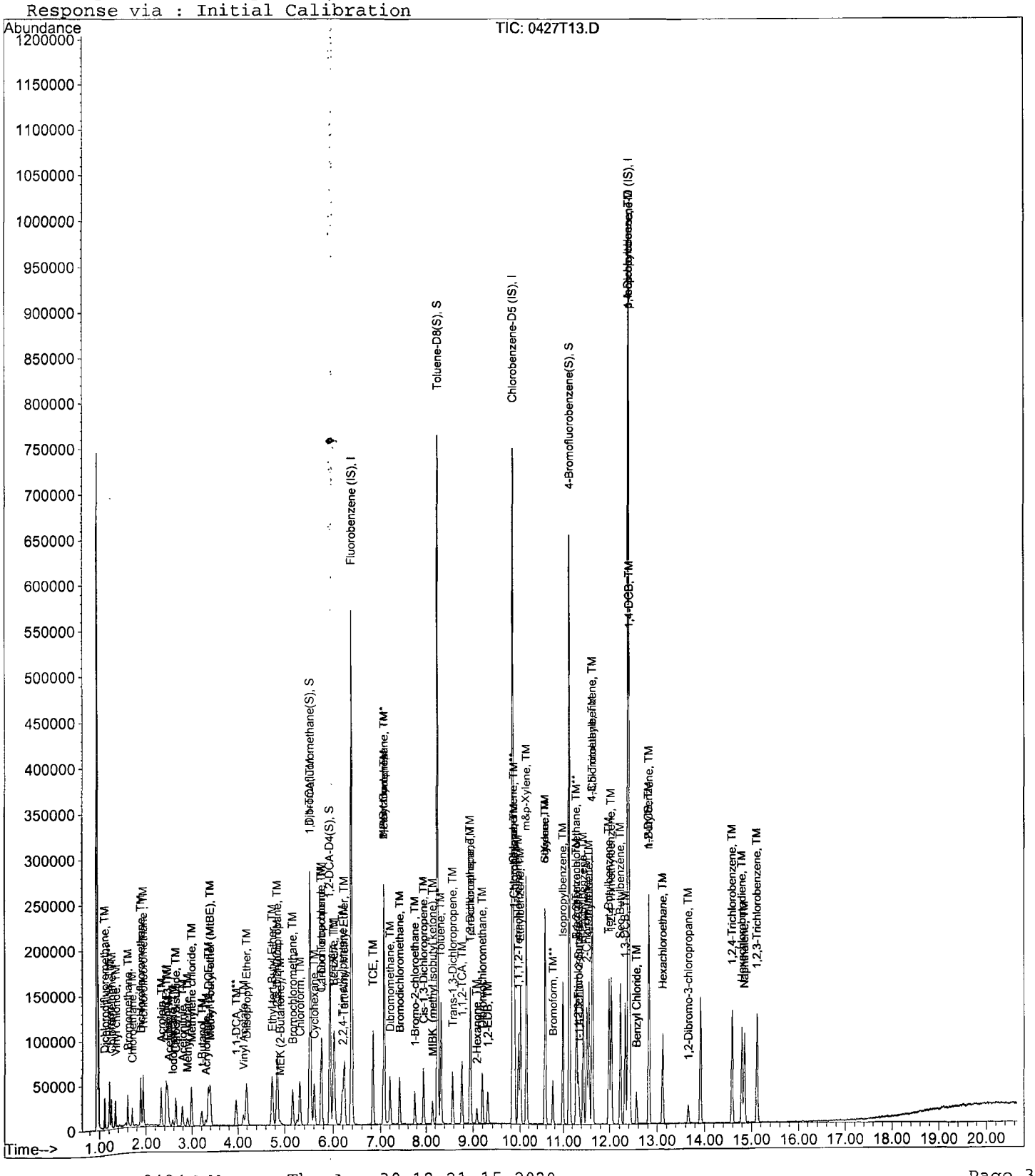
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T13.D Vial: 12
Acq On : 27 Apr 20 15:06 Operator:
Sample : 200427A LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:48 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T14.D Vial: 13
Acq On : 27 Apr 20 15:33 Operator:
Sample : 200427A LCSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:55 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	549870	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	492817	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	315337	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	155354	25.54	ppb		0.00
Spiked Amount 25.000			Recovery = 102.160%				
48) 1,2-DCA-D4(S)	5.93	65	165359	25.12	ppb		0.00
Spiked Amount 25.000			Recovery = 100.480%				
69) Toluene-D8(S)	8.25	98	542991	24.55	ppb		0.00
Spiked Amount 25.000			Recovery = 98.184%				
77) 4-Bromofluorobenzene(S)	11.13	95	218400	24.22	ppb		0.00
Spiked Amount 25.000			Recovery = 96.864%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	17584	8.18	ppb		100
4) Freon 114	1.22	85	10832	7.51	ppb		90
5) Chloromethane	1.25	50	17144	9.87	ppb		97
6) Vinyl chloride	1.34	62	16640	9.06	ppb		95
9) Bromomethane	1.60	94	15441	9.22	ppb		92
10) Chloroethane	1.70	66	2875	9.68	ppb		84
11) Dichlorofluoromethane	1.88	67	35905	9.55	ppb		93
12) Trichlorofluoromethane	1.94	101	30670	8.41	ppb		92
16) Acrolein	2.33	56	19168	118.87	ppb	#	100
17) Acetone	2.50	43	4077	11.60	ppb	#	83
18) Freon-113	2.47	101	13864	7.72	ppb		96
19) 1,1-DCE	2.44	61	24820	8.95	ppb		97
21) Acetonitrile	2.78	40	6863	124.29	ppb		86
22) t-Butanol	3.21	59	20158	117.15	ppb	#	89
23) Methyl Acetate	2.89	43	11651	9.11	ppb		91
24) Iodomethane	2.58	142	9065	6.67	ppb		90
25) Acrylonitrile	3.29	52	4703	8.18	ppb		89
26) Methylene chloride	2.98	49	21870	9.90	ppb		94
27) Carbon disulfide	2.64	76	39101	9.55	ppb		99
28) Methyl t-butyl ether (MtBE	3.40	73	57351	9.55	ppb		100
29) Trans-1,2-DCE	3.35	61	23228	9.15	ppb	#	86
31) Diisopropyl Ether	4.19	45	48223	9.38	ppb		96
33) 1,1-DCA	3.96	63	29517	8.81	ppb		94
34) Vinyl Acetate	4.12	43	20877	8.07	ppb		96
35) Ethyl tert Butyl Ether	4.74	59	54949	9.19	ppb		100
36) MEK (2-Butanone)	4.90	43	7207	9.57	ppb	#	80
37) Cis-1,2-DCE	4.84	61	32079	9.57	ppb		95
38) 2,2-Dichloropropane	4.84	77	30947	9.24	ppb		99
41) Chloroform	5.31	83	42850	9.55	ppb		95
42) Bromochloromethane	5.16	49	14482	9.14	ppb		90
44) 1,1,1-TCA	5.53	97	38157	9.47	ppb		94
45) Cyclohexane	5.61	56	18499	7.68	ppb	#	95
46) 1,1-Dichloropropene	5.76	75	24126	8.39	ppb		95
47) 2,2,4-Trimethylpentane	6.19	57	32387	7.12	ppb		98
49) Carbon Tetrachloride	5.76	117	32491	9.08	ppb		93
50) Tert Amyl Methyl Ether	6.23	73	58036	9.17	ppb		97
52) 1,2-DCA	6.03	62	34482	9.01	ppb		98
53) Benzene	6.01	78	80144	9.09	ppb		100
54) TCE	6.84	130	38838	11.50	ppb		91

(#) = qualifier out of range (m) = manual integration
0427T14.D T0424W.M Thu Apr 30 12:21:18 2020

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T14.D Vial: 13
Acq On : 27 Apr 20 15:33 Operator:
Sample : 200427A LCSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:55 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	158281	121.31	ppb		96
56)	1,2-Dichloropropane	7.08	63	21113	9.71	ppb		99
57)	Bromodichloromethane	7.42	83	34669	9.80	ppb		98
58)	Methyl Cyclohexane	7.07	83	23046	7.88	ppb		96
59)	Dibromomethane	7.21	174	26357	10.06	ppb		95
60)	MIBK (methyl isobutyl ket	8.14	43	16425	8.87	ppb		91
61)	1-Bromo-2-chloroethane	7.75	63	14629	9.44	ppb		96
63)	Cis-1,3-Dichloropropene	7.95	75	34218	9.18	ppb	#	91
64)	Toluene	8.32	91	98966	9.27	ppb		97
65)	Trans-1,3-Dichloropropene	8.58	75	33368	9.57	ppb		96
66)	1,1,2-TCA	8.77	97	22916	9.19	ppb		95
67)	2-Hexanone	9.07	43	10378	9.20	ppb	#	86
70)	1,2-EDB	9.30	107	26126	10.05	ppb		97
71)	Tetrachloroethene	8.94	166	35866	9.03	ppb		92
72)	1-Chlorohexane	9.88	91	26381	9.02	ppb		95
73)	1,1,1,2-Tetrachloroethane	9.96	131	31647	9.87	ppb		96
74)	m&p-Xylene	10.14	91	176557	18.59	ppb		99
75)	o-Xylene	10.57	91	94935	9.25	ppb		97
76)	Styrene	10.58	104	75241	9.39	ppb		95
78)	1,3-Dichloropropane	8.95	76	36395	9.31	ppb		95
79)	Dibromochloromethane	9.19	129	33313	10.17	ppb		93
80)	Chlorobenzene	9.87	112	75830	9.36	ppb		99
81)	Ethylbenzene	10.01	91	114913	9.24	ppb		95
82)	Bromoform	10.76	173	27463	10.05	ppb		93
84)	Isopropylbenzene	10.99	105	114611	8.95	ppb		100
85)	1,1,2,2-Tetrachloroethane	11.29	83	24664	8.99	ppb		95
86)	1,2,3-Trichloropropane	11.33	110	11211	8.91	ppb	#	81
87)	t-1,4-Dichloro-2-Butene	11.35	53	5115	9.85	ppb		87
88)	Bromobenzene	11.29	77	55688	9.01	ppb		93
89)	n-Propylbenzene	11.43	91	127701	9.08	ppb		98
90)	4-Ethyltoluene	11.56	105	113083	9.23	ppb		100
91)	2-Chlorotoluene	11.51	91	91469	8.86	ppb		99
92)	1,3,5-Trimethylbenzene	11.63	105	103618	9.25	ppb		98
93)	4-Chlorotoluene	11.63	91	100082	9.44	ppb		99
94)	Tert-Butylbenzene	11.98	119	104482	9.27	ppb		95
95)	1,2,4-Trimethylbenzene	12.03	105	105447	9.09	ppb		97
96)	Sec-Butylbenzene	12.22	105	117914	8.95	ppb		100
97)	p-Isopropyltoluene	12.39	119	111111	9.13	ppb		97
98)	Benzyl Chloride	12.56	91	29384	8.27	ppb	#	96
99)	1,3-DCB	12.32	146	76800	9.57	ppb		97
100)	1,4-DCB	12.42	146	79244	10.18	ppb		96
101)	n-Butylbenzene	12.83	91	84061	8.82	ppb		95
102)	1,2-DCB	12.82	146	75386	9.30	ppb		98
103)	Hexachloroethane	13.12	201	23235	10.12	ppb		99
104)	1,2-Dibromo-3-chloropropan	13.66	157	8740	10.15	ppb		99
105)	1,2,4-Trichlorobenzene	14.59	180	61390	10.24	ppb		94
106)	Hexachlorobutadiene	14.79	225	28894	9.27	ppb		98
107)	Naphthalene	14.85	127	13930	9.54	ppb		76
108)	1,2,3-Trichlorobenzene	15.12	180	56952	9.65	ppb		95

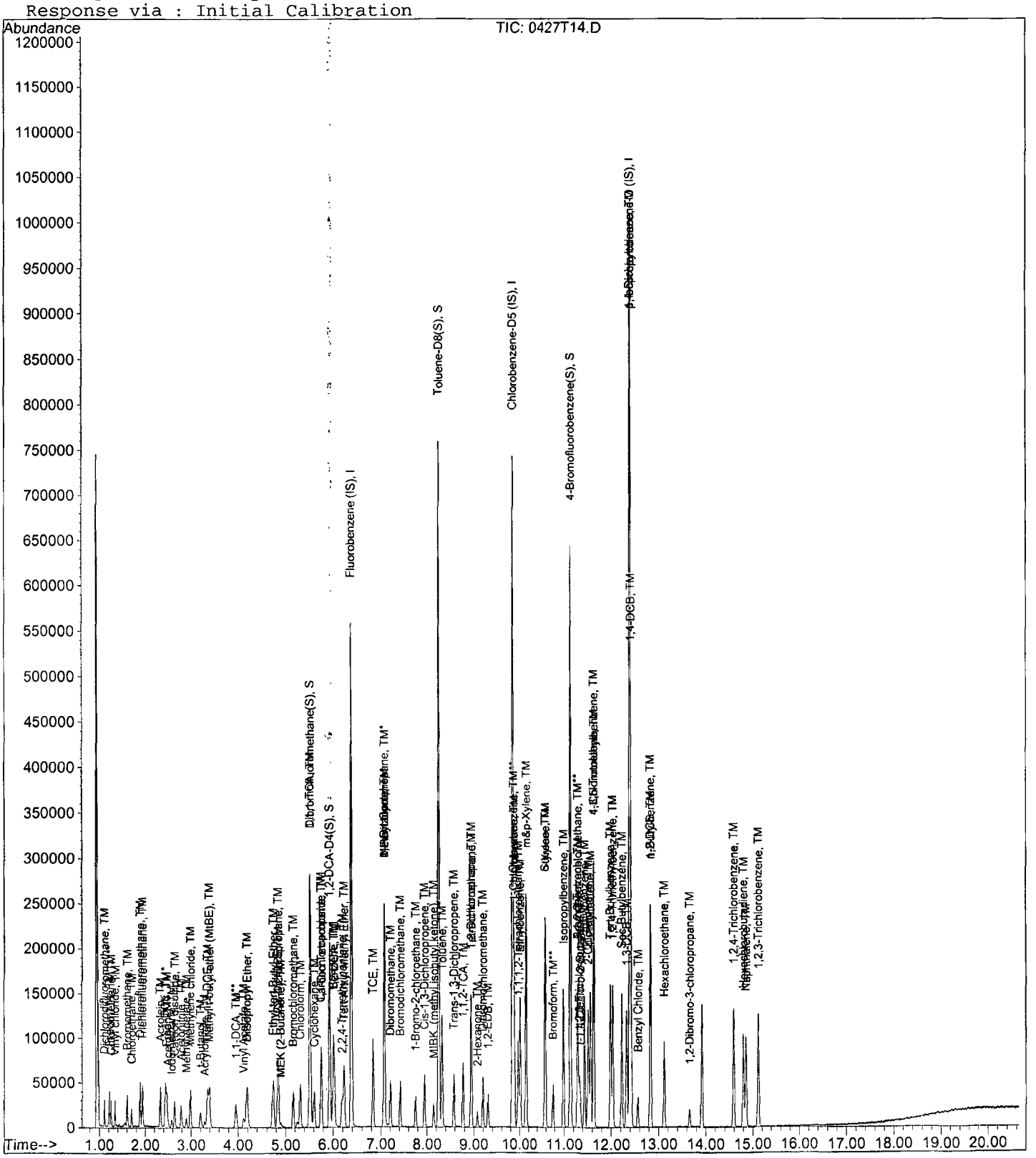
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T14.D Vial: 13
Acq On : 27 Apr 20 15:33 Operator:
Sample : 200427A LCSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:55 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T31.D Vial: 30
Acq On : 27 Apr 20 23:28 Operator:
Sample : BA10158W02 MS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	512443	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	459301	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	291876	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	142921	25.21	ppb		0.00
Spiked Amount 25.000			Recovery = 100.848%				
48) 1,2-DCA-D4(S)	5.93	65	152363	24.84	ppb		0.00
Spiked Amount 25.000			Recovery = 99.344%				
69) Toluene-D8(S)	8.25	98	506002	24.54	ppb		0.00
Spiked Amount 25.000			Recovery = 98.172%				
77) 4-Bromofluorobenzene(S)	11.13	95	207485	24.68	ppb		0.00
Spiked Amount 25.000			Recovery = 98.736%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	20184	10.16	ppb		98
4) Freon 114	1.22	85	11593	8.65	ppb		92
5) Chloromethane	1.25	50	16416	10.17	ppb		97
6) Vinyl chloride	1.34	62	15969	9.35	ppb		94
9) Bromomethane	1.60	94	15620	10.06	ppb		93
10) Chloroethane	1.70	66	2843	10.29	ppb		78
11) Dichlorofluoromethane	1.89	67	31948	9.11	ppb		99
12) Trichlorofluoromethane	1.94	101	35303	10.39	ppb		97
16) Acrolein	2.33	56	16308	109.00	ppb	#	100
17) Acetone	2.50	43	5611	18.03	ppb	#	69
18) Freon-113	2.47	101	14694	8.78	ppb		95
19) 1,1-DCE	2.44	61	24258	9.39	ppb		93
21) Acetonitrile	2.78	40	6860	133.31	ppb	#	75
22) t-Butanol	3.21	59	21865	136.35	ppb	#	84
23) Methyl Acetate	2.90	43	9554	7.95	ppb		93
24) Iodomethane	2.58	142	7657	6.23	ppb		99
25) Acrylonitrile	3.30	52	4347	8.12	ppb	#	82
26) Methylene chloride	2.99	49	21985	10.71	ppb		97
27) Carbon disulfide	2.64	76	33902	8.89	ppb		97
28) Methyl t-butyl ether (MtBE	3.40	73	49424	8.83	ppb		96
29) Trans-1,2-DCE	3.35	61	22099	9.34	ppb		93
31) Diisopropyl Ether	4.19	45	41379	8.63	ppb		99
33) 1,1-DCA	3.96	63	30884	9.89	ppb		99
34) Vinyl Acetate	4.12	43	23588	9.78	ppb		99
35) Ethyl tert Butyl Ether	4.73	59	45740	8.20	ppb		96
36) MEK (2-Butanone)	4.90	43	6219	8.86	ppb		95
37) Cis-1,2-DCE	4.84	61	30663	9.81	ppb		98
38) 2,2-Dichloropropane	4.84	77	24687	7.91	ppb		95
41) Chloroform	5.31	83	40990	9.80	ppb		96
42) Bromochloromethane	5.16	49	13507	9.15	ppb		89
44) 1,1,1-TCA	5.53	97	37200	9.91	ppb		95
45) Cyclohexane	5.61	56	19206	8.55	ppb		88
46) 1,1-Dichloropropene	5.77	75	23988	8.96	ppb		96
47) 2,2,4-Trimethylpentane	6.19	57	32609	7.69	ppb		98
49) Carbon Tetrachloride	5.76	117	34415	10.32	ppb		97
50) Tert Amyl Methyl Ether	6.23	73	48581	8.24	ppb		98
52) 1,2-DCA	6.03	62	33390	9.37	ppb		95
53) Benzene	6.01	78	75043	9.13	ppb		99
54) TCE	6.83	130	33660	10.70	ppb		97

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T31.D Vial: 30
Acq On : 27 Apr 20 23:28 Operator:
Sample : BA10158W02 MS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	138398	113.82	ppb		99
56)	1,2-Dichloropropane	7.08	63	18624	9.19	ppb	#	91
57)	Bromodichloromethane	7.42	83	32510	9.87	ppb		98
58)	Methyl Cyclohexane	7.07	83	24522	9.00	ppb		99
59)	Dibromomethane	7.21	174	24283	9.95	ppb		95
60)	MIBK (methyl isobutyl ket	8.14	43	14409	8.35	ppb	#	85
61)	1-Bromo-2-chloroethane	7.76	63	12586	8.71	ppb		97
63)	Cis-1,3-Dichloropropene	7.95	75	29793	8.58	ppb	#	94
64)	Toluene	8.32	91	93297	9.38	ppb		97
65)	Trans-1,3-Dichloropropene	8.58	75	27823	8.56	ppb		95
66)	1,1,2-TCA	8.77	97	22307	9.60	ppb		94
67)	2-Hexanone	9.08	43	9424	8.96	ppb	#	95
70)	1,2-EDB	9.31	107	23059	9.51	ppb		99
71)	Tetrachloroethene	8.94	166	35103	9.49	ppb		98
72)	1-Chlorohexane	9.88	91	22217	8.15	ppb	#	91
73)	1,1,1,2-Tetrachloroethane	9.96	131	30310	10.14	ppb		99
74)	m&p-Xylene	10.14	91	166156	18.77	ppb		96
75)	o-Xylene	10.57	91	88942	9.30	ppb		94
76)	Styrene	10.58	104	70436	9.43	ppb		95
78)	1,3-Dichloropropane	8.95	76	34957	9.59	ppb		95
79)	Dibromochloromethane	9.19	129	30229	9.90	ppb		92
80)	Chlorobenzene	9.87	112	68112	9.02	ppb		93
81)	Ethylbenzene	10.01	91	107202	9.25	ppb		98
82)	Bromoform	10.76	173	24816	9.75	ppb		99
84)	Isopropylbenzene	10.98	105	109693	9.26	ppb		96
85)	1,1,2,2-Tetrachloroethane	11.29	83	22772	8.97	ppb		95
86)	1,2,3-Trichloropropane	11.33	110	10531	9.04	ppb	#	87
87)	t-1,4-Dichloro-2-Butene	11.35	53	3151	6.56	ppb	#	52
88)	Bromobenzene	11.29	77	50205	8.78	ppb		92
89)	n-Propylbenzene	11.43	91	117922	9.06	ppb		96
90)	4-Ethyltoluene	11.56	105	97468	8.60	ppb		98
91)	2-Chlorotoluene	11.51	91	84945	8.88	ppb		96
92)	1,3,5-Trimethylbenzene	11.63	105	98668	9.52	ppb		99
93)	4-Chlorotoluene	11.63	91	91794	9.36	ppb		99
94)	Tert-Butylbenzene	11.98	119	99911	9.58	ppb		98
95)	1,2,4-Trimethylbenzene	12.04	105	98397	9.17	ppb		97
96)	Sec-Butylbenzene	12.22	105	115627	9.48	ppb		99
97)	p-Isopropyltoluene	12.39	119	103067	9.15	ppb		97
98)	Benzyl Chloride	12.57	91	21191	6.44	ppb	#	92
99)	1,3-DCB	12.32	146	68256	9.18	ppb		95
100)	1,4-DCB	12.42	146	70614	9.79	ppb		98
101)	n-Butylbenzene	12.83	91	75337	8.54	ppb		98
102)	1,2-DCB	12.82	146	69928	9.32	ppb		96
103)	Hexachloroethane	13.12	201	21592	10.16	ppb		90
104)	1,2-Dibromo-3-chloropropan	13.66	157	8633	10.83	ppb	#	79
105)	1,2,4-Trichlorobenzene	14.59	180	52221	9.43	ppb		91
106)	Hexachlorobutadiene	14.80	225	27187	9.42	ppb		96
107)	Naphthalene	14.85	127	11223	8.37	ppb		81
108)	1,2,3-Trichlorobenzene	15.12	180	48639	8.91	ppb		99

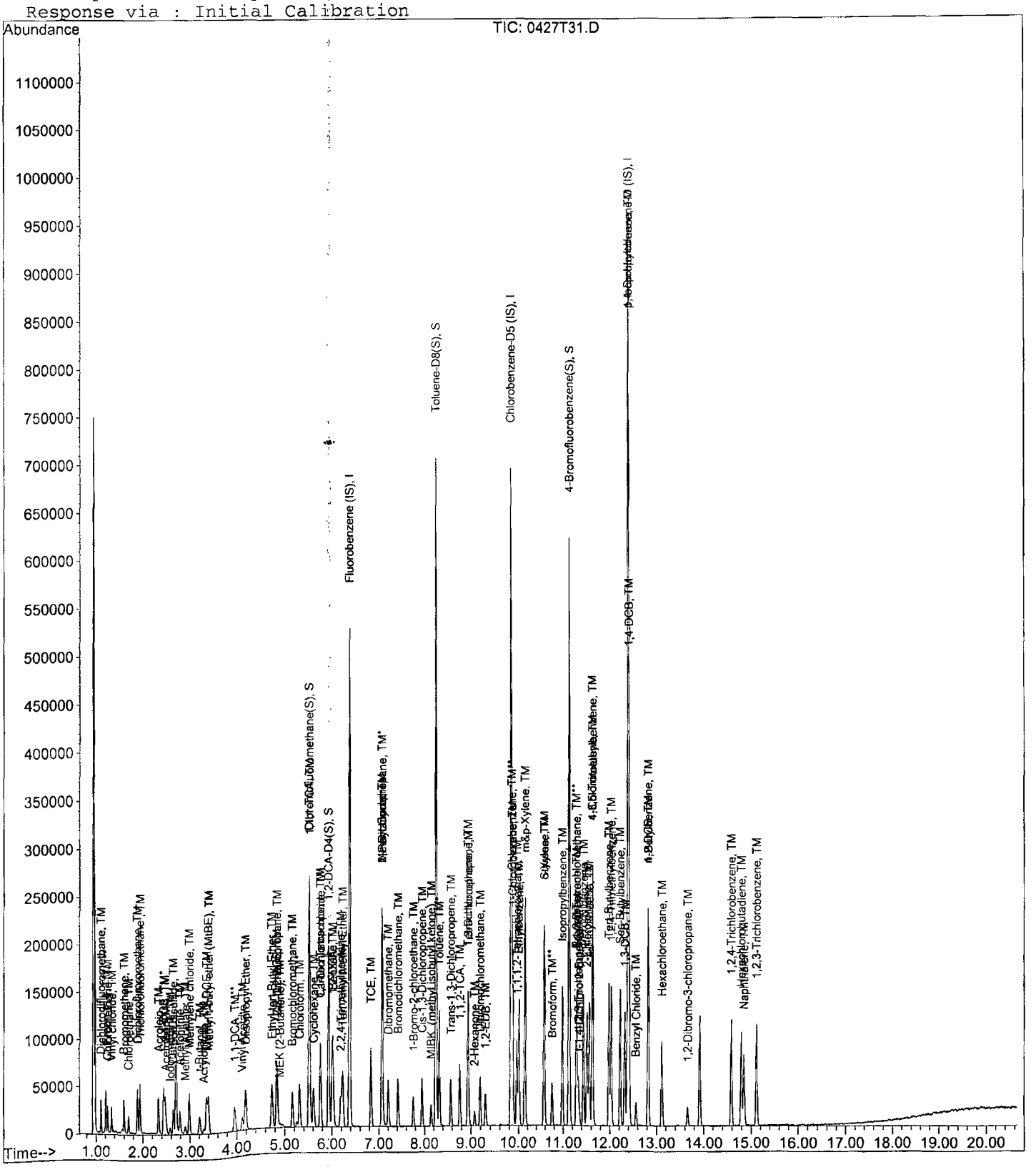
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T31.D Vial: 30
Acq On : 27 Apr 20 23:28 Operator:
Sample : BA10158W02 MS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T32.D Vial: 31
Acq On : 27 Apr 20 23:56 Operator:
Sample : BA10158W03 MSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	503827	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	453171	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	290256	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	142166	25.51	ppb		0.00
Spiked Amount 25.000			Recovery = 102.032%				
48) 1,2-DCA-D4(S)	5.93	65	155764	25.82	ppb		0.00
Spiked Amount 25.000			Recovery = 103.296%				
69) Toluene-D8(S)	8.25	98	495821	24.37	ppb		0.00
Spiked Amount 25.000			Recovery = 97.496%				
77) 4-Bromofluorobenzene(S)	11.13	95	205916	24.83	ppb		0.00
Spiked Amount 25.000			Recovery = 99.316%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	20456	10.49	ppb		96
4) Freon 114	1.22	85	12223	9.29	ppb		94
5) Chloromethane	1.25	50	16880	10.69	ppb		97
6) Vinyl chloride	1.34	62	15865	9.45	ppb		96
9) Bromomethane	1.60	94	15369	10.07	ppb		97
10) Chloroethane	1.70	66	3046	11.23	ppb	#	62
11) Dichlorofluoromethane	1.89	67	32851	9.53	ppb		98
12) Trichlorofluoromethane	1.94	101	35900	10.74	ppb		91
16) Acrolein	2.33	56	16656	113.04	ppb	#	100
17) Acetone	2.50	43	3938	12.33	ppb	#	75
18) Freon-113	2.47	101	15926	9.68	ppb		91
19) 1,1-DCE	2.44	61	24649	9.70	ppb		95
21) Acetonitrile	2.79	40	5998	118.55	ppb		87
22) t-Butanol	3.21	59	20145	127.77	ppb	#	86
23) Methyl Acetate	2.90	43	9654	8.19	ppb		96
24) Iodomethane	2.58	142	9408	7.29	ppb		98
25) Acrylonitrile	3.30	52	5069	9.63	ppb	#	71
26) Methylene chloride	2.99	49	21090	10.44	ppb		85
27) Carbon disulfide	2.65	76	35956	9.58	ppb		99
28) Methyl t-butyl ether (MtBE	3.40	73	49536	9.01	ppb		97
29) Trans-1,2-DCE	3.35	61	23155	9.95	ppb		98
31) Diisopropyl Ether	4.19	45	40084	8.51	ppb		94
33) 1,1-DCA	3.96	63	30122	9.81	ppb	#	96
34) Vinyl Acetate	4.12	43	24711	10.42	ppb		100
35) Ethyl tert Butyl Ether	4.74	59	47056	8.59	ppb		96
36) MEK (2-Butanone)	4.91	43	7331	10.62	ppb	#	89
37) Cis-1,2-DCE	4.84	61	27276	8.88	ppb		91
38) 2,2-Dichloropropane	4.84	77	26576	8.66	ppb		100
41) Chloroform	5.31	83	40769	9.92	ppb		95
42) Bromochloromethane	5.16	49	12595	8.68	ppb		96
44) 1,1,1-TCA	5.53	97	40007	10.84	ppb	#	92
45) Cyclohexane	5.61	56	19899	9.01	ppb		97
46) 1,1-Dichloropropene	5.76	75	25532	9.70	ppb		90
47) 2,2,4-Trimethylpentane	6.19	57	33774	8.11	ppb		99
49) Carbon Tetrachloride	5.76	117	35446	10.81	ppb		90
50) Tert Amyl Methyl Ether	6.23	73	49983	8.62	ppb		93
52) 1,2-DCA	6.03	62	33980	9.70	ppb	#	90
53) Benzene	6.01	78	74866	9.27	ppb		94
54) TCE	6.84	130	33409	10.80	ppb		94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T32.D Vial: 31
Acq On : 27 Apr 20 23:56 Operator:
Sample : BA10158W03 MSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
55)	2-Pentanone	7.08	43	141523	118.38 ppb		99
56)	1,2-Dichloropropane	7.08	63	17954	9.01 ppb		96
57)	Bromodichloromethane	7.42	83	32488	10.03 ppb		97
58)	Methyl Cyclohexane	7.07	83	24711	9.22 ppb		99
59)	Dibromomethane	7.21	174	24942	10.39 ppb		90
60)	MIBK (methyl isobutyl ket	8.14	43	15495	9.13 ppb	#	85
61)	1-Bromo-2-chloroethane	7.75	63	12683	8.93 ppb		96
63)	Cis-1,3-Dichloropropene	7.94	75	31751	9.30 ppb		99
64)	Toluene	8.32	91	95048	9.72 ppb		98
65)	Trans-1,3-Dichloropropene	8.58	75	28662	8.97 ppb		97
66)	1,1,2-TCA	8.77	97	21810	9.55 ppb		99
67)	2-Hexanone	9.08	43	9519	9.21 ppb		86
70)	1,2-EDB	9.31	107	23152	9.68 ppb		100
71)	Tetrachloroethene	8.94	166	35824	9.81 ppb		98
72)	1-Chlorohexane	9.88	91	23544	8.76 ppb		94
73)	1,1,1,2-Tetrachloroethane	9.97	131	30842	10.46 ppb		96
74)	m&p-Xylene	10.14	91	171319	19.62 ppb		98
75)	o-Xylene	10.57	91	89637	9.50 ppb		93
76)	Styrene	10.58	104	72677	9.86 ppb		97
78)	1,3-Dichloropropane	8.95	76	34882	9.70 ppb		96
79)	Dibromochloromethane	9.19	129	31472	10.45 ppb		100
80)	Chlorobenzene	9.87	112	71391	9.58 ppb		99
81)	Ethylbenzene	10.01	91	108437	9.49 ppb		99
82)	Bromoform	10.76	173	23976	9.54 ppb		100
84)	Isopropylbenzene	10.99	105	116414	9.88 ppb		96
85)	1,1,2,2-Tetrachloroethane	11.29	83	24196	9.59 ppb	#	93
86)	1,2,3-Trichloropropane	11.33	110	10056	8.68 ppb		90
87)	t-1,4-Dichloro-2-Butene	11.35	53	3937	8.24 ppb	#	79
88)	Bromobenzene	11.29	77	50715	8.92 ppb		95
89)	n-Propylbenzene	11.43	91	123098	9.51 ppb		97
90)	4-Ethyltoluene	11.56	105	101551	9.01 ppb		99
91)	2-Chlorotoluene	11.51	91	91022	9.57 ppb		95
92)	1,3,5-Trimethylbenzene	11.63	105	99289	9.63 ppb		95
93)	4-Chlorotoluene	11.63	91	93580	9.59 ppb		96
94)	Tert-Butylbenzene	11.98	119	103263	9.96 ppb		99
95)	1,2,4-Trimethylbenzene	12.03	105	101419	9.50 ppb		97
96)	Sec-Butylbenzene	12.22	105	118754	9.79 ppb		97
97)	p-Isopropyltoluene	12.39	119	107399	9.59 ppb		96
98)	Benzyl Chloride	12.56	91	22189	6.79 ppb	#	88
99)	1,3-DCB	12.32	146	70238	9.50 ppb		93
100)	1,4-DCB	12.42	146	71699	10.01 ppb		99
101)	n-Butylbenzene	12.83	91	78130	8.91 ppb		99
102)	1,2-DCB	12.82	146	70207	9.41 ppb		98
103)	Hexachloroethane	13.12	201	23220	10.99 ppb		94
104)	1,2-Dibromo-3-chloropropan	13.66	157	7744	9.77 ppb		94
105)	1,2,4-Trichlorobenzene	14.59	180	53646	9.73 ppb		98
106)	Hexachlorobutadiene	14.80	225	27190	9.48 ppb		94
107)	Naphthalene	14.85	127	13314	9.89 ppb		100
108)	1,2,3-Trichlorobenzene	15.12	180	53550	9.85 ppb		100

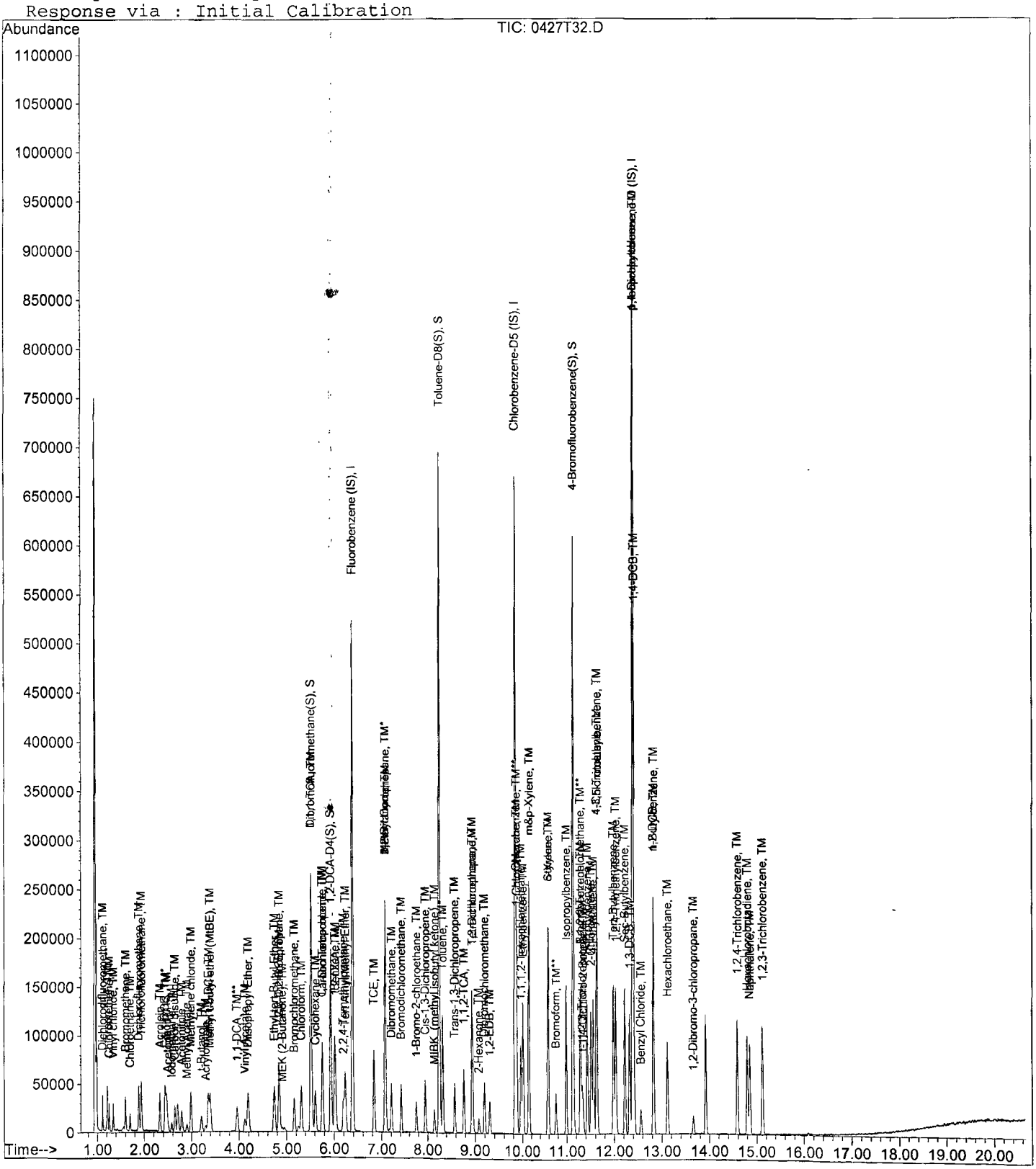
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T32.D Vial: 31
Acq On : 27 Apr 20 23:56 Operator:
Sample : BA10158W03 MSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T33.D Vial: 32
Acq On : 28 Apr 20 00:24 Operator:
Sample : BA10166W02 MS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	511086	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	456714	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	295842	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	146767	25.96	ppb		0.00
Spiked Amount 25.000			Recovery = 103.836%				
48) 1,2-DCA-D4(S)	5.93	65	154203	25.20	ppb		0.00
Spiked Amount 25.000			Recovery = 100.808%				
69) Toluene-D8(S)	8.25	98	501722	24.47	ppb		0.00
Spiked Amount 25.000			Recovery = 97.892%				
77) 4-Bromofluorobenzene(S)	11.13	95	207565	24.83	ppb		0.00
Spiked Amount 25.000			Recovery = 99.336%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	19208	9.68	ppb		97
4) Freon 114	1.22	85	11932	8.93	ppb		81
5) Chloromethane	1.25	50	14104	8.62	ppb	#	87
6) Vinyl chloride	1.34	62	15583	9.13	ppb		99
9) Bromomethane	1.60	94	15262	9.84	ppb		95
10) Chloroethane	1.70	66	2772	10.05	ppb		82
11) Dichlorofluoromethane	1.88	67	34747	9.94	ppb		95
12) Trichlorofluoromethane	1.94	101	35864	10.58	ppb		95
16) Acrolein	2.33	56	16197	108.57	ppb	#	100
17) Acetone	2.50	43	4884	15.49	ppb		89
18) Freon-113	2.47	101	16324	9.78	ppb		90
19) 1,1-DCE	2.44	61	22379	8.68	ppb	#	88
21) Acetonitrile	2.79	40	6459	125.85	ppb		78
22) t-Butanol	3.20	59	20994	131.26	ppb	#	75
23) Methyl Acetate	2.90	43	10095	8.45	ppb		95
24) Iodomethane	2.58	142	10570	7.86	ppb		97
25) Acrylonitrile	3.29	52	4122	7.72	ppb		86
26) Methylene chloride	2.98	49	19746	9.60	ppb		90
27) Carbon disulfide	2.64	76	36878	9.68	ppb		99
28) Methyl t-butyl ether (MtBE	3.40	73	52995	9.50	ppb		99
29) Trans-1,2-DCE	3.35	61	22495	9.53	ppb		91
31) Diisopropyl Ether	4.19	45	43159	9.03	ppb		91
33) 1,1-DCA	3.96	63	30803	9.89	ppb	#	95
34) Vinyl Acetate	4.12	43	22918	9.53	ppb	#	92
35) Ethyl tert Butyl Ether	4.74	59	48474	8.72	ppb		98
36) MEK (2-Butanone)	4.91	43	6833	9.76	ppb		93
37) Cis-1,2-DCE	4.84	61	28510	9.15	ppb		94
38) 2,2-Dichloropropane	4.84	77	25662	8.25	ppb		95
41) Chloroform	5.31	83	39564	9.49	ppb		99
42) Bromochloromethane	5.16	49	13157	8.93	ppb		94
44) 1,1,1-TCA	5.53	97	37454	10.01	ppb		93
45) Cyclohexane	5.61	56	19851	8.86	ppb		97
46) 1,1-Dichloropropene	5.76	75	24605	9.21	ppb		95
47) 2,2,4-Trimethylpentane	6.19	57	33879	8.01	ppb		99
49) Carbon Tetrachloride	5.76	117	33636	10.11	ppb		94
50) Tert Amyl Methyl Ether	6.23	73	51399	8.74	ppb		99
52) 1,2-DCA	6.03	62	32427	9.12	ppb		97
53) Benzene	6.01	78	76158	9.29	ppb		95
54) TCE	6.83	130	32962	10.50	ppb		94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T33.D Vial: 32
Acq On : 28 Apr 20 00:24 Operator:
Sample : BA10166W02 MS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	138857	114.50	ppb		99
56)	1,2-Dichloropropane	7.08	63	18104	8.96	ppb		98
57)	Bromodichloromethane	7.42	83	31343	9.54	ppb		98
58)	Methyl Cyclohexane	7.07	83	24782	9.11	ppb		99
59)	Dibromomethane	7.21	174	22982	9.44	ppb		97
60)	MIBK (methyl isobutyl ket	8.14	43	14862	8.63	ppb	#	95
61)	1-Bromo-2-chloroethane	7.75	63	11758	8.16	ppb	#	86
63)	Cis-1,3-Dichloropropene	7.95	75	29581	8.54	ppb		92
64)	Toluene	8.32	91	92375	9.31	ppb		99
65)	Trans-1,3-Dichloropropene	8.58	75	28311	8.74	ppb		91
66)	1,1,2-TCA	8.77	97	21030	9.07	ppb		97
67)	2-Hexanone	9.07	43	9974	9.51	ppb	#	72
70)	1,2-EDB	9.30	107	22293	9.25	ppb		94
71)	Tetrachloroethene	8.94	166	35255	9.58	ppb		98
72)	1-Chlorohexane	9.88	91	22874	8.44	ppb	#	90
73)	1,1,1,2-Tetrachloroethane	9.96	131	28486	9.58	ppb		97
74)	m&p-Xylene	10.14	91	159901	18.17	ppb		99
75)	o-Xylene	10.57	91	86790	9.12	ppb		95
76)	Styrene	10.59	104	70480	9.49	ppb		97
78)	1,3-Dichloropropane	8.95	76	33583	9.27	ppb		93
79)	Dibromochloromethane	9.19	129	29137	9.60	ppb		100
80)	Chlorobenzene	9.87	112	68803	9.16	ppb		100
81)	Ethylbenzene	10.01	91	101985	8.85	ppb		99
82)	Bromoform	10.76	173	24802	9.80	ppb		96
84)	Isopropylbenzene	10.99	105	107266	8.93	ppb		98
85)	1,1,2,2-Tetrachloroethane	11.29	83	23045	8.96	ppb		92
86)	1,2,3-Trichloropropane	11.33	110	9786	8.29	ppb	#	85
87)	t-1,4-Dichloro-2-Butene	11.35	53	3892	7.99	ppb	#	71
88)	Bromobenzene	11.29	77	49487	8.54	ppb		97
89)	n-Propylbenzene	11.43	91	117088	8.88	ppb		98
90)	4-Ethyltoluene	11.56	105	102941	8.96	ppb		98
91)	2-Chlorotoluene	11.51	91	83534	8.62	ppb		97
92)	1,3,5-Trimethylbenzene	11.63	105	96480	9.18	ppb		99
93)	4-Chlorotoluene	11.63	91	87954	8.85	ppb		96
94)	Tert-Butylbenzene	11.98	119	99985	9.46	ppb		98
95)	1,2,4-Trimethylbenzene	12.04	105	96738	8.89	ppb		98
96)	Sec-Butylbenzene	12.22	105	111992	9.06	ppb		98
97)	p-Isopropyltoluene	12.39	119	105956	9.28	ppb		95
98)	Benzyl Chloride	12.56	91	20272	6.08	ppb		100
99)	1,3-DCB	12.32	146	67995	9.03	ppb		96
100)	1,4-DCB	12.42	146	67995	9.29	ppb		98
101)	n-Butylbenzene	12.83	91	78293	8.76	ppb		99
102)	1,2-DCB	12.82	146	67627	8.90	ppb		94
103)	Hexachloroethane	13.12	201	20941	9.72	ppb		94
104)	1,2-Dibromo-3-chloropropan	13.66	157	7913	9.79	ppb		96
105)	1,2,4-Trichlorobenzene	14.59	180	52354	9.33	ppb		97
106)	Hexachlorobutadiene	14.80	225	27713	9.47	ppb		95
107)	Naphthalene	14.85	127	12548	9.18	ppb		96
108)	1,2,3-Trichlorobenzene	15.12	180	49774	8.99	ppb		97

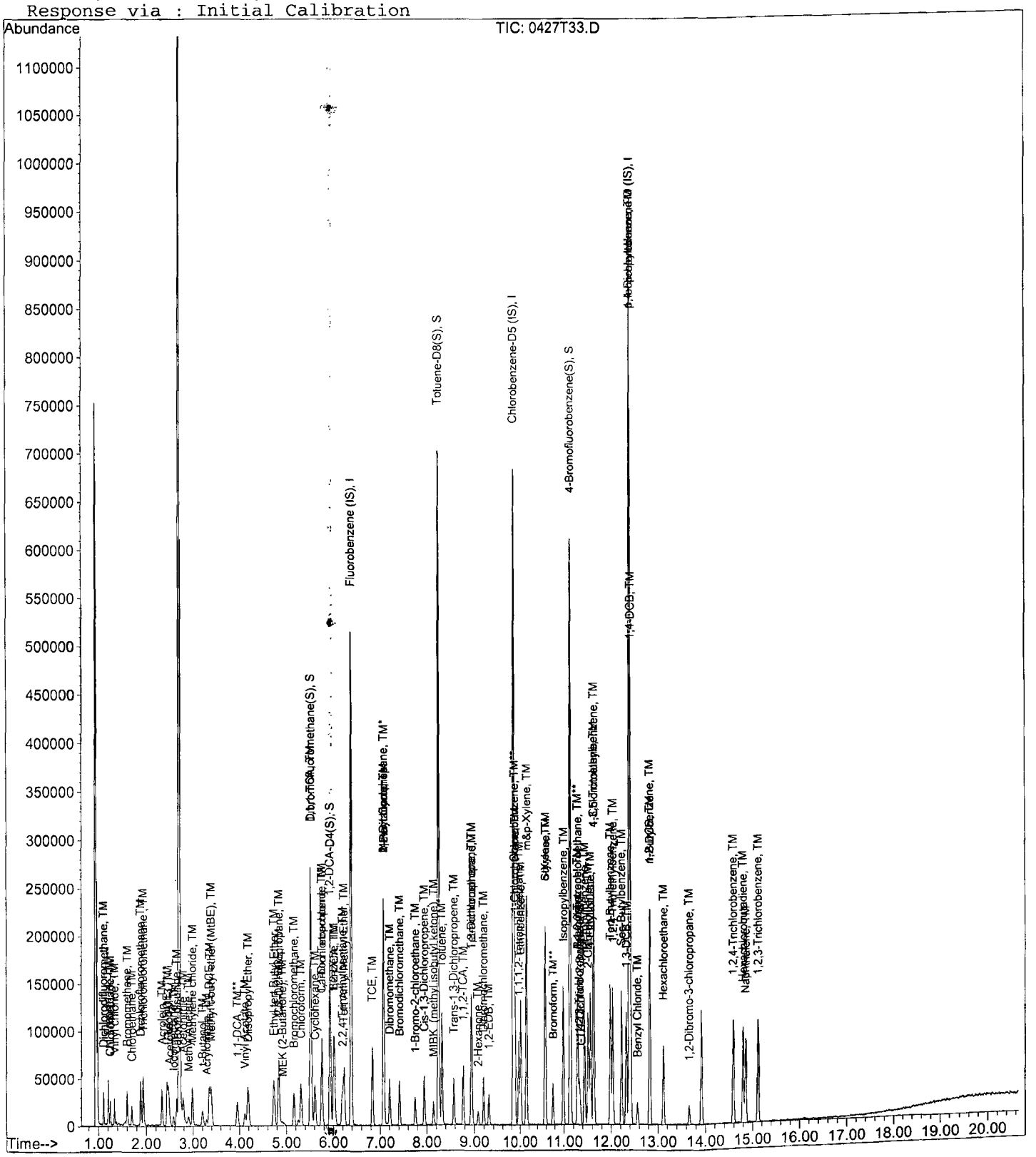
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T33.D Vial: 32
Acq On : 28 Apr 20 00:24 Operator:
Sample : BA10166W02 MS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T34.D Vial: 33
Acq On : 28 Apr 20 00:51 Operator:
Sample : BA10166W03 MSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	497420	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	444135	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	285408	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	143222	26.03	ppb		0.00
Spiked Amount 25.000			Recovery = 104.112%				
48) 1,2-DCA-D4(S)	5.93	65	153511	25.78	ppb		0.00
Spiked Amount 25.000			Recovery = 103.116%				
69) Toluene-D8(S)	8.25	98	491780	24.67	ppb		0.00
Spiked Amount 25.000			Recovery = 98.668%				
77) 4-Bromofluorobenzene(S)	11.13	95	201350	24.77	ppb		0.00
Spiked Amount 25.000			Recovery = 99.088%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	19104	9.90	ppb		97
4) Freon 114	1.22	85	12203	9.39	ppb		95
5) Chloromethane	1.25	50	15118	9.60	ppb		100
6) Vinyl chloride	1.34	62	15470	9.33	ppb		100
9) Bromomethane	1.60	94	15146	10.05	ppb		94
10) Chloroethane	1.70	66	2778	10.36	ppb	#	64
11) Dichlorofluoromethane	1.89	67	32178	9.46	ppb		95
12) Trichlorofluoromethane	1.94	101	32258	9.78	ppb		97
16) Acrolein	2.33	56	15146	104.48	ppb	#	100
17) Acetone	2.50	43	4916	16.09	ppb	#	82
18) Freon-113	2.47	101	16749	10.31	ppb	#	84
19) 1,1-DCE	2.44	61	23551	9.39	ppb		96
21) Acetonitrile	2.78	40	5498	110.07	ppb		91
22) t-Butanol	3.21	59	19283	123.88	ppb		97
23) Methyl Acetate	2.90	43	8944	7.65	ppb		96
24) Iodomethane	2.58	142	13156	9.46	ppb		99
25) Acrylonitrile	3.29	52	4803	9.24	ppb		91
26) Methylene chloride	2.99	49	21010	10.54	ppb		89
27) Carbon disulfide	2.64	76	36745	9.91	ppb		98
28) Methyl t-butyl ether (MtBE	3.39	73	50789	9.35	ppb		95
29) Trans-1,2-DCE	3.35	61	20775	9.04	ppb		95
31) Diisopropyl Ether	4.19	45	42238	9.08	ppb		97
33) 1,1-DCA	3.96	63	28735	9.48	ppb		95
34) Vinyl Acetate	4.12	43	22897	9.78	ppb		96
35) Ethyl tert Butyl Ether	4.73	59	48123	8.89	ppb		99
36) MEK (2-Butanone)	4.91	43	6400	9.39	ppb		97
37) Cis-1,2-DCE	4.84	61	28234	9.31	ppb		97
38) 2,2-Dichloropropane	4.84	77	24948	8.24	ppb		99
41) Chloroform	5.32	83	39894	9.83	ppb		94
42) Bromochloromethane	5.16	49	13561	9.46	ppb		96
44) 1,1,1-TCA	5.53	97	35921	9.86	ppb		97
45) Cyclohexane	5.61	56	20275	9.30	ppb		91
46) 1,1-Dichloropropene	5.76	75	25208	9.70	ppb	#	86
47) 2,2,4-Trimethylpentane	6.19	57	34645	8.42	ppb		96
49) Carbon Tetrachloride	5.75	117	32308	9.98	ppb		99
50) Tert Amyl Methyl Ether	6.23	73	50877	8.89	ppb		100
52) 1,2-DCA	6.03	62	32696	9.45	ppb	#	94
53) Benzene	6.01	78	72687	9.11	ppb		99
54) TCE	6.83	130	32299	10.58	ppb		92

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T34.D Vial: 33
Acq On : 28 Apr 20 00:51 Operator:
Sample : BA10166W03 MSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	137687	116.66	ppb		98
56)	1,2-Dichloropropane	7.08	63	17529	8.91	ppb	#	94
57)	Bromodichloromethane	7.42	83	30836	9.64	ppb		92
58)	Methyl Cyclohexane	7.07	83	24297	9.18	ppb		98
59)	Dibromomethane	7.21	174	23998	10.13	ppb		89
60)	MIBK (methyl isobutyl ket	8.14	43	14064	8.40	ppb	#	93
61)	1-Bromo-2-chloroethane	7.75	63	12339	8.80	ppb		97
63)	Cis-1,3-Dichloropropene	7.95	75	29296	8.69	ppb		94
64)	Toluene	8.32	91	90484	9.37	ppb		100
65)	Trans-1,3-Dichloropropene	8.58	75	28596	9.07	ppb		98
66)	1,1,2-TCA	8.77	97	21119	9.36	ppb		95
67)	2-Hexanone	9.08	43	9639	9.44	ppb		92
70)	1,2-EDB	9.30	107	21811	9.31	ppb	#	98
71)	Tetrachloroethene	8.94	166	32795	9.16	ppb		95
72)	1-Chlorohexane	9.88	91	23228	8.82	ppb	#	81
73)	1,1,1,2-Tetrachloroethane	9.96	131	29737	10.29	ppb		97
74)	m&p-Xylene	10.14	91	161398	18.86	ppb		97
75)	o-Xylene	10.57	91	87226	9.43	ppb		99
76)	Styrene	10.59	104	68083	9.43	ppb		96
78)	1,3-Dichloropropane	8.95	76	32547	9.23	ppb		98
79)	Dibromochloromethane	9.19	129	28388	9.62	ppb		93
80)	Chlorobenzene	9.87	112	66893	9.16	ppb		97
81)	Ethylbenzene	10.01	91	104312	9.31	ppb		100
82)	Bromoform	10.76	173	23632	9.60	ppb		91
84)	Isopropylbenzene	10.99	105	106441	9.19	ppb		96
85)	1,1,2,2-Tetrachloroethane	11.29	83	23054	9.29	ppb	#	97
86)	1,2,3-Trichloropropane	11.33	110	10613	9.32	ppb	#	79
87)	t-1,4-Dichloro-2-Butene	11.35	53	3787	8.06	ppb		89
88)	Bromobenzene	11.29	77	50134	8.96	ppb		93
89)	n-Propylbenzene	11.43	91	116596	9.16	ppb		96
90)	4-Ethyltoluene	11.56	105	102385	9.24	ppb		98
91)	2-Chlorotoluene	11.51	91	84143	9.00	ppb		99
92)	1,3,5-Trimethylbenzene	11.63	105	97239	9.59	ppb		100
93)	4-Chlorotoluene	11.63	91	89353	9.31	ppb		98
94)	Tert-Butylbenzene	11.98	119	97977	9.61	ppb		98
95)	1,2,4-Trimethylbenzene	12.03	105	96044	9.15	ppb		94
96)	Sec-Butylbenzene	12.22	105	114411	9.59	ppb		98
97)	p-Isopropyltoluene	12.39	119	102747	9.33	ppb		94
98)	Benzyl Chloride	12.56	91	20820	6.47	ppb		100
99)	1,3-DCB	12.32	146	68102	9.37	ppb		99
100)	1,4-DCB	12.42	146	69553	9.87	ppb		99
101)	n-Butylbenzene	12.83	91	77101	8.94	ppb		100
102)	1,2-DCB	12.82	146	66677	9.09	ppb		96
103)	Hexachloroethane	13.12	201	20375	9.81	ppb		98
104)	1,2-Dibromo-3-chloropropan	13.66	157	8069	10.35	ppb	#	81
105)	1,2,4-Trichlorobenzene	14.58	180	54198	9.99	ppb		93
106)	Hexachlorobutadiene	14.79	225	29290	10.38	ppb		95
107)	Naphthalene	14.85	127	12362	9.37	ppb		70
108)	1,2,3-Trichlorobenzene	15.12	180	52542	9.83	ppb		100

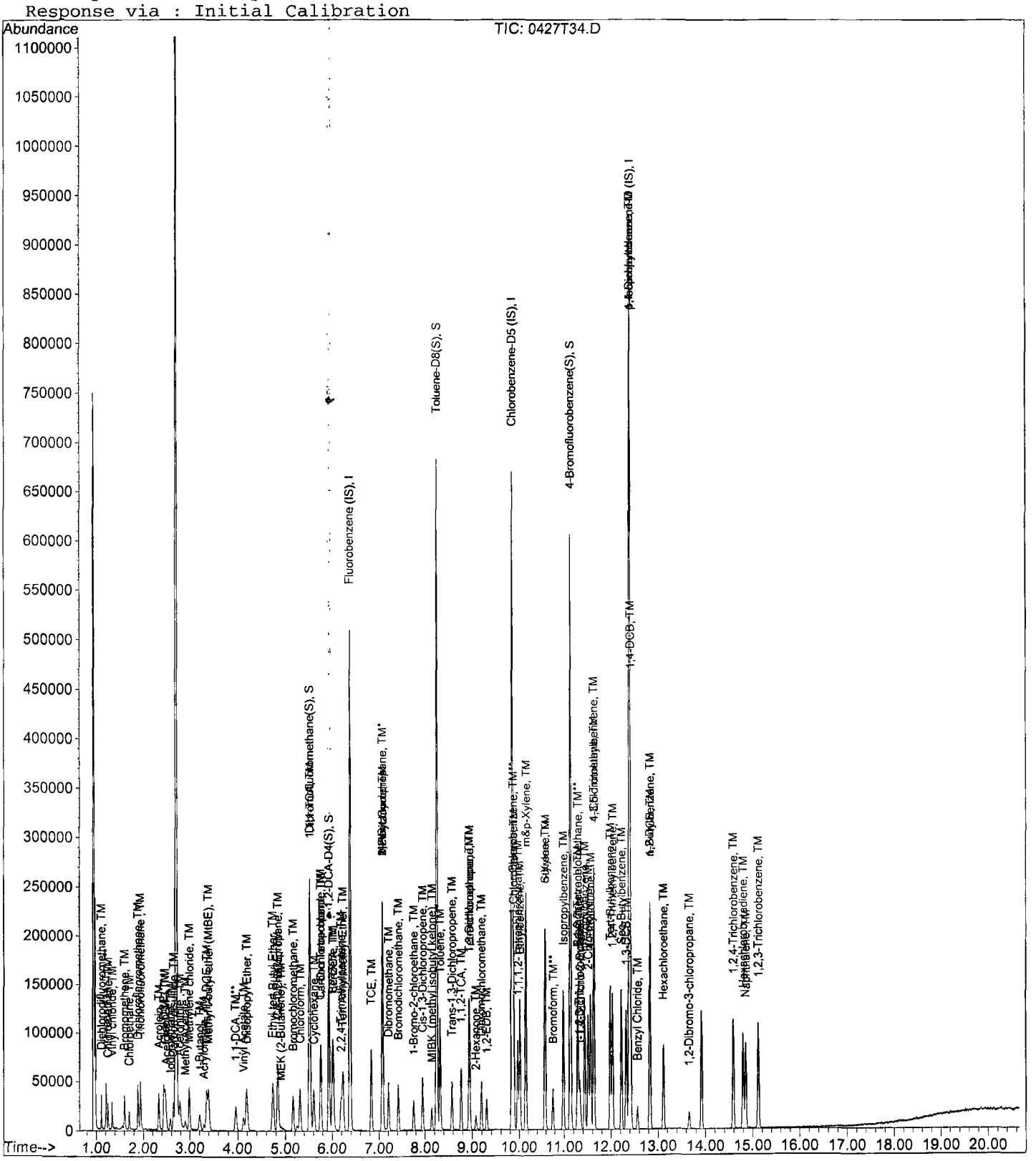
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T34.D Vial: 33
Acq On : 28 Apr 20 00:51 Operator:
Sample : BA10166W03 MSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

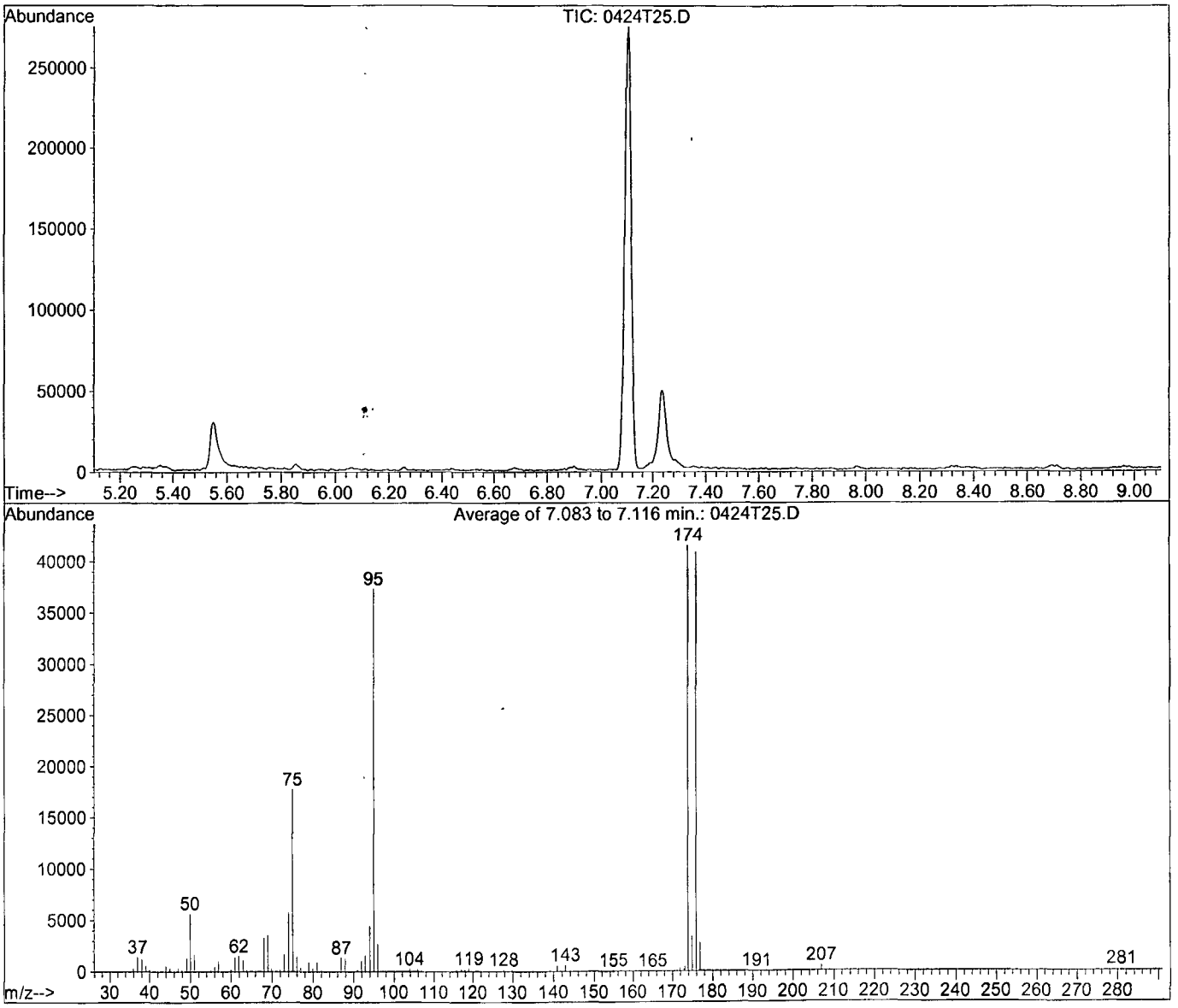
Quant Time: Apr 28 9:40 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Data File : M:\THOR\DATA\T200424\0424T25.D Vial: 1
Acq On : 24 Apr 20 13:38 Operator:
Sample : 25ug/mL BFB STD 3/25/20 Inst : Thor
Misc : 2uL Multiplr: 1.00

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B

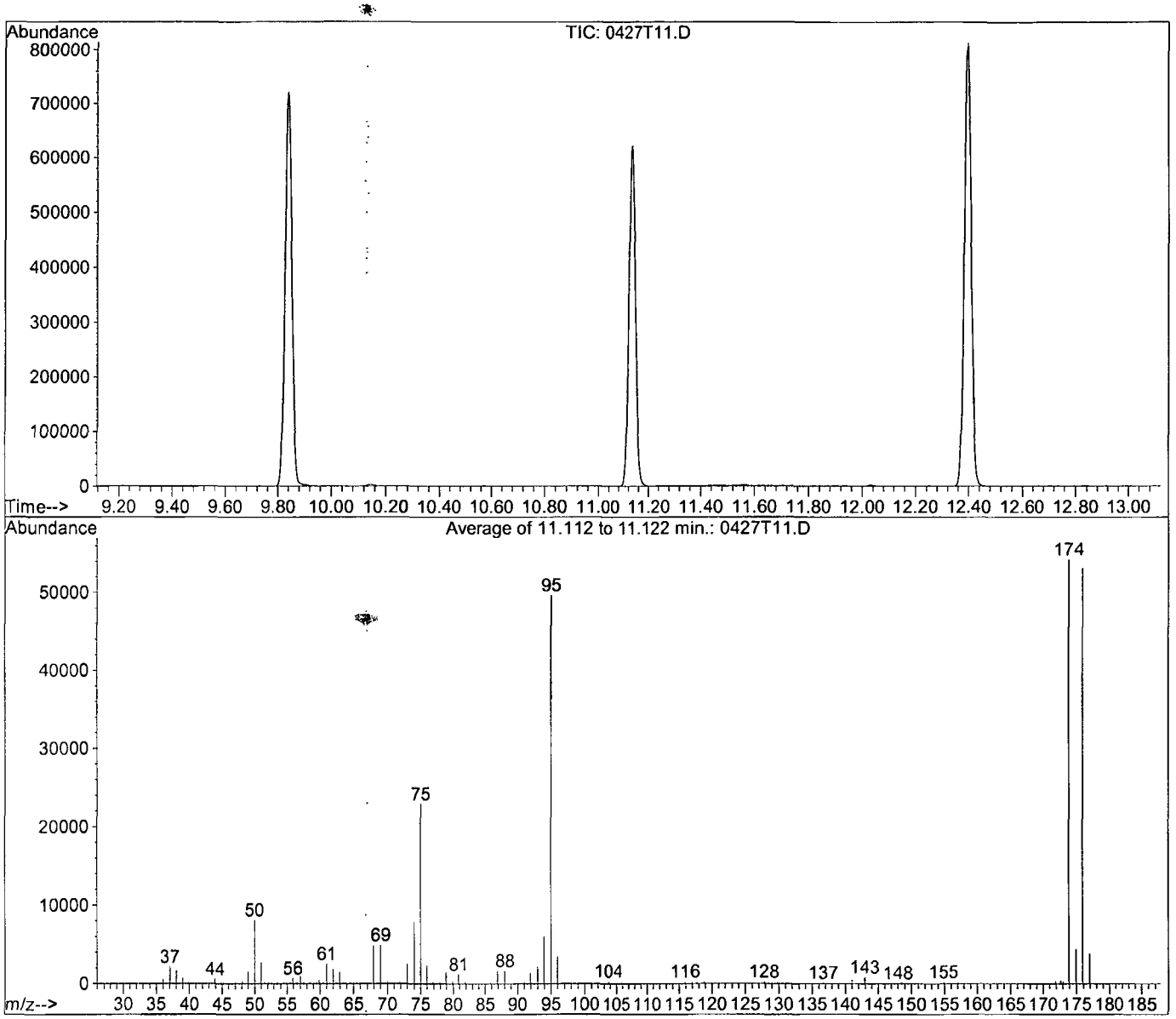


Spectrum Information: Average of 7.083 to 7.116 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	15.0	5614	PASS
75	95	30	60	47.5	17725	PASS
95	95	100	100	100.0	37307	PASS
96	95	5	9	7.2	2675	PASS
173	174	0.00	2	0.9	394	PASS
174	95	50	200	111.5	41609	PASS
175	174	5	9	8.1	3375	PASS
176	174	95	101	98.4	40932	PASS
177	176	5	9	6.9	2806	PASS

Data File : M:\THOR\DATA\T200424\0427T11.D Vial: 10
Acq On : 27 Apr 20 14:10 Operator:
Sample : 25ug/mL BFB STD 3/25/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B



Spectrum Information: Average of 11.112 to 11.122 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	16.2	8054	PASS
75	95	30	60	46.1	22880	PASS
95	95	100	100	100.0	49618	PASS
96	95	5	9	6.9	3426	PASS
173	174	0.00	2	0.7	400	PASS
174	95	50	200	109.4	54266	PASS
175	174	5	9	8.2	4444	PASS
176	174	95	101	98.0	53182	PASS
177	176	5	9	7.2	3831	PASS

Thor 8260 Standard Prep

Thor 8260 Water Calibration Curve

Prepared By (Initials): CH

0.3ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	0.3ug/L	5	Prepared 04/14/20	06/13/20	N/A	3uL	50mL	P&T Water	0.3
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	3uL			5
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	3uL			0.3
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	2uL			10

0.5ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	0.5ug/L	5	Prepared 04/14/20	06/13/20	N/A	5uL	50mL	P&T Water	0.5
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			10
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	5uL			0.5
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	5uL			25

1.0ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	1.0ug/L	5	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	1
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			20
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	10uL			1
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	10uL			50

2.0ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	2.0ug/L	5	Prepared 04/14/20	06/13/20	N/A	20uL	50mL	P&T Water	2
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			30
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	20uL			2
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	15uL			75

5ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	5ug/L	50	Prepared 04/14/20	06/13/20	N/A	5uL	50mL	P&T Water	5
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	5uL			5
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			40
VOA STD 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			5
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	20uL			100

10ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	10ug/L	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			50
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	25uL			125

20ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	20ug/L	50	Prepared 04/14/20	06/13/20	N/A	20uL	50mL	P&T Water	20
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	20uL			20
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			60
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			20
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	30uL			150

40ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	40ug/L	50	Prepared 04/14/20	06/13/20	N/A	40uL	50mL	P&T Water	40
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	40uL			40
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	40uL			80
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	40uL			40
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	35uL			175

100ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	100ug/L	50	Prepared 04/14/20	06/13/20	N/A	100uL	50mL	P&T Water	100
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	100uL			100
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	100uL			100
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	100uL			100
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	40uL			200

Thor 8260 Water Second Source (SS)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. Gases	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 3	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. 2-CEVE	Absolute	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 6	Various	8260 Water SS	50	Prepared 04/14/20	04/22/20	N/A	10uL			10
VOA STD. 0	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
Voa STD. TBA	Various	8260 Water SS	250	Prepared 04/14/20	04/02/20	N/A	25uL			250

8260 Water Continuing Calibrations (CCV)/ Lab Control Spikes (LCS)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 04/25/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	CCV/ LCS	50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 2	O2SI	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. TBA	Various	CCV/ LCS	250	Prepared 04/14/20	05/06/20	N/A	25uL			125

LCS (X4 Ketones)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 04/25/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	LCS X4 Ketones	50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 2	O2SI	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	40uL			40
VOA STD. TBA	Various	LCS X4 Ketones	250	Prepared 04/14/20	05/06/20	N/A	25uL			125

Primary and Secondary Working Standards

Primary Standards

VOA STD 7

Prepared: 04/14/20 A
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Gasses STD	Phenova	ALO-101206	2,000	**CL14053-49896**	**04/14/21**	**10/31/24**	100uL	4mL	Methanol	50
Hexachloroethane	Absolute	70199	1,000	**091818-49911**	**04/14/21**	**09/18/23**	200uL			50
Benzyl Chloride	Accusta	M-8010-01	1,000	**011320-49979**	**04/14/21**	**01/13/21**	200uL			50

VOA STD 8

Prepared: 04/14/20 B
Expires: 05/06/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Additions STD	Phenova	ALO-130175	2,000	**CL14058-49891**	**04/14/21**	**08/31/21**	100uL	4mL	Methanol	50
502.2 Cal. Std.	Phenova	ALO-101200	2,000	**CL14379-49943**	**04/14/21**	**10/31/24**	100uL			50
Vinyl Acetate	Phenova	ALO-101228	2,000	**CL15169-50084**	**04/14/21**	**05/06/20**	100uL			50

VOA STD TBA

Prepared: 04/14/20 C
Expires: 05/06/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOC Mix	Phenova	ALO-130176	2,000	**CL12929-49956**	**04/14/21**	**11/30/20**	500uL	4mL	Methanol	250
Acrolein	Phenova	ALO-130549	10,000	**CL15174-50085**	**04/14/21**	**05/06/20**	100uL			250

VOA STD 1

Prepared: 04/14/20 D
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE	Absolute	82408	2,000	**011320-49914**	**04/14/21**	**01/13/23**	50	2mL	Methanol	50

VOA STD 2

Prepared: 04/14/20 E
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Std.	Phenova	ALO-109211	2,000	**CL12730-49961**	**04/14/21**	**08/31/28**	100	4mL	Methanol	50

VOA STD 9

Prepared: 04/14/20 F
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 7		VOA STD. 9	50	Prepared 04/14/20	**04/14/21**	N/A	200uL	2mL	Methanol	5
VOA STD. 8			50	Prepared 04/14/20	**04/14/21**	N/A	200uL			5

VOA STD. 10

Prepared: 04/14/20 G
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 1		VOA STD. 10	50	Prepared 04/14/20	**04/14/21**	N/A	200uL	2mL	Methanol	5

VOA STD. 12

Prepared: 04/14/20 H
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 2		VOA STD. 12	50	Prepared 04/14/20	**04/14/21**	N/A	200uL	2mL	Methanol	5

Second Source (SS) Standards

VOA STD. 3

Prepared: 04/14/20 I
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Standard	Phenova	ALO-101211	2,000	CL13994-49966	04/14/21	08/31/29	50uL	2mL	Methanol	50

VOA STD. Gases

Prepared: 04/14/20 J
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
8260 Gases (SS)	Phenova	ALO-101206	2,000	CL14504-49899	04/14/21	10/31/24	50uL	2mL	Methanol	50

VOA STD. 6

Prepared: 04/14/20 K
Expires: 04/22/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
502.2 Calibration STD. (54-compounds)	Phenova	ALO-101200	2,000	CL14381-49947	04/14/21	10/31/24	50uL	2mL	Methanol	50
Vinyl Acetate	Phenova	ALO-101228	2,000	CL15134-50008	04/02/21	04/22/20	50uL			50
Hexachloroethane	Accustan	AS-E0011	1,000	219061767-49989	04/14/21	06/28/29	100uL			50
Benzyl Chloride	Accustan	M-8010-01	200	219041664-49933	04/14/21	12/25/21	500uL			50

VOA STD. TBA

Prepared: 04/14/20 L
Expires: 04/02/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOA Mix (4-3)	Phenova	ALO-130176	2,000	CL12734-49952	04/14/21	08/31/20	250uL	2mL	Methanol	250
Acrolein	Phenova	ALO-101224	10,000	CL15142-50009	04/02/20	04/22/20	50uL			250

VOA STD. 0

Prepared: 04/14/20 M
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Addition STD.	Phenova	ALO-130175	2,000	CL14058-49972	04/14/21	08/31/21	50uL	2mL	Methanol	50

VOA STD. 2-CEVE

Prepared: 04/14/20 N
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE (SS)	Absolute	82408	2,000	121119-49915	04/14/21	12/11/22	50uL	2mL	Methanol	50

Injection Log

Directory: M:\THOR\DATA\T200424\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	0424T25.D	1	25ug/mL BFB STD 3/25/20	2uL	24 Apr 20 13:38
2	0424T27.D	1	0.3ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 14:31
3	0424T28.D	1	0.5ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 14:59
4	0424T29.D	1	1.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 15:27
5	0424T30.D	1	2.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 15:55
6	0424T31.D	1	5.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 16:23
7	0424T32.D	1	10ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 16:50
8	0424T33.D	1	20ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 17:18
9	0424T34.D	1	40ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 17:46
10	0424T35.D	1	100ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 18:14
12	0424T37.D	1	(SS)10ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 19:10
10	0427T11.D	1	25ug/mL BFB STD 3/25/20	IS&S 3/17/20, 4/7/20	27 Apr 20 14:10
11	0427T12.D	1	200427A CCV 10ug/L	IS&S 3/17/20, 4/7/20	27 Apr 20 14:38
12	0427T13.D	1	200427A LCS 10ug/L	IS&S 3/17/20, 4/7/20	27 Apr 20 15:06
13	0427T14.D	1	200427A LCSD 10ug/L	IS&S 3/17/20, 4/7/20	27 Apr 20 15:33
17	0427T18.D	1	200427A BLK	IS&S 3/17/20, 4/7/20	27 Apr 20 17:25
18	0427T19.D	1	BA10157W01	IS&S 3/17/20, 4/7/20	27 Apr 20 17:53
19	0427T20.D	1	BA10158W01	IS&S 3/17/20, 4/7/20	27 Apr 20 18:21
20	0427T21.D	1	BA10159W01	IS&S 3/17/20, 4/7/20	27 Apr 20 18:49
21	0427T22.D	1	BA10160W01	IS&S 3/17/20, 4/7/20	27 Apr 20 19:16
22	0427T23.D	1	BA10161W01	IS&S 3/17/20, 4/7/20	27 Apr 20 19:44
23	0427T24.D	1	BA10162W01	IS&S 3/17/20, 4/7/20	27 Apr 20 20:12
24	0427T25.D	1	BA10163W01	IS&S 3/17/20, 4/7/20	27 Apr 20 20:40
25	0427T26.D	1	BA10164W01	IS&S 3/17/20, 4/7/20	27 Apr 20 21:08
26	0427T27.D	1	BA10165W01	IS&S 3/17/20, 4/7/20	27 Apr 20 21:36
27	0427T28.D	1	BA10166W01	IS&S 3/17/20, 4/7/20	27 Apr 20 22:04
28	0427T29.D	1	BA10167W01	IS&S 3/17/20, 4/7/20	27 Apr 20 22:32
29	0427T30.D	1	BA10168W01	IS&S 3/17/20, 4/7/20	27 Apr 20 23:00
30	0427T31.D	1	BA10158W02 MS 10ug/L	IS&S 3/17/20, 4/7/20	27 Apr 20 23:28
31	0427T32.D	1	BA10158W03 MSD 10ug/L	IS&S 3/17/20, 4/7/20	27 Apr 20 23:56
32	0427T33.D	1	BA10166W02 MS 10ug/L	IS&S 3/17/20, 4/7/20	28 Apr 20 00:24
33	0427T34.D	1	BA10166W03 MSD 10ug/L	IS&S 3/17/20, 4/7/20	28 Apr 20 00:51
38	0427T39.D	1	Ending CCV 10ug/L	IS&S 3/17/20, 4/7/20	28 Apr 20 3:11

ORGANICS
Calibration Data

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/24/20
Matrix: Instrument: Thor Initials: DP

			0424T27 D	0424T28 D	0424T29 D	0424T30 D	0424T31 D	0424T32 D	0424T33.D	0424T34.D	0424T35 D							
		Compound	1	2	3	4	5	6	7	8	9		Avg	%RSD	Type	r^2	Q	MRF
1	I	Fluorobenzene (IS)																
2	S	Dibromofluoromethane(S)	0.3078	0.2602	0.2715	0.2736	0.2648	0.2834	0.2757	0.2768	0.2753		0.28	4.9	S			
3	S	1,2-DCA-D4(S)	0.3499	0.2675	0.2975	0.2941	0.2834	0.3042	0.3007	0.3003	0.2961		0.30	7.4	S			
4	I	Chlorobenzene-D5 (IS)																
5	S	Toluene-D8(S)	1.306	1.025	1.107	1.114	1.052	1.132	1.124	1.121	1.119		1.1	7.0	S			
6	S	4-Bromofluorobenzene(S)	0.5406	0.4031	0.4411	0.4434	0.4370	0.4720	0.4563	0.4551	0.4691		0.46	8.1	S			
7	I	1,4-Dichlorobenzene-D (IS)																
8																		
9																		
10																		
11																		
12																		
13																		
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34																		
35																		

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T27.D Vial: 2
Acq On : 24 Apr 20 14:31 Operator:
Sample : 0.3ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	633330	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	552044	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	332191	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	38983	5.56	ppb	0.00
Spiked Amount 25.000			Recovery = 22.256%			
3) 1,2-DCA-D4(S)	5.93	65	44315	5.84	ppb	0.00
Spiked Amount 25.000			Recovery = 23.380%			
5) Toluene-D8(S)	8.25	98	144215	5.82	ppb	0.00
Spiked Amount 25.000			Recovery = 23.280%			
6) 4-Bromofluorobenzene(S)	11.13	95	59687	5.91	ppb	0.00
Spiked Amount 25.000			Recovery = 23.632%			

Target Compounds Qvalue

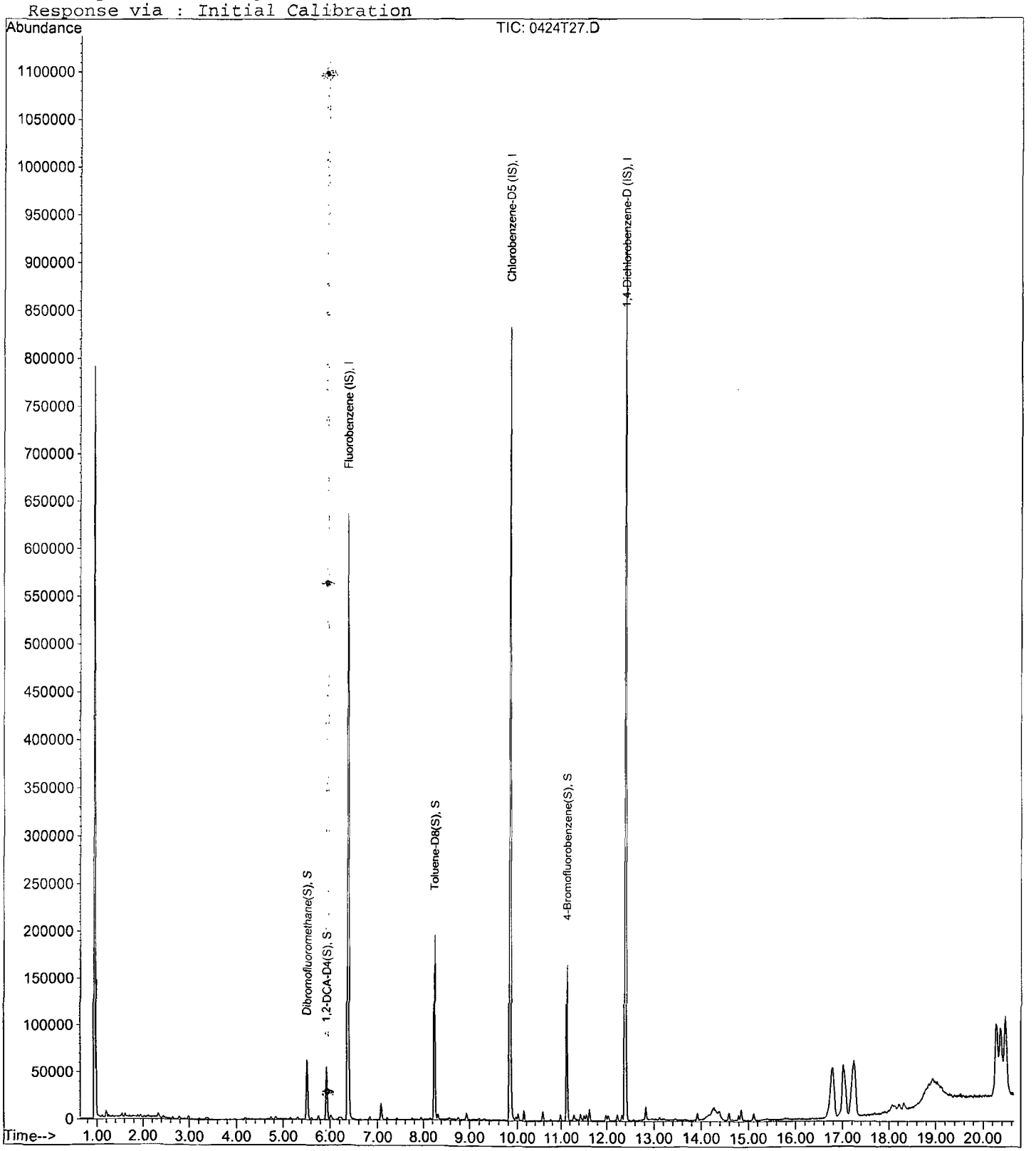
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T27.D Vial: 2
Acq On : 24 Apr 20 14:31 Operator:
Sample : 0.3ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T28.D Vial: 3
Acq On : 24 Apr 20 14:59 Operator:
Sample : 0.5ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	628870	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	555532	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	335709	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	65447	9.41	ppb	0.00
Spiked Amount 25.000			Recovery =	37.632%		
3) 1,2-DCA-D4(S)	5.93	65	67289	8.94	ppb	0.00
Spiked Amount 25.000			Recovery =	35.752%		
5) Toluene-D8(S)	8.25	98	227746	9.13	ppb	0.00
Spiked Amount 25.000			Recovery =	36.532%		
6) 4-Bromofluorobenzene(S)	11.13	95	89582	8.81	ppb	0.00
Spiked Amount 25.000			Recovery =	35.244%		

Target Compounds Qvalue

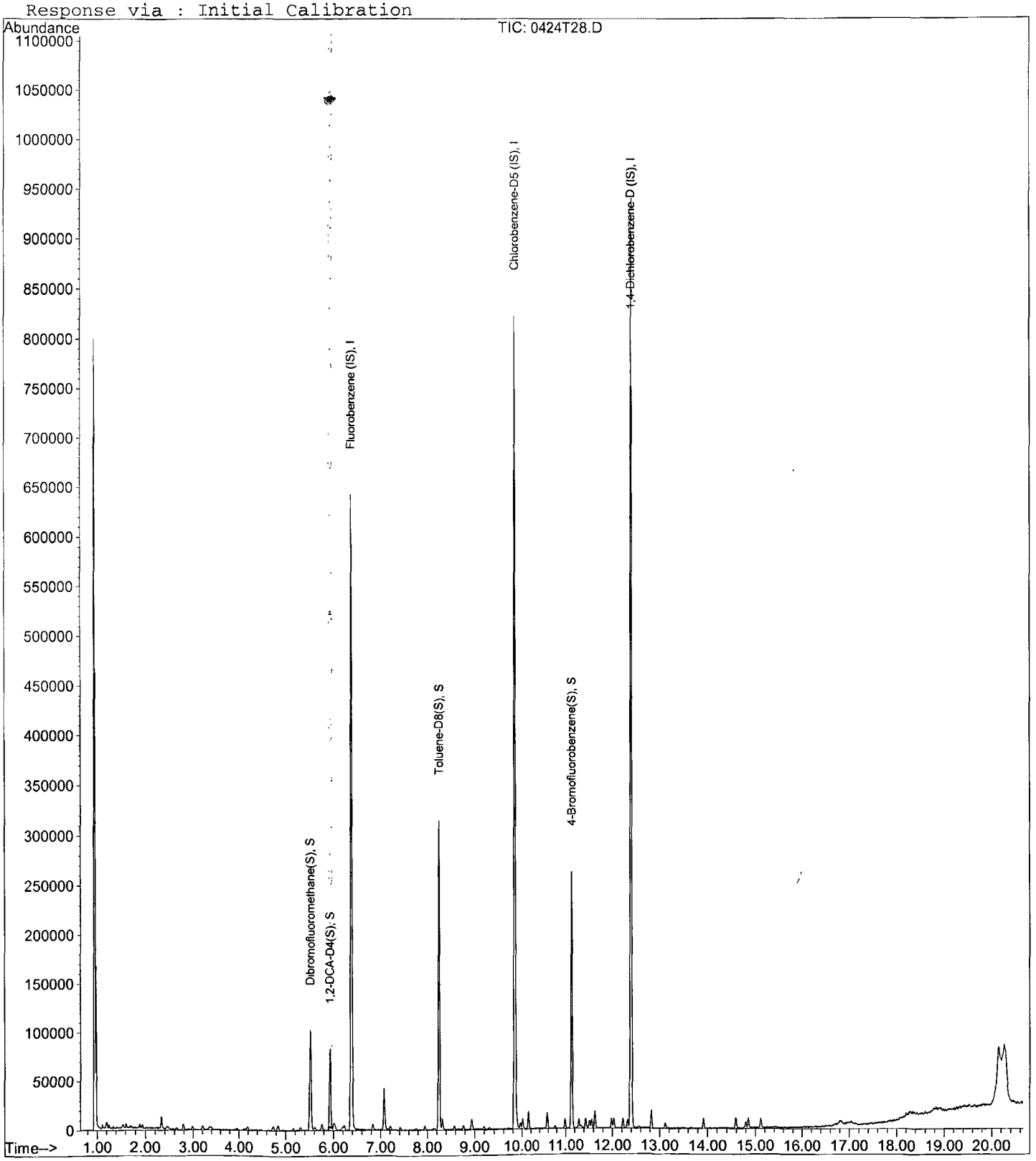
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T28.D Vial: 3
Acq On : 24 Apr 20 14:59 Operator:
Sample : 0.5ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T29.D Vial: 4
Acq On : 24 Apr 20 15:27 Operator:
Sample : 1.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	617973	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	541739	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	325141	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	167798	24.55	ppb	0.00
Spiked Amount 25.000			Recovery = 98.184%			
3) 1,2-DCA-D4(S)	5.93	65	183855	24.85	ppb	0.00
Spiked Amount 25.000			Recovery = 99.404%			
5) Toluene-D8(S)	8.25	98	599887	24.67	ppb	0.00
Spiked Amount 25.000			Recovery = 98.676%			
6) 4-Bromofluorobenzene(S)	11.13	95	238964	24.10	ppb	0.00
Spiked Amount 25.000			Recovery = 96.412%			

Target Compounds Qvalue

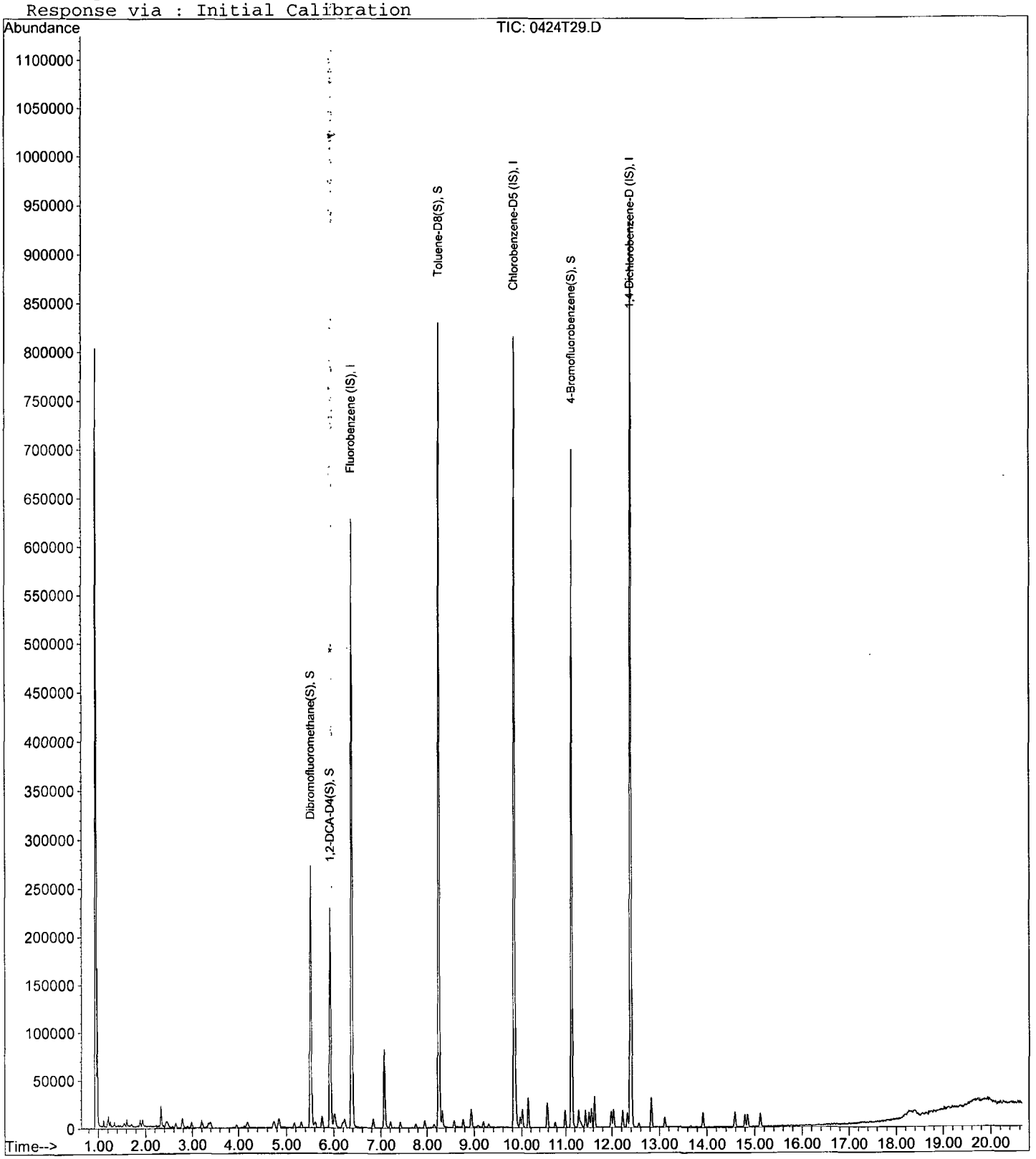
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T29.D Vial: 4
Acq On : 24 Apr 20 15:27 Operator:
Sample : 1.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T30.D Vial: 5
Acq On : 24 Apr 20 15:55 Operator:
Sample : 2.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	606274	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	528656	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	327988	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	331695	49.46	ppb	0.00
Spiked Amount 25.000			Recovery =	197.828%		
3) 1,2-DCA-D4(S)	5.93	65	356597	49.13	ppb	0.00
Spiked Amount 25.000			Recovery =	196.524%		
5) Toluene-D8(S)	8.25	98	1177925	49.64	ppb	0.00
Spiked Amount 25.000			Recovery =	198.552%		
6) 4-Bromofluorobenzene(S)	11.13	95	468783	48.45	ppb	0.00
Spiked Amount 25.000			Recovery =	193.816%		

Target Compounds Qvalue

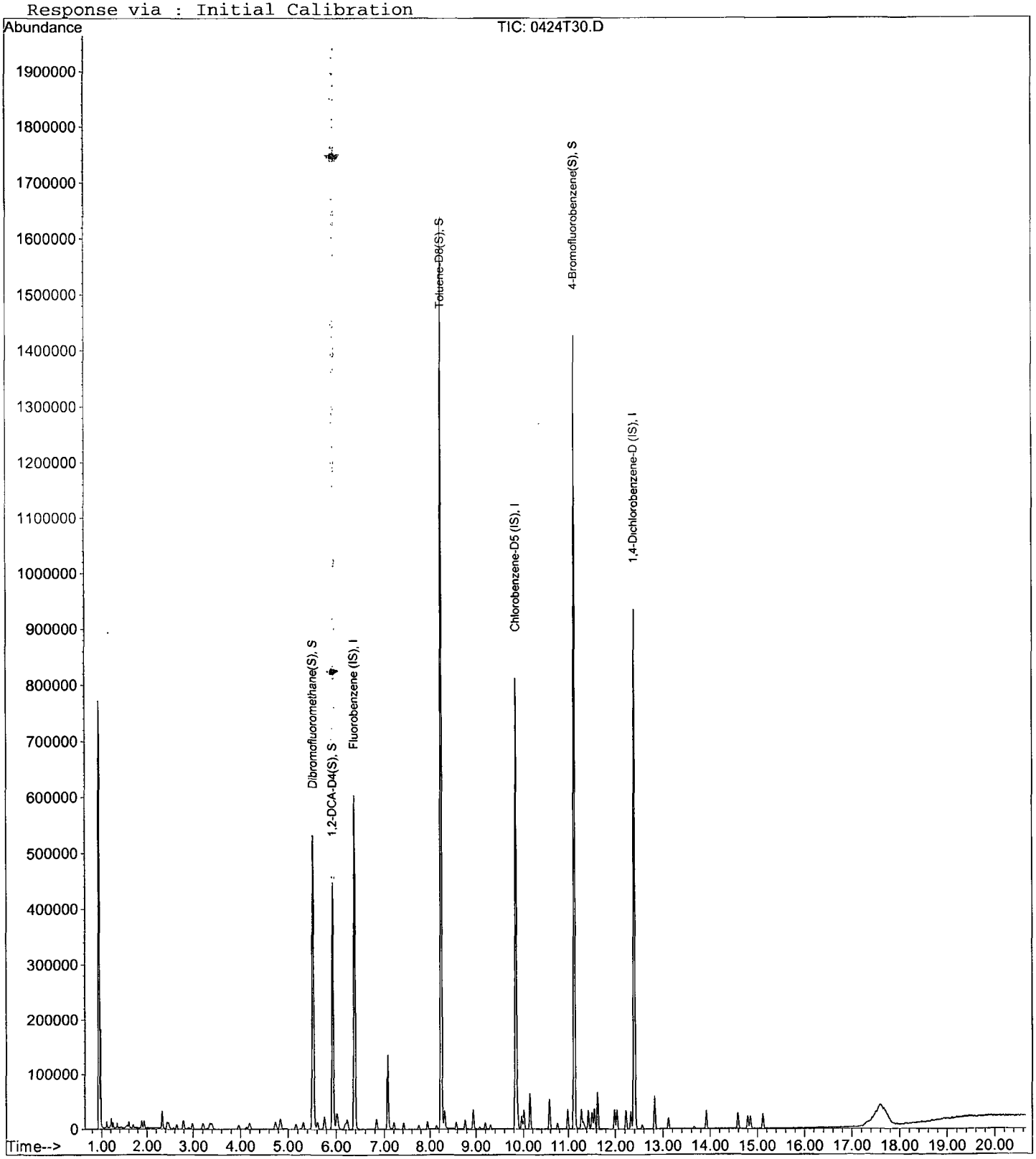
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T30.D Vial: 5
Acq On : 24 Apr 20 15:55 Operator:
Sample : 2.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T31.D Vial: 6
Acq On : 24 Apr 20 16:23 Operator:
Sample : 5.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	602684	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	540454	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	335907	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	638292	95.74	ppb	0.00
Spiked Amount 25.000			Recovery =	382.956%		
3) 1,2-DCA-D4(S)	5.93	65	683254	94.70	ppb	0.00
Spiked Amount 25.000			Recovery =	378.788%		
5) Toluene-D8(S)	8.25	98	2273371	93.71	ppb	0.00
Spiked Amount 25.000			Recovery =	374.836%		
6) 4-Bromofluorobenzene(S)	11.13	95	944760	95.52	ppb	0.00
Spiked Amount 25.000			Recovery =	382.076%		

Target Compounds Qvalue

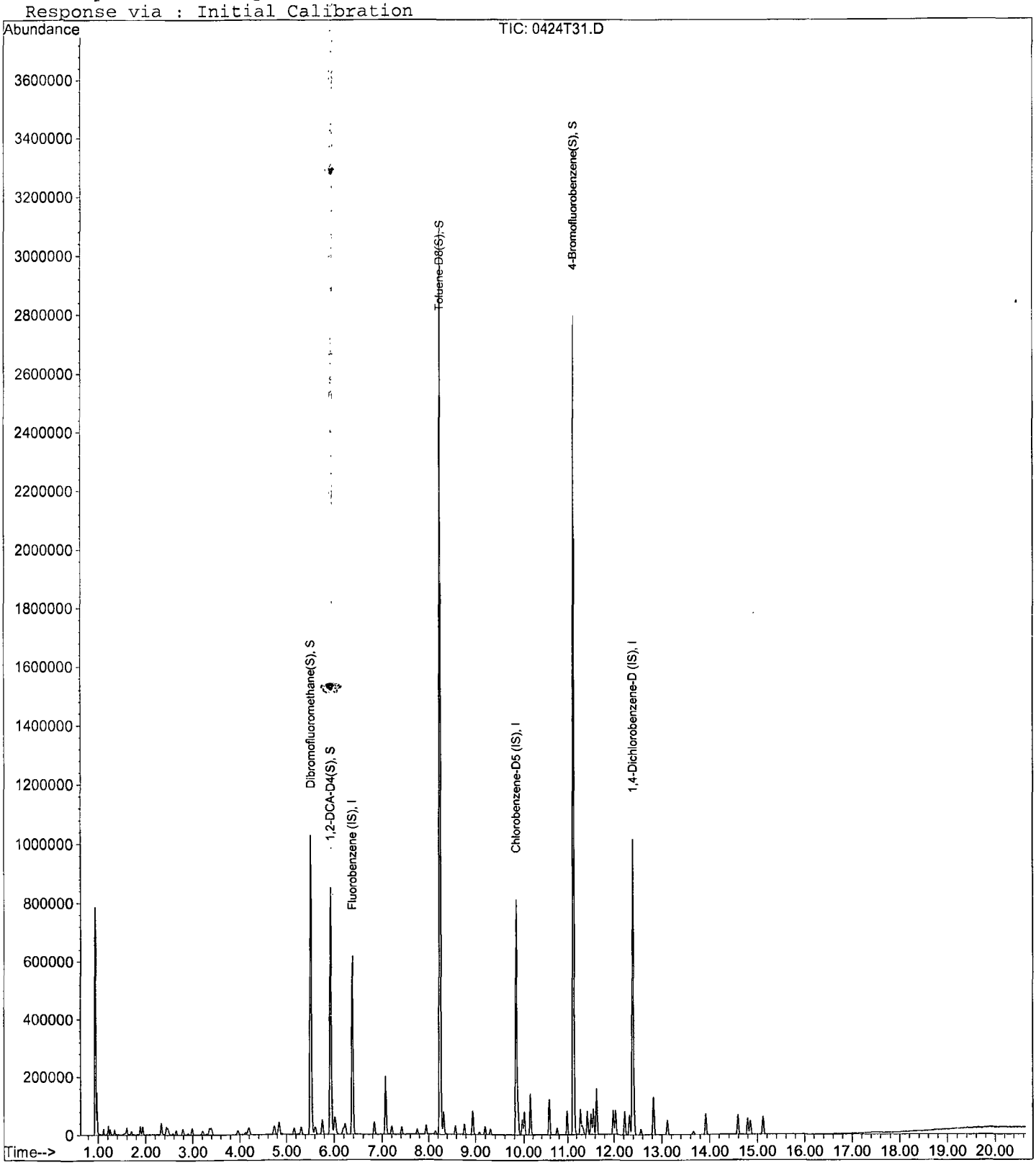
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T31.D Vial: 6
Acq On : 24 Apr 20 16:23 Operator:
Sample : 5.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T32.D Vial: 7
Acq On : 24 Apr 20 16:50 Operator:
Sample : 10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	605202	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	531673	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	337525	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	171517	25.62	ppb	0.00
Spiked Amount 25.000			Recovery = 102.476%			
3) 1,2-DCA-D4(S)	5.93	65	184080	25.41	ppb	0.00
Spiked Amount 25.000			Recovery = 101.628%			
5) Toluene-D8(S)	8.25	98	601842	25.22	ppb	0.00
Spiked Amount 25.000			Recovery = 100.872%			
6) 4-Bromofluorobenzene(S)	11.13	95	250949	25.79	ppb	0.00
Spiked Amount 25.000			Recovery = 103.164%			

Target Compounds Qvalue

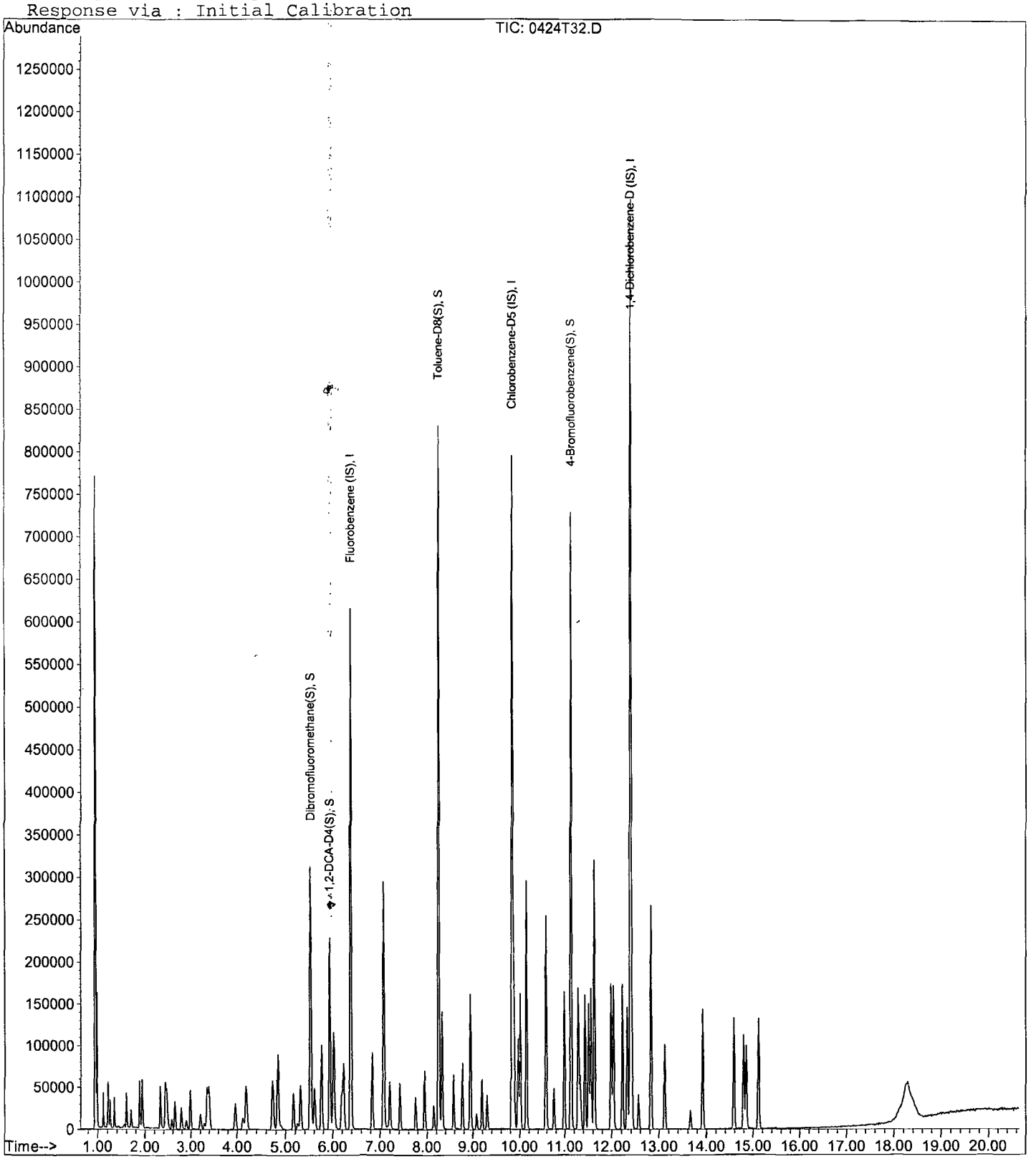
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T32.D Vial: 7
Acq On : 24 Apr 20 16:50 Operator:
Sample : 10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T33.D Vial: 8
Acq On : 24 Apr 20 17:18 Operator:
Sample : 20ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	606353	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	530559	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	343364	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	167194	24.93	ppb	0.00
Spiked Amount 25.000			Recovery = 99.704%			
3) 1,2-DCA-D4(S)	5.93	65	182313	25.12	ppb	0.00
Spiked Amount 25.000			Recovery = 100.460%			
5) Toluene-D8(S)	8.25	98	596370	25.04	ppb	0.00
Spiked Amount 25.000			Recovery = 100.164%			
6) 4-Bromofluorobenzene(S)	11.13	95	242082	24.93	ppb	0.00
Spiked Amount 25.000			Recovery = 99.728%			

Target Compounds Qvalue

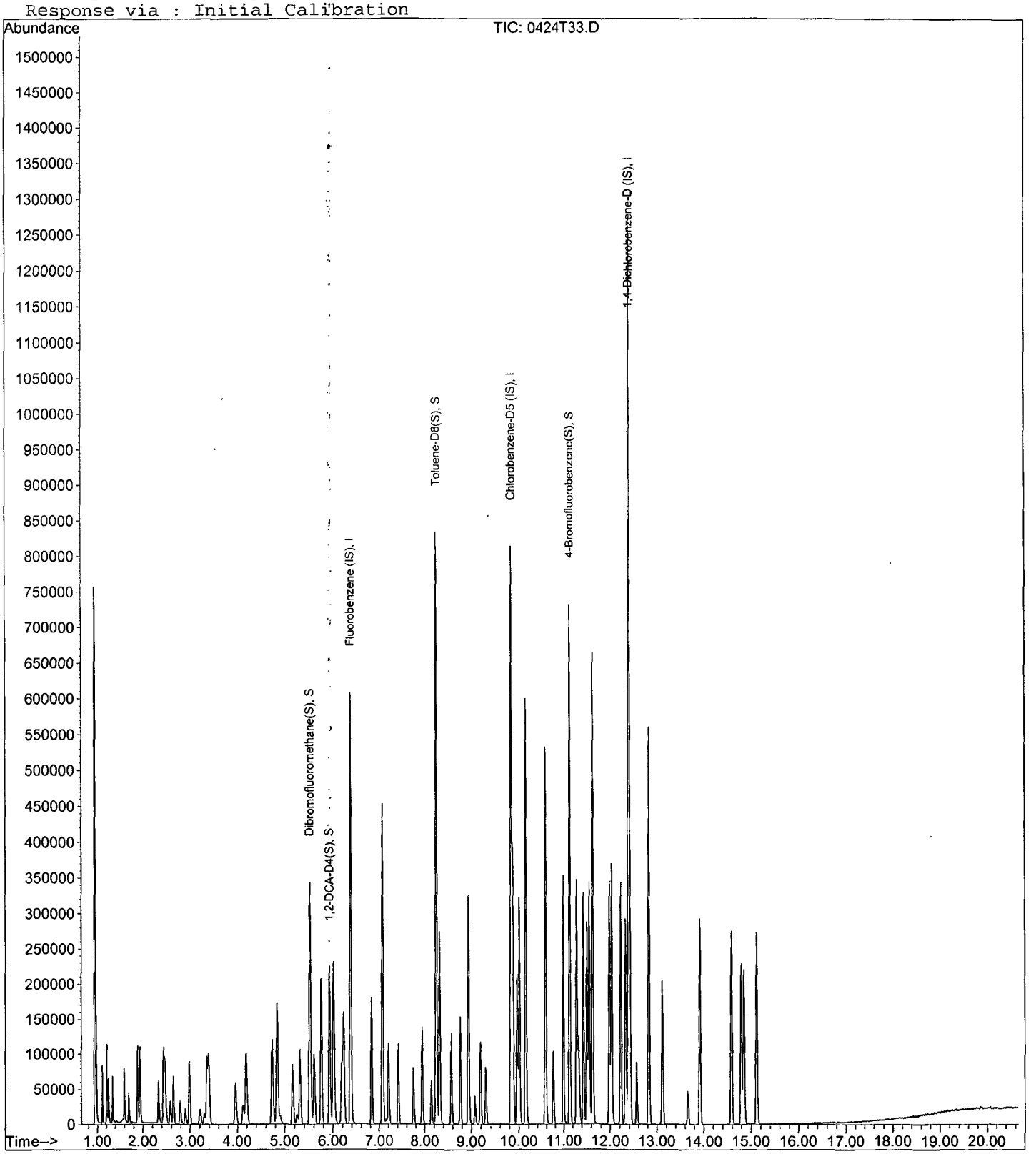
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T33.D Vial: 8
Acq On : 24 Apr 20 17:18 Operator:
Sample : 20ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T34.D Vial: 9
Acq On : 24 Apr 20 17:46 Operator:
Sample : 40ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	607670	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	542766	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	351135	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	168193	25.02	ppb	0.00
Spiked Amount 25.000			Recovery =	100.084%		
3) 1,2-DCA-D4(S)	5.93	65	182478	25.08	ppb	0.00
Spiked Amount 25.000			Recovery =	100.332%		
5) Toluene-D8(S)	8.25	98	608300	24.97	ppb	0.00
Spiked Amount 25.000			Recovery =	99.868%		
6) 4-Bromofluorobenzene(S)	11.13	95	246989	24.87	ppb	0.00
Spiked Amount 25.000			Recovery =	99.460%		

Target Compounds Qvalue

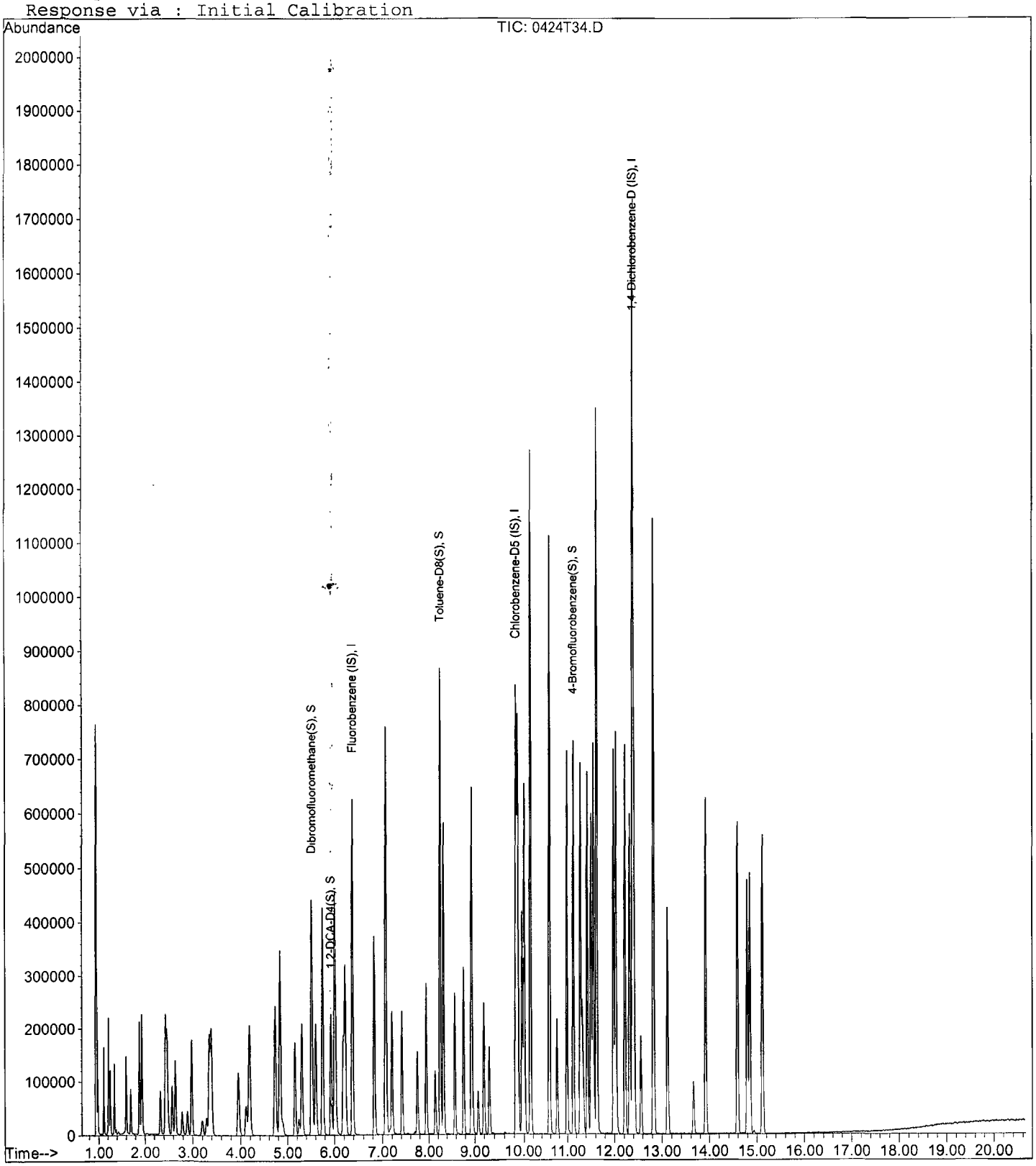
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T34.D Vial: 9
Acq On : 24 Apr 20 17:46 Operator:
Sample : 40ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T35.D Vial: 10
Acq On : 24 Apr 20 18:14 Operator:
Sample : 100ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	610400	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	542481	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	368942	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	168030	24.88	ppb	0.00
Spiked Amount 25.000			Recovery = 99.540%			
3) 1,2-DCA-D4(S)	5.93	65	180754	24.74	ppb	0.00
Spiked Amount 25.000			Recovery = 98.940%			
5) Toluene-D8(S)	8.25	98	607029	24.93	ppb	0.00
Spiked Amount 25.000			Recovery = 99.712%			
6) 4-Bromofluorobenzene(S)	11.13	95	254493	25.63	ppb	0.00
Spiked Amount 25.000			Recovery = 102.536%			

Target Compounds Qvalue

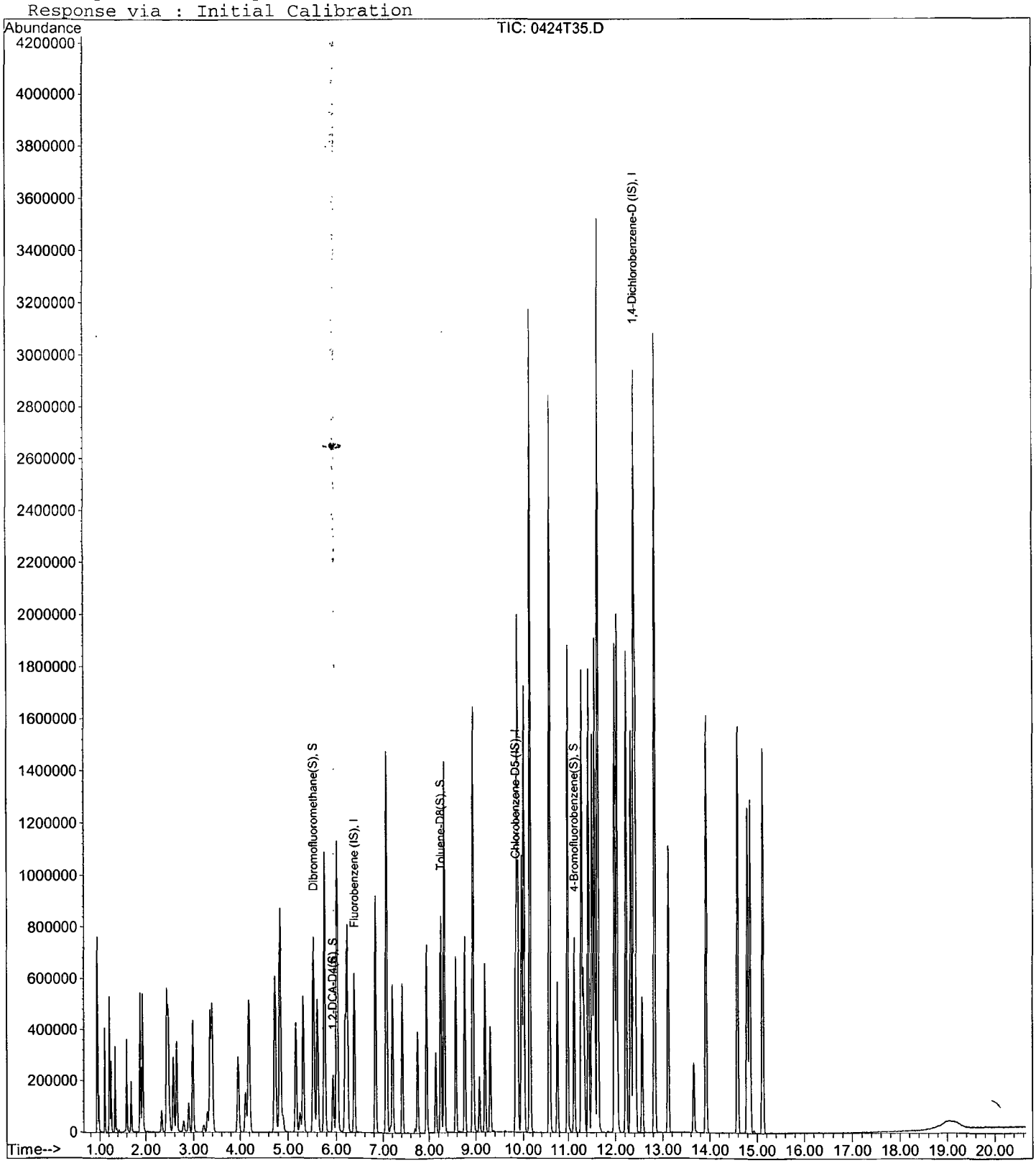
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T35.D Vial: 10
Acq On : 24 Apr 20 18:14 Operator:
Sample : 100ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:
SDG No:
Initial Cal. Date: 04/24/20
Instrument: Thor
Initials: DP

			0427T03 D	0427T04 D	0427T05.D	0427T06.D	0427T07.D	0427T08 D	0427T09 D									
		Compound	1	2	3	4	5	6	7				Avg	%RSD	Type	r^2	Q	MRF
1	I	Fluorobenzene (IS)																
2	TMHBL	Gasoline C6-C10	14.3	5.914	3.054	1.175	0.8139	0.6933	0.6159				3.8	132	TMHBL	0.994		
3	I	Chlorobenzene-D5 (IS)																
4	I	1,4-Dichlorobenzene-D (IS)																
5																		
6																		
7																		
8																		
9																		
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11																		
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Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T03.D Vial: 2
Acq On : 27 Apr 20 10:27 Operator:
Sample : 20ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:45 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	598775	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	770841	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	856942	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6830780m	20.95	ppb	100

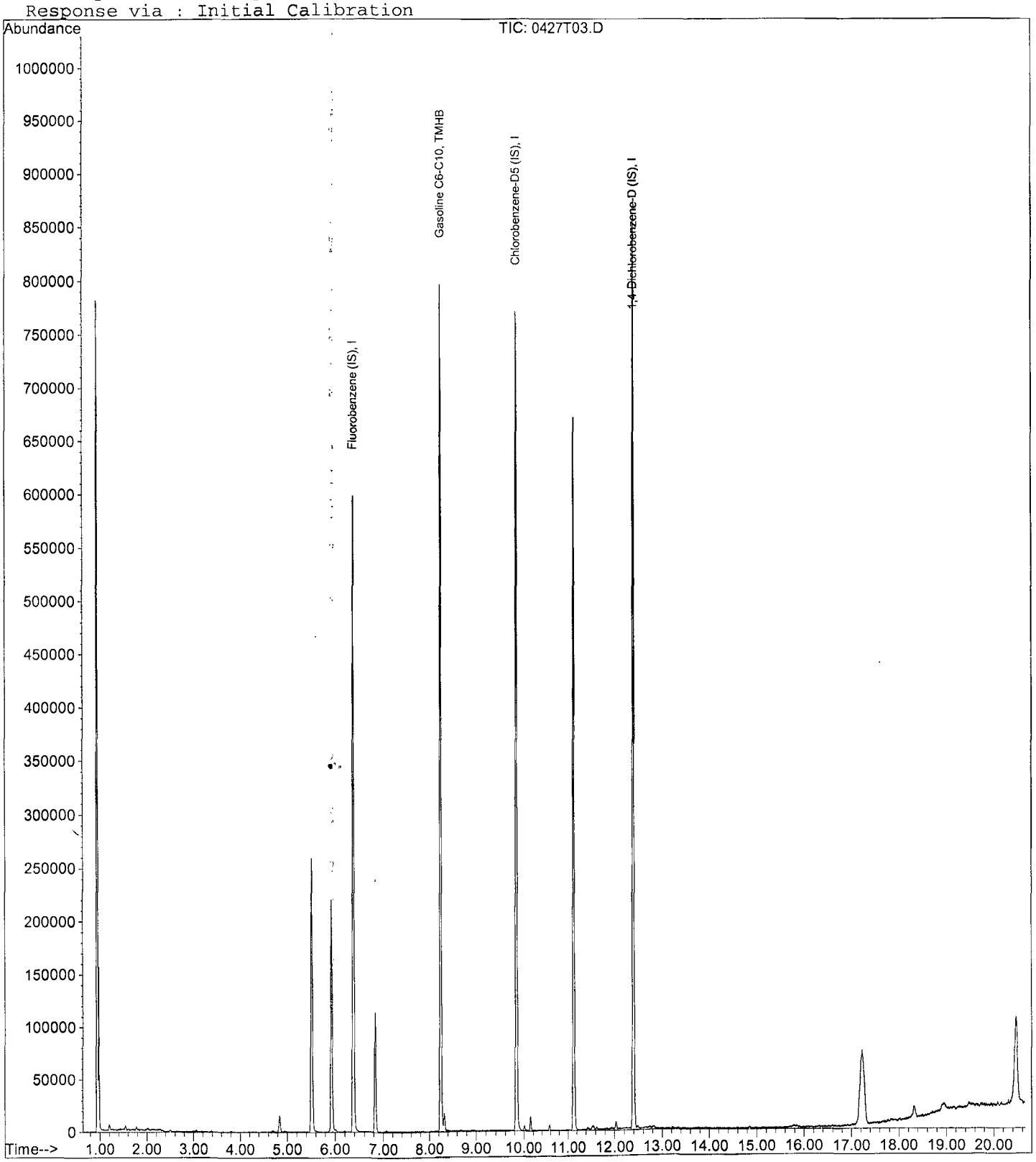
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T03.D Vial: 2
Acq On : 27 Apr 20 10:27 Operator:
Sample : 20ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:45 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T04.D Vial: 3
Acq On : 27 Apr 20 10:55 Operator:
Sample : 50ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:45 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	571536	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	752701	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	861970	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6759670m	47.33	ppb	100

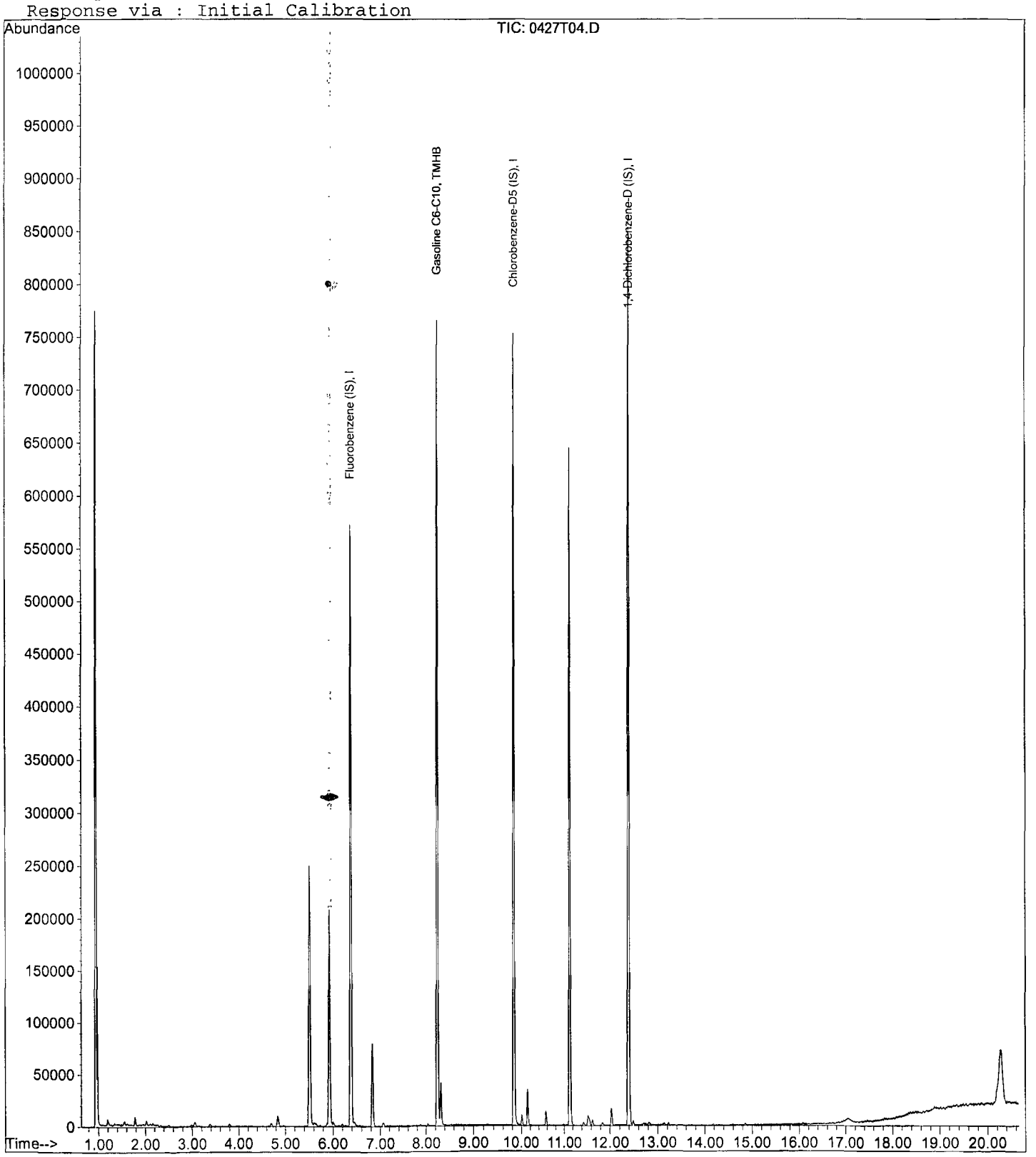
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T04.D Vial: 3
Acq On : 27 Apr 20 10:55 Operator:
Sample : 50ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:45 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T05.D Vial: 4
Acq On : 27 Apr 20 11:23 Operator:
Sample : 100ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	577561	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	746938	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	853116	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	7055454m	70.36	ppb	100

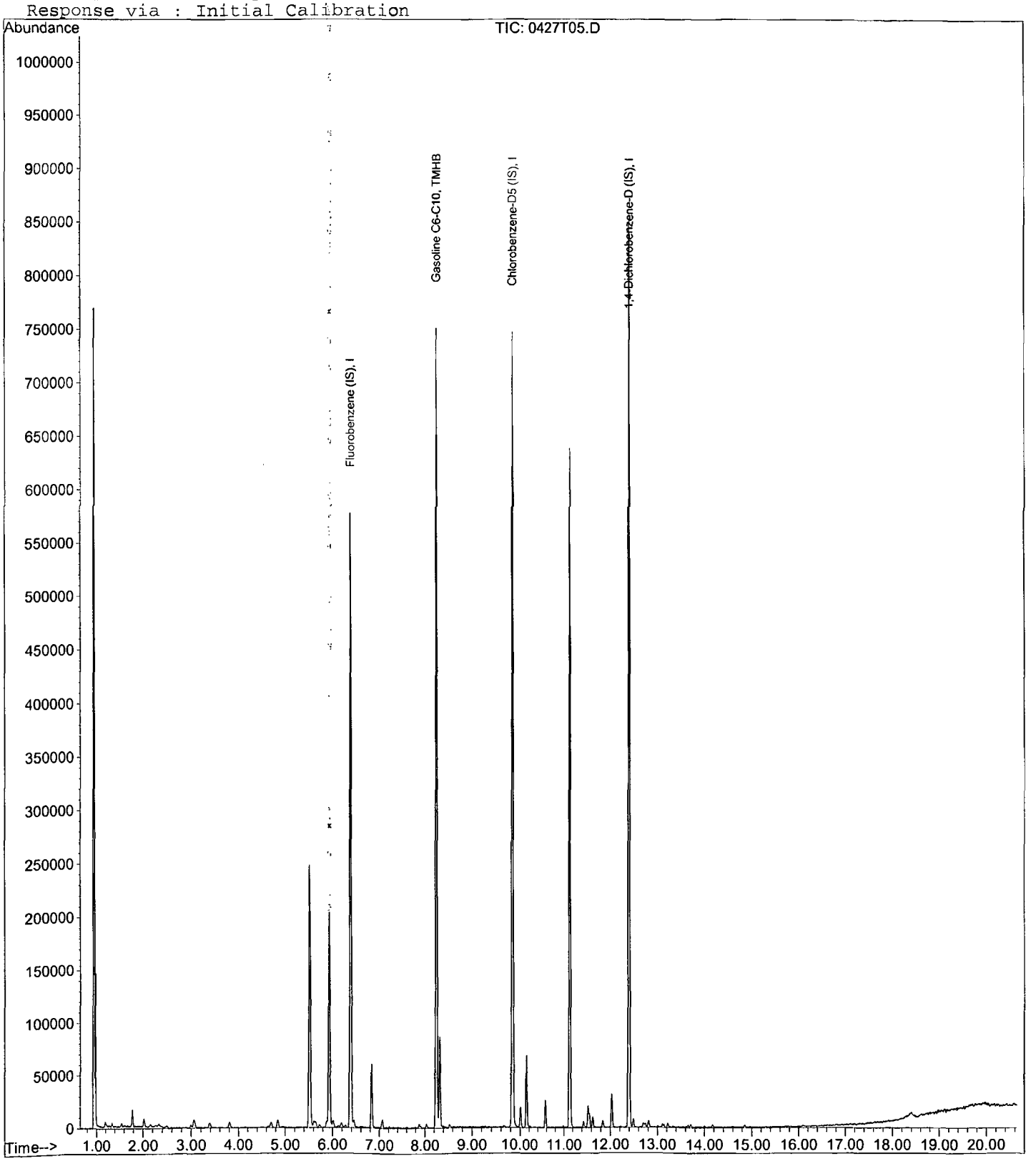
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T05.D Vial: 4
Acq On : 27 Apr 20 11:23 Operator:
Sample : 100ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T06.D Vial: 5
Acq On : 27 Apr 20 11:51 Operator:
Sample : 300ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	579412	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	745628	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	853726	25.00 ppb	0.00
System Monitoring Compounds					
Target Compounds					Qvalue
2) Gasoline C6-C10	8.25	TIC	8172672m	186.68 ppb	100

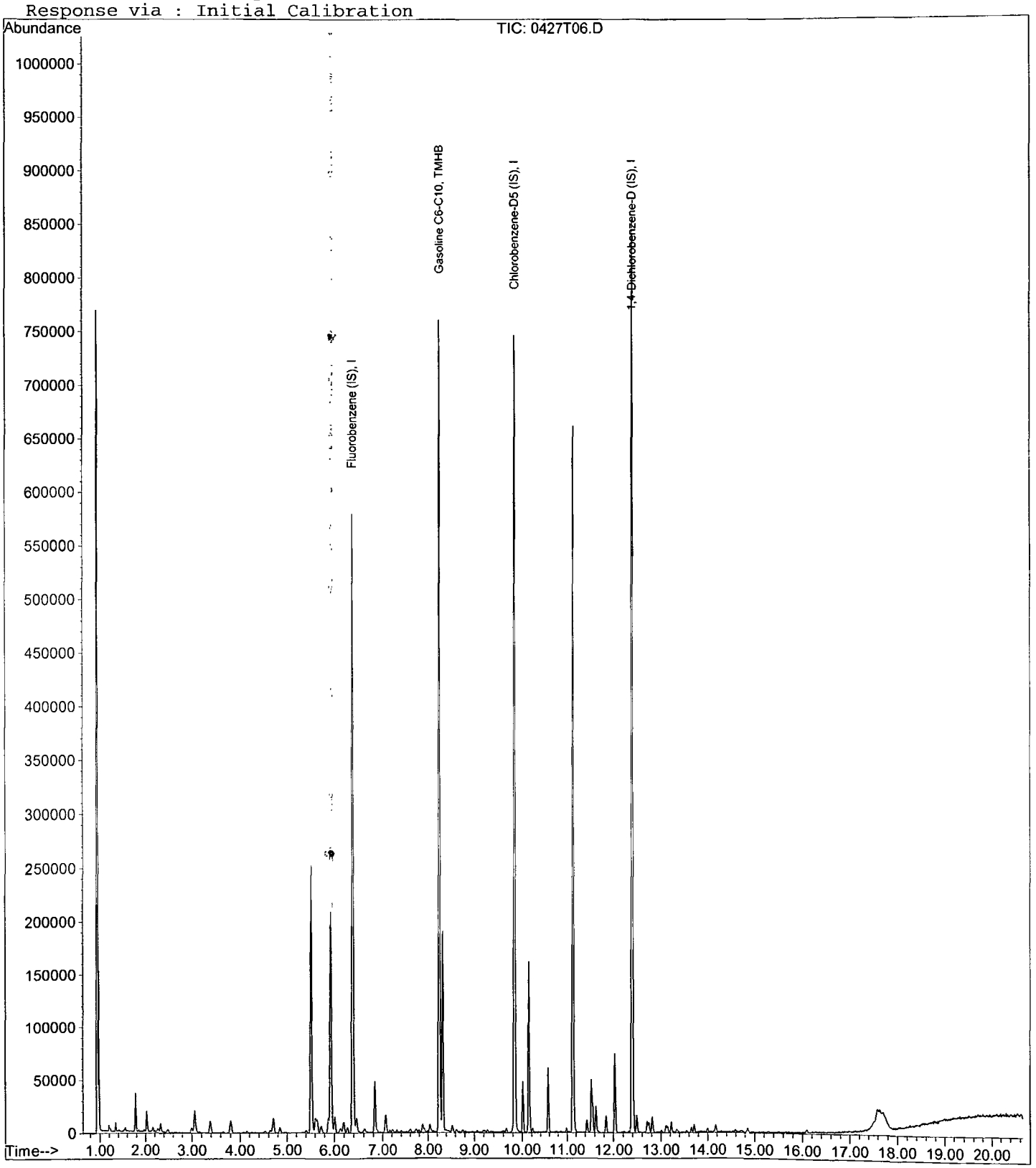
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T06.D Vial: 5
Acq On : 27 Apr 20 11:51 Operator:
Sample : 300ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T07.D Vial: 6
Acq On : 27 Apr 20 12:19 Operator:
Sample : 600ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	562866	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	756491	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	841114	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	10994130m	515.55	ppb	100

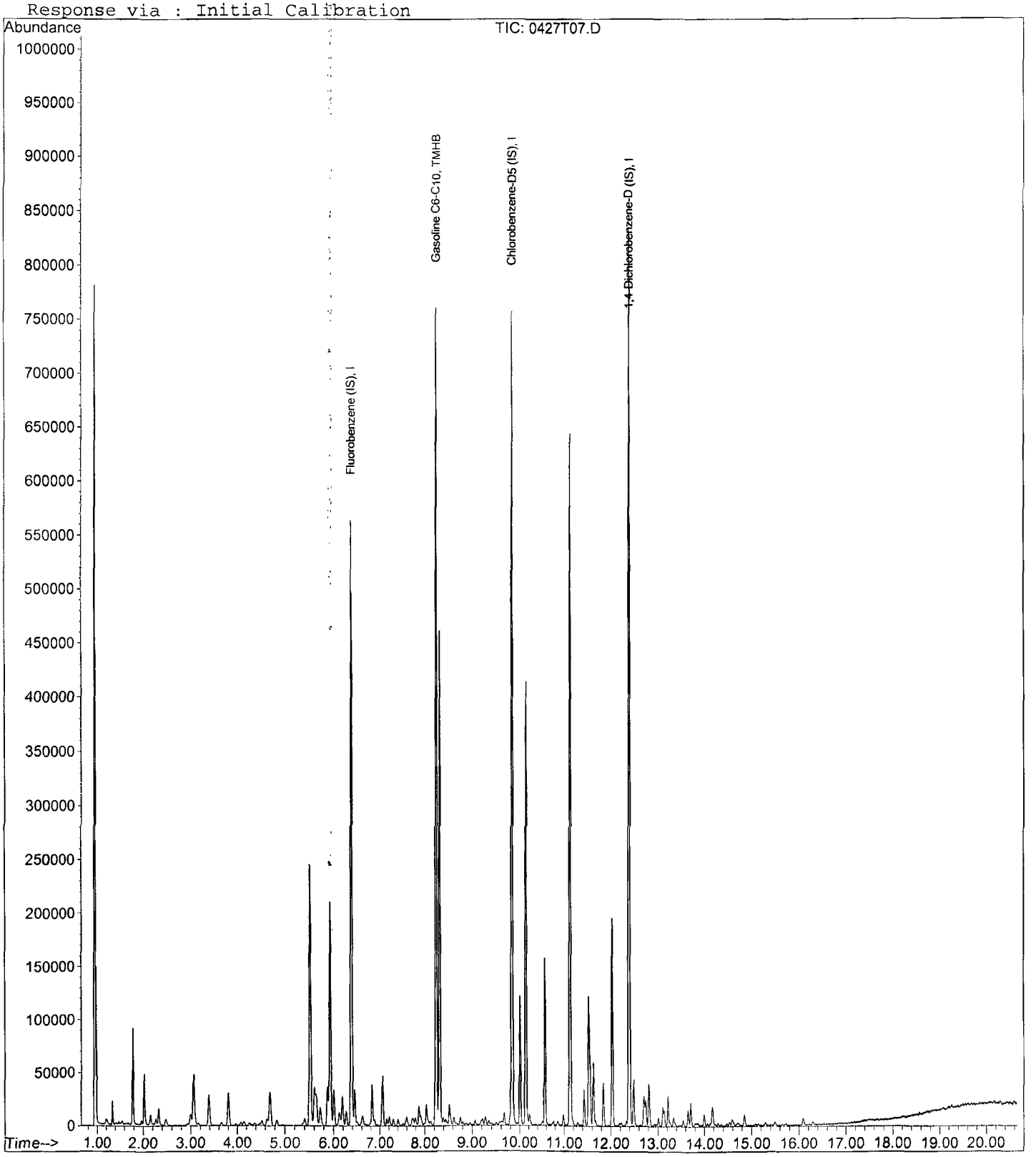
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T07.D Vial: 6
Acq On : 27 Apr 20 12:19 Operator:
Sample : 600ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T08.D Vial: 7
Acq On : 27 Apr 20 12:46 Operator:
Sample : 800ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	567984	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	757006	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	865612	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	12601692m	686.50	ppb	100

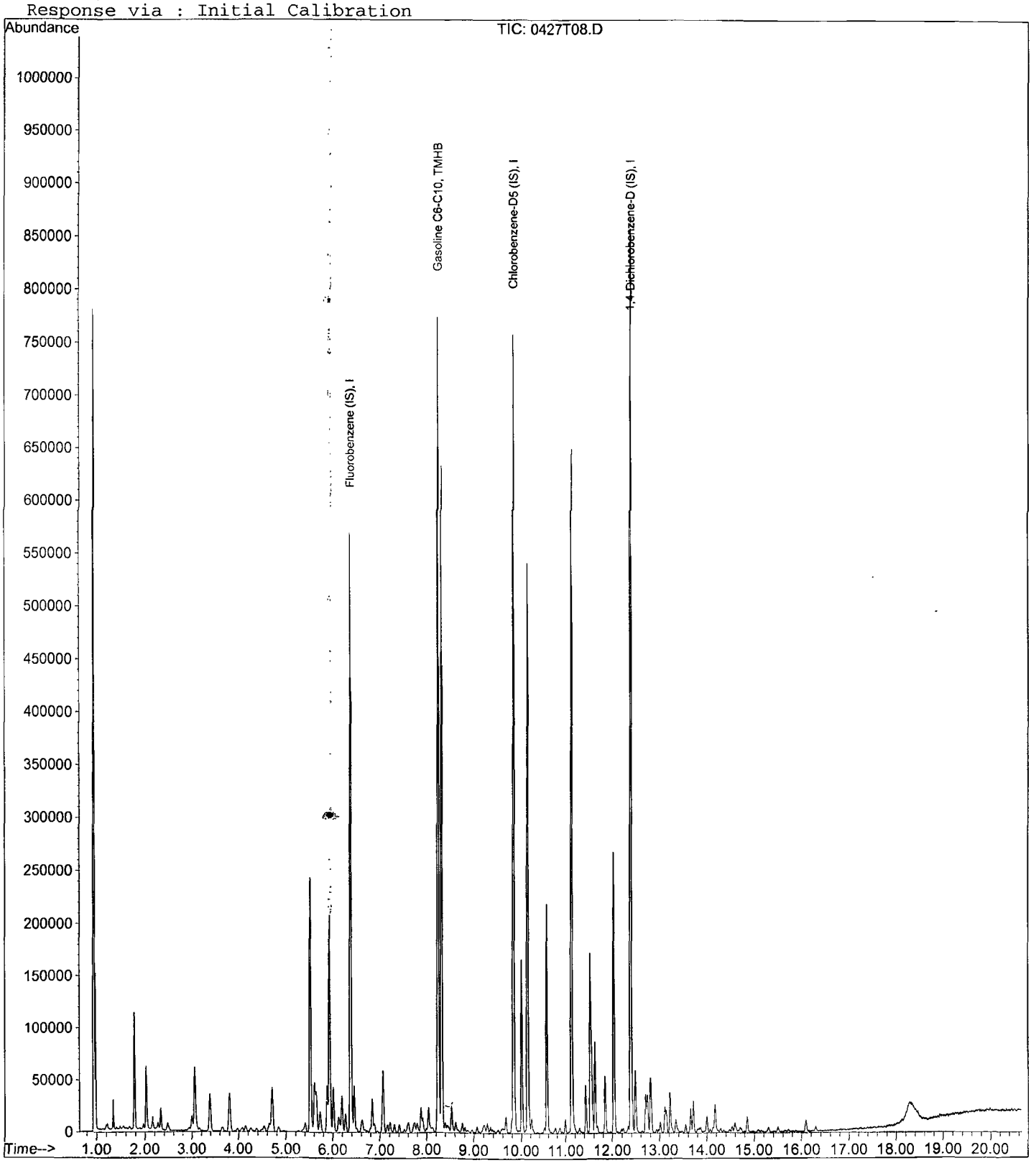
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T08.D Vial: 7
Acq On : 27 Apr 20 12:46 Operator:
Sample : 800ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T09.D Vial: 8
Acq On : 27 Apr 20 13:14 Operator:
Sample : 1000ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:47 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	578094	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	755934	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	871536	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.32	TIC	14242946m	871.03	ppb	100

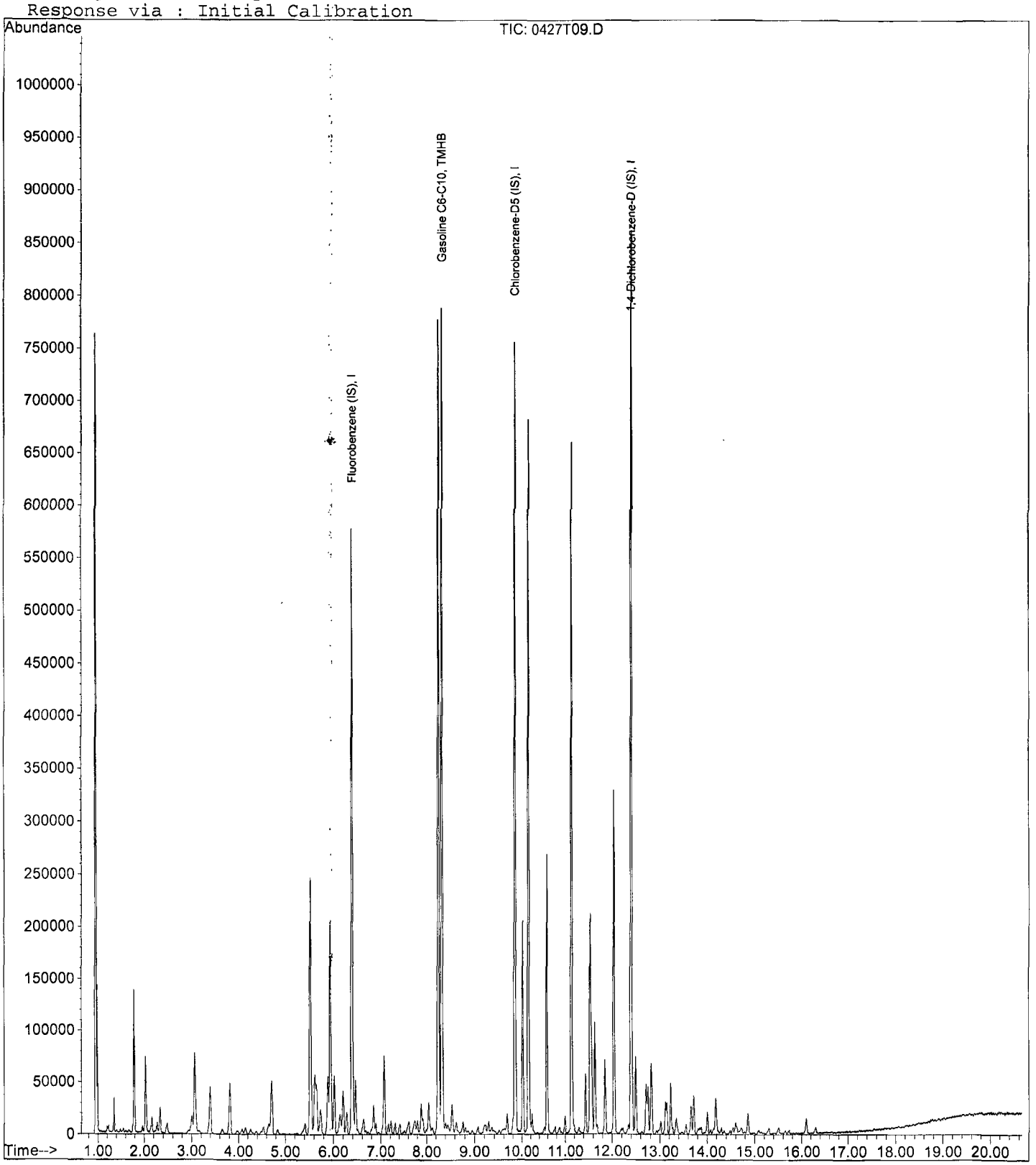
(#) = qualifier out of range (m) = manual integration

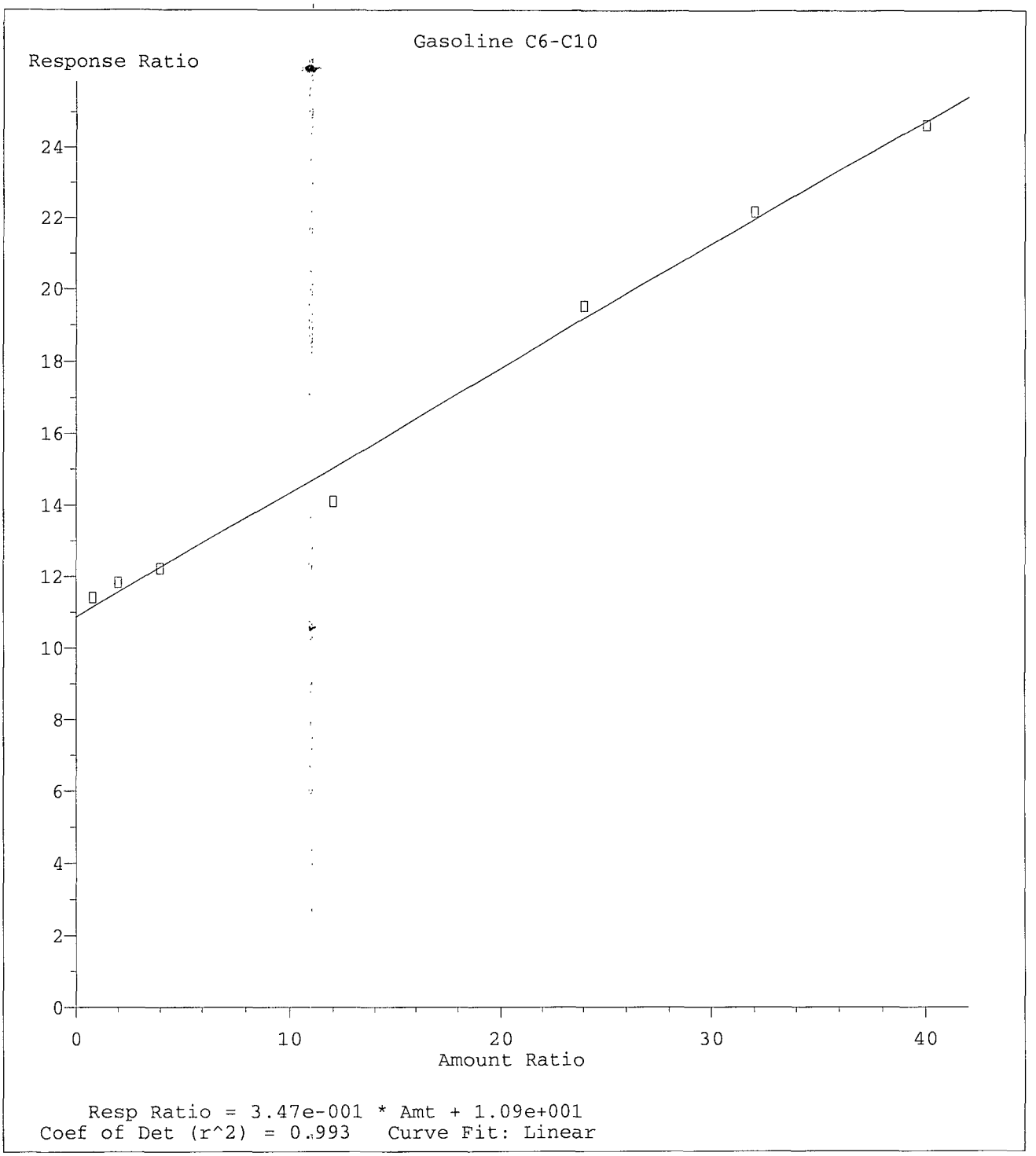
Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T09.D Vial: 8
Acq On : 27 Apr 20 13:14 Operator:
Sample : 1000ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:47 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration





Method Name: M:\THOR\DATA\T200424\TGAS0427.M
Calibration Table Last Updated: Wed Apr 15 09:44:32 2020

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/27/20
Instrument: Thor
Initial Cal. Date: 04/27/20
Data File: 0427T10.D

		Compound	MEAN	CCRF	%D		%Drift
1	TMHB	Gasoline C6-C10	3.789	1.274	66	TMHBL	6.1
2							
3							
4							
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38							
39							
40							
		Average			66.0		

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T10.D Vial: 9
Acq On : 27 Apr 20 13:42 Operator:
Sample : (SS)300ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:47 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	561723	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	741761	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	854949	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	8585753m	318.18	ppb	100

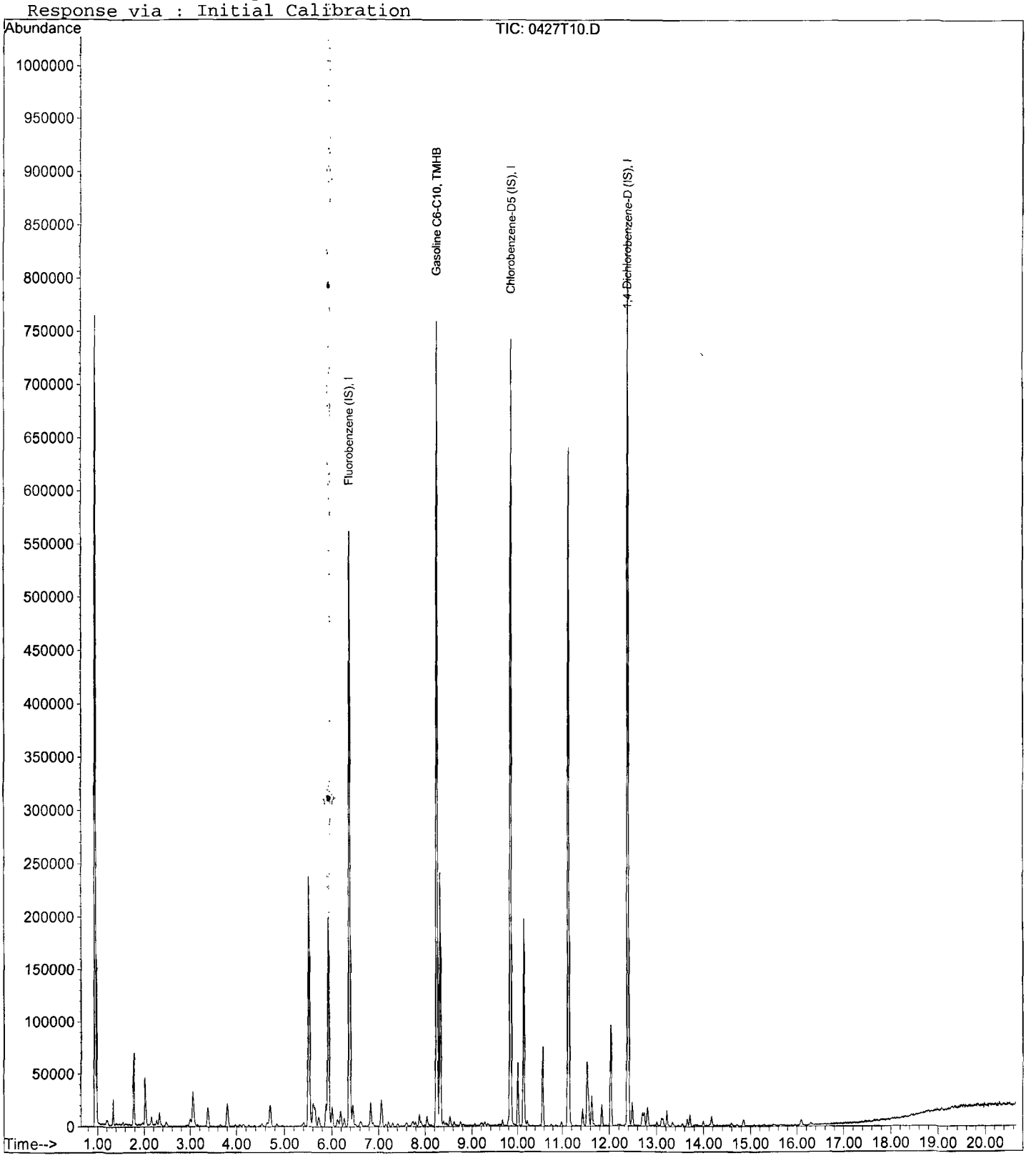
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T10.D Vial: 9
Acq On : 27 Apr 20 13:42 Operator:
Sample : (SS)300ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:47 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 04/27/20
Matrix: Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0427t15.D

		Compound	MEAN	CCRF	%D	%Drift	
1	I	Fluorobenzene (IS)	ISTD			I	
2	TMHB	Gasoline C6-C10	3.789	1.264	67	TMHBL	3.3
3	I	Chlorobenzene-D5 (IS)	ISTD			I	
4	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
5							
6							
7							
8							
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33							
34							
35							
36							
37							
38							
39							
40							
		Average			67.0		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/27/20
Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0427t15.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	S	Dibromofluoromethane(S)	0.2766	0.2801	1.3	S	
3	S	1,2-DCA-D4(S)	0.2993	0.3033	1.3	S	
4	I	Chlorobenzene-D5 (IS)	ISTD			I	
5	S	Toluene-D8(S)	1.122	1.107	1.4	S	
6	S	4-Bromofluorobenzene(S)	0.4575	0.4487	1.9	S	
7	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
8							
9							
10							
11							
12							
13							
14							
15							
16							
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34							
35							
36							
37							
38							
39							
40							
		Average			1.5		

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427t15.D Vial: 14
Acq On : 27 Apr 20 16:01 Operator:
Sample : 200427A CCV 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 16:36 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	543924	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	723252	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	851019	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	8250975m	309.87	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427t15.D Vial: 14
Acq On : 27 Apr 20 16:01 Operator:
Sample : 200427A CCV 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	538283	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	481199	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	296634	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	150750	25.32	ppb	0.00
Spiked Amount 25.000			Recovery = 101.268%			
3) 1,2-DCA-D4(S)	5.93	65	163250	25.33	ppb	0.00
Spiked Amount 25.000			Recovery = 101.332%			
5) Toluene-D8(S)	8.25	98	532603	24.66	ppb	0.00
Spiked Amount 25.000			Recovery = 98.628%			
6) 4-Bromofluorobenzene(S)	11.13	95	215926	24.52	ppb	0.00
Spiked Amount 25.000			Recovery = 98.076%			

Target Compounds Qvalue

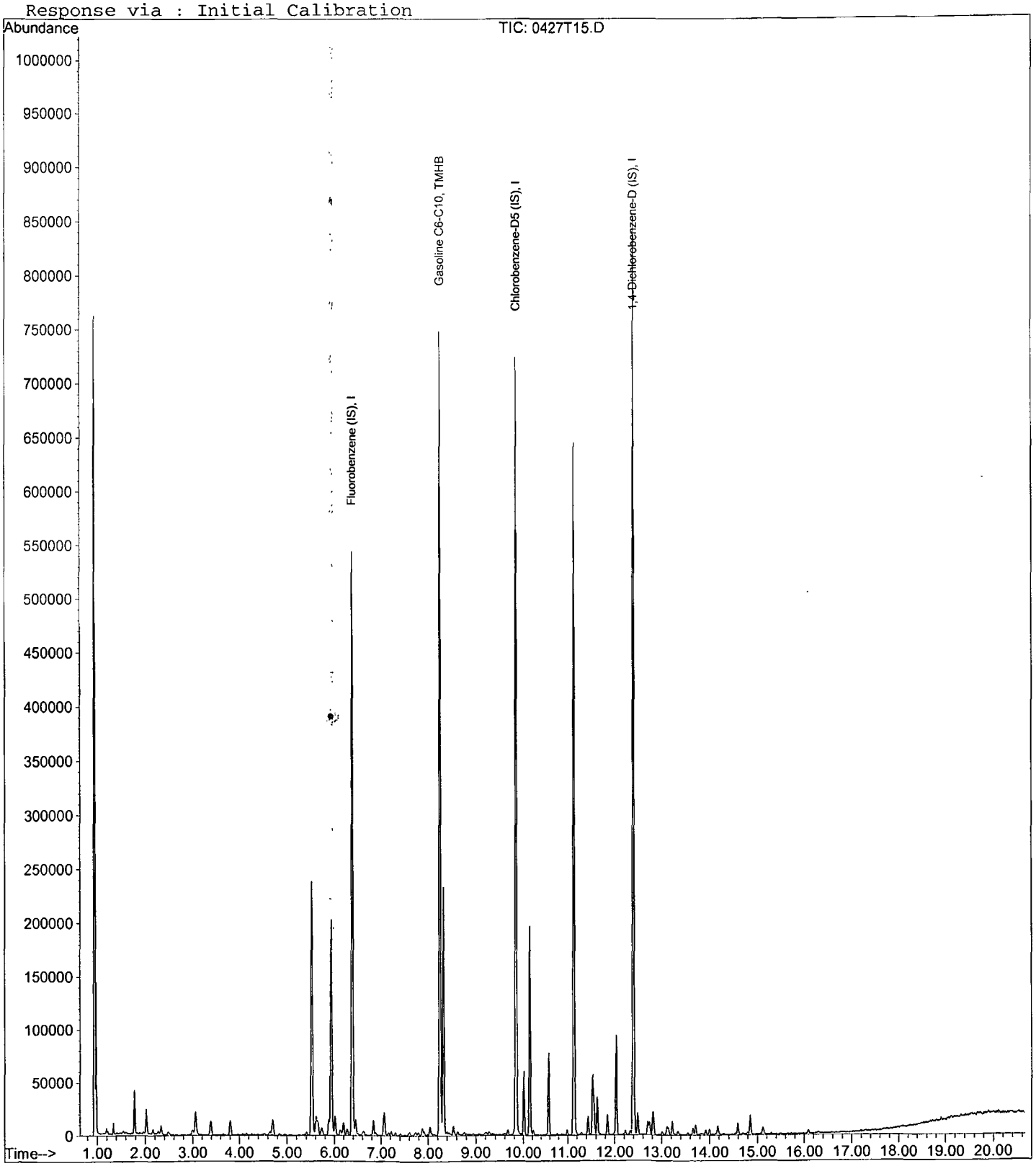
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427t15.D Vial: 14
Acq On : 27 Apr 20 16:01 Operator:
Sample : 200427A CCV 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 16:36 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 04/28/20
Matrix: Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0427t40.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	TMHB	Gasoline C6-C10	3.789	1.249	67	TMHBL	1.1
3	I	Chlorobenzene-D5 (IS)	ISTD			I	
4	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			67.0		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/28/20
Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0427t40.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	S	Dibromofluoromethane(S)	0.2766	0.2820	2.0	S	
3	S	1,2-DCA-D4(S)	0.2993	0.2944	1.6	S	
4	I	Chlorobenzene-D5 (IS)	ISTD			I	
5	S	Toluene-D8(S)	1.122	1.099	2.0	S	
6	S	4-Bromofluorobenzene(S)	0.4575	0.4433	3.1	S	
7	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
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26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			2.2		

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427t40.D Vial: 39
Acq On : 28 Apr 20 3:39 Operator:
Sample : Ending CCV 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:44 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	514903	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	687250	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	778483	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	7715626m	296.56	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427t40.D Vial: 39
Acq On : 28 Apr 20 3:39 Operator:
Sample : Ending CCV 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	514882	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	459358	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	280328	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	145198	25.49	ppb	0.00
Spiked Amount 25.000			Recovery =	101.968%		
3) 1,2-DCA-D4(S)	5.93	65	151573	24.59	ppb	0.00
Spiked Amount 25.000			Recovery =	98.360%		
5) Toluene-D8(S)	8.25	98	505041	24.49	ppb	0.00
Spiked Amount 25.000			Recovery =	97.972%		
6) 4-Bromofluorobenzene(S)	11.13	95	203629	24.22	ppb	0.00
Spiked Amount 25.000			Recovery =	96.888%		

Target Compounds Qvalue

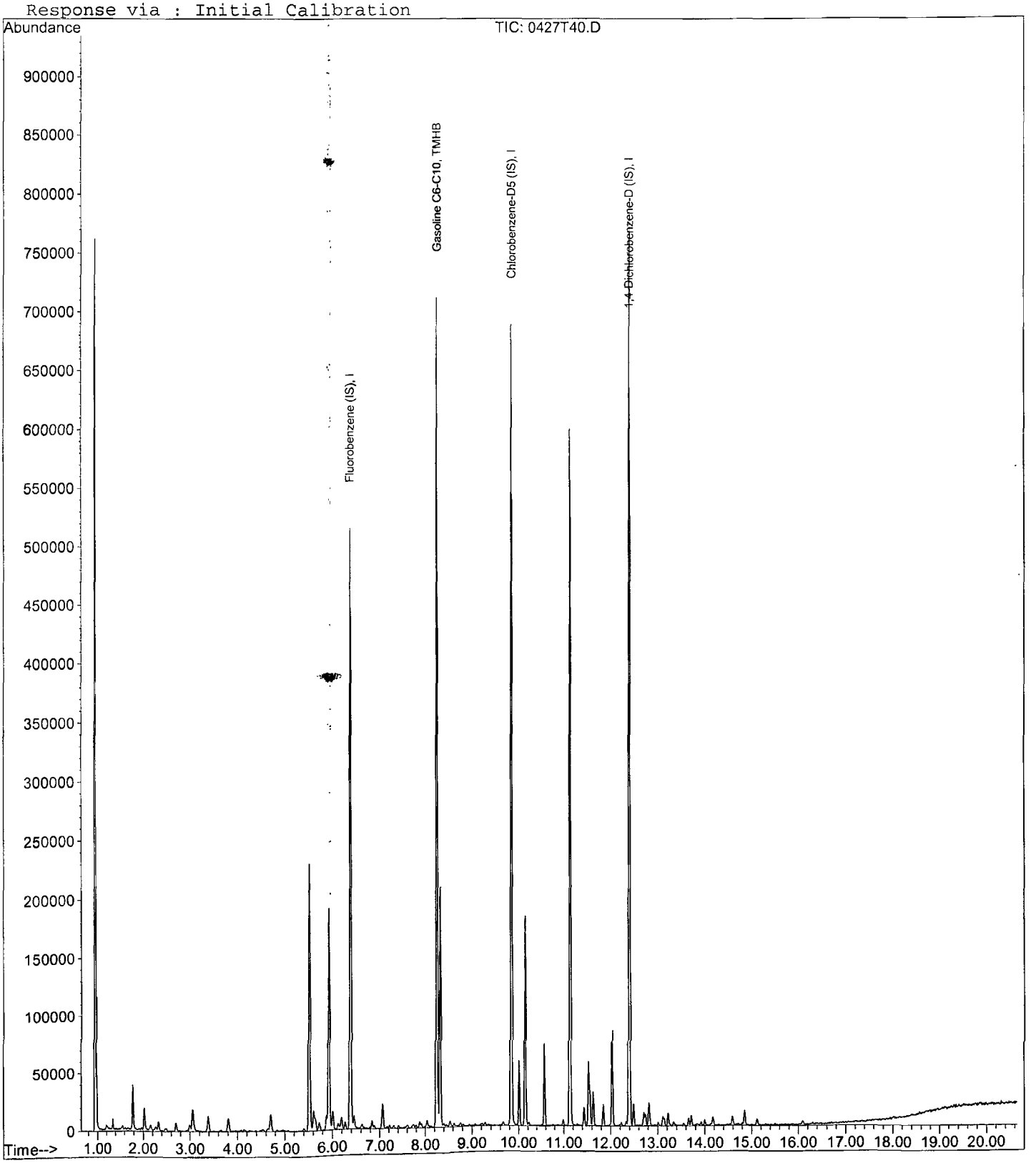
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427t40.D Vial: 39
Acq On : 28 Apr 20 3:39 Operator:
Sample : Ending CCV 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:44 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T19.D Vial: 18
Acq On : 27 Apr 20 17:53 Operator:
Sample : BA10157W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	538703	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	709603	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	808377	25.00 ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T19.D Vial: 18
Acq On : 27 Apr 20 17:53 Operator:
Sample : BA10157W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	529492	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	470524	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	287758	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	147231	25.14	ppb	0.00
Spiked Amount 25.000			Recovery =	100.544%		
3) 1,2-DCA-D4(S)	5.93	65	162750	25.67	ppb	0.00
Spiked Amount 25.000			Recovery =	102.700%		
5) Toluene-D8(S)	8.25	98	523673	24.79	ppb	0.00
Spiked Amount 25.000			Recovery =	99.176%		
6) 4-Bromofluorobenzene(S)	11.13	95	205911	23.91	ppb	0.00
Spiked Amount 25.000			Recovery =	95.652%		

Target Compounds Qvalue

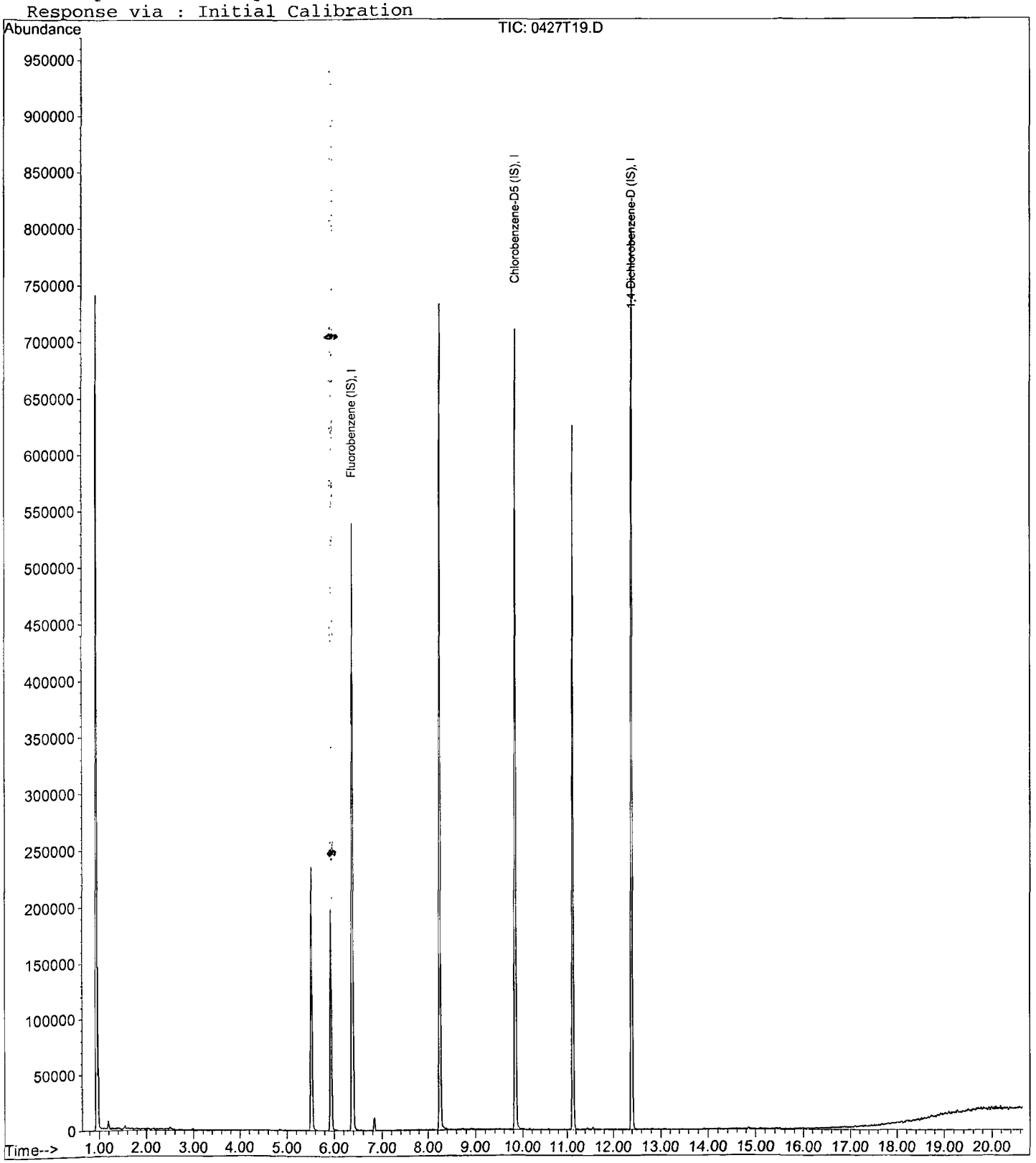
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T19.D Vial: 18
Acq On : 27 Apr 20 17:53 Operator:
Sample : BA10157W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T20.D Vial: 19
Acq On : 27 Apr 20 18:21 Operator:
Sample : BA10158W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	536006	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	684222	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	784248	25.00 ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T20.D Vial: 19
Acq On : 27 Apr 20 18:21 Operator:
Sample : BA10158W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	523307	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	464291	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	281093	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	150279	25.96	ppb	0.00
Spiked Amount 25.000			Recovery = 103.840%			
3) 1,2-DCA-D4(S)	5.93	65	160080	25.55	ppb	0.00
Spiked Amount 25.000			Recovery = 102.208%			
5) Toluene-D8(S)	8.25	98	524483	25.17	ppb	0.00
Spiked Amount 25.000			Recovery = 100.664%			
6) 4-Bromofluorobenzene(S)	11.13	95	205838	24.22	ppb	0.00
Spiked Amount 25.000			Recovery = 96.900%			

Target Compounds Qvalue

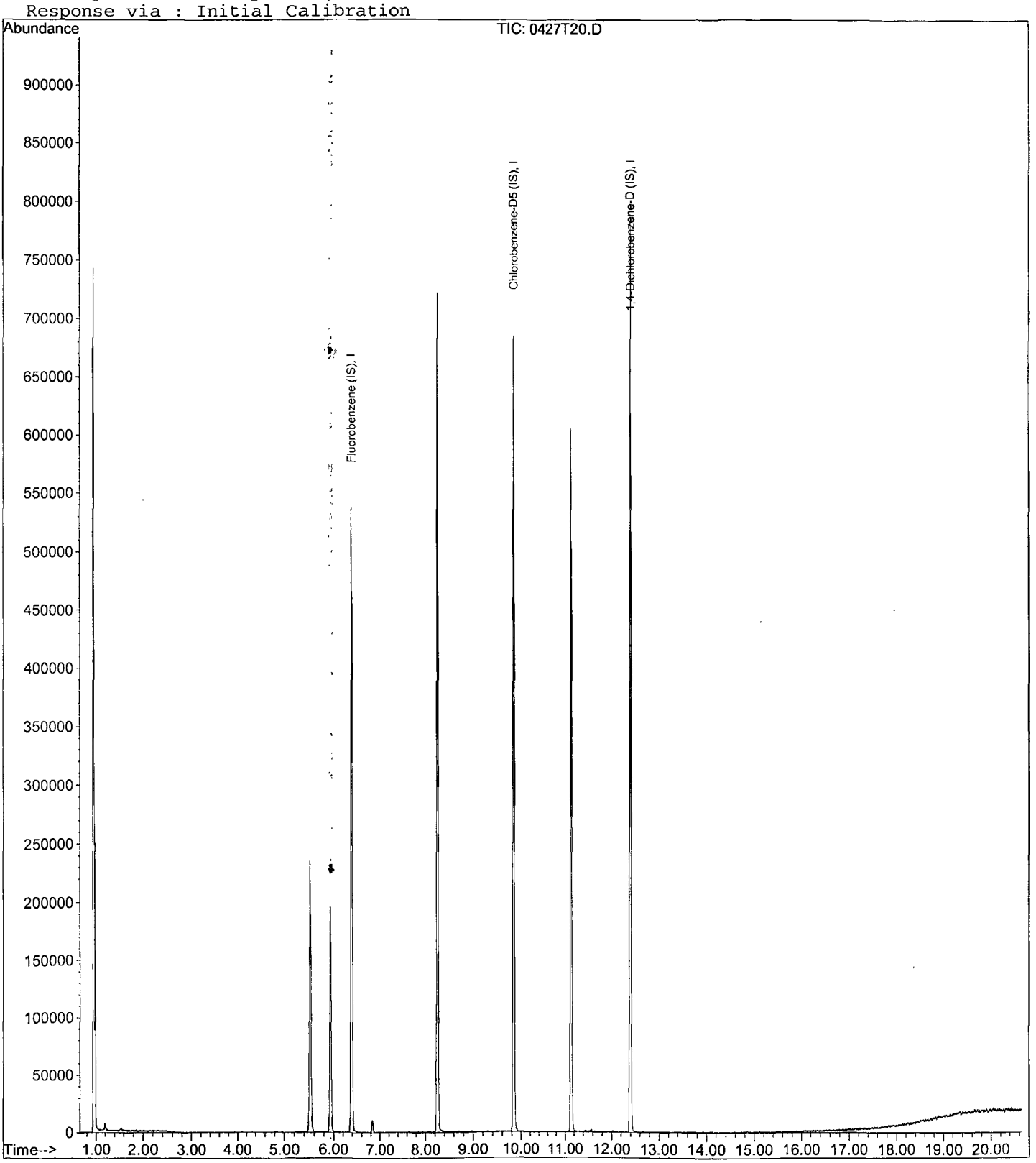
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T20.D Vial: 19
Acq On : 27 Apr 20 18:21 Operator:
Sample : BA10158W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T21.D Vial: 20
Acq On : 27 Apr 20 18:49 Operator:
Sample : BA10159W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	525811	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	697723	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	798426	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T21.D Vial: 20
Acq On : 27 Apr 20 18:49 Operator:
Sample : BA10159W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	521082	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	470277	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	283388	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	148309	25.73	ppb	0.00
Spiked Amount 25.000			Recovery = 102.916%			
3) 1,2-DCA-D4(S)	5.93	65	159769	25.61	ppb	0.00
Spiked Amount 25.000			Recovery = 102.444%			
5) Toluene-D8(S)	8.25	98	516699	24.48	ppb	0.00
Spiked Amount 25.000			Recovery = 97.908%			
6) 4-Bromofluorobenzene(S)	11.13	95	204375	23.75	ppb	0.00
Spiked Amount 25.000			Recovery = 94.988%			

Target Compounds Qvalue

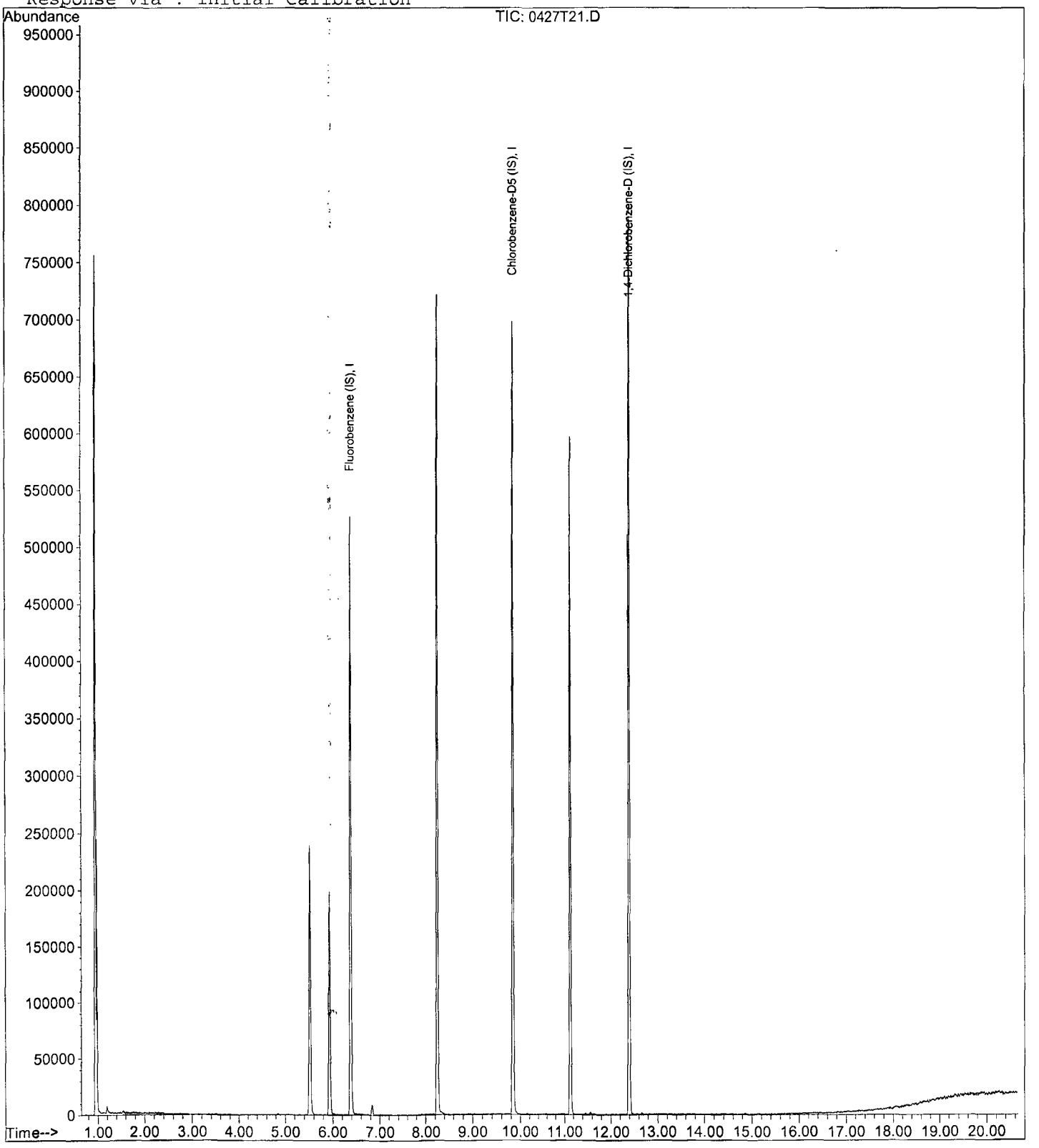
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T21.D Vial: 20
Acq On : 27 Apr 20 18:49 Operator:
Sample : BA10159W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T22.D Vial: 21
Acq On : 27 Apr 20 19:16 Operator:
Sample : BA10160W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	521485	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	687813	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	789688	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration
0427T22.D TGAS0427.M Thu Apr 30 12:37:28 2020 Page 1

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T22.D Vial: 21
Acq On : 27 Apr 20 19:16 Operator:
Sample : BA10160W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	517514	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	459299	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	281119	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	144815	25.30	ppb	0.00
Spiked Amount 25.000			Recovery = 101.184%			
3) 1,2-DCA-D4(S)	5.93	65	157668	25.45	ppb	0.00
Spiked Amount 25.000			Recovery = 101.796%			
5) Toluene-D8(S)	8.25	98	502613	24.38	ppb	0.00
Spiked Amount 25.000			Recovery = 97.512%			
6) 4-Bromofluorobenzene(S)	11.13	95	198546	23.62	ppb	0.00
Spiked Amount 25.000			Recovery = 94.484%			

Target Compounds Qvalue

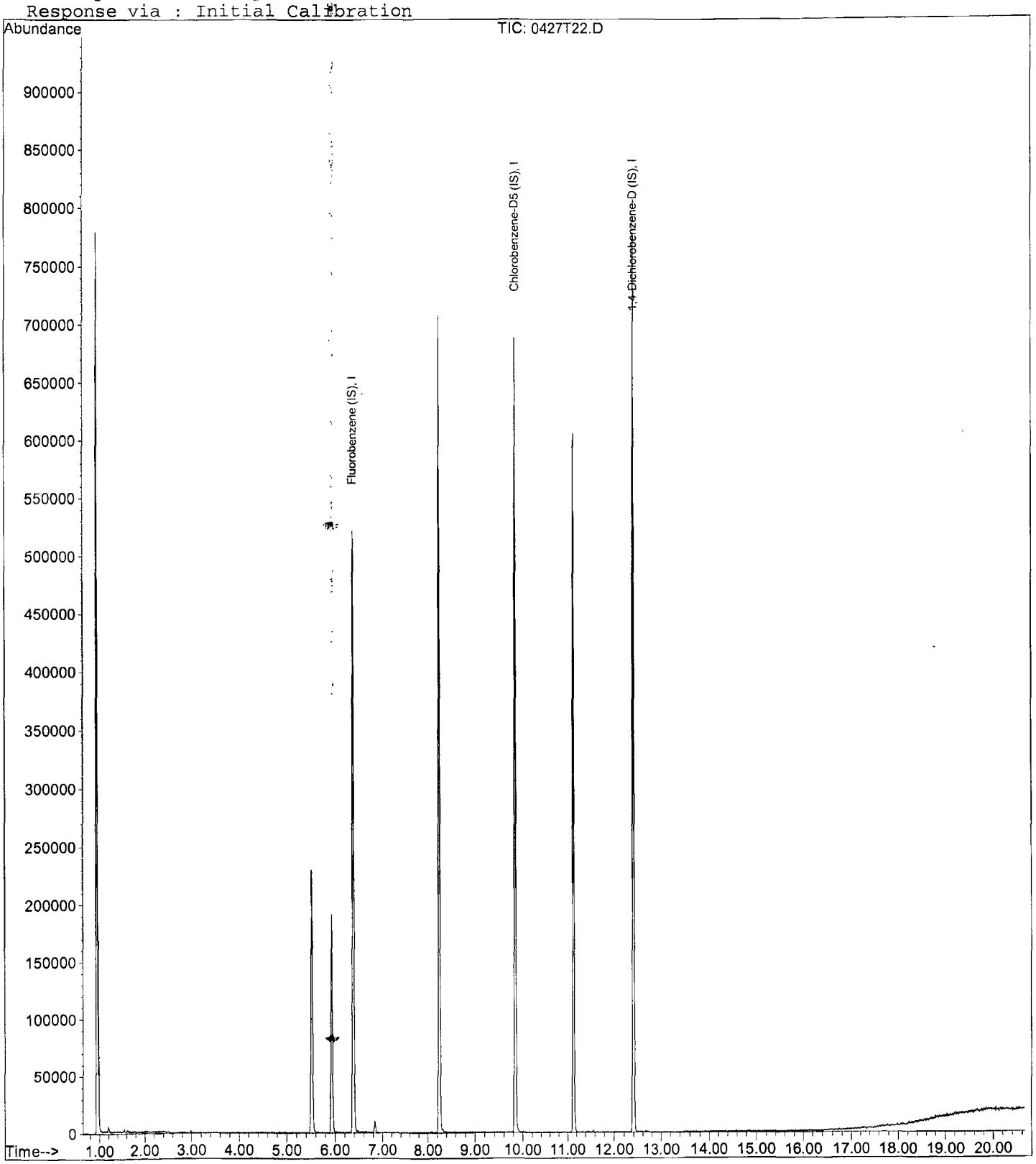
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T22.D Vial: 21
Acq On : 27 Apr 20 19:16 Operator:
Sample : BA10160W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T23.D Vial: 22
Acq On : 27 Apr 20 19:44 Operator:
Sample : BA10161W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	530079	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	699380	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	801044	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6119804m	48.74	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T23.D Vial: 22
Acq On : 27 Apr 20 19:44 Operator:
Sample : BA10161W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	517664	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	460495	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	291024	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	148246	25.89	ppb	0.00
Spiked Amount 25.000			Recovery = 103.552%			
3) 1,2-DCA-D4(S)	5.93	65	157632	25.44	ppb	0.00
Spiked Amount 25.000			Recovery = 101.744%			
5) Toluene-D8(S)	8.25	98	513483	24.84	ppb	0.00
Spiked Amount 25.000			Recovery = 99.364%			
6) 4-Bromofluorobenzene(S)	11.13	95	207452	24.62	ppb	0.00
Spiked Amount 25.000			Recovery = 98.464%			

Target Compounds Qvalue

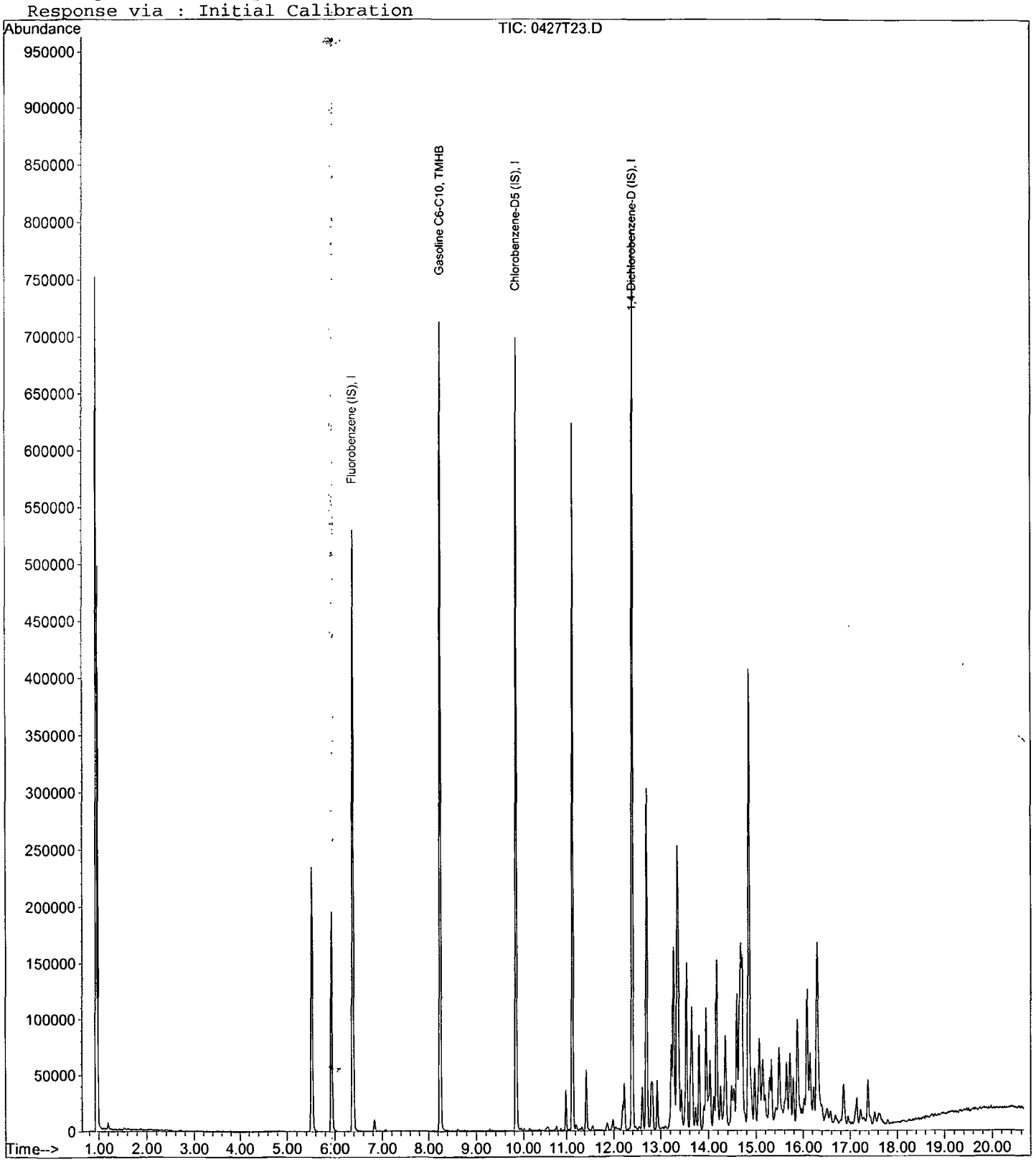
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T23.D Vial: 22
Acq On : 27 Apr 20 19:44 Operator:
Sample : BA10161W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T24.D Vial: 23
Acq On : 27 Apr 20 20:12 Operator:
Sample : BA10162W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	522629	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	691906	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	818521	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6133877m	62.54	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T24.D Vial: 23
Acq On : 27 Apr 20 20:12 Operator:
Sample : BA10162W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	515256	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	468921	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	295972	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	146720	25.74	ppb	0.00
Spiked Amount 25.000			Recovery = 102.964%			
3) 1,2-DCA-D4(S)	5.93	65	160081	25.95	ppb	0.00
Spiked Amount 25.000			Recovery = 103.804%			
5) Toluene-D8(S)	8.25	98	513319	24.39	ppb	0.00
Spiked Amount 25.000			Recovery = 97.548%			
6) 4-Bromofluorobenzene(S)	11.13	95	203710	23.74	ppb	0.00
Spiked Amount 25.000			Recovery = 94.952%			

Target Compounds Qvalue

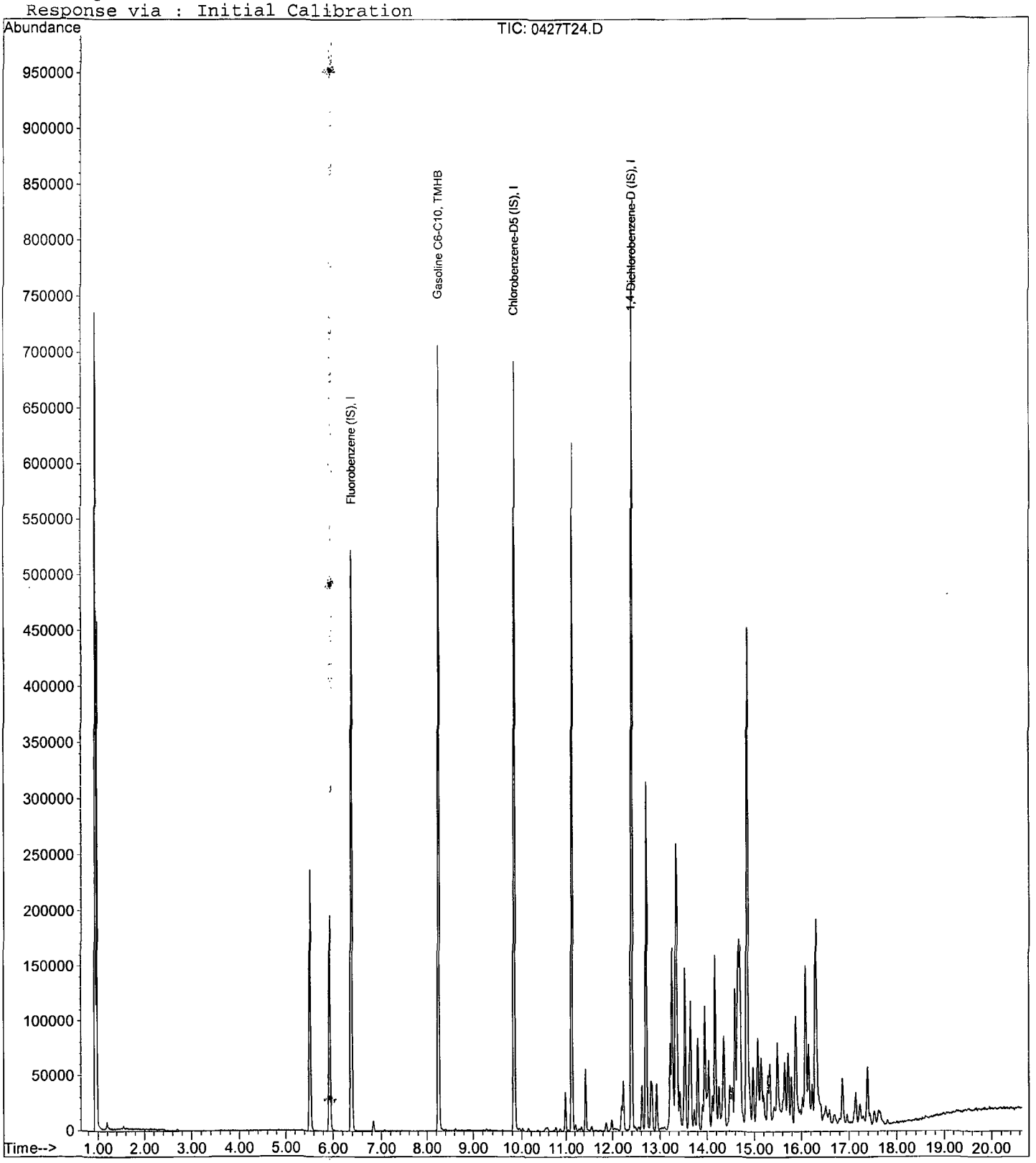
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T24.D Vial: 23
Acq On : 27 Apr 20 20:12 Operator:
Sample : BA10162W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T25.D Vial: 24
Acq On : 27 Apr 20 20:40 Operator:
Sample : BA10163W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	529647	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	691365	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	776702	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T25.D Vial: 24
Acq On : 27 Apr 20 20:40 Operator:
Sample : BA10163W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	523720	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	468043	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	285480	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	149883	25.87	ppb	0.00
Spiked Amount 25.000			Recovery =	103.484%		
3) 1,2-DCA-D4(S)	5.93	65	161810	25.81	ppb	0.00
Spiked Amount 25.000			Recovery =	103.232%		
5) Toluene-D8(S)	8.25	98	521703	24.83	ppb	0.00
Spiked Amount 25.000			Recovery =	99.328%		
6) 4-Bromofluorobenzene(S)	11.13	95	206239	24.08	ppb	0.00
Spiked Amount 25.000			Recovery =	96.312%		

Target Compounds Qvalue

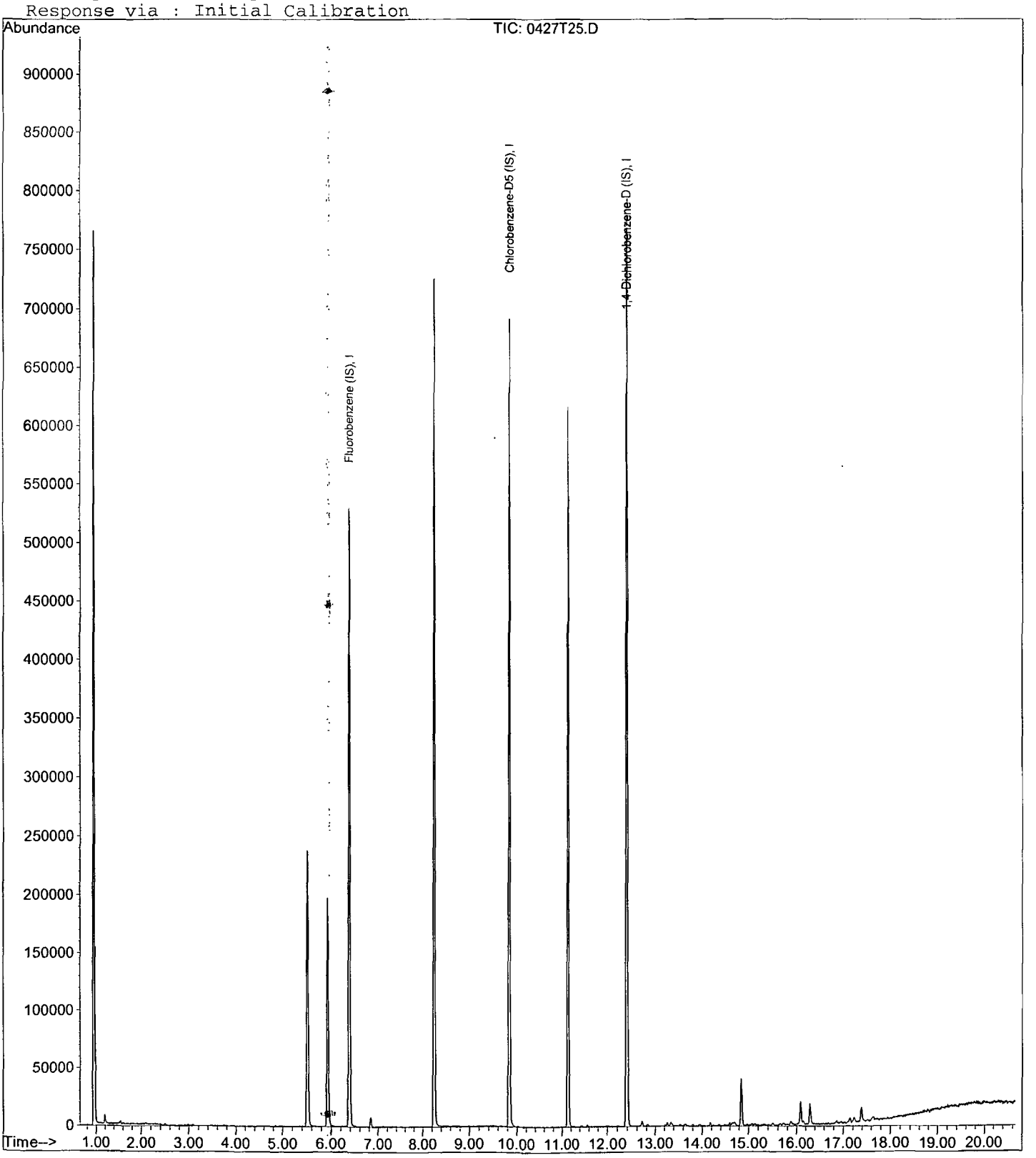
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T25.D Vial: 24
Acq On : 27 Apr 20 20:40 Operator:
Sample : BA10163W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T26.D Vial: 25
Acq On : 27 Apr 20 21:08 Operator:
Sample : BA10164W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	522340	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	697018	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	776448	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T26.D Vial: 25
Acq On : 27 Apr 20 21:08 Operator:
Sample : BA10164W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	513978	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	457552	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	276219	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	145928	25.67	ppb	0.00
Spiked Amount 25.000			Recovery = 102.664%			
3) 1,2-DCA-D4(S)	5.93	65	153972	25.02	ppb	0.00
Spiked Amount 25.000			Recovery = 100.092%			
5) Toluene-D8(S)	8.25	98	503564	24.52	ppb	0.00
Spiked Amount 25.000			Recovery = 98.072%			
6) 4-Bromofluorobenzene(S)	11.13	95	202152	24.14	ppb	0.00
Spiked Amount 25.000			Recovery = 96.568%			

Target Compounds Qvalue

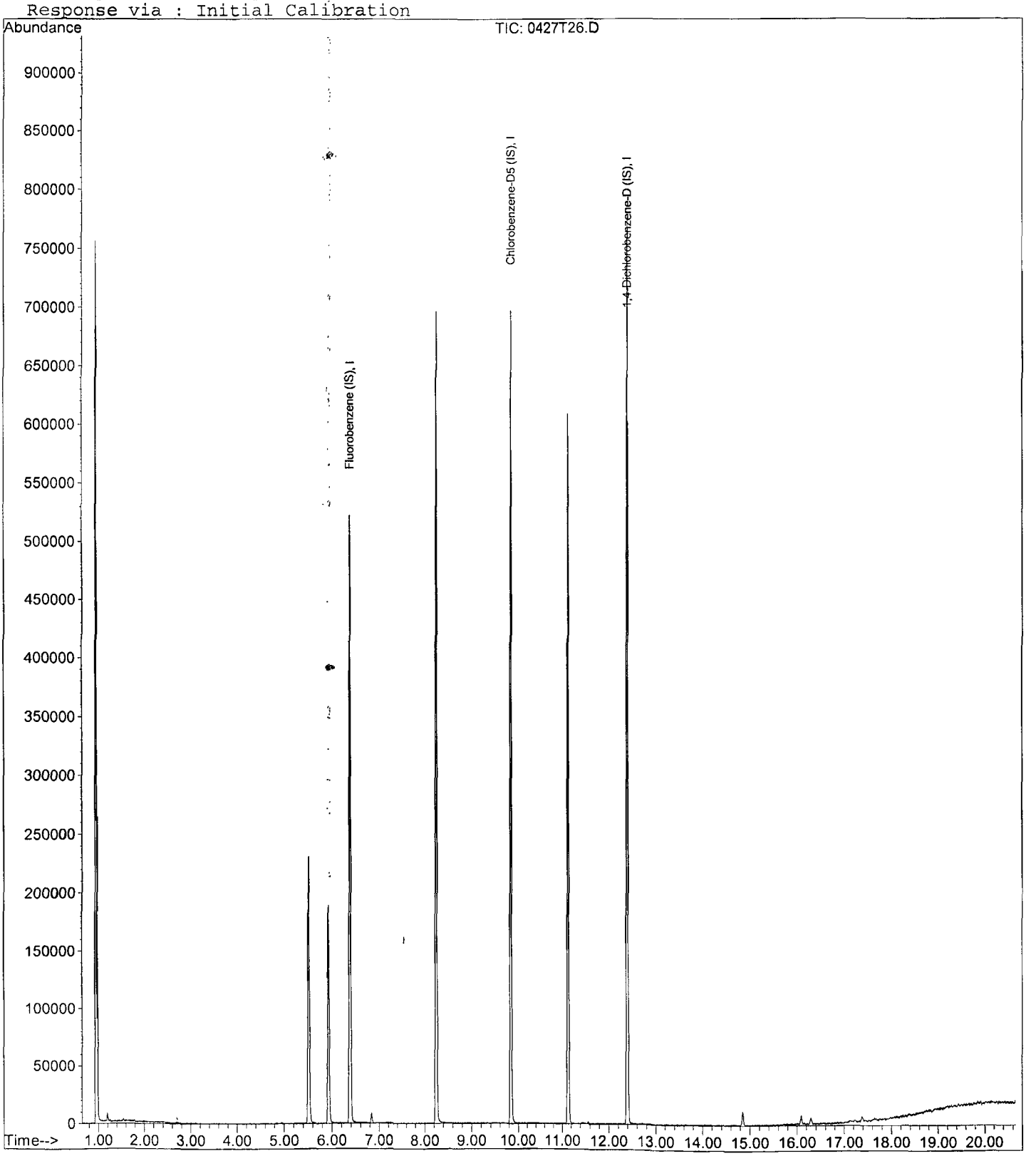
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T26.D Vial: 25
Acq On : 27 Apr 20 21:08 Operator:
Sample : BA10164W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T27.D Vial: 26
Acq On : 27 Apr 20 21:36 Operator:
Sample : BA10165W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	523193	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	685436	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	782496	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T27.D Vial: 26
Acq On : 27 Apr 20 21:36 Operator:
Sample : BA10165W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	515499	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	462877	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	280905	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	145922	25.59	ppb	0.00
Spiked Amount 25.000			Recovery = 102.356%			
3) 1,2-DCA-D4(S)	5.93	65	158577	25.70	ppb	0.00
Spiked Amount 25.000			Recovery = 102.780%			
5) Toluene-D8(S)	8.25	98	497874	23.96	ppb	0.00
Spiked Amount 25.000			Recovery = 95.848%			
6) 4-Bromofluorobenzene(S)	11.13	95	198795	23.47	ppb	0.00
Spiked Amount 25.000			Recovery = 93.872%			

Target Compounds Qvalue

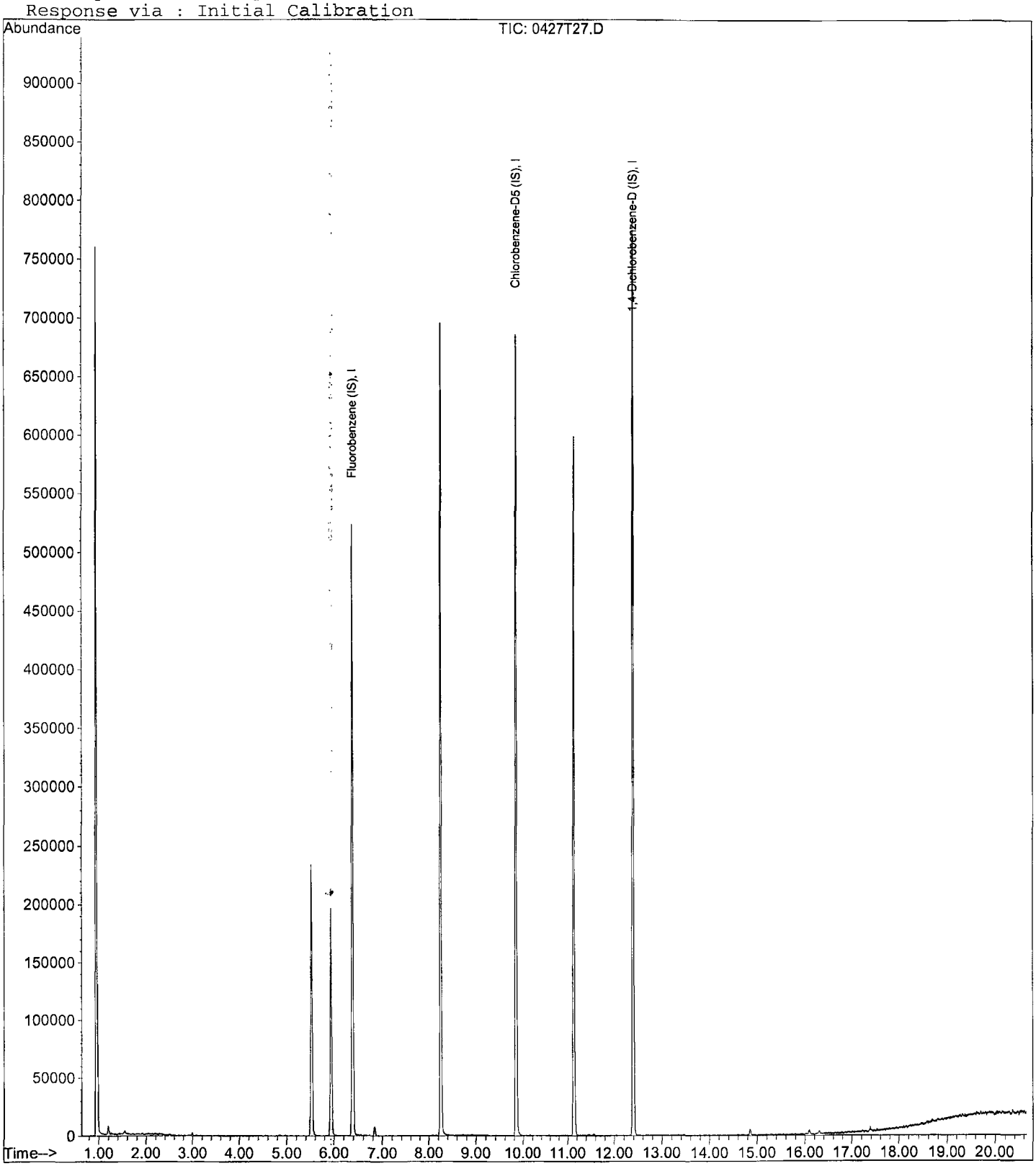
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T27.D Vial: 26
Acq On : 27 Apr 20 21:36 Operator:
Sample : BA10165W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T28.D Vial: 27
Acq On : 27 Apr 20 22:04 Operator:
Sample : BA10166W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	520198	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	687335	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	779526	25.00 ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T28.D Vial: 27
Acq On : 27 Apr 20 22:04 Operator:
Sample : BA10166W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	506081	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	456747	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	280283	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	143751	25.68	ppb	0.00
Spiked Amount 25.000			Recovery =	102.708%		
3) 1,2-DCA-D4(S)	5.93	65	156002	25.75	ppb	0.00
Spiked Amount 25.000			Recovery =	102.996%		
5) Toluene-D8(S)	8.25	98	501516	24.46	ppb	0.00
Spiked Amount 25.000			Recovery =	97.844%		
6) 4-Bromofluorobenzene(S)	11.13	95	196053	23.45	ppb	0.00
Spiked Amount 25.000			Recovery =	93.816%		

Target Compounds Qvalue

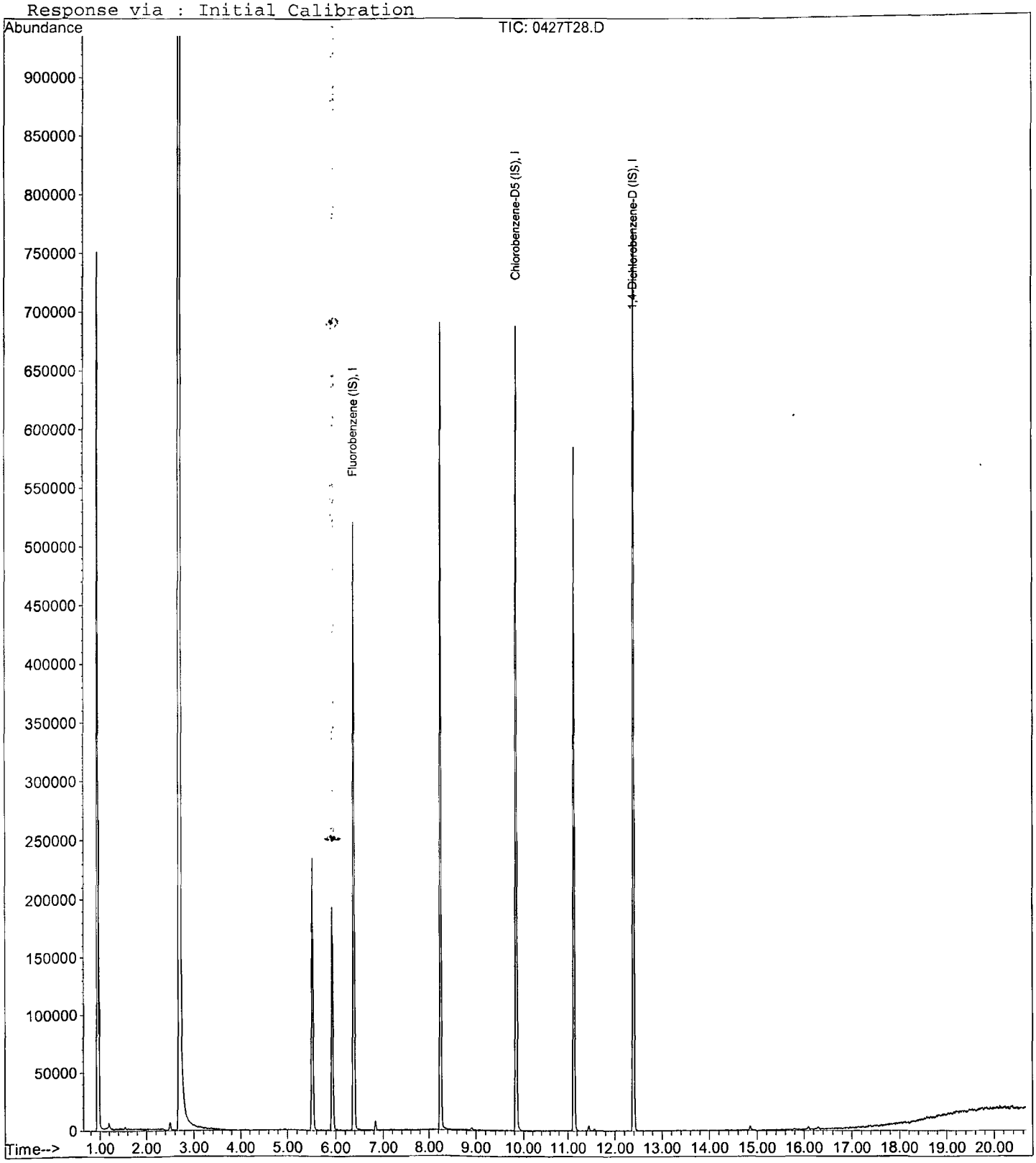
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T28.D Vial: 27
Acq On : 27 Apr 20 22:04 Operator:
Sample : BA10166W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T29.D Vial: 28
Acq On : 27 Apr 20 22:32 Operator:
Sample : BA10167W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	513763	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	661860	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	763189	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T29.D Vial: 28
Acq On : 27 Apr 20 22:32 Operator:
Sample : BA10167W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	503129	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	443159	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	272449	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	144270	25.92	ppb	0.00
Spiked Amount 25.000			Recovery = 103.684%			
3) 1,2-DCA-D4(S)	5.93	65	155256	25.78	ppb	0.00
Spiked Amount 25.000			Recovery = 103.104%			
5) Toluene-D8(S)	8.25	98	486830	24.47	ppb	0.00
Spiked Amount 25.000			Recovery = 97.892%			
6) 4-Bromofluorobenzene(S)	11.13	95	196776	24.26	ppb	0.00
Spiked Amount 25.000			Recovery = 97.052%			

Target Compounds Qvalue

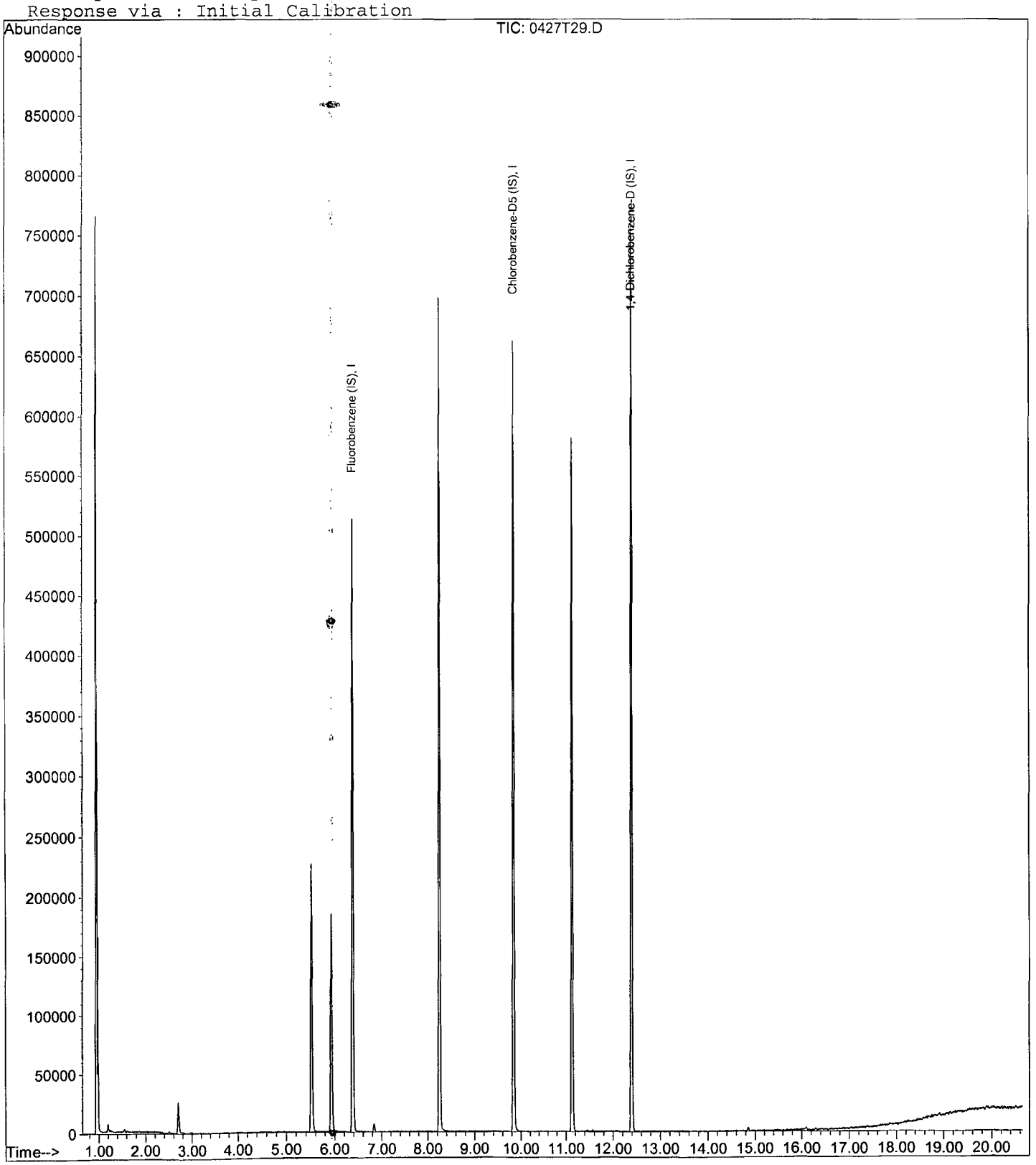
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T29.D Vial: 28
Acq On : 27 Apr 20 22:32 Operator:
Sample : BA10167W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T30.D Vial: 29
Acq On : 27 Apr 20 23:00 Operator:
Sample : BA10168W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	517716	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	664986	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	761960	25.00 ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T30.D Vial: 29
Acq On : 27 Apr 20 23:00 Operator:
Sample : BA10168W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	504408	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	447985	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	269924	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	140975	25.26	ppb	0.00
Spiked Amount 25.000			Recovery = 101.060%			
3) 1,2-DCA-D4(S)	5.93	65	151238	25.05	ppb	0.00
Spiked Amount 25.000			Recovery = 100.180%			
5) Toluene-D8(S)	8.25	98	485219	24.13	ppb	0.00
Spiked Amount 25.000			Recovery = 96.516%			
6) 4-Bromofluorobenzene(S)	11.13	95	194991	23.78	ppb	0.00
Spiked Amount 25.000			Recovery = 95.136%			

Target Compounds Qvalue

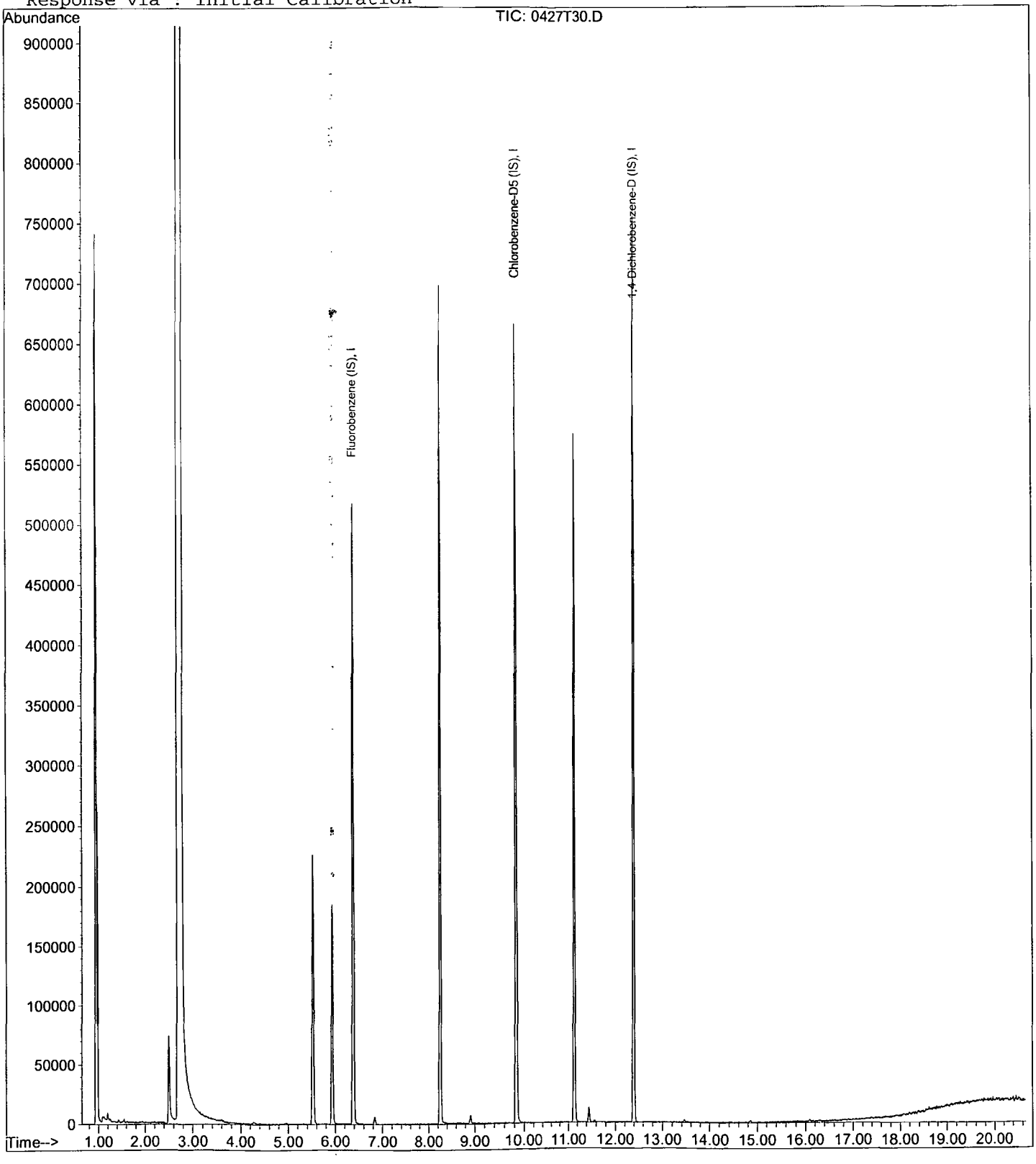
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T30.D Vial: 29
Acq On : 27 Apr 20 23:00 Operator:
Sample : BA10168W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:08 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T18.D Vial: 17
Acq On : 27 Apr 20 17:25 Operator:
Sample : 200427A BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	542921	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	706044	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	789266	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T18.D Vial: 17
Acq On : 27 Apr 20 17:25 Operator:
Sample : 200427A BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	530763	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	472413	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	285229	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	148837	25.35	ppb	0.00
Spiked Amount 25.000			Recovery = 101.396%			
3) 1,2-DCA-D4(S)	5.93	65	160199	25.21	ppb	0.00
Spiked Amount 25.000			Recovery = 100.848%			
5) Toluene-D8(S)	8.25	98	515719	24.32	ppb	0.00
Spiked Amount 25.000			Recovery = 97.280%			
6) 4-Bromofluorobenzene(S)	11.13	95	206919	23.93	ppb	0.00
Spiked Amount 25.000			Recovery = 95.736%			

Target Compounds Qvalue

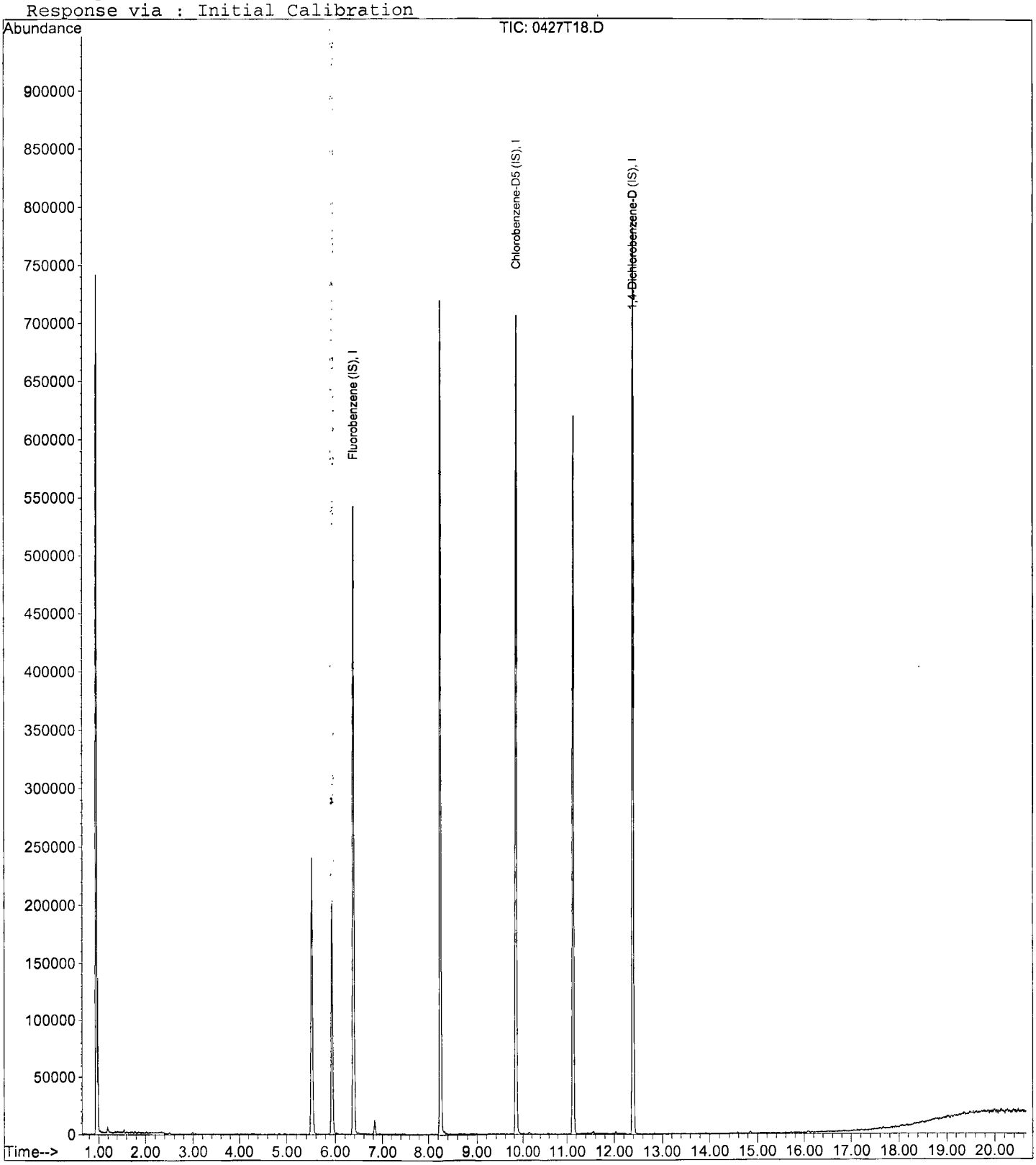
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T18.D Vial: 17
Acq On : 27 Apr 20 17:25 Operator:
Sample : 200427A BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:07 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T16.D Vial: 15
Acq On : 27 Apr 20 16:29 Operator:
Sample : 200427A LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:38 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	545578	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	710552	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	814933	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	7865804m	255.69	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T16.D Vial: 15
Acq On : 27 Apr 20 16:29 Operator:
Sample : 200427A LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	535832	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	479539	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	301174	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	149741	25.26	ppb	0.00
Spiked Amount 25.000			Recovery = 101.048%			
3) 1,2-DCA-D4(S)	5.93	65	161275	25.14	ppb	0.00
Spiked Amount 25.000			Recovery = 100.564%			
5) Toluene-D8(S)	8.25	98	515234	23.94	ppb	0.00
Spiked Amount 25.000			Recovery = 95.744%			
6) 4-Bromofluorobenzene(S)	11.13	95	210254	23.96	ppb	0.00
Spiked Amount 25.000			Recovery = 95.832%			

Target Compounds Qvalue

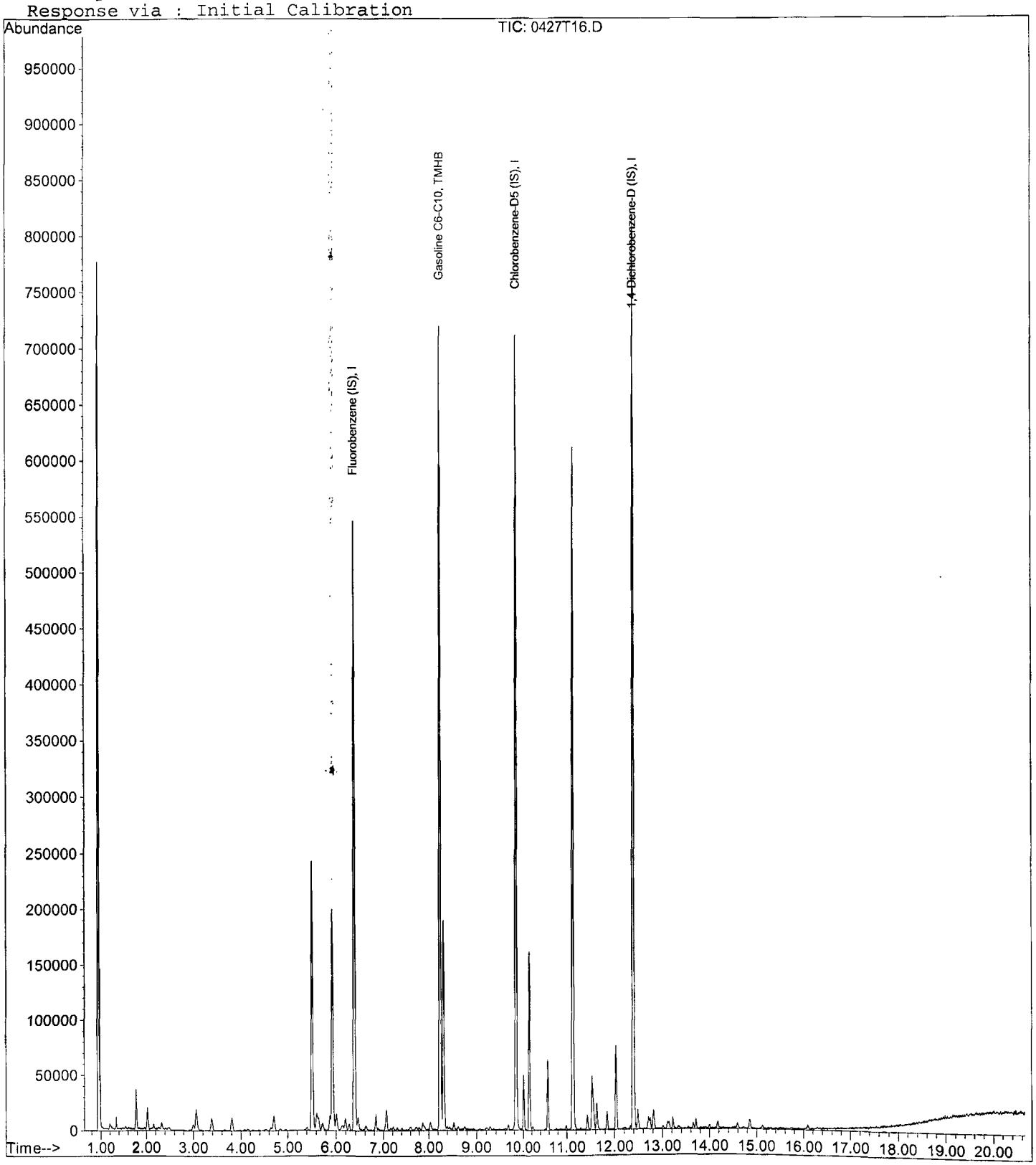
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T16.D Vial: 15
Acq On : 27 Apr 20 16:29 Operator:
Sample : 200427A LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:38 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T17.D Vial: 16
Acq On : 27 Apr 20 16:57 Operator:
Sample : 200427A LCSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:38 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	543557	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	726309	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	812101	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	8154122m	297.77	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T17.D Vial: 16
Acq On : 27 Apr 20 16:57 Operator:
Sample : 200427A LCSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	536413	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	477652	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	295086	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	148148	24.97	ppb	0.00
Spiked Amount 25.000			Recovery =	99.864%		
3) 1,2-DCA-D4(S)	5.93	65	163503	25.46	ppb	0.00
Spiked Amount 25.000			Recovery =	101.844%		
5) Toluene-D8(S)	8.25	98	535223	24.96	ppb	0.00
Spiked Amount 25.000			Recovery =	99.852%		
6) 4-Bromofluorobenzene(S)	11.13	95	219584	25.12	ppb	0.00
Spiked Amount 25.000			Recovery =	100.480%		

Target Compounds Qvalue

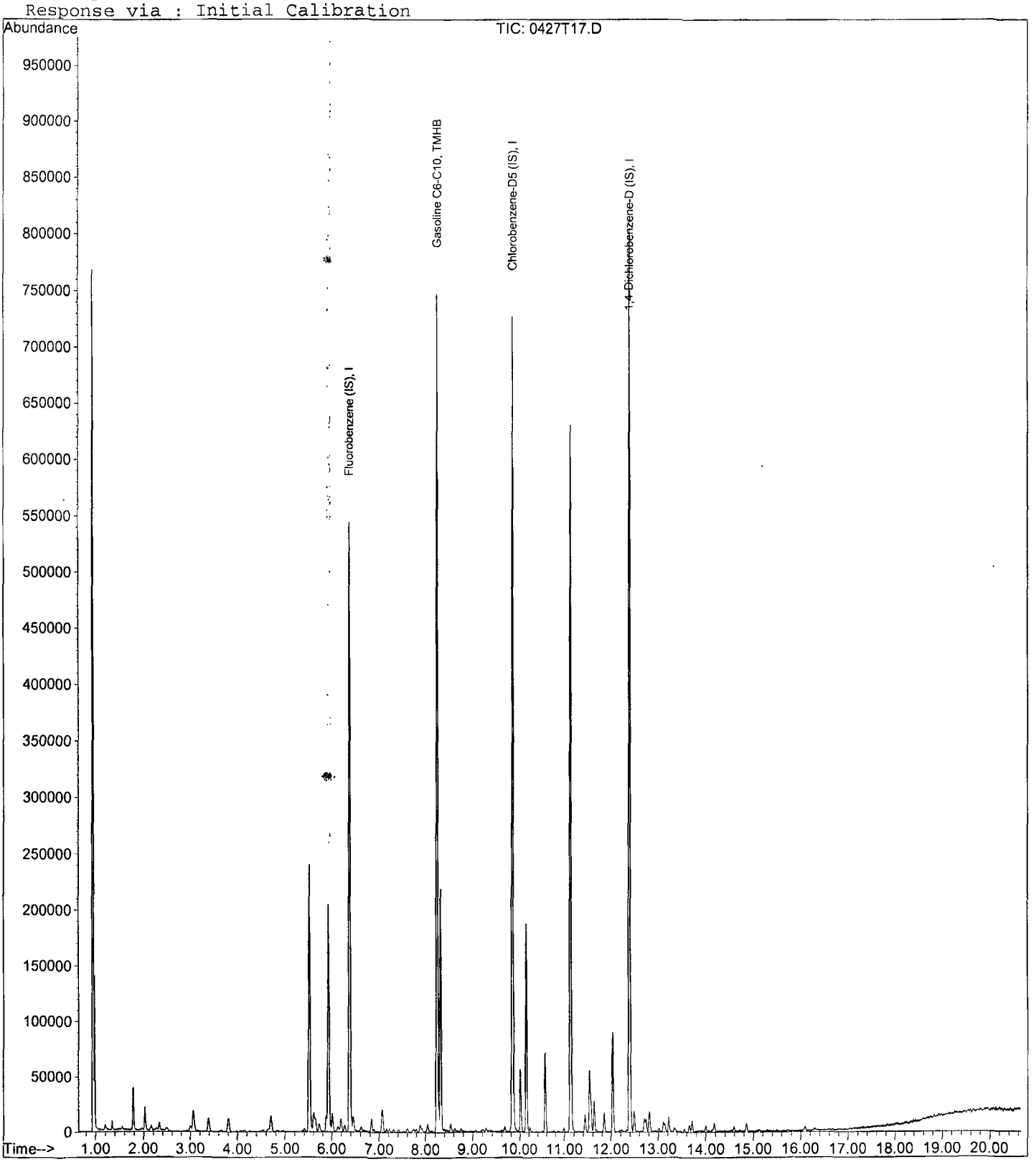
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T17.D Vial: 16
Acq On : 27 Apr 20 16:57 Operator:
Sample : 200427A LCSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:38 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T35.D Vial: 34
Acq On : 28 Apr 20 1:19 Operator:
Sample : BA10158W05 MS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:43 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	529812	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	689611	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	787883	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	9.84	TIC	7809690m	278.97	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T35.D Vial: 34
Acq On : 28 Apr 20 1:19 Operator:
Sample : BA10158W05 MS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	515675	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	461687	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	281957	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	145032	25.42	ppb	0.00
Spiked Amount 25.000			Recovery = 101.696%			
3) 1,2-DCA-D4(S)	5.93	65	153178	24.81	ppb	0.00
Spiked Amount 25.000			Recovery = 99.248%			
5) Toluene-D8(S)	8.25	98	503625	24.30	ppb	0.00
Spiked Amount 25.000			Recovery = 97.204%			
6) 4-Bromofluorobenzene(S)	11.13	95	202333	23.95	ppb	0.00
Spiked Amount 25.000			Recovery = 95.788%			

Target Compounds Qvalue

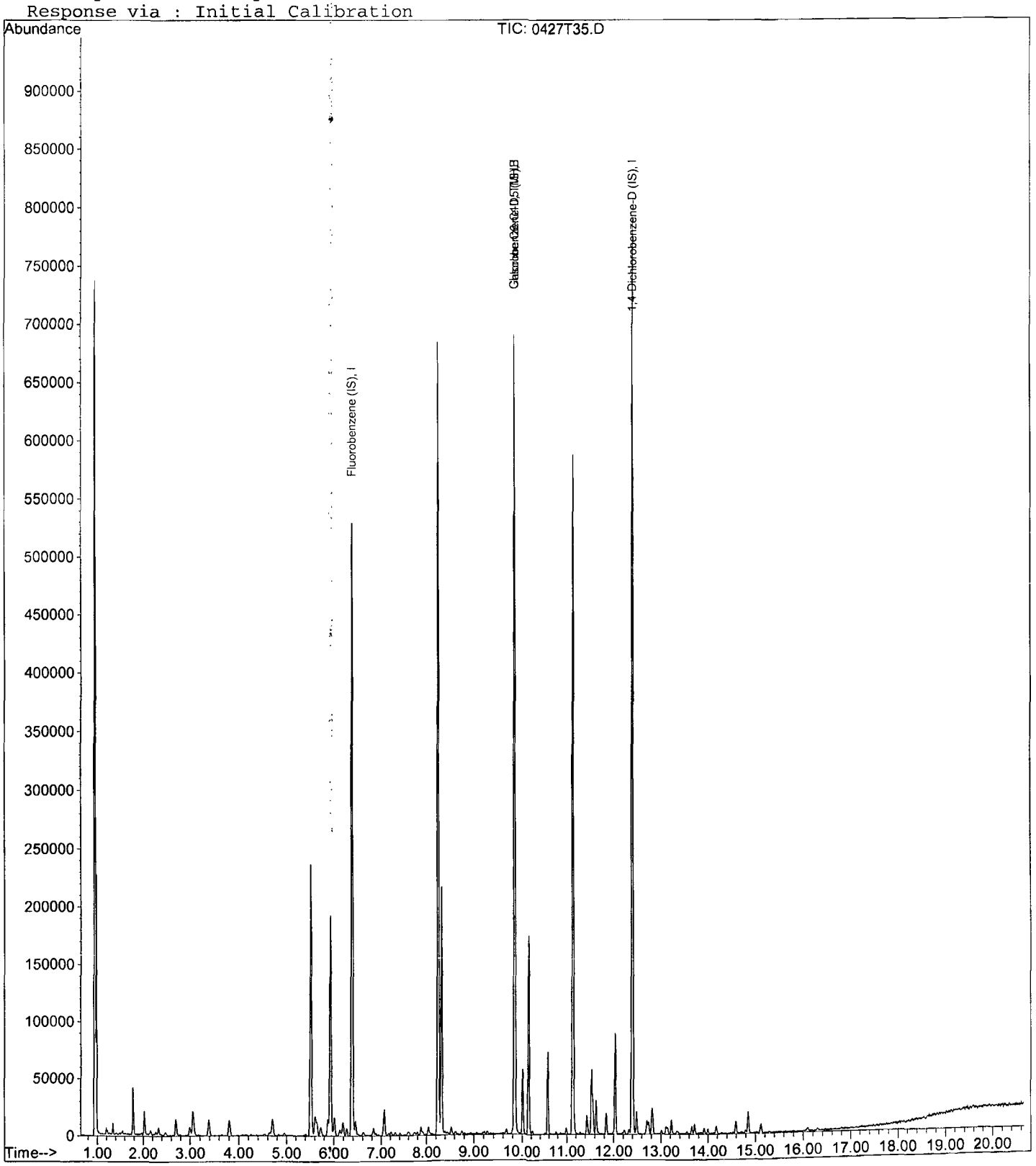
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T35.D Vial: 34
Acq On : 28 Apr 20 1:19 Operator:
Sample : BA10158W05 MS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:43 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T36.D Vial: 35
Acq On : 28 Apr 20 1:47 Operator:
Sample : BA10158W06 MSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:43 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	516632	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	683847	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	799939	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	9.84	TIC	7671135m	286.75	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T36.D Vial: 35
Acq On : 28 Apr 20 1:47 Operator:
Sample : BA10158W06 MSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	510397	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	459352	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	288696	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	141145	25.00	ppb	0.00
Spiked Amount 25.000			Recovery =	99.996%		
3) 1,2-DCA-D4(S)	5.93	65	153776	25.17	ppb	0.00
Spiked Amount 25.000			Recovery =	100.668%		
5) Toluene-D8(S)	8.25	98	493789	23.95	ppb	0.00
Spiked Amount 25.000			Recovery =	95.792%		
6) 4-Bromofluorobenzene(S)	11.13	95	198007	23.55	ppb	0.00
Spiked Amount 25.000			Recovery =	94.216%		

Target Compounds Qvalue

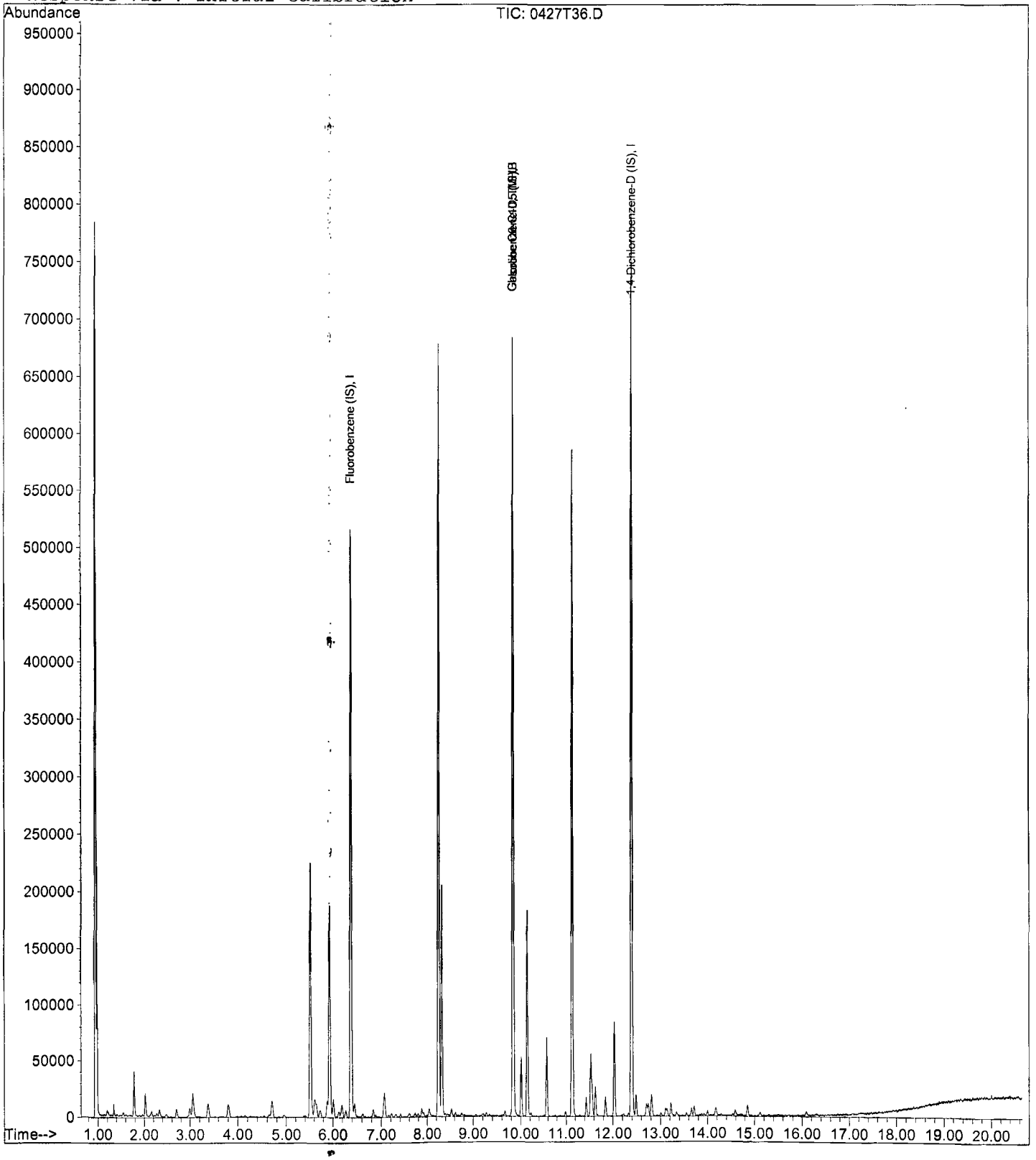
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T36.D Vial: 35
Acq On : 28 Apr 20 1:47 Operator:
Sample : BA10158W06 MSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:43 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T37.D Vial: 36
Acq On : 28 Apr 20 2:15 Operator:
Sample : BA10166W05 MS 300ug/l Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:43 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	506845	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	681185	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	775179	25.00 ppb	0.00
System Monitoring Compounds					
Target Compounds					Qvalue
2) Gasoline C6-C10	9.84	TIC	7649082m	304.27 ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T37.D Vial: 36
Acq On : 28 Apr 20 2:15 Operator:
Sample : BA10166W05 MS 300ug/l Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	501783	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	451581	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	281272	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	140319	25.28	ppb	0.00
Spiked Amount 25.000			Recovery = 101.116%			
3) 1,2-DCA-D4(S)	5.93	65	153998	25.64	ppb	0.00
Spiked Amount 25.000			Recovery = 102.544%			
5) Toluene-D8(S)	8.25	98	489061	24.13	ppb	0.00
Spiked Amount 25.000			Recovery = 96.508%			
6) 4-Bromofluorobenzene(S)	11.13	95	196760	23.81	ppb	0.00
Spiked Amount 25.000			Recovery = 95.232%			

Target Compounds Qvalue

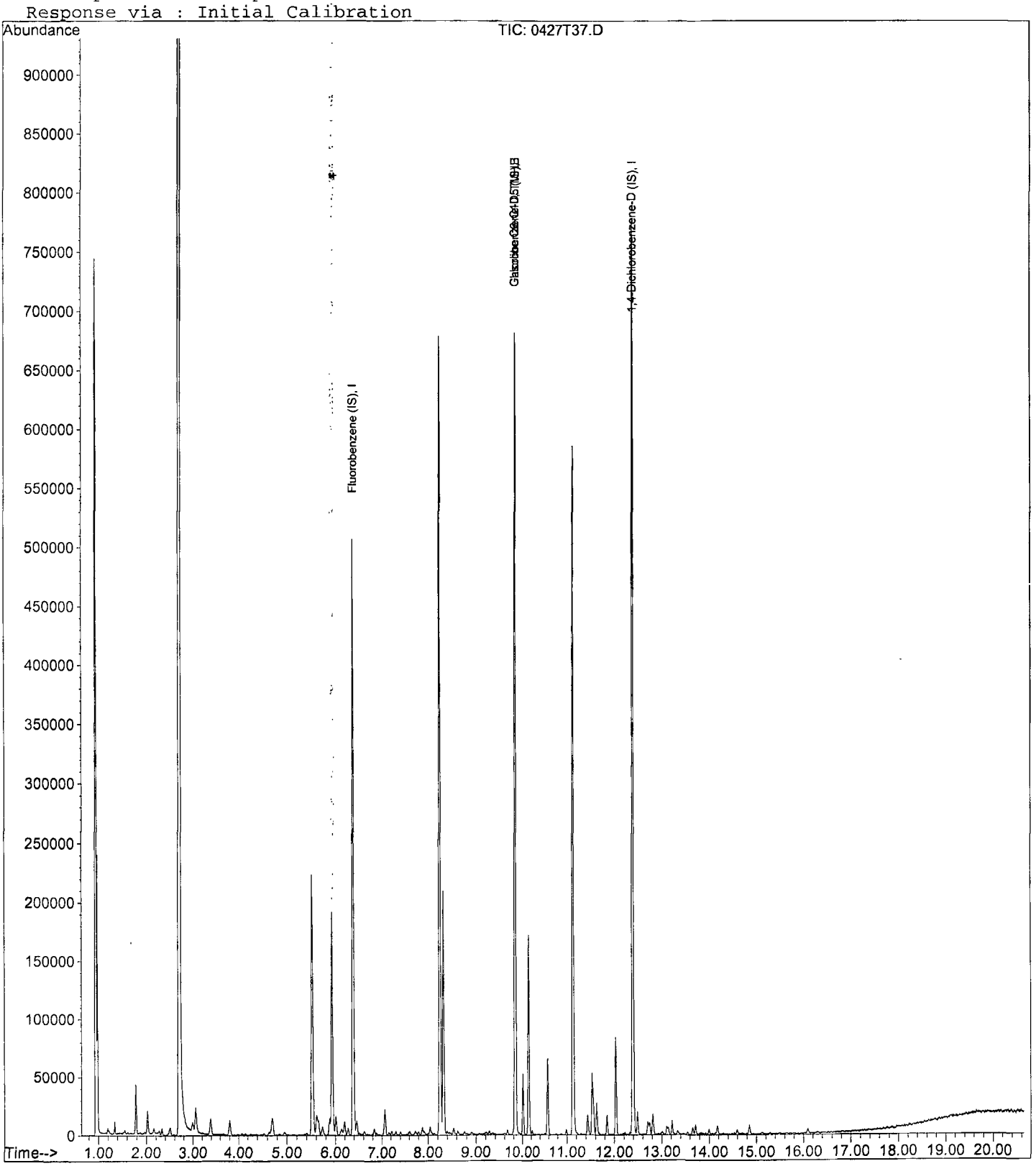
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T37.D Vial: 36
Acq On : 28 Apr 20 2:15 Operator:
Sample : BA10166W05 MS 300ug/l Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:43 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T38.D Vial: 37
Acq On : 28 Apr 20 2:43 Operator:
Sample : BA10166W06 MSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:44 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	521452	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	698205	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	799859	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	7697941m	280.56	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0427T38.D Vial: 37
Acq On : 28 Apr 20 2:43 Operator:
Sample : BA10166W06 MSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 10:09 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	510039	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	460743	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	285734	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	145297	25.75	ppb	0.00
Spiked Amount 25.000			Recovery = 103.008%			
3) 1,2-DCA-D4(S)	5.93	65	151614	24.83	ppb	0.00
Spiked Amount 25.000			Recovery = 99.320%			
5) Toluene-D8(S)	8.25	98	504785	24.41	ppb	0.00
Spiked Amount 25.000			Recovery = 97.628%			
6) 4-Bromofluorobenzene(S)	11.13	95	203687	24.16	ppb	0.00
Spiked Amount 25.000			Recovery = 96.624%			

Target Compounds Qvalue

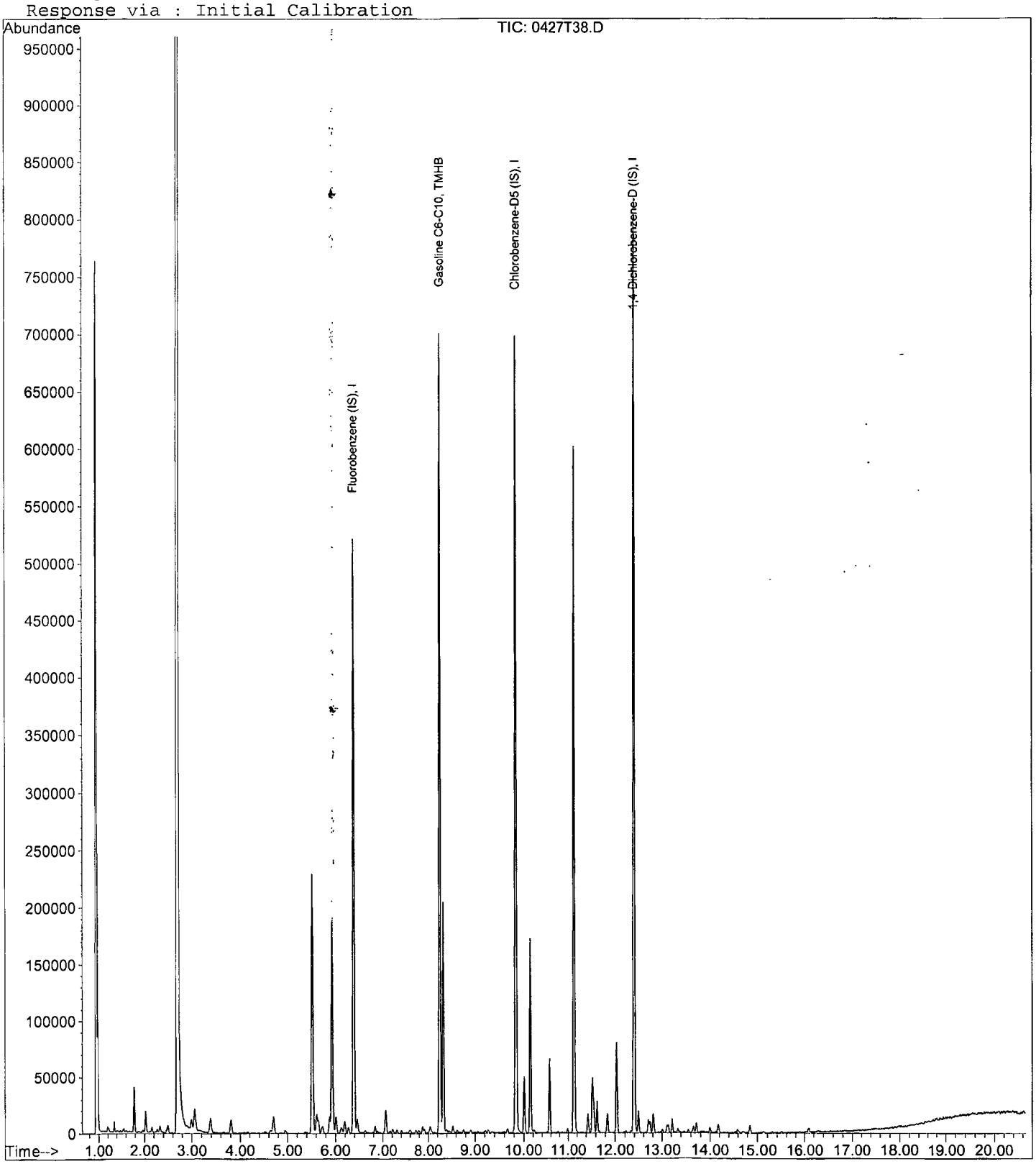
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T38.D Vial: 37
Acq On : 28 Apr 20 2:43 Operator:
Sample : BA10166W06 MSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 28 9:44 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Thor Gas Standard Prep

Gas Primary Working Standard

Prepared: 03/13/20 — **Prepared By (Initials): CH**

Expires: 01/06/21

Methanol Lot No. 58019-00962

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
50,000ug/mL Gas STD	Restek	30205	50,000	A0132443-39859	01/06/21	12/31/24	80uL	2mL	Methanol	2,000

Gas Second Source (SS) Working Standard

Prepared: 03/13/20 — **Prepared By (Initials): CH**

Expires: 07/16/20

Methanol Lot No. 58019-00962

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Gasoline (5,000ppm)	O2SI	020246-06	5,000	CL11750-40999	07/16/20	02/28/27	800uL	2mL	Methanol	2,000

Thor Gas Calibration Curve

Prepared: 04/27/20 — **Prepared By (Initials): CH**

Expires: 06/26/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA Gasses Standards	Phenova	20ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	1uL	100mL	P&T Water	20
VOA Gasses Standards	Phenova	50ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	2.5uL	100mL	P&T Water	50
VOA Gasses Standards	Phenova	100ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	5uL	100mL	P&T Water	100
VOA Gasses Standards	Phenova	300ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	15uL	100mL	P&T Water	300
VOA Gasses Standards	Phenova	600ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	30uL	100mL	P&T Water	600
VOA Gasses Standards	Phenova	800ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	40uL	100mL	P&T Water	800
VOA Gasses Standards	Phenova	1,000ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	50uL	100mL	P&T Water	1,000

Thor Gas Second Source

Prepared: 04/27/20 — **Prepared By (Initials): CH**

Expires: 06/26/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
50,000ug/mL Gas STD	Phenova	SS 300ug/L	2,000	Prepared 03/13/20	07/16/20	N/A	15uL	100mL	P&T Water	300

Thor Gas Continuing Calibrations/Lab Control Spikes

Prepared: 04/27/20 — **Prepared By (Initials): CH**

Expires: 04/28/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Gasses Standards	Phenova	300ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	15uL	100mL	P&T Water	300

Thor 8260 Standard Prep

Thor 8260 Water Calibration Curve

Prepared By (Initials): CH

0.3ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	0.3ug/L	5	Prepared 04/14/20	06/13/20	N/A	3uL	50mL	P&T Water	0.3
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	3uL			5
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	3uL			0.3
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	2uL			10

0.5ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	0.5ug/L	5	Prepared 04/14/20	06/13/20	N/A	5uL	50mL	P&T Water	0.5
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			10
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	5uL			0.5
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	5uL			25

1.0ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	1 0ug/L	5	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	1
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			20
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	10uL			1
VOA STD TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	10uL			50

2.0ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	2.0ug/L	5	Prepared 04/14/20	06/13/20	N/A	20uL	50mL	P&T Water	2
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			30
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	20uL			2
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	15uL			75

5ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	5ug/L	50	Prepared 04/14/20	06/13/20	N/A	5uL	50mL	P&T Water	5
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	5uL			5
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			40
VOA STD 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			5
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	20uL			100

10ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	10ug/L	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			50
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	25uL			125

20ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	20ug/L	50	Prepared 04/14/20	06/13/20	N/A	20uL	50mL	P&T Water	20
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	20uL			20
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			60
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			20
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	30uL			150

40ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	40ug/L	50	Prepared 04/14/20	06/13/20	N/A	40uL	50mL	P&T Water	40
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	40uL			40
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	40uL			80
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	40uL			40
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	35uL			175

100ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	100ug/L	50	Prepared 04/14/20	06/13/20	N/A	100uL	50mL	P&T Water	100
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	100uL			100
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	100uL			100
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	100uL			100
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	40uL			200

Thor 8260 Water Second Source (SS)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. Gases	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 3	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. 2-CEVE	Absolute	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 6	Various	8260 Water SS	50	Prepared 04/14/20	04/22/20	N/A	10uL			10
VOA STD. 0	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
Voa STD. TBA	Various	8260 Water SS	250	Prepared 04/14/20	04/02/20	N/A	25uL			250

8260 Water Continuing Calibrations (CCV)/ Lab Control Spikes (LCS)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 04/25/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	CCV/ LCS	50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 2	O2SI	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. TBA	Various	CCV/ LCS	250	Prepared 04/14/20	05/06/20	N/A	25uL			125

LCS (X4 Ketones)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 04/25/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	LCS X4 Ketones	50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 2	O2SI	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	40uL			40
VOA STD TBA	Various	LCS X4 Ketones	250	Prepared 04/14/20	05/06/20	N/A	25uL			125

Primary and Secondary Working Standards

Primary Standards

VOA STD 7

Prepared: 04/14/20 A
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Gasses STD	Phenova	ALO-101206	2,000	**CL14053-49896**	**04/14/21**	**10/31/24**	100uL	4mL	Methanol	50
Hexachloroethane	Absolute	70199	1,000	**091818-49911**	**04/14/21**	**09/18/23**	200uL			50
Benzyl Chloride	Accusta	M-8010-01	1,000	**011320-49979**	**04/14/21**	**01/13/21**	200uL			50

VOA STD 8

Prepared: 04/14/20 B
Expires: 05/06/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Additions STD	Phenova	ALO-130175	2,000	**CL14058-49891**	**04/14/21**	**08/31/21**	100uL	4mL	Methanol	50
502.2 Cal. Std.	Phenova	ALO-101200	2,000	**CL14379-49943**	**04/14/21**	**10/31/24**	100uL			50
Vinyl Acetate	Phenova	ALO-101228	2,000	**CL15169-50084**	**04/14/21**	**05/06/20**	100uL			50

VOA STD TBA

Prepared: 04/14/20 C
Expires: 05/06/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOC Mix	Phenova	ALO-130176	2,000	**CL12929-49956**	**04/14/21**	**11/30/20**	500uL	4mL	Methanol	250
Acrolein	Phenova	ALO-130549	10,000	**CL15174-50085**	**04/14/21**	**05/06/20**	100uL			250

VOA STD 1

Prepared: 04/14/20 D
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE	Absolute	82408	2,000	**011320-49914**	**04/14/21**	**01/13/23**	50	2mL	Methanol	50

VOA STD 2

Prepared: 04/14/20 E
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Std.	Phenova	ALO-109211	2,000	**CL12730-49961**	**04/14/21**	**08/31/28**	100	4mL	Methanol	50

VOA STD 9

Prepared: 04/14/20 F
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 7		VOA STD. 9	50	Prepared 04/14/20	**04/14/21**	N/A	200uL	2mL	Methanol	5
VOA STD. 8			50	Prepared 04/14/20	**04/14/21**	N/A	200uL			5

VOA STD. 10

Prepared: 04/14/20 G
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 1		VOA STD. 10	50	Prepared 04/14/20	**04/14/21**	N/A	200uL	2mL	Methanol	5

VOA STD. 12

Prepared: 04/14/20 H
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 2		VOA STD. 12	50	Prepared 04/14/20	**04/14/21**	N/A	200uL	2mL	Methanol	5

Second Source (SS) Standards

VOA STD. 3

Prepared: 04/14/20 I
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Standard	Phenova	ALO-101211	2,000	CL13994-49966	04/14/21	08/31/29	50uL	2mL	Methanol	50

VOA STD. Gases

Prepared: 04/14/20 J
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
8260 Gases (SS)	Phenova	ALO-101206	2,000	CL14504-49899	04/14/21	10/31/24	50uL	2mL	Methanol	50

VOA STD. 6

Prepared: 04/14/20 K
Expires: 04/22/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
502.2 Calibration STD. (54-compounds)	Phenova	ALO-101200	2,000	CL14381-49947	04/14/21	10/31/24	50uL	2mL	Methanol	50
Vinyl Acetate	Phenova	ALO-101228	2,000	CL15134-50008	04/02/21	04/22/20	50uL			50
Hexachloroethane	Accustan	AS-E0011	1,000	219061767-49989	04/14/21	06/28/29	100uL			50
Benzyl Chloride	Accustan	M-8010-01	200	219041664-49933	04/14/21	12/25/21	500uL			50

VOA STD. TBA

Prepared: 04/14/20 L
Expires: 04/02/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOA Mix (4-3)	Phenova	ALO-130176	2,000	CL12734-49952	04/14/21	08/31/20	250uL	2mL	Methanol	250
Acrolein	Phenova	ALO-101224	10,000	CL15142-50009	04/02/20	04/22/20	50uL			250

VOA STD. 0

Prepared: 04/14/20 M
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Addition STD.	Phenova	ALO-130175	2,000	CL14058-49972	04/14/21	08/31/21	50uL	2mL	Methanol	50

VOA STD. 2-CEVE

Prepared: 04/14/20 N
Expires: 06/13/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE (SS)	Absolute	82408	2,000	121119-49915	04/14/21	12/11/22	50uL	2mL	Methanol	50

Injection Log

Directory: M:\THOR\DATA\T200424\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
2	0424T27.D	1	0.3ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 14:31
3	0424T28.D	1	0.5ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 14:59
4	0424T29.D	1	1.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 15:27
5	0424T30.D	1	2.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 15:55
6	0424T31.D	1	5.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 16:23
7	0424T32.D	1	10ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 16:50
8	0424T33.D	1	20ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 17:18
9	0424T34.D	1	40ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 17:46
10	0424T35.D	1	100ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 18:14
2	0427T03.D	1	20ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 10:27
3	0427T04.D	1	50ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 10:55
4	0427T05.D	1	100ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 11:23
5	0427T06.D	1	300ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 11:51
6	0427T07.D	1	600ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 12:19
7	0427T08.D	1	800ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 12:46
8	0427T09.D	1	1000ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 13:14
9	0427T10.D	1	(SS)300ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 13:42
14	0427T15.D	1	200427A CCV 300ug/L	IS&S 3/17/20, 4/7/20	27 Apr 20 16:01
15	0427T16.D	1	200427A LCS 300ug/L	IS&S 3/17/20, 4/7/20	27 Apr 20 16:29
16	0427T17.D	1	200427A LCSD 300ug/L	IS&S 3/17/20, 4/7/20	27 Apr 20 16:57
17	0427T18.D	1	200427A BLK	IS&S 3/17/20, 4/7/20	27 Apr 20 17:25
18	0427T19.D	1	BA10157W01	IS&S 3/17/20, 4/7/20	27 Apr 20 17:53
19	0427T20.D	1	BA10158W01	IS&S 3/17/20, 4/7/20	27 Apr 20 18:21
20	0427T21.D	1	BA10159W01	IS&S 3/17/20, 4/7/20	27 Apr 20 18:49
21	0427T22.D	1	BA10160W01	IS&S 3/17/20, 4/7/20	27 Apr 20 19:16
22	0427T23.D	1	BA10161W01	IS&S 3/17/20, 4/7/20	27 Apr 20 19:44
23	0427T24.D	1	BA10162W01	IS&S 3/17/20, 4/7/20	27 Apr 20 20:12
24	0427T25.D	1	BA10163W01	IS&S 3/17/20, 4/7/20	27 Apr 20 20:40
25	0427T26.D	1	BA10164W01	IS&S 3/17/20, 4/7/20	27 Apr 20 21:08
26	0427T27.D	1	BA10165W01	IS&S 3/17/20, 4/7/20	27 Apr 20 21:36
27	0427T28.D	1	BA10166W01	IS&S 3/17/20, 4/7/20	27 Apr 20 22:04
28	0427T29.D	1	BA10167W01	IS&S 3/17/20, 4/7/20	27 Apr 20 22:32
29	0427T30.D	1	BA10168W01	IS&S 3/17/20, 4/7/20	27 Apr 20 23:00
34	0427T35.D	1	BA10158W05 MS 300ug/L	IS&S 3/17/20, 4/7/20	28 Apr 20 1:19
35	0427T36.D	1	BA10158W06 MSD 300ug/L	IS&S 3/17/20, 4/7/20	28 Apr 20 1:47
36	0427T37.D	1	BA10166W05 MS 300ug/l	IS&S 3/17/20, 4/7/20	28 Apr 20 2:15
37	0427T38.D	1	BA10166W06 MSD 300ug/L	IS&S 3/17/20, 4/7/20	28 Apr 20 2:43
39	0427T40.D	1	Ending CCV 300ug/L	IS&S 3/17/20, 4/7/20	28 Apr 20 3:39

ORGANICS
Calibration Data

Form 6
Initial Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:
SDG No:
Initial Cal. Date: 03/11/20
Instrument: 7890
Initials:

			0311R03.D	0311R04 D	0311R07 D	0311R08.D	0311R09 D	0311R11.D	0311R13.D								
		Compound	1	2	3	4	5	6	7				Avg	%RSD	Type	r^2	Q
1	ATML	Methane	29734	15773	13580	17096	20094	18490	14651				18488	29	ATM	0.995	
2	ATML	Ethane	23899	13476	11688	13961	16062	14509	11867				15066	28	ATM	0.996	
3	ATML	Ethene	18360	10463	8970	10401	12628	10583	9230				11519	28	ATM	0.998	
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2.435739

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R03.D Vial: 3
Acq On : 11 Mar 20 13:00 Operator: GA
Sample : RSK Std 1 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

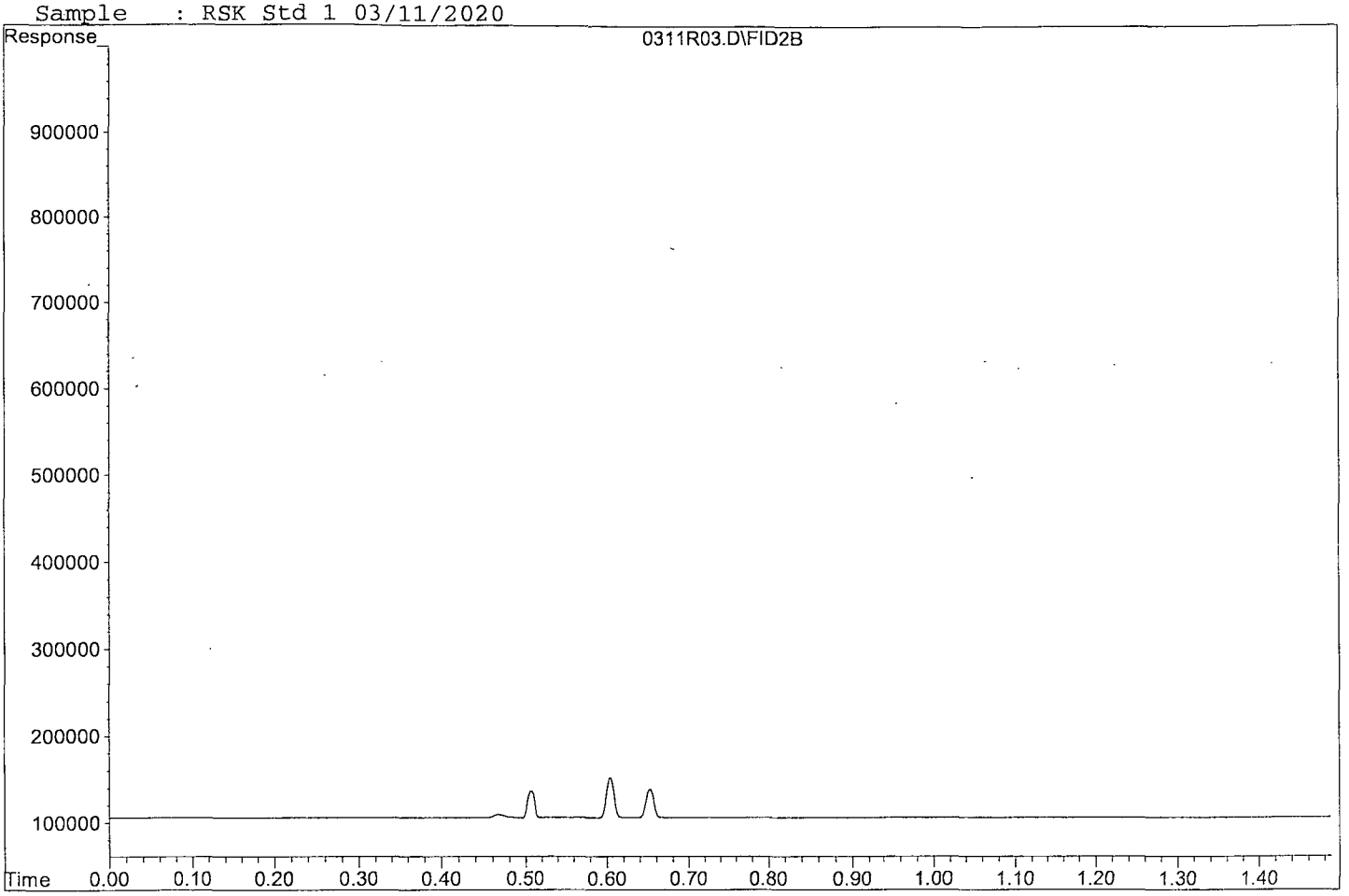
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.51	30923	N.D.	ppb
2) ATM Ethane	0.60	46722	N.D.	ppb
3) ATM Ethene	0.65	33507	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R03.D
Sample : RSK Std 1 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R04.D Vial: 4
Acq On : 11 Mar 20 13:03 Operator: GA
Sample : RSK Std 2 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

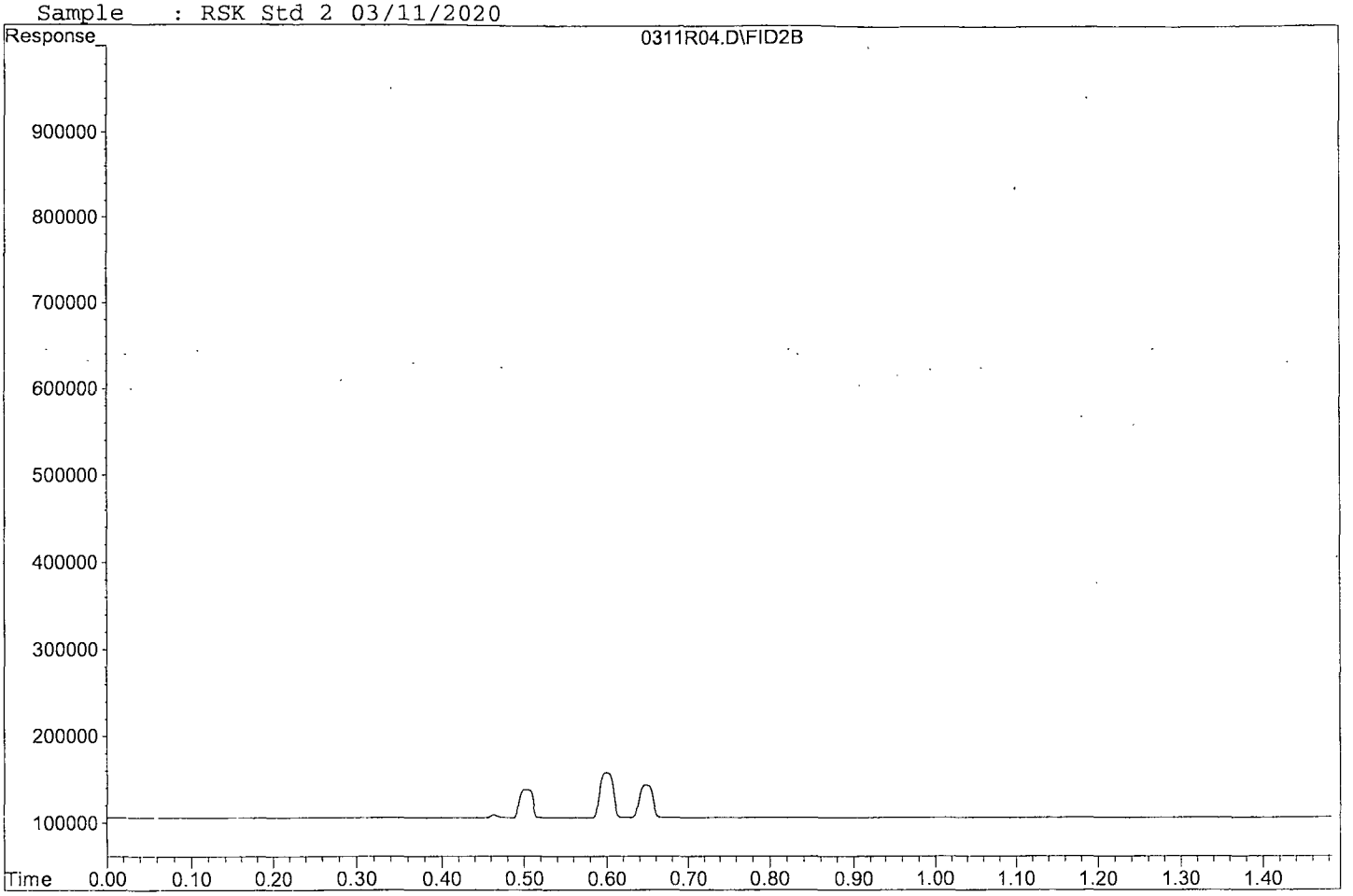
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.50	32807	N.D.	ppb
2) ATM Ethane	0.60	52625	N.D.	ppb
3) ATM Ethene	0.65	38189	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R04.D
Sample : RSK Std 2 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R07.D Vial: 7
Acq On : 11 Mar 20 13:12 Operator: GA
Sample : RSK Std 3 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

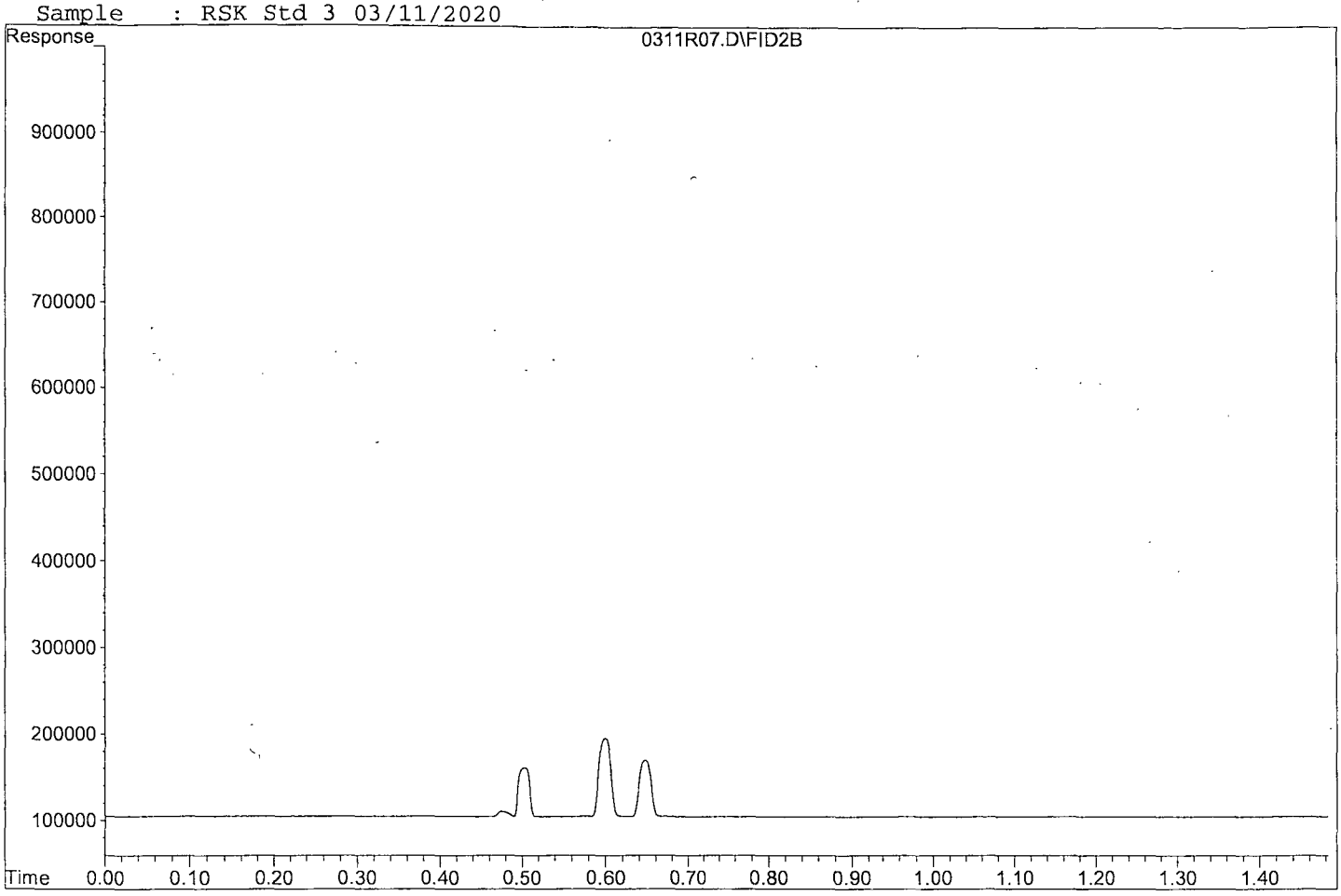
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.50	56629	N.D.	ppb
2) ATM Ethane	0.60	91168	N.D.	ppb
3) ATM Ethene	0.65	65481	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R07.D
Sample : RSK Std 3 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R08.D Vial: 8
Acq On : 11 Mar 20 13:15 Operator: GA
Sample : RSK Std 4 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 17 11:28 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Mar 17 11:20:36 2020
Response via : Multiple Level Calibration

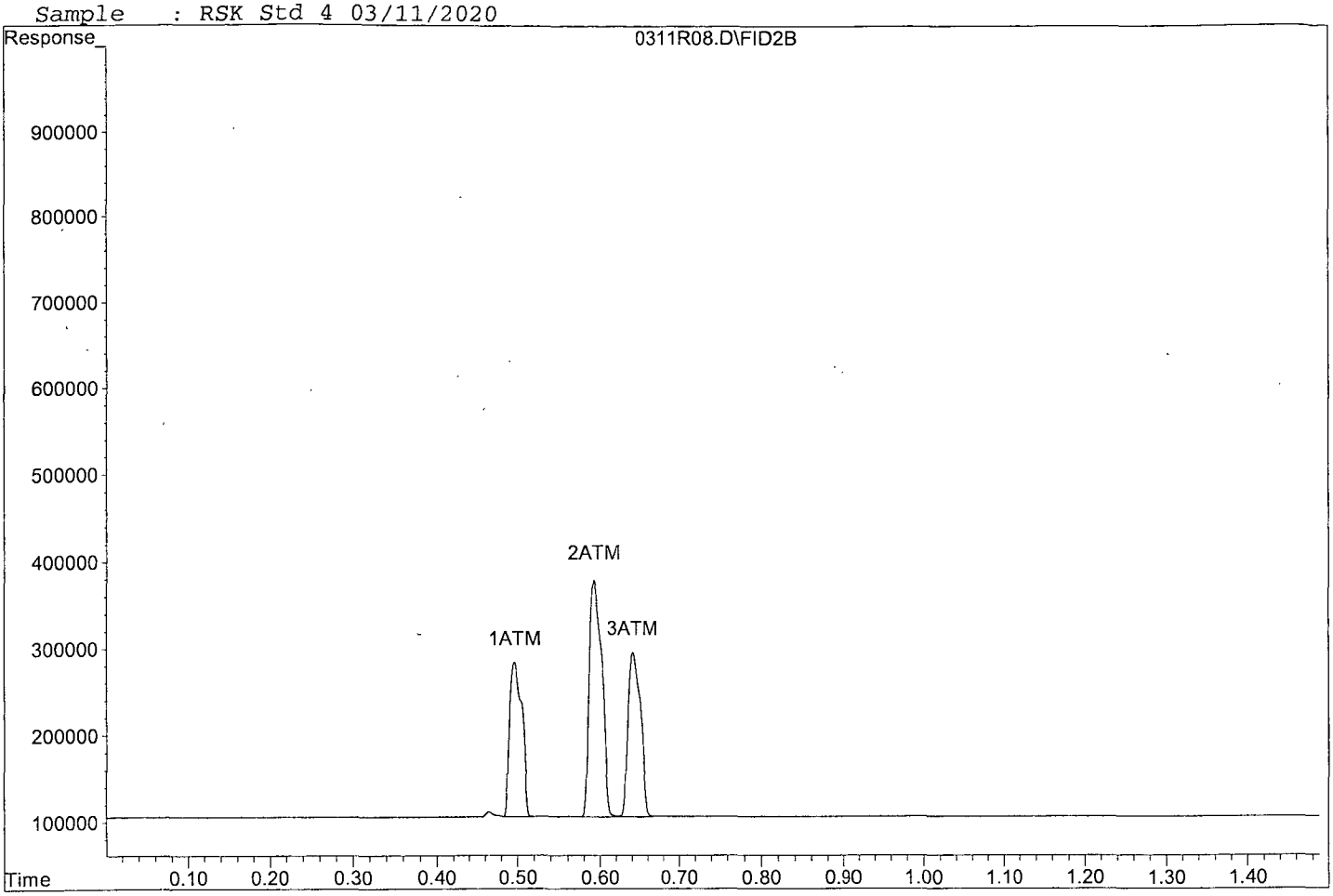
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	178225	11.047 ppb
2) ATM Ethane	0.59	272861	23.257 ppb
3) ATM Ethene	0.64	189615	23.557 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R08.D
Sample : RSK Std 4 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R09.D Vial: 9
Acq On : 11 Mar 20 13:17 Operator: GA
Sample : RSK Std 5 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

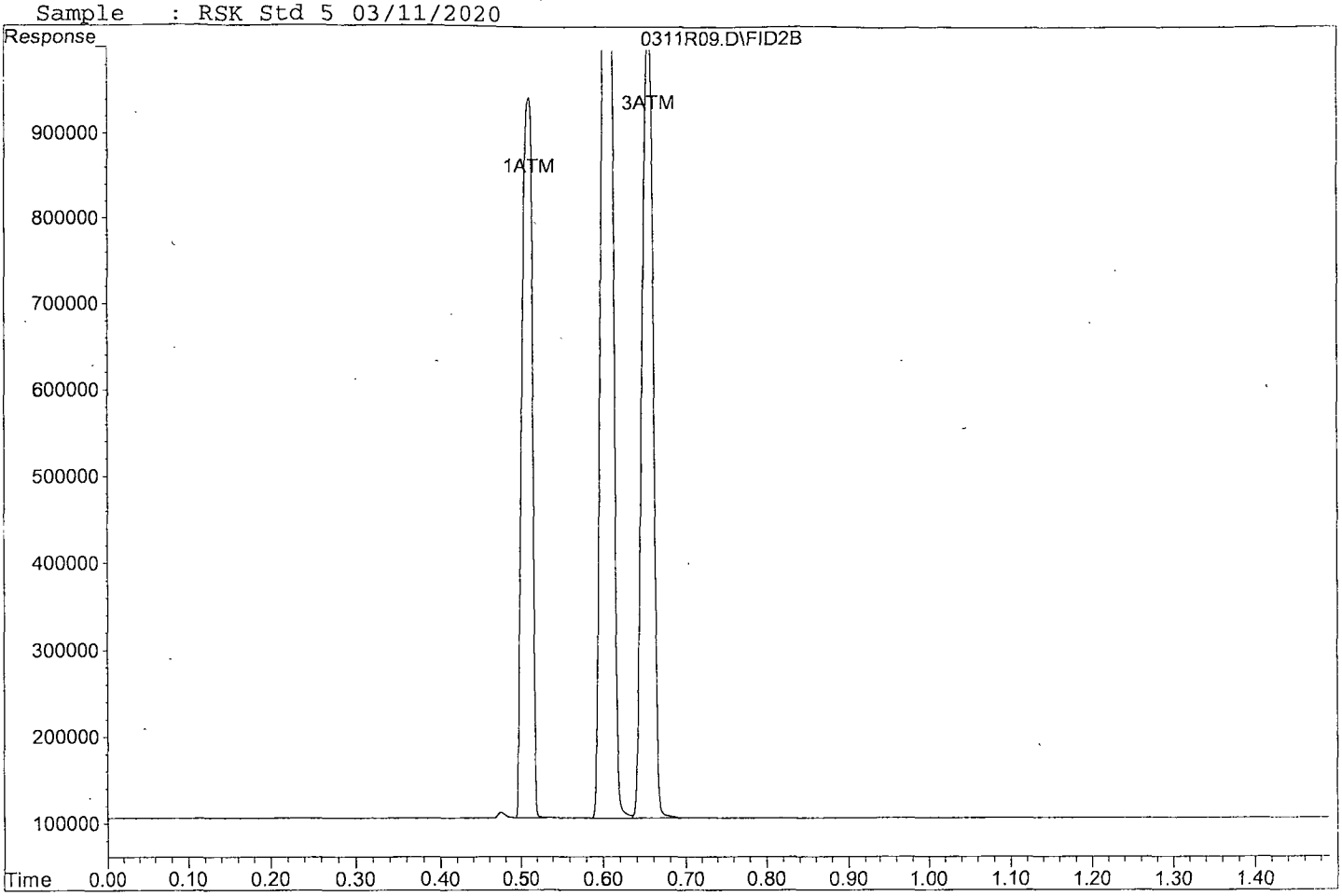
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.51	837925	101.270 ppb
2) ATM Ethane	0.61	1255676	189.317 ppb
3) ATM Ethene	0.66	920839	182.581 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R09.D
Sample : RSK Std 5 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R11.D Vial: 11
Acq On : 11 Mar 20 13:22 Operator: GA
Sample : RSK Std 6 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

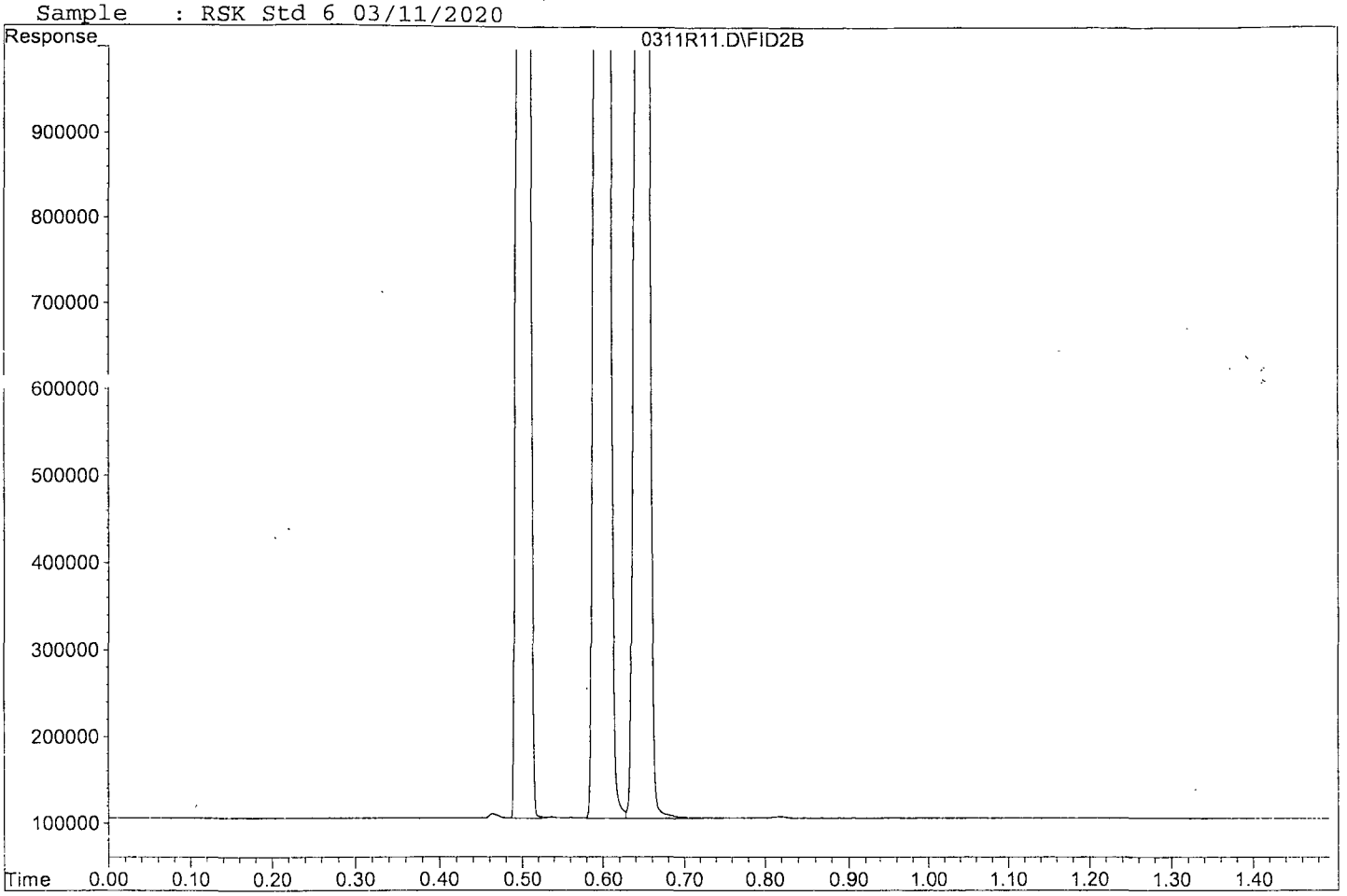
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	1927571	250.295 ppb
2) ATM Ethane	0.60	2835810	456.301 ppb
3) ATM Ethene	0.65	1929291	401.895 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R11.D
Sample : RSK Std 6 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R13.D Vial: 13
Acq On : 11 Mar 20 13:28 Operator: GA
Sample : RSK Std 7 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 17 11:30 2020 Quant Results File: RSK0311.RES

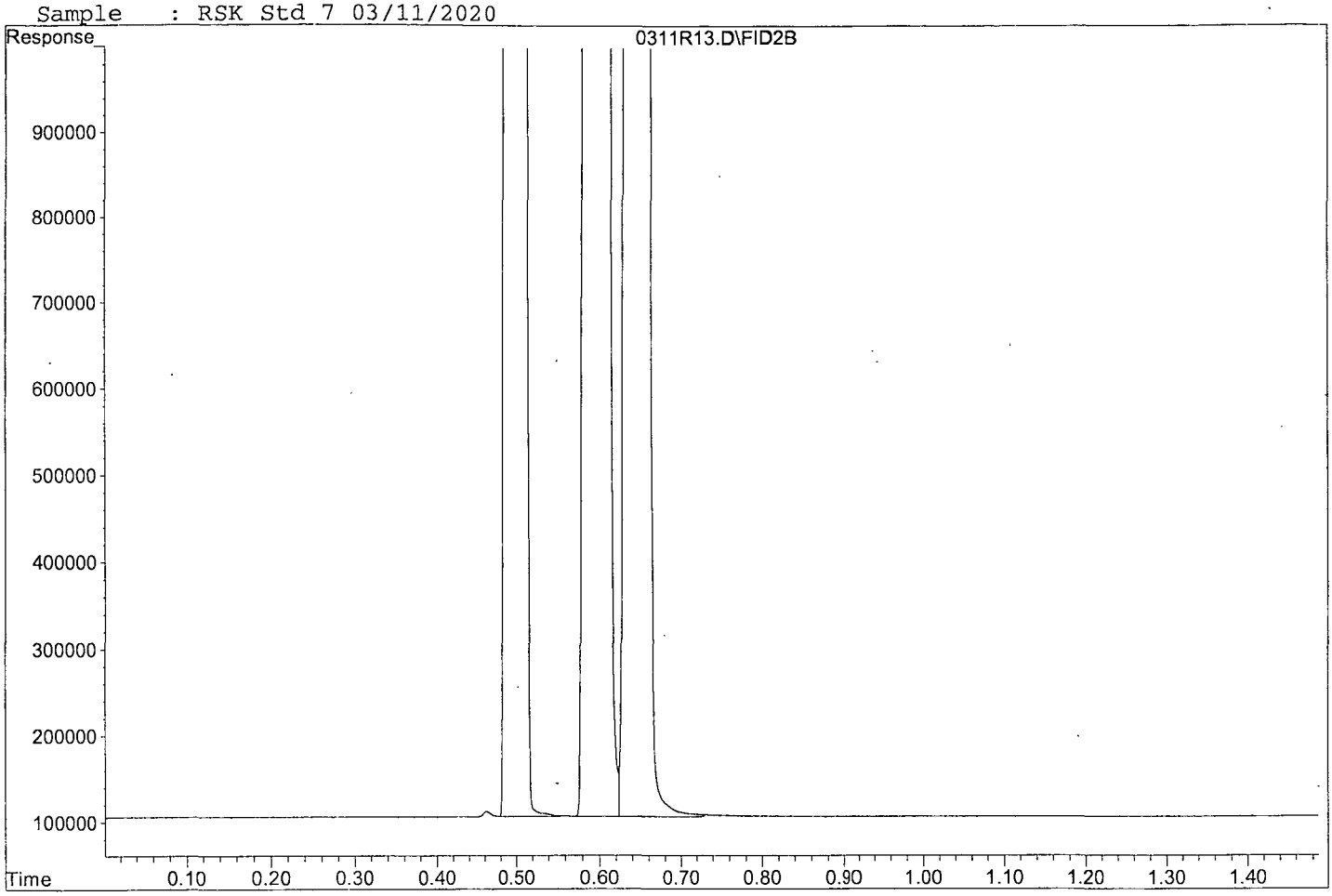
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Mar 17 11:20:36 2020
Response via : Multiple Level Calibration

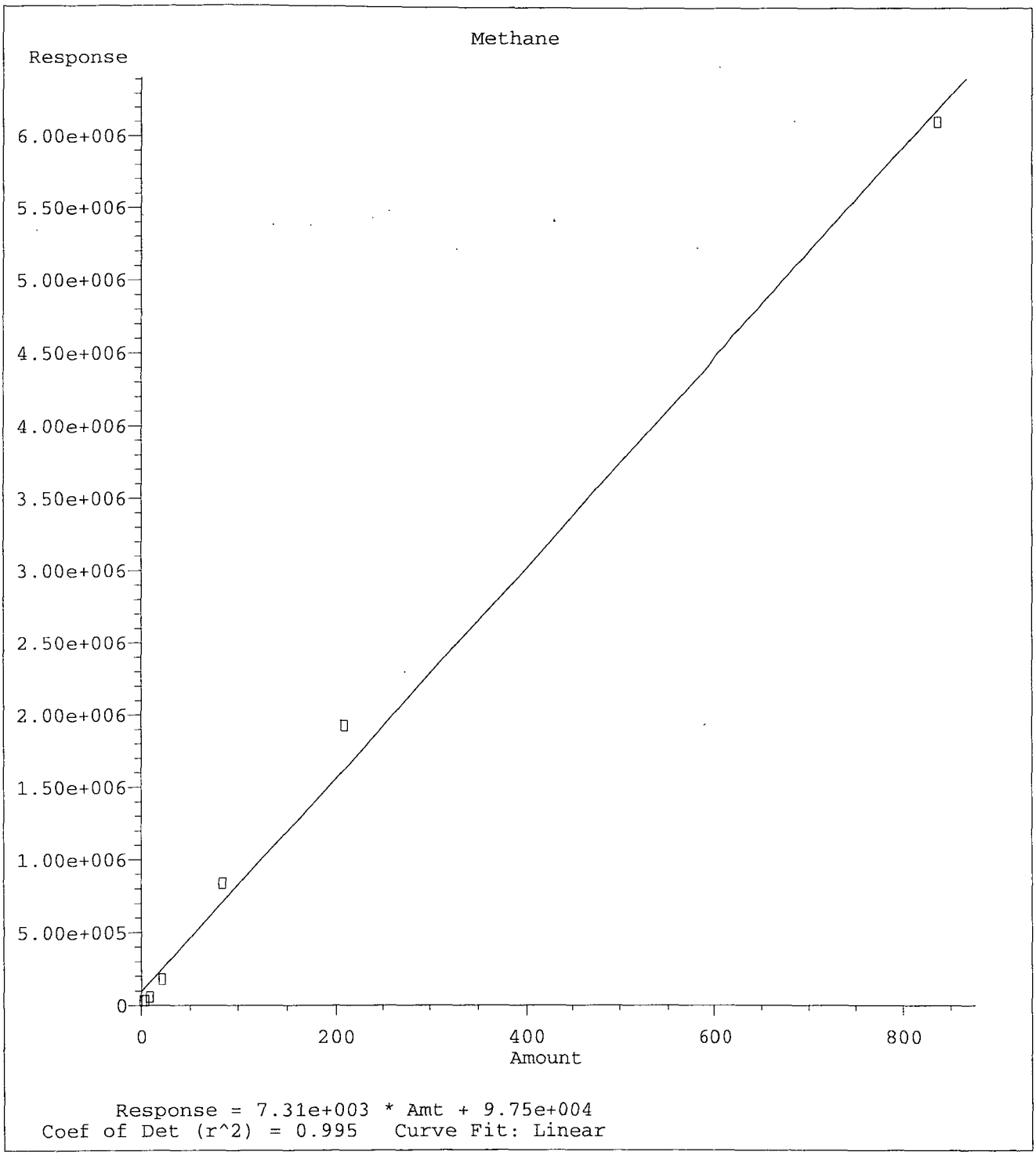
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) ATM Methane	0.50	6109561	822.241	ppb
2) ATM Ethane	0.60	9277052	1544.634	ppb
3) ATM Ethene	0.64	6730405	1446.024	ppb

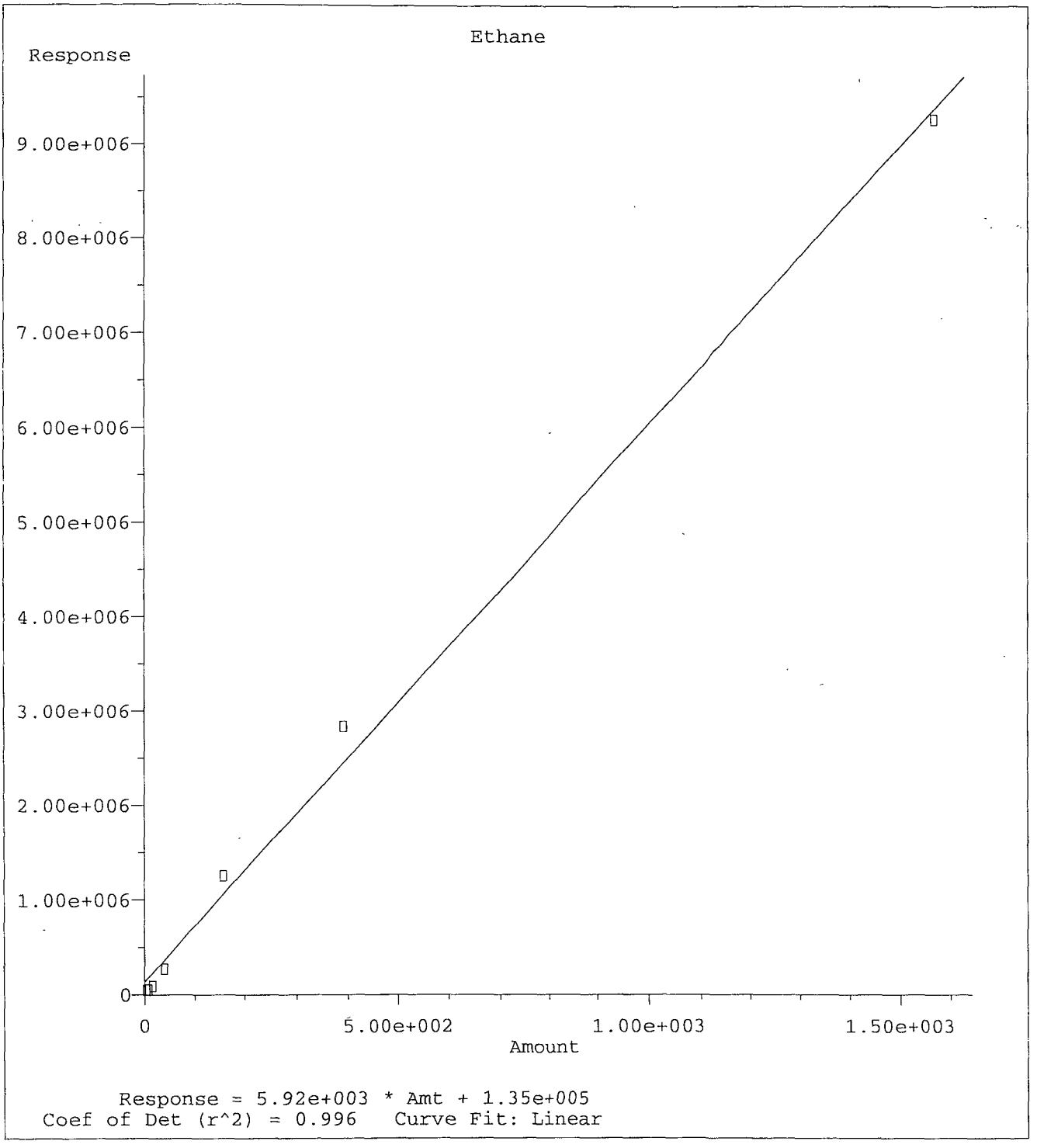
Target Compounds

Data File: G:\ROCKY\DATA\200311RS\0311R13.D
Sample : RSK Std 7 03/11/2020

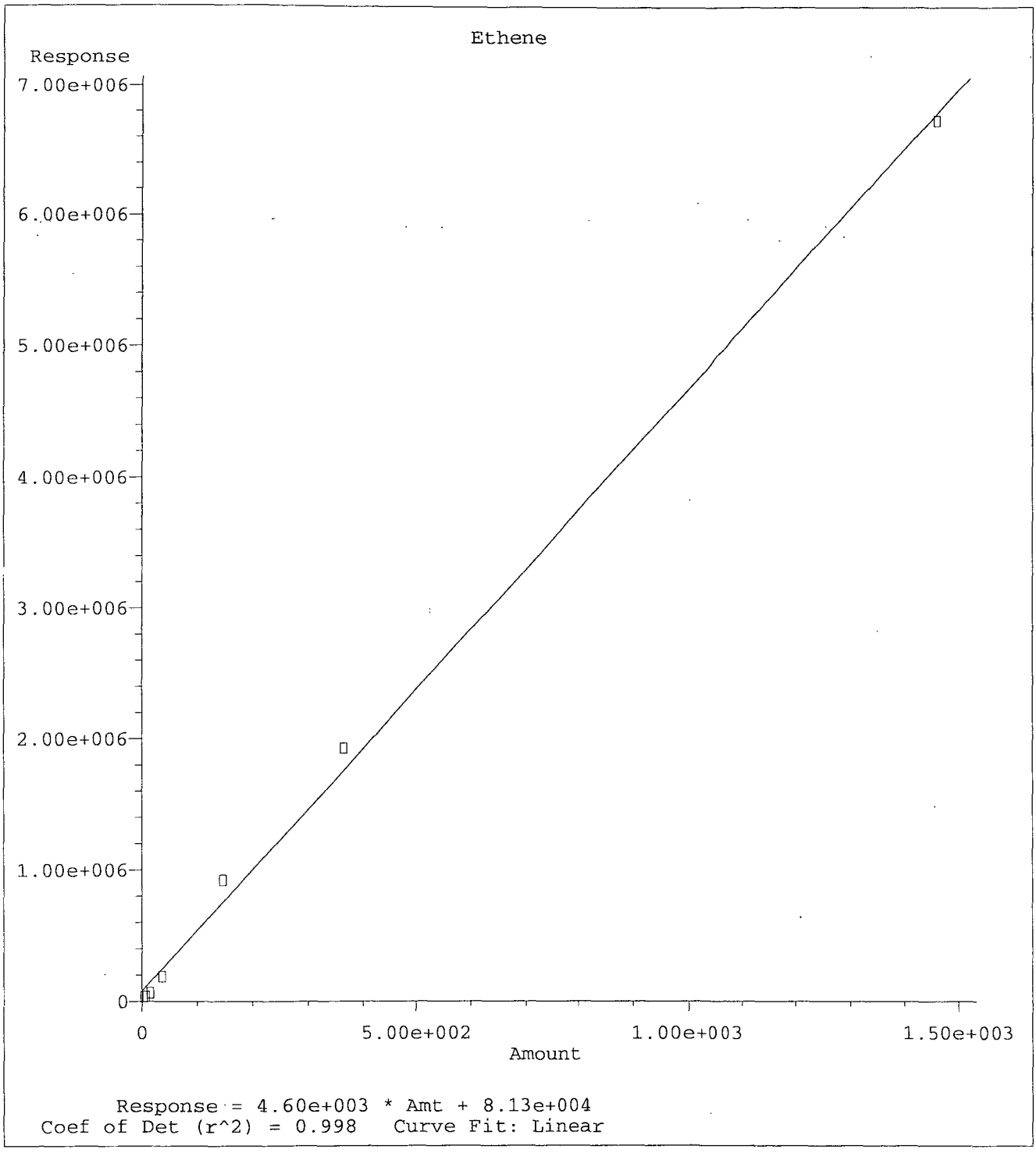




Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020



Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020



Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 03/11/20
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0311R15.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	16733	9.5	ATML	1.6
2	ATML	Ethane	15066	13396	11	ATML	1.4
3	ATML	Ethene	11519	10439	9.4	ATML	1.4
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39							
40							
		Average			10.0		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R15.D Vial: 15
Acq On : 11 Mar 20 13:38 Operator: GA
Sample : RSK SS Std 5 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:40 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

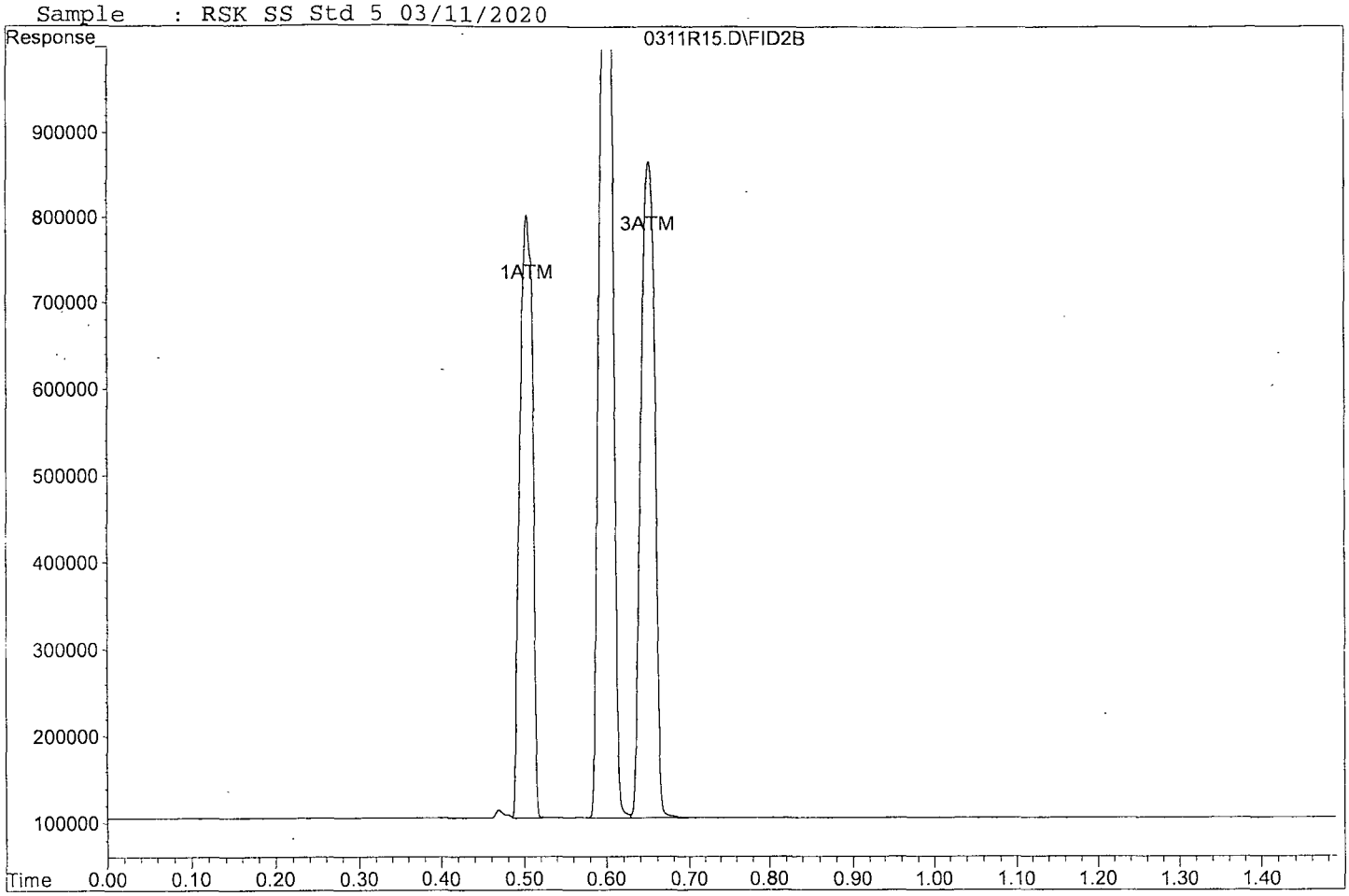
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	697755	82.100 ppb
2) ATM Ethane	0.60	1047226	154.096 ppb
3) ATM Ethene	0.65	761233	147.870 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R15.D
Sample : RSK SS Std 5 03/11/2020



Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/28/20
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0428R04.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	17405	5.9	ATML	3.0
2	ATML	Ethane	15066	13150	13	ATML	3.5
3	ATML	Ethene	11519	10259	11	ATML	0.57
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			10.0		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R04.D Vial: 4
Acq On : 28 Apr 20 12:33 Operator: GA; CMM
Sample : 200428A CCV/LCS RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 12:35 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

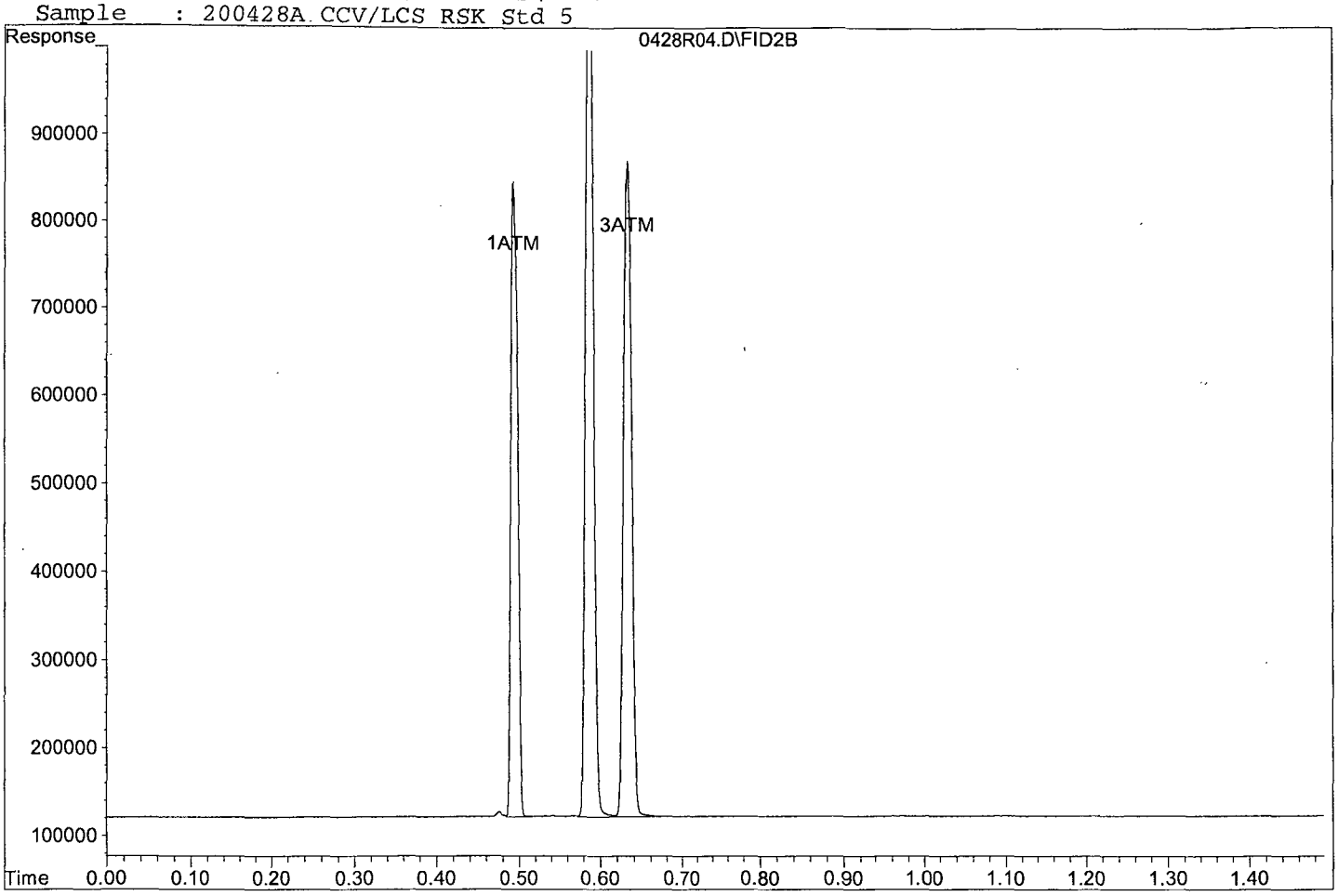
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.49	725767	85.931 ppb
2) ATM Ethane	0.59	1028023	150.852 ppb
3) ATM Ethene	0.63	748105	145.015 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R04.D
Sample : 200428A CCV/LCS RSK Std 5



Form 7

Ending Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/28/20
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0428R28.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	17910	3.1	ATML	6.5
2	ATML	Ethane	15066	12762	15	ATML	6.8
3	ATML	Ethene	11519	9657	16	ATML	7.1
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
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26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			11.4		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R28.D Vial: 28
Acq On : 28 Apr 20 13:45 Operator: GA; CMM
Sample : Ending CCV RSK Std 5 04/28/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:47 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

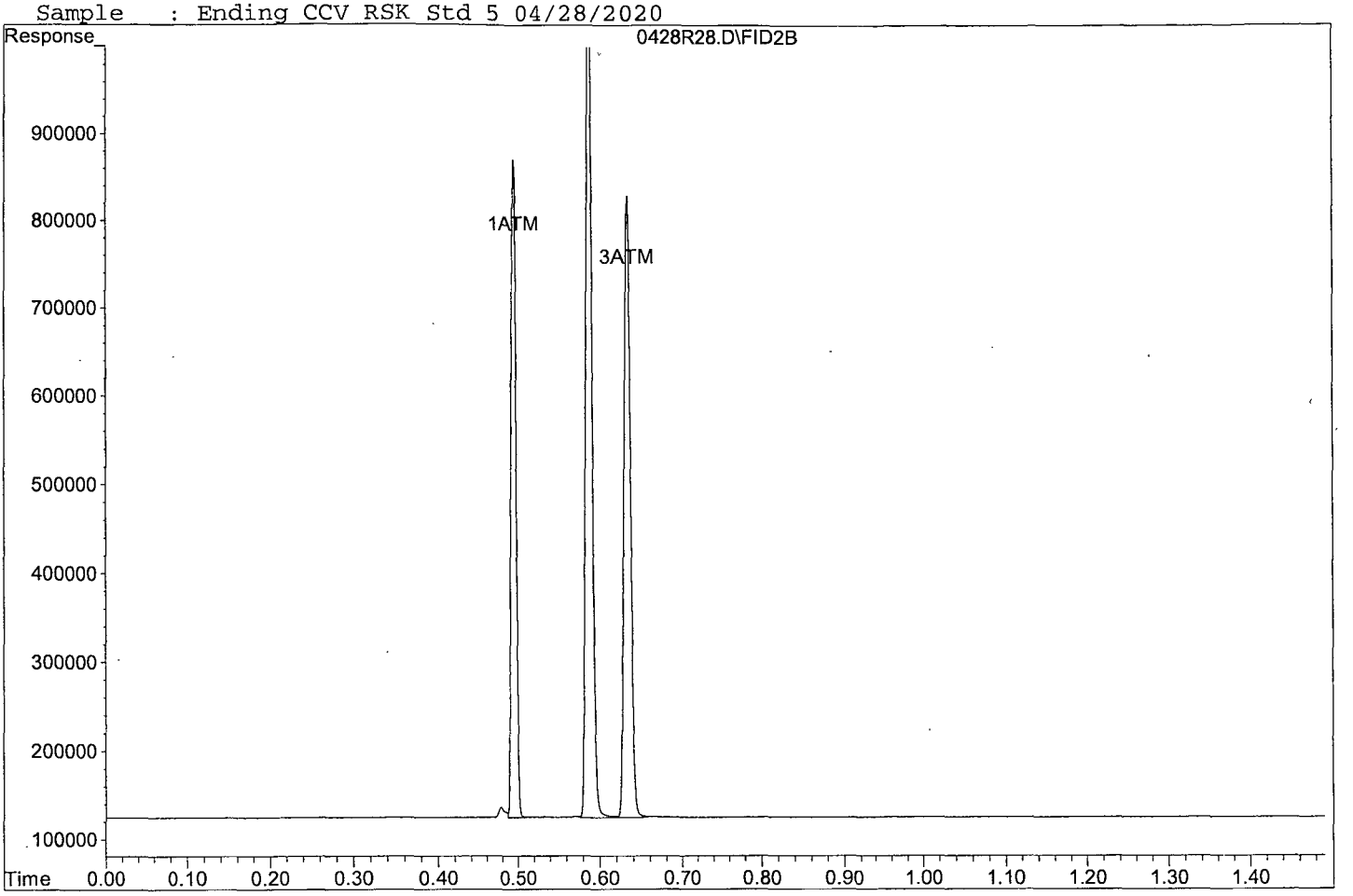
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

	Compound	R.T.	Response	Conc	Units
	Target Compounds				
1)	ATM Methane	0.49	746834	88.812	ppb
2)	ATM Ethane	0.59	997634	145.717	ppb
3)	ATM Ethene	0.63	704185	135.464	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R28.D
Sample : Ending CCV RSK Std 5 04/28/2020



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R13.D Vial: 13
Acq On : 28 Apr 20 13:02 Operator: GA; CMM
Sample : BA10157W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:05 2020 Quant Results File: RSK0311.RES

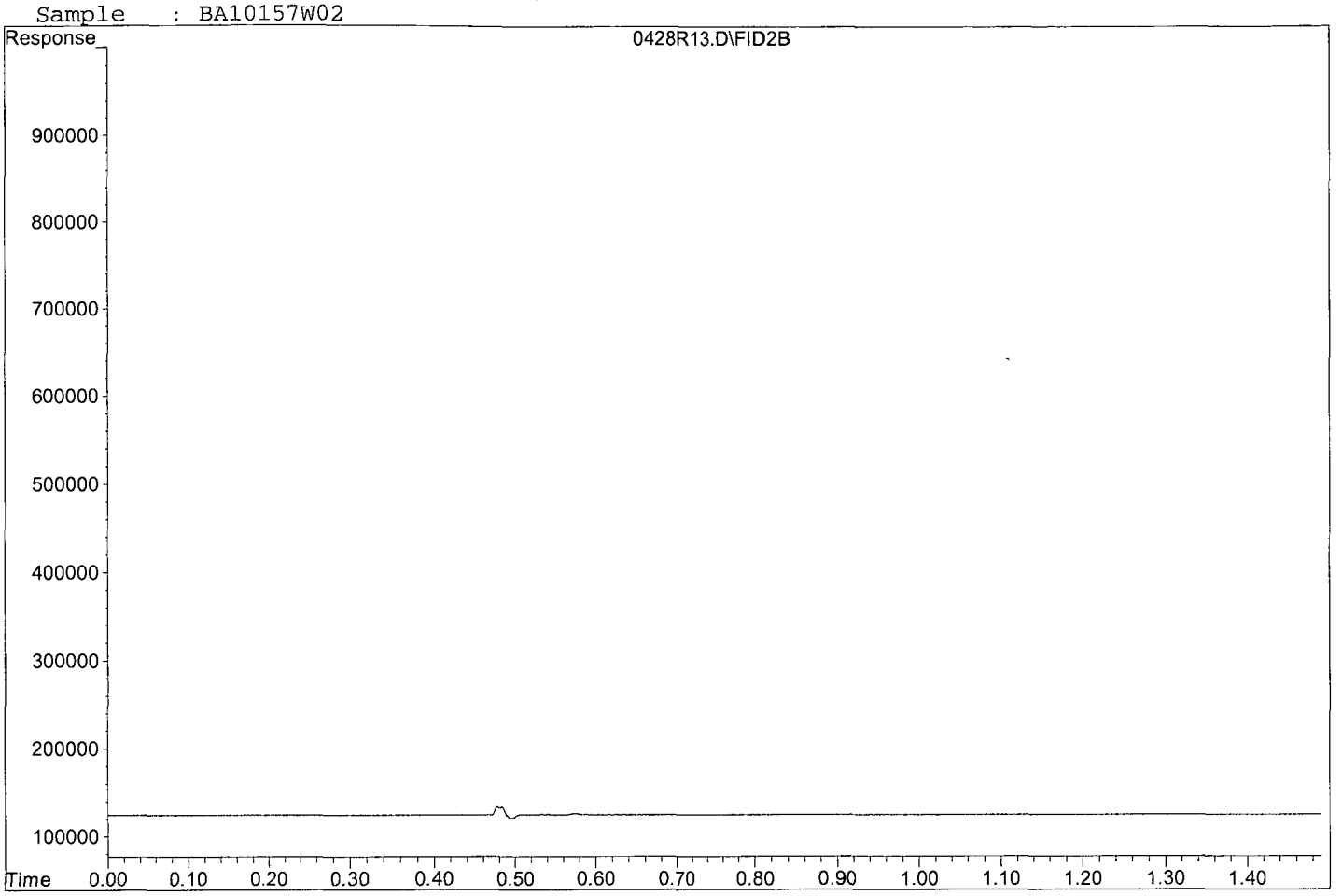
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R13.D
Sample : BA10157W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R14.D Vial: 14
Acq On : 28 Apr 20 13:04 Operator: GA; CMM
Sample : BA10158W07 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:09 2020 Quant Results File: RSK0311.RES

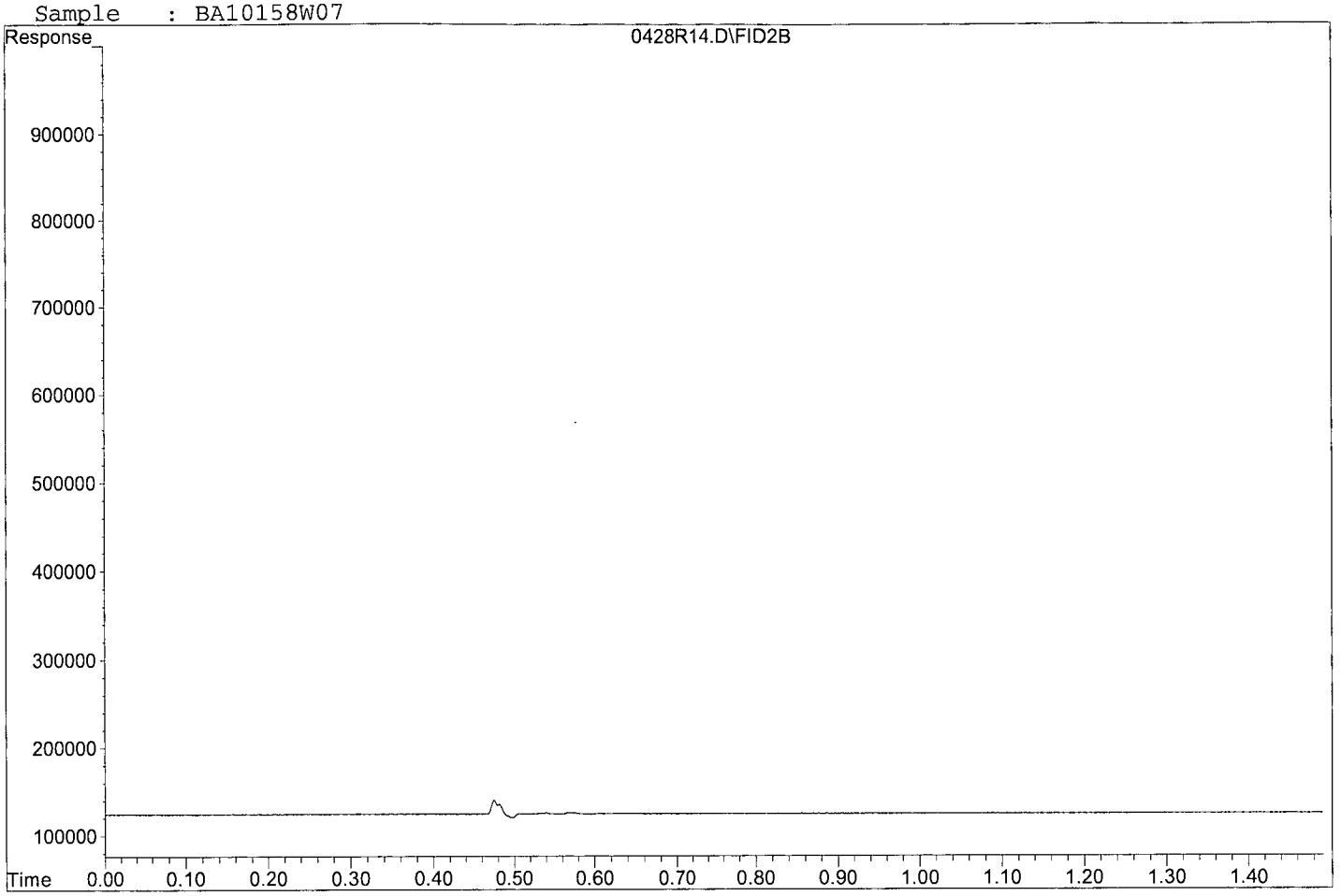
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R14.D
Sample : BA10158W07



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R19.D Vial: 19
Acq On : 28 Apr 20 13:23 Operator: GA; CMM
Sample : BA10160W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:26 2020 Quant Results File: RSK0311.RES

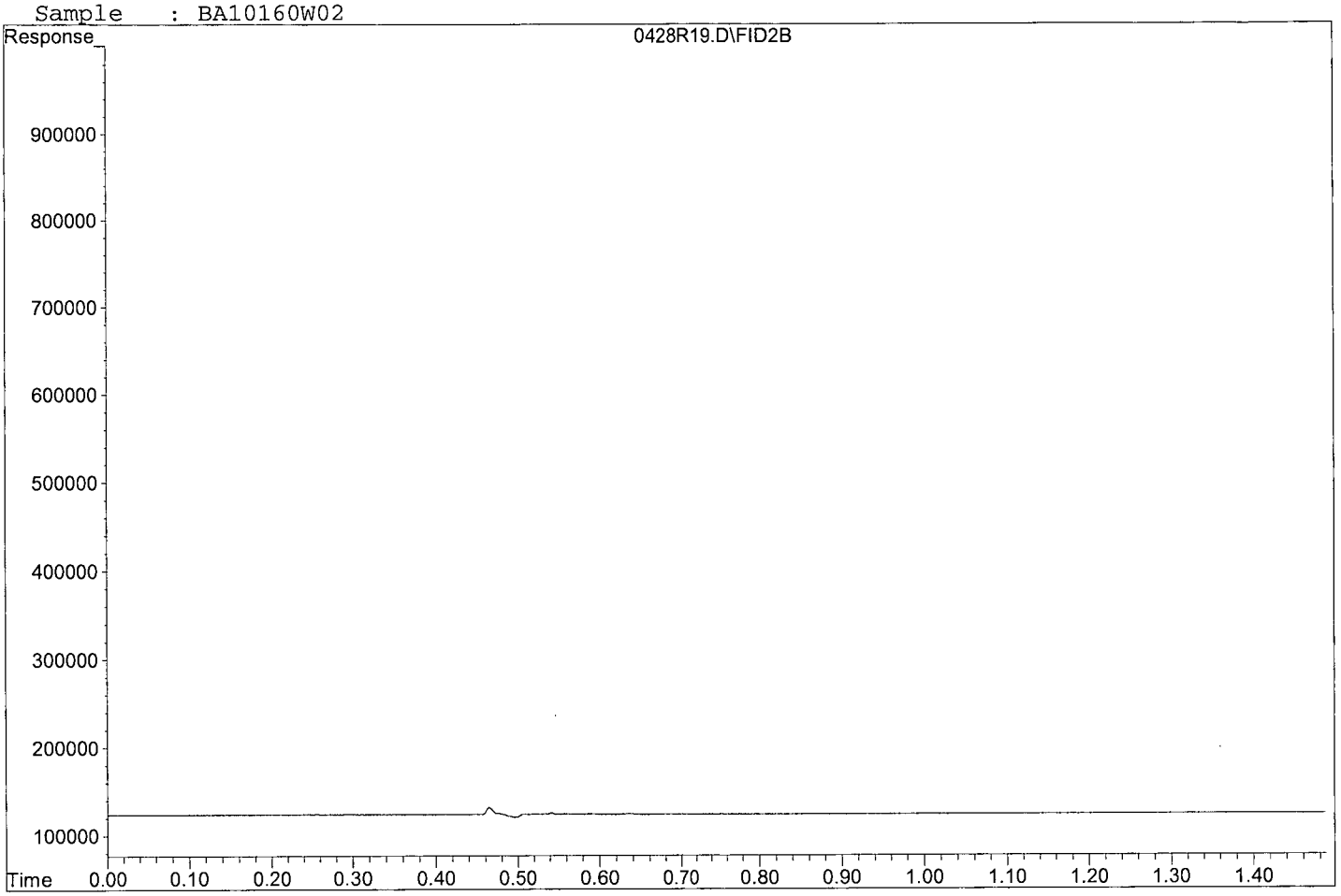
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R19.D
Sample : BA10160W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R20.D Vial: 20
Acq On : 28 Apr 20 13:25 Operator: GA; CMM
Sample : BA10161W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:28 2020 Quant Results File: RSK0311.RES

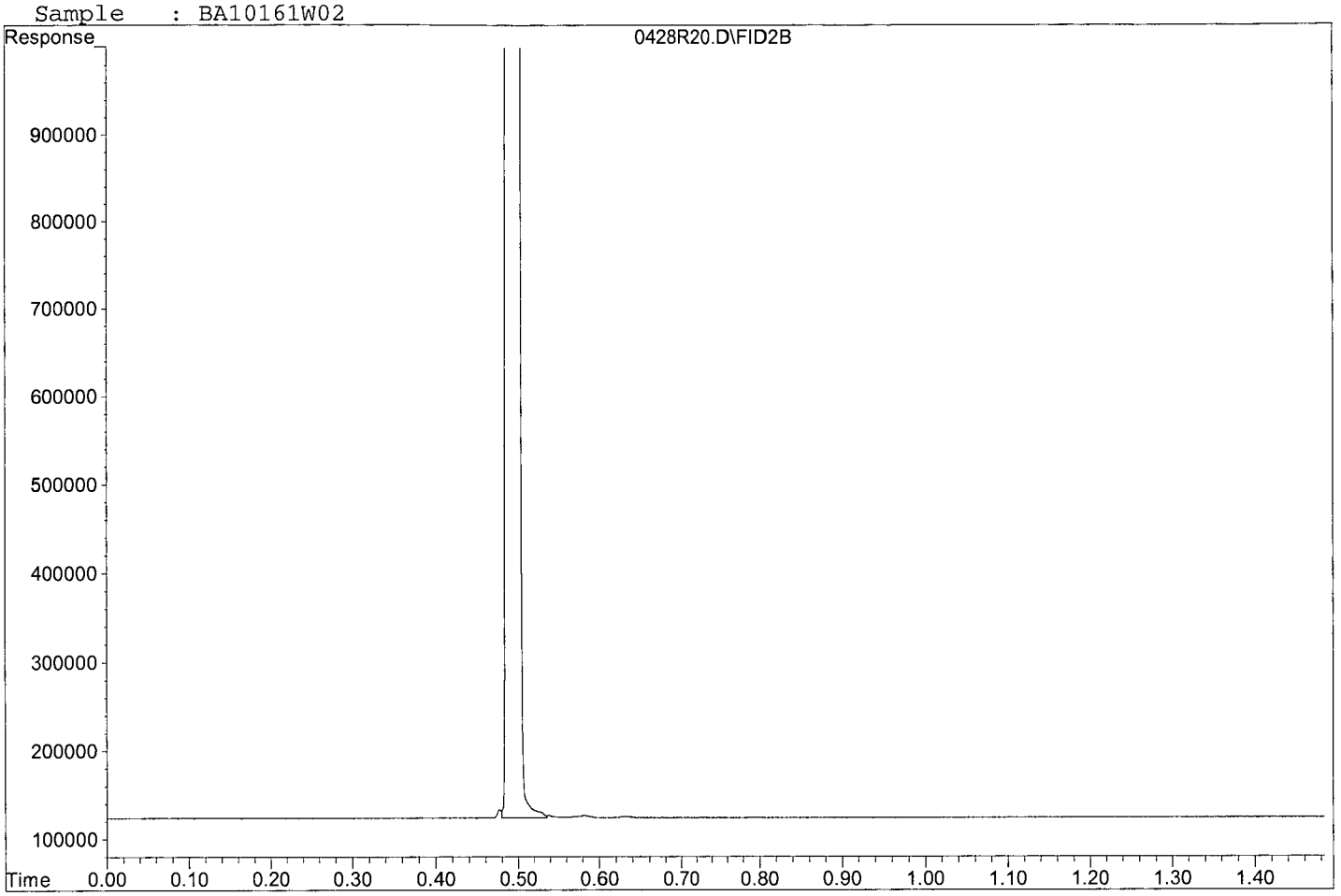
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
1) ATM Methane	0.49	30342279	4136.410	ppb	
Target Compounds					
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R20.D
Sample : BA10161W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R21.D Vial: 21
Acq On : 28 Apr 20 13:28 Operator: GA; CMM
Sample : BA10161W02 DF20 Inst : 7890
Misc : Multiplr: 20.00
IntFile : autoint1.e
Quant Time: Apr 28 13:30 2020 Quant Results File: RSK0311.RES

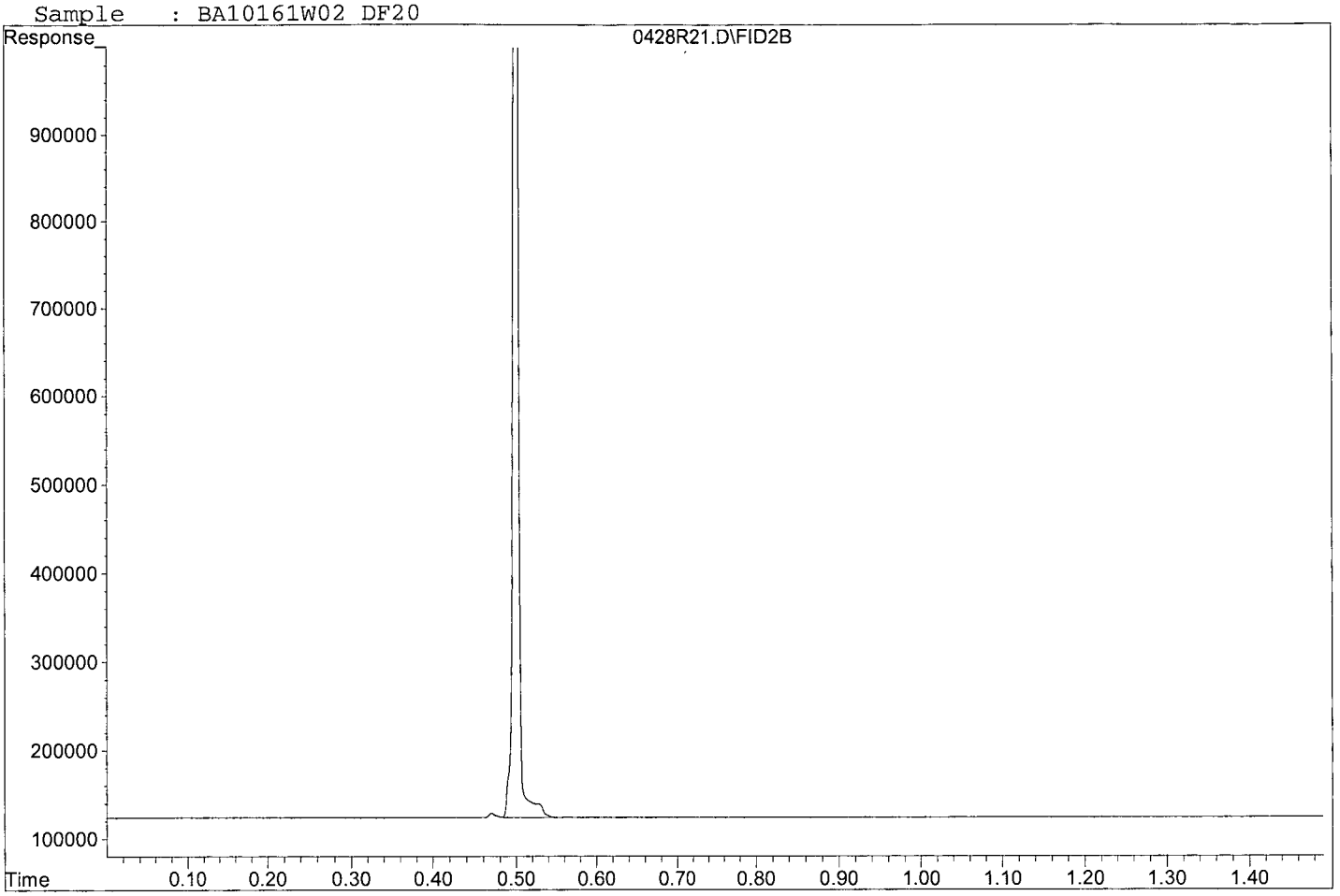
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
1) ATM Methane	0.50	2560914	6738.267	ppb	
Target Compounds					
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R21.D
Sample : BA10161W02 DF20



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R22.D Vial: 22
Acq On : 28 Apr 20 13:31 Operator: GA; CMM
Sample : BA10163W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:34 2020 Quant Results File: RSK0311.RES

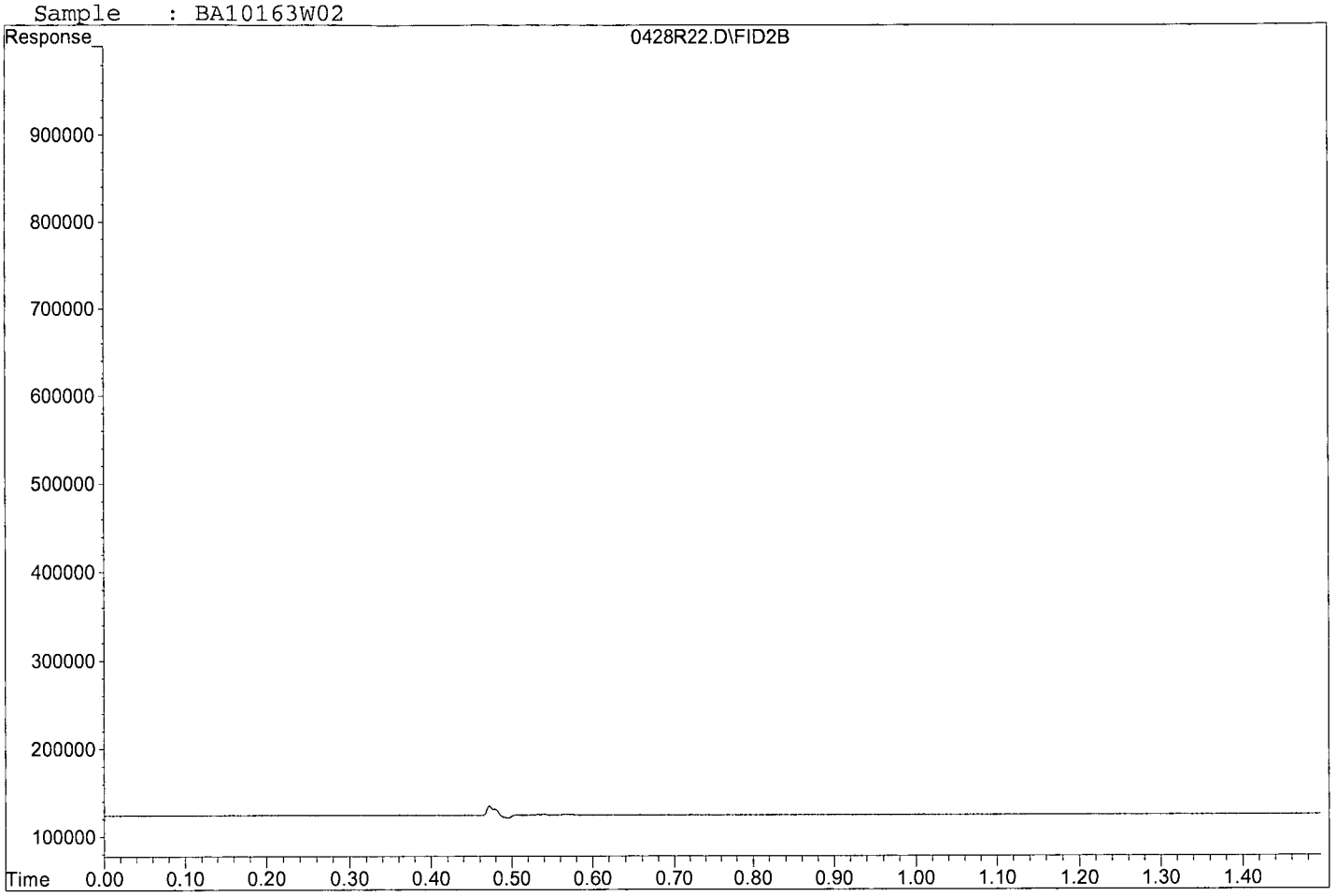
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R22.D
Sample : BA10163W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R23.D Vial: 23
Acq On : 28 Apr 20 13:33 Operator: GA; CMM
Sample : BA10164W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:37 2020 Quant Results File: RSK0311.RES

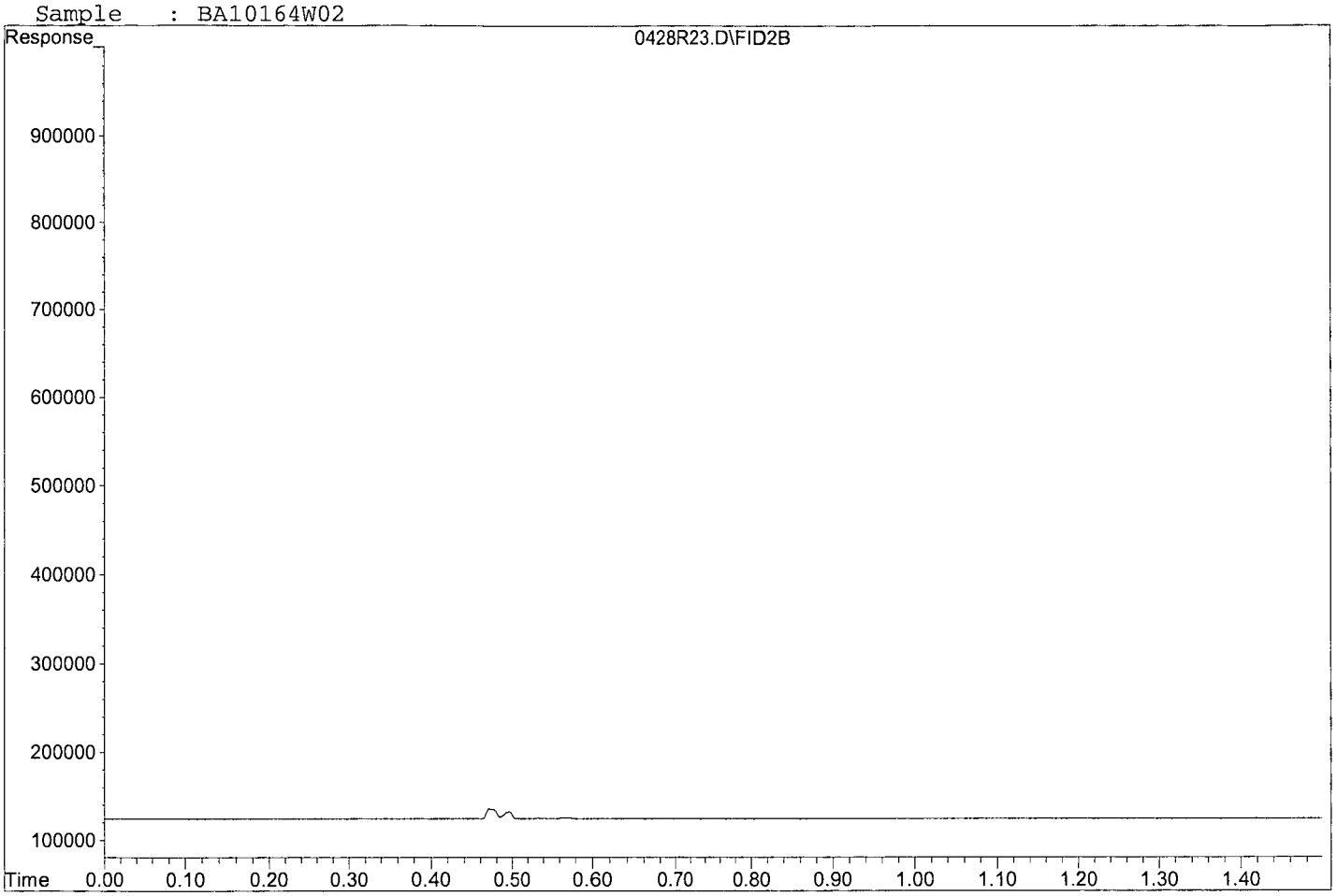
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R23.D
Sample : BA10164W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R24.D
Acq On : 28 Apr 20 13:36
Sample : BA10165W02
Misc :
IntFile : autoint1.e
Quant Time: Apr 28 13:39 2020 Quant Results File: RSK0311.RES

Vial: 24
Operator: GA; CMM
Inst : 7890
Multiplr: 1.00

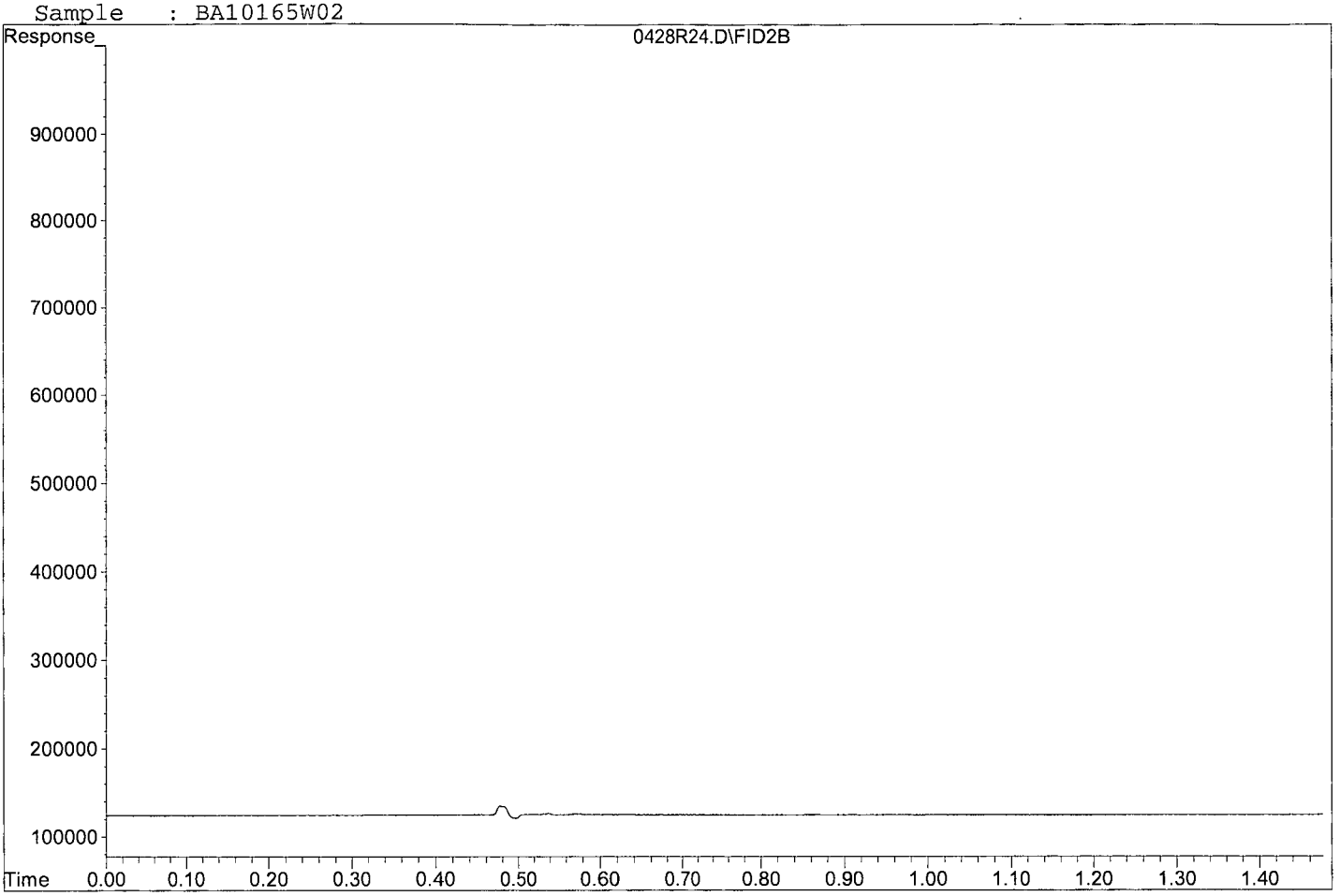
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R24.D
Sample : BA10165W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R25.D Vial: 25
Acq On : 28 Apr 20 13:39 Operator: GA; CMM
Sample : BA10166W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:42 2020 Quant Results File: RSK0311.RES

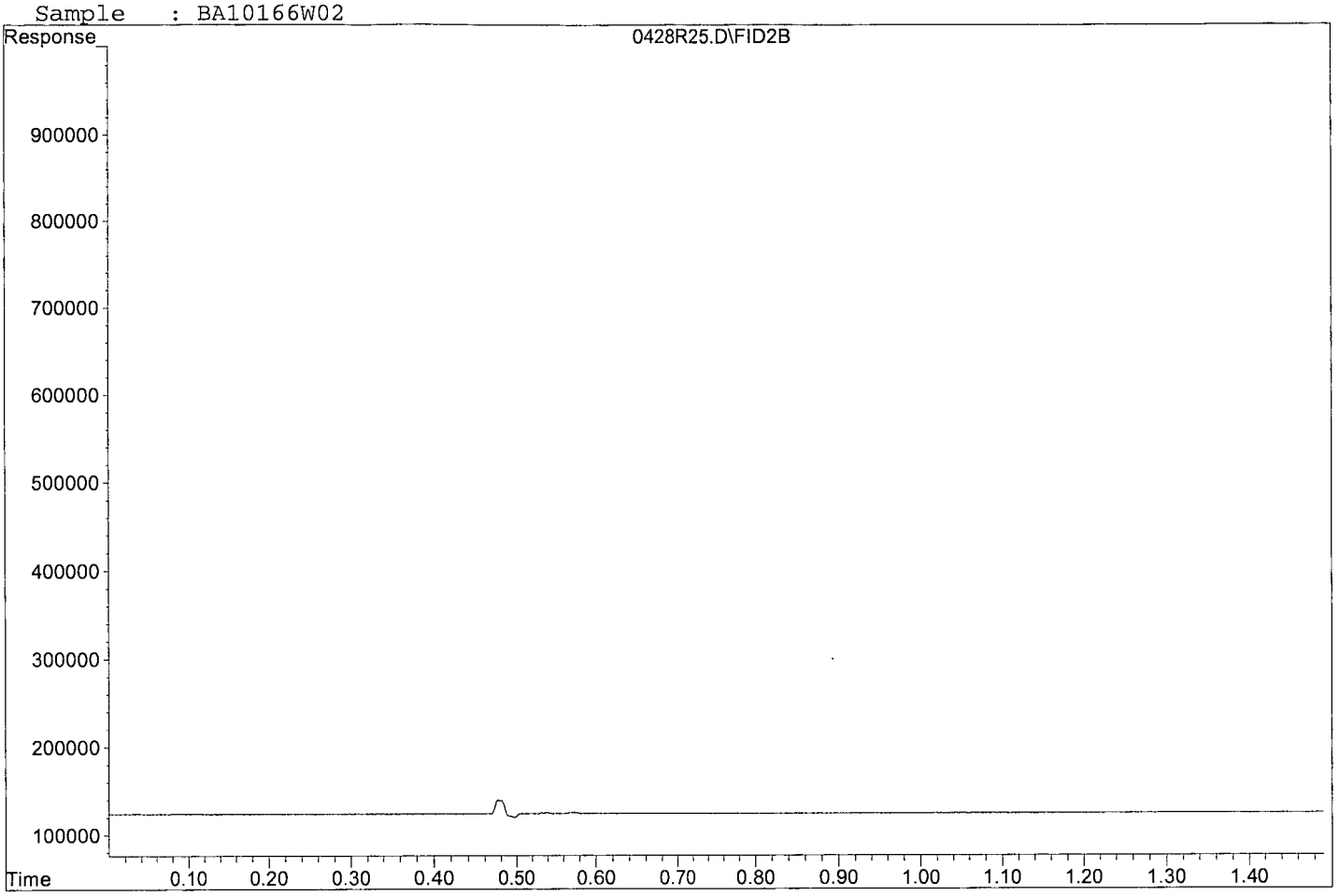
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R25.D
Sample : BA10166W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R26.D Vial: 26
Acq On : 28 Apr 20 13:41 Operator: GA; CMM
Sample : BA10167W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:44 2020 Quant Results File: RSK0311.RES

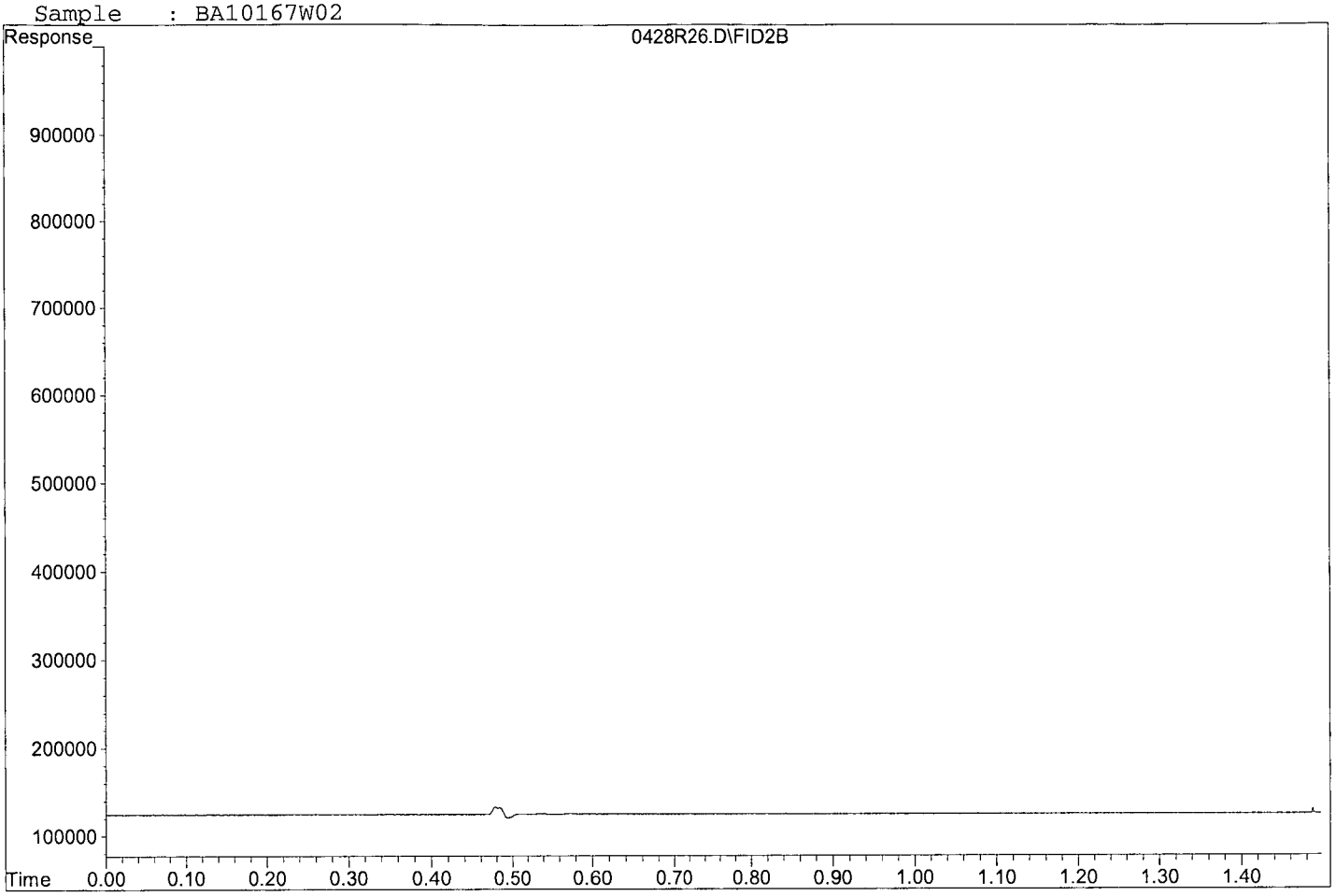
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R26.D
Sample : BA10167W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R27.D Vial: 27
Acq On : 28 Apr 20 13:43 Operator: GA; CMM
Sample : BA10168W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:46 2020 Quant Results File: RSK0311.RES

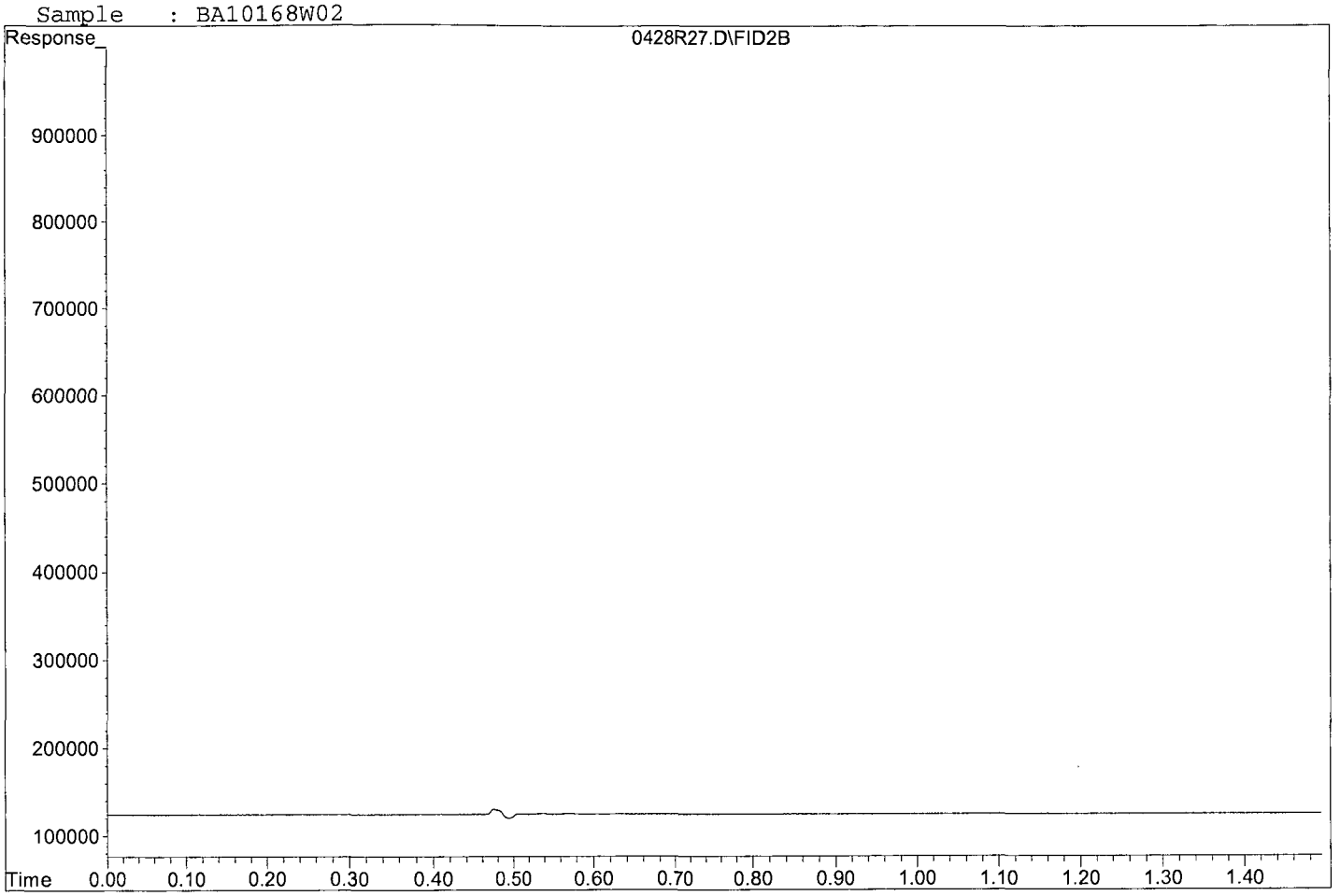
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R27.D
Sample : BA10168W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R06.D
Acq On : 28 Apr 20 12:38
Sample : 200428A Blk
Misc :
IntFile : autoint1.e
Quant Time: Apr 28 12:41 2020 Quant Results File: RSK0311.RES

Vial: 6
Operator: GA; CMM
Inst : 7890
Multiplr: 1.00

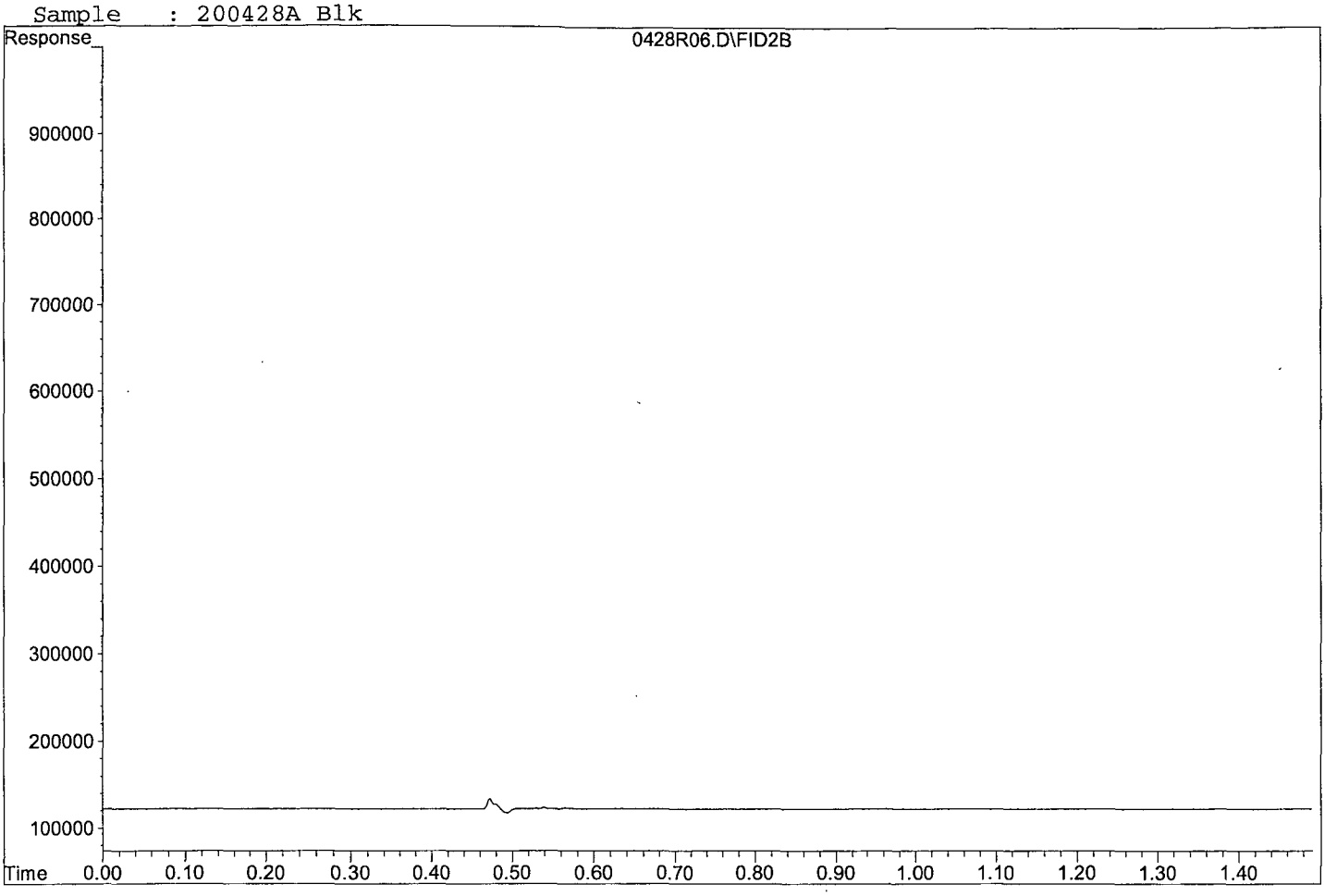
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R06.D
Sample : 200428A Blk



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R04.D Vial: 4
Acq On : 28 Apr 20 12:33 Operator: GA; CMM
Sample : 200428A CCV/LCS RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 12:35 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

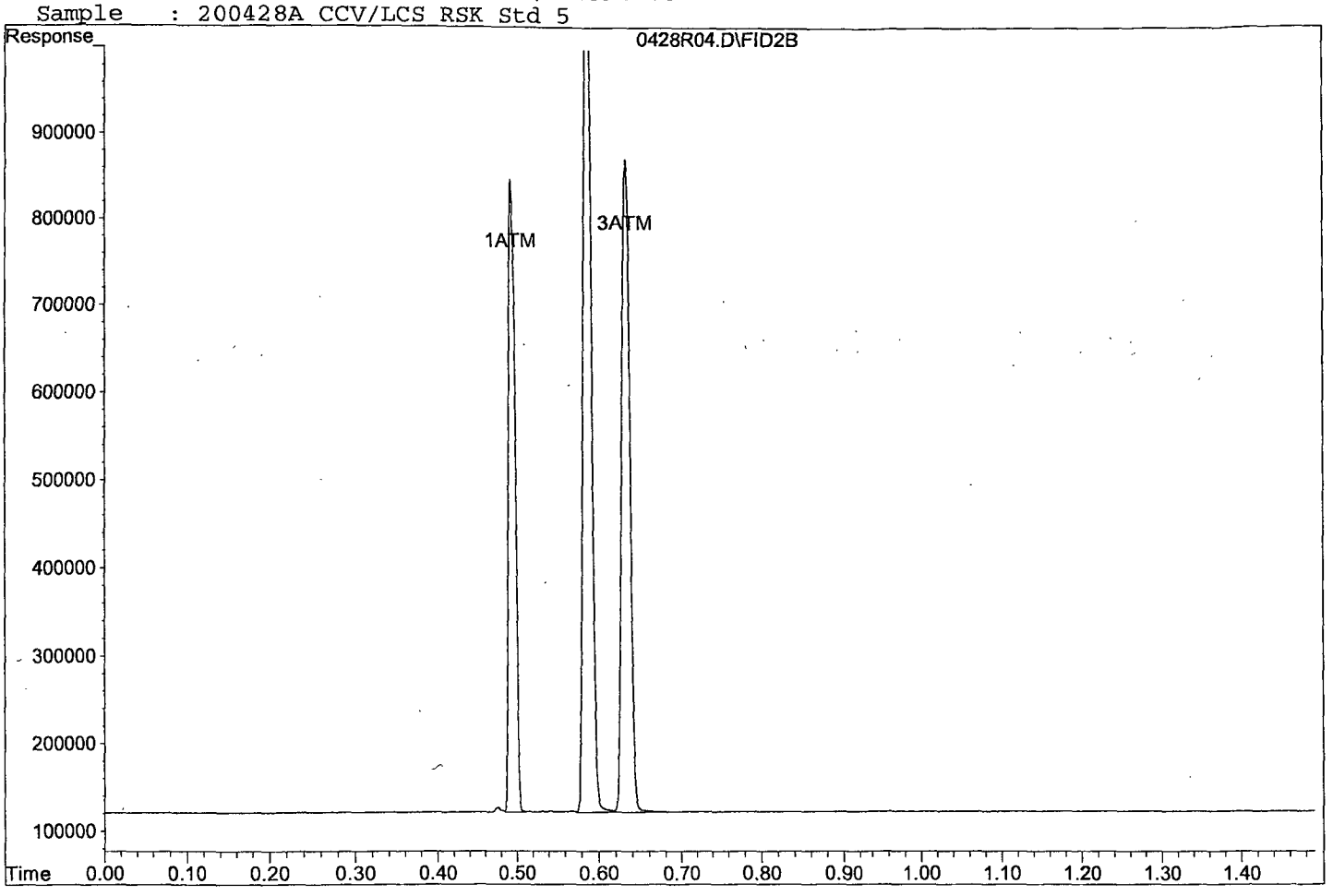
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.49	725767	85.931 ppb
2) ATM Ethane	0.59	1028023	150.852 ppb
3) ATM Ethene	0.63	748105	145.015 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.
0428R04.D RSK0311.M Tue Apr 28 12:36:39 2020 Page 1

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0428R04.D
Sample : 200428A CCV/LCS RSK Std 5



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R05.D Vial: 5
Acq On : 28 Apr 20 12:35 Operator: GA; CMM
Sample : 200428A LCSD RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 12:37 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

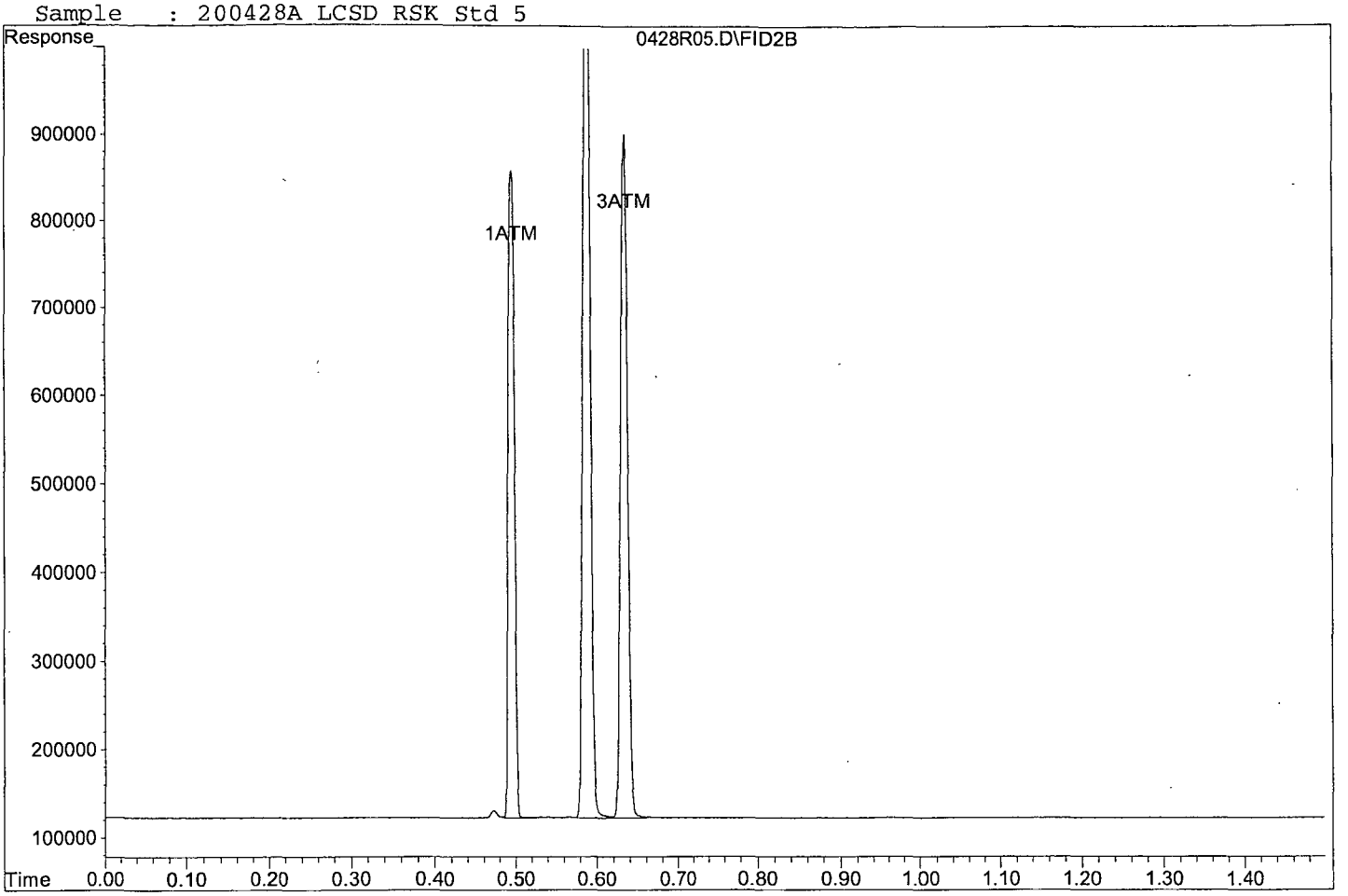
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) ATM Methane	0.50	736479	87.396	ppb
2) ATM Ethane	0.59	1074755	158.748	ppb
3) ATM Ethene	0.63	778779	151.686	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R05.D
Sample : 200428A LCSD RSK Std 5



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R16.D Vial: 16
Acq On : 28 Apr 20 13:11 Operator: GA; CMM
Sample : BA10158W08 MS RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:15 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

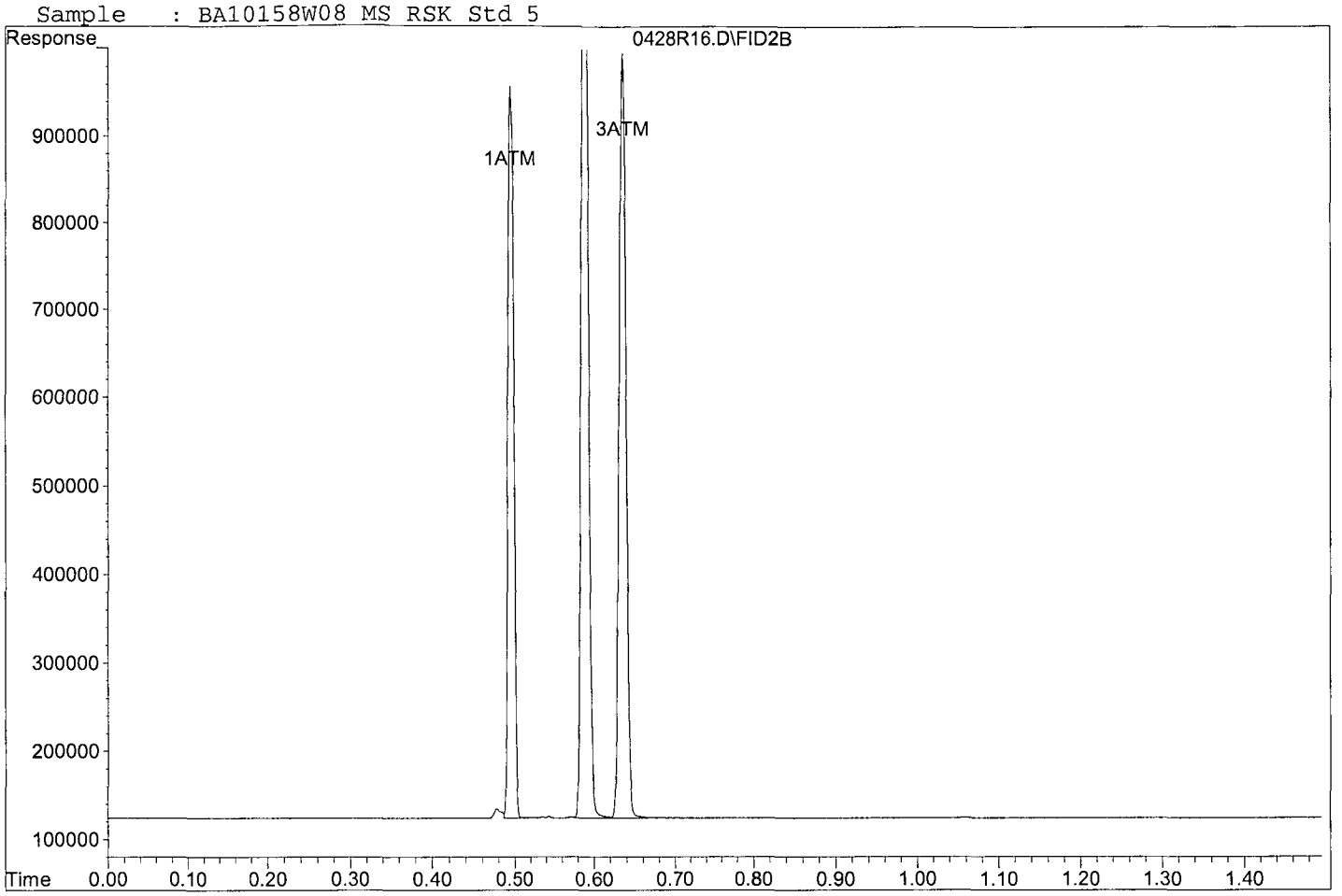
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.49	833398	100.651 ppb
2) ATM Ethane	0.59	1230433	185.052 ppb
3) ATM Ethene	0.64	870945	171.730 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R16.D
Sample : BA10158W08 MS RSK Std 5



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0428R18.D Vial: 18
Acq On : 28 Apr 20 13:20 Operator: GA; CMM
Sample : BA10158W08 MSD RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Apr 28 13:22 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

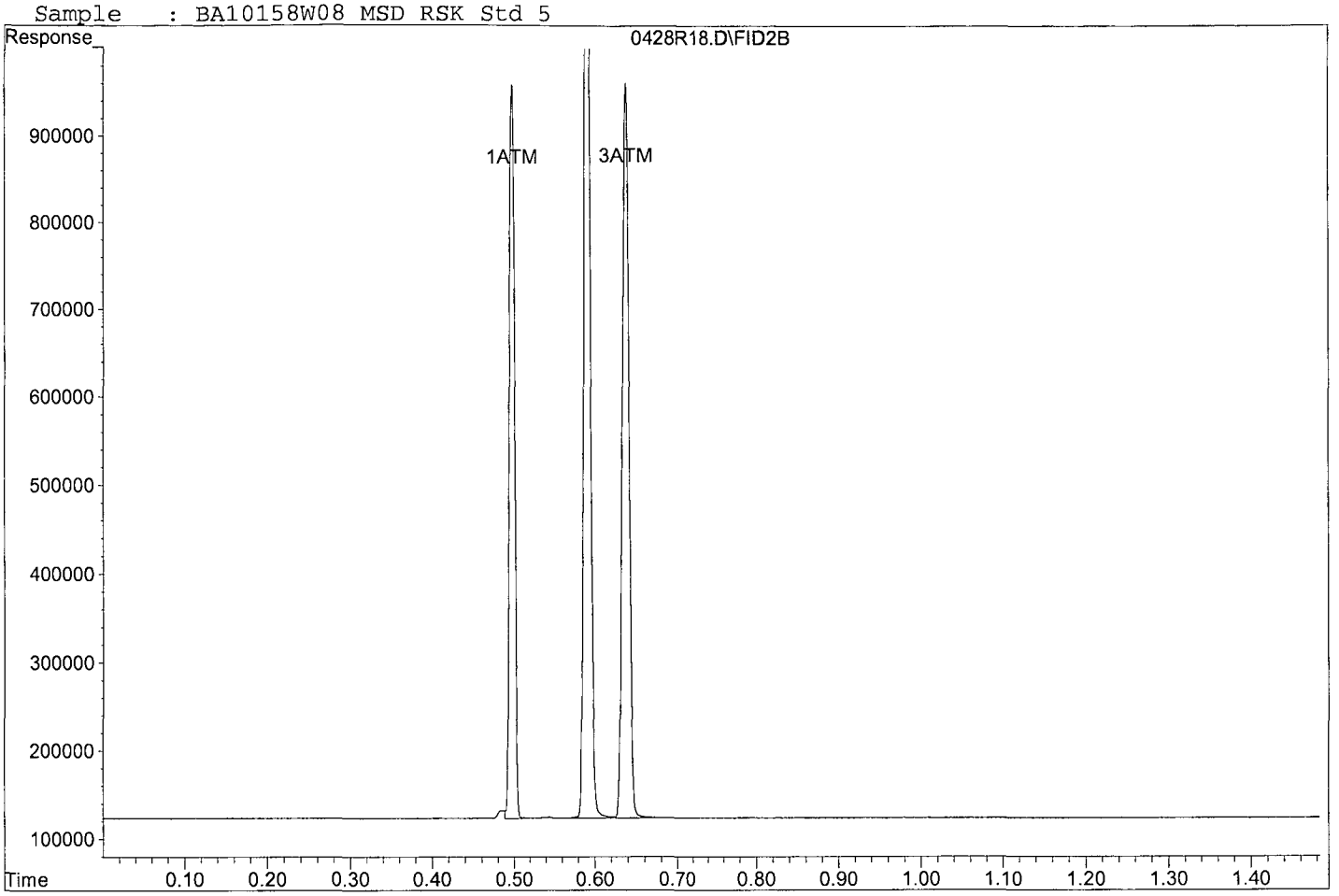
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	833089	100.609 ppb
2) ATM Ethane	0.59	1208294	181.311 ppb
3) ATM Ethene	0.64	836323	164.201 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0428R18.D
Sample : BA10158W08 MSD RSK Std 5



Primary Stock Source

10,000ppmV **Manufacture Expiration:** 09/21/21

RSK Gas Mix (Scott Specialty Gas) CAT#X04NI97CP140001 LOT#160-401558175-1

1% Gas Concentration Moles = 10,000ppmV Methane, Ethane, Ethene

RSK Calibration Curve (prepared in 1.0 L Tedlar Bags at room temp) **05/11/20** **03/11/20**

Analyte	Conc Std 1 (1/2 = LOD) (ug/L)	Conc Std 2 (LOQ Chk) (ug/L)	Conc Std 3 (ug/L)	Conc Std 4 (ug/L)	Conc Std 5 (ug/L)	Conc Std 6 (ug/L)	Conc Std 7 (ug/L)
Methane (MW 16.04)	2.08	4.16	8.34	20.85	83.40	208.5	834.0
Ethane (MW 30.07)	3.91	7.81	15.6	39.09	156.35	390.9	1563.5
Ethene (MW 28.05)	3.65	7.30	14.6	36.46	145.84	364.6	1458.4
Stock Source	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1
Stock Conc (ppmv)	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV
Stock Aliquot (mL)	0.010	0.020	0.040	0.100	0.400	1.00	4.00
Final Volume P&T Water	32 mL	32 mL	32 mL	32 mL	32 mL	32 mL	32 mL

Second Source Stock Standard 10,000ppmV **Manufacturer Exp date 9-21-2021**

RSK Gas Mix (Scott Specialty Gas) Cat.# 23452, Lot # 160-401303032-1-39774

1% Gas Concentration Moles = 10,000ppmV Methane, Ethane, Ethene

Second Source **Expires 03/12/2020** **CMM 03/11/2020**

Spike 0.400mL of 10,000ppmV into 32mL DI water, with 8mL Nitrogen headspace

final conc: 83.40ug/L Methane, 156.35ug/L Ethane, and 145.84ug/L Ethene

CCV/LCS/LCSD **CMM 04/28/20**

Spike 0.400mL of 10,000ppmV into 32mL DI water, with 8mL Nitrogen headspace

final conc: 83.40ug/L Methane, 156.35ug/L Ethane, and 145.84ug/L Ethene

Injection Log

Directory: G:\ROCKY\DATA\200311RS\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	3	0311R03.D	1	RSK Std 1 03/11/2020		11 Mar 20 13:00
2	4	0311R04.D	1	RSK Std 2 03/11/2020		11 Mar 20 13:03
3	7	0311R07.D	1	RSK Std 3 03/11/2020		11 Mar 20 13:12
4	8	0311R08.D	1	RSK Std 4 03/11/2020		11 Mar 20 13:15
5	9	0311R09.D	1	RSK Std 5 03/11/2020		11 Mar 20 13:17
6	11	0311R11.D	1	RSK Std 6 03/11/2020		11 Mar 20 13:22
7	13	0311R13.D	1	RSK Std 7 03/11/2020		11 Mar 20 13:28
8	15	0311R15.D	1	RSK SS Std 5 03/11/2020		11 Mar 20 13:38
9	4	0428R04.D	1	200428A CCV/LCS RSK Std 5		28 Apr 20 12:33
10	5	0428R05.D	1	200428A LCSD RSK Std 5		28 Apr 20 12:35
11	6	0428R06.D	1	200428A Blk		28 Apr 20 12:38
18	13	0428R13.D	1	BA10157W02		28 Apr 20 13:02
19	14	0428R14.D	1	BA10158W07		28 Apr 20 13:04
20	16	0428R16.D	1	BA10158W08 MS RSK Std 5		28 Apr 20 13:11
21	18	0428R18.D	1	BA10158W08 MSD RSK Std 5		28 Apr 20 13:20
22	19	0428R19.D	1	BA10160W02		28 Apr 20 13:23
23	20	0428R20.D	1	BA10161W02		28 Apr 20 13:25
24	21	0428R21.D	20	BA10161W02 DF20		28 Apr 20 13:28
25	22	0428R22.D	1	BA10163W02		28 Apr 20 13:31
26	23	0428R23.D	1	BA10164W02		28 Apr 20 13:33
27	24	0428R24.D	1	BA10165W02		28 Apr 20 13:36
28	25	0428R25.D	1	BA10166W02		28 Apr 20 13:39
29	26	0428R26.D	1	BA10167W02		28 Apr 20 13:41
30	27	0428R27.D	1	BA10168W02		28 Apr 20 13:43
31	28	0428R28.D	1	Ending CCV RSK Std 5 04/28/2020		28 Apr 20 13:45

INORGANIC ANALYSIS
Calibration Data

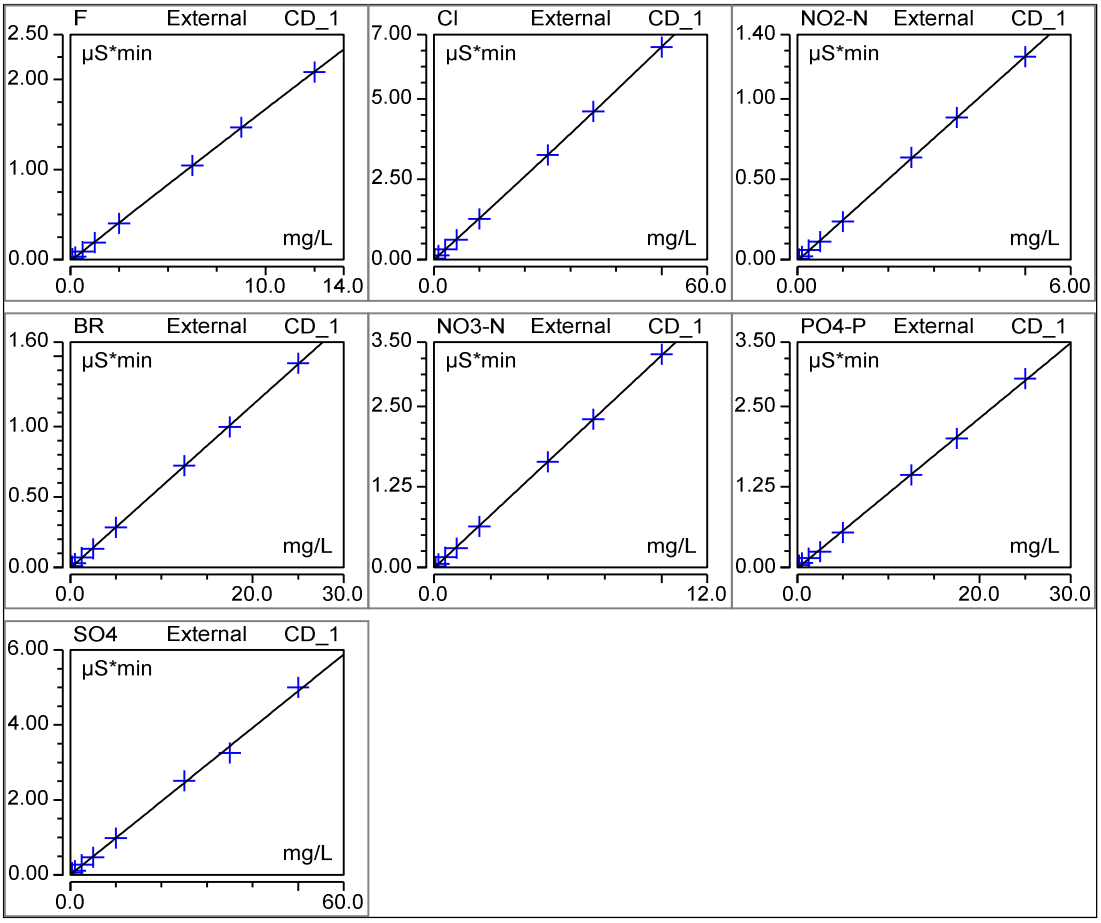
Calibration Batch Report

Sequence:	**200326**	*Injection Volume:*	**25.00**
Instrument Method:	**Anions IM**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:22**	*Run Time:*	**14**

Calibration Summary

Peak Name	Eval.Type	Cal.Type	Points	Offset (C0)	Slope (C1)	Curve (C2)	Coeff.Det. %
F	Area	Quad, WithOffset	8.000	-0.016	0.171	0.000	99.9922
Cl	Area	Quad, WithOffset	8.000	-0.007	0.128	0.000	99.9957
NO2-N	Area	Lin, WithOffset	8.000	-0.009	0.255	0.000	99.9838
BR	Area	Lin, WithOffset	8.000	-0.006	0.058	0.000	99.9872
NO3-N	Area	Lin, WithOffset, 1/A	8.000	-0.014	0.331	0.000	99.9739
PO4-P	Area	Lin, WithOffset	8.000	-0.016	0.117	0.000	99.9396
SO4	Area	Lin, WithOffset	8.000	0.006	0.098	0.000	99.7903

Injection Name	Amount mg/L CD_1 F	Amount mg/L CD_1 Cl	Amount mg/L CD_1 NO2-N	Amount mg/L CD_1 BR	Amount mg/L CD_1 NO3-N	Amount mg/L CD_1 PO4-P	Amount mg/L CD_1 SO4
Cal 1	0.157	0.3163	0.0511	0.2474	0.0796	0.4282	0.6148
Cal 2	0.273	1.0789	0.1153	0.5781	0.2054	0.7072	1.0626
Cal 3	0.611	2.5316	0.2592	1.2595	0.5238	1.1933	2.7192
Cal 4	1.187	4.8096	0.4672	2.4043	0.9297	2.1420	4.7385
Cal 5	2.371	9.8094	0.9573	4.9426	1.9148	4.5306	9.9082
Cal 6	6.245	25.0387	2.4641	12.3303	4.9622	12.0807	25.4677
Cal 7	8.827	34.9499	3.4985	17.2085	6.9204	17.1012	35.1265
Cal 8 2020.03.25	12.582	49.9317	4.9740	25.1090	9.9430	25.1800	50.7694



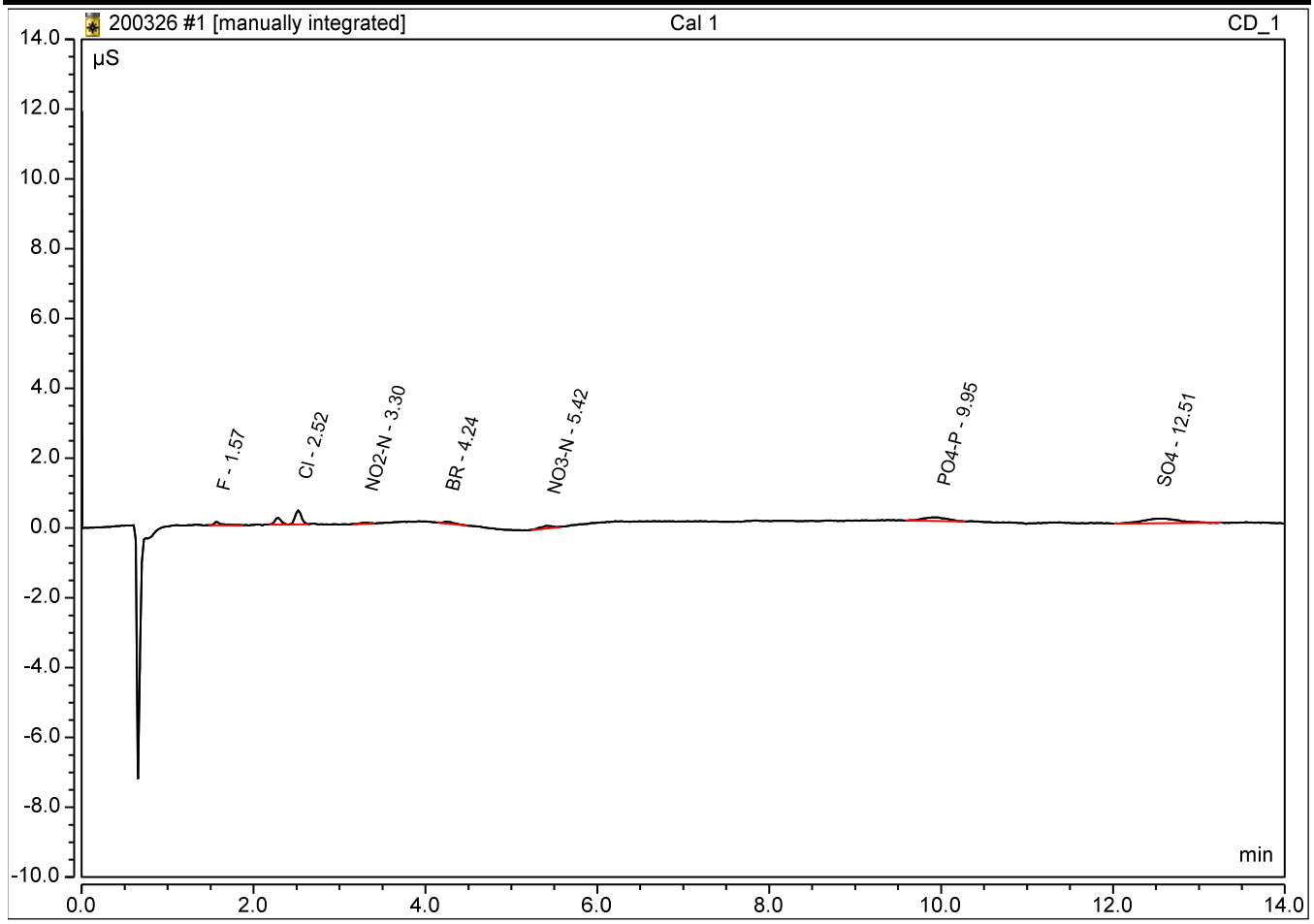
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:28**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.011	0.098	0.16	0.1	157.2%
3	2.52	**Cl**	BMB	0.034	0.405	0.32	0.2	158.1%
4	3.30	**NO2-N**	BMB	0.005	0.038	0.05	0.04	127.7%
5	4.24	**BR**	BMB	0.009	0.050	0.25	0.2	123.7%
6	5.42	**NO3-N**	BMB	0.012	0.074	0.08	0.08	99.5%
7	9.95	**PO4-P**	BMB*	0.034	0.107	0.43	0.2	214.1%
8	12.51	**SO4**	BMB*	0.067	0.137	0.61	0.4	153.7%



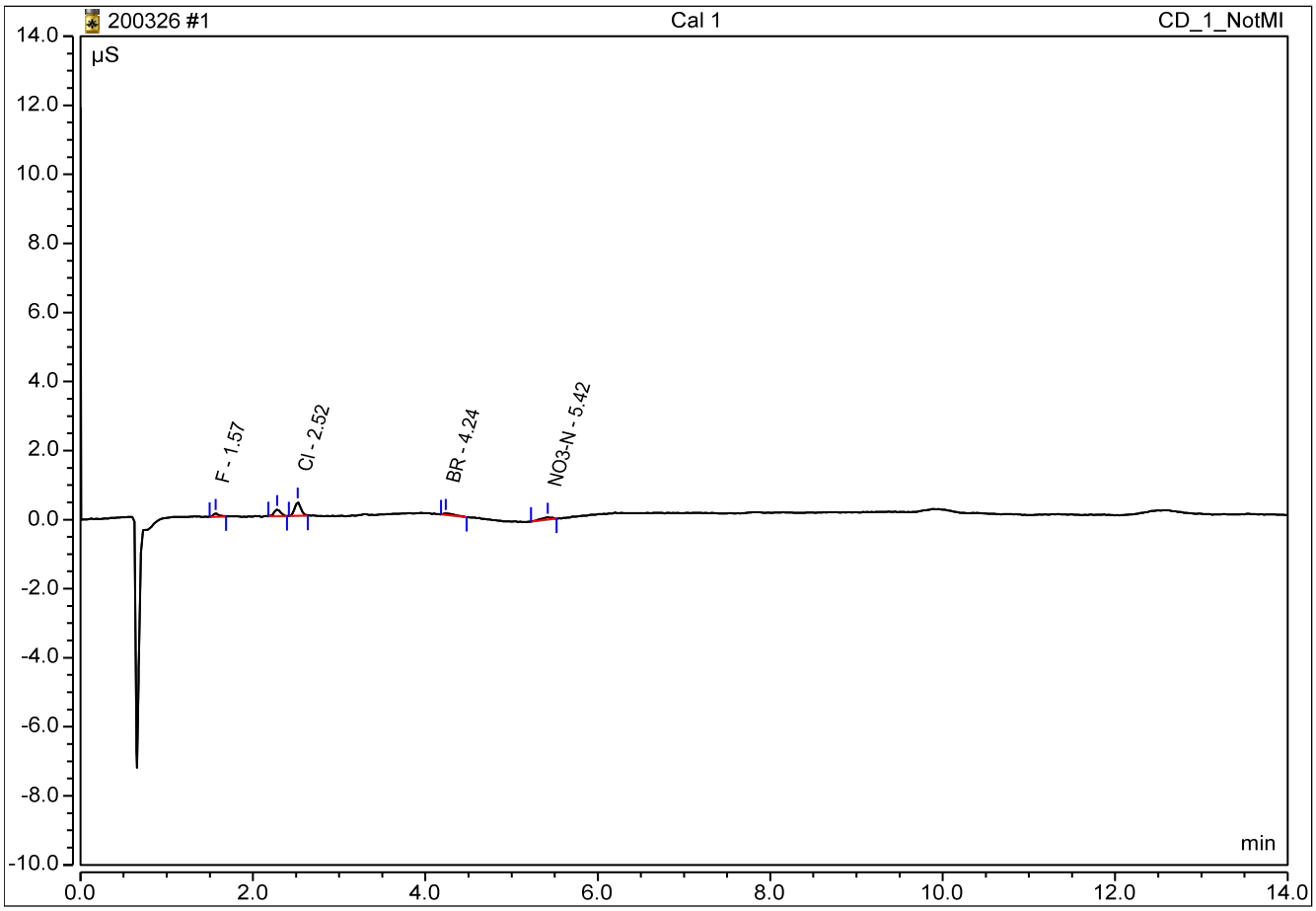
GA MI 1 2020.03.26

Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Not Manipulated Peak Integration Report

Sample Name:	**Cal 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:28**	*Run Time:*	**14.00**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	1.57	**F**	BMB	0.007	0.093	0.1305
3	2.52	**Cl**	BMB	0.034	0.405	0.3164
4	n.a.	**NO2-N**	BMB	n.a.	n.a.	n.a.
5	4.24	**BR**	BMB	0.006	0.041	0.2065
6	5.42	**NO3-N**	BMB	0.010	0.068	0.0644
7	n.a.	**PO4-P**	BMB*	n.a.	n.a.	n.a.
8	n.a.	**SO4**	BMB*	n.a.	n.a.	n.a.

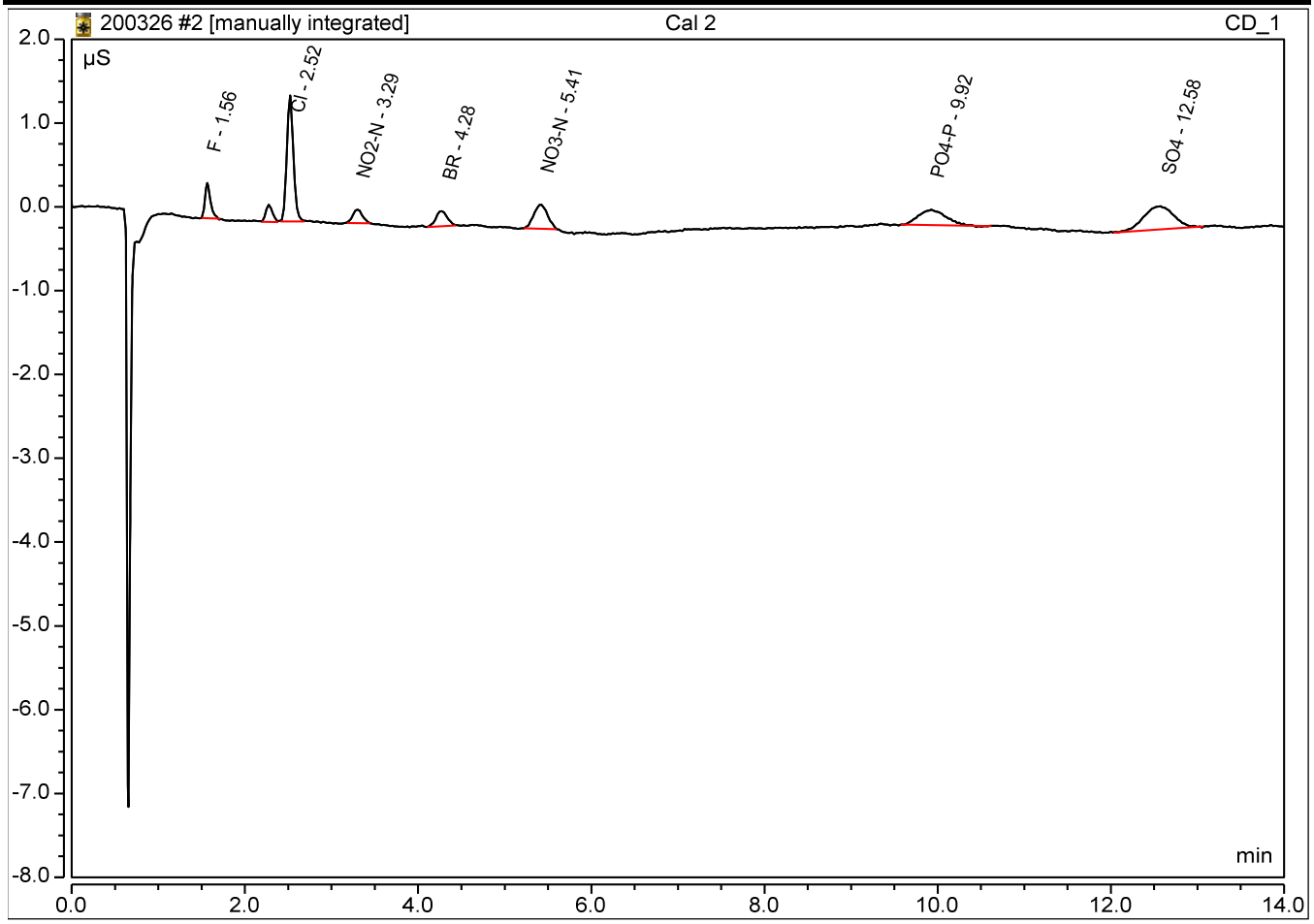


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:44**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.56	**F**	BMB*	0.030	0.420	0.27	0.25	109.1%
3	2.52	**Cl**	BMB	0.132	1.502	1.08	1	107.9%
4	3.29	**NO2-N**	BMB	0.021	0.165	0.12	0.1	115.3%
5	4.28	**BR**	BMB	0.028	0.182	0.58	0.5	115.6%
6	5.41	**NO3-N**	BMB	0.054	0.288	0.21	0.2	102.7%
7	9.92	**PO4-P**	BMB*	0.067	0.192	0.71	0.5	141.4%
8	12.58	**SO4**	BMB*	0.110	0.278	1.06	1	106.3%

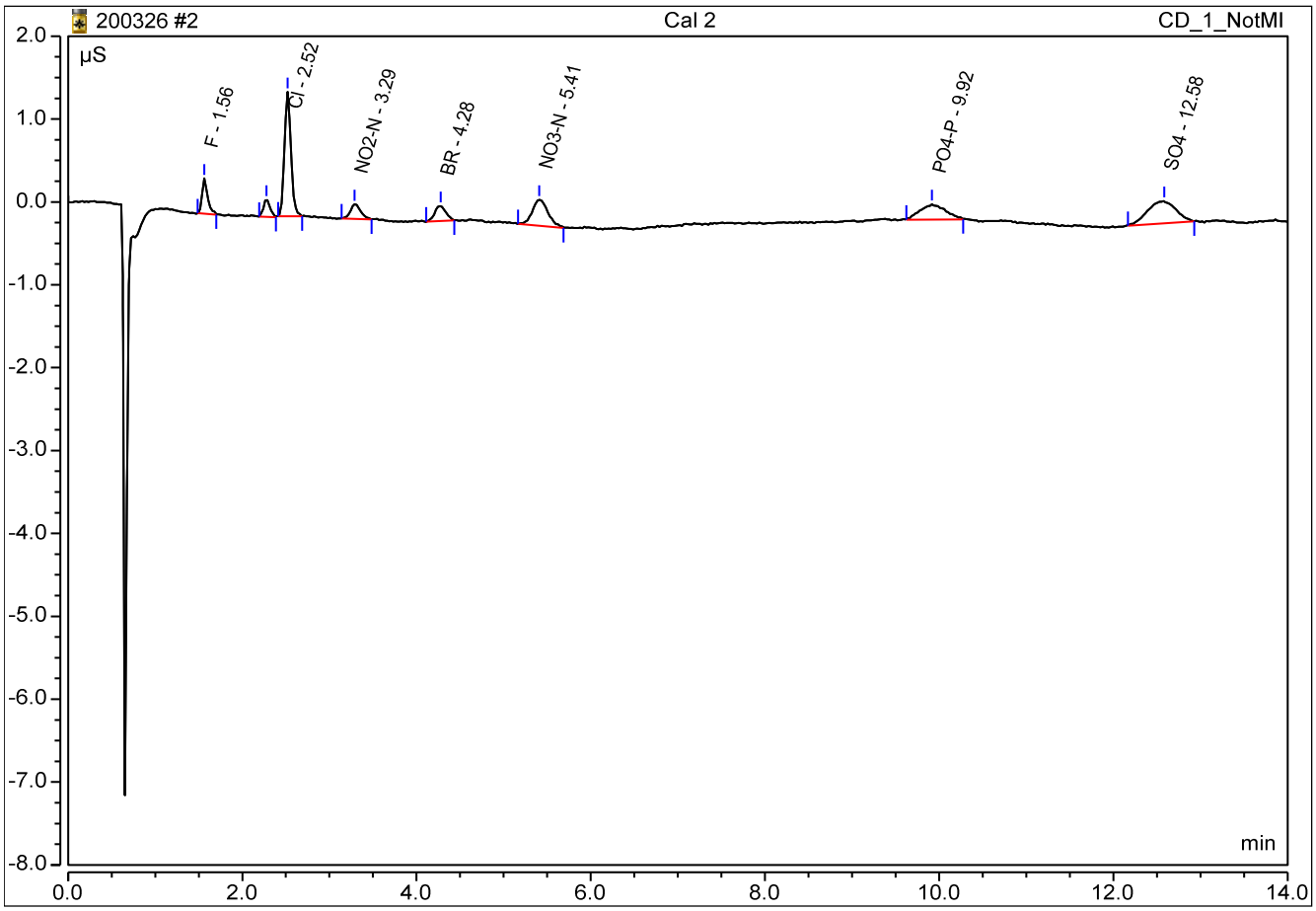


GA MI 1 2020.03.26

Not Manipulated Peak Integration Report

Sample Name:	**Cal 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:44**	*Run Time:*	**14.00**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	1.56	**F**	BMB*	0.032	0.425	0.2765
3	2.52	**Cl**	BMB	0.132	1.502	1.0796
4	3.29	**NO2-N**	BMB	0.025	0.176	0.1249
5	4.28	**BR**	BMB	0.027	0.180	0.5628
6	5.41	**NO3-N**	BMB	0.067	0.315	0.2352
7	9.92	**PO4-P**	BMB*	0.061	0.185	0.6914
8	12.58	**SO4**	BMB*	0.103	0.270	1.0287

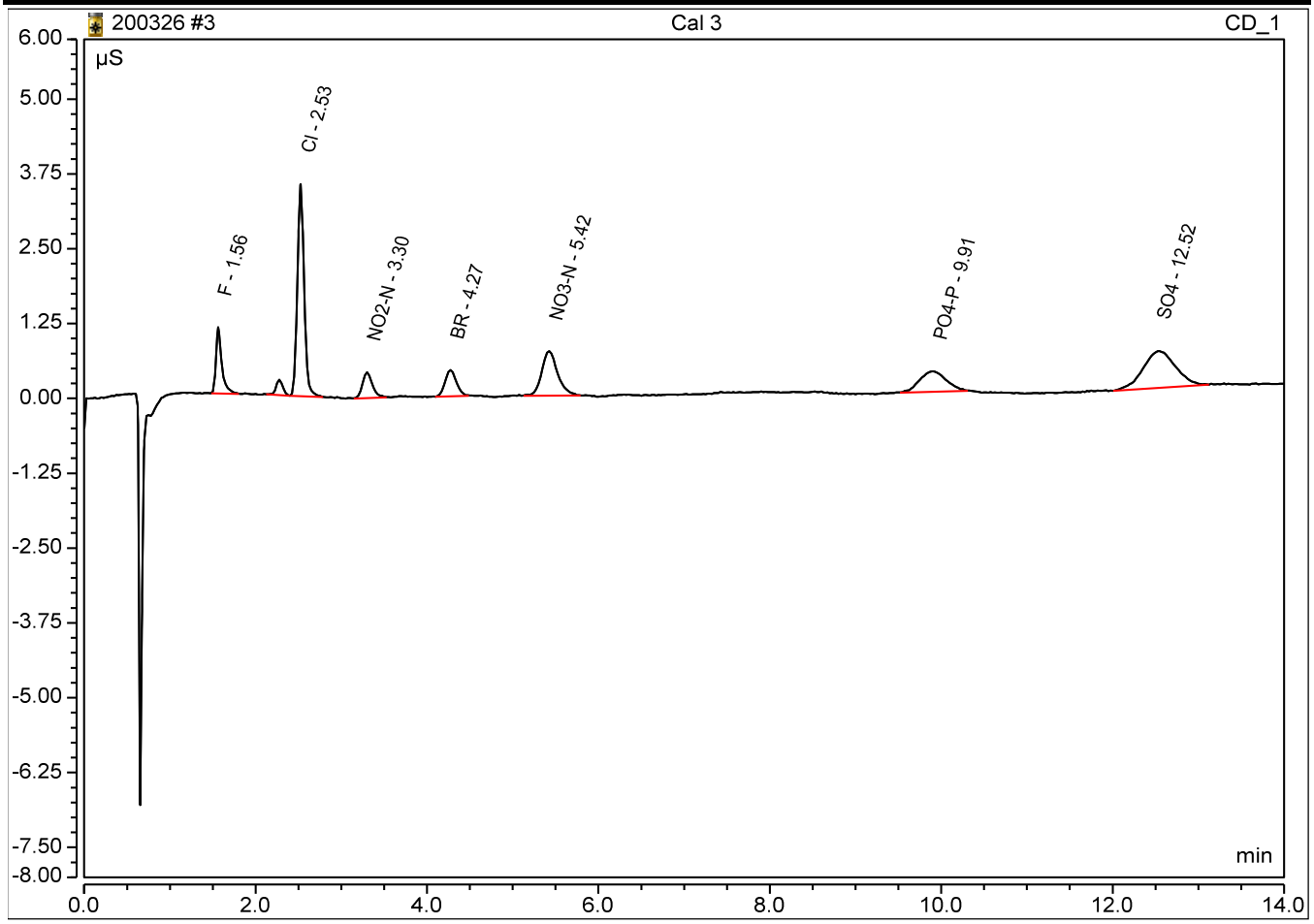


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:01**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.56	**F**	BMB	0.088	1.107	0.61	0.625	97.8%
3	2.53	**Cl**	BMB	0.319	3.543	2.53	2.5	101.3%
4	3.30	**NO2-N**	BMB	0.057	0.430	0.26	0.25	103.7%
5	4.27	**BR**	BMB	0.067	0.442	1.26	1.25	100.8%
6	5.42	**NO3-N**	BMB	0.159	0.742	0.52	0.5	104.8%
7	9.91	**PO4-P**	BMB	0.124	0.343	1.19	1.25	95.5%
8	12.52	**SO4**	BMB	0.273	0.621	2.72	2.5	108.8%



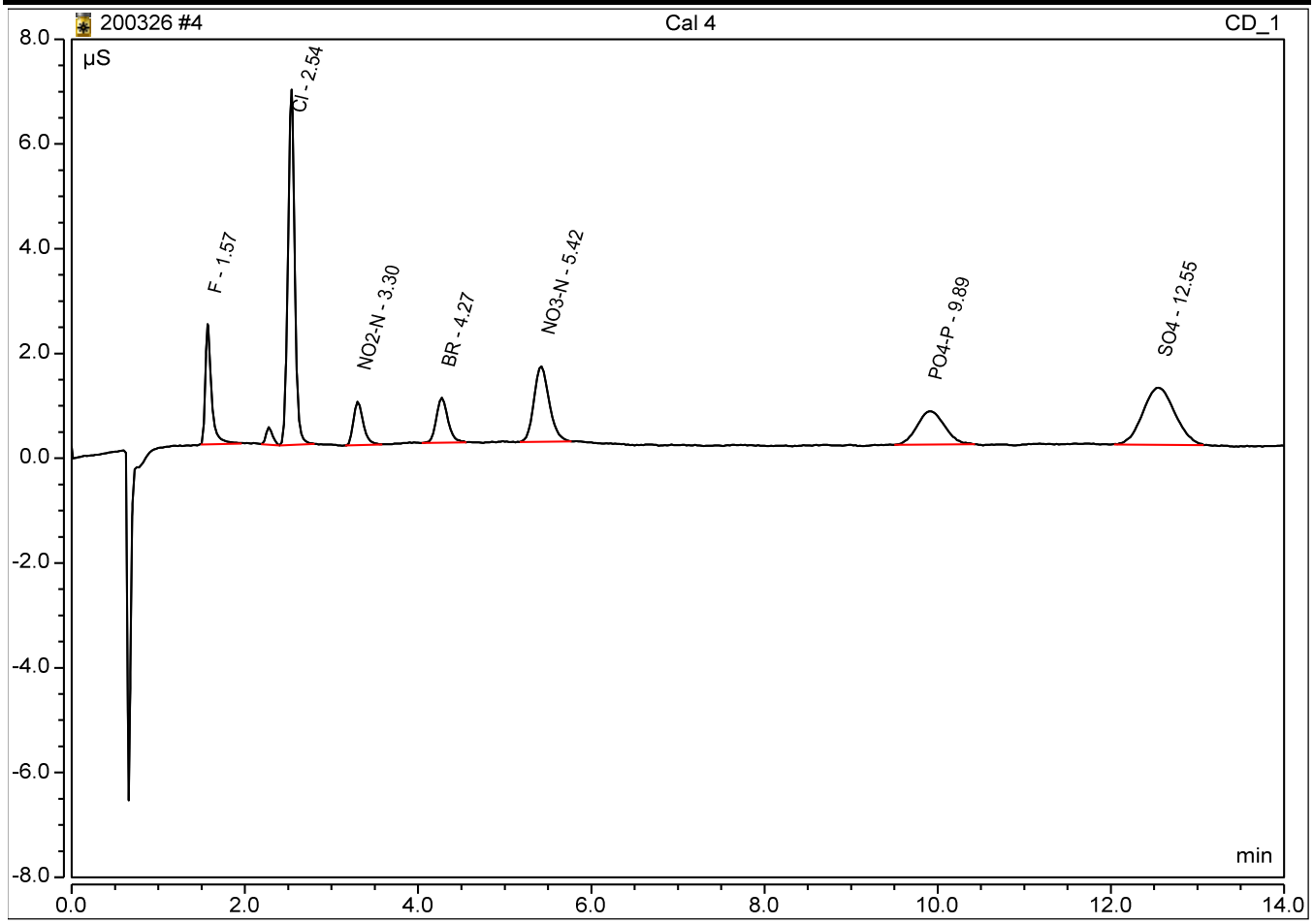
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 4**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:17**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.186	2.294	1.19	1.25	94.9%
3	2.54	**Cl**	BMB	0.612	6.787	4.81	5	96.2%
4	3.30	**NO2-N**	BMB	0.110	0.831	0.47	0.5	93.4%
5	4.27	**BR**	BMB	0.134	0.859	2.40	2.5	96.2%
6	5.42	**NO3-N**	BMB	0.293	1.442	0.93	1	93.0%
7	9.89	**PO4-P**	BMB	0.234	0.639	2.14	2.5	85.7%
8	12.55	**SO4**	BMB	0.470	1.092	4.74	5	94.8%



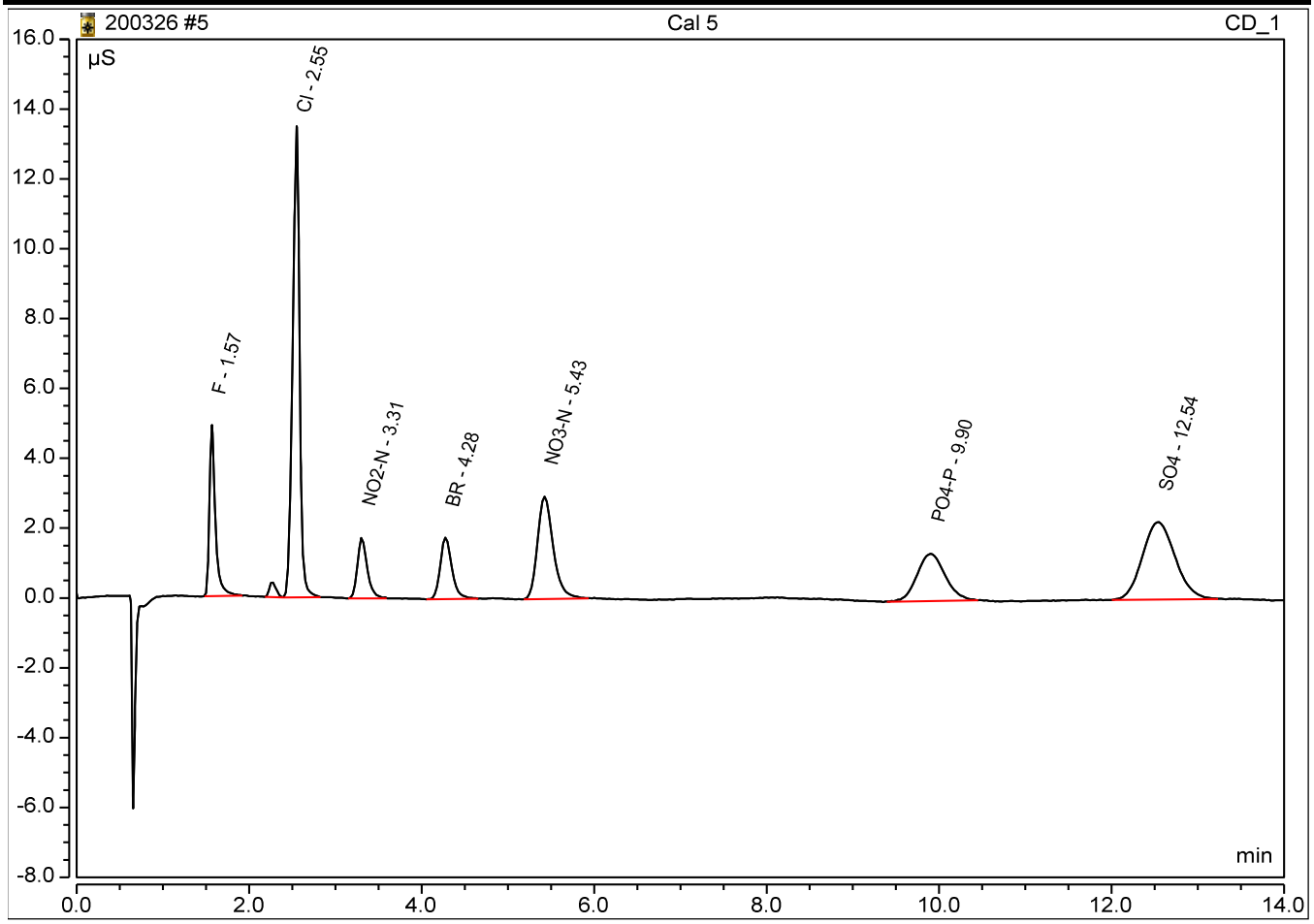
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:33**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.388	4.897	2.37	2.5	94.8%
3	2.55	**Cl**	BMB	1.260	13.489	9.81	10	98.1%
4	3.31	**NO2-N**	BMB	0.235	1.743	0.96	1	95.7%
5	4.28	**BR**	BMB	0.281	1.762	4.94	5	98.9%
6	5.43	**NO3-N**	BMB	0.619	2.936	1.91	2	95.7%
7	9.90	**PO4-P**	BMB	0.513	1.360	4.53	5	90.6%
8	12.54	**SO4**	BMB	0.977	2.218	9.91	10	99.1%



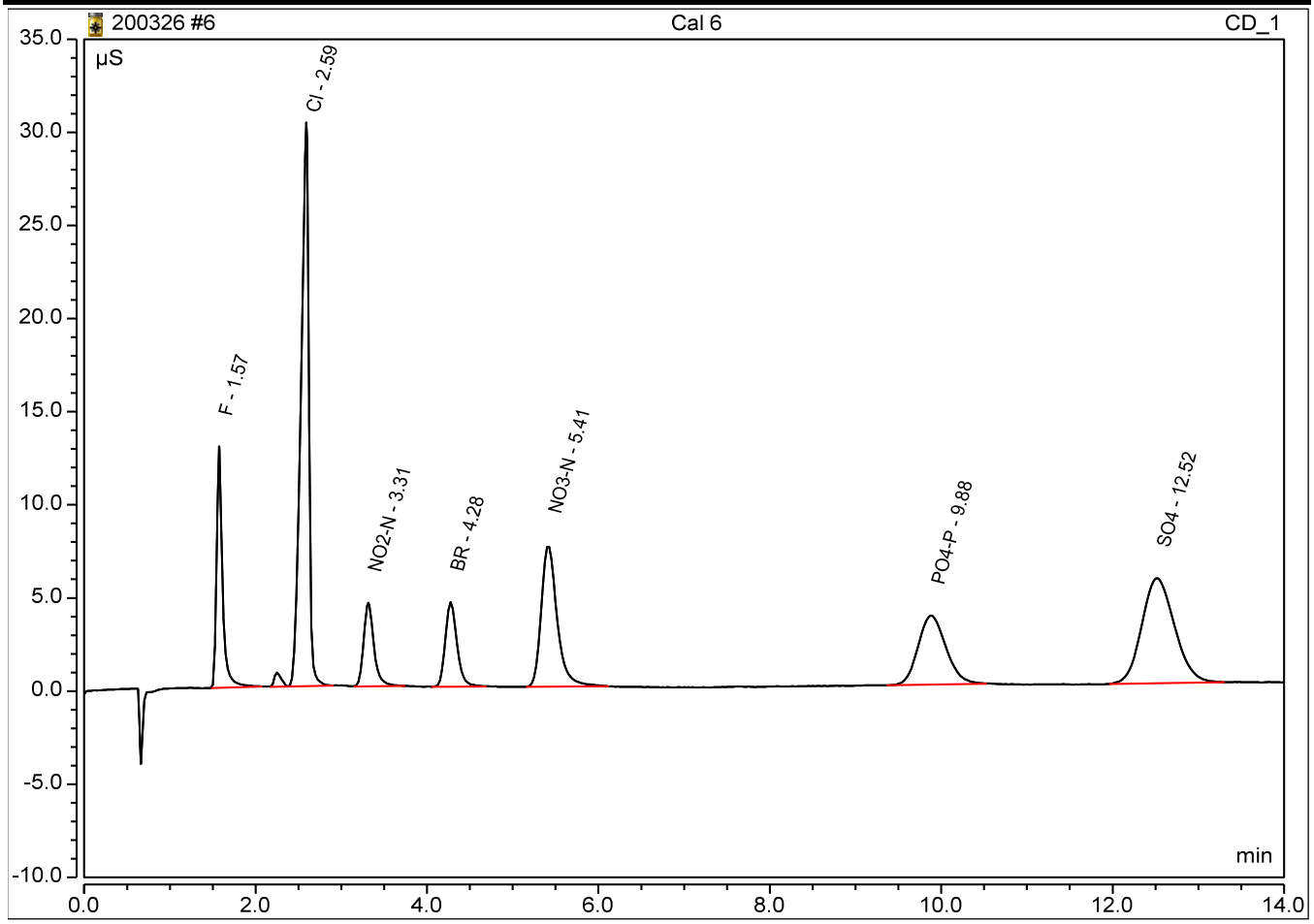
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 6**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:50**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	1.043	12.959	6.25	6.25	99.9%
3	2.59	**Cl**	BMB	3.257	30.258	25.04	25	100.2%
4	3.31	**NO2-N**	BMB	0.619	4.484	2.46	2.5	98.6%
5	4.28	**BR**	BMB	0.709	4.535	12.33	12.5	98.6%
6	5.41	**NO3-N**	BMB	1.628	7.608	4.96	5	99.2%
7	9.88	**PO4-P**	BMB	1.395	3.711	12.08	12.5	96.6%
8	12.52	**SO4**	BMB	2.500	5.638	25.47	25	101.9%



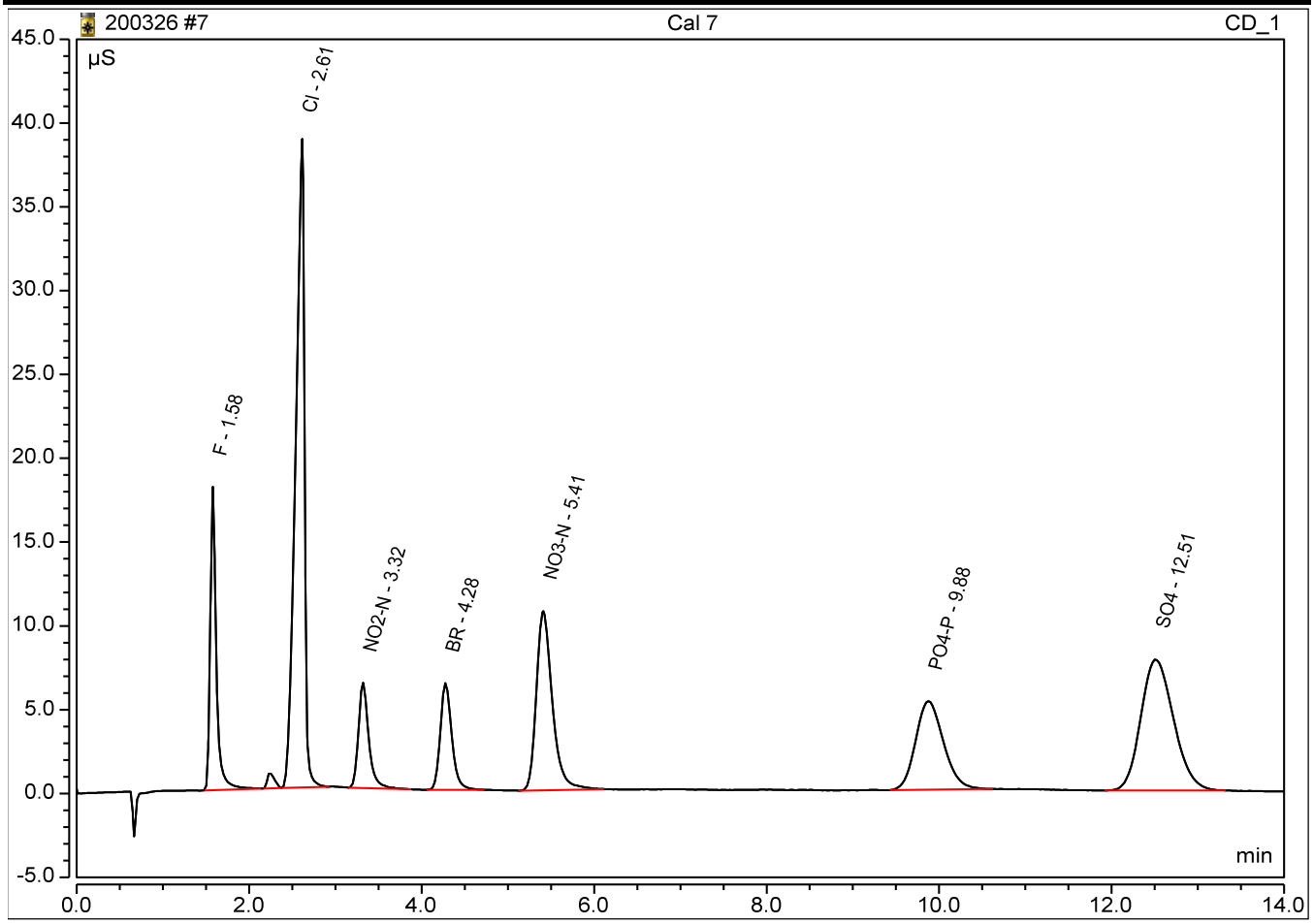
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 7**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:06**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.58	**F**	BMB	1.476	18.100	8.83	8.75	100.9%
3	2.61	**Cl**	BMB	4.578	38.681	34.95	35	99.9%
4	3.32	**NO2-N**	BMB	0.882	6.277	3.50	3.5	100.0%
5	4.28	**BR**	BMB	0.992	6.366	17.21	17.5	98.3%
6	5.41	**NO3-N**	BMB	2.276	10.681	6.92	7	98.9%
7	9.88	**PO4-P**	BMB	1.981	5.287	17.10	17.5	97.7%
8	12.51	**SO4**	BMB	3.446	7.825	35.13	35	100.4%



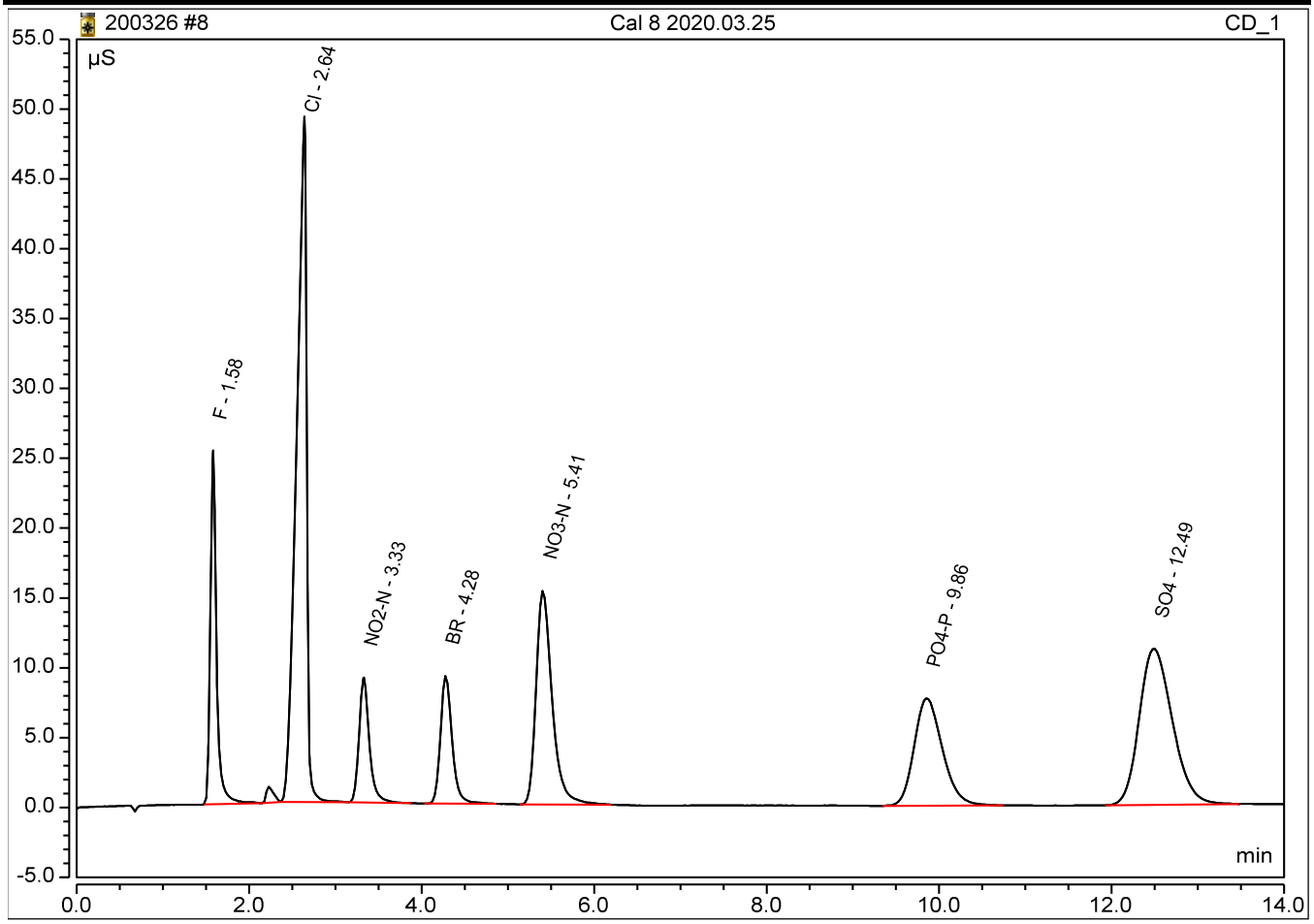
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 8 2020.03.25**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:22**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.58	**F**	BMB	2.100	25.328	12.58	12.5	100.7%
3	2.64	**Cl**	BMB	6.606	49.067	49.93	50	99.9%
4	3.33	**NO2-N**	BMB	1.257	8.938	4.97	5	99.5%
5	4.28	**BR**	BMB	1.450	9.175	25.11	25	100.4%
6	5.41	**NO3-N**	BMB	3.277	15.327	9.94	10	99.4%
7	9.86	**PO4-P**	BMB	2.924	7.700	25.18	25	100.7%
8	12.49	**SO4**	BMB	4.978	11.186	50.77	50	101.5%



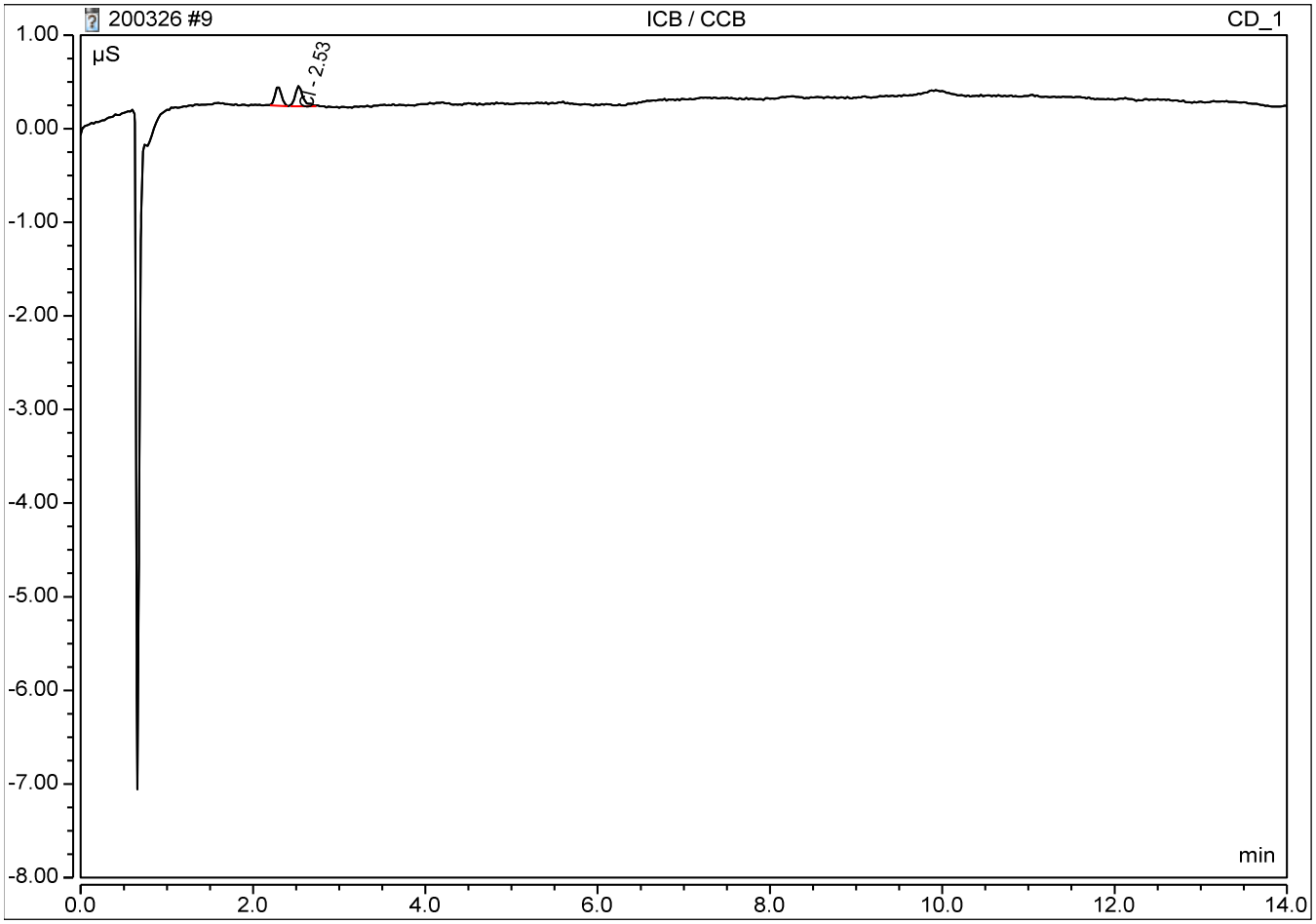
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**ICB / CCB**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:39**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.53	**Cl**	BMB	0.022	0.219	0.22		

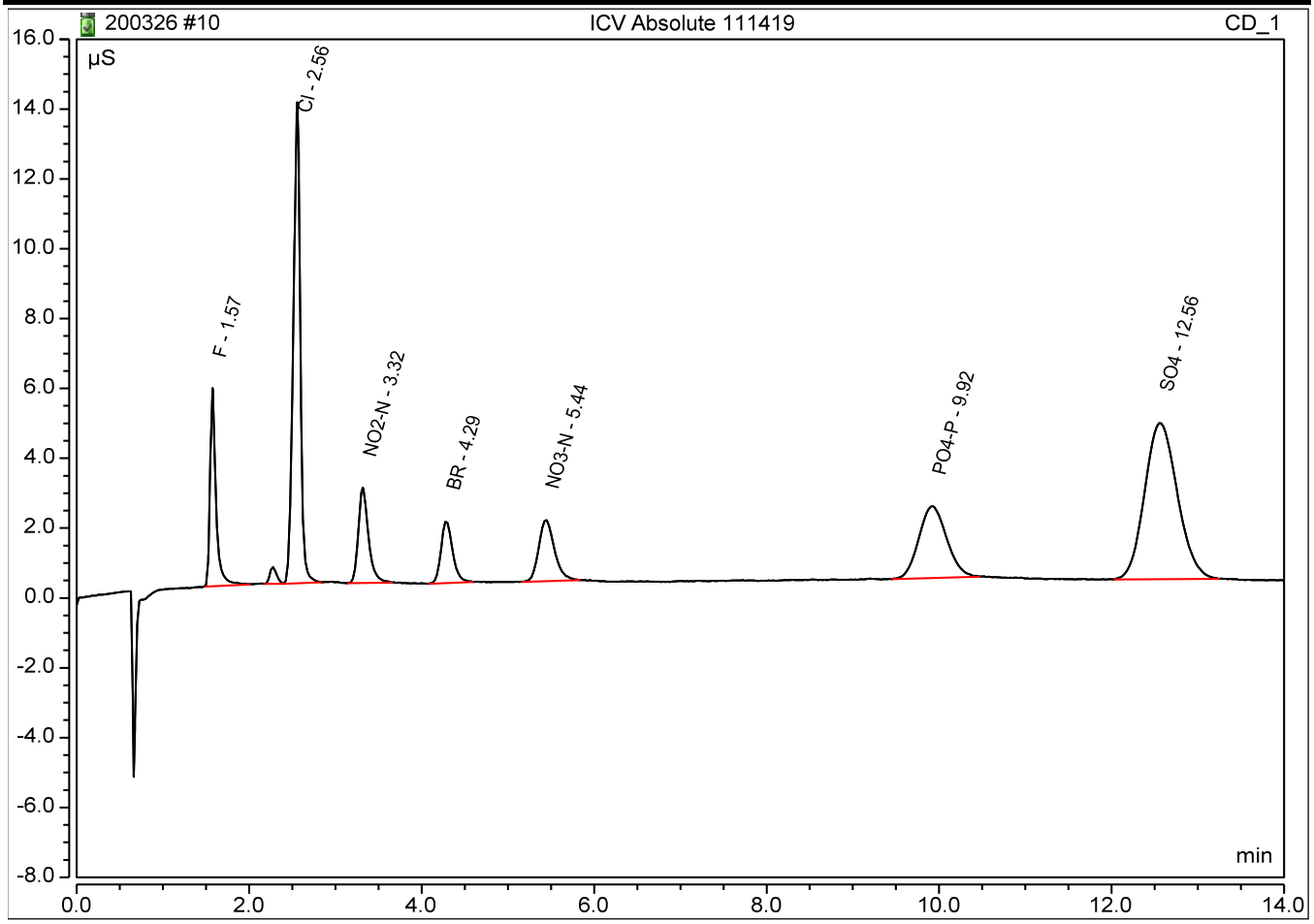


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**ICV Absolute 111419**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:55**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.452	5.670	2.75	2.5	110.0%
3	2.56	**Cl**	BMB	1.301	13.777	10.13	10	101.3%
4	3.32	**NO2-N**	BMB	0.377	2.729	1.51	1.522334	99.4%
5	4.29	**BR**	BMB	0.279	1.779	4.91	5	98.3%
6	5.44	**NO3-N**	BMB	0.370	1.758	1.16	1.129525	102.7%
7	9.92	**PO4-P**	BMB	0.771	2.060	6.74	6.522	103.3%
8	12.56	**SO4**	BMB	1.968	4.481	20.04	20	100.2%



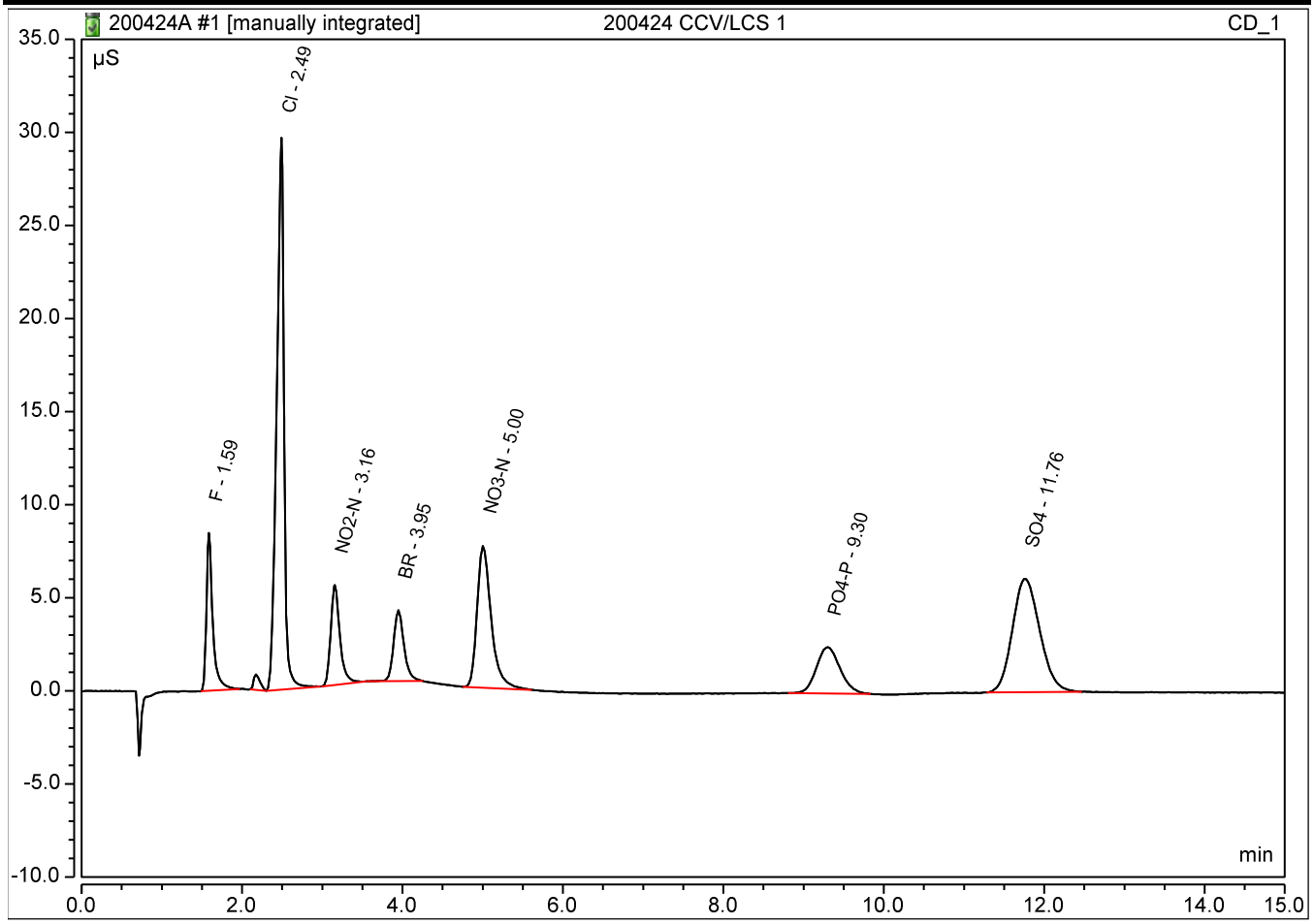
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**200424 CCV/LCS 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 11:01**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.766	8.482	4.60	5	92.0%
3	2.49	**Cl**	BMB	3.169	29.643	24.37	25	97.5%
4	3.16	**NO2-N**	BMb*	0.714	5.361	2.84	3.04	93.4%
5	3.95	**BR**	bMB*	0.571	3.807	9.95	10	99.5%
6	5.00	**NO3-N**	BMB	1.552	7.622	4.73	5	94.7%
7	9.30	**PO4-P**	BMB	0.859	2.502	7.49	10	74.9%
8	11.76	**SO4**	BMB	2.404	6.105	24.49	25	97.9%



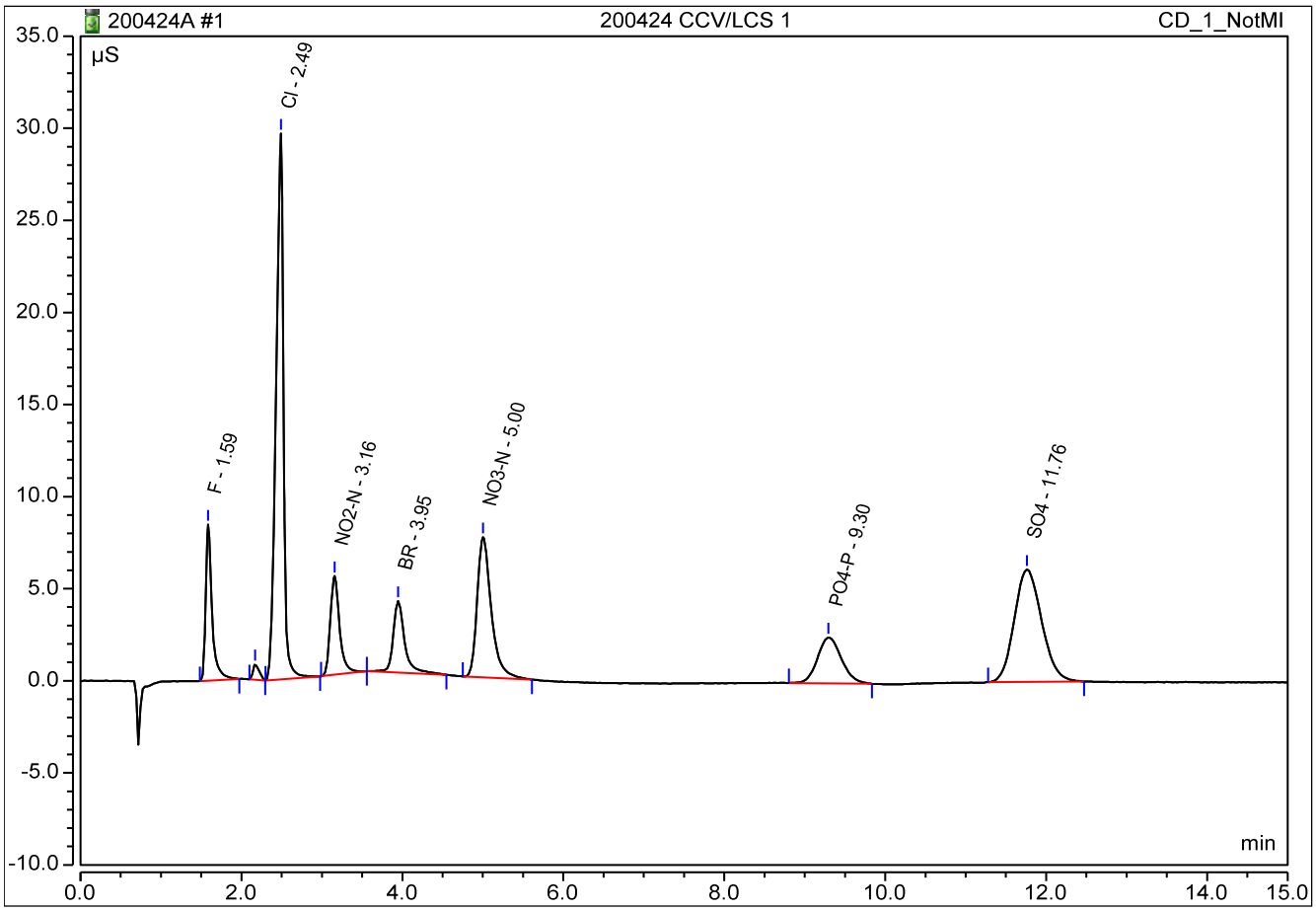
MI 1 BR GA 4/24/20

Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Not Manipulated Peak Integration Report

Sample Name:	**200424 CCV/LCS 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 11:01**	*Run Time:*	**15.00**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	1.59	**F**	BMB	0.766	8.482	4.5778
3	2.49	**Cl**	BMB	3.169	29.643	24.7575
4	3.16	**NO2-N**	BMb*	0.714	5.361	2.8394
5	3.95	**BR**	bMB*	0.649	3.897	11.2949
6	5.00	**NO3-N**	BMB	1.552	7.622	4.7308
7	9.30	**PO4-P**	BMB	0.859	2.502	7.5121
8	11.76	**SO4**	BMB	2.404	6.105	24.4989

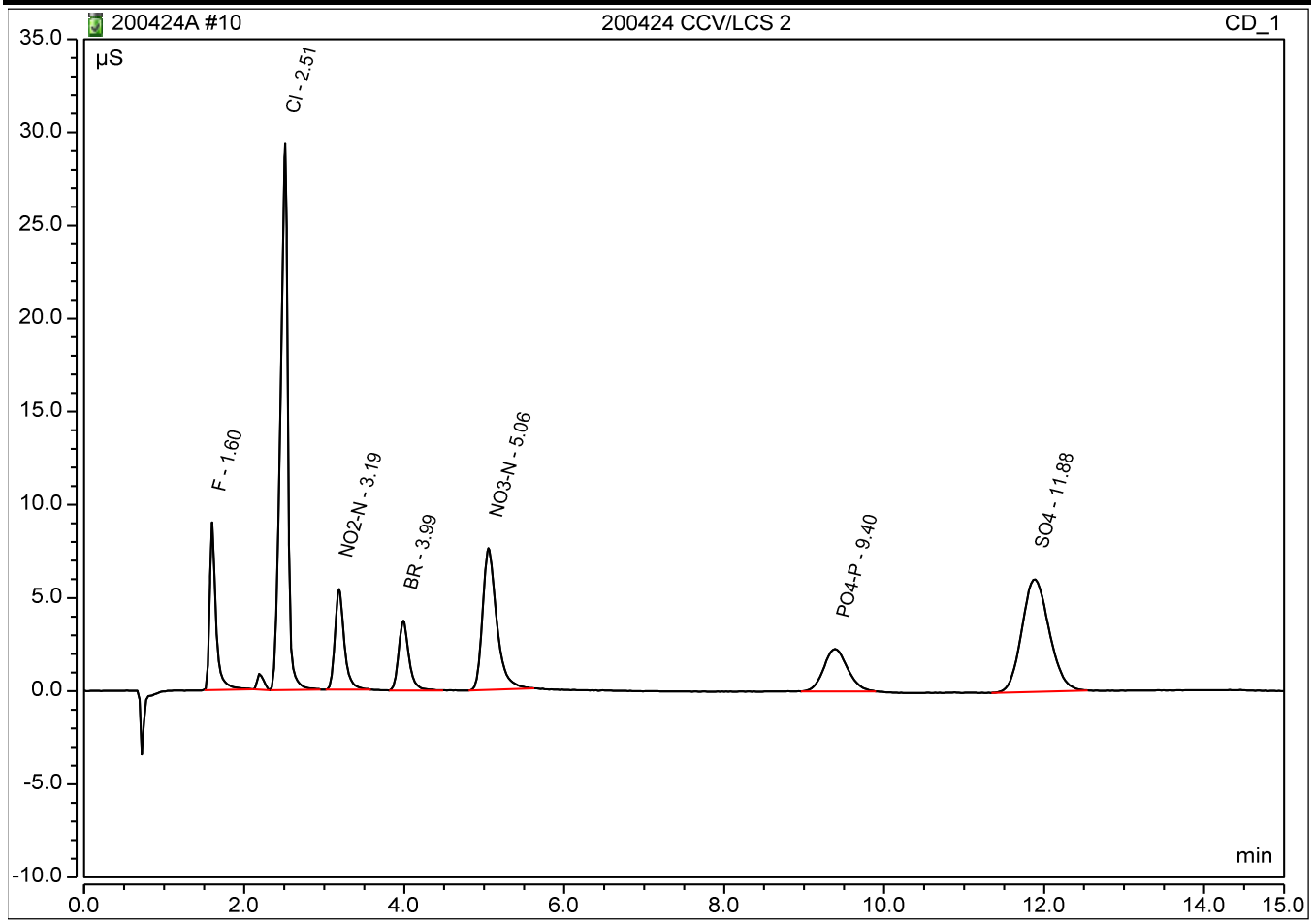


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**200424 CCV/LCS 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 15:58**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	**F**	BMB	0.810	9.012	4.86	5	97.3%
3	2.51	**Cl**	BMB	3.169	29.371	24.37	25	97.5%
4	3.19	**NO2-N**	BMB	0.732	5.407	2.91	3.04	95.7%
5	3.99	**BR**	BMB	0.565	3.747	9.84	10	98.4%
6	5.06	**NO3-N**	BMB	1.563	7.602	4.77	5	95.3%
7	9.40	**PO4-P**	BMB	0.794	2.284	6.94	10	69.4%
8	11.88	**SO4**	BMB	2.402	6.057	24.47	25	97.9%



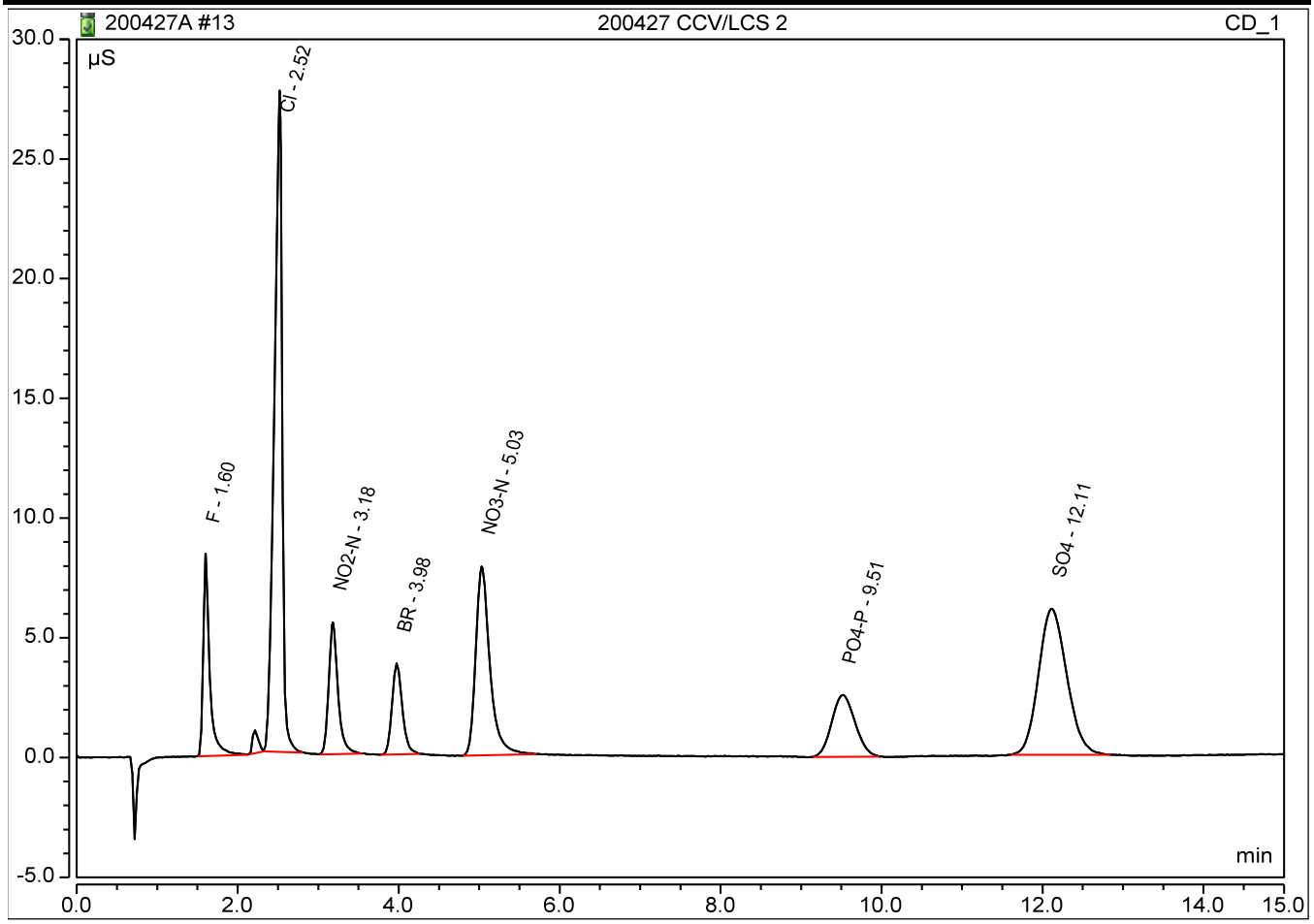
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200427A

Peak Integration Report

Sample Name:	**200427 CCV/LCS 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**27-Apr-2020 / 17:23**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	**F**	BMB	0.796	8.454	4.78	5	95.6%
3	2.52	**Cl**	BMB	3.132	27.611	24.09	25	96.4%
4	3.18	**NO2-N**	BMB	0.740	5.508	2.94	3.04	96.8%
5	3.98	**BR**	BMB	0.560	3.812	9.76	10	97.6%
6	5.03	**NO3-N**	BMB	1.621	7.887	4.94	5	98.8%
7	9.51	**PO4-P**	BMB	0.869	2.587	7.57	10	75.7%
8	12.11	**SO4**	BMB	2.490	6.118	25.36	25	101.4%



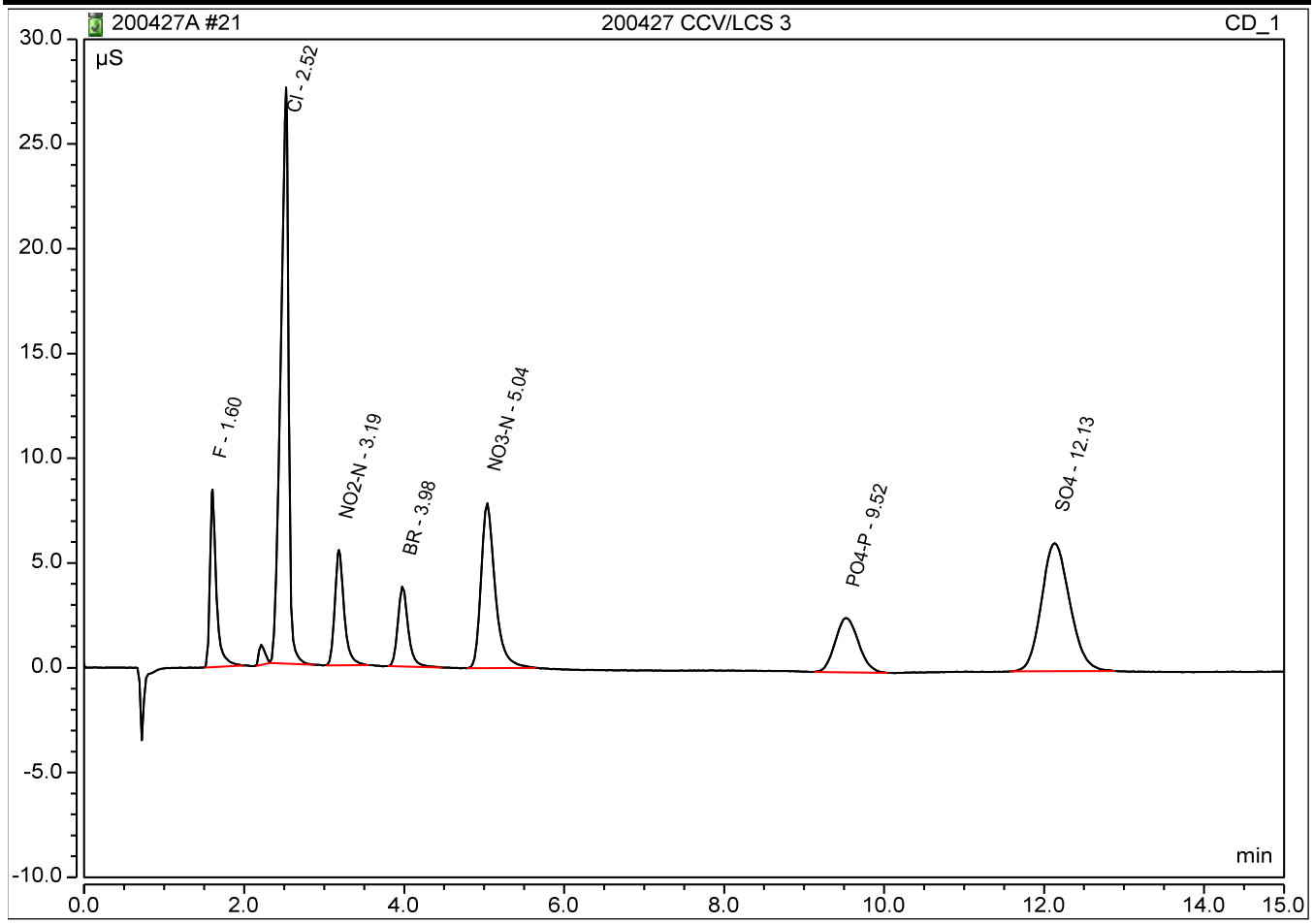
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200427A

Peak Integration Report

Sample Name:	**200427 CCV/LCS 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**27-Apr-2020 / 19:42**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	**F**	BMB	0.772	8.483	4.64	5	92.7%
3	2.52	**Cl**	BMB	3.137	27.498	24.13	25	96.5%
4	3.19	**NO2-N**	BMB	0.745	5.505	2.96	3.04	97.4%
5	3.98	**BR**	BMB	0.574	3.836	10.00	10	100.0%
6	5.04	**NO3-N**	BMB	1.609	7.878	4.90	5	98.1%
7	9.52	**PO4-P**	BMB	0.879	2.598	7.66	10	76.6%
8	12.13	**SO4**	BMB	2.508	6.122	25.54	25	102.2%

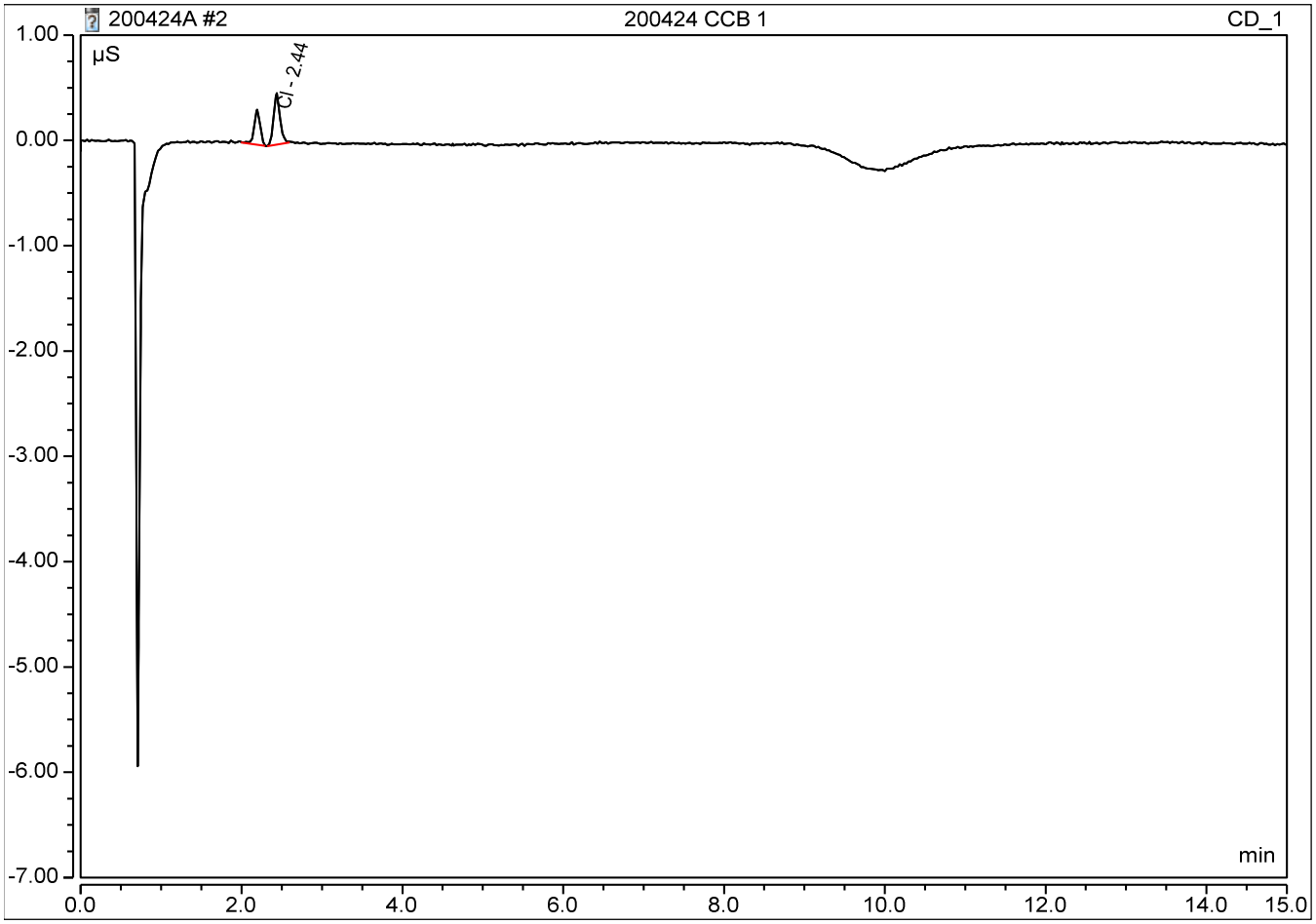


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**200424 CCB 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 11:19**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.44	**Cl**	BMB	0.045	0.489	0.40		



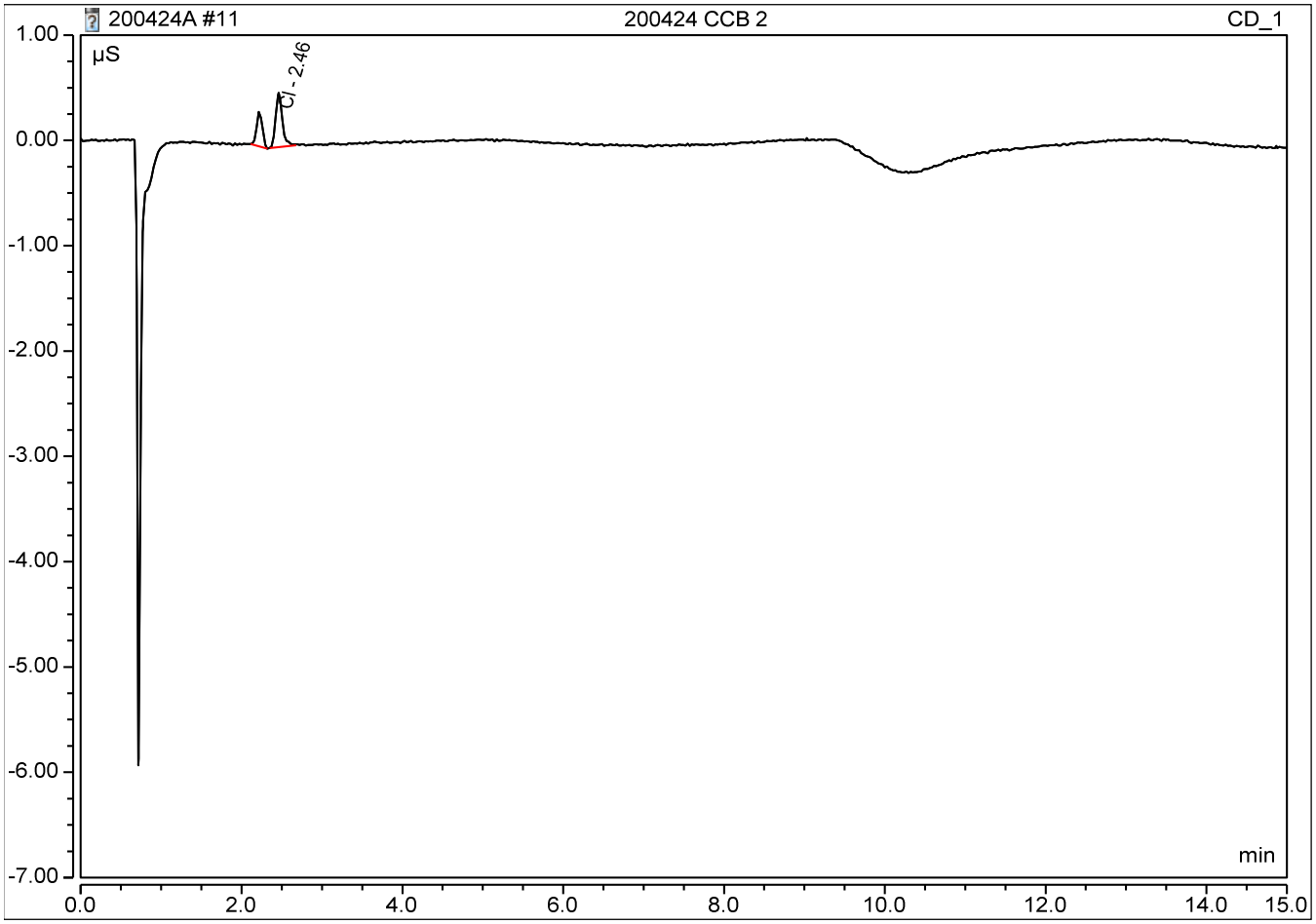
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**200424 CCB 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 16:15**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.46	**Cl**	BMB	0.050	0.515	0.44		

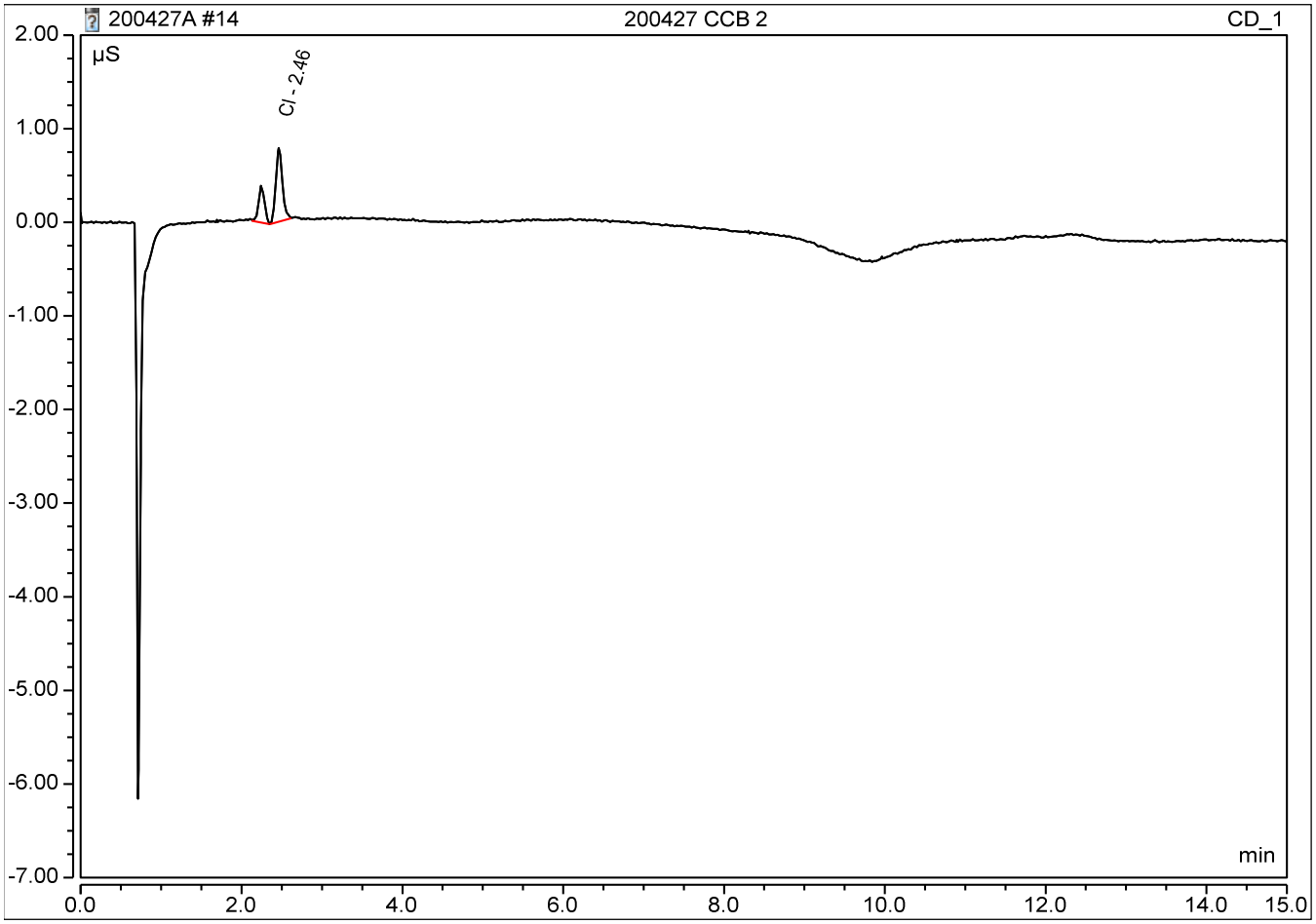


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200427A

Peak Integration Report

Sample Name:	**200427 CCB 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**27-Apr-2020 / 17:40**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.46	**Cl**	BMB	0.074	0.785	0.63		



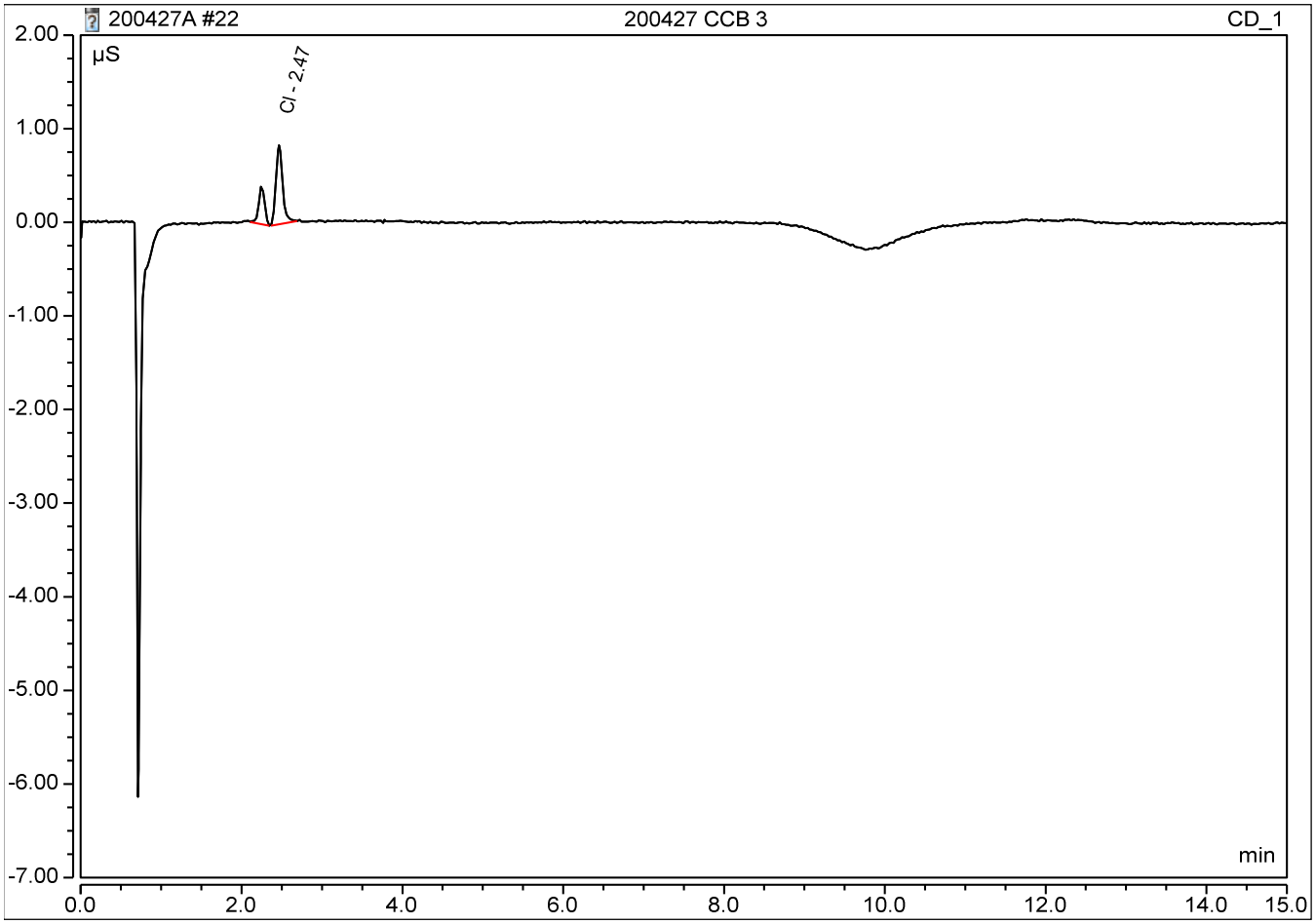
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200427A

Peak Integration Report

Sample Name:	**200427 CCB 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**27-Apr-2020 / 20:00**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.47	**Cl**	BMB	0.082	0.845	0.69		



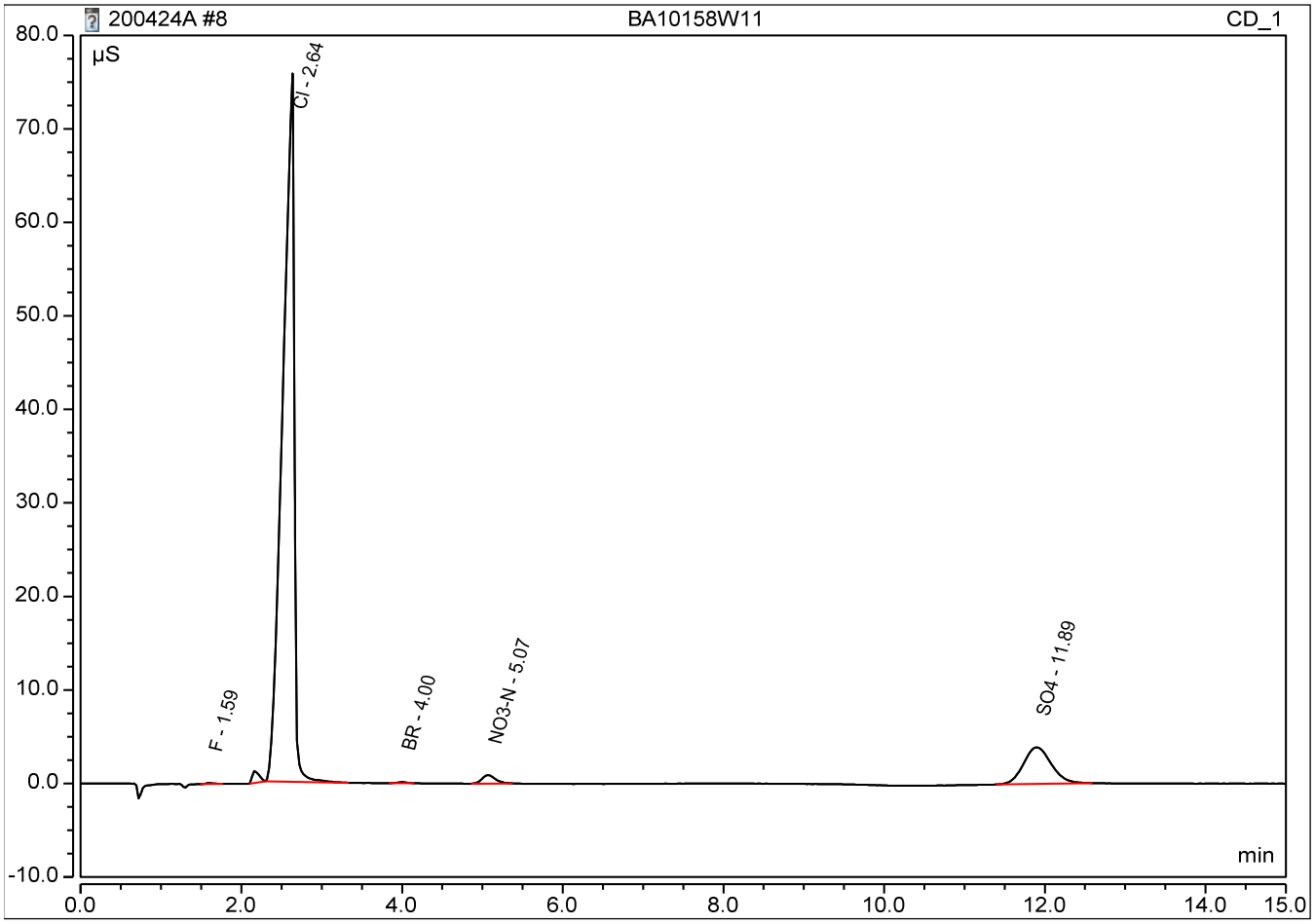
INORGANIC ANALYSIS
Raw Data

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**BA10158W11**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 15:23**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.013	0.127	0.17		
3	2.64	**Cl**	BMB	12.612	75.732	92.77		
4	4.00	**BR**	BMB	0.020	0.144	0.45		
5	5.07	**NO3-N**	BMB	0.180	0.918	0.59		
6	11.89	**SO4**	BMB	1.573	3.910	16.00		



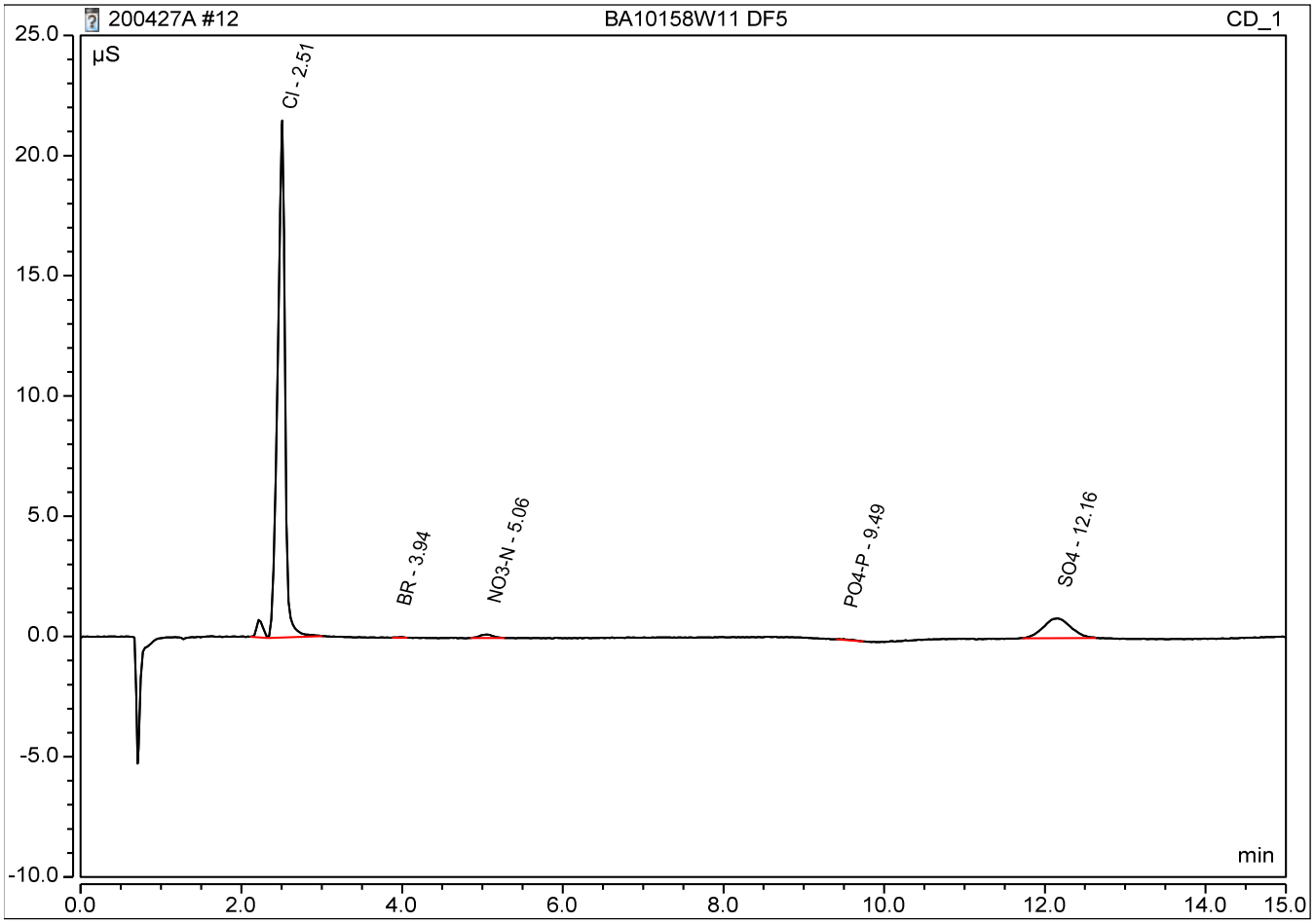
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200427A

Peak Integration Report

Sample Name:	**BA10158W11 DF5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**27-Apr-2020 / 17:06**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.51	**Cl**	BMB	2.289	21.499	88.46		
3	3.94	**BR**	BMB	0.003	0.038	0.79		
4	5.06	**NO3-N**	BMB	0.029	0.158	0.66		
5	9.49	**PO4-P**	BMB	0.006	0.037	0.95		
6	12.16	**SO4**	BMB	0.331	0.824	16.56		



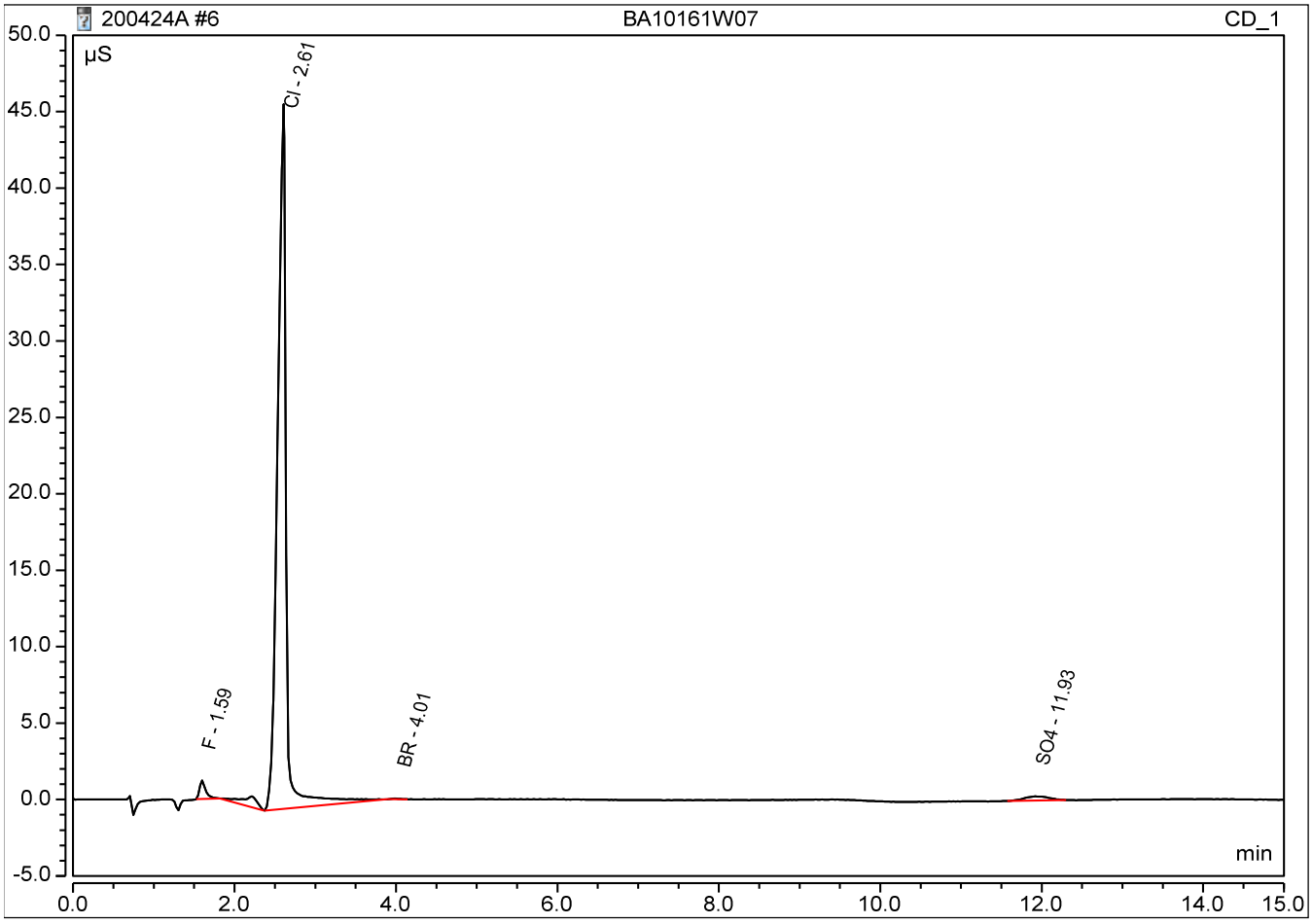
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**BA10161W07**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 14:48**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.111	1.232	0.74		
3	2.61	**Cl**	BMB	5.583	46.099	42.41		
4	4.01	**BR**	BMB	0.007	0.057	0.22		
5	11.93	**SO4**	BMB	0.097	0.279	0.92		



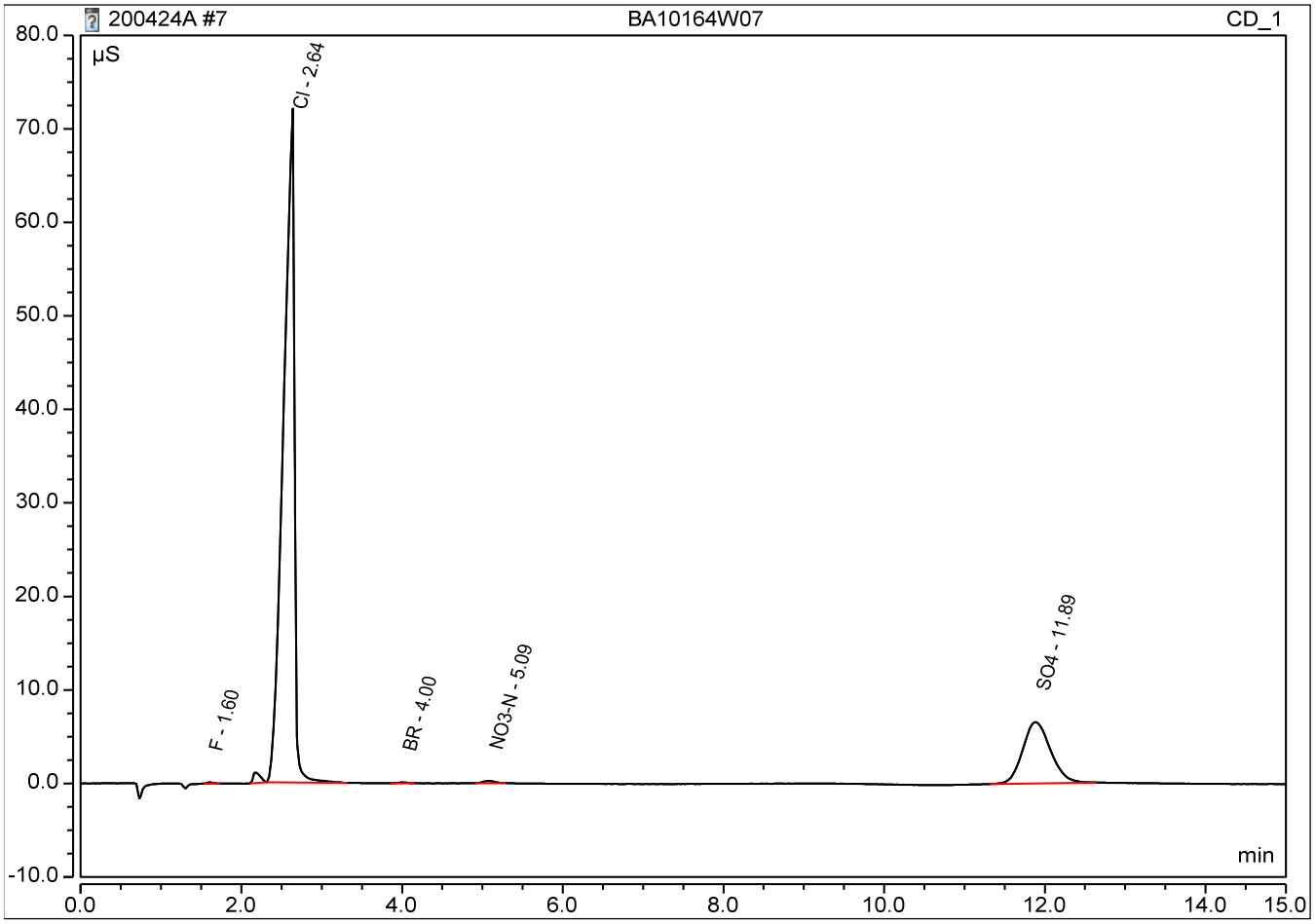
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**BA10164W07**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 15:05**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	**F**	BMB	0.014	0.149	0.18		
3	2.64	**Cl**	BMB	11.440	72.043	84.58		
4	4.00	**BR**	BMB	0.015	0.110	0.35		
5	5.09	**NO3-N**	BMB	0.048	0.260	0.19		
6	11.89	**SO4**	BMB	2.637	6.568	26.86		



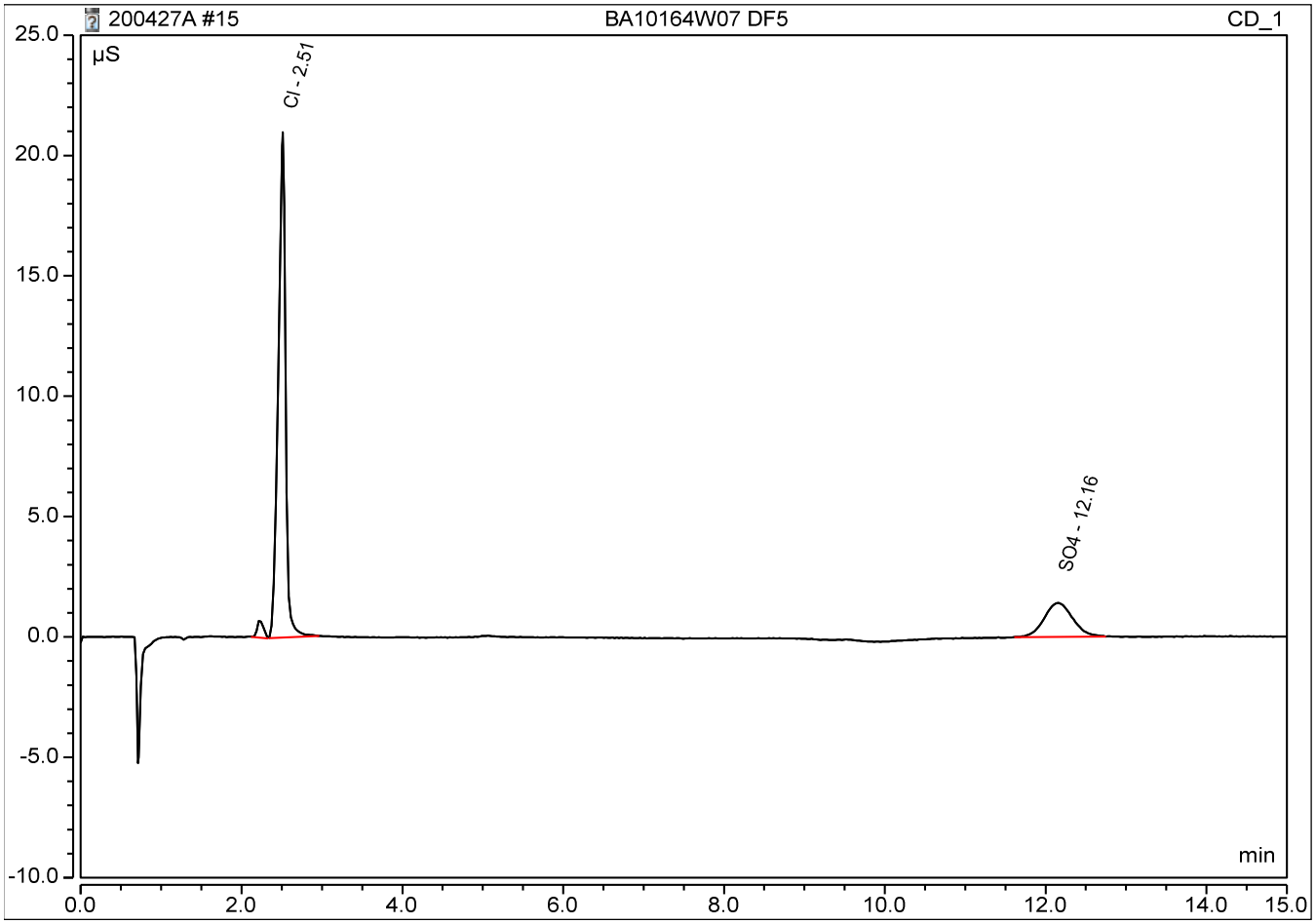
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200427A

Peak Integration Report

Sample Name:	**BA10164W07 DF5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**27-Apr-2020 / 17:58**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.51	**Cl**	BMB	2.218	20.995	85.77		
3	12.16	**SO4**	BMB	0.583	1.418	29.46		



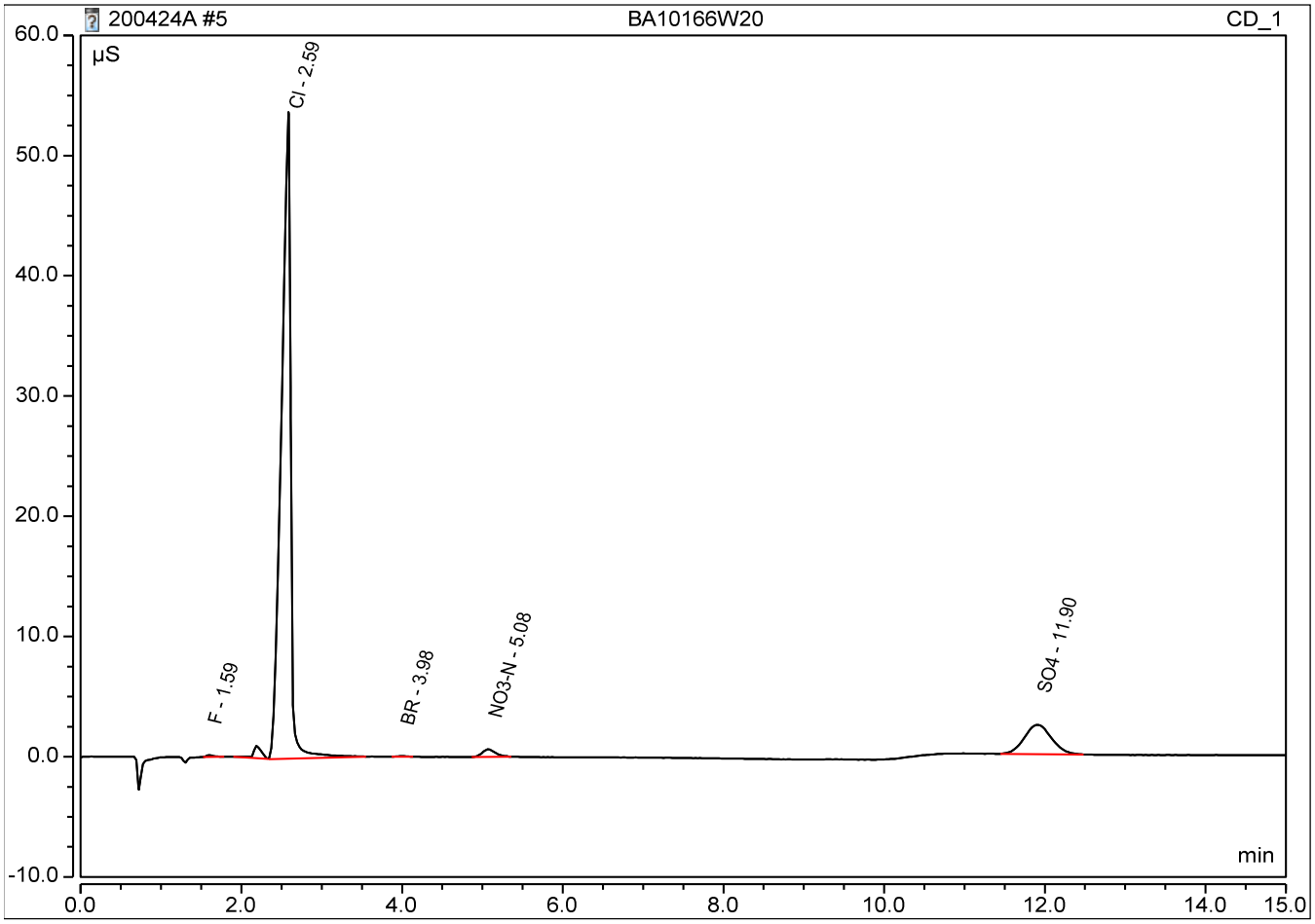
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**BA10166W20**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 14:31**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.016	0.171	0.19		
3	2.59	**Cl**	BMB	7.145	53.766	53.87		
4	3.98	**BR**	BMB	0.011	0.078	0.28		
5	5.08	**NO3-N**	BMB	0.123	0.634	0.41		
6	11.90	**SO4**	BMB	0.957	2.442	9.71		



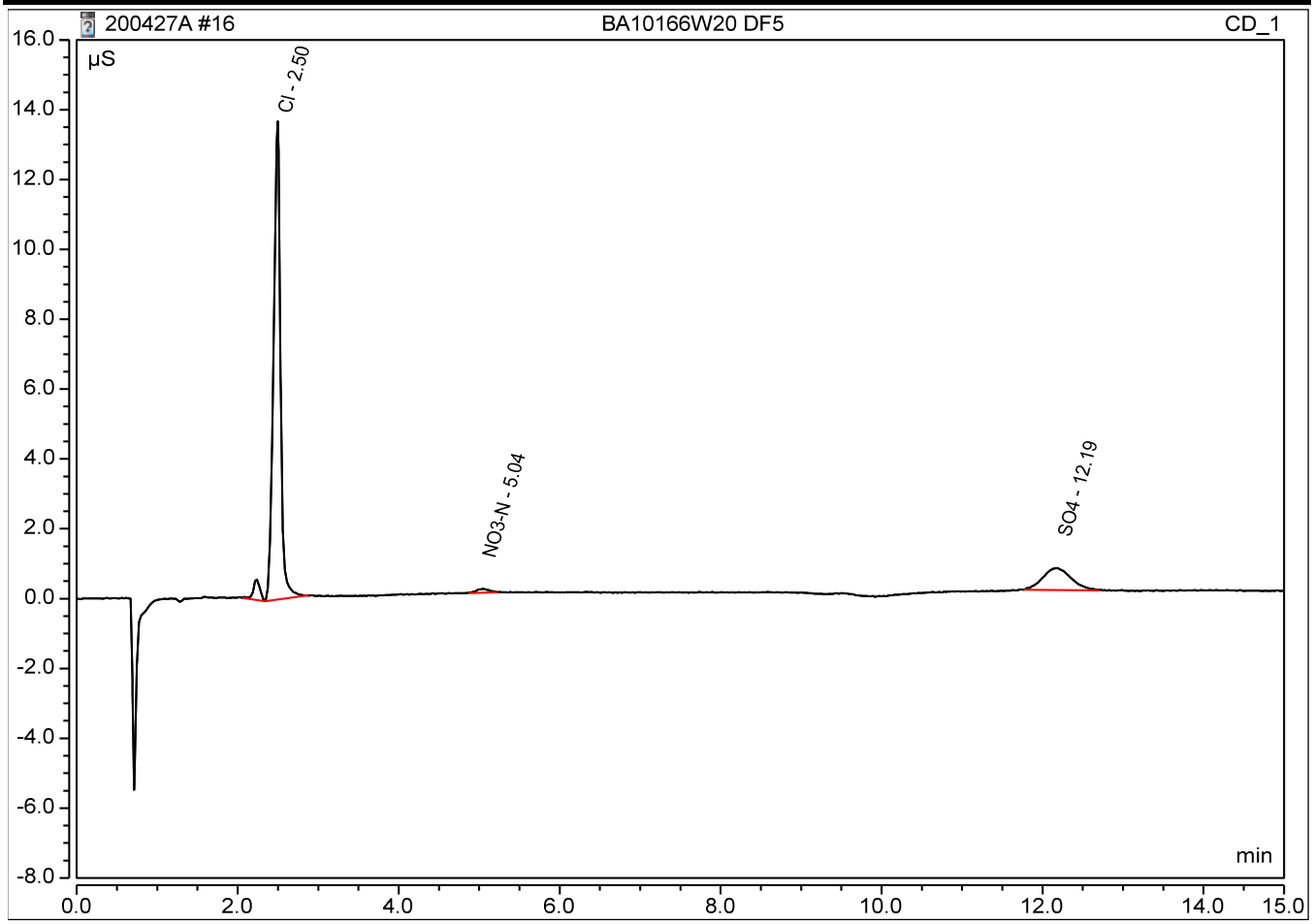
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200427A

Peak Integration Report

Sample Name:	**BA10166W20 DF5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**27-Apr-2020 / 18:15**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.50	**Cl**	BMB	1.373	13.699	53.42		
3	5.04	**NO3-N**	BMB	0.021	0.116	0.53		
4	12.19	**SO4**	BMB	0.258	0.634	12.83		



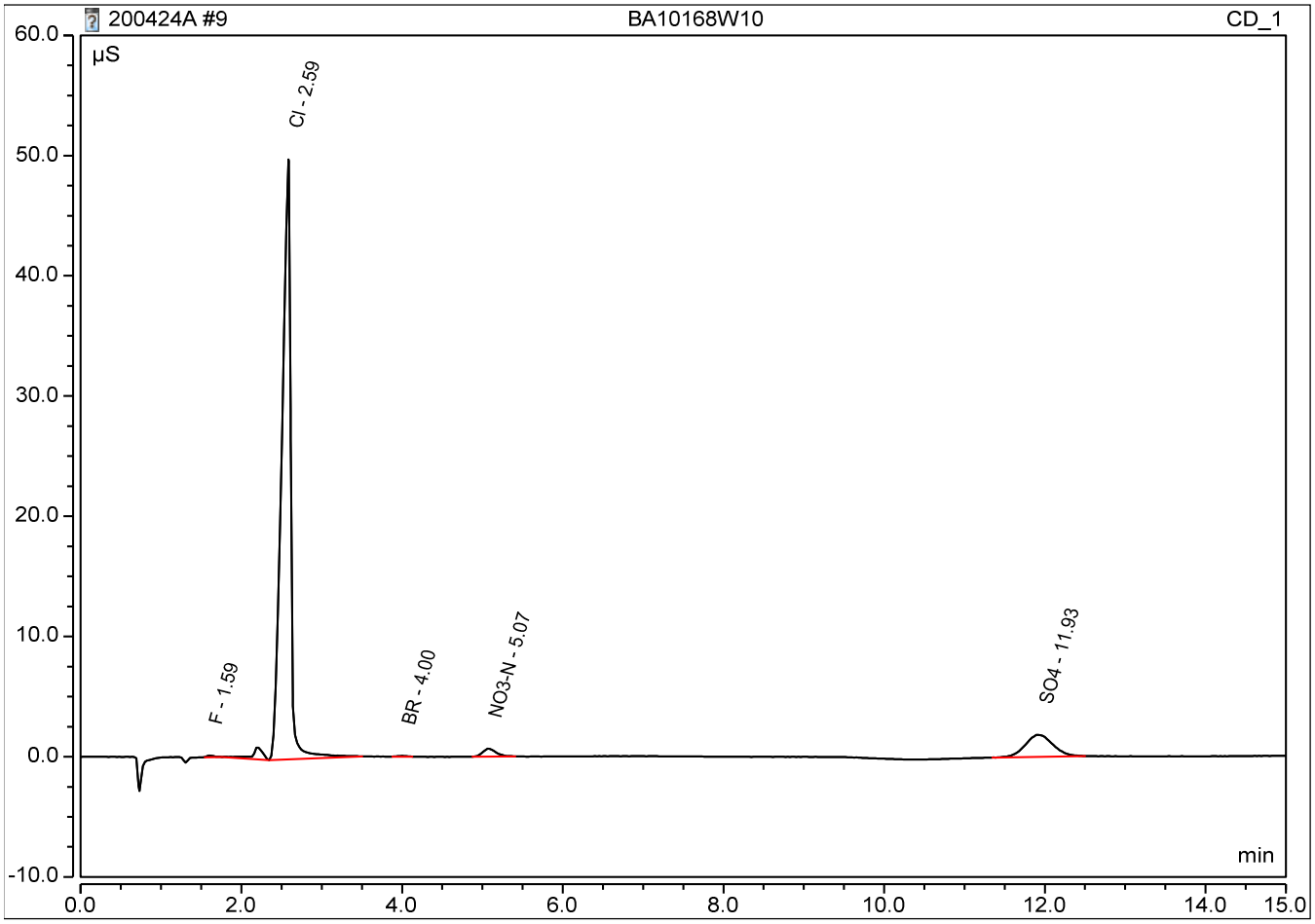
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Peak Integration Report

Sample Name:	**BA10168W10**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**24-Apr-2020 / 15:40**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.013	0.132	0.17		
3	2.59	**Cl**	BMB	6.411	49.895	48.50		
4	4.00	**BR**	BMB	0.008	0.071	0.24		
5	5.07	**NO3-N**	BMB	0.132	0.664	0.44		
6	11.93	**SO4**	BMB	0.742	1.842	7.51		



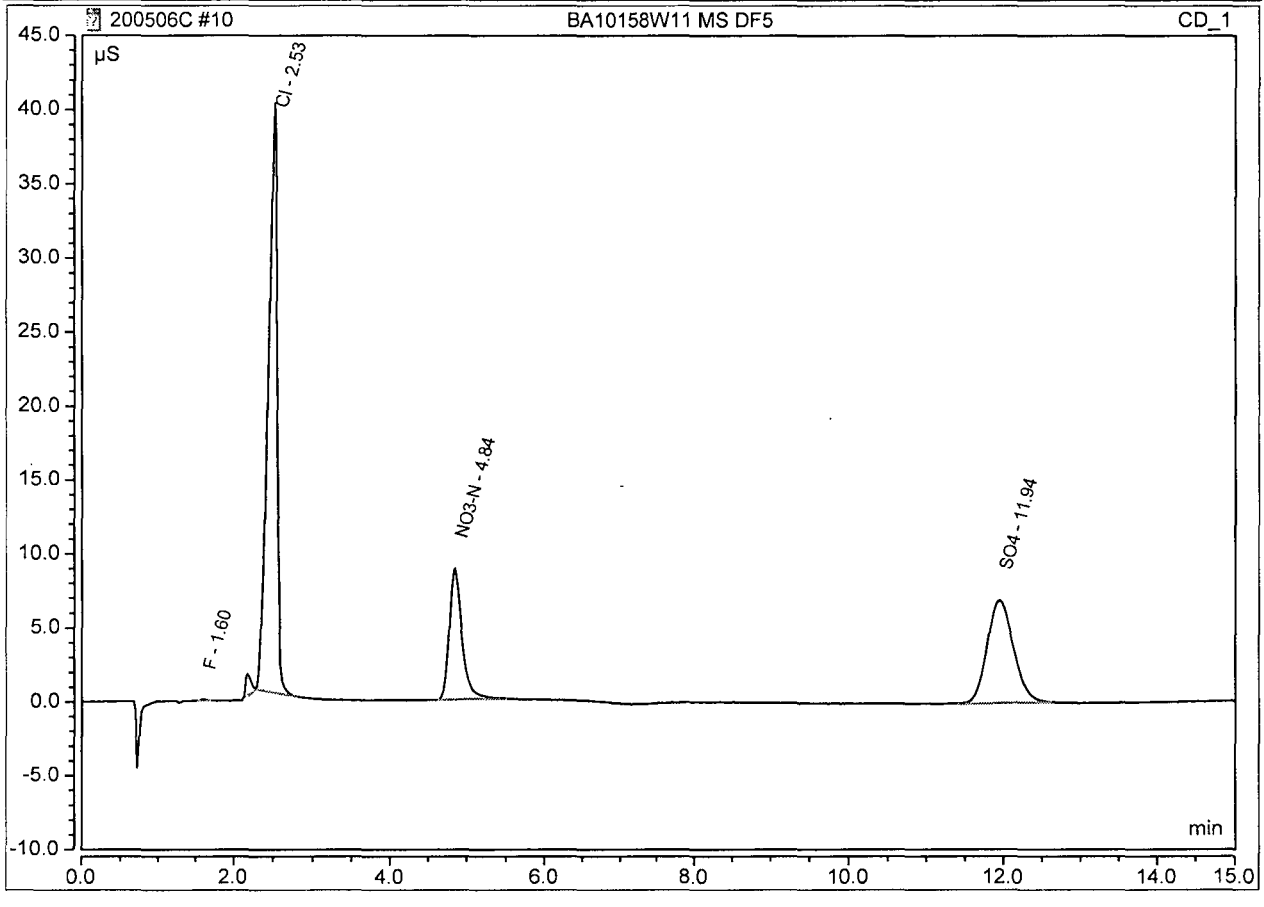
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200506C

Peak Integration Report

Sample Name:	**BA10158W11 MS DF5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 15:29**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	F	BMB	0.009	0.106	0.73		
3	2.53	Cl	BMB	5.181	39.823	197.14		
4	4.84	NO3-N	BMB	1.708	8.844	26.02		
5	11.94	SO4	BMB	2.765	6.937	140.86		



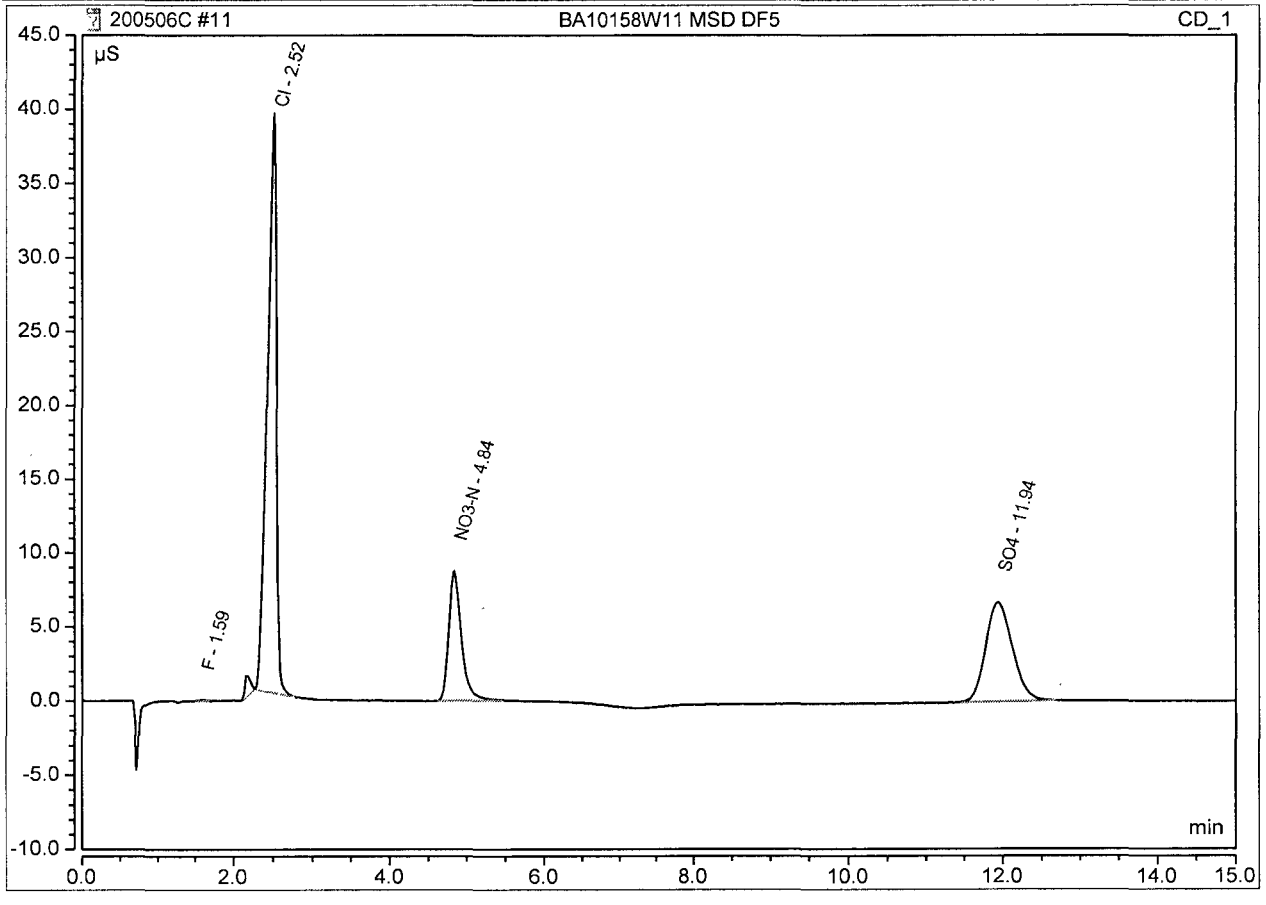
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200506C

Peak Integration Report

Sample Name:	**BA10158W11 MSD DF5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 15:46**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.006	0.072	0.65		
3	2.52	**Cl**	BMB	5.057	39.193	192.57		
4	4.84	**NO3-N**	BMB	1.681	8.757	25.60		
5	11.94	**SO4**	BMB	2.672	6.687	136.11		



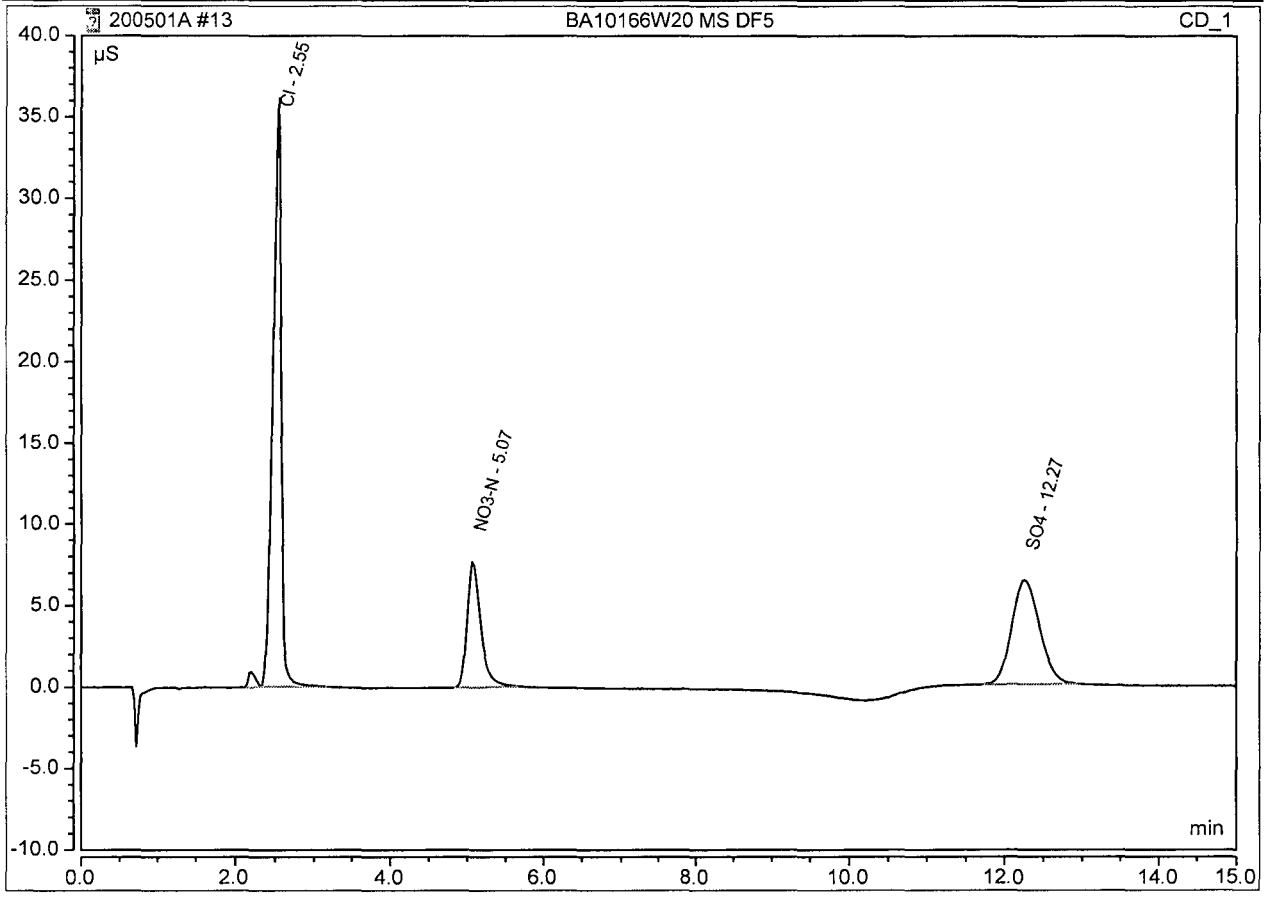
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200501A

Peak Integration Report

Sample Name:	**BA10166W20 MS DF5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**01-May-2020 / 15:27**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.55	**Cl**	BMB	4.352	36.145	166.29		
3	5.07	**NO3-N**	BMB	1.600	7.738	24.38		
4	12.27	**SO4**	BMB	2.634	6.384	134.19		



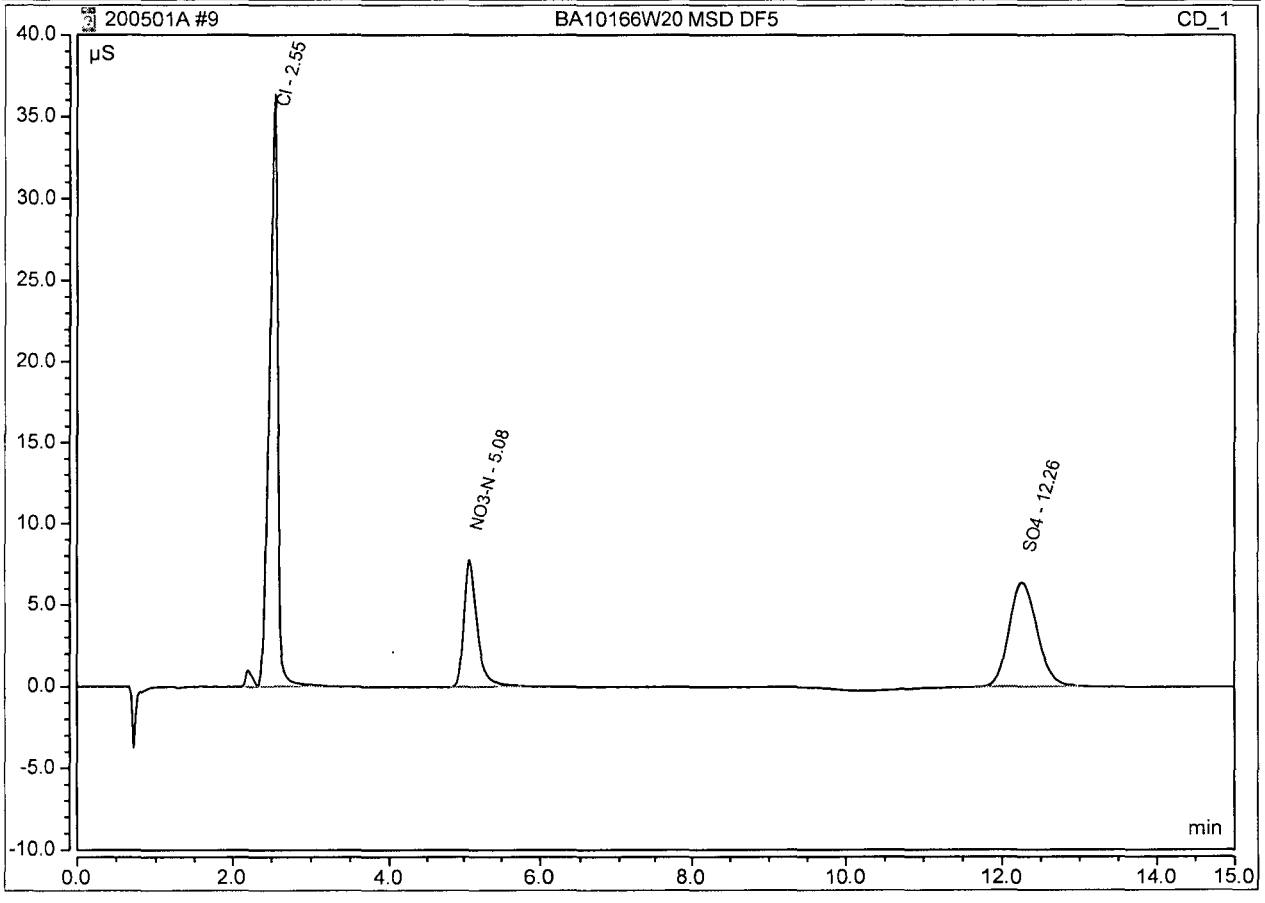
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200501A

Peak Integration Report

Sample Name:	**BA10166W20 MSD DF5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**01-May-2020 / 14:17**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.55	**Cl**	BMB	4.358	36.314	166.54		
3	5.08	**NO3-N**	BMB	1.613	7.747	24.58		
4	12.26	**SO4**	BMB	2.640	6.390	134.48		



Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Anion Chromatography Working Standard

Prep Date: 03/25/20

Exp Date: 03/26/20

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Ion Chromatography Standard Fluoride 1000 µg/mL in H2O	o2si	O2SI-062002-01-01	1000	**687393-38-40744**	**10/30/20**	312.5 µL	25 mL	Millipore Water	12.5
Ion Chromatography Standard Nitrite 1000 µg/mL in H2O	Inorganic Ventures	ICCL1	1000	**P2-CL675597-41353**	**01/15/23**	411 µL	25 mL	Millipore Water	5 as NO2-N
Ion Chromatography Standard Chloride 5000 µg/mL in H2O	Inorganic Ventures	ICNO21	1000	**N2-NOX672889-49601**	**01/30/23**	1250 µL	25 mL	Millipore Water	50
Ortho-Phosphate as P Standard	Agilent	ICC-005A	1000	**G34-CP-3323-49590**	**05/31/25**	625 µL	25 mL	Millipore Water	25
Ion Chromatography Standard Nitrate as N 1000 µg/mL in H2O	Inorganic Ventures	P2-NOX675324	1000	**P2-NOX675324-49391**	**02/14/23**	250 µL	25 mL	Millipore Water	10
Bromide Standard	CPI international	4400-IC8M	1000	**1011817-12-49602**	**06/04/21**	625 µL	25 mL	Millipore Water	25
Sulfate Standard	Inorganic Ventures	ICS041	1000	**P2-SOX677315**	**04/03/23**	1250 µL	25 mL	Millipore Water	50

Anion Chromatography Calibration Curve

Prep Date: 03/25/20

Exp Date: 03/26/20

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. Range (ug/mL)	Reference To APPL Prep Date	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc. Range (µg/mL)
Anion Chromatography Working Standard	Varies	ICal1	5.0-50.0	Prepared 03/25/20	03/26/20	4 µL	1000 µL	Millipore Water	0.04-0.40
Anion Chromatography Working Standard	Varies	ICal2	5.0-50.0	Prepared 03/25/20	03/26/20	20 µL	1000 µL	Millipore Water	0.1-1.0
Anion Chromatography Working Standard	Varies	ICal3	5.0-50.0	Prepared 03/25/20	03/26/20	50 µL	1000 µL	Millipore Water	0.25-2.5
Anion Chromatography Working Standard	Varies	ICal4	5.0-50.0	Prepared 03/25/20	03/26/20	100 µL	1000 µL	Millipore Water	0.5-5.0
Anion Chromatography Working Standard	Varies	ICal5	5.0-50.0	Prepared 03/25/20	03/26/20	200 µL	1000 µL	Millipore Water	1.0-10.0
Anion Chromatography Working Standard	Varies	ICal6	5.0-50.0	Prepared 03/25/20	03/26/20	500 µL	1000 µL	Millipore Water	2.5-25.0
Anion Chromatography Working Standard	Varies	ICal7	5.0-50.0	Prepared 03/25/20	03/26/20	700 µL	1000 µL	Millipore Water	3.5-35.0
Anion Chromatography Working Standard	Varies	ICal8	5.0-50.0	Prepared 03/25/20	03/26/20	1000 µL	1000 µL	Millipore Water	5.0-50.0

Anion Chromatography ICV Absolute COA 49866

Prep Date: See injection Log

Exp Date: 24 hours after prep

Prep'd By (Initials): Absolute

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. Range (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Flouride	Absolute	50021	2.5	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	2.5
Nitrite	Absolute	50021	1.522334	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.522334
Chloride	Absolute	50021	1.522334	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.522334
O-Phosphate as P	Absolute	50021	6.522	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	6.522
Nitrate as N	Absolute	50021	1.129525	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.129525
Ion Chromatography Standard Bromide, 1000 µg/mL in H2O	Absolute	50021	5	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	5
Sulfate	Absolute	50021	20	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	20

Anion Chromatography CCV / LCS

Prep Date: See injection Log

Exp Date: 24 hours after prep

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Ion Chromatography Standard Fluoride 1000 µg/mL in H2O	o2si	O2SI-062002-01-01	1000	**687393-38-40744**	**10/30/20**	125 µL	25 mL	Millipore Water	5
Ion Chromatography Standard Nitrite 1000 µg/mL in H2O	Inorganic Ventures	ICCL1	1000	**P2-CL675597-41353**	**01/15/23**	250 µL	25 mL	Millipore Water	10
Ion Chromatography Standard Chloride 5000 µg/mL in H2O	Inorganic Ventures	ICNO21	1000	**N2-NOX672889-49601**	**01/30/23**	125 µL	25 mL	Millipore Water	25
Ortho-Phosphate as P Standard	Agilent	ICC-005A	1000	**G34-CP-3323-49590**	**05/31/25**	250 µL	25 mL	Millipore Water	10
Ion Chromatography Standard Nitrate as N 1000 µg/mL in H2O	Inorganic Ventures	P2-NOX675324	1000	**P2-NOX675324-49391**	**02/14/23**	125 µL	25 mL	Millipore Water	5
Bromide Standard	CPI international	4400-IC8M	1000	**1011817-12-49602**	**06/04/21**	250 µL	25 mL	Millipore Water	10
Sulfate Standard	Inorganic Ventures	ICS041	1000	**P2-SOX677315**	**04/03/23**	625 µL	25 mL	Millipore Water	25

Method 300 and 9056 Injection Log

No.	Position	Injection Description	Inject Time		Type	Comment
1	RA1	Cal 1	26/Mar/2020	13:28	Calibration Standard	
2	RA2	Cal 2	26/Mar/2020	13:44	Calibration Standard	
3	RA3	Cal 3	26/Mar/2020	14:01	Calibration Standard	MDL 1
4	RA4	Cal 4	26/Mar/2020	14:17	Calibration Standard	
5	RA5	Cal 5	26/Mar/2020	14:33	Calibration Standard	
6	RA6	Cal 6	26/Mar/2020	14:50	Calibration Standard	
7	RA7	Cal 7	26/Mar/2020	15:06	Calibration Standard	
8	RA8	Cal 8 2020.03.25	26/Mar/2020	15:22	Calibration Standard	
9	R1	ICB / CCB	26/Mar/2020	15:39	Unknown	
10	RB1	ICV Absolute 111419	26/Mar/2020	15:55	Check Standard	
11	RB2	BA09192W01	26/Mar/2020	16:18	Unknown	
12	RB3	BA09197W07	26/Mar/2020	16:35	Unknown	
13	RB4	BA09203W13	26/Mar/2020	16:51	Unknown	
14	RB5	BA09227W13	26/Mar/2020	17:08	Unknown	
15	RB6	BA08726W07	26/Mar/2020	17:24	Unknown	
16	RB7	BA08727W07	26/Mar/2020	17:40	Unknown	
17	RB8	BA08728W07	26/Mar/2020	17:57	Unknown	
18	RC1	BA08729W07	26/Mar/2020	18:13	Unknown	
19	RC2	BA08730W07	26/Mar/2020	18:30	Unknown	
20	RC3	BA08731W07	26/Mar/2020	18:46	Unknown	
21	R2	200326 CCV/LCS 1	26/Mar/2020	19:02	Check Standard	
22	R1	200326 CCB 1	26/Mar/2020	19:19	Unknown	
23	RC4	BA08735W07	26/Mar/2020	19:35	Unknown	
24	RC5	BA08540W07 DF5	26/Mar/2020	19:52	Unknown	
25	RC6	BA08540W07 DF10	26/Mar/2020	20:08	Unknown	
26	RC7	BA08548W14 DF5	26/Mar/2020	20:24	Unknown	
27	RC8	BA08548W14 DUP DF5	26/Mar/2020	20:41	Unknown	
28	RD1	BA08548W14 MS DF5	26/Mar/2020	20:57	Unknown	
29	RD2	BA08746W14	26/Mar/2020	21:13	Unknown	
30	RD3	BA08747W07	26/Mar/2020	21:30	Unknown	
31	RD4	BA08748W07	26/Mar/2020	21:46	Unknown	
32	RD5	BA08749W07	26/Mar/2020	22:03	Unknown	
33	RD6	BA08750W14	26/Mar/2020	22:19	Unknown	
34	RD7	BA08750W14 MS	26/Mar/2020	22:35	Unknown	
35	RD8	BA08750W14 MSD	26/Mar/2020	22:52	Unknown	
36	RE1	BA08751W07	26/Mar/2020	23:08	Unknown	
37	R2	200326 CCV/LCS 2	26/Mar/2020	23:24	Check Standard	
38	R1	200326 CCB 2	26/Mar/2020	23:41	Unknown	
39	RE2	BA08752W07	26/Mar/2020	23:57	Unknown	
40	RE3	BA08753W07	27/Mar/2020	00:14	Unknown	
41	RE4	BA08754W07	27/Mar/2020	00:30	Unknown	
42	RE5	BA08755W07	27/Mar/2020	00:46	Unknown	
43	RE6	BA08756W07	27/Mar/2020	01:03	Unknown	
44	RE7	BA08757W07	27/Mar/2020	01:19	Unknown	
45	RE8	BA08758W14	27/Mar/2020	01:35	Unknown	
46	BA1	BA08759W07	27/Mar/2020	01:52	Unknown	
47	BA2	BA08760W07	27/Mar/2020	02:08	Unknown	
48	BA3	BA08765W07	27/Mar/2020	02:25	Unknown	
49	R2	200326 CCV/LCS 3	27/Mar/2020	02:41	Check Standard	
50	R1	200326 CCB 3	27/Mar/2020	02:57	Unknown	
51	RA3	MDL 2	27/Mar/2020	03:14	Unknown	
52	RA3	MDL 3	27/Mar/2020	03:30	Unknown	
53	R1	MDL BLK 1	27/Mar/2020	03:47	Unknown	
54	R1	MDL BLK 2	27/Mar/2020	04:03	Unknown	
55	R1	MDL BLK 3	27/Mar/2020	04:19	Unknown	
56	BA4	BLK Nitro AR	27/Mar/2020	04:36	Unknown	
57	BA5	DOC 1 Nitro AR	27/Mar/2020	04:52	Unknown	
58	BA6	DOC 2 Nitro AR	27/Mar/2020	05:09	Unknown	
59	BA7	DOC 3 Nitro AR	n.a.		Unknown	
60	BA8	DOC 4 Nitro AR	n.a.		Unknown	
61	R2	200326 CCV/LCS 4	n.a.		Check Standard	
62	R1	200326 CCB 4	n.a.		Unknown	

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200427A

Method 300 and 9056 Injection Log

No.	Position	Injection Description	Inject Time		Type	Comment
1	R2	200427 CCV/LCS 1	27/Apr/2020	13:34	Check Standard	
2	R1	200427 CCB 1	27/Apr/2020	13:51	Unknown	
3	GD1	BA10074W01 DF10	27/Apr/2020	14:29	Unknown	
4	GD2	BA10075W01 DF5	27/Apr/2020	14:47	Unknown	
5	GD3	BA10076W01 DF20	27/Apr/2020	15:04	Unknown	
6	GD4	BA10077W01 DF10	27/Apr/2020	15:21	Unknown	
7	GD5	BA10078W01 DF10	27/Apr/2020	15:39	Unknown	
8	GD6	BA10087W07 DF5	27/Apr/2020	15:56	Unknown	
9	GD7	BA10089W07 DF5	27/Apr/2020	16:14	Unknown	
10	GD8	BA10091W07 DF10	27/Apr/2020	16:31	Unknown	
11	GE1	BA10181W01 DF20	27/Apr/2020	16:48	Unknown	
12	GE2	BA10158W11 DF5	27/Apr/2020	17:06	Unknown	
13	R2	200427 CCV/LCS 2	27/Apr/2020	17:23	Check Standard	
14	R1	200427 CCB 2	27/Apr/2020	17:40	Unknown	
15	GE3	BA10164W07 DF5	27/Apr/2020	17:58	Unknown	
16	GE4	BA10166W20 DF5	27/Apr/2020	18:15	Unknown	
17	GE5	BA10207W01 DF5	27/Apr/2020	18:33	Unknown	
18	GE6	BA10208W01 DF5	27/Apr/2020	18:50	Unknown	
19	GE7	BA10209W01 DF20	27/Apr/2020	19:07	Unknown	
20	GE8	BA10091W07 DF20	27/Apr/2020	19:25	Unknown	
21	R2	200427 CCV/LCS 3	27/Apr/2020	19:42	Check Standard	
22	R1	200427 CCB 3	27/Apr/2020	20:00	Unknown	

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200424A

Method 300 and 9056 Injection Log

No.	Position	Injection Description	Inject Time		Type	Comment
1	R2	200424 CCV/LCS 1	24/Apr/2020	11:01	Check Standard	
2	R1	200424 CCB 1	24/Apr/2020	11:19	Unknown	
3	GA3	BA10127W03	24/Apr/2020	13:56	Unknown	
4	GA4	BA10181W01	24/Apr/2020	14:13	Unknown	
5	GA8	BA10166W20	24/Apr/2020	14:31	Unknown	
6	GA6	BA10161W07	24/Apr/2020	14:48	Unknown	
7	GA7	BA10164W07	24/Apr/2020	15:05	Unknown	
8	GA5	BA10158W11	24/Apr/2020	15:23	Unknown	
9	GB1	BA10168W10	24/Apr/2020	15:40	Unknown	
10	R2	200424 CCV/LCS 2	24/Apr/2020	15:58	Check Standard	
11	R1	200424 CCB 2	24/Apr/2020	16:15	Unknown	
12	GB2	BA10207W01	24/Apr/2020	16:58	Unknown	
13	GB3	BA10208W01	24/Apr/2020	17:15	Unknown	
14	GB4	BA10209W01	24/Apr/2020	17:32	Unknown	
15	R2	200424 CCV/LCS 3	24/Apr/2020	17:50	Check Standard	
16	R1	200424 CCB 3	24/Apr/2020	18:07	Unknown	

Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

INORGANIC ANALYSIS
Calibration and Raw Data

A.P.P.L. INC.
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: A.P.P.L. INC. Contract: AECOM
ARF No: 91991 SDG: 91991
Initial Calibration Source: CPI
Continuing Calibration Source: Environmental Express
Analysis Date: 04/28/20

Analyte	Calibration Verification									M
	True CCV1	Found 11:07	%R(1)	True ICV	Found 11:11	%R(1)	True CCV1	Found 11:33	%R(1)	
TOXN	3	3.031	101	3	3.1079	104	3	3.0895	103	

(1) Control Limits: 90-110

ILM02.0

A.P.P.L. INC.
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: A.P.P.L. INC. Contract: AECOM
ARF No: 91991 SDG: 91991
Initial Calibration Source: CPI
Continuing Calibration Source: Environmental Express
Analysis Date: 04/28/20

Analyte	Calibration Verification									M
	True CCV1	Found 11:40	%R(1)	True	Found	%R(1)	True	Found	%R(1)	
TOXN	3	2.9666	98.9							

(1) Control Limits: 90-110

ILM02.0

A.P.P.L. INC.
3
BLANKS

Lab Name: A.P.P.L. INC. Contract: AECOM

ARF No.: 91991 SDG: 91991

Preparation Blank Matrix (soil/water): water

Preparation Blank Concentration Units (ug/L or mg/kg): mg/L

Analyte	Calibration Blanks										M
	CCB 04/28/20 11:09	C	ICB 04/28/20 11:14	C	CCB 04/28/20 11:34	C	CCB 04/28/20 11:41	C		C	
TOXN	.100	U	.100	U	.100	U	.032	J			

AQ2 Report

Serial Number:	190170
Software Version:	2.1.0
Report Requested By:	Kyle S
Date & Time:	2020-04-28 11:44:18
Tray Number:	2
Tray Name:	200428A TOXN

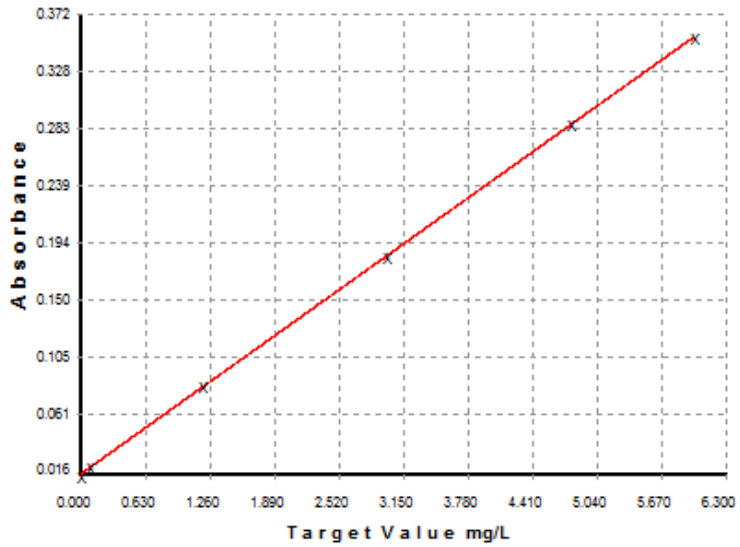
TOXN

Calibration Chart

Type	Absorbance	Calc mg/L	Target mg/L	% Error
S1	0.0164	-0.0152	0.0000	
S90	0.0230	0.1020	0.1000	1.99
S91	0.0858	1.2165	1.2000	1.38
S92	0.1859	2.9935	3.0000	-0.22
S93	0.2886	4.8162	4.8000	0.34
S94	0.3546	5.9869	6.0000	-0.22
S0	0.0208	0.0627	0.0000	

Polynomial Order:	1
Correlation Coefficient:	1.0000
Carryover(%):	1.3
Calibration equation:	y = bx + a
y =:	Concentration mg/L
x =:	Measured absorbance
a =:	-3.065240E-001
b =:	1.775009E+001
Date & Time:	2020-04-28 11:04:54

Calibration Graph



Cup	Type	ID	Result	Units	QC Pro	Raw Data	Auto Dil.	Man Dil.	User	Time/Date
	S1	Standard 1	0.0164			0.016413			KS	2020-04-28 10:51:08
	S90	Standard 90	0.0230			0.023015			KS	2020-04-28 10:53:25
	S91	Standard 91	0.0858			0.085805			KS	2020-04-28 10:55:43
	S92	Standard 92	0.1859			0.185919			KS	2020-04-28 10:58:01
	S93	Standard 93	0.2886			0.288604			KS	2020-04-28 11:00:18
	S94	Standard 94	0.3546			0.354558			KS	2020-04-28 11:02:36
	S0	Standard 0	0.0208			0.020803			KS	2020-04-28 11:04:54
	CCV	CCV	3.0310	mg/L		0.188031			KS	2020-04-28 11:07:12
	CCB	CCB	0.0079	mg/L		0.017712			KS	2020-04-28 11:09:30
3	U1	ICV TOXN	3.1079	mg/L		0.192363			KS	2020-04-28 11:11:45
4	U2	ICB TOXN	0.0044	mg/L		0.017519			KS	2020-04-28 11:14:00
5	U3	200428A Blk TOXN	0.0198	mg/L		0.018383			KS	2020-04-28 11:16:19
6	U4	200428A LCS TOXN	3.1240	mg/L		0.193269			KS	2020-04-28 11:18:37
7	U5	200428A LCSD TOXN	3.1683	mg/L		0.195767			KS	2020-04-28 11:20:55
8	U6	1 ppm NO3	1.0106	mg/L		0.074205			KS	2020-04-28 11:23:13
9	U7	BA10158W12 MS Thing 1 pH 7.48	4.0452	mg/L		0.245168			KS	2020-04-28 11:25:30
10	U8	BA10158W12 MSD Thing 1 pH 7.48	3.9760	mg/L		0.241270			KS	2020-04-28 11:27:48
11	U9	BA10166W21 MS Thing 1 pH 6.54	3.7732	mg/L		0.229843			KS	2020-04-28 11:30:06
12	U10	BA10166W21 MSD Thing 1 pH 6.54	3.9711	mg/L		0.240989			KS	2020-04-28 11:32:24
	CCV	CCV	3.0895	mg/L		0.191324			KS	2020-04-28 11:33:32
	CCB	CCB	0.0065	mg/L		0.017635			KS	2020-04-28 11:34:29
13	U11	BA10158W12 Thing 1 pH 7.48	0.6568	mg/L		0.054270			KS	2020-04-28 11:35:25
14	U12	BA10161W08 Thing 1 pH 8.84	0.0118	mg/L		0.017931			KS	2020-04-28 11:36:21
15	U13	BA10164W08 Thing 1 pH 6.63	0.2276	mg/L		0.030090			KS	2020-04-28 11:37:18
16	U14	BA10166W21 Thing 1 pH 6.54	0.4317	mg/L		0.041589			KS	2020-04-28 11:38:14
17	U15	BA10168W11 Thing 1 pH 8.13	0.4831	mg/L		0.044485			KS	2020-04-28 11:39:10
	CCV	CCV	2.9666	mg/L		0.184403			KS	2020-04-28 11:40:07
	CCB	CCB	0.0317	mg/L		0.019054			KS	2020-04-28 11:41:04

TOXN

High Point @ 6 mg/L

0.150 mL NO3 O2Si lot 880117-39577 exp: 2/21/20
25 mL DI Water

CCV @ 3.0 mg/L

0.075 mL NO3 O2Si lot 880117-39577 exp: 2/21/20
25 mL DI Water

ICV/LCS @ 3.0 mg/L

0.075 mL NO3 Inorganic Ventures lot P2-NOX675324-49391 exp: 02/14/23
25 mL DI Water

1 mg/L NO3

100 uL of High point and 500 uL of DI made directly into a sample cup

MS @ 0.73 mg/L NO2 and 2.5 mg/L NO3

0.060 mL NO2 Inorganic Ventures lot M2-NOX660562-40468 exp: 08/25/21 and
0.0625 mL NO3 Inorganic Ventures lot P2-NOX675324-49391 exp: 02/14/23
Final volume 25 mL of sample

Prep: 04/28/20
Exp: 05/05/20

KS

Ferrous Iron — Rev 2, 04-05-19

Method SM3500Fe | Units mg/L | Instrument: Genisis Spectrometer
Analyte Fe2+ | QCG: 200424 | Wavelength: 510 nm
Analyist fjr | Final Volume: 50mL | Units: mg/L

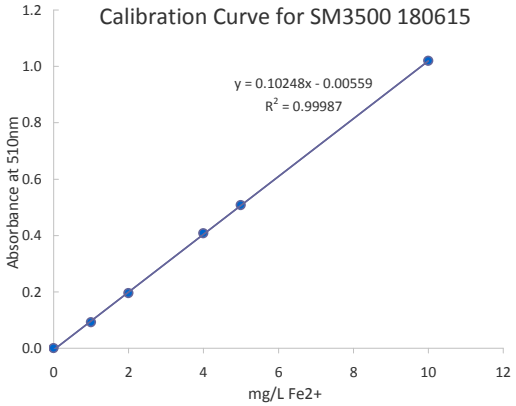
Date	Time	Appl ID	[Fe2+]	Absorbance	% Recovery
06/28/19	12:48	ICB	0.00	0.000	
06/28/19	12:49	Ical 1	1.00	0.092	95.2%
06/28/19	12:50	Ical 2	2.00	0.195	97.9%
06/28/19	12:51	Ical 3	4.00	0.408	100.9%
06/28/19	12:51	Ical 4	5.00	0.507	100.0%
06/28/19	12:52	Ical 5	10.00	1.019	100.0%
06/28/19	13:08	ICV	3.00	0.326	107.9%
06/28/19	12:53	ICB	0.00	0.002	

Slope	0.102479592
Intercept	-0.005591837
Coefficient of Determination	0.999872044

Algortithm Check:	**Appl ID**	**Absorbance**	**Result**
	LCS 200424	0.299	2.97

Result = (Absorbance-Raw Blk-Intercept)/ Slope

Test:	FJR	04/24/20	2.97



Date	Time	Appl ID	DF	Raw Result	SubSample Amount	Raw BLK	Calc Conc	Result	QC True	% Recovery
04/24/20	20:10	CCV 4.0 200424	1	0.398	25mL		3.94	3.94	4.00	98.5%
04/24/20	20:10	CCB 200424	1	0.000	25mL		0.05	0.05		
04/24/20	20:11	LCS 200424	1	0.299	25mL		2.97	2.97	3.00	99.1%
04/24/20	20:11	LCSD 200424	1	0.310	25mL		3.08	3.08	3.00	102.7%
04/24/20	20:12	BA10087W09	1	0.005	25mL		0.10	0.10		
04/24/20	20:12	BA10089W09	1	0.002	25mL		0.07	0.07		
04/24/20	20:13	BA10091W09	1	0.002	25mL		0.07	0.07		
04/24/20	20:13	BA10158W13	1	0.004	25mL		0.09	0.09		
04/24/20	20:13	BA10161W09	1	0.201	25mL		2.02	2.02		
04/24/20	20:14	BA10164W09	1	0.249	25mL		2.48	2.48		
04/24/20	20:15	BA10166W22	1	0.004	25mL		0.09	0.09		
04/24/20	20:15	BA10168W12	1	0.003	25mL		0.08	0.08		
04/24/20	20:16	BA10168W12 MS	1	0.303	25mL		3.01	3.01		
04/24/20	20:16	BA10168W12 MSD	1	0.306	25mL		3.04	3.04		
04/24/20	20:17	CCV 4.0 200424	1	0.405	25mL		4.01	4.01	4.00	100.2%
04/24/20	20:17	CCB 200424	1	0.003	25mL		0.08	0.08		

Standard Prep

	Ferrous Iron Standards		Prep'd By (Initials)		FJR		
Prep Date	06/28/18						
Exp Date	06/28/19						
Stock Label	Supplier	Batch Number	Exp Date	Aliquot from Stock	Final Volume	Solvent	Ferrous Iron Concentration
Ferrous Ammonium Sulfate	J.T.Baker	0000184592	08/21/20	0.351	250mL	5ml H2SO4 (0000167828) Diluted with water	200ug/L
Ferrous Sulfate	Mallinckrodt	Lot 5056 KDRX	NA	0.250	250mL	5ml H2SO4 (0000167828) Diluted with water	200ug/L
Ferrous Iron CCV/LCS/MS/ICV			Prep'd By (Initials)		FJR		
Prep Date	See Injection Log						
Exp Date	24 Hours						
Initial Standard Information	Supplier	Batch Number	Exp Date	Final Standard Information			
Ferrous Iron CCV	J.T.Baker	0000184592	06/14/19	500uL	25mL	Deionized water	4mg/L
Ferrous Iron ICV/LCS	Mallinckrodt	Lot 5056 KDRX	06/14/19	375uL	25mL	Deionized water	3mg/L
	Ferrous Iron Calibration Curve		Prep'd By (Initials)		FJR		
Prep Date	06/28/18						
Exp Date	06/28/19						
Final Standard Information							
Point Label	Supplier	Batch Number	Exp Date	Aliquot from Stock (mL)	Final Volume	Solvent	Ferrous Iron Concentration
CCB	J.T.Baker	0000184592	06/14/19	0	25mL	Deionized water	0mg/L
Ical 1	J.T.Baker	0000184592	06/14/19	0.125	25mL	Deionized water	1mg/L
Ical 2	J.T.Baker	0000184592	06/14/19	0.25	25mL	Deionized water	2mg/L
Ical 3	J.T.Baker	0000184592	06/14/19	0.5	25mL	Deionized water	4mg/L
Ical 4	J.T.Baker	0000184592	06/14/19	0.625	25mL	Deionized water	5mg/L
Ical 5	J.T.Baker	0000184592	06/14/19	1.25	25mL	Deionized water	10mg/L
ICV	Mallinckrodt	Lot 5056 KDRX	06/14/19	0.375	25mL	Deionized water	3mg/L

Reagent Prep

Reagent	Chemical Lot #	Chemical	Chemical Expiration Date	Amount	Date Prep
Colorizer	0747C107	1,10-phenanthroline	na	1.008	03/12/20
		10% HCL conc	na	enough to dissolve	03/12/20
Buffer	Z28B018	Ammonia Acetate	na	248	01/03/20
	2018071399	Glacial Acetic Acid	06/27/20	700mL	

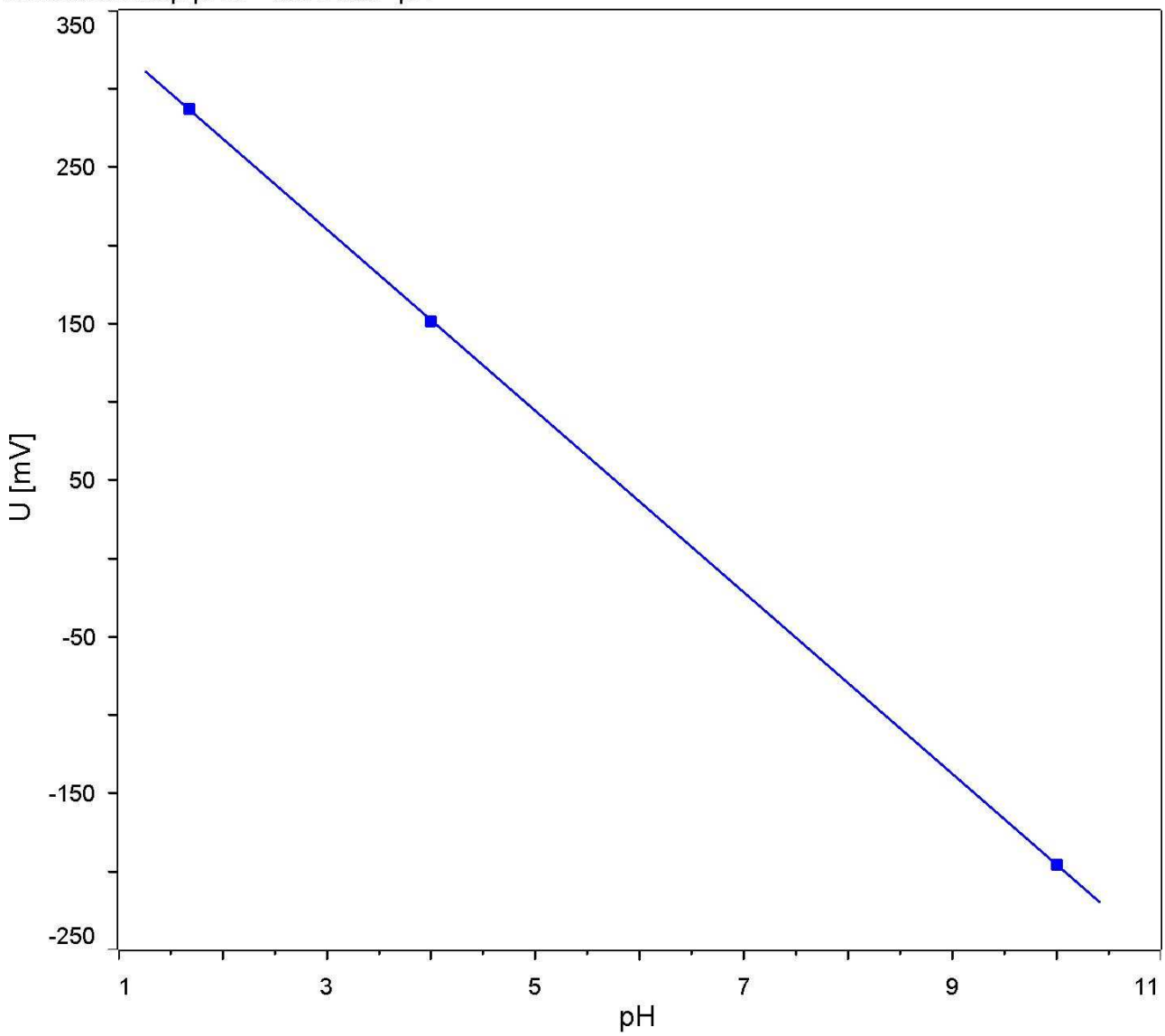
Timao Calibration Curve

2020-04-27 12:39:03

Calculations

Buffer 7	7.04	
Formula	'MEAS pH.EME'	
MEAS pH.EME	7.0407	
Slope	98.40	
Formula	'Calibration loop pH.SLO'	
Calibration loop pH.SLO	98.4	
pH(as)	6.62	
Formula	'Calibration loop pH.ENP'	
Calibration loop pH.ENP	6.624	
Res19	23.6	°C
Formula	'CAL MEAS pH.ETE'	
CAL MEAS pH.ETE	23.6431	

Calibration loop pH.1 - CAL LOOP pH



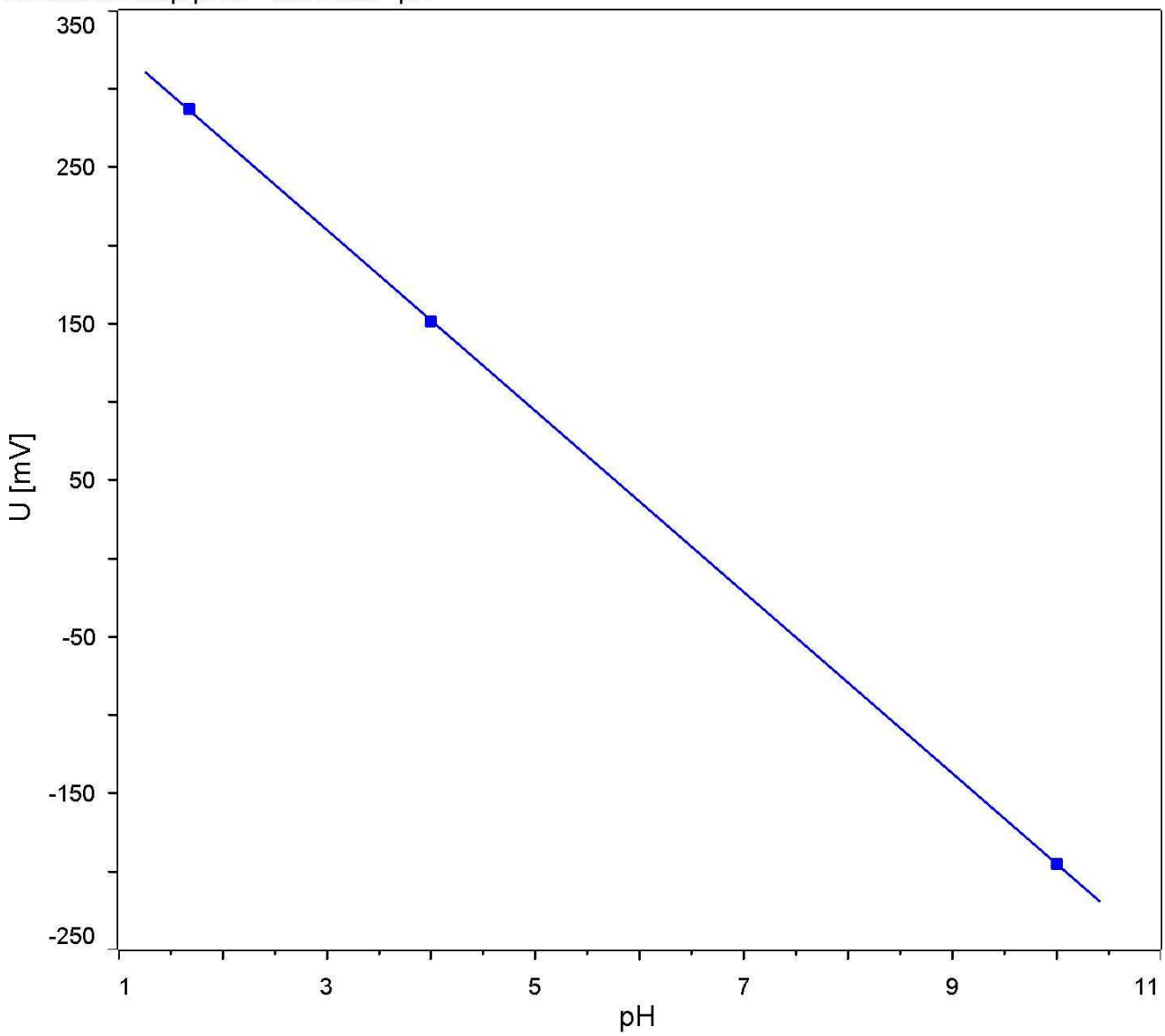
Timao Calibration Curve

2020-04-28 13:04:00

Calculations

Buffer 7	7.04	
Formula	'MEAS pH.EME'	
MEAS pH.EME	7.0449	
Slope	98.30	
Formula	'Calibration loop pH.SLO'	
Calibration loop pH.SLO	98.3	
pH(as)	6.63	
Formula	'Calibration loop pH.ENP'	
Calibration loop pH.ENP	6.626	
Res19	23.6	°C
Formula	'CAL MEAS pH.ETE'	
CAL MEAS pH.ETE	23.6119	

Calibration loop pH.1 - CAL LOOP pH



Metrohm 814/809 Titrando Data

Sample ID	Analysis Date/Time	Method	Titration Volume (to 8.3)	Titration Volume (total)	OH	CO3	HCO3	Total Alk	Unit	Sample Vol	N	Batch	Initials
200428A BLK	2020-04-28 21:40:25 UTC-7	Alkalinity	0.000	0.000	0.00	0.00	0.00	0.00		25 mL	0.0202		AR
BA10166W20 MSD	2020-04-28 21:30:06 UTC-7	Alkalinity	0.174	7.820	0.00	14.06	301.87	315.93	mg/L	25 mL	0.0202	200428A	AR
BA10166W20 MS	2020-04-28 21:19:52 UTC-7	Alkalinity	0.164	7.832	0.00	13.25	303.16	316.41	mg/L	25 mL	0.0202	200428A	AR
BA10166W20 DUP	2020-04-28 21:15:40 UTC-7	Alkalinity	0.000	1.602	0.00	0.00	64.72	64.72	mg/L	25 mL	0.0202	200428A	AR
BA10166W20	2020-04-28 21:11:41 UTC-7	Alkalinity	0.000	1.586	0.00	0.00	64.07	64.07	mg/L	25 mL	0.0202	200428A	AR
BA10158W11 MSD	2020-04-28 21:01:44 UTC-7	Alkalinity	0.118	7.832	0.00	9.53	306.88	316.41	mg/L	25 mL	0.0202	200428A	AR
BA10158W11 MS	2020-04-28 20:51:29 UTC-7	Alkalinity	0.114	7.812	0.00	9.21	306.39	315.60	mg/L	25 mL	0.0202	200428A	AR
BA10158W11 DUP	2020-04-28 20:38:47 UTC-7	Alkalinity	0.000	2.138	0.00	0.00	86.38	86.38	mg/L	25 mL	0.0202	200428A	AR
BA10158W11	2020-04-28 20:34:34 UTC-7	Alkalinity	0.000	1.578	0.00	0.00	63.75	63.75	mg/L	25 mL	0.0202	200428A	AR
200428A LCSD	2020-04-28 20:25:48 UTC-7	Alkalinity	0.190	6.452	0.00	15.35	245.31	260.66	mg/L	25 mL	0.0202	200428A	AR
200428A LCS	2020-04-28 20:17:02 UTC-7	Alkalinity	0.188	6.384	0.00	15.19	242.72	257.91	mg/L	25 mL	0.0202	200428A	AR
BA10168W10	2020-04-27 17:02:18 UTC-7	Alkalinity	0.000	1.810	0.00	0.00	73.12	73.12	mg/L	25 mL	0.0202	200427A	AR
BA10164W07	2020-04-27 16:53:30 UTC-7	Alkalinity	0.000	1.312	0.00	0.00	53.00	53.00	mg/L	25 mL	0.0202	200427A	AR
BA10161W07	2020-04-27 16:45:41 UTC-7	Alkalinity	0.000	4.588	0.00	0.00	185.36	185.36	mg/L	25 mL	0.0202	200427A	AR
200427A LCSD	2020-04-27 16:32:12 UTC-7	Alkalinity	0.156	6.392	0.00	12.60	245.63	258.24	mg/L	25 mL	0.0202	200427A	AR

Metrohm 814/809 Titrando Data

Sample ID	Analysis Date/Time	Method	Titration Volume (to 8.3)	Titration Volume (total)	OH	CO3	HCO3	Total Alk	Unit	Sample Vol	N	Batch	Initials
200427A LCS	2020-04-27 16:23:08 UTC-7	Alkalinity	0.158	6.292	0.00	12.77	241.43	254.20	mg/L	25 mL	0.0202	200427A	AR
200427A BLK	2020-04-27 16:19:59 UTC-7	Alkalinity	0.000	0.098	0.00	0.00	3.96	3.96	mg/L	25 mL	0.0202	200427A	AR

Tiamo Alkalinity Standard Prep

Prep Date:

Exp Date:

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Unit	Conc	Lot Number - QA Number	Prep/Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc
Sulfuric Acid (H2SO4)	J.T.Baker	NA	NA	167828	NA	NA	PURCHASED	NA	NA	NA
0.10N Sulfuric Acid (H2SO4)	J.T.Baker	Normality	0.1N	167828	05/24/19	05/24/20	3ml	1L	DI	0.10N
0.02N Sulfuric Acid (H2SO4)	J.T.Baker	Normality	0.02N	167828	05/24/19	05/24/20	200mL	1L	DI	0.02N
Inorganic Spike(NaHCO3)	BDH	NA	NA	1575C510	10/18/18	08/14/20	PURCHASED	NA	NA	NA
Inorganic Spike Solution	BDH	Milligrams/Liters	250mg/L	1575C510	01/30/20	07/30/20	3.5g	500mL	DI	250mg/L
Standarizing Solution(NaCO3)	J.T.Baker	Normality	1N	178494	07/25/17	07/25/19	PURCHASED	NA	NA	NA

Tiamo Electroconductivity Standard Prep

Prep Date:

Exp Date:

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Units	Conc	Lot Number	Prep/Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc. Range (µg/mL)
EC Spike(KCl)	Mallinckrodt AR	Na	NA	6858 KHMV	NA	NA	PURCHASED	NA	NA	NA
EC Spike Solution	Mallinckrodt AR	Moles/Conductivity	0.01M	6858 KHMV	11/26/18	11/26/19	0.7456g	1L	DI	1412umos
EC Daily LCS Solution	Mallinckrodt AR	Moles/Conductivity	0.0070824M	6858 KHMV	06/06/19	6/6/20	0.5280g	1L	DI	1000umos
Storage Solution EC Probe	APPL	NA	NA	NA	NA	NA	NA	NA	DI	NA

Tiamo pH Buffer Reference Standards

Prep Date: Daily

Exp Date: Daily

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Units	pH	Lot Number - QA Number	Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
pH 1.68 Buffer	ORION	pH Units	1.68	WX1-40709	04/22/19	01/01/21	NA	NA	NA	NA
pH 4.00 Buffer	RICCA	pH Units	4	1807191-39782	04/22/19	01/01/21	NA	NA	NA	NA
pH 10.01 Buffer	VWR	pH Units	10.01	0903980-40707	04/22/19	08/27/19	NA	NA	NA	NA
pH 7.00 Buffer	Ricca	pH Units	7	1805M17 - 39765	10/11/18	05/01/20	NA	NA	NA	NA

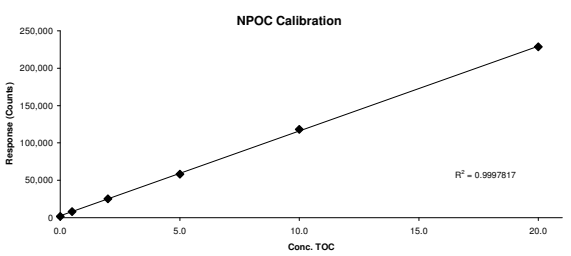
TOTAL ORGANIC CARBON

Method: WetChem | Units mg/L | Instrument: Tic Toc

Analyte: TOC | QCG: 200425

Analyist: ARAMOS | Final Volume: 40mL

Date	Time	Appl ID	[TOC]	Raw	% Recovery
01/15/20	13:42	QC blank	0.00	1639	
01/15/20	14:25	Ical 1	0.50	8021	
01/15/20	15:01	Ical 2	2.00	25461	
01/15/20	15:37	Ical 3	5.00	58252	
01/15/20	16:13	Ical 4	10.00	118315	
01/15/20	16:49	Ical 5	20.00	228427	
01/16/20	15:11	ICB	0.08	906	
01/16/20	14:33	ICV	5.20	59018	104.0%



Date	Time	Appl ID	DF	Raw Result	SubSample Amount	Filter Blank Subtract	Calc Conc	Result	Range (mg/L)	QC True	% Recovery
2020-04-24	05:07 PM	QCB	1	1672	40mL	0.000	0	0.00	0.00		
2020-04-24	05:45 PM	CCV	1	58552	40mL	0.000	5.011	5.01	0.04	5.00	100.2%
2020-04-24	06:25 PM	CCB	1	948	40mL	0.000	0	0.00	0.00		
2020-04-24	07:03 PM	200425A LCS	1	60484	40mL	0.000	5.181	5.18	0.01	5.00	103.6%
2020-04-24	07:43 PM	200425A LCSD	1	60628	40mL	0.000	5.194	5.19	0.03	5.00	103.9%
2020-04-24	08:23 PM	BA09915W05	1	8157	40mL	0.000	0.689	0.69	0.03		
2020-04-24	08:59 PM	BA09917W05	1	4784	40mL	0.000	0.392	0.39	0.02		
2020-04-24	09:35 PM	BA09919W05	1	7538	40mL	0.000	0.635	0.64	0.05		
2020-04-24	10:12 PM	BA09921W05	1	2467	40mL	0.000	0.188	0.19	0.01		
2020-04-24	10:47 PM	BA09926W06	1	8982	40mL	0.000	0.761	0.76	0.06		
2020-04-24	11:23 PM	BA09928W08	1	6427	40mL	0.000	0.536	0.54	0.02		
2020-04-24	11:58 PM	BA10087W06	1	3129	40mL	0.000	0.246	0.25	0.01		
2020-04-25	12:33 AM	BA10089W05	1	2500	40mL	0.000	0.191	0.19	0.01		
2020-04-25	01:08 AM	BA10158W09	1	2150	40mL	0.000	0.16	0.16	0.01		
2020-04-25	01:42 AM	BA10158W09 DUP	1	2326	40mL	0.000	0.175	0.18	0.02		
2020-04-25	02:18 AM	BA10158W09 MS	1	53929	40mL	0.000	4.721	4.72	0.03		
2020-04-25	02:55 AM	BA10158W09 MSD	1	54039	40mL	0.000	4.731	4.73	0.11		
2020-04-25	03:32 AM	BA10175W10 DF2	2	21715	40mL	0.000	1.883	3.77	0.08		
2020-04-25	04:10 AM	CCV	1	59218	40mL	0.000	5.07	5.07	0.07	5.00	101.4%
2020-04-25	04:50 AM	CCB	1	836	40mL	0.000	0	0.00	0.00		
2020-04-25	05:28 AM	BA10176W10 DF2	2	45344	40mL	0.000	3.965	7.93	0.01		
2020-04-25	06:06 AM	BA10177W10 DF2	2	41510	40mL	0.000	3.627	7.25	0.02		
2020-04-25	06:43 AM	BA10178W10 DF2	2	57726	40mL	0.000	5.056	10.11	0.03		
2020-04-25	07:21 AM	BA10179W10 DF2	2	211074	40mL	0.000	18.565	37.13	0.58		
2020-04-25	07:59 AM	BA10180W10 DF2	2	121513	40mL	0.000	10.675	21.35	0.31		
2020-04-25	08:37 AM	BA10161W06	1	39996	40mL	0.000	3.493	3.49	0.40		
2020-04-25	09:14 AM	BA10164W05	1	3910	40mL	0.000	0.315	0.32	0.06		
2020-04-25	09:51 AM	BA10166W18	1	18578	40mL	0.000	1.607	1.61	0.01		
2020-04-25	10:28 AM	BA10166W18 DUP	1	18801	40mL	0.000	1.627	1.63	0.02		
2020-04-25	11:06 AM	BA10166W19 MS	1	77558	40mL	0.000	6.803	6.80	0.55		
2020-04-25	11:44 AM	BA10166W19 MSD	1	78379	40mL	0.000	6.875	6.88	0.13		
2020-04-25	12:22 PM	BA10168W09	1	183764	40mL	0.000	16.159	16.16	8.12		
2020-04-25	12:59 PM	CCV	1	68225	40mL	0.000	5.863	5.86	2.55	5.00	117.3%
2020-04-25	01:39 PM	CCB	1	1258	40mL	0.000	0	0.00	0.00		

Name of Final Standard TOC Calibration Curve — **Prep'd By (Initials)** AR

Prep Date 01/15/20

Exp Date 01/15/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	20 uL	40 mL	DI Water	0.5 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	100 uL	40 mL	DI Water	2 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	250 uL	40 mL	DI Water	5 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	500 uL	40 mL	DI Water	10 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	1000 uL	40 mL	DI Water	20 ppm

Name of Final Standard ICV (TOC) — **Prep'd By (Initials)** HH

Prep Date 01/15/20

Exp Date 01/15/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
1000 PPM ICV TOC Intermediate	APPL Inc.	Prep: 2/11/19	1000 mg/L	Prep: 2/11/19	01/15/21	500 uL	40mL	DI Water	10 ppm

Name of Final Standard CCV (TOC) — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	200 uL	40 mL	DI Water	5 ppm

Name of Final Standard TOC_LCS/LCSD — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	ULTRA Scientific	IQC-106-5	1000 mg/L	CR-0328-37639	02/28/19	200 uL	40 mL	DI Water	5 ppm

Name of Final Standard TOC_MS/MSD — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	ULTRA Scientific	IQC-106-5	1000 mg/L	CR-0328-37639	02/28/19	200 uL	40 mL	sample	5 ppm

908 North Temperance Ave. ∇ Clovis, CA 93611 ∇ Phone 559-275-2175 ∇ Fax 559-275-4422

Certification Number: CA1312
NELAP Certification number: CA00046
DoD-ELAP Certificate number: 4064.01

Data Validatable Report

May 22, 2020

AECOM
1001 Bishop Street, Suite 1600
Honolulu, Hawaii 96813

Attn: Margie Pascua

Title: Report of Data: Case 92025

Project: 60571032 CV18F0126 Red Hill Fuel Storage, HI

Contract #: Prime contract # for DoD: NAVY CLEAN N62742-17-F-1800, CV18F0126
Subcontract: 18S-22209-HI27

Dear Ms. Pascua:

Two water samples were received April 29, 2020. Written results for the requested analyses are being provided on this May 22, 2020.

Results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

If you have any questions or require further information, please contact your APPL Project Manager, Libby Cheeseborough, libby@applinc.com, at your convenience. Thank you for choosing APPL, Inc.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. These test results meet all requirements of NELAC and DoD QSM. Release of the hard copy has been authorized by the Laboratory Manager or her designee, as verified by the following signature.

Sharon Dehnlow For PM

Paula McCartney, Laboratory Director
APPL, Inc.

PM/lac
Enclosure
cc: File

Data Validation Package
for
60571032 CV18F0126 Red Hill Fuel Storage
APPL SDG 92025
TABLE OF CONTENTS

LABORATORY NAME: *APPL, Inc.*

Case Narrative	3
Sample Management Records	7
Sample Results	12
QC Forms	28
Method 8011 Calibration Data	104
Method 8011 Raw Data	131
Method 8015B Calibration Data	148
Method 8015B Raw Data	211
Method 8270D Calibration Data	246
Method 8270D Raw Data	300
Method 8270D SIM Calibration Data	327
Method 8270D SIM Raw Data	354
APPL SOP 2-MEE Calibration Data	374
APPL SOP 2-MEE Raw Data	401
Method 8260B Calibration Data	424
Method 8260B Raw Data	490
Method 8260B GRO Calibration Data	510
Method 8260B GRO Raw Data	559
Method RSK-175 Calibration Data	581
Method RSK-175 Raw Data	609
Method 300 Calibration Data	622
Method 300 Raw Data	640
Inorganic Analyses Calibration & Raw Data	645

CASE NARRATIVE

Case Narrative

ARF: 92025

Project: 60571032 CV18F0126 Red Hill Fuel Storage. HI

Sample Receipt Information:

Two water samples were received April 29, 2020, at 5.5°C. The sample group was assigned Analytical Request Form (ARF) number 92025.

Sample Preparation and Analysis Information:

For the EPA 8011 analysis, the samples were extracted according to APPL SOP method MWE012.

For the EPA 8015B analysis, the sample was extracted according to EPA method 3520C. The sample extracts were silica gel cleaned according to APPL's SOP CLN004 and placed on hold.

For the EPA 8270D Phenol analysis, the samples were extracted according to EPA method 3520C.

For the EPA 8270D SIM analysis, the samples were extracted according to EPA method 3520C.

For the APPL SOP ANA2MEE analysis, the samples were extracted according to EPA method 3535.

For the EPA 8260B analysis, the samples were purged according to EPA method 5030B.

For the RSK-175 analysis, the samples were allowed to equilibrate for 10 minutes at 40°C and a portion of the headspace was analyzed.

For the EPA 9060A, 300.0, 353.2, SM 2320B, and SM 3500FeB analyses, the sample was prepared according to the methods.

Only the portion of the injection log relative to these samples is included. A full sequence log is available upon request. Measurement uncertainty can be reported upon request.

Analytical Exceptions, Deviations and Abnormalities.

EPA 8270D: Three surrogates recovered above their control limits in the LCS/LCSD. They are not associated with the target analyte.

One to three internal standards are outside of the control limits in the Blank, LCS and LCSD. They are not associated with the target analyte.

SOP 2-MEE: In the 200504A LCS/LCSD, the RPD exceeded the 20% limit.

EPA 300: Sample ERH1078 received past holding time and analyzed five hours out of holding time for nitrate.

SDG	Received	Client ID	APPL ID	Collected DateTime	Matrix	Method	Method Description
92025	04/29/20	ERH1077	BA10438	04/27/20 8:08:00 AM	WATER	8011	EPA 8011
92025	04/29/20	ERH1077	BA10438	04/27/20 8:08:00 AM	WATER	EPA 8260B	EPA 8260B BTEX & 1,2-DCA WATER
92025	04/29/20	ERH1077	BA10438	04/27/20 8:08:00 AM	WATER	EPA 8260B	EPA 8260B GRO WATER
92025	04/29/20	ERH1077	BA10438	04/27/20 8:08:00 AM	WATER	RSK 175	METHANE BY RSK 175
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	SM 2320B	Wetlab 2320B - Water
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	EPA 300.0	Wetlab 300.0 - Water
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	SM3500FeB	Ferrous Iron
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	EPA 353.2	EPA 353.2 - WATER
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	8011	EPA 8011
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	EPA 8260B	EPA 8260B BTEX & 1,2-DCA WATER
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	EPA 8270D	EPA 8270D WATER
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	EPA 8270D	EPA 8270D MODIFIED WATER
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	EPA 8015B-eHL	EPA 8015B TPH WATER L-L SGC
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	EPA 8015B-eHL	EPA 8015B TPH LIQ-LIQ
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	EPA 8260B	EPA 8260B GRO WATER
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	RSK 175	METHANE BY RSK 175
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	8270D-SIM	EPA 8270D SIM LIQ-LIQ
92025	04/29/20	ERH1078	BA10439	04/27/20 9:30:00 AM	WATER	SW846 9060A	9060A TOC

Abbreviations and Flags

FLAG	DESCRIPTION
#	Recovery or RPD outside control limits
*	Recovery or RPD outside control limits
B	Analyte detected in associated method blank
C1	Reason for correction: wrote incorrect response
C2	Reason for correction: calculated incorrectly
C3	Reason for correction: needs to be rechecked
C4	Reason for correction: data not usable
DO	Diluted out
E	Exceeds linear range
F	Estimated value
G1	Includes a wide range of hydrocarbons which does not match our gasoline standard
G10	Includes a match to hydrocarbon profiles within the range of mineral spirits
G11	Includes a match to hydrocarbon profiles within the range of JP-4
G12	Pattern does not match the gasoline standard; the carbon range for this sample is consistent with JP8
G13	Closely resembles the hydrocarbon profile of aviation gasoline
G14	Analyte concentration may be biased due to carry over
G2	Closely resembles the boiling point hydrocarbon profile consistent with weathered gasoline
G3	Includes higher boiling hydrocarbons
G4	Includes dominant peak(s) not indicative of petroleum hydrocarbons
G5	Is mainly dominant peak(s) not indicative of petroleum hydrocarbons
G6	Contains recognizable contaminant peak(s) which has been removed from quantitation
G7	Is mainly a match to hydrocarbons within the range of gasoline
G8	Closely resembles the boiling point hydrocarbon profile consistent with weathered gasoline
G9	Includes hydrocarbons within the range of kerosene
J	Estimated value
M	Matrix effect
MI1	Manual integration: integration does not follow baseline
MI2	Manual integration: non-target peak interference
MI3	Manual integration: to split a peak that was integrated as one peak by the computer
MI4	Manual integration: to integrate a split peak
MI5	Manual integration: the whole peak or part of the peak was not integrated
MI6	Manual integration: computer integrated wrong peak
MI7	Manual integration: other - explain
MDL	Method detection limit
ND	Not detected
NT	Non-target
Q	Acceptance criteria not met
T1 I	Includes wide range of hydrocarbons not indicative of diesel
T1 M	Is mainly wide range of hydrocarbons not necessarily indicative of diesel
T2 I	Includes lower boiling hydrocarbons, i.e. mineral spirits, kerosene, stoddard solvent, white gas
T2 M	Is mainly lower boiling hydrocarbons, i.e. mineral spirits, kerosene, stoddard solvent, white gas
T3 I	Includes higher boiling hydrocarbons, i.e. asphaltene, waster oil, motor oil, or weathered diesel fuel
T3 M	Is mainly higher boiling hydrocarbons, i.e. asphaltene, waster oil, motor oil, or weathered diesel fuel
T4 I	Includes dominant peak(s) not indicative of hydrocarbons
T4 M	Is mainly dominant peak(s) not indicative of hydrocarbons
T5	Contains recognizable contaminant peak(s) which has been removed from quantitation
T6	Is mainly a match to hydrocarbons within range of diesel fuel
T7	Closely resembles the boiling point hydrocarbon profile consistent with diesel fuel
T8	Includes a match to hydrocarbon profiles within range of diesel and kerosene fuel
T9 I	Includes non-diesel hydrocarbons within boiling point range of diesel fuel
T9 M	Is mainly non-diesel hydrocarbons within boiling point range of diesel fuel.
Y	Percent difference between primary and confirmation column > 40%

SAMPLE RECORDS MANAGEMENT

CHAIN OF CUSTODY,

ARF, CRF, AND

CLIENT COMMUNICATION

APPL - Analysis Request Form

92025

Client: AECOM
Address: 1001 Bishop Street, Suite 1600
Honolulu, HI 96813
Attn: Margie Pascua
Phone: 808-356-5373 Fax: 808-523-8950
Job: 60571032 CV18F0126 Red Hill Fuel Storage
PO #: 18S-22209-HI27 PO# 102604
Chain of Custody (Y/N): Y # 210
RAD Screen (Y/N): Y pH (Y/N): Y
Turn Around Type: 1 WEEK

Received by: AAR
Date Received: 04/29/20 Time: 11:15
Delivered by: FEDEX
Shuttle Custody Seals (Y/N): Y Time Zone: -10
Chest Temp(s): 5.5°C
Color: VFRG/A-Green
Samples Chilled until Placed in Refrig/Freezer: Y
Project Manager: Libby Cheesebor LM
QC Report Type: DVP4DOD/EQUIS/HI
Due Date: 05/06/20

Comments: WL

PM: login and F1s to Margie.Pascua@aecom.com ✓
AN: 7 day TAT for Form 1s; 21 day TAT for PKG STYLE 1; DOD v5.1; DOD Forms: LOD database
Wetlab: NO3, CL, & SO4 by EPA 300 and NO3-N & NO2-N by 353.2; report MS/MSD/DUPs when AECOM sample used.
8260: BTEX & TPH-G only; 8270 SIM: 1-methylnaphthalene, 2-methylnaphthalene & naphthalene only.
TPH D & O both with and w/o SGC, reverse surrogate for the SGC; analyze SGC if detections
RSK: Methane only; 8011: EDB only; $87DC53W5: report phenol
FR: email ftp info to Margie, Stella, trommelfanger@lab-data.com & jcanlas@lab-data.com
EDD: AECOM EQuIS EDD 2.5.3 Red Hill 87DMEE->3535A to Margie.Pascua@aecom.com & jecklund@lab-data.com

Sample Distribution:
GC: 2-$8011, 1-$87DC53W5, 1-$87DMEEW5, 1-$DOC53W5LIQ, 1-$SIM53LIQ51
Extractions: 2-_MWE012, 1-_LIQ003, 1-_LIQ005, 1-_MWE2MEE
VOA: 2-$86BTOTXDCAW, 2-$GASBL, 2-$GRO86BW, 2-$RSKMETH
Wetlab: 1-$232W(HCO3,CO3,ALK), 1-$300W, 1-$35FE, 1-$35OF, 1-$TOCW53

Charges:

Invoice To:
ACCOUNTS PAYABLE
1001 Bishop Street, Ste 1600
USAPImaging@aecom.com
mary.basano@aecom.com

	Client ID	APPL ID	Sampled	Analyses Requested
1.	ERH1077	LCSD BA10438W	04/27/20 08:08	$8011, $86BTOTXDCAW, $GASBL, $GRO86BW, $RSKMETH -- See comments
2.	ERH1078	LCSD BA10439W	04/27/20 09:30	$232W(HCO3,CO3,ALK), $300W, $35FE, $35OF, $8011, $86BTOTXDCAW, $87DC53W5, $87DMEEW5, $DOC53W5LIQ, $GASBL, $GRO86BW, $RSKMETH, $SIM53LIQ51, $TOCW53 -- See comments

Note: All times, excluding sample collection times, are Pacific Time Zone unless noted otherwise. Collection times are in: -10 UTC

APPL Sample Receipt Form

ARF# **92025**

Sample	Container Type	Count	p
BA10438	[13] VOAs - HCL	4	NA
	[15] VOAs - NP	3	NA
BA10439	[3] PL 250mL	1	NA
	[10] PL 250mL - H2SO4	1	
	[13] VOAs - HCL	4	NA
	[15] VOAs - NP	3	NA
	[17] Amber Liter	4	NA
	[32] Clear VOA - H2SO4	2	NA
	[38] 250mL brn poly, HCl prsvd	1	
	[40] 500mL Amber, unprsrvd	3	NA

Sample	Container Type	Count	p

APPL, Inc.
908 N Temperance Ave
Clovis, CA 93611
www.applinc.com
Phone: (559) 275-2175
Fax: (559) 275-4422
coc@applinc.com

CHAIN OF CUSTODY RECORD

92025

C.O.C. 210

Report to: PLEASE PRINT

Company Name: AECOM Phone: 808-356-5373

Address: 1001 Bishop St, Suite 1600
Honolulu, HI 96813 Fax: 808-523-8950

Attn: Margie Pascua

Email: margie.pascua@aecom.com

Invoice to: PLEASE PRINT

Company Name: AECOM Phone: 808-529-7249

Address: 1001 Bishop St, Suite 1600
Honolulu, HI 96813 Fax: 808-523-8950

Attn: Mary Basano

Email: mary.basano@aecom.com; usapimaging@aecom.com

Project Name/Number: CV18F0126 / 60571032

Purchase Order Number: 102604

Sampler (Print): BM, DH, TV

Sampler (Signature): for BM, DH, TV

Date Shipped: 4/28/20

Carrier: FedEx

Waybill No.:

Comments:

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Matrix: Aq	Matrix: Sed.	Matrix: Soil	8260C BTEX,TPH-g	8260C DCA 8011 EDB	8015C TPH-d/o	3630/8015C TPH-d/o w/ SGT	8270DSIM PAHs short list	8270D Phenol; ~~Flos~~	8270D 2-(2-methoxy ethoxy)-ethanol	RSK175M Methane	SM3500-Fe Ferrous Iron	353.2 Nitrate-Nitrite N	SM2320B Alkalinity 300.0 Nitrate,Sulfate,Chloride	300.0 Bromide/Fluoride 3010 Total Ca,Mg,Mn,K,Na SM4500 Total & Dissolved Silica	9060A TOC
ERH1077	Trip Blank	4/27/20	0908	HST	7	X			X	X						X					
ERH1078	RHMW13-04			HST	19	X			X	X	X	X*	X	X	X	X	X	X	X		X

Page 10 of 659

*Analyze TPH w/SGT only if TPH-d/o detected.

TPH-d/o & PAHs need liquid-liquid extraction.

4/28/20

Shuttle Temperature: IR @ 0°C 5.5/5.5°C

Turnaround Requested: Check one
☐ Standard 2-3 wk ☒ One week ☐ 3 days ☐ 24/48 Hrs. ☐ Other: _____

Sample Disposal:
☐ Return to client ☒ Disposal by Lab (30-day retention)

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
Sampler: AECOM	4/28/20	12:50					
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received at lab by:
					4/29/20	11:15	

See page 2 for Container Preservative and Sampling Information

COOLER RECEIPT FORM **ARF: 92025**

1) Project: 60571032 CV18F0126 Red Hill Fuel Storage Date Received: 04/29/20

2) Coolers: Number of Coolers: 1

3) YES Were custody seals present and intact?
How many? 2 Name/Date on seal? See Below

4) YES Was there a shipping slip? Carrier name: FEDEX

5) Type of packing in cooler: X bubble wrap __ popcorn __ foam X plastic bags __ other
X wet ice __ dry ice __ no ice __ gel ice

6) YES Were cooler temperatures acceptable?

7) Serial number of certified NIST thermometer use IR @ 0.0°C

8) Cooler temp(s): In °C. Thermometer Temp / Corrected Temp
1: 5.5/5.5 2: ____ 3: ____ 4: ____ 5: ____ 6: ____
7: ____ 8: ____ 9: ____ 10: ____ 11: ____ 12: ____

Chain of custody:

9) YES Was a chain of custody received?

10) No Were the custody papers complete/signed in the appropriate places?

Sample Labels:

11) YES Were all sample labels complete (sample ID, date/time of sampling, etc.)?

12) YES Did all container labels agree with custody papers?

Sample Containers:

13) YES Were all containers sealed in separate bags?

14) YES Did all containers arrive in good condition:(unbroken, no leakage, no cracked/broken lids)?

15) YES Were correct containers and preservatives used for the tests indicated?

16) YES Was a sufficient amount of sample sent for tests indicated?

17) No Were bubbles present in volatile samples?
If yes, the following were received with air bubbles:
Larger than a pea: ____
Smaller than a pea: ____

Preservation Hold time:

18) Yes Was a sufficient amount of holding time remaining to analyze the samples?

19) Yes Was the pH taken of all non-VOA preserved samples and written on the sample container?

20) Yes Was the pH of acid preserved non-VOA samples < 2?

21) NA Was the pH of the "basic" preserved samples for Cyanide > 12, Sulfide >9, Hexchrom >9?

22) NO Were unpreserved VOA Vials received?

23) NA Are unpreserved VOA vials noted in the ADD TEST FIELD on the ARF?
pH strip lot number: HC982588
Lab notified if pH was not adequate: ____

Notes/Deficiencies:
Sample ERH 1078 has no time or date listed on the COC. ERH1078 containers were labeled 4/27/20 09:30. Two of the amber liters were not quite full.

CUSTODY SEAL
APPL, Inc. (559) 275-2175
Initials AM Date 4/28/20

Personnel receiving samples: RB Second reviewer: AA
Personnel labeling samples: RB
Project manager notified: AA Date/Time of notification 04/29/20 11:42:00 AM
Name of client notified: ____ Date/Time of notification ____

SAMPLE RESULTS

EPA 8011

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1077

APPL ID: BA10438

Sample Collection Date: 04/27/20

QCG: #8011-200504A-252304

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
8011	EDB	0.019 U	0.02	0.019	0.010	ug/L	05/04/20	05/04/20
8011	SURROGATE: 1,3-DIBROMOPROPANE	103	70-132			%	05/04/20	05/04/20

Quant Method:	80110427.M
Run #:	0430022
Instrument:	Herbie
Sequence:	200430
Dilution Factor:	1
Initials:	SSE

Printed: 05/06/20 10:28:38 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8011

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #8011-200504A-252304

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
8011	EDB	0.019 U	0.02	0.019	0.010	ug/L	05/04/20	05/04/20
8011	SURROGATE: 1,3-DIBROMOPROPANE	99.1	70-132			%	05/04/20	05/04/20

Quant Method:	80110427.M
Run #:	0430023
Instrument:	Herbie
Sequence:	200430
Dilution Factor:	1
Initials:	SSE

Printed: 05/06/20 10:28:38 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8015B TPH LIQ-LIQ

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #DOC53-200430A1-252259

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8015B-e	DIESEL (C10-C24)	160 J	320	300.0	150.0	ug/L	04/30/20	05/04/20
EPA 8015B-e	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/04/20
EPA 8015B-e	SURROGATE: OCTACOSANE (S)	95.1	60-142			%	04/30/20	05/04/20
EPA 8015B-e	SURROGATE: ORTHO-TERPHENYL (S)	73.9	56-125			%	04/30/20	05/04/20

J = Estimated value.

Quant Method:	DOC0310.M
Run #:	424111
Instrument:	Apollo
Sequence:	200424
Dilution Factor:	1
Initials:	SSE

Printed: 05/06/20 9:41:23 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8015B TPH WATER L-L SGC

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #DOC53-200430A3-252582

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8015B-e	DIESEL (C10-C24)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/12/20
EPA 8015B-e	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: (R) DECANOIC ACID (S)	0.0	0-1			%	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: OCTACOSANE (S)	99.5	60-142			%	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: ORTHO-TERPHENYL (S)	74.3	56-125			%	04/30/20	05/12/20

Quant Method: DOC0310.M
Run #: 424260
Instrument: Apollo
Sequence: 200424
Dilution Factor: 1
Initials: SSE

Printed: 05/13/20 11:50:09 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #87DC5-200504A-252339

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8270D	PHENOL	4.00 U	5.0	4.00	1.00	ug/L	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2,4,6-TRIBROMOPHENO	83.2	43-140			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2-FLUORBIPHENYL (S)	83.7	44-119			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2-FLUOROPHENOL (S)	68.8	19-119			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: NITROBENZENE-D5 (S)	84.8	44-120			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: PHENOL-D6 (S)	69.0	10-115			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: TERPHENYL-D14 (S)	87.6	50-134			%	05/04/20	05/06/20

Quant Method: Y0420.M
Run #: 0420Y195
Instrument: Yoda
Sequence: Y200420
Dilution Factor: 1
Initials: MA

Printed: 05/06/20 5:07:59 PM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D SIM LIQ-LIQ

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #SIM53-200504A-252338

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
8270D-SIM	1-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	2-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	NAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	SURROGATE: 2-METHYLNAPHTHALEN	78.0	39-114			%	05/04/20	05/06/20
8270D-SIM	SURROGATE: FLUORANTHENE-D10 (S	79.7	58-120			%	05/04/20	05/06/20

Quant Method: L0204.M
Run #: 0424L175
Instrument: Linus
Sequence: L200424
Dilution Factor: 1
Initials: MA

Printed: 05/06/20 4:32:05 PM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D MODIFIED WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #87DME-200504A-252289

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8270D	2-(2-METHOXYETHOXY)-ETHANOL	80.0 U	100	80.0	40.0	ug/L	05/04/20	05/04/20

Quant Method:	YMEE0501.M
Run #:	0501Y035
Instrument:	Yoda
Sequence:	Y200501M
Dilution Factor:	1
Initials:	MA

Printed: 05/06/20 1:28:36 PM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B BTEX & 1,2-DCA WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1077

APPL ID: BA10438

Sample Collection Date: 04/27/20

QCG: #86BTO-200430BT-252176

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	1,2-DICHLOROETHANE	0.30 U	1.0	0.30	0.14	ug/L	04/30/20	04/30/20
EPA 8260B	BENZENE	0.30 U	1.0	0.30	0.15	ug/L	04/30/20	04/30/20
EPA 8260B	ETHYLBENZENE	0.50 U	1.0	0.50	0.23	ug/L	04/30/20	04/30/20
EPA 8260B	TOLUENE	0.30 U	1.0	0.30	0.15	ug/L	04/30/20	04/30/20
EPA 8260B	XYLENES (TOTAL)	0.30 U	2.0	0.30	0.15	ug/L	04/30/20	04/30/20
EPA 8260B	SURROGATE: 1,2-DICHLOROETHANE-	110	81-118			%	04/30/20	04/30/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	90.8	85-114			%	04/30/20	04/30/20
EPA 8260B	SURROGATE: DIBROMOFLUOROMETH	104	80-119			%	04/30/20	04/30/20
EPA 8260B	SURROGATE: TOLUENE-D8 (S)	96.4	89-112			%	04/30/20	04/30/20

Quant Method: T0424W.M
Run #: 0430T22
Instrument: Thor
Sequence: T200424
Dilution Factor: 1
Initials: DPO

Printed: 05/01/20 11:50:05 AM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B BTEX & 1,2-DCA WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #86BTO-200430BT-252176

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	1,2-DICHLOROETHANE	0.30 U	1.0	0.30	0.14	ug/L	04/30/20	04/30/20
EPA 8260B	BENZENE	0.30 U	1.0	0.30	0.15	ug/L	04/30/20	04/30/20
EPA 8260B	ETHYLBENZENE	0.50 U	1.0	0.50	0.23	ug/L	04/30/20	04/30/20
EPA 8260B	TOLUENE	0.30 U	1.0	0.30	0.15	ug/L	04/30/20	04/30/20
EPA 8260B	XYLENES (TOTAL)	0.30 U	2.0	0.30	0.15	ug/L	04/30/20	04/30/20
EPA 8260B	SURROGATE: 1,2-DICHLOROETHANE-	114	81-118			%	04/30/20	04/30/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	91.6	85-114			%	04/30/20	04/30/20
EPA 8260B	SURROGATE: DIBROMOFLUOROMETH	108	80-119			%	04/30/20	04/30/20
EPA 8260B	SURROGATE: TOLUENE-D8 (S)	96.5	89-112			%	04/30/20	04/30/20

Quant Method: T0424W.M
Run #: 0430T23
Instrument: Thor
Sequence: T200424
Dilution Factor: 1
Initials: DPO

Printed: 05/01/20 11:50:05 AM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B GRO WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1077

APPL ID: BA10438

Sample Collection Date: 04/27/20

QCG: #GRO86-200430BT-252177

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	GASOLINE RANGE ORGANICS	18.0 U	20	18.0	8.6	ug/L	04/30/20	04/30/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	90.8	85-114			%	04/30/20	04/30/20

Quant Method:	TGAS0427.M
Run #:	0430T22
Instrument:	Thor
Sequence:	T200424
Dilution Factor:	1
Initials:	DPO

Printed: 05/01/20 12:18:17 PM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B GRO WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #GRO86-200430BT-252177

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	GASOLINE RANGE ORGANICS	18.0 U	20	18.0	8.6	ug/L	04/30/20	04/30/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	91.6	85-114			%	04/30/20	04/30/20

Quant Method: TGAS0427.M
Run #: 0430T23
Instrument: Thor
Sequence: T200424
Dilution Factor: 1
Initials: DPO

Printed: 05/01/20 12:18:17 PM
APPL-F1-SC-NoMC-REG MDLs-DOD

METHANE

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1077

APPL ID: BA10438

Sample Collection Date: 04/27/20

QCG: #RSKME-200505A-252264

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
RSK 175	METHANE	1.00 U	5.0	1.00	0.25	ug/L	05/05/20	05/05/20

Quant Method:	RSK0311.M
Run #:	0505R06
Instrument:	Rocky
Sequence:	200311
Dilution Factor:	1
Initials:	CMO

Printed: 05/06/20 10:40:22 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

METHANE

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92025

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

QCG: #RSKME-200505A-252264

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
RSK 175	METHANE	1.00 U	5.0	1.00	0.25	ug/L	05/05/20	05/05/20

Quant Method:	RSK0311.M
Run #:	0505R07
Instrument:	Rocky
Sequence:	200311
Dilution Factor:	1
Initials:	CMO

Printed: 05/06/20 10:40:22 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

Wet Lab Analysis

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

ARF: 92025

Method	Analyte	Result	LOQ	LOD	DL	Units	DF	Prep Date	Analysis Date
EPA 300.0	CHLORIDE	47.9	1.0	0.20	0.08	mg/L	1	04/29/20	04/29/20
EPA 300.0	NITRATE	1.8	0.5	0.18	0.04	mg/L	1	04/29/20	04/29/20
EPA 300.0	SULFATE	7.5	1.0	0.20	0.09	mg/L	1	04/29/20	04/29/20

Printed: 05/06/20 1:02:22 PM

APPL-F1-SC-NoMC-REG MDLs

Wet Lab Analysis

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

Sample ID: ERH1078

APPL ID: BA10439

Sample Collection Date: 04/27/20

ARF: 92025

Method	Analyte	Result	LOQ	LOD	DL	Units	DF	Prep Date	Analysis Date
EPA 353.2	NITRATE-NITRITE-N	0.50	0.10	0.090	0.028	mg/L	1	05/01/20	05/01/20
SM 2320B	BICARBONATE AS CACO3	71.7	2.0	1.70	0.85	mg/L	1	05/04/20	05/04/20
SM 2320B	CARBONATE AS CACO3	1.70 U	2.0	1.70	0.85	mg/L	1	05/04/20	05/04/20
SM 2320B	TOTAL ALKALINITY AS CACO	71.7	2.0	1.70	0.85	mg/L	1	05/04/20	05/04/20
SM3500FeB	FERROUS IRON	0.32 U	1.0	0.32	0.16	mg/L	1	05/01/20	05/01/20
SW846 9060A	TOTAL ORGANIC CARBON	9.8	0.93	0.350	0.130	mg/L	1	05/01/20	05/01/20

Printed: 05/06/20 1:57:03 PM

APPL-F1-SC-NoMC-REG MDLs

QC FORMS

8011

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/04/20

Matrix: WATER Instrument: Herbie

APPL ID.	Client Sample No.	SURROGATE: 1,3-DIBROMOPROPANE (S)					
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	70-132	101				
200504A-LCS	Lab Control Spike	70-132	106				
200504A-LCSD	Lab Control SpikeD	70-132	98.4				
BA10438	ERH1077	70-132	103				
BA10439	ERH1078	70-132	99.1				

Comments: Batch: #8011-200504A

8011

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Herbie
Blank ID:	200504A-BLK	Time Analyzed:	1405

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0430019	05/04/20 1405
200504A-LCS	Lab Control Spike	0430020	05/04/20 1425
200504A-LCSD	Lab Control SpikeD	0430021	05/04/20 1445
BA10438	ERH1077	0430022	05/04/20 1506
BA10439	ERH1078	0430023	05/04/20 1526

Comments: Batch: #8011-200504A

Method Blank
EPA 8011

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200504W-10438 - 252304**
Batch ID: #8011-200504A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	EDB	0.019 U	0.02	0.019	0.010	ug/L	05/04/20	05/04/20
BLANK	SURROGATE: 1,3-DIBROMOPRO	101	70-132			%	05/04/20	05/04/20

Quant Method:80110427.M
Run #:0430019
Instrument:Herbie
Sequence:200430
Initials:SSE

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 10:28:38 AM

8011

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Herbie
LCS ID:	200504A-LCS	Time Analyzed:	1425

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0430019	05/04/20 1405
200504A-LCS	Lab Control Spike	0430020	05/04/20 1425
200504A-LCSD	Lab Control SpikeD	0430021	05/04/20 1445
BA10438	ERH1077	0430022	05/04/20 1506
BA10439	ERH1078	0430023	05/04/20 1526

Comments: Batch: #8011-200504A

Laboratory Control Spike Recoveries
EPA 8011

APPL ID: **200504W-10438 LCS - 252304**
Batch ID: #8011-200504A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
EDB	0.250	0.253	0.246	101	98.4	60-140	2.8	25
SURROGATE: 1,3-DIBROMOPROPANE (	0.250	0.265	0.246	106	98.4	70-132		

Comments:

Primary	SPK	DUP
Quant Method :	80110427.M	80110427.M
Extraction Date :	05/04/20	05/04/20
Analysis Date :	05/04/20	05/04/20
Instrument :	Herbie	Herbie
Run :	0430020	0430021
Initials :	SSE	

EPA 8015B-eHL

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/04/20

Matrix: WATER Instrument: Apollo

APPL ID.	Client Sample No.	SURROGATE: OCTACOSANE (S)			SURROGATE: ORTHO-TERPHENYL (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430A1-BLK	Blank	60-142	87.0		56-125	73.1	
200430A1-LCS	Lab Control Spike	60-142	94.5		56-125	84.5	
200430A1-LCSD	Lab Control SpikeD	60-142	91.1		56-125	83.2	
BA10439	ERH1078	60-142	95.1		56-125	73.9	

Comments: Batch: #DOC53-200430A1

EPA 8015B-eH

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Apollo
Blank ID:	200430A1-BLK	Time Analyzed:	1527

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A1-BLK	Blank	424096	05/04/20 1527
200430A1-LCS	Lab Control Spike	424097	05/04/20 1550
200430A1-LCSD	Lab Control SpikeD	424098	05/04/20 1613
BA10439	ERH1078	424111	05/04/20 2108

Comments: Batch: #DOC53-200430A1

Method Blank
EPA 8015B TPH LIQ-LIQ

Blank Name/QCG: **200430W-10439 - 252259**
Batch ID: #DOC53-200430A1

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	DIESEL (C10-C24)	150 J	320	300.0	150.0	ug/L	04/30/20	05/04/20
BLANK	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/04/20
BLANK	SURROGATE: OCTACOSANE (S)	87.0	60-142			%	04/30/20	05/04/20
BLANK	SURROGATE: ORTHO-TERPHEN	73.1	56-125			%	04/30/20	05/04/20

J = Estimated value.

Quant Method: DOC0310.M
Run #: 424096
Instrument: Apollo
Sequence: 200424
Initials: SSE

GC SC-Blank-REG MDLs-DOD
Printed: 05/27/20 10:21:44 AM

AMENDED PAGE

EPA 8015B-eH

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Apollo
LCS ID:	200430A1-LCS	Time Analyzed:	1550

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A1-BLK	Blank	424096	05/04/20 1527
200430A1-LCS	Lab Control Spike	424097	05/04/20 1550
200430A1-LCSD	Lab Control SpikeD	424098	05/04/20 1613
BA10439	ERH1078	424111	05/04/20 2108

Comments: Batch: #DOC53-200430A1

Laboratory Control Spike Recoveries
EPA 8015B TPH LIQ-LIQ

APPL ID: **200430W-10439 LCS - 252259**
Batch ID: #DOC53-200430A1

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
DIESEL (C10-C24)	1250	1200	1140	96.0	91.2	36-132	5.1	30
OIL (C24-C40)	1250	1150	1120	92.0	89.6	41-113	2.6	30
SURROGATE: OCTACOSANE (S)	75.0	70.9	68.3	94.5	91.1	60-142		
SURROGATE: ORTHO-TERPHENYL (S)	75.0	63.4	62.4	84.5	83.2	56-125		

Comments:

Primary	SPK	DUP
Quant Method :	DOC0310.M	DOC0310.M
Extraction Date :	04/30/20	04/30/20
Analysis Date :	05/04/20	05/04/20
Instrument :	Apollo	Apollo
Run :	424097	424098
Initials :	SSE	

EPA 8015B-eHL

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/07/20

Matrix: WATER Instrument: Apollo

APPL ID.	Client Sample No.	SURROGATE: (R) DECANOIC ACID (S)			SURROGATE: OCTACOSANE (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430A3-BLK	Blank	0-1	0.0		60-142	88.3	
200430A3-LCS	Lab Control Spike	0-1	0.0		60-142	96.9	
200430A3-LCSD	Lab Control SpikeD	0-1	0.0		60-142	82.0	
BA10439	ERH1078	0-1	0.0		60-142	99.5	

Comments: Batch: #DOC53-200430A3

EPA 8015B-eHL

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/07/20

Matrix: WATER Instrument: Apollo

APPL ID.	Client Sample No.	SURROGATE: ORTHO-TERPHENYL (S)					
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430A3-BLK	Blank	56-125	73.8				
200430A3-LCS	Lab Control Spike	56-125	87.3				
200430A3-LCSD	Lab Control SpikeD	56-125	77.5				
BA10439	ERH1078	56-125	74.3				

Comments: Batch: #DOC53-200430A3

EPA 8015B-eH

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/07/20
Matrix:	WATER	Instrument:	Apollo
Blank ID:	200430A3-BLK	Time Analyzed:	1755

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A3-BLK	Blank	424187	05/07/20 1755
200430A3-LCS	Lab Control Spike	424188	05/07/20 1818
200430A3-LCSD	Lab Control SpikeD	424189	05/07/20 1841
BA10439	ERH1078	424260	05/12/20 2116

Comments: Batch: #DOC53-200430A3

Method Blank
EPA 8015B TPH WATER L-L SGC

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200430W-10439 - 252582**
Batch ID: #DOC53-200430A3

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	DIESEL (C10-C24)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/07/20
BLANK	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/07/20
BLANK	SURROGATE: (R) DECANOIC AC	0.0	0-1			%	04/30/20	05/07/20
BLANK	SURROGATE: OCTACOSANE (S)	88.3	60-142			%	04/30/20	05/07/20
BLANK	SURROGATE: ORTHO-TERPHEN	73.8	56-125			%	04/30/20	05/07/20

Quant Method: DOC0310.M
Run #: 424187
Instrument: Apollo
Sequence: 200424
Initials: SSE

GC SC-Blank-REG MDLs-DOD
Printed: 05/13/20 11:50:09 AM

EPA 8015B-eH

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/07/20
Matrix:	WATER	Instrument:	Apollo
LCS ID:	200430A3-LCS	Time Analyzed:	1818

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A3-BLK	Blank	424187	05/07/20 1755
200430A3-LCS	Lab Control Spike	424188	05/07/20 1818
200430A3-LCSD	Lab Control SpikeD	424189	05/07/20 1841
BA10439	ERH1078	424260	05/12/20 2116

Comments: Batch: #DOC53-200430A3

Laboratory Control Spike Recoveries
EPA 8015B TPH WATER L-L SGC

APPL ID: **200430W-10439 LCS - 252582**
Batch ID: #DOC53-200430A3

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
DIESEL (C10-C24)	1250	921	867	73.7	69.4	36-132	6.0	30
OIL (C24-C40)	1250	1170	1020	93.6	81.6	41-113	13.7	30
SURROGATE: (R) DECANOIC ACID (S)	10.00	0	0	0.0	0.0	0-1		
SURROGATE: OCTACOSANE (S)	75.0	72.7	61.5	96.9	82.0	60-142		
SURROGATE: ORTHO-TERPHENYL (S)	75.0	65.5	58.1	87.3	77.5	56-125		

Comments:

Primary	SPK	DUP
Quant Method :	DOC0310.M	DOC0310.M
Extraction Date :	04/30/20	04/30/20
Analysis Date :	05/07/20	05/07/20
Instrument :	Apollo	Apollo
Run :	424188	424189
Initials :	SSE	

EPA 8270D

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Yoda

APPL ID.	Client Sample No.	SURROGATE: 2,4,6-TRIBROMOPHENOL (S)			SURROGATE: 2-FLUORBIPHENYL (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	43-140	82.7		44-119	85.1	
200504A-LCS	Lab Control Spike	43-140	172	*	44-119	169	*
200504A-LCSD	Lab Control SpikeD	43-140	440	*	44-119	433	*
BA10439	ERH1078	43-140	83.2		44-119	83.7	

Comments: Batch: #87DC5-200504A

* = Recovery outside of Control Limits on QC Sample.

EPA 8270D

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Yoda

APPL ID.	Client Sample No.	SURROGATE: 2-FLUOROPHENOL (S)			SURROGATE: NITROBENZENE-D5 (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	19-119	65.0		44-120	81.2	
200504A-LCS	Lab Control Spike	19-119	74.8		44-120	85.6	
200504A-LCSD	Lab Control SpikeD	19-119	72.8		44-120	85.6	
BA10439	ERH1078	19-119	68.8		44-120	84.8	

Comments: Batch: #87DC5-200504A

EPA 8270D

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Yoda

APPL ID.	Client Sample No.	SURROGATE: PHENOL-D6 (S)			SURROGATE: TERPHENYL-D14 (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	10-115	57.3		50-134	89.4	
200504A-LCS	Lab Control Spike	10-115	52.0		50-134	96.0	
200504A-LCSD	Lab Control SpikeD	10-115	27.2		50-134	236	*
BA10439	ERH1078	10-115	69.0		50-134	87.6	

Comments: Batch: #87DC5-200504A

* = Recovery outside of Control Limits on QC Sample.

EPA 8270D

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Yoda

Blank ID: 200504A-BLK Time Analyzed: 1040

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0420Y192	05/06/20 1040
200504A-LCS	Lab Control Spike	0420Y193	05/06/20 1109
200504A-LCSD	Lab Control SpikeD	0420Y194	05/06/20 1137
BA10439	ERH1078	0420Y195	05/06/20 1206

Comments: Batch: #87DC5-200504A

Method Blank
EPA 8270D WATER

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200504W-10439 - 252339**
Batch ID: #87DC5-200504A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	PHENOL	4.00 U	5.0	4.00	1.00	ug/L	05/04/20	05/06/20
BLANK	SURROGATE: 2,4,6-TRIBROMOP	82.7	43-140			%	05/04/20	05/06/20
BLANK	SURROGATE: 2-FLUORBIPHENY	85.1	44-119			%	05/04/20	05/06/20
BLANK	SURROGATE: 2-FLUOROPHENO	65.0	19-119			%	05/04/20	05/06/20
BLANK	SURROGATE: NITROBENZENE-	81.2	44-120			%	05/04/20	05/06/20
BLANK	SURROGATE: PHENOL-D6 (S)	57.3	10-115			%	05/04/20	05/06/20
BLANK	SURROGATE: TERPHENYL-D14 (	89.4	50-134			%	05/04/20	05/06/20

Quant Method: Y0420.M
Run #: 0420Y192
Instrument: Yoda
Sequence: Y200420
Initials: MA

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 5:08:58 PM

EPA 8270D

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/06/20
Matrix:	WATER	Instrument:	Yoda
LCS ID:	200504A-LCS	Time Analyzed:	1109

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0420Y192	05/06/20 1040
200504A-LCS	Lab Control Spike	0420Y193	05/06/20 1109
200504A-LCSD	Lab Control SpikeD	0420Y194	05/06/20 1137
BA10439	ERH1078	0420Y195	05/06/20 1206

Comments: Batch: #87DC5-200504A

Laboratory Control Spike Recoveries
EPA 8270D WATER

APPL ID: **200504W-10439 LCS - 252339**
Batch ID: #87DC5-200504A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
PHENOL	62.5	37.4	33.3	59.8	53.3	10-115	11.6	20
SURROGATE: 2,4,6-TRIBROMOPHENOL	250	429	1100	172 #	440 #	43-140		
SURROGATE: 2-FLUORBIPHENYL (S)	125	211	541	169 #	433 #	44-119		
SURROGATE: 2-FLUOROPHENOL (S)	250	187	182	74.8	72.8	19-119		
SURROGATE: NITROBENZENE-D5 (S)	125	107	107	85.6	85.6	44-120		
SURROGATE: PHENOL-D6 (S)	250	130	68.1	52.0	27.2	10-115		
SURROGATE: TERPHENYL-D14 (S)	125	120	295	96.0	236 #	50-134		

= Recovery is outside QC limits.

Comments:

Primary	SPK	DUP
Quant Method :	Y0420.M	Y0420.M
Extraction Date :	05/04/20	05/04/20
Analysis Date :	05/06/20	05/06/20
Instrument :	Yoda	Yoda
Run :	0420Y193	0420Y194
Initials :	MA	

Form 5
Tune Summary

Lab Name: APPL Inc. SDG No:
Case No: Date Analyzed: 04/20/20
Matrix: Water Instrument: Yoda
ID: 0420Y002.D Time Analyzed: 9:12

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		4ug/ml 8270 3/4/20	0420Y003.D	04/20/20 9:28
2		5ug/ml 8270 3/4/20	0420Y004.D	04/20/20 9:57
3		10ug/ml 8270 3/4/20	0420Y005.D	04/20/20 10:31
4		20ug/ml 8270 3/4/20	0420Y006.D	04/20/20 11:00
5		40ug/ml 8270 3/4/20	0420Y007.D	04/20/20 11:28
6		50ug/ml 8270 3/4/20	0420Y008.D	04/20/20 11:57
7		60ug/ml 8270 3/4/20	0420Y009.D	04/20/20 12:26
8		80ug/ml 8270 3/4/20	0420Y010.D	04/20/20 12:55
9		100ug/ml 8270 3/4/20	0420Y011.D	04/20/20 13:24
10		SS 8270 3/4/20	0420Y012.D	04/20/20 13:53
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	10 - 80% of mass 198	34.1
68	0 - 2% of mass 69	0.0
70	0 - 2% of mass 69	0.8
127	10 - 80% of mass 198	48.2
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.9
275	10 - 60% of mass 198	27.9
365	1 - 100% of mass 198	3.2
441	0.01 - 24% of mass 442	1.3
442	50 - 500% of mass 198	87.6
443	15 - 24% of mass 442	19.0

Form 5
Tune Summary

Lab Name: APPL Inc. SDG No: 92025
Case No: 92025 Date Analyzed: 05/06/20
Matrix: Water Instrument: Yoda
ID: 0420Y190.D Time Analyzed: 9:54

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		50ug/ml 8270 3/30/20	0420Y191.D	05/06/20 10:10
2	Blank	200504A BLK 1/800	0420Y192.D	05/06/20 10:40
3	Lab Control Spike	200504A LCS-1 1/800	0420Y193.D	05/06/20 11:09
4	Lab Control SpikeD	200504A LCSD-1 1/800	0420Y194.D	05/06/20 11:37
5	ERH1078	BA10439W19 1/800	0420Y195.D	05/06/20 12:06
6		50ug/ml 8270 3/30/20	0420Y198.D	05/06/20 13:32
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	9.95 - 80.04% of mass 198	38.7
68	0 - 2% of mass 69	0.0
70	0 - 2% of mass 69	0.6
127	10 - 80% of mass 198	51.9
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198.05	100.0
199	5 - 9% of mass 198	6.9
275	10 - 60% of mass 198	26.2
365	1 - 100% of mass 198	2.8
441	0.01 - 24% of mass 442	12.8
442	50 - 500% of mass 198.05	68.8
443	15 - 24% of mass 442	19.5

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0420Y191.D Date Analyzed: 6 May 20 10:10

Instrument ID: Yoda Time Analyzed: 6 May 20 10:10

GC Column: ID: Heated Purge: (Y/N)

		1,4-dichlorobenzene-D4(IS)		Napthalene-D8(IS)		Acenaphthene-D10(IS)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	560488	5.28	2480990	6.71	1519110	8.74
	UPPER LIMIT	1120976	5.45	4961980	6.88	3038220	8.91
	LOWER LIMIT	280244	5.11	1240495	6.54	759555	8.57
	SAMPLE NO.						
01	200504A BLK 1/800	490692	5.27	2027580	6.71	1094660	8.73
02	200504A LCS-1 1/800	429277	5.28	1870440	6.71	552807 *	8.73
03	200504A LCSD-1 1/800	451589	5.28	1898690	6.71	216990 *	8.73
04	BA10439W19 1/800	463675	5.27	1945170	6.71	1133050	8.73
05	50ug/ml 8270 3/30/20 (5	400214	5.28	1651960	6.71	974422	8.74
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0420Y191.D Date Analyzed: 6 May 20 10:10

Instrument ID: Yoda Time Analyzed: 6 May 20 10:10

GC Column: ID: Heated Purge: (Y/N)

		Phenanthrene-D10(IS)		Chrysene-D12(IS)		Perylene-D12(IS)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	2861200	10.46	3331180	13.56	2679200	15.35
	UPPER LIMIT	5722400	10.63	6662360	13.73	5358400	15.52
	LOWER LIMIT	1430600	10.29	1665590	13.39	1339600	15.18
	SAMPLE NO.						
01	200504A BLK 1/800	2246300	10.46	2168050	13.55	445281 *	15.34
02	200504A LCS-1 1/800	1989460	10.46	1946170	13.55	21401 *	15.34
03	200504A LCSD-1 1/800	1695320	10.46	699718 *	13.55	4267 *	15.34
04	BA10439W19 1/800	2142730	10.46	2181240	13.55	1794200	15.34
05	50ug/ml 8270 3/30/20 (5	1820290	10.47	2031760	13.56	1660390	15.34
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8270D-SIM

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Linus

APPL ID.	Client Sample No.	SURROGATE: 2-METHYLNAPHTHALENE-D10 (S)			SURROGATE: FLUORANTHENE-D10 (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	39-114	83.8		58-120	75.0	
200504A-LCS	Lab Control Spike	39-114	74.9		58-120	69.1	
200504A-LCSD	Lab Control SpikeD	39-114	72.5		58-120	71.8	
BA10439	ERH1078	39-114	78.0		58-120	79.7	

Comments: Batch: #SIM53-200504A

8270D-SIM

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/06/20
Matrix:	WATER	Instrument:	Linus
Blank ID:	200504A-BLK	Time Analyzed:	1023

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0424L172	05/06/20 1023
200504A-LCS	Lab Control Spike	0424L173	05/06/20 1045
200504A-LCSD	Lab Control SpikeD	0424L174	05/06/20 1107
BA10439	ERH1078	0424L175	05/06/20 1129

Comments: Batch: #SIM53-200504A

Method Blank
EPA 8270D SIM LIQ-LIQ

Blank Name/QCG: **200504W-10439 - 252338**
Batch ID: #SIM53-200504A

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	1-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
BLANK	2-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
BLANK	NAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
BLANK	SURROGATE: 2-METHYLNAPHT	83.8	39-114			%	05/04/20	05/06/20
BLANK	SURROGATE: FLUORANTHENE-	75.0	58-120			%	05/04/20	05/06/20

Quant Method:L0204.M
Run #:0424L172
Instrument:Linus
Sequence:L200424
Initials:MA

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 4:33:16 PM

8270D-SIM

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/06/20
Matrix:	WATER	Instrument:	Linus
LCS ID:	200504A-LCS	Time Analyzed:	1045

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0424L172	05/06/20 1023
200504A-LCS	Lab Control Spike	0424L173	05/06/20 1045
200504A-LCSD	Lab Control SpikeD	0424L174	05/06/20 1107
BA10439	ERH1078	0424L175	05/06/20 1129

Comments: Batch: #SIM53-200504A

Laboratory Control Spike Recoveries
EPA 8270D SIM LIQ-LIQ

APPL ID: **200504W-10439 LCS - 252338**
Batch ID: #SIM53-200504A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
1-METHYLNAPHTHALENE	6.25	4.47	4.37	71.5	69.9	41-115	2.3	20
2-METHYLNAPHTHALENE	6.25	4.63	4.55	74.1	72.8	39-114	1.7	20
NAPHTHALENE	6.25	4.47	4.35	71.5	69.6	43-114	2.7	20
SURROGATE: 2-METHYLNAPHTHALEN	6.25	4.68	4.53	74.9	72.5	39-114		
SURROGATE: FLUORANTHENE-D10 (S)	6.25	4.32	4.49	69.1	71.8	58-120		

Comments:

Primary	SPK	DUP
Quant Method :	L0204.M	L0204.M
Extraction Date :	05/04/20	05/04/20
Analysis Date :	05/06/20	05/06/20
Instrument :	Linus	Linus
Run :	0424L173	0424L174
Initials :	MA	

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No:
Matrix: Water
ID: 0204L002.D

SDG No:
Date Analyzed: 02/04/20
Instrument: Linus
Time Analyzed: 9:32

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		0.1 SIM 02/03/20	0204L003.D	02/04/20 9:48
2		0.2 SIM 02/03/20	0204L004.D	02/04/20 10:09
3		0.5 SIM 02/03/20	0204L005.D	02/04/20 10:31
4		1 SIM 02/03/20	0204L006.D	02/04/20 10:53
5		5 SIM 02/03/20	0204L007.D	02/04/20 11:15
6		10 SIM 02/03/20	0204L008.D	02/04/20 11:37
7		50 SIM 02/03/20	0204L009.D	02/04/20 11:59
8		100 SIM 02/03/20	0204L010.D	02/04/20 12:21
9		SS SIM 02/03/20	0204L011.D	02/04/20 13:21
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	9.95 - 80.1% of mass 198	18.6
68	0 - 2.05% of mass 69	0.0
70	0 - 2% of mass 69	0.4
127	10 - 80% of mass 198	40.9
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.3
275	10 - 60% of mass 198	30.0
365	1 - 100% of mass 198	4.7
441	0.01 - 24% of mass 442	15.8
442	50 - 500% of mass 198	200.3
443	15 - 24% of mass 442	19.3

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No: 92025
Matrix: Water
ID: 0424L170.D

SDG No: 92025
Date Analyzed: 05/06/20
Instrument: Linus
Time Analyzed: 8:38

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		5 SIM 2/4/20 (3)	0424L171.D	05/06/20 8:54
2	Blank	200504A BLK 1/800	0424L172.D	05/06/20 10:23
3	Lab Control Spike	200504A LCS-2 1/800	0424L173.D	05/06/20 10:45
4	Lab Control SpikeD	200504A LCSD-2 1/800	0424L174.D	05/06/20 11:07
5	ERH1078	BA10439W19 1/800	0424L175.D	05/06/20 11:29
6		5 SIM 2/4/20 (4)	0424L178.D	05/06/20 12:52
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	9.95 - 80.1% of mass 198	15.2
68	0 - 2.05% of mass 69	0.0
70	0 - 2% of mass 69	0.5
127	10 - 80% of mass 198	37.0
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.6
275	10 - 60% of mass 198	33.6
365	1 - 100% of mass 198	4.8
441	0.01 - 24% of mass 442	15.9
442	50 - 500% of mass 198	245.4
443	15 - 24% of mass 442	19.1

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0424L171.D Date Analyzed: 6 May 20 8:54

Instrument ID: Linus Time Analyzed: 6 May 20 8:54

GC Column: ID: Heated Purge: (Y/N)

		Napthalene-D8(IS)		Acenaphthene-D10(IS)		Phenanthrene-D10(IS)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	92595	4.14	51356	6.13	99414	7.87
	UPPER LIMIT	185190	4.31	102712	6.30	198828	8.04
	LOWER LIMIT	46298	3.97	25678	5.96	49707	7.70
	SAMPLE NO.						
01	200504A BLK 1/800	80484	4.14	42134	6.13	91708	7.87
02	200504A LCS-2 1/800	82766	4.14	30697	6.13	87731	7.86
03	200504A LCSD-2 1/800	84996	4.14	46150	6.13	92781	7.86
04	BA10439W19 1/800	82324	4.14	45613	6.13	87808	7.87
05	5 SIM 2/4/20 (4)	73064	4.14	40148	6.14	78468	7.87
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0424L171.D Date Analyzed: 6 May 20 8:54

Instrument ID: Linus Time Analyzed: 6 May 20 8:54

GC Column: ID: Heated Purge: (Y/N)

	Chrysene-D12(IS)						
	AREA #	RT #	AREA #	RT #	AREA #	RT #	
12 HOUR STD	128459	10.99					
UPPER LIMIT	256918	11.16					
LOWER LIMIT	64230	10.82					
SAMPLE NO.							
01 200504A BLK 1/800	114406	10.99					
02 200504A LCS-2 1/800	99404	10.99					
03 200504A LCSD-2 1/800	119811	10.98					
04 BA10439W19 1/800	117548	10.99					
05 5 SIM 2/4/20 (4)	100616	10.99					
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

EPA 8270D

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Yoda
Blank ID:	200504A-BLK	Time Analyzed:	1556

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0501Y032	05/04/20 1556
200504A-LCS	Lab Control Spike	0501Y033	05/04/20 1620
200504A-LCSD	Lab Control SpikeD	0501Y034	05/04/20 1644
BA10439	ERH1078	0501Y035	05/04/20 1708

Comments: Batch: #87DME-200504A

Method Blank
EPA 8270D MODIFIED WATER

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200504W-10439 - 252289**
Batch ID: #87DME-200504A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	2-(2-METHOXYETHOXY)-ETHAN	80.0 U	100	80.0	40.0	ug/L	05/04/20	05/04/20

Quant Method: YMEE0501.M
Run #: 0501Y032
Instrument: Yoda
Sequence: Y200501M
Initials: MA

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 1:30:51 PM

EPA 8270D

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Yoda
LCS ID:	200504A-LCS	Time Analyzed:	1620

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0501Y032	05/04/20 1556
200504A-LCS	Lab Control Spike	0501Y033	05/04/20 1620
200504A-LCSD	Lab Control SpikeD	0501Y034	05/04/20 1644
BA10439	ERH1078	0501Y035	05/04/20 1708

Comments: Batch: #87DME-200504A

Laboratory Control Spike Recoveries
EPA 8270D MODIFIED WATER

APPL ID: **200504W-10439 LCS - 252289**
Batch ID: #87DME-200504A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
2-(2-METHOXYETHOXY)-ETHANOL	80.0	55.4	42.2	69.3	52.8	30-130	27.0 #	20

= Recovery is outside QC limits.

Comments:

Primary	SPK	DUP
Quant Method :	YMEE0501.M	YMEE0501.M
Extraction Date :	05/04/20	05/04/20
Analysis Date :	05/04/20	05/04/20
Instrument :	Yoda	Yoda
Run :	0501Y033	0501Y034
Initials :	MA	

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No:
Matrix: Soil
ID: 0501Y002.D

SDG No:
Date Analyzed: 05/01/20
Instrument: Yoda
Time Analyzed: 9:23

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		50ug/ml MEE 05/01/20	0501Y003.D	05/01/20 9:39
2		100ug/ml MEE 05/01/2	0501Y004.D	05/01/20 10:03
3		200ug/ml MEE 05/01/2	0501Y006.D	05/01/20 10:51
4		400ug/ml MEE 05/01/2	0501Y007.D	05/01/20 11:24
5		500ug/ml MEE 05/01/2	0501Y008.D	05/01/20 11:48
6		600ug/ml MEE 05/01/2	0501Y009.D	05/01/20 12:13
7		800ug/ml MEE 05/01/2	0501Y010.D	05/01/20 12:37
8		1000ug/ml MEE 05/01/	0501Y011.D	05/01/20 13:01
9		SSug/ml MEE 05/01/20	0501Y013.D	05/01/20 13:50
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	10 - 80% of mass 198	40.1
68	0 - 2% of mass 69	0.0
70	0 - 2% of mass 69	0.5
127	10 - 80% of mass 198	52.5
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.8
275	10 - 60% of mass 198	26.7
365	1 - 100% of mass 198	2.8
441	0.01 - 24% of mass 442	3.9
442	50 - 500% of mass 198	71.6
443	15 - 24% of mass 442	19.8

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No: 92025
Matrix: Soil
ID: 0501Y030.D

SDG No: 92025
Date Analyzed: 05/04/20
Instrument: Yoda
Time Analyzed: 14:52

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		500ug/ml MEE 05/01/2	0501Y031.D	05/04/20 15:07
2	Blank	200504A BLK 2/500	0501Y032.D	05/04/20 15:56
3	Lab Control Spike	200504A LCS-1 2/500	0501Y033.D	05/04/20 16:20
4	Lab Control SpikeD	200504A LCSD-1 2/500	0501Y034.D	05/04/20 16:44
5	ERH1078	BA10439W14 2/500	0501Y035.D	05/04/20 17:08
6		500ug/ml MEE 05/01/2	0501Y038.D	05/04/20 18:21
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	10 - 80% of mass 198	40.6
68	0 - 2% of mass 69	0.0
70	0 - 2% of mass 69	0.7
127	10 - 80% of mass 198	52.5
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.9
275	10 - 60% of mass 198	25.7
365	1 - 100% of mass 198	2.6
441	0.01 - 24% of mass 442	10.1
442	50 - 500% of mass 198	64.6
443	15 - 24% of mass 442	19.9

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0501Y031.D Date Analyzed: 4 May 20 15:07

Instrument ID: Yoda Time Analyzed: 4 May 20 15:07

GC Column: ID: Heated Purge: (Y/N)

	1,4-dichlorobenzene-D4(IS)							
		AREA #	RT #	AREA #	RT #	AREA #	RT #	
	12 HOUR STD	450181	5.06					
	UPPER LIMIT	900362	5.23					
	LOWER LIMIT	225091	4.89					
	SAMPLE NO.							
01	200504A BLK 2/500	476418	5.04					
02	200504A LCS-1 2/500	460181	5.05					
03	200504A LCSD-1 2/500	495995	5.04					
04	BA10439W14 2/500	352777	5.04					
05	500ug/ml MEE 05/01/20	391416	5.06					
06								
07								
08								
09								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

EPA 8260B

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 04/30/20

Matrix: WATER Instrument: Thor

APPL ID.	Client Sample No.	SURROGATE: 1,2-DICHLOROETHANE-D4 (S)			SURROGATE: 4-BROMOFLUOROBENZENE (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430BT-LCS	Lab Control Spike	81-118	110		85-114	98.4	
200430BT-LCSD	Lab Control SpikeD	81-118	108		85-114	96.4	
200430BT-BLK	Blank	81-118	110		85-114	91.1	
BA10438	ERH1077	81-118	110		85-114	90.8	
BA10439	ERH1078	81-118	114		85-114	91.6	

Comments: Batch: #86BTO-200430BT

EPA 8260B

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 04/30/20

Matrix: WATER Instrument: Thor

APPL ID.	Client Sample No.	SURROGATE: DIBROMOFLUOROMETHANE (S)			SURROGATE: TOLUENE-D8 (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430BT-LCS	Lab Control Spike	80-119	107		89-112	100	
200430BT-LCSD	Lab Control SpikeD	80-119	104		89-112	98.0	
200430BT-BLK	Blank	80-119	107		89-112	95.1	
BA10438	ERH1077	80-119	104		89-112	96.4	
BA10439	ERH1078	80-119	108		89-112	96.5	

Comments: Batch: #86BTO-200430BT

EPA 8260B

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 04/30/20

Matrix: WATER Instrument: Thor

Blank ID: 200430BT-BLK Time Analyzed: 1722

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430BT-LCS	Lab Control Spike	0430T09	04/30/20 1213
200430BT-LCSD	Lab Control SpikeD	0430T10	04/30/20 1241
200430BT-BLK	Blank	0430T21	04/30/20 1722
BA10438	ERH1077	0430T22	04/30/20 1750
BA10439	ERH1078	0430T23	04/30/20 1818

Comments: Batch: #86BTO-200430BT

Method Blank
EPA 8260B BTEX & 1,2-DCA WATER

Blank Name/QCG: **200430W-10438 - 252176**
Batch ID: #86BTO-200430BT

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	1,2-DICHLOROETHANE	0.30 U	1.0	0.30	0.14	ug/L	04/30/20	04/30/20
BLANK	BENZENE	0.30 U	1.0	0.30	0.15	ug/L	04/30/20	04/30/20
BLANK	ETHYLBENZENE	0.50 U	1.0	0.50	0.23	ug/L	04/30/20	04/30/20
BLANK	TOLUENE	0.30 U	1.0	0.30	0.15	ug/L	04/30/20	04/30/20
BLANK	XYLENES (TOTAL)	0.30 U	2.0	0.30	0.15	ug/L	04/30/20	04/30/20
BLANK	SURROGATE: 1,2-DICHLOROET	110	81-118			%	04/30/20	04/30/20
BLANK	SURROGATE: 4-BROMOFLUORO	91.1	85-114			%	04/30/20	04/30/20
BLANK	SURROGATE: DIBROMOFLUOR	107	80-119			%	04/30/20	04/30/20
BLANK	SURROGATE: TOLUENE-D8 (S)	95.1	89-112			%	04/30/20	04/30/20

Quant Method: T0424W.M
Run #: 0430T21
Instrument: Thor
Sequence: T200424
Initials: DPO

GC SC-Blank-REG MDLs-DOD
Printed: 05/01/20 11:51:06 AM

EPA 8260B

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	04/30/20
Matrix:	WATER	Instrument:	Thor
LCS ID:	200430BT-LCS	Time Analyzed:	1213

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430BT-LCS	Lab Control Spike	0430T09	04/30/20 1213
200430BT-LCSD	Lab Control SpikeD	0430T10	04/30/20 1241
200430BT-BLK	Blank	0430T21	04/30/20 1722
BA10438	ERH1077	0430T22	04/30/20 1750
BA10439	ERH1078	0430T23	04/30/20 1818

Comments: Batch: #86BTO-200430BT

Laboratory Control Spike Recoveries
EPA 8260B BTEX & 1,2-DCA WATER

APPL ID: **200430W-10438 LCS - 252176**
Batch ID: #86BTO-200430BT

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
1,2-DICHLOROETHANE	10.00	10.6	9.68	106	96.8	73-128	9.1	20
BENZENE	10.00	9.80	8.79	98.0	87.9	79-120	10.9	20
ETHYLBENZENE	10.00	9.94	9.05	99.4	90.5	79-121	9.4	20
TOLUENE	10.00	10.1	9.26	101	92.6	80-121	8.7	20
XYLENES (TOTAL)	30.0	30.8	27.7	103	92.3	79-121	10.6	20
SURROGATE: 1,2-DICHLOROETHANE-D	25.0	27.6	27.0	110	108	81-118		
SURROGATE: 4-BROMOFLUOROBENZE	25.0	24.6	24.1	98.4	96.4	85-114		
SURROGATE: DIBROMOFLUOROMETH	25.0	26.8	26.0	107	104	80-119		
SURROGATE: TOLUENE-D8 (S)	25.0	25.0	24.5	100	98.0	89-112		

Comments:

Primary	SPK	DUP
Quant Method :	T0424W.M	T0424W.M
Extraction Date :	04/30/20	04/30/20
Analysis Date :	04/30/20	04/30/20
Instrument :	Thor	Thor
Run :	0430T09	0430T10
Initials :	DPO	

Printed: 05/01/20 11:50:47 AM
APPL Standard LCSD

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No:
Matrix: Water
ID: 0424t25.D

SDG No:
Date Analyzed: 04/24/20
Instrument: Thor
Time Analyzed: 13:38

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		0.3ug/L VOC STD 4/24	0424T27.D	04/24/20 14:31
2		0.5ug/L VOC STD 4/24	0424T28.D	04/24/20 14:59
3		1.0ug/L VOC STD 4/24	0424T29.D	04/24/20 15:27
4		2.0ug/L VOC STD 4/24	0424T30.D	04/24/20 15:55
5		5.0ug/L VOC STD 4/24	0424T31.D	04/24/20 16:23
6		10ug/L VOC STD 4/24/	0424T32.D	04/24/20 16:50
7		20ug/L VOC STD 4/24/	0424T33.D	04/24/20 17:18
8		40ug/L VOC STD 4/24/	0424T34.D	04/24/20 17:46
9		100ug/L VOC STD 4/24	0424T35.D	04/24/20 18:14
10		(SS)10ug/L VOC STD 4	0424T37.D	04/24/20 19:10
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
50	15 - 40% of mass 95	15.2
75	30 - 60% of mass 95	46.2
95	100 - 100% of mass 95	100.0
96	5 - 9% of mass 95	7.5
173	0 - 2.05% of mass 174	0.5
174	50 - 200% of mass 95	109.0
175	5 - 9% of mass 174	8.1
176	95 - 101% of mass 174	99.6
177	5 - 9% of mass 176	7.6

Form 5
Tune Summary

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No: 92025
Matrix: Water
ID: 0430t08.D

SDG No: 92025
Date Analyzed: 04/30/20
Instrument: Thor
Time Analyzed: 11:46

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1	Lab Control Spike	200430B CCV/LCS 10ug	0430T09.D	04/30/20 12:13
2	Lab Control SpikeD	200430B LCSD 10ug/L	0430T10.D	04/30/20 12:41
3	Blank	200430B BLK	0430T21.D	04/30/20 17:22
4	ERH1077	BA10438W01	0430T22.D	04/30/20 17:50
5	ERH1078	BA10439W01	0430T23.D	04/30/20 18:18
6		Ending CCV 10ug/l 04	0430T38.D	05/01/20 1:16
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
50	15 - 40% of mass 95	15.3
75	30 - 60% of mass 95	48.7
95	100 - 100% of mass 95	100.0
96	5 - 9% of mass 95	6.2
173	0 - 2.05% of mass 174	1.3
174	50 - 200% of mass 95	117.0
175	5 - 9% of mass 174	7.4
176	95 - 101% of mass 174	100.0
177	5 - 9% of mass 176	6.7

Form 5
Tune Summary

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0424T32.D Date Analyzed: 04/24/20

Instrument ID: Thor Time Analyzed: 16:50

GC Column: ID: Heated Purge: (Y/N)

		Fluorobenzene (IS)		Chlorobenzene-D5 (IS)		1,4-Dichlorobenzene-D (IS)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	605202	6.38	531673	9.84	337525	12.40
	UPPER LIMIT	1210404	6.55	1063346	10.01	675050	12.57
	LOWER LIMIT	302601	6.21	265837	9.67	168763	12.23
	SAMPLE NO.						
01	200430B CCV/LCS 10ug	433246	6.38	391228	9.84	263406	12.40
02	200430B LCSD 10ug/L	460801	6.38	410890	9.84	265295	12.40
03	200430B BLK	422185	6.37	385190	9.84	234397	12.39
04	BA10438W01	422392	6.38	378201	9.84	233865	12.39
05	BA10439W01	417012	6.38	374902	9.84	230338	12.40
06	Ending CCV 10ug/l 04/2	421247	6.38	374594	9.84	248036	12.40
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

EPA 8260B

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 04/30/20

Matrix: WATER Instrument: Thor

APPL ID.	Client Sample No.	SURROGATE: 4-BROMOFLUOROBENZENE (S)					
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430BT-LCS	Lab Control Spike	85-114	95.6				
200430BT-LCSD	Lab Control SpikeD	85-114	93.6				
200430BT-BLK	Blank	85-114	91.1				
BA10438	ERH1077	85-114	90.8				
BA10439	ERH1078	85-114	91.6				

Comments: Batch: #GRO86-200430BT

EPA 8260B

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 04/30/20

Matrix: WATER Instrument: Thor

Blank ID: 200430BT-BLK Time Analyzed: 1722

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430BT-LCS	Lab Control Spike	0430T13	04/30/20 1404
200430BT-LCSD	Lab Control SpikeD	0430T14	04/30/20 1432
200430BT-BLK	Blank	0430T21	04/30/20 1722
BA10438	ERH1077	0430T22	04/30/20 1750
BA10439	ERH1078	0430T23	04/30/20 1818

Comments: Batch: #GRO86-200430BT

Method Blank
EPA 8260B GRO WATER

Blank Name/QCG: **200430W-10438 - 252177**
Batch ID: #GRO86-200430BT

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	GASOLINE RANGE ORGANICS	18.0 U	20	18.0	8.6	ug/L	04/30/20	04/30/20
BLANK	SURROGATE: 4-BROMOFLUORO	91.1	85-114			%	04/30/20	04/30/20

Quant Method: TGAS0427.M
Run #: 0430T21
Instrument: Thor
Sequence: T200424
Initials: DPO

GC SC-Blank-REG MDLs-DOD
Printed: 05/01/20 12:19:05 PM

EPA 8260B

Form 4

LCS Summary

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 04/30/20

Matrix: WATER Instrument: Thor

LCS ID: 200430BT-LCS Time Analyzed: 1404

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430BT-LCS	Lab Control Spike	0430T13	04/30/20 1404
200430BT-LCSD	Lab Control SpikeD	0430T14	04/30/20 1432
200430BT-BLK	Blank	0430T21	04/30/20 1722
BA10438	ERH1077	0430T22	04/30/20 1750
BA10439	ERH1078	0430T23	04/30/20 1818

Comments: Batch: #GRO86-200430BT

Laboratory Control Spike Recoveries
EPA 8260B GRO WATER

APPL ID: **200430W-10438 LCS - 252177**
Batch ID: #GRO86-200430BT

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
GASOLINE RANGE ORGANICS	300	277	288	92.3	96.0	78-122	3.9	20
SURROGATE: 4-BROMOFLUOROBENZE	25.0	23.9	23.4	95.6	93.6	85-114		

Comments:

Primary	SPK	DUP
Quant Method :	TGAS0427.M	TGAS0427.M
Extraction Date :	04/30/20	04/30/20
Analysis Date :	04/30/20	04/30/20
Instrument :	Thor	Thor
Run :	0430T13	0430T14
Initials :	DPO	

RSK 175

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92025

Case No: 92025 Date Analyzed: 05/05/20

Matrix: WATER Instrument: Rocky

Blank ID: 200505A-BLK Time Analyzed: 1152

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200505A-LCS	Lab Control Spike	0505R01	05/05/20 1128
200505A-LCSD	Lab Control SpikeD	0505R03	05/05/20 1146
200505A-BLK	Blank	0505R05	05/05/20 1152
BA10438	ERH1077	0505R06	05/05/20 1159
BA10439	ERH1078	0505R07	05/05/20 1201

Comments: Batch: #RSKME-200505A

Method Blank
METHANE

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200505W-10438 - 252264**
Batch ID: #RSKME-200505A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	METHANE	1.00 U	5.0	1.00	0.25	ug/L	05/05/20	05/05/20

Quant Method: RSK0311.M
Run #: 0505R05
Instrument: Rocky
Sequence: 200311
Initials: CMO

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 10:40:20 AM

RSK 175

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/05/20
Matrix:	WATER	Instrument:	Rocky
LCS ID:	200505A-LCS	Time Analyzed:	1128

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200505A-LCS	Lab Control Spike	0505R01	05/05/20 1128
200505A-LCSD	Lab Control SpikeD	0505R03	05/05/20 1146
200505A-BLK	Blank	0505R05	05/05/20 1152
BA10438	ERH1077	0505R06	05/05/20 1159
BA10439	ERH1078	0505R07	05/05/20 1201

Comments: Batch: #RSKME-200505A

Laboratory Control Spike Recoveries
METHANE

APPL ID: **200505W-10438 LCS - 252264**
Batch ID: #RSKME-200505A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
METHANE	83.4	73.9	74.8	88.6	89.7	72-125	1.2	30

Comments:

Primary	SPK	DUP
Quant Method :	RSK0311.M	RSK0311.M
Extraction Date :	05/05/20	05/05/20
Analysis Date :	05/05/20	05/05/20
Instrument :	Rocky	Rocky
Run :	0505R01	0505R03
Initials :	CMO	

EPA 300.0

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	04/29/20
Matrix:	WATER	Instrument:	Charlie
Blank ID:	200429A-BLK	Time Analyzed:	1145

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200429A-LCS	Lab Control Spike	4	04/29/20 1127
200429A-BLK	Blank	5	04/29/20 1145
BA10439	ERH1078	6	04/29/20 1447
200429A-LCSD	Lab Control SpikeD	7	04/29/20 1520

Comments: Batch: #300W-200429A

WETLAB BLANK

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Analyte	Result	LOQ	LOD	DL	Units	Prep Date	Analysis Date	QC Group
EPA 300.0	CHLORIDE	0.11 J	1.0	0.20	0.08	mg/L	04/29/20	04/29/20	#300W-200429A-BA10439
EPA 300.0	NITRATE	0.18 U	0.5	0.18	0.04	mg/L	04/29/20	04/29/20	#300W-200429A-BA10439
EPA 300.0	SULFATE	0.20 U	1.0	0.20	0.09	mg/L	04/29/20	04/29/20	#300W-200429A-BA10439

J = Estimated value.

EPA 300.0

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	04/29/20
Matrix:	WATER	Instrument:	Charlie
LCS ID:	200429A-LCS	Time Analyzed:	1127

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200429A-LCS	Lab Control Spike	4	04/29/20 1127
200429A-BLK	Blank	5	04/29/20 1145
BA10439	ERH1078	6	04/29/20 1447
200429A-LCSD	Lab Control SpikeD	7	04/29/20 1520

Comments: Batch: #300W-200429A

Laboratory Control Spike Recoveries

WETLAB

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Lvl mg/L	SPK Res mg/L	DUP Res mg/L	SPK % Recov	DUP % Recov	RPD	RPD Max	QC Limits	Extract Date-Spk	Analysis Date-Spk	Extract Date-Dup	Analysis Date-Dup	QC Group
EPA 300.0	CHLORIDE	25.0	23.0	23.0	92.0	92.0	0.0	20	90-110	04/29/20	04/29/20	04/29/20	04/29/20	#300W-200429A-BA10439
EPA 300.0	NITRATE	22.1	20.1	20.3	91.0	91.9	0.99	20	90-110	04/29/20	04/29/20	04/29/20	04/29/20	#300W-200429A-BA10439
EPA 300.0	SULFATE	25.0	22.9	23.1	91.6	92.4	0.87	20	90-110	04/29/20	04/29/20	04/29/20	04/29/20	#300W-200429A-BA10439

Comments:

EPA 353.2

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	EVE
Blank ID:	200501A-BLK	Time Analyzed:	1128

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501A-BLK	Blank	12	05/01/20 1128
200501A-LCS	Lab Control Spike	13	05/01/20 1130
200501A-LCSD	Lab Control SpikeD	14	05/01/20 1132
BA10439	ERH1078	18	05/01/20 1147

Comments: Batch: #35OF-200501A

SM 2320B

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Tiamo
Blank ID:	200504A-BLK	Time Analyzed:	1651

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	1	05/04/20 1651
BA10439	ERH1078	2	05/04/20 1711
200504A-LCS	Lab Control Spike	8	05/04/20 1949
200504A-LCSD	Lab Control SpikeD	9	05/04/20 2000

Comments: Batch: #232W-200504A

SM3500FeB

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	Manual Spec
Blank ID:	A200501-BLK	Time Analyzed:	2031

APPL ID.	Client Sample No.	File ID.	Date Analyzed
A200501-BLK	Blank	24	05/01/20 2031
A200501-LCS	Lab Control Spike	25	05/01/20 2032
A200501-LCSD	Lab Control SpikeD	26	05/01/20 2033
BA10439	ERH1078	27	05/01/20 2035

Comments: Batch: #35FE-A200501

SW846 9060A

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	TICTOC
Blank ID:	200501A-BLK	Time Analyzed:	1846

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501A-LCS	Lab Control Spike	28	05/01/20 1807
200501A-BLK	Blank	29	05/01/20 1846
BA10439	ERH1078	30	05/01/20 1925

Comments: Batch: #TOCW5-200501A

WETLAB BLANK

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Analyte	Result	LOQ	LOD	DL	Units	Prep Date	Analysis Date	QC Group
SM 2320B	BICARBONATE AS	3.5	2.0	1.70	0.85	mg/L	05/04/20	05/04/20	#232W-200504A-BA10439
SM 2320B	CARBONATE AS C	1.70 U	2.0	1.70	0.85	mg/L	05/04/20	05/04/20	#232W-200504A-BA10439
SM 2320B	TOTAL ALKALINITY	3.5	2.0	1.70	0.85	mg/L	05/04/20	05/04/20	#232W-200504A-BA10439
SM3500Fe	FERROUS IRON	0.32 U	1.0	0.32	0.16	mg/L	05/01/20	05/01/20	#35FE-A200501-BA10504
EPA 353.2	NITRATE-NITRITE-	0.090 U	0.10	0.090	0.028	mg/L	05/01/20	05/01/20	#35OF-200501A-BA10439
SW846 90	TOTAL ORGANIC C	0.350 U	0.93	0.350	0.130	mg/L	05/01/20	05/01/20	#TOCW5-200501A-BA10439

EPA 353.2

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	EVE
LCS ID:	200501A-LCS	Time Analyzed:	1130

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501A-BLK	Blank	12	05/01/20 1128
200501A-LCS	Lab Control Spike	13	05/01/20 1130
200501A-LCSD	Lab Control SpikeD	14	05/01/20 1132
BA10439	ERH1078	18	05/01/20 1147

Comments: Batch: #35OF-200501A

SM 2320B

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Tiamo
LCS ID:	200504A-LCS	Time Analyzed:	1949

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	1	05/04/20 1651
BA10439	ERH1078	2	05/04/20 1711
200504A-LCS	Lab Control Spike	8	05/04/20 1949
200504A-LCSD	Lab Control SpikeD	9	05/04/20 2000

Comments: Batch: #232W-200504A

SM3500FeB

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	Manual Spec
LCS ID:	A200501-LCS	Time Analyzed:	2032

APPL ID.	Client Sample No.	File ID.	Date Analyzed
A200501-BLK	Blank	24	05/01/20 2031
A200501-LCS	Lab Control Spike	25	05/01/20 2032
A200501-LCSD	Lab Control SpikeD	26	05/01/20 2033
BA10439	ERH1078	27	05/01/20 2035

Comments: Batch: #35FE-A200501

SW846 9060A

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92025
Case No:	92025	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	TICTOC
LCS ID:	200501A-LCS	Time Analyzed:	1807

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501A-LCS	Lab Control Spike	28	05/01/20 1807
200501A-BLK	Blank	29	05/01/20 1846
BA10439	ERH1078	30	05/01/20 1925

Comments: Batch: #TOCW5-200501A

Laboratory Control Spike Recoveries

WETLAB

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Lvl mg/L	SPK Res mg/L	DUP Res mg/L	SPK % Recov	DUP % Recov	RPD	RPD Max	QC Limits	Extract Date-Spk	Analysis Date-Spk	Extract Date-Dup	Analysis Date-Dup	QC Group
EPA 353.2	NITRATE-NITRITE-N	3.00	3.05	3.06	102	102	0.33	20	90-110	05/01/20	05/01/20	05/01/20	05/01/20	#35OF-200501A-BA10439
SM 2320B	BICARBONATE AS CACO3	250	251	251	100	100	0.0	20	90-110	05/04/20	05/04/20	05/04/20	05/04/20	#232W-200504A-BA10439
SM 2320B	TOTAL ALKALINITY AS CA	250	274	269	110	108	1.8	20	90-110	05/04/20	05/04/20	05/04/20	05/04/20	#232W-200504A-BA10439
SM3500Fe	FERROUS IRON	3.00	2.99	2.99	99.7	99.7	0.0	20	80-120	05/01/20	05/01/20	05/01/20	05/01/20	#35FE-A200501-BA10504
SW846 90	TOTAL ORGANIC CARBO	5.00	5.06	5.11	101	102	0.98	20	80-120	05/01/20	05/01/20	05/02/20	05/02/20	#TOCW5-200501A-BA104

Comments:

ORGANICS
Calibration Data

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/27/20
Matrix: Water Instrument: Herbie

Initials: SS/M

			0415059.D	0415060.D	0415061.D	0415062.D	0415063.D	0415064.D									
		Compound	1	2	3	4	5	6					Avg	%RSD	Type	r^2	Q
1	TM	EDB	960275	899850	834866	818853	759309	771204					840726	9.2	TM		
2	TML	1,2,3-TCP	36375	207265	198548	185496	180463	175607					163959	39	TM	0.998	
3	S	1,3-DIBROMOPROPANE(S)	1001975	930625	841584	804786	752701	747788					846576	12	S		
4	TM	DBCP	2735975	2487160	2481396	2394301	2258606	2342415					2449976	6.7	TM		
5		Signal #2											0	0			
6																	
7																	
8																	
9																	
10																	
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33																	
34																	
35																	

1.905049

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/27/20
Matrix: Water Instrument: Herbie
Initials:

			0415059.D	0415060.D	0415061.D	0415062.D	0415063.D	0415064.D									
		Compound	1	2	3	4	5	6					Avg	%RSD	Type	r^2	Q
36	TM	EDB #2	4763350	4508730	4218204	4123172	3900906	3977083					4248574	7.8	TM		
37	TM	1,2,3-TCP #2	859850	815650	773492	736561	669808	675536					755149	10	TM		
38	S	1,3-DIBROMOPROPANE(S) #2	3477100	3310950	3153720	3001657	2704575	2810090					3076349	9.6	S		
39	TM	DBCP #2	11314550	11290080	11290178	11781011	11322228	11874927					11478829	2.4	TM		
40																	
41																	
42																	
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70																	

0.851729

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415059.D\ECD1A.CH Vial: 59
Signal #2 : G:\HERBIE\DATA\200415\0415059.D\ECD2B.CH
Acq On : 04-27-20 13:33:12 Operator: SS
Sample : 8011-1 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	40079	139084	0.024	0.023
Spiked Amount	0.350			Recovery	=	6.86%	6.57%
	Target Compounds						
1) TM	EDB	5.76	7.21	38411	190534	0.023	0.022
2) TM	1,2,3-TCP	9.23	10.44	1455	34394	N.D.	0.023
4) TM	DBCP	13.34	14.08	109439	452582	0.022	0.020

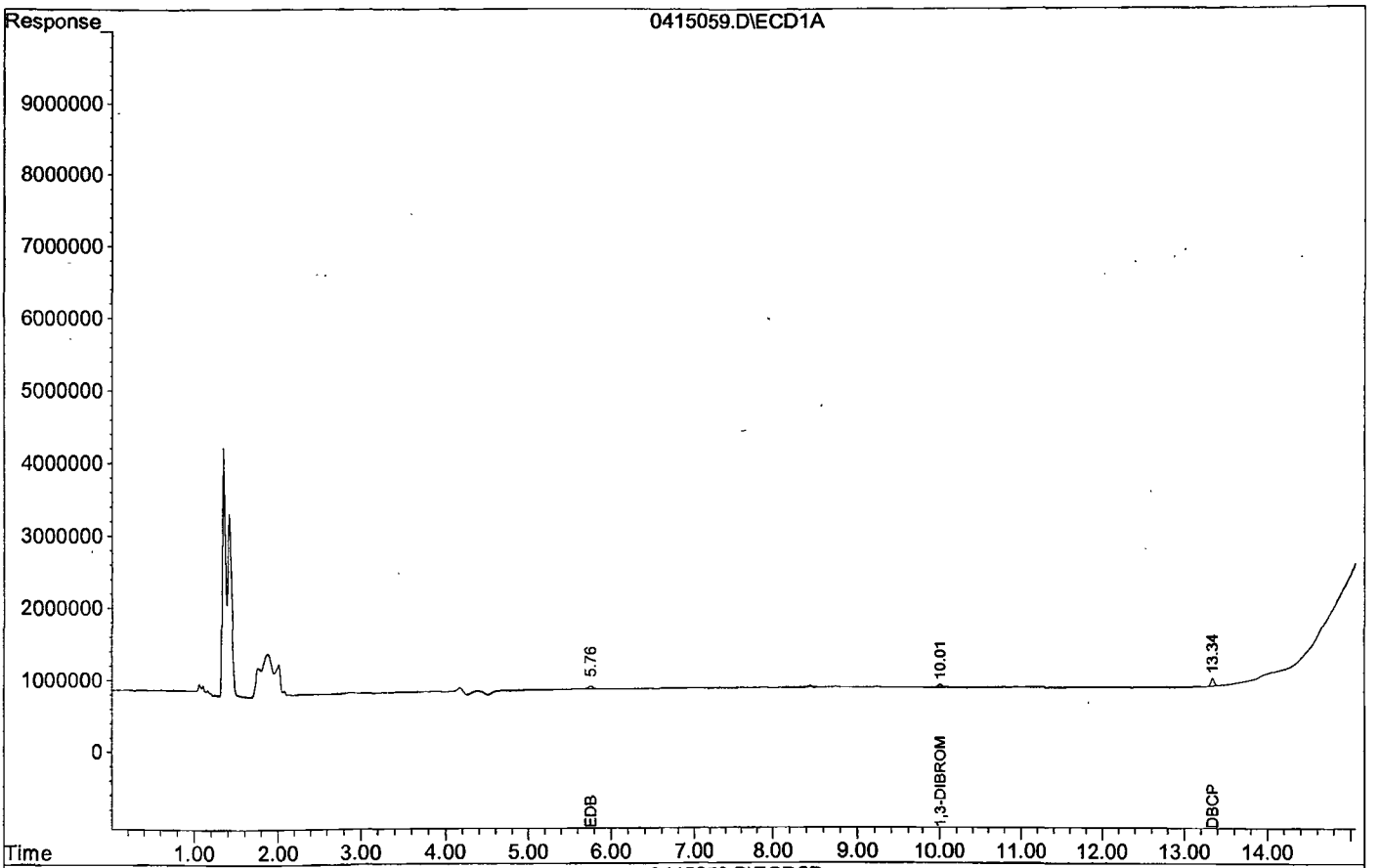
Target Compounds

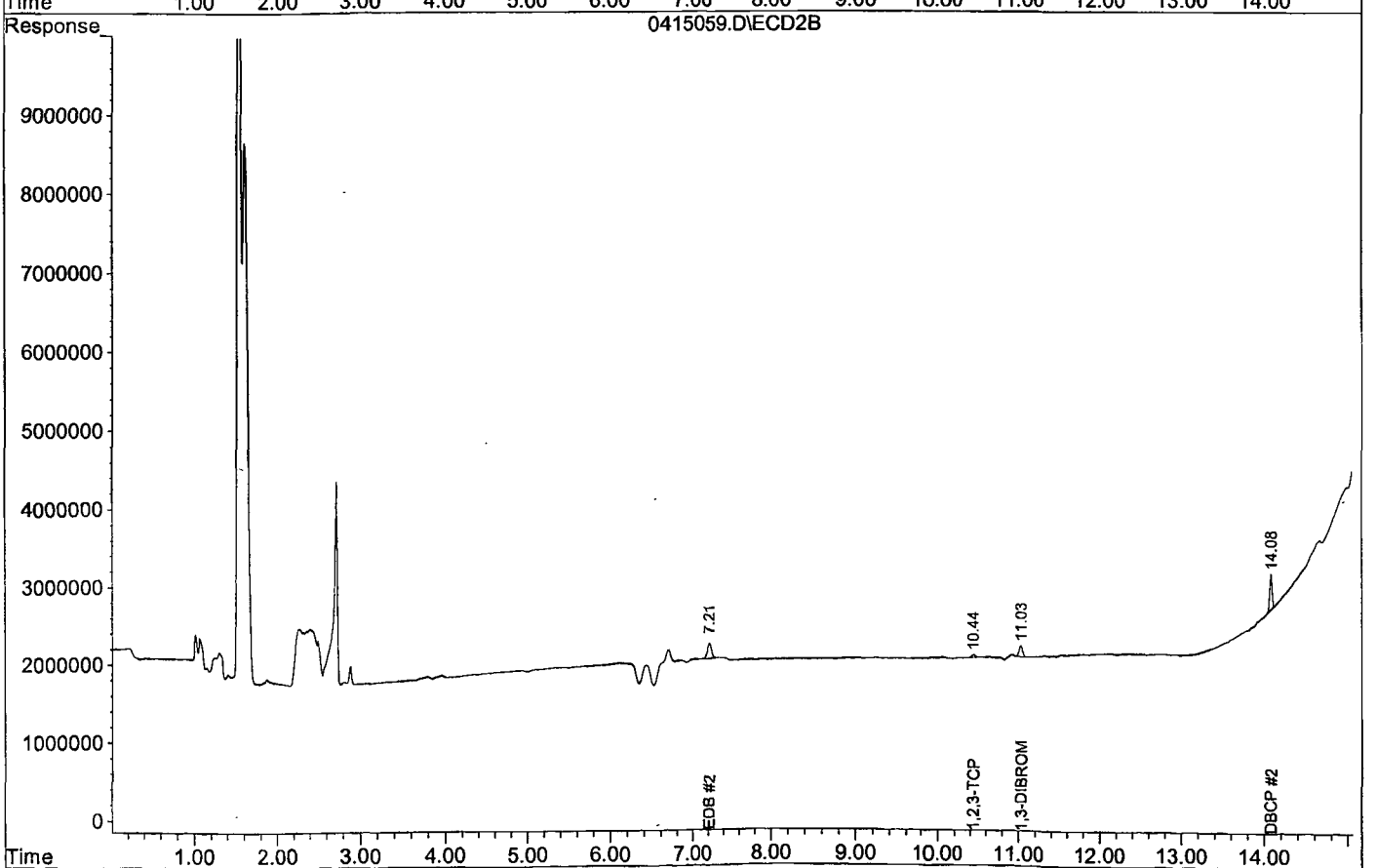
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415059.D
Acq On : 04-27-20 13:33:12
Sample : 8011-1 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 59
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415060.D\ECD1A.CH Vial: 60
Signal #2 : G:\HERBIE\DATA\200415\0415060.D\ECD2B.CH
Acq On : 04-27-20 13:53:33 Operator: SS
Sample : 8011-2 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	186125	662190	0.110	0.108
Spiked Amount	0.350			Recovery	=	31.43%	30.86%
	Target Compounds						
1) TM	EDB	5.76	7.22	179970	901746	0.107	0.106
2) TM	1,2,3-TCP	9.24	10.44	41453	163130	0.105	0.108
4) TM	DBCP	13.34	14.08	497432	2258016	0.102	0.098

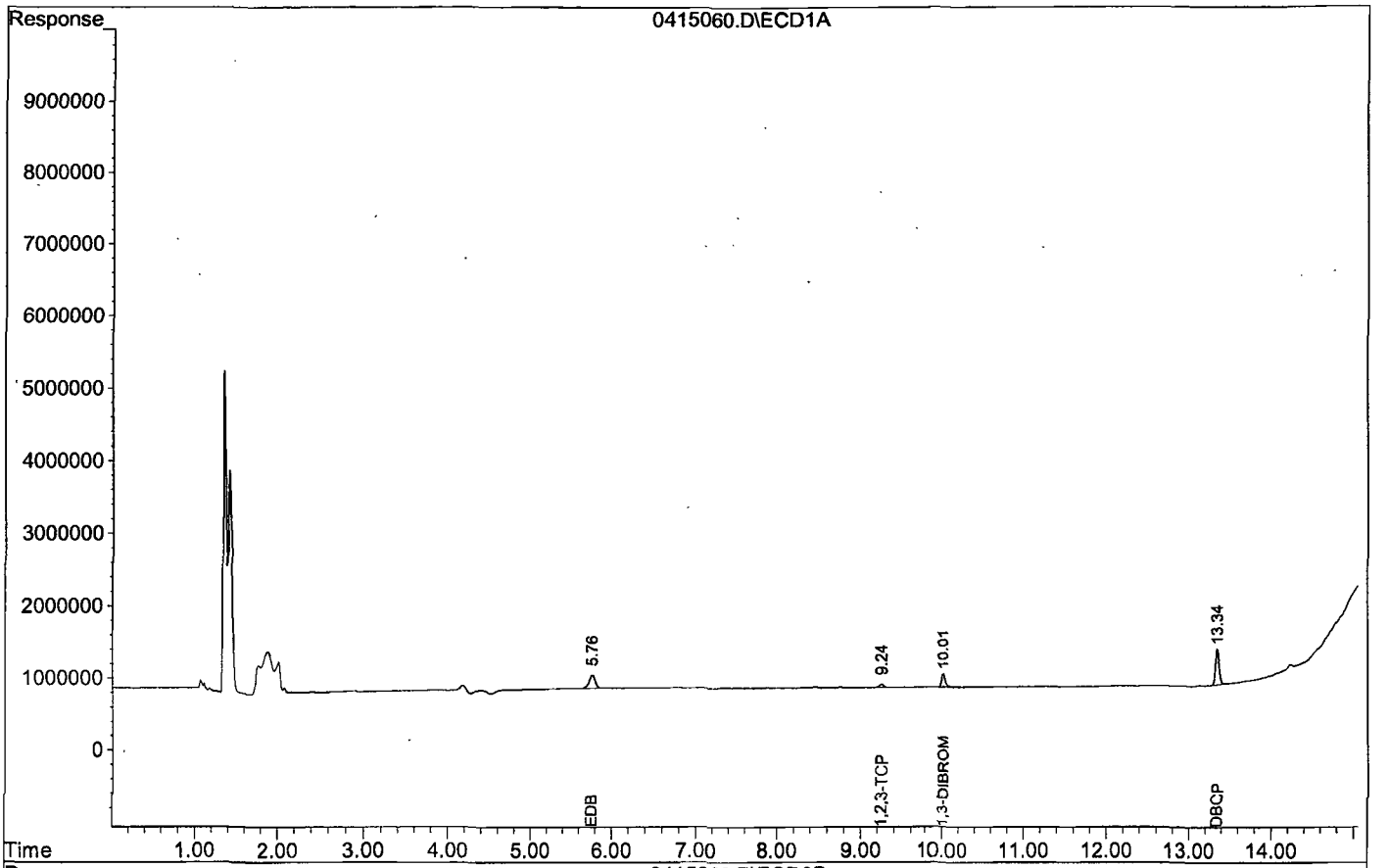
Target Compounds

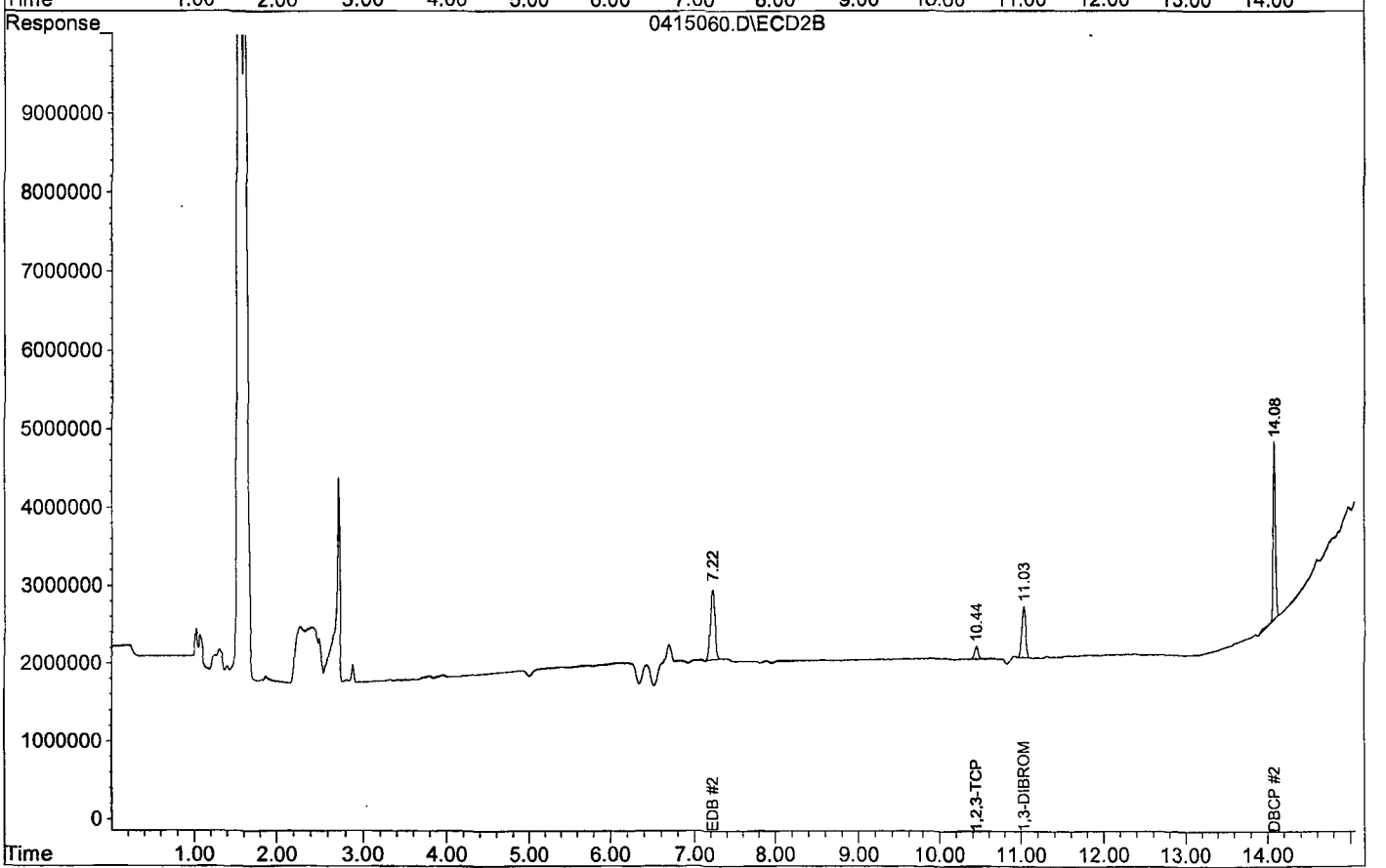
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415060.D
Acq On : 04-27-20 13:53:33
Sample : 8011-2 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 60
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415061.D\ECD1A.CH Vial: 61
Signal #2 : G:\HERBIE\DATA\200415\0415061.D\ECD2B.CH
Acq On : 04-27-20 14:14:01 Operator: SS
Sample : 8011-3 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	420792	1576860	0.249	0.256
Spiked Amount	0.350			Recovery	=	71.14%	73.14%
	Target Compounds						
1) TM	EDB	5.76	7.22	417433	2109102	0.248	0.248
2) TM	1,2,3-TCP	9.24	10.45	99274	386746	0.269	0.256
4) TM	DBCP	13.34	14.08	1240698	5645089	0.253	0.246

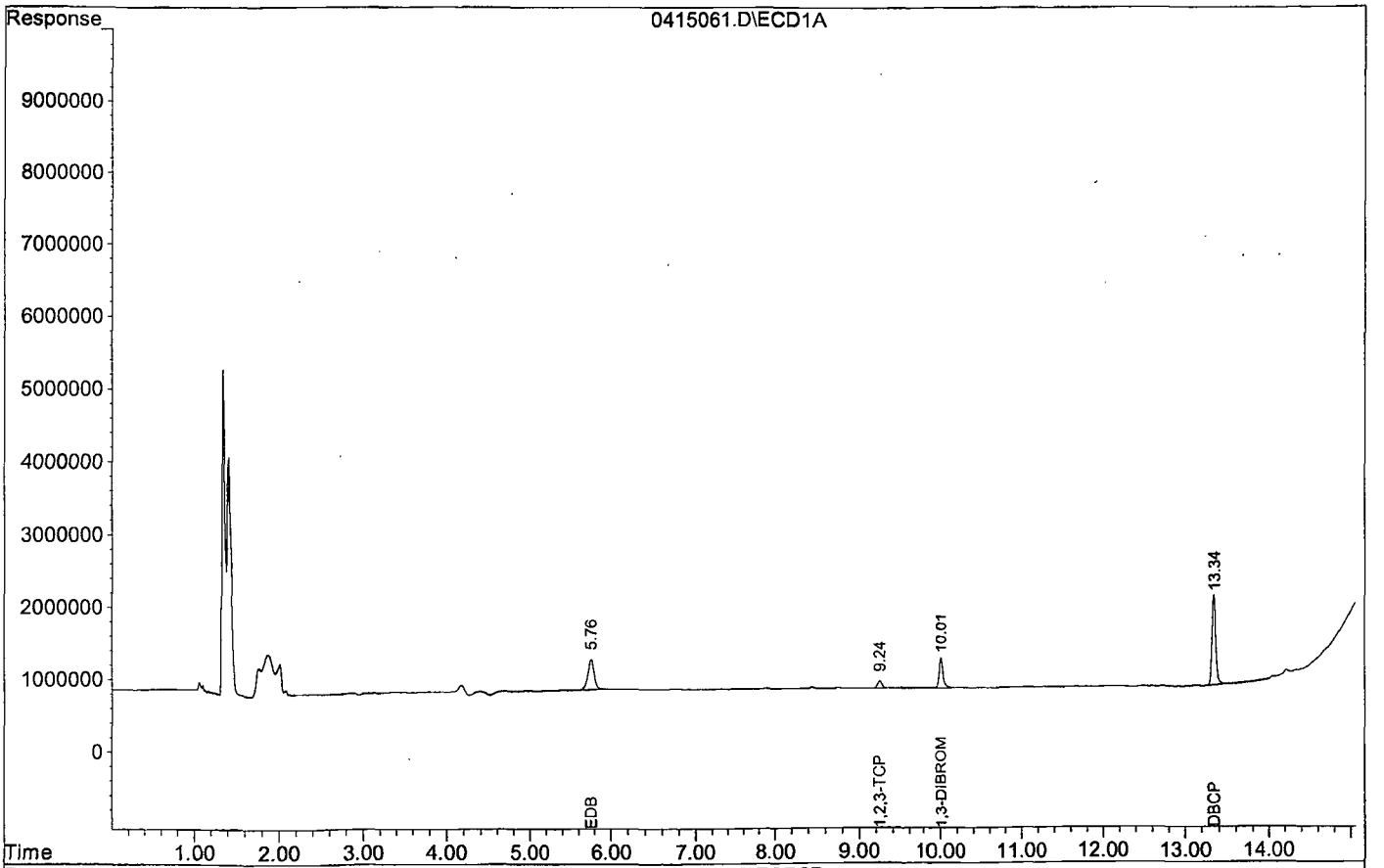
Target Compounds

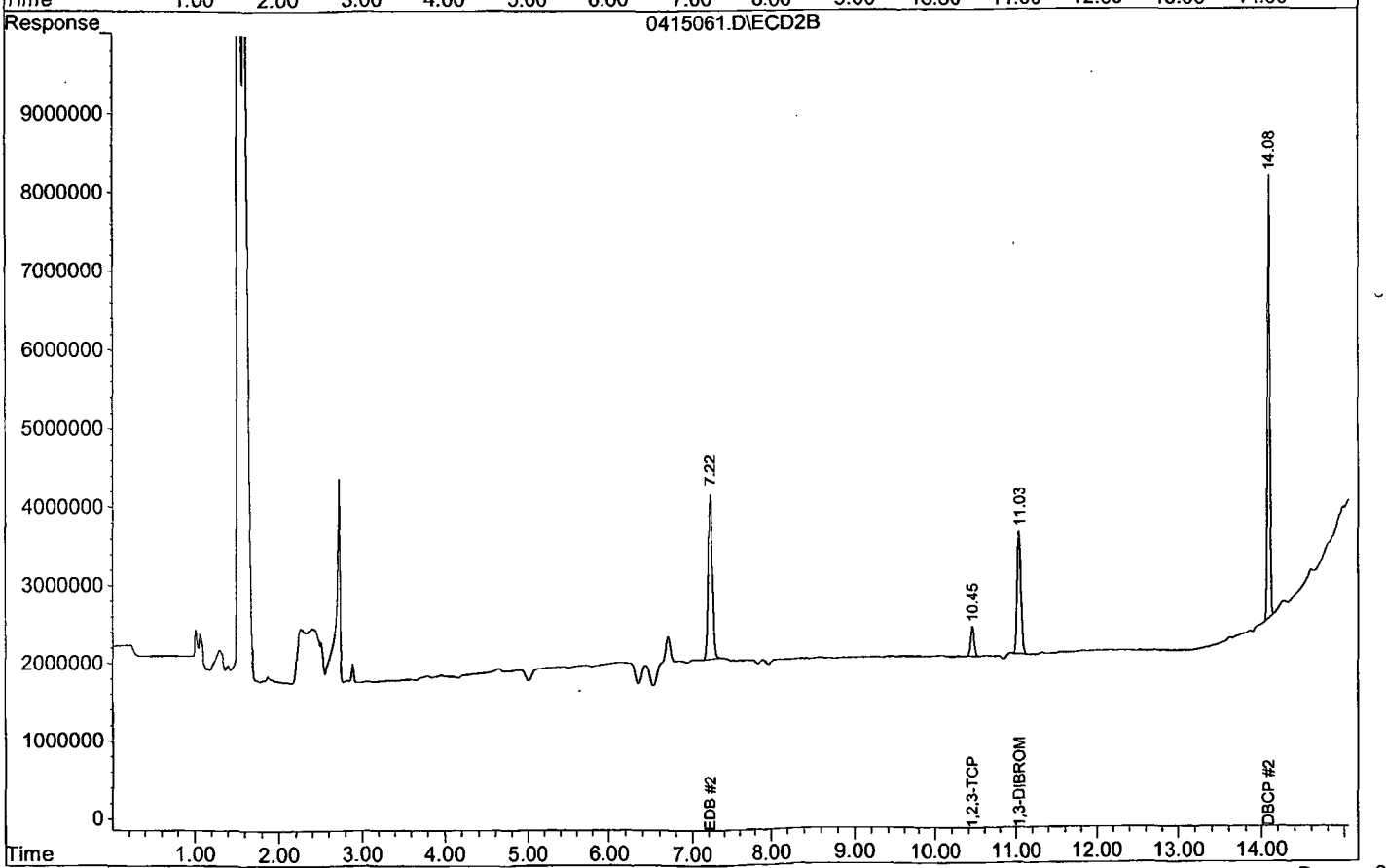
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415061.D
Acq On : 04-27-20 14:14:01
Sample : 8011-3 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 61
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415062.D\ECD1A.CH Vial: 62
Signal #2 : G:\HERBIE\DATA\200415\0415062.D\ECD2B.CH
Acq On : 04-27-20 14:34:31 Operator: SS
Sample : 8011-4 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	804786	3001657	0.475	0.488
Spiked Amount	0.350			Recovery	=	135.71%	139.43%
	Target Compounds						
1) TM	EDB	5.76	7.22	818853	4123172	0.487	0.485
2) TM	1,2,3-TCP	9.24	10.45	185496	736561	0.514	0.488
4) TM	DBCP	13.34	14.08	2394301	11781011	0.489	0.513

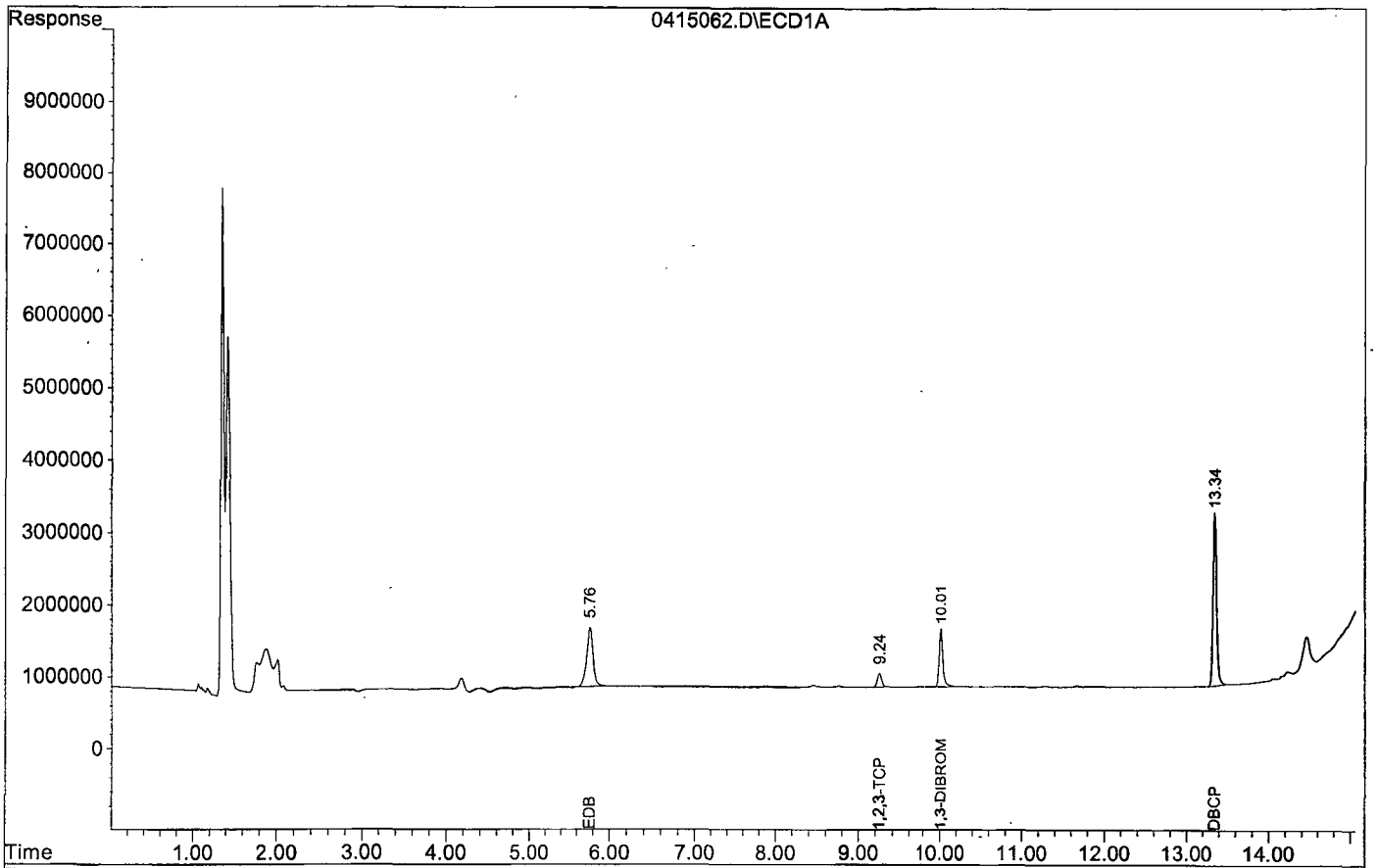
Target Compounds

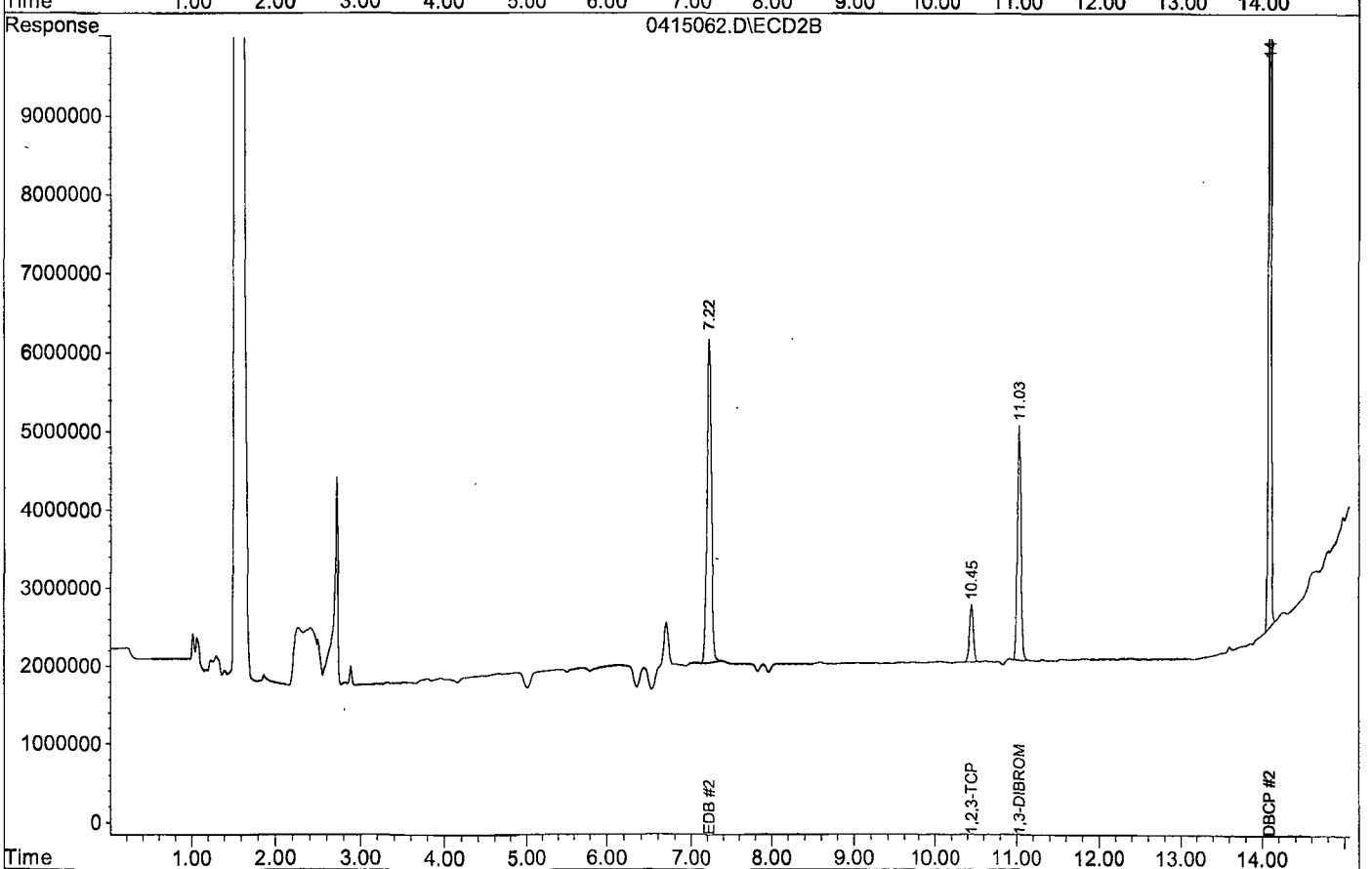
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415062.D
Acq On : 04-27-20 14:34:31
Sample : 8011-4 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 62
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415063.D\ECD1A.CH Vial: 63
Signal #2 : G:\HERBIE\DATA\200415\0415063.D\ECD2B.CH
Acq On : 04-27-20 14:54:56 Operator: SS
Sample : 8011-5 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	1129051	4056863	0.667	0.659
Spiked Amount	0.350			Recovery	=	190.57%	188.29%
	Target Compounds						
1) TM	EDB	5.76	7.22	1138964	5851359	0.677	0.689
2) TM	1,2,3-TCP	9.24	10.44	270694	1004712	0.756	0.665
4) TM	DBCP	13.34	14.08	3387909	16983342	0.691	0.740

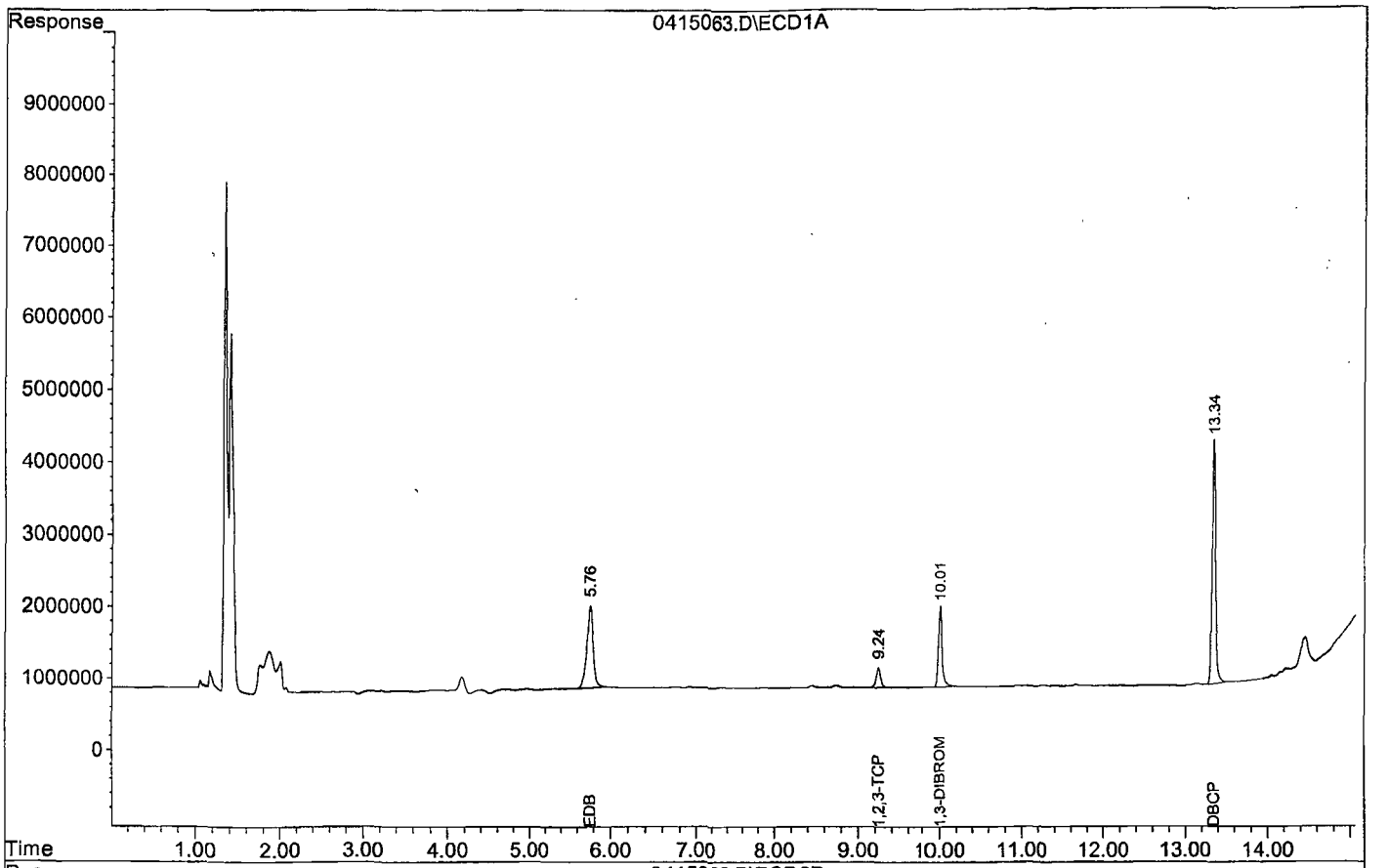
Target Compounds

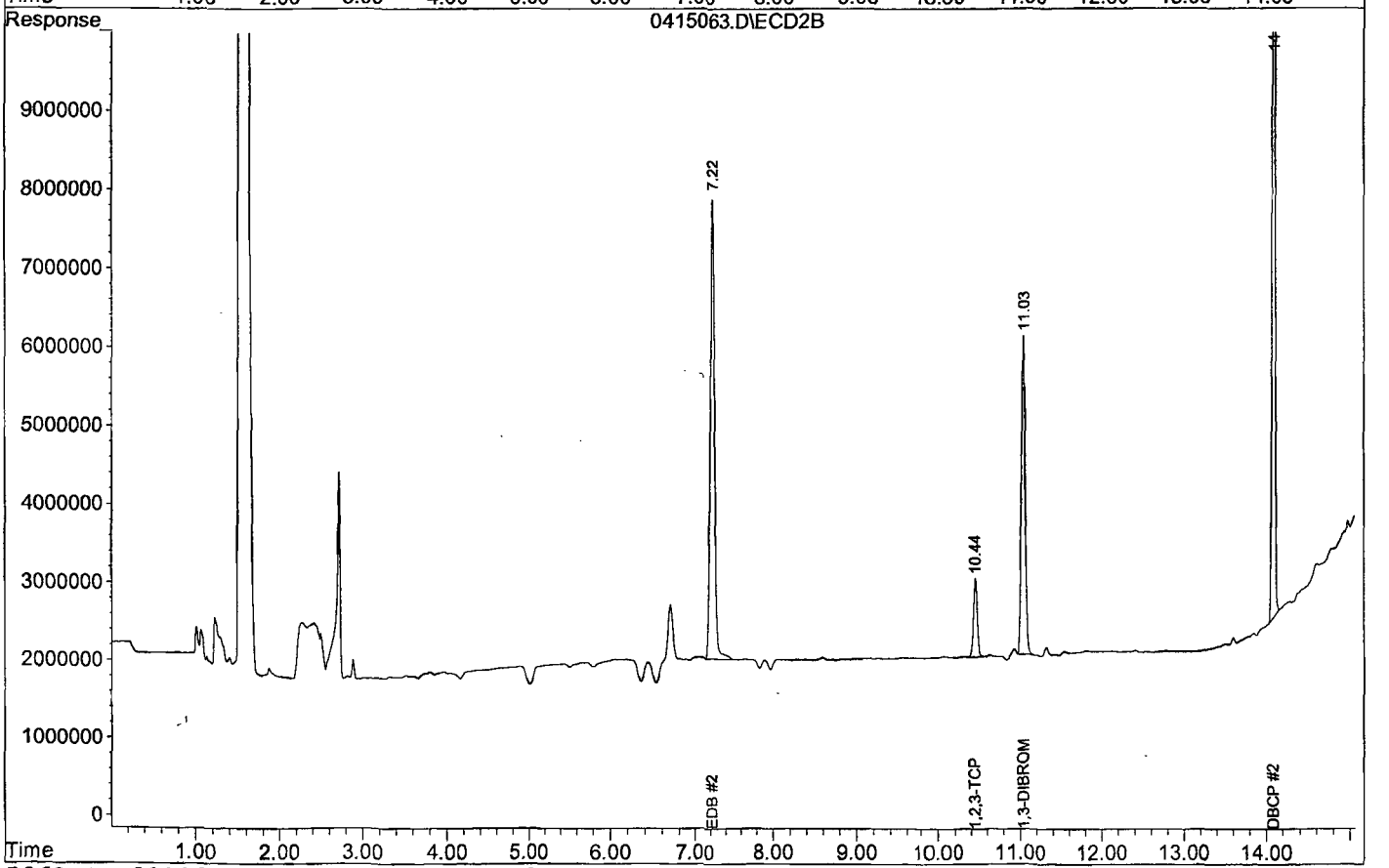
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415063.D
Acq On : 04-27-20 14:54:56
Sample : 8011-5 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 63
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415064.D\ECD1A.CH Vial: 64
Signal #2 : G:\HERBIE\DATA\200415\0415064.D\ECD2B.CH
Acq On : 04-27-20 15:15:22 Operator: SS
Sample : 8011-6 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

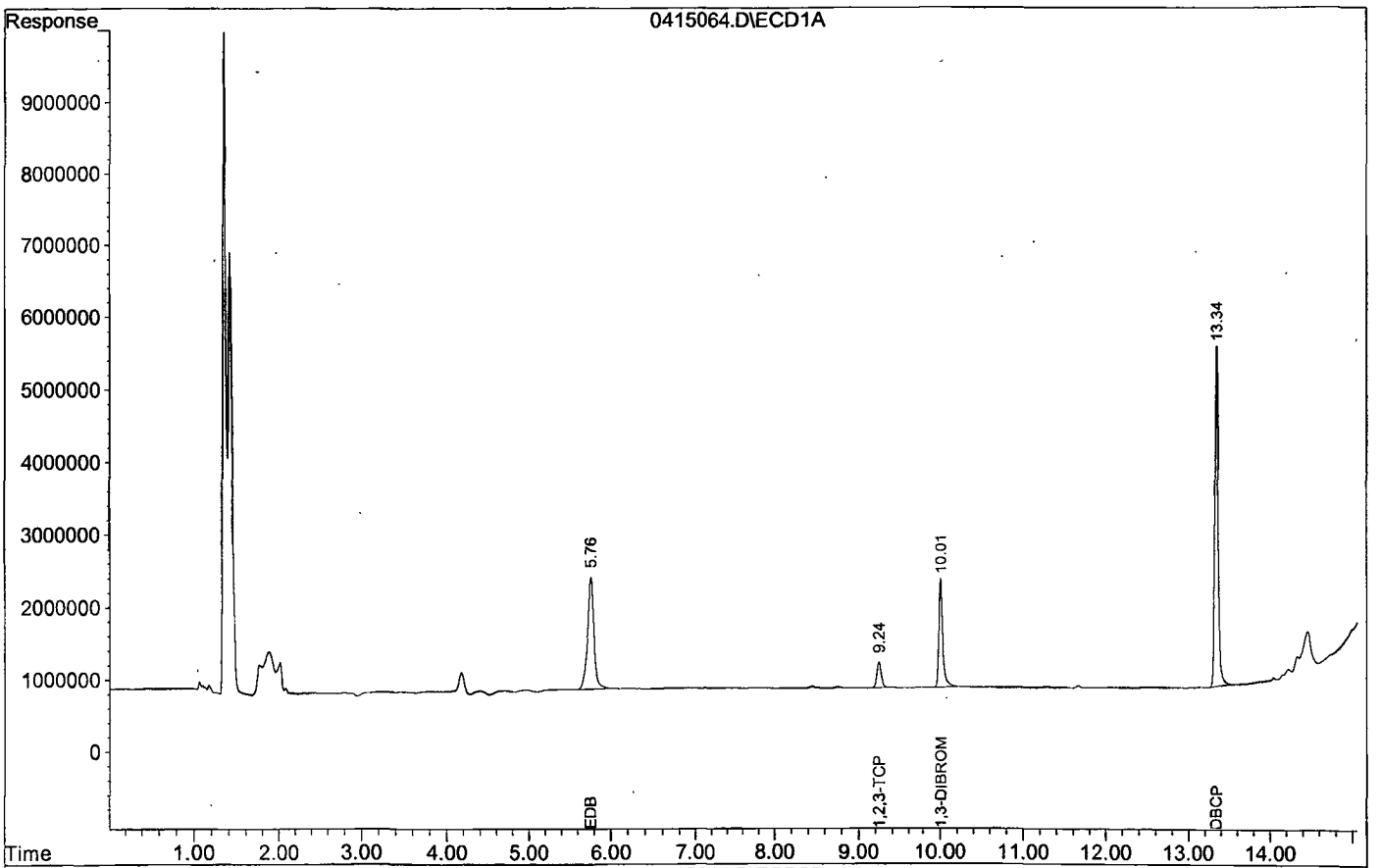
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	1495575	5620180	0.883	0.913
	Spiked Amount 0.350			Recovery	=	252.29%	260.86%
	Target Compounds						
1) TM	EDB	5.76	7.22	1542407	7954165	0.917	0.936
2) TM	1,2,3-TCP	9.24	10.44	351213	1351071	0.984	0.895
4) TM	DBCP	13.34	14.08	4684830	23749854	0.956	1.035
	Target Compounds						

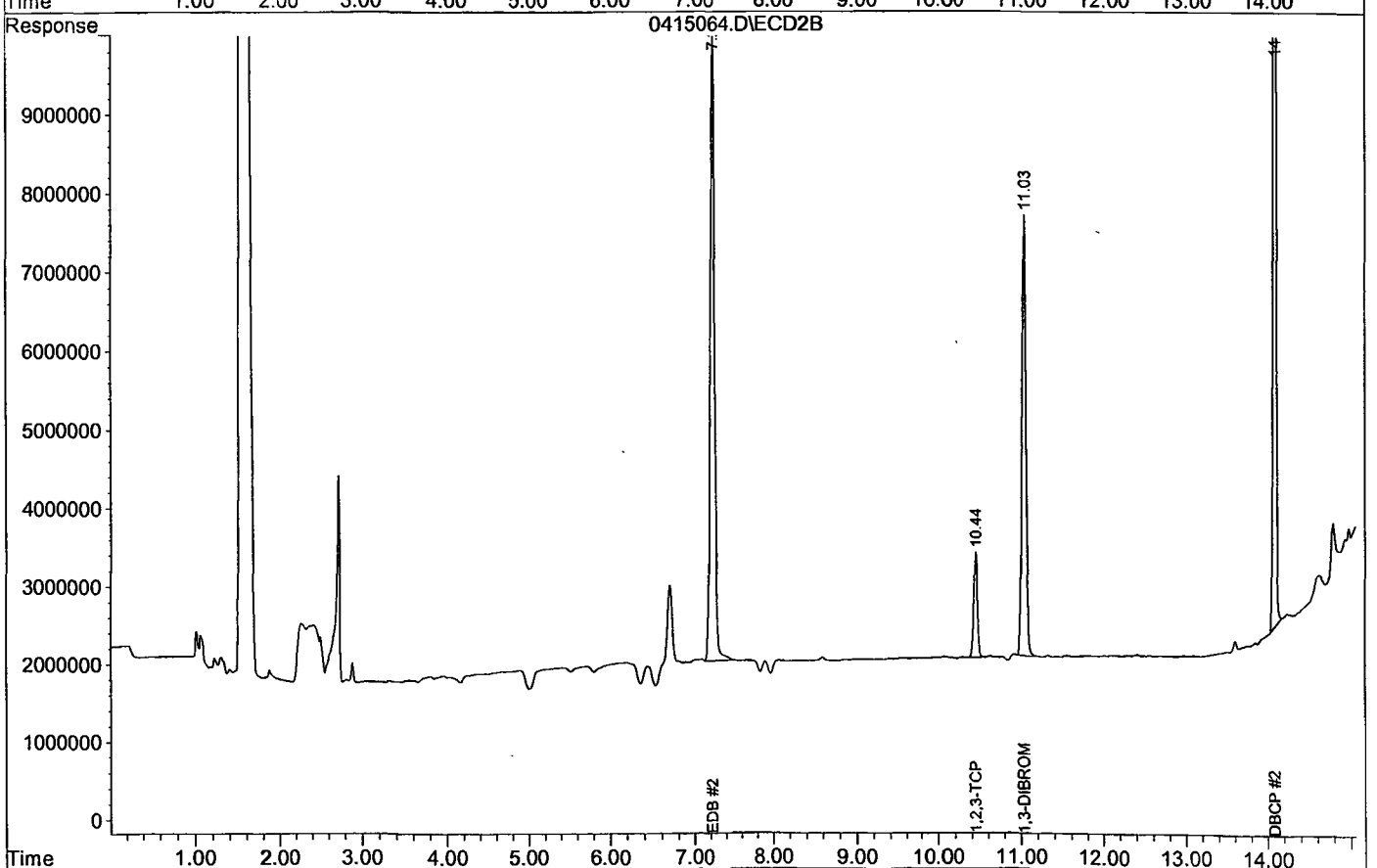
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415064.D
Acq On : 04-27-20 15:15:22
Sample : 8011-6 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 64
Operator: SS
Inst : Herbie
Multiplr: 1.00





DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 04/28/20
Instrument: Herbie
Initial Cal. Date: 04/27/20
Data File: 0415089.D

		Compound	MEAN	CCRF	%D	%Drift		
1	TM	EDB	840726	993645	18	TM		
2	TML	1,2,3-TCP	163959	248460	52	TML	29	*nt
3	TM	DBCP	2449980	3127230	28	TM		*nt
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
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32								
33								
34								
35								
36								
37								
38								
39								
40								
		Average			32.7			

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 04/28/20
Instrument: Herbie
Cal. Date: 04/27/20
Data File: 0415089.D

		Compound	MEAN	CCRF	%D	%Drift		
41	TM	EDB	4248570	5068940	19	TM		
42	TM	1,2,3-TCP	755149	979365	30	TM		*nt
43	TM	DBCP	11478800	13030500	14	TM		
44								
45								
46								
47								
48								
49								
50								
51								
52								
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72								
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75								
76								
77								
78								
79								
80								
		Average			21.0			

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415089.D\ECD1A.CH Vial: 89
Signal #2 : G:\HERBIE\DATA\200415\0415089.D\ECD2B.CH
Acq On : 04-28-20 8:29:21 Operator: SS
Sample : 8011-SS Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 28 9:03 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L	
	System Monitoring Compounds							
3) S	1,3-DIBROMOPROPA	9.97	0.00	1257	0	0.001	N.D.	#
Spiked Amount	0.350			Recovery	=	0.29%	0.00%	
	Target Compounds							
1) TM	EDB	5.76	7.22	198729	1013788	0.118	0.119	
2) TM	1,2,3-TCP	9.24	10.45	49692	195873	0.129	0.130	
4) TM	DBCP	13.34	14.08	625445	2606099	0.128	0.114	

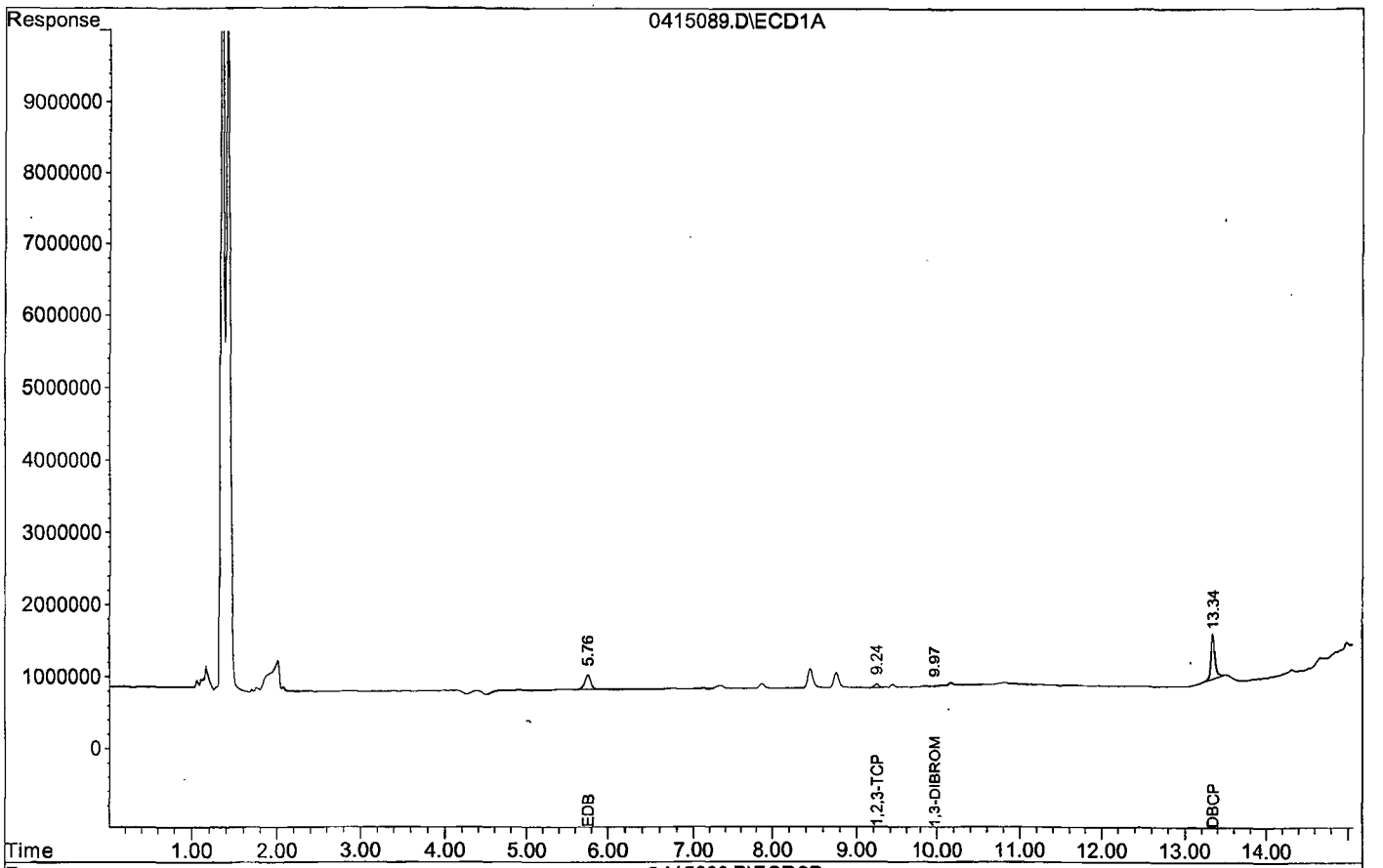
Target Compounds

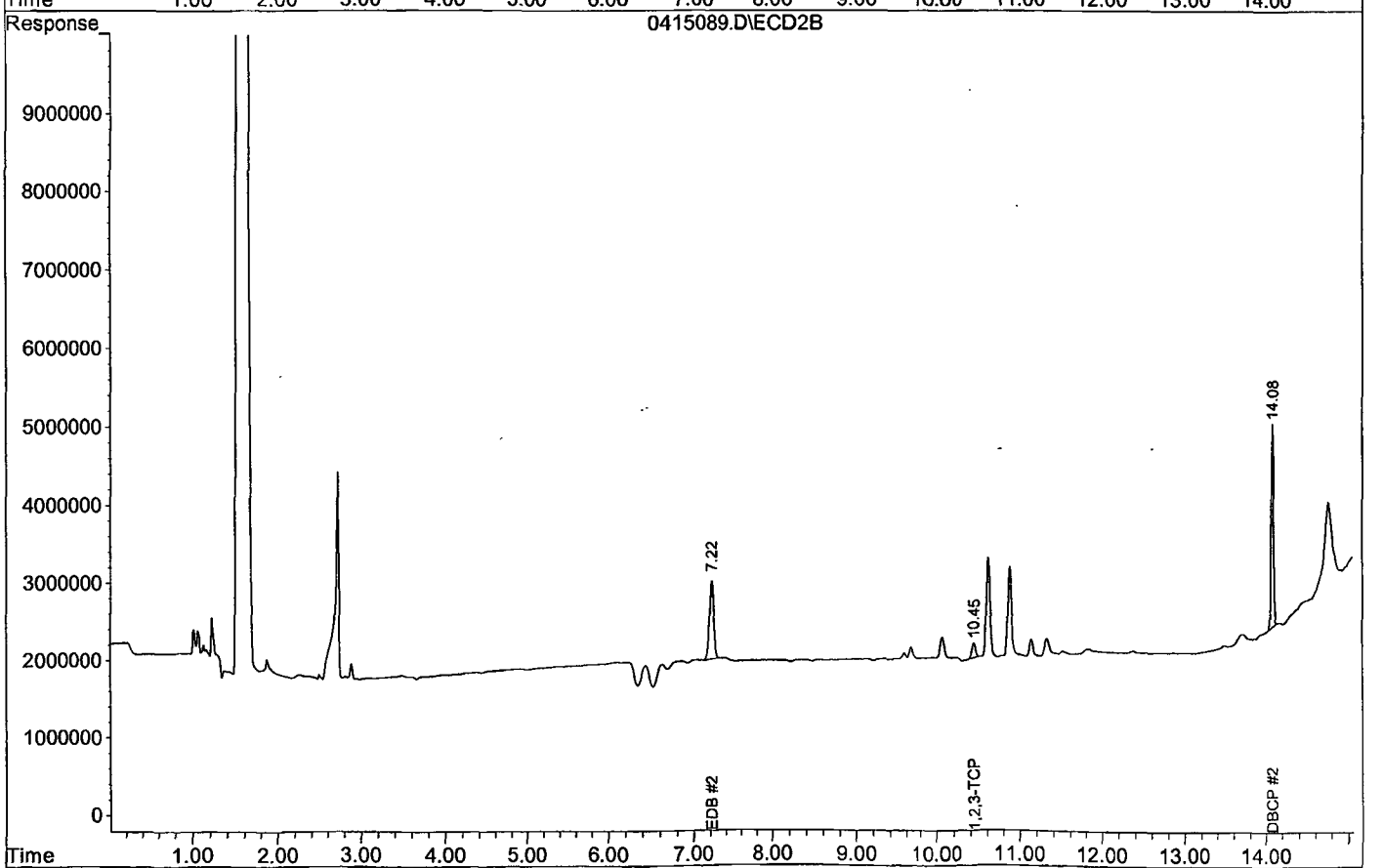
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415089.D
Acq On : 04-28-20 8:29:21
Sample : 8011-SS
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 89
Operator: SS
Inst : Herbie
Multiplr: 1.00





DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Herbie
Initial Cal. Date: 04/27/20
Data File: 0430018.D

		Compound	MEAN	CCRF	%D		%Drift
1	TM	EDB	840726	823328	2.1	TM	
2	TML	1,2,3-TCP	163959	193770	18	TML	5.0
3	S	1,3-DIBROMOPROPANE(S)	846576	830958	1.8	S	
4	TM	DBCP	2449980	2415410	1.4	TM	
5							
6							
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35							
36							
37							
38							
39							
40							
		Average			5.8		

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Herbie
Cal. Date: 04/27/20
Data File: 0430018.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	EDB	4248570	4162230	2.0	TM	
42	TM	1,2,3-TCP	755149	740052	2.0	TM	
43	S	1,3-DIBROMOPROPANE(S)	3076350	2989390	2.8	S	
44	TM	DBCP	11478800	10431100	9.1	TM	
45							
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80							
		Average			4.0		

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430018.D\ECD1A.CH Vial: 18
Signal #2 : G:\HERBIE\DATA\200430\0430018.D\ECD2B.CH
Acq On : 05-04-20 10:31:10 Operator: SS/LP
Sample : 8011-3 CCV 05/04/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:51 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	415479	1494694	0.245	0.243
Spiked Amount	0.350			Recovery	=	70.00%	69.43%
	Target Compounds						
1) TM	EDB	5.76	7.22	411664	2081116	0.245	0.245
2) TM	1,2,3-TCP	9.24	10.44	96885	370026	0.263	0.245
4) TM	DBCP	13.34	14.08	1207706	5215541	0.246	0.227

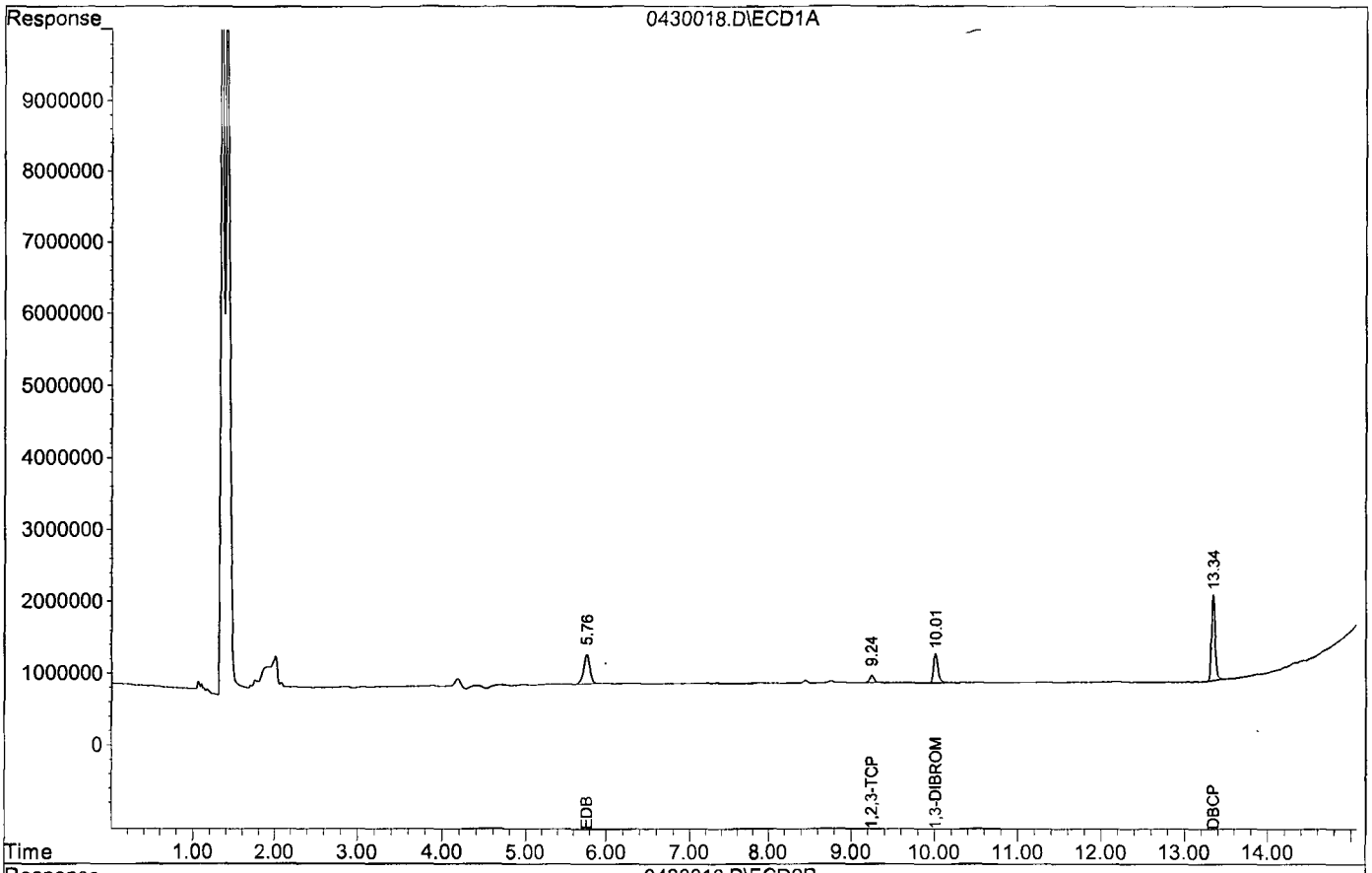
Target Compounds

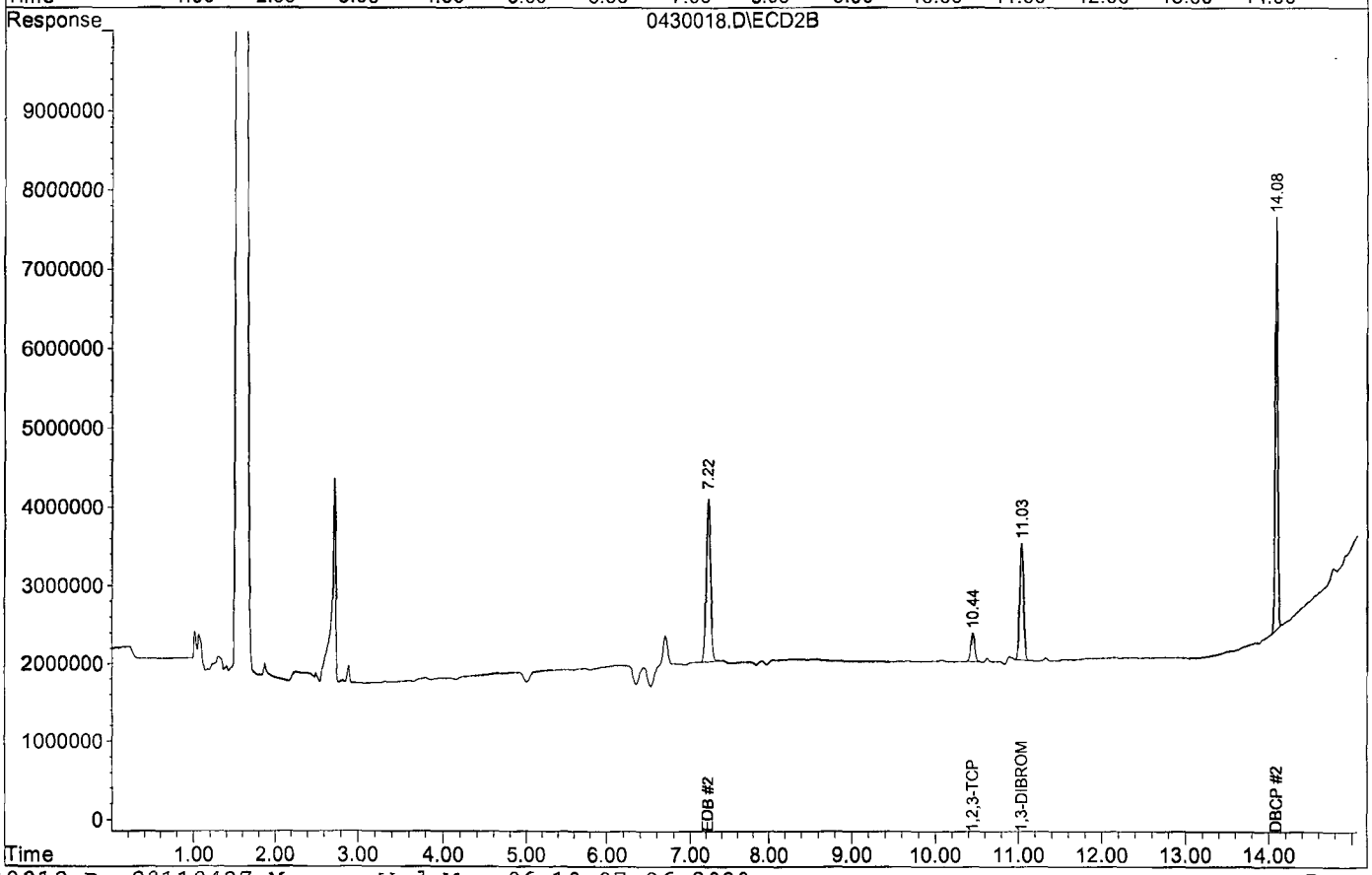
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430018.D
Acq On : 05-04-20 10:31:10
Sample : 8011-3 CCV 05/04/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 18
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Herbie
Initial Cal. Date: 04/27/20
Data File: 0430027.D

		Compound	MEAN	CCRF	%D	%Drift	
1	TM	EDB	840726	809166	3.8	TM	
2	TML	1,2,3-TCP	163959	188900	15	TML	2.3
3	S	1,3-DIBROMOPROPANE(S)	846576	832244	1.7	S	
4	TM	DBCP	2449980	2448980	0.04	TM	
5							
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35							
36							
37							
38							
39							
40							
		Average			5.1		

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Herbie
Cal. Date: 04/27/20
Data File: 0430027.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	EDB	4248570	4036930	5.0	TM	
42	TM	1,2,3-TCP	755149	735746	2.6	TM	
43	S	1,3-DIBROMOPROPANE(S)	3076350	3057940	0.60	S	
44	TM	DBCP	11478800	11778300	2.6	TM	
45							
46							
47							
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75							
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78							
79							
80							
		Average			2.7		

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430027.D\ECD1A.CH Vial: 27
Signal #2 : G:\HERBIE\DATA\200430\0430027.D\ECD2B.CH
Acq On : 05-04-20 16:48:22 Operator: SS/LP
Sample : 8011-3 CCV 05/04/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:52 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3)	S 1,3-DIBROMOPROPA	10.01	11.03	416122	1528971	0.246	0.249
	Spiked Amount 0.350			Recovery =		70.29%	71.14%
	Target Compounds						
1)	TM EDB	5.76	7.22	404583	2018465	0.241	0.238
2)	TM 1,2,3-TCP	9.24	10.44	94450	367873	0.256	0.244
4)	TM DBCP	13.34	14.08	1224492	5889146	0.250	0.257

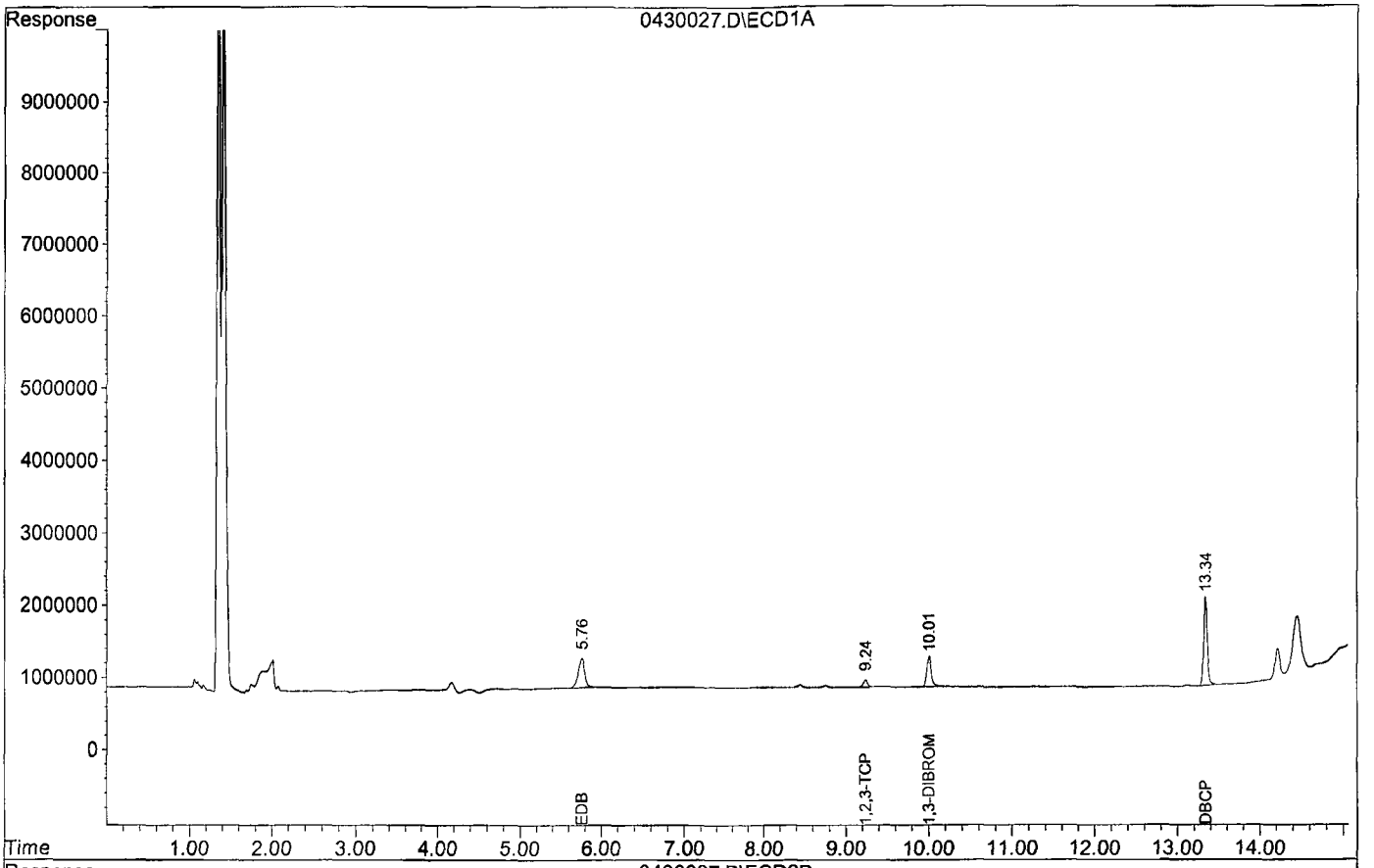
Target Compounds

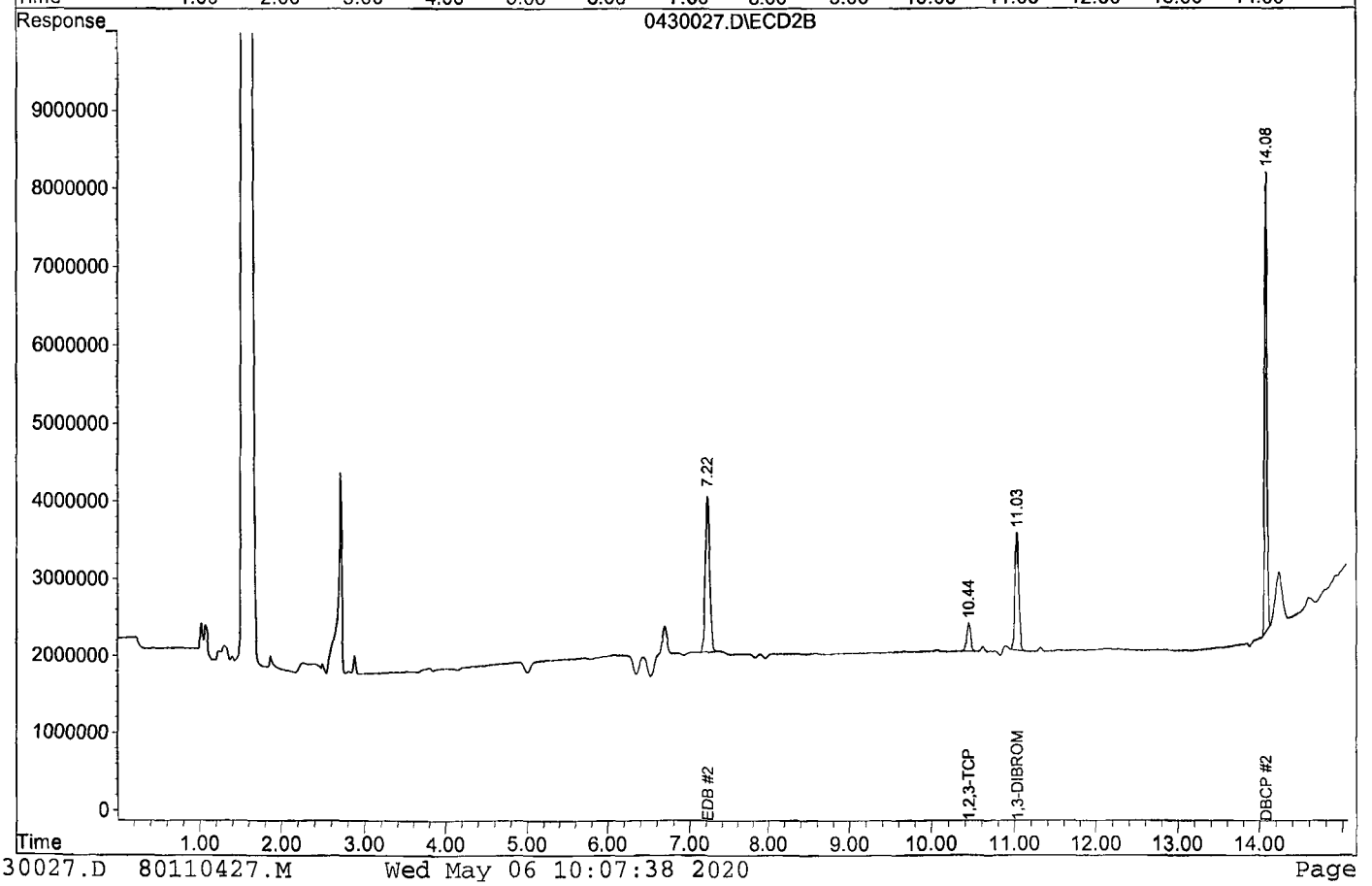
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430027.D
Acq On : 05-04-20 16:48:22
Sample : 8011-3 CCV 05/04/20
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 27
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430022.D\ECD1A.CH Vial: 22
Signal #2 : G:\HERBIE\DATA\200430\0430022.D\ECD2B.CH
Acq On : 05-04-20 15:06:12 Operator: SS/LP
Sample : BA10438W06 2/35.92 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:54 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

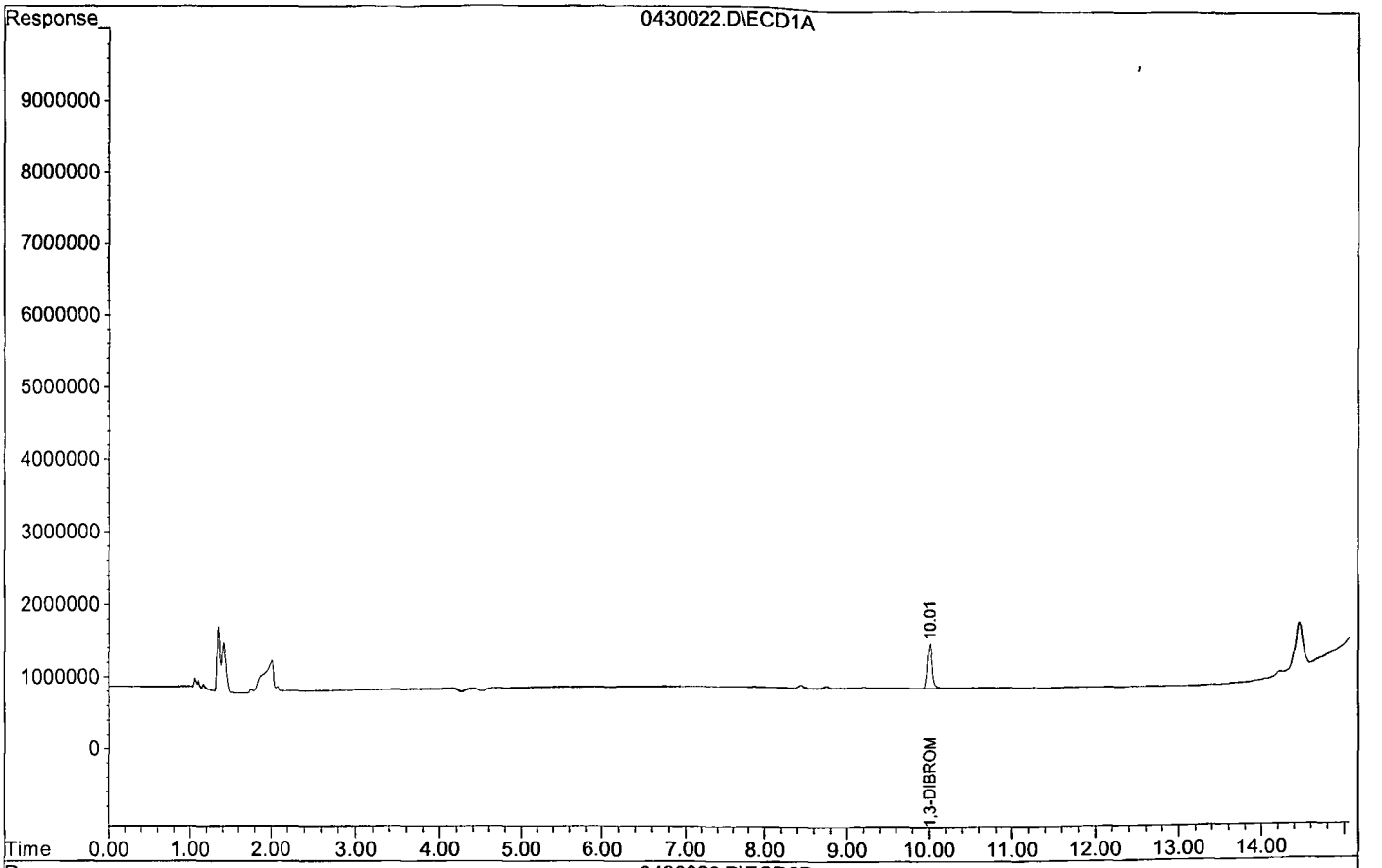
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	607188	2254607	0.359	0.366
Spiked Amount	0.350			Recovery	=	102.57%	104.57%
	Target Compounds						
	Target Compounds						
1) TM	EDB	0.00	0.00	0	0	N.D. d	N.D. d
2) TM	1,2,3-TCP	0.00	0.00	0	0	N.D. d	N.D. d
4) TM	DBCP	0.00	0.00	0	0	N.D. d	N.D. d

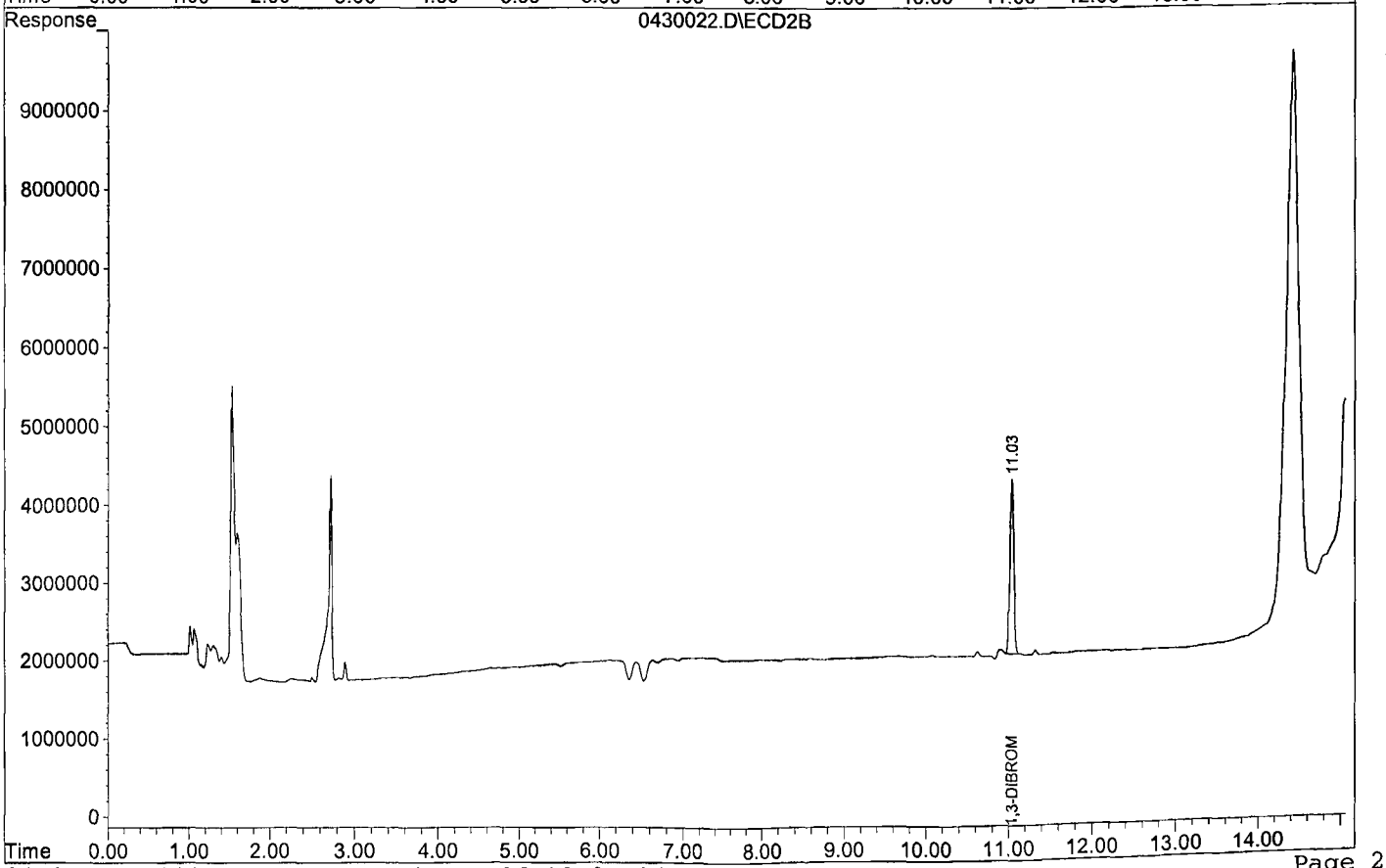
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430022.D
Acq On : 05-04-20 15:06:12
Sample : BA10438W06 2/35.92
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 22
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430023.D\ECD1A.CH Vial: 23
Signal #2 : G:\HERBIE\DATA\200430\0430023.D\ECD2B.CH
Acq On : 05-04-20 15:26:36 Operator: SS/LP
Sample : BA10439W07 2/35.47 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:53 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

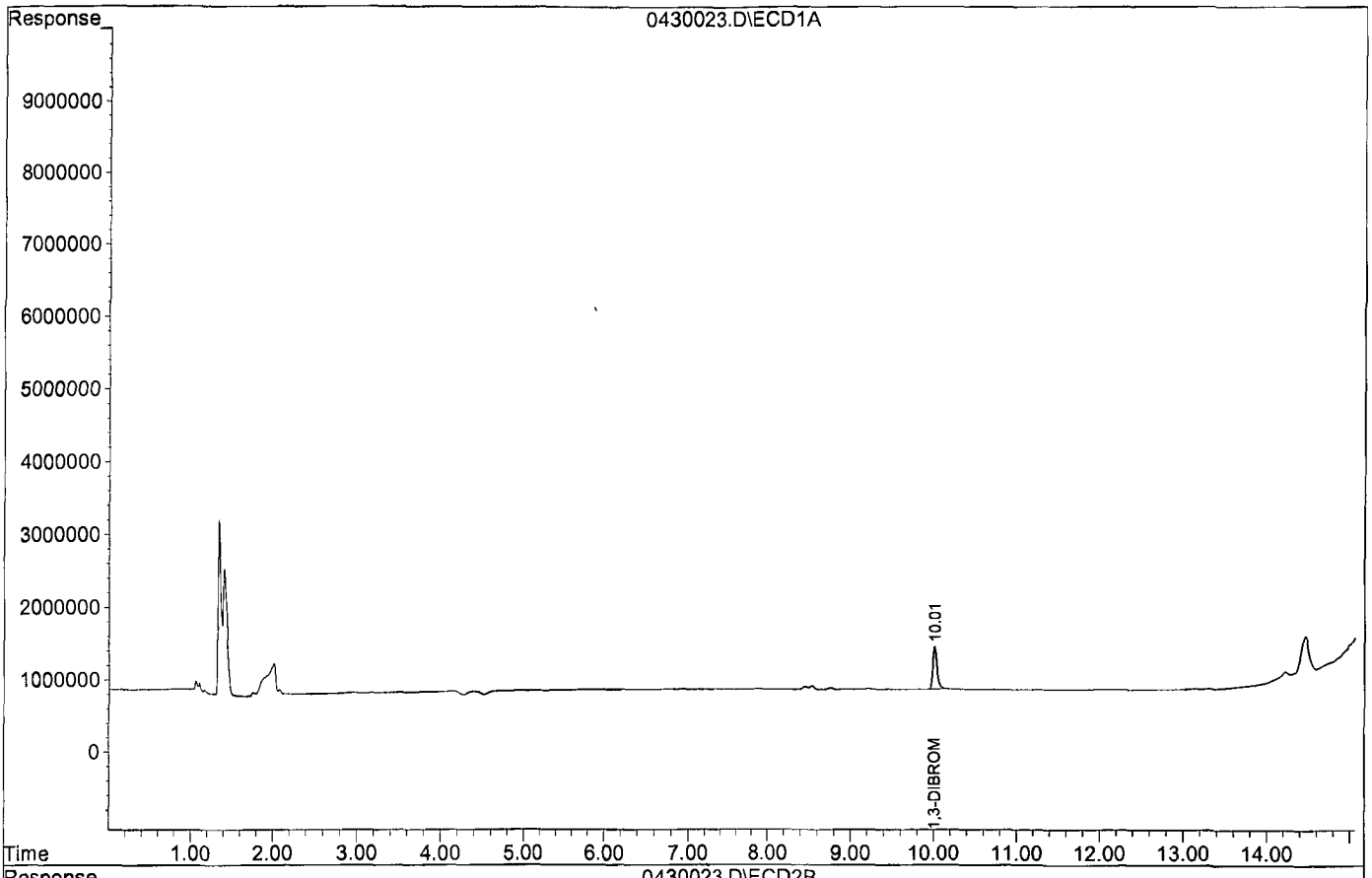
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	588186	2224494	0.347	0.362
Spiked Amount	0.350			Recovery	=	99.14%	103.43%
	Target Compounds						
	Target Compounds						
1) TM	EDB	0.00	0.00	0	0	N.D. d	N.D. d
2) TM	1,2,3-TCP	0.00	0.00	0	0	N.D. d	N.D. d
4) TM	DBCP	0.00	0.00	0	0	N.D. d	N.D. d

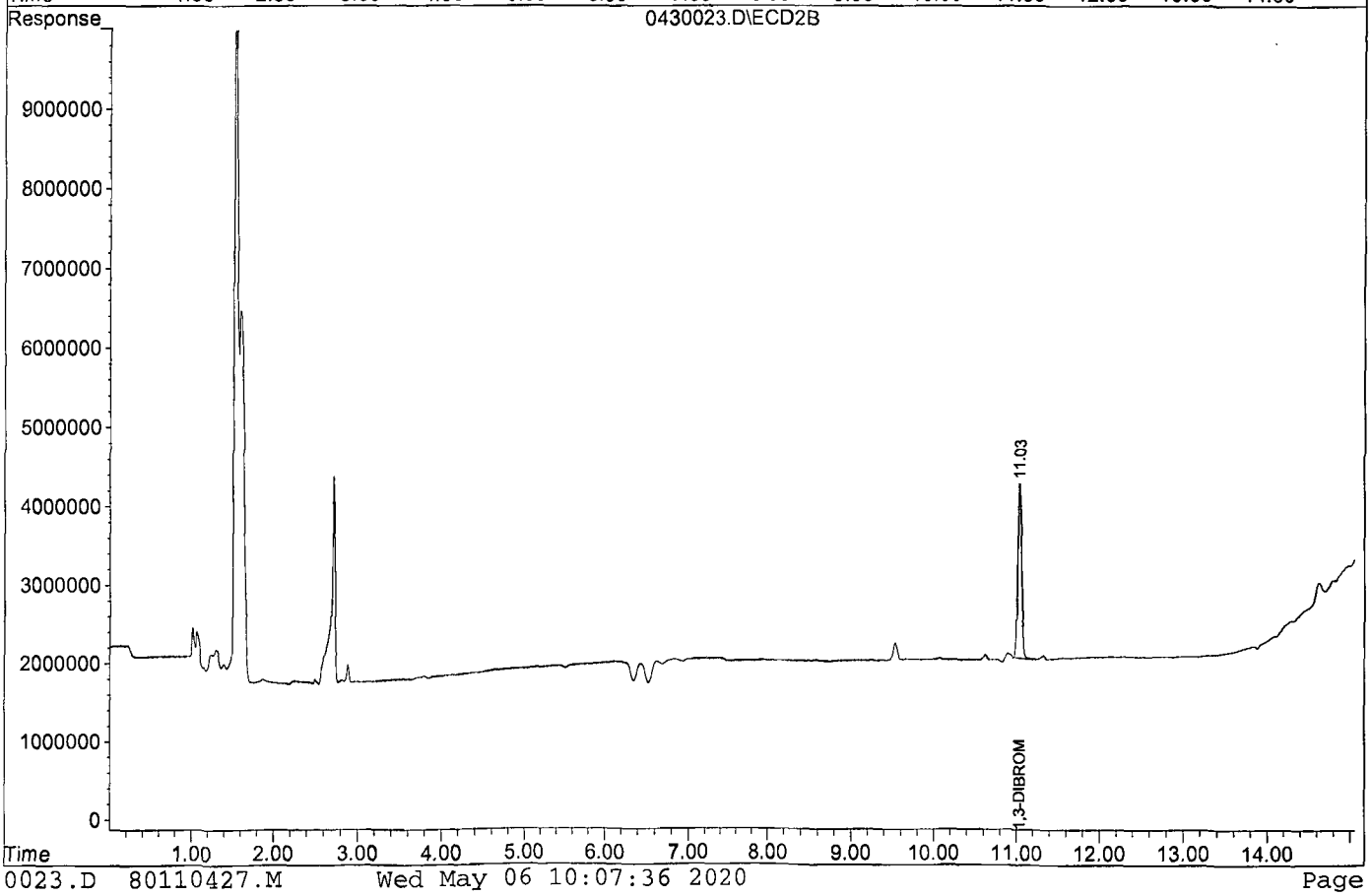
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430023.D
Acq On : 05-04-20 15:26:36
Sample : BA10439W07 2/35.47
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 23
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430019.D\ECD1A.CH Vial: 19
Signal #2 : G:\HERBIE\DATA\200430\0430019.D\ECD2B.CH
Acq On : 05-04-20 14:05:04 Operator: SS/LP
Sample : 200504A BLK 2/35.69 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:54 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

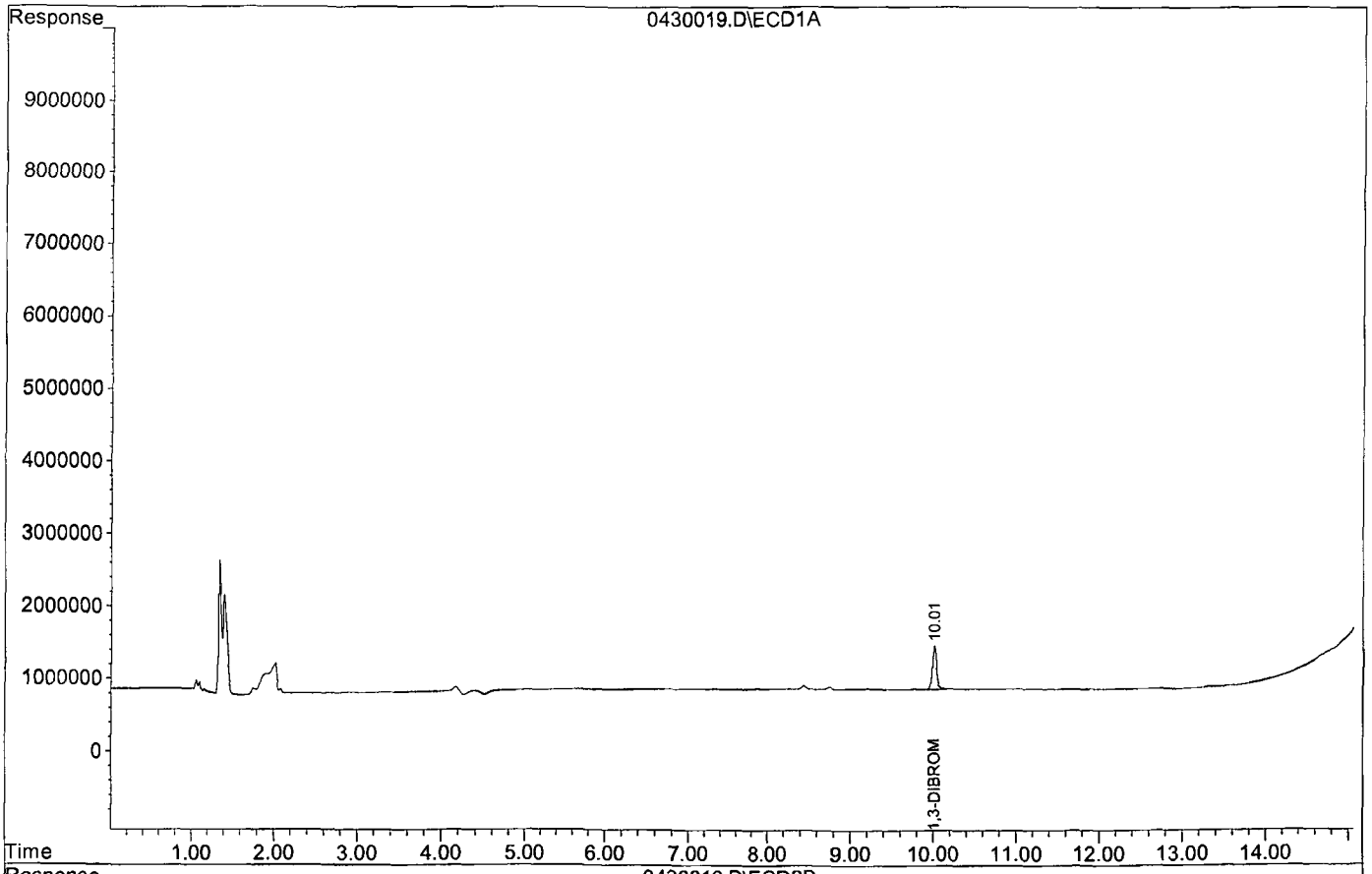
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	600504	2203117	0.355	0.358
Spiked Amount	0.350			Recovery	=	101.43%	102.29%
	Target Compounds						
	Target Compounds						
1) TM	EDB	0.00	0.00	0	0	N.D. d	N.D. d
2) TM	1,2,3-TCP	0.00	0.00	0	0	N.D. d	N.D. d
4) TM	DBCP	0.00	0.00	0	0	N.D. d	N.D. d

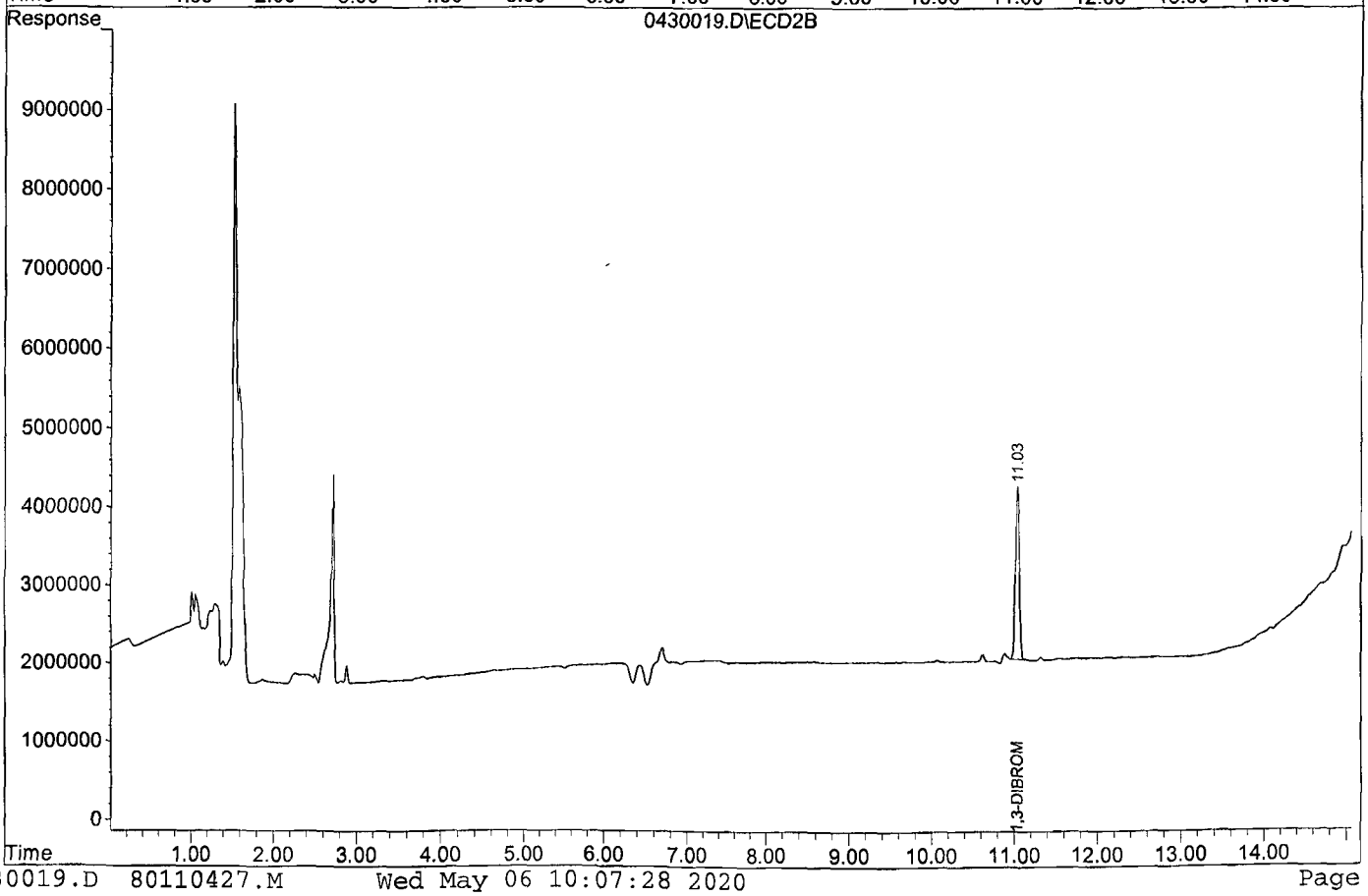
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430019.D
Acq On : 05-04-20 14:05:04
Sample : 200504A BLK 2/35.69
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 19
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430020.D\ECD1A.CH Vial: 20
Signal #2 : G:\HERBIE\DATA\200430\0430020.D\ECD2B.CH
Acq On : 05-04-20 14:25:21 Operator: SS/LP
Sample : 200504A LCS-1 2/35.45 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:52 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	448164	1613099	0.265	0.262
Spiked Amount	0.350			Recovery	=	75.71%	74.86%
	Target Compounds						
1) TM	EDB	5.76	7.22	424985	2137165	0.253	0.252
2) TM	1,2,3-TCP	9.24	10.44	103539	396502	0.281	0.263
4) TM	DBCP	13.34	14.08	1264647	5791812	0.258	0.252

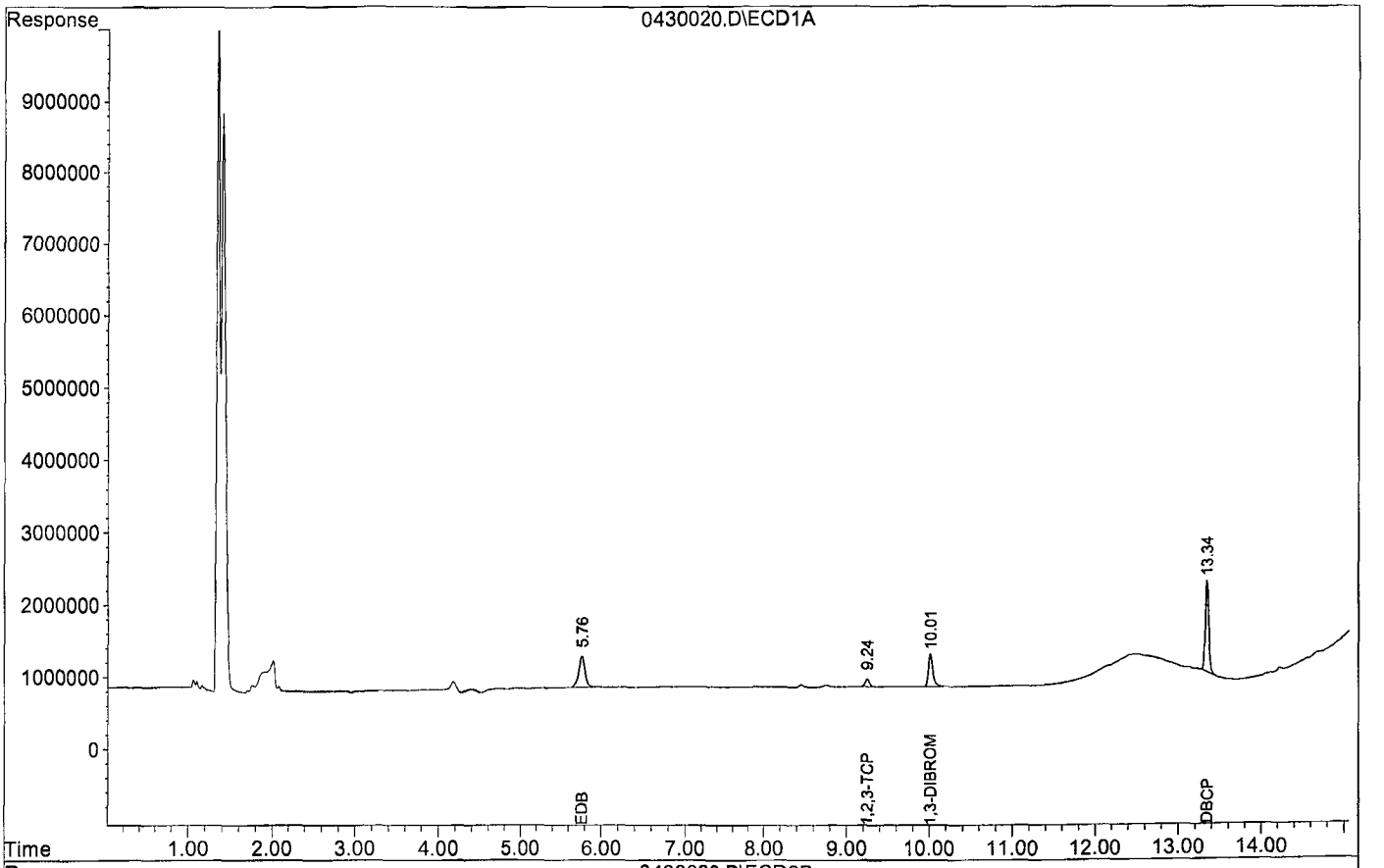
Target Compounds

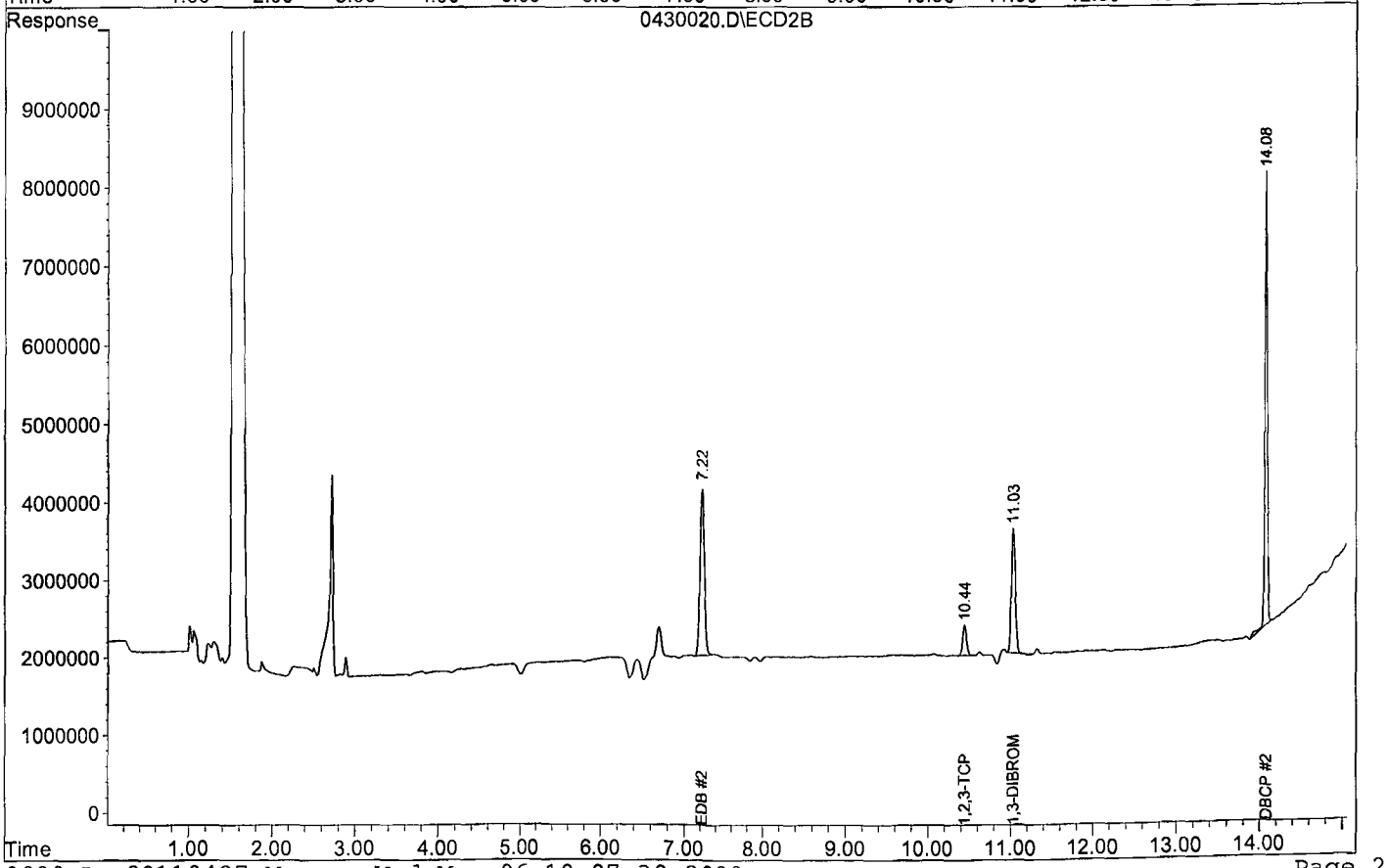
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430020.D
Acq On : 05-04-20 14:25:21
Sample : 200504A LCS-1 2/35.45
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 20
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430021.D\ECD1A.CH Vial: 21
Signal #2 : G:\HERBIE\DATA\200430\0430021.D\ECD2B.CH
Acq On : 05-04-20 14:45:41 Operator: SS/LP
Sample : 200504A LCSD-1 2/35.62 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:52 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.04	416391	1560091	0.246	0.254
Spiked Amount	0.350			Recovery	=	70.29%	72.57%
	Target Compounds						
1) TM	EDB	5.76	7.22	413425	2134771	0.246	0.251
2) TM	1,2,3-TCP	9.24	10.45	97279	388091	0.264	0.257
4) TM	DBCP	13.34	14.08	1219362	5083503	0.249	0.221

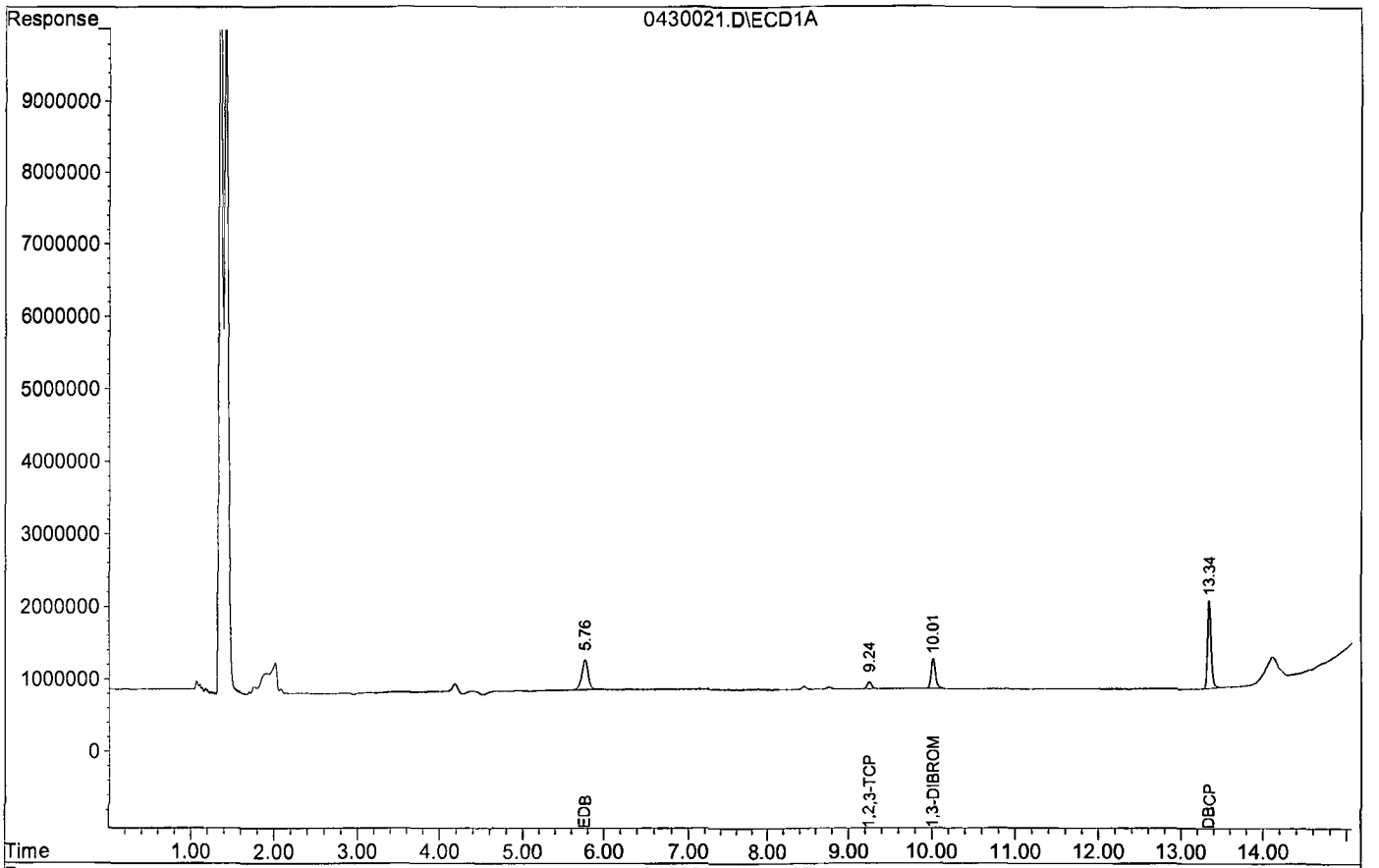
Target Compounds

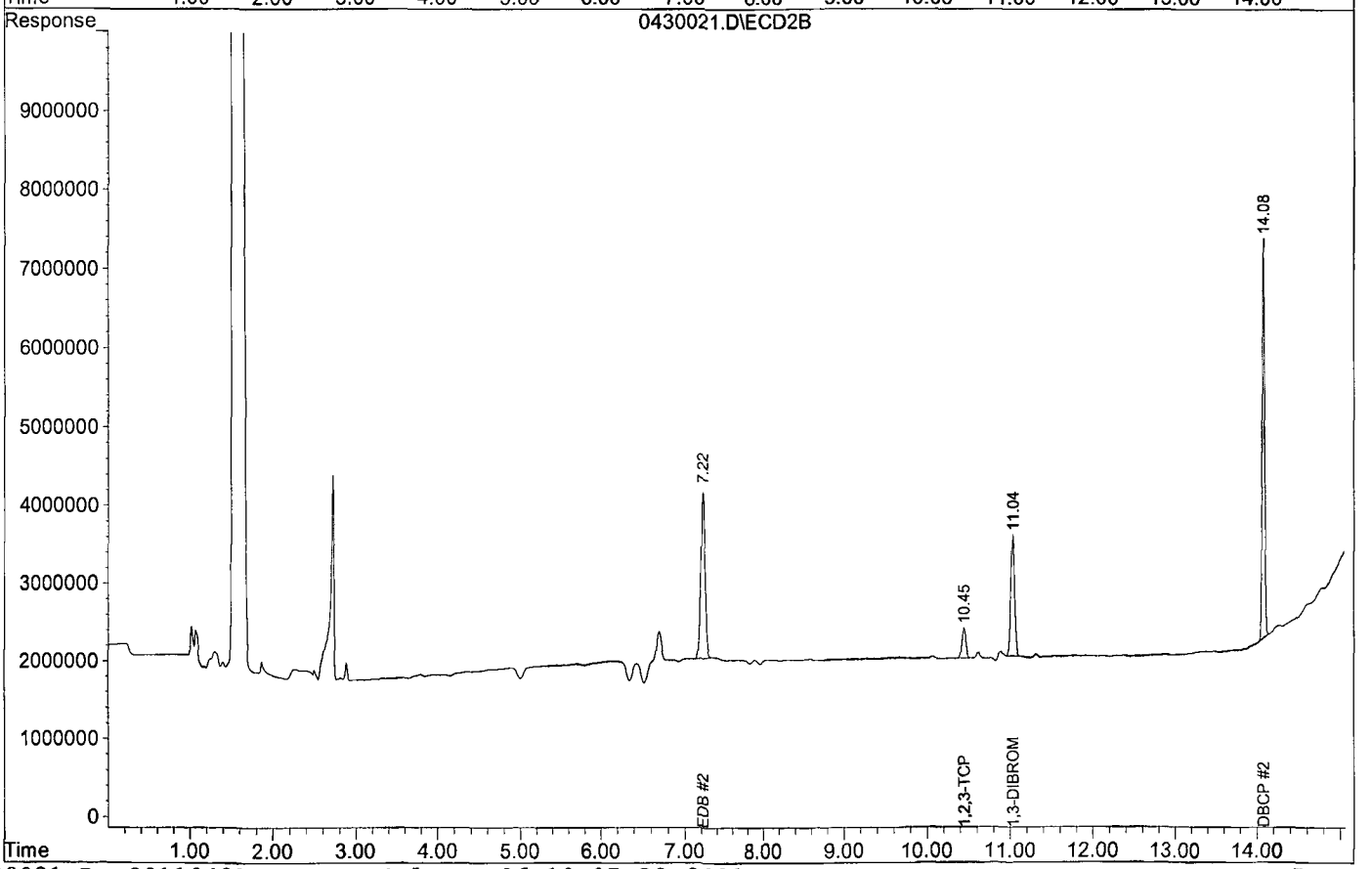
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430021.D
Acq On : 05-04-20 14:45:41
Sample : 200504A LCSD-1 2/35.62
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 21
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Name of Final Standard	504/8011 Stock	**Prep'd By (Initials)**	GA
Prep Date	01/08/20		
Exp Date	05/08/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
504/DOHS Stock	APPL	504/DOHS Stock	20 ug/mL	**01/07/20**	**01/07/21**	438 uL	25 mL	**Methanol #208858**	0.35 ug/mL
1,3 DBP Stock	APPL	1,3 DBP Stock	100 ug/mL	**01/07/20**	**01/07/21**	88 uL	*	*	*

Name of Final Standard	504/8011 Spike	**Prep'd By (Initials)**	**SS**
Prep Date	**04/30/20**		
Exp Date	**05/08/20**		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
504/8011 Stock	APPL	504/8011 Stock	0.35 ug/mL	**01/08/20**	**05/08/20**	2.5 mL	25 mL	**Methanol #208858**	0.035 ug/mL

Name of Final Standard: **504/8011 SS SPK**

Prep'd By (Initials): **SS**

Prep Date: **04/27/20**

Exp Date: **04/27/21**

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
504/8011 SS Stock	APPL	504/8011 SS Stock	0.35 ug/mL	**04/27/20**	**04/27/21**	1000 uL	10 mL	**Methanol #042317C**	0.035 ug/mL

Name of Final Standard: **504/8011 SS Stock**

Prep'd By (Initials): **SS**

Prep Date: **04/27/20**

Exp Date: **04/27/21**

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
EDB TCP DBCP	Absolute	30096	200 ug/mL	**031218-49750**	**03/12/23**	44 uL	25 mL	**Methanol #042317C**	0.35 ug/mL

Name of Final Standard	504/8011 Surrogate	**Prep'd By (Initials)**	GA
Prep Date	01/08/20		
Exp Date	05/08/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
1,3 DBP Stock	APPL	1,3 DBP Stock	100 ug/mL	**01/07/20**	**01/07/21**	35 uL	10 mL	**Methanol #208858**	0.35ug/ml

Organic Extraction Worksheet

Method	EPA Method 8011 DBCP/EDB	Extraction Set	200504A	Extraction Method	MWE012	Units	mL

Spiked ID 1	504.1 Spike 4-30-20 5-8-20		Surrogate ID 1	504.1 Surrogate 1-8-20 5-8-20	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	05/04/20 9:05	
Spiked ID 8			Ext. End Time:	05/04/20 9:28	
			GC Requires Extract By:		

pH1			Water Bath Temp 1 °C	
pH2			Water Bath Temp 2 °C	
pH3			Water Bath Temp 3 °C	

Spiked By: KY **Date** 05/04/20 **Witnessed By:** CFM **Date** 05/04/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200504A Blk				0.035	1 equip	35.69	2	7	05/04/20 9:05	
2	200504A LCS-1		0.250	1	NA	NA equip	35.45	2	7	05/04/20 9:05	
3	200504A LCSD-1		0.250	1	NA	NA equip	35.62	2	7	05/04/20 9:05	
4	BA10438	BA10438W06			0.035	1 equip	35.92	2	7	05/04/20 9:05	92025
5	BA10439	BA10439W07			0.035	1 equip	35.47	2	7	05/04/20 9:05	92025
6	BA10503	BA10503W05			0.035	1 equip	35.10	2	7	05/04/20 9:05	92039
7	BA10504	BA10504W06			0.035	1 equip	35.37	2	7	05/04/20 9:05	92039
8	BA10505	BA10505W06			0.035	1 equip	35.32	2	7	05/04/20 9:05	92039

Solvent and Lot#	
Scale Blance ID	EB1
pH strip	hc998032
Sod. Thiosulfate	1016c241
NaCL	19h295201
GC2 Hexane (2mLs)	dv910

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	5/14/20
Time	9:45
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	KY
Extraction	KY
Concentration	KY

Modified	05/04/20 9:31:43 AM

Reviewed By: **Date**

Injection Log

Directory: G:\HERBIE\DATA\200415\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	59	0415059.D	1	8011-1 4/27/20	water	04-27-20 13:33:12
2	60	0415060.D	1	8011-2 4/27/20	water	04-27-20 13:53:33
3	61	0415061.D	1	8011-3 4/27/20	water	04-27-20 14:14:01
4	62	0415062.D	1	8011-4 4/27/20	water	04-27-20 14:34:31
5	63	0415063.D	1	8011-5 4/27/20	water	04-27-20 14:54:56
6	64	0415064.D	1	8011-6 4/27/20	water	04-27-20 15:15:22
7	89	0415089.D	1	8011-SS 4/27/20	water	04-28-20 8:29:21
8	18	0430018.D	1	8011-3 CCV 05/04/20	water	05-04-20 10:31:10
9	19	0430019.D	1	200504A BLK 2/35.69	water	05-04-20 14:05:04
10	20	0430020.D	1	200504A LCS-1 2/35.45	water	05-04-20 14:25:21
11	21	0430021.D	1	200504A LCSD-1 2/35.62	water	05-04-20 14:45:41
12	22	0430022.D	1	BA10438W06 2/35.92	water	05-04-20 15:06:12
13	23	0430023.D	1	BA10439W07 2/35.47	water	05-04-20 15:26:36
14	27	0430027.D	1	8011-3 CCV 05/04/20	water	05-04-20 16:48:22

ORGANICS
Calibration Data

TPH Extractables
DOC0310

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 03/10/20
Matrix: Water Instrument: Apollo
Initials: SS/M

310003 D 310004.D 310005 D 310006.D 310007 D 310008.D

		Compound	1	2	3	4	5	6					Avg	%RSD	Type	r^2	Q
1	HATM	Diesel (C10-C24)	1402793	2048774	1956346	1950680	1978298	2168778					1917612	14	HATM		
2	HBTM	Motor Oil (C24-C40)	1787356	1629558	1383257	1334462	1324161	1387579					1474395	13	HBTM		
3	SA	Ortho-Terphenyl(S)	2782070	2786055	2347676	2294556	2308475	2544283					2510519	9.2	SA		
4	SA	Octacosane(S)	1771075	1912436	1683790	1654254	1670744	1785274					1746262	5.6	SA		
5																	
6																	
7																	
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1.184705

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310003.D Vial: 3
Acq On : 3-10-20 9:37:22 Operator: SS
Sample : Diesel Motor Oil-1 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

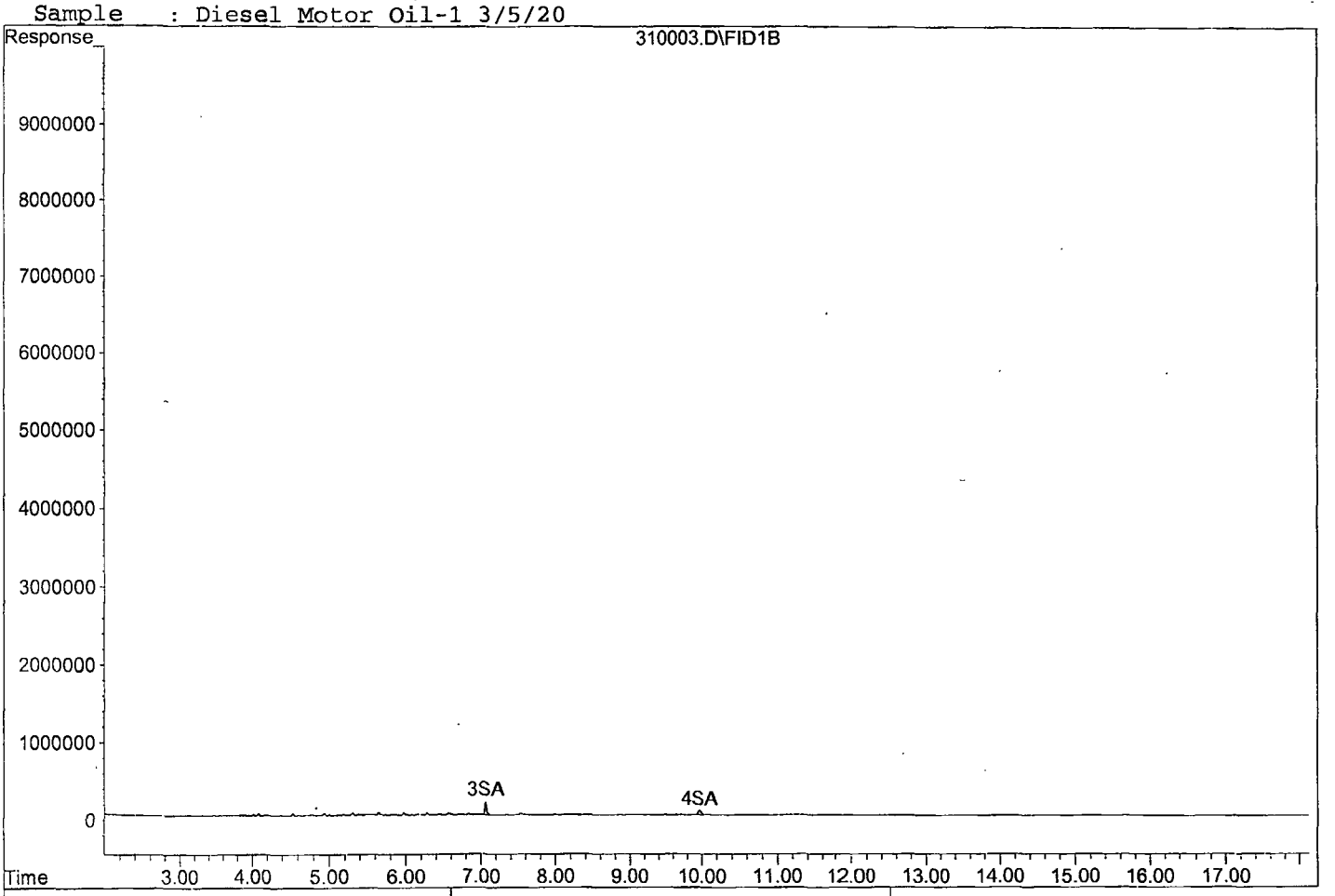
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

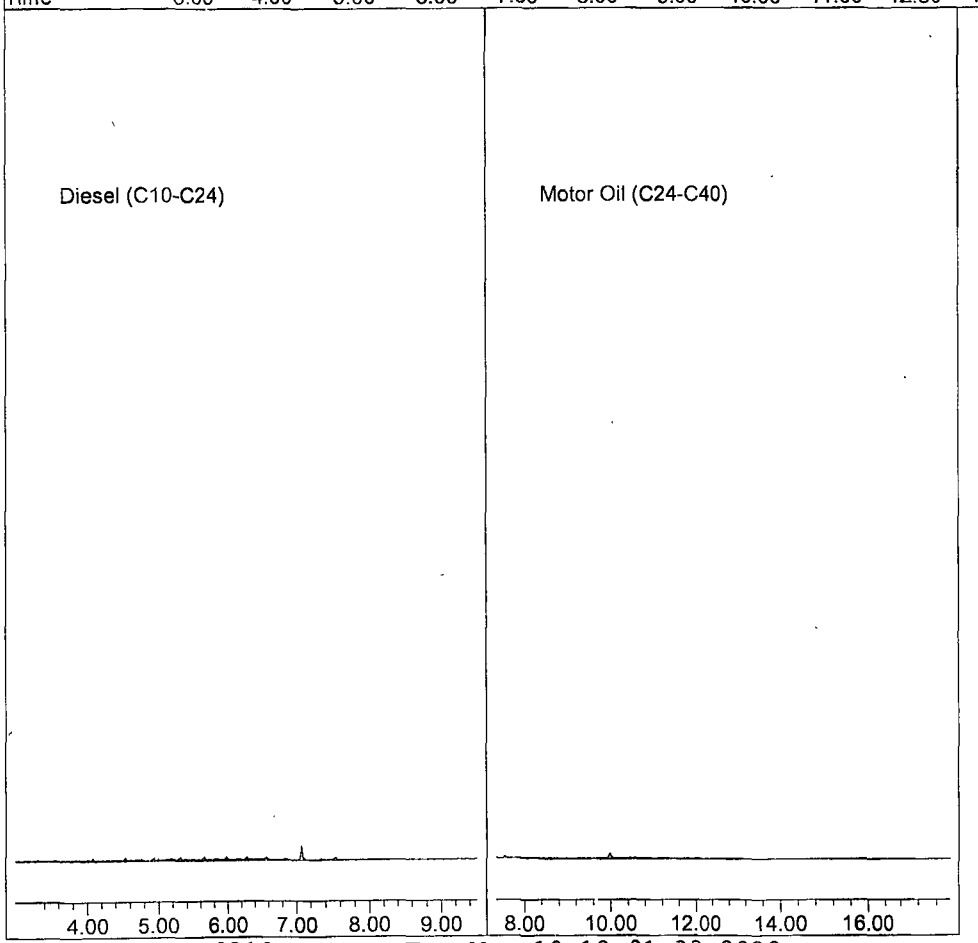
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	2782070	0.554 ppb
Surrogate Spike 30.000	Recovery =		1.85%
4) SA Octacosane(S)	9.97	1771075	0.507 ppb
Surrogate Spike 30.000	Recovery =		1.69%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	28055866	7.315 ppb
2) HBTM Motor Oil (C24-C40)	12.60	35747115	12.123 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310003.D
Sample : Diesel Motor Oil-1 3/5/20





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310004.D Vial: 4
Acq On : 3-10-20 9:59:49 Operator: SS
Sample : Diesel Motor Oil-2 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

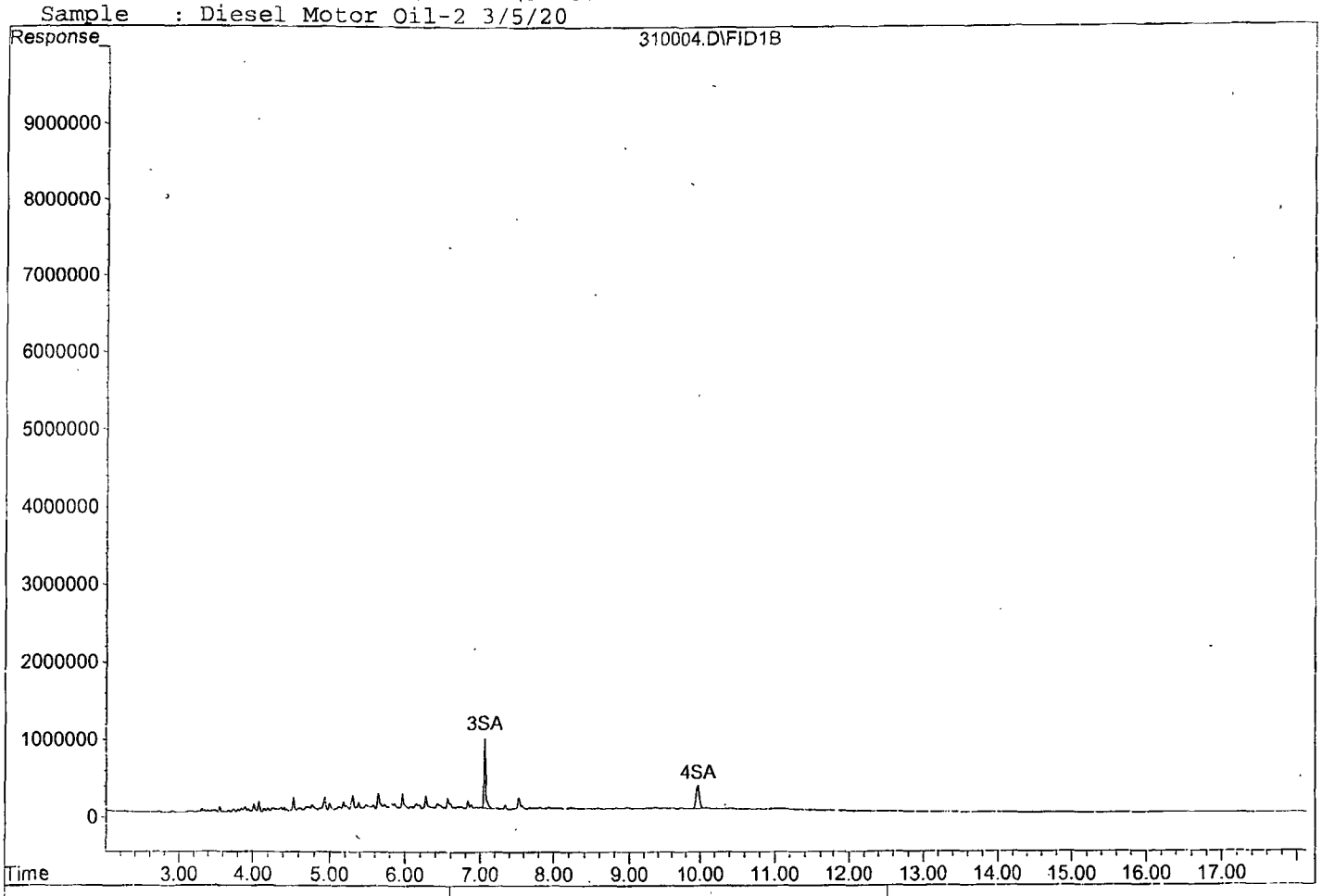
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

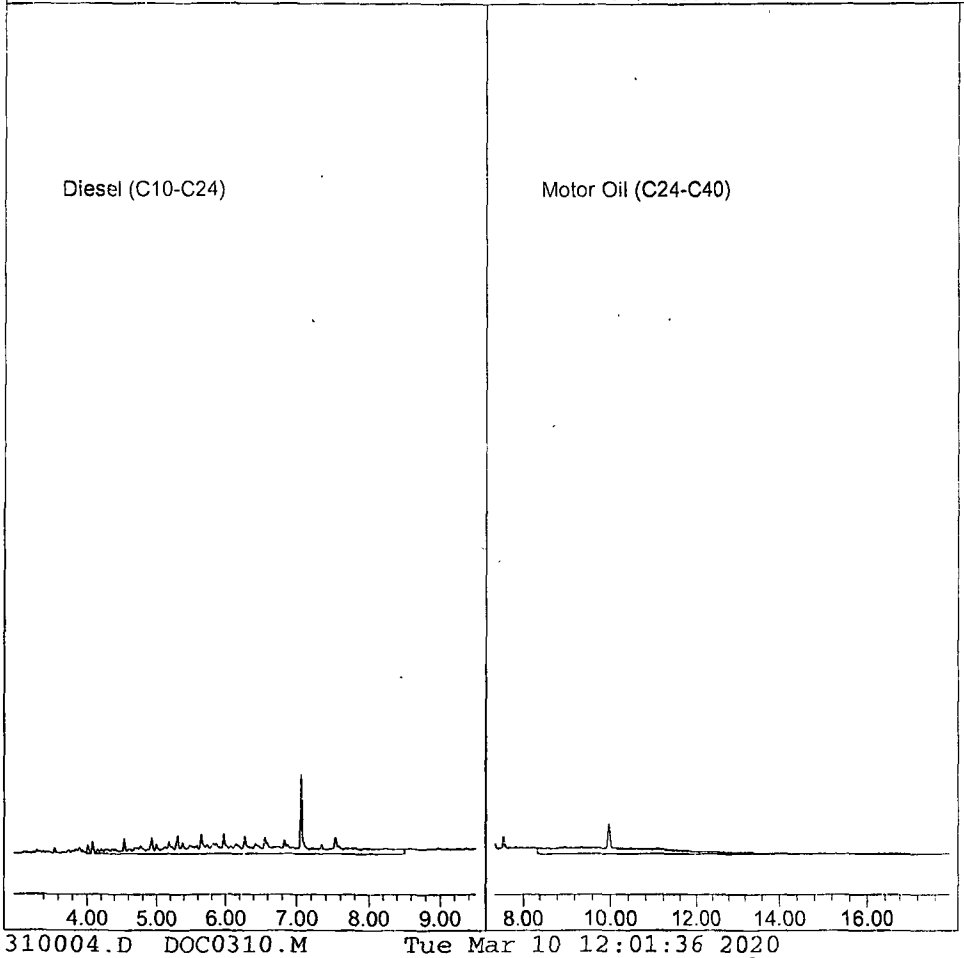
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	13930276	2.774 ppb
Surrogate Spike 30.000	Recovery =		9.25%
4) SA Octacosane(S)	9.97	9562178	2.738 ppb
Surrogate Spike 30.000	Recovery =		9.13%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	204877430	53.420 ppb
2) HBTM Motor Oil (C24-C40)	12.60	162955782	55.262 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310004.D
Sample : Diesel Motor Oil-2 3/5/20





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310005.D Vial: 5
Acq On : 3-10-20 10:22:19 Operator: SS
Sample : Diesel Motor Oil-3 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

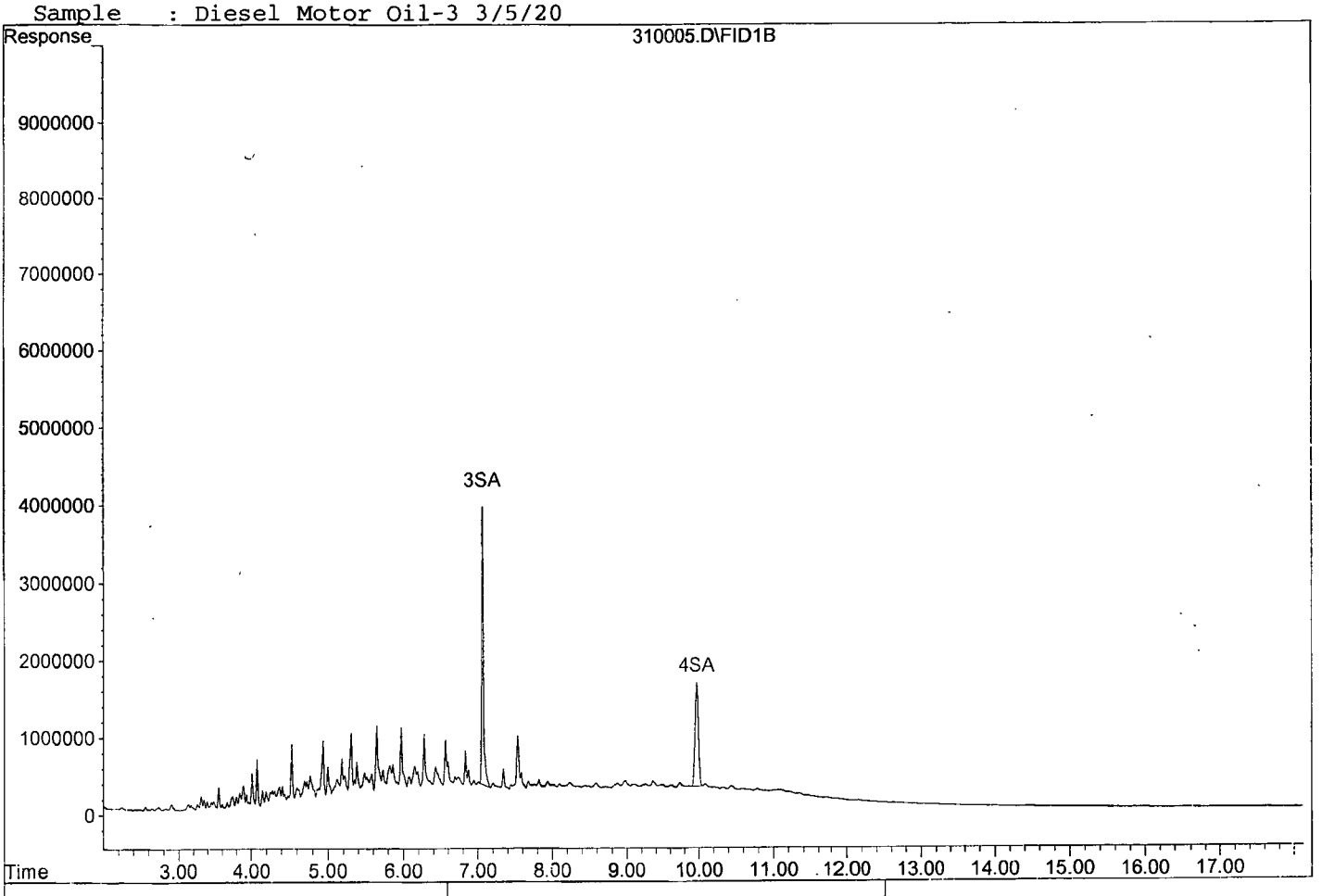
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

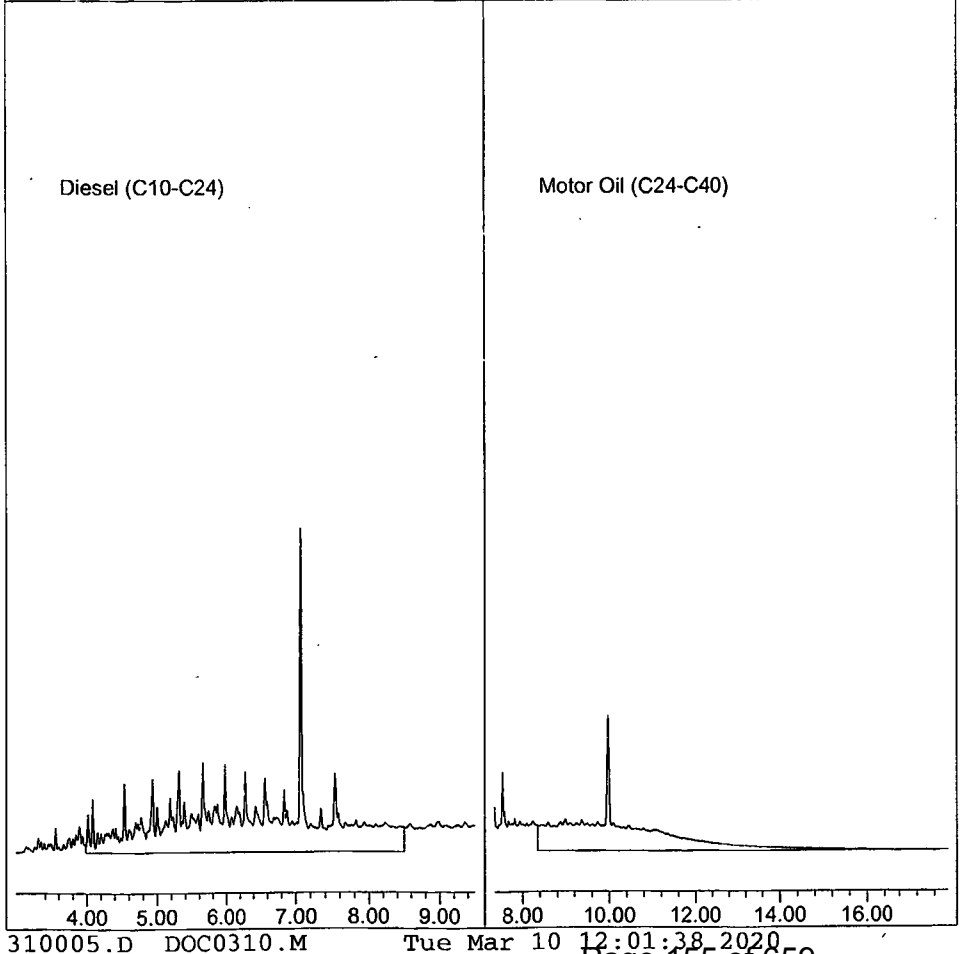
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	58691912	11.689 ppb
Surrogate Spike 30.000		Recovery =	38.96%
4) SA Octacosane(S)	9.97	42094760	12.053 ppb
Surrogate Spike 30.000		Recovery =	40.18%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	978173133	255.050 ppb
2) HBTM Motor Oil (C24-C40)	12.60	691628331	234.546 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310005.D
Sample : Diesel Motor Oil-3 3/5/20





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310006.D Vial: 6
Acq On : 3-10-20 10:44:50 Operator: SS
Sample : Diesel Motor Oil-4 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

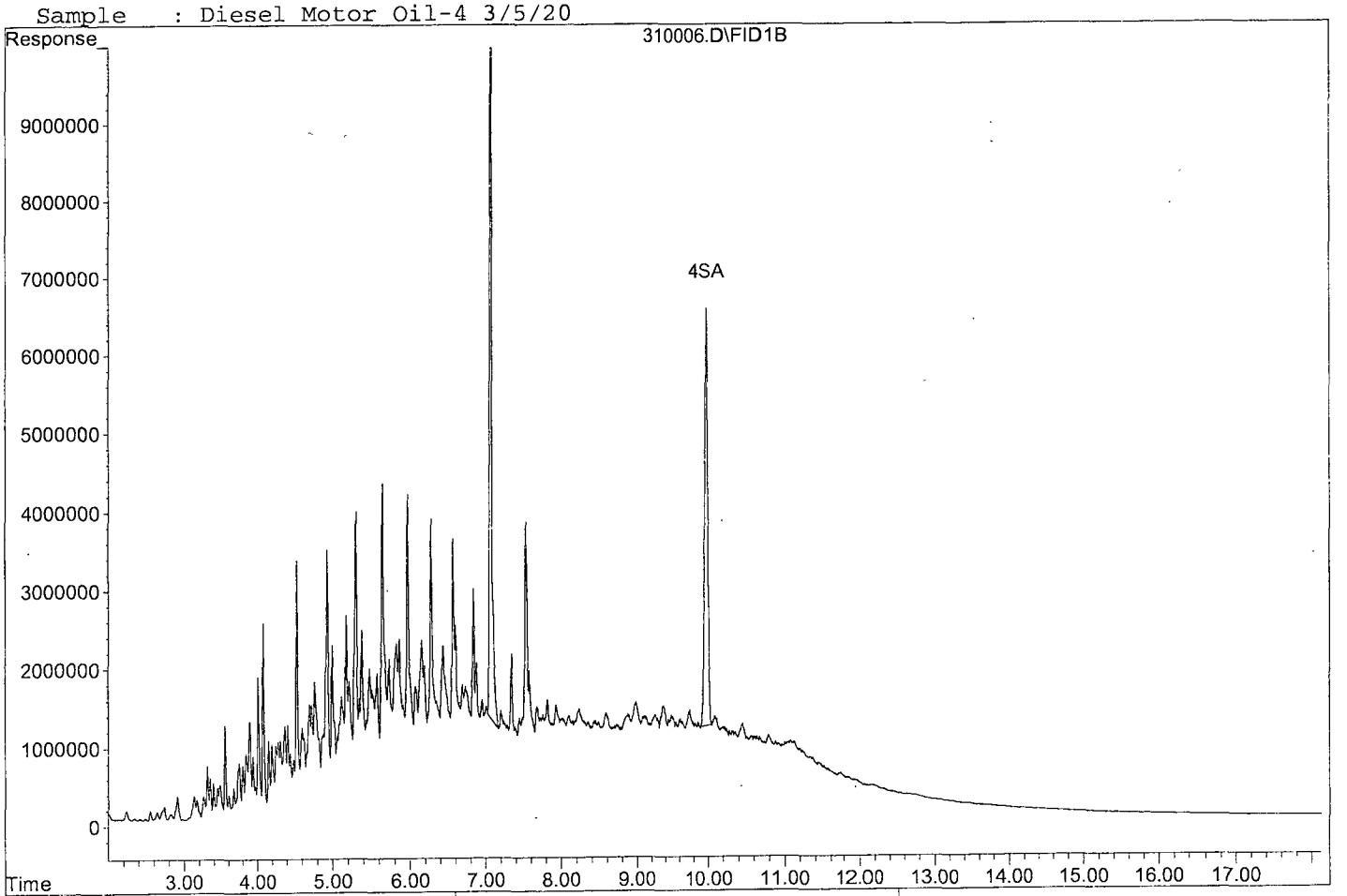
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

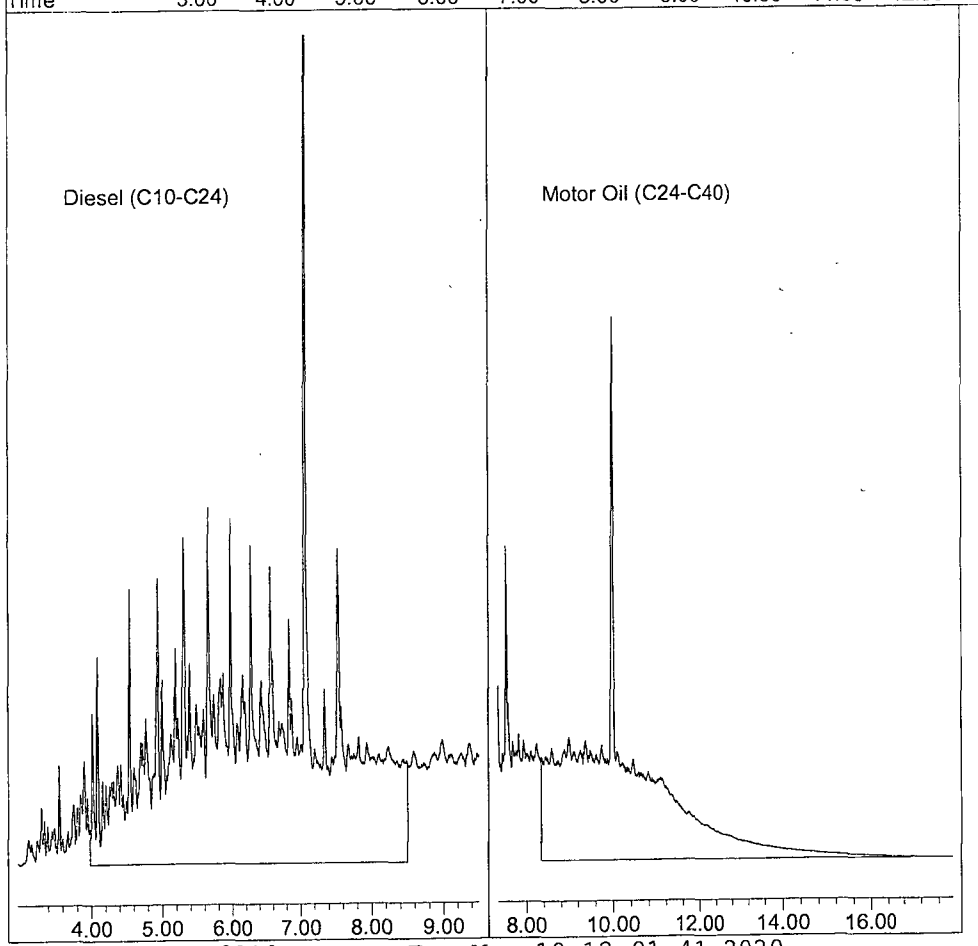
Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.07	229455620	45.699	ppb
Surrogate Spike 30.000		Recovery =	152.33%	
4) SA Octacosane(S)	9.98	165425400	47.366	ppb
Surrogate Spike 30.000		Recovery =	157.89%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	3901360613	1017.245	ppb
2) HBTM Motor Oil (C24-C40)	12.60	2668923786	905.091	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310006.D
Sample : Diesel Motor Oil-4 3/5/20





310006.D DOC0310.M Tue Mar 10 12:01:41 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310007.D Vial: 7
Acq On : 3-10-20 11:07:20 Operator: SS
Sample : Diesel Motor Oil-5 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

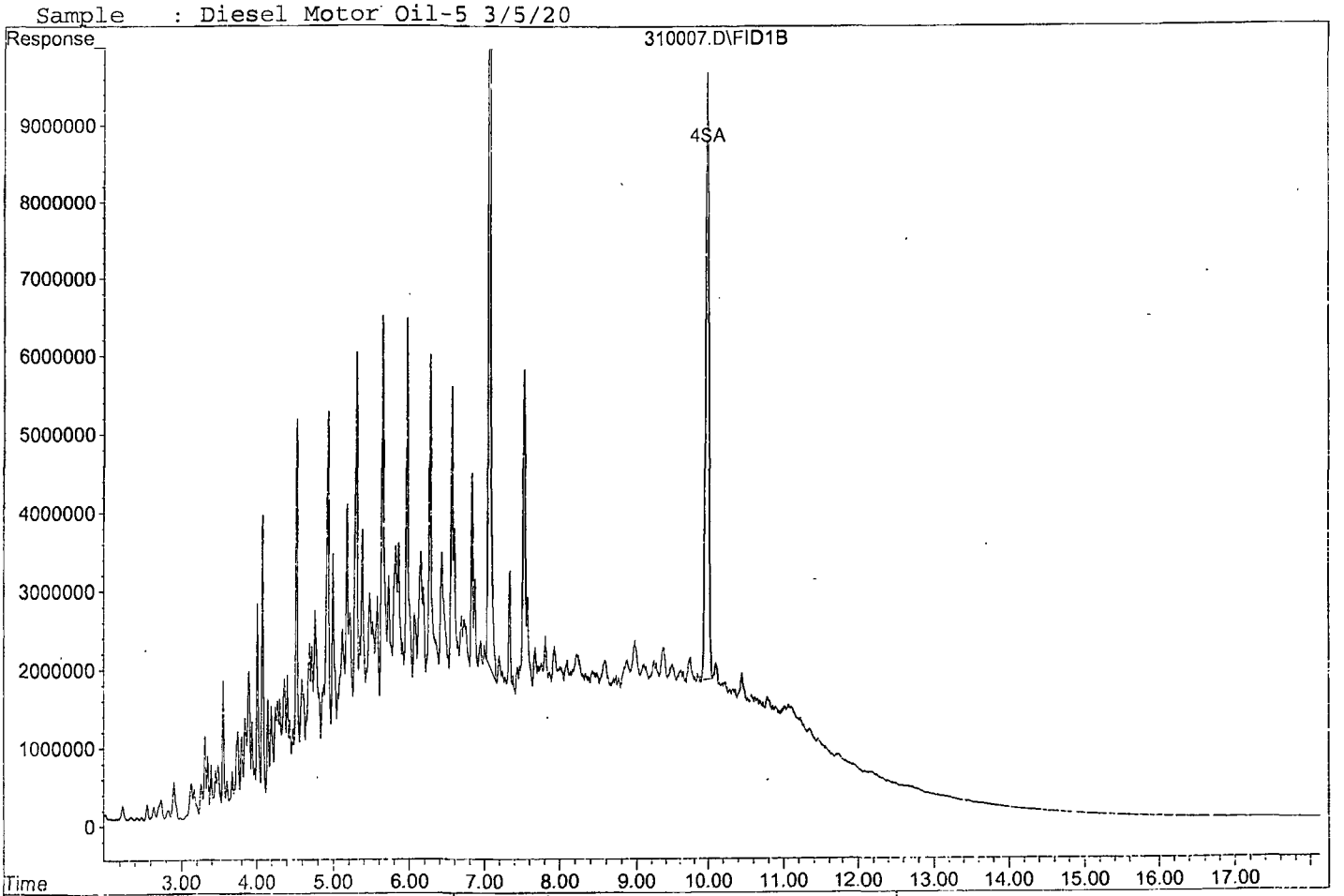
Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.07	346271320	68.964	ppb
Surrogate Spike 30.000	Recovery =		229.88%	
4) SA Octacosane(S)	9.98	250611670	71.757	ppb
Surrogate Spike 30.000	Recovery =		239.19%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	5934893648	1547.470	ppb
2) HBTM Motor Oil (C24-C40)	12.60	3972483300	1347.157	ppb

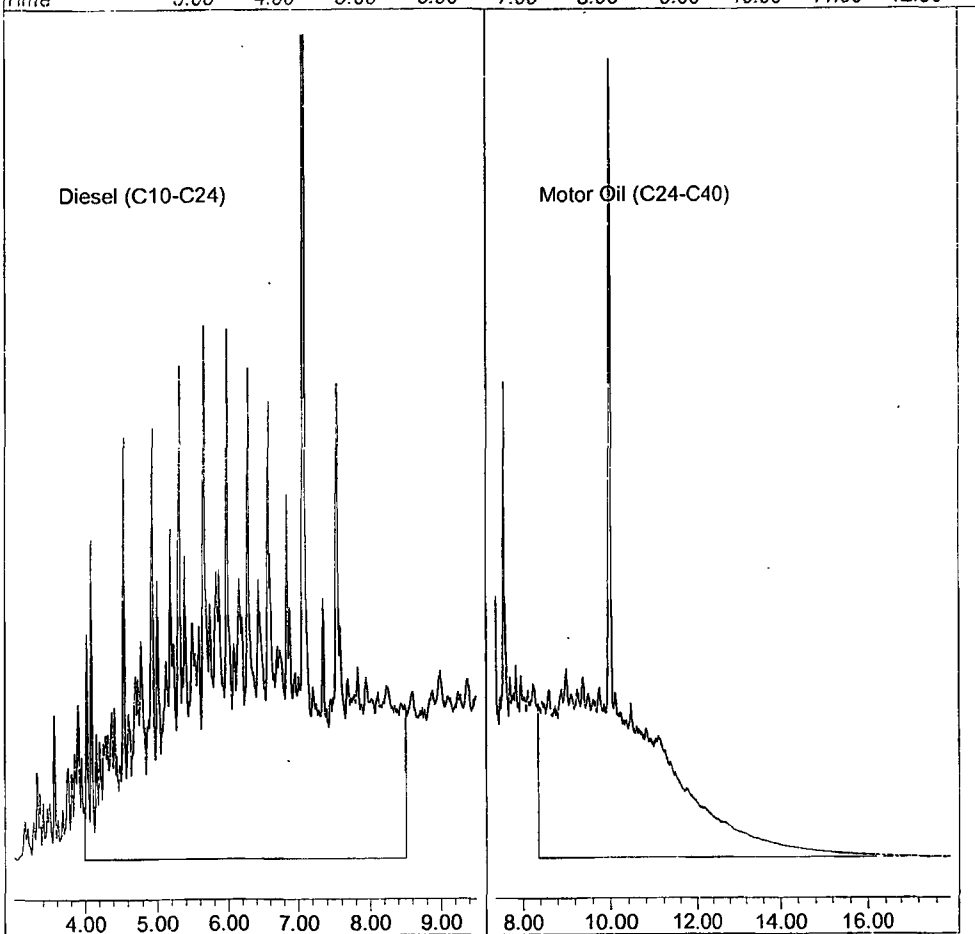
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200310\310007.D
Sample : Diesel Motor Oil-5 3/5/20





310007.D DOC0310.M Tue Mar 10 12:01:43 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310008.D Vial: 8
Acq On : 3-10-20 11:29:51 Operator: SS
Sample : Diesel Motor Oil-6 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

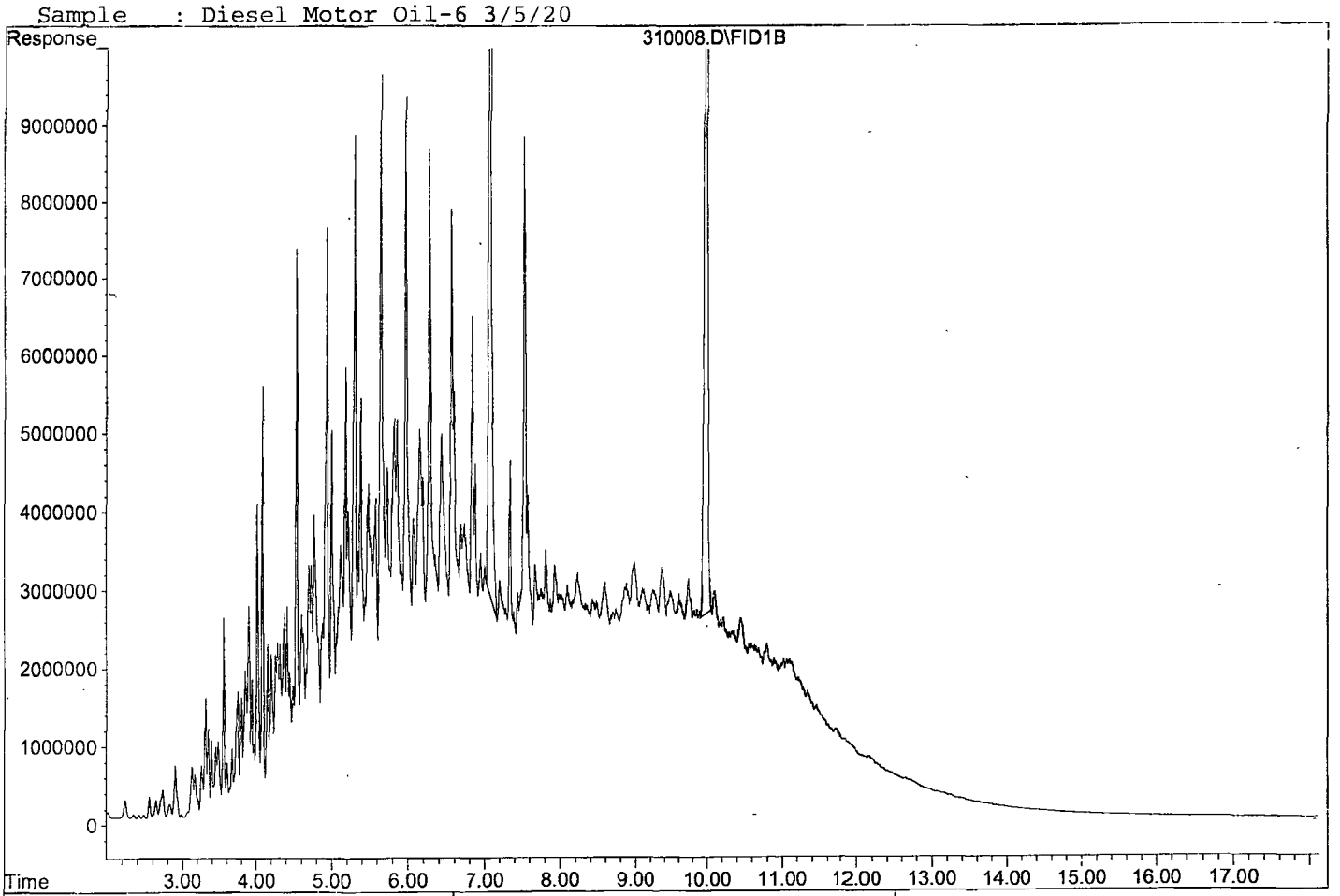
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

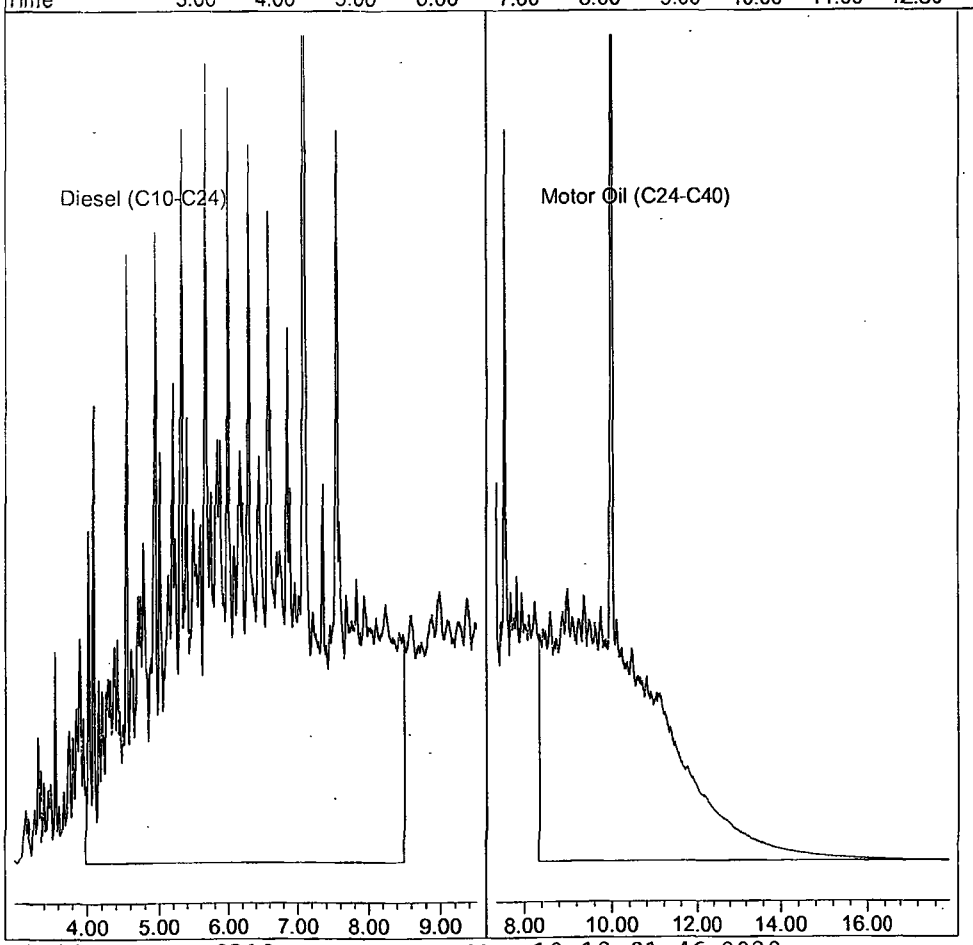
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.07	508856564	101.345 ppb
Surrogate Spike 30.000	Recovery =		337.82%
4) SA Octacosane(S)	9.99	357054728	102.234 ppb
Surrogate Spike 30.000	Recovery =		340.78%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	8675111292	2261.957 ppb
2) HBTM Motor Oil (C24-C40)	12.60	5550316563	1882.235 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310008.D
Sample : Diesel Motor Oil-6 3/5/20





310008.D DOC0310.M Tue Mar 10 12:01:46 2020 Page 2

TPH Extractables
DOC0310

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 03/10/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 310009.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2127840	11	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1535490	4.1	HBTM	
3							
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40							
		Average			7.6		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310009.D Vial: 9
Acq On : 3-10-20 11:52:24 Operator: SS
Sample : Diesel Motor Oil-SS 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 12:11 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

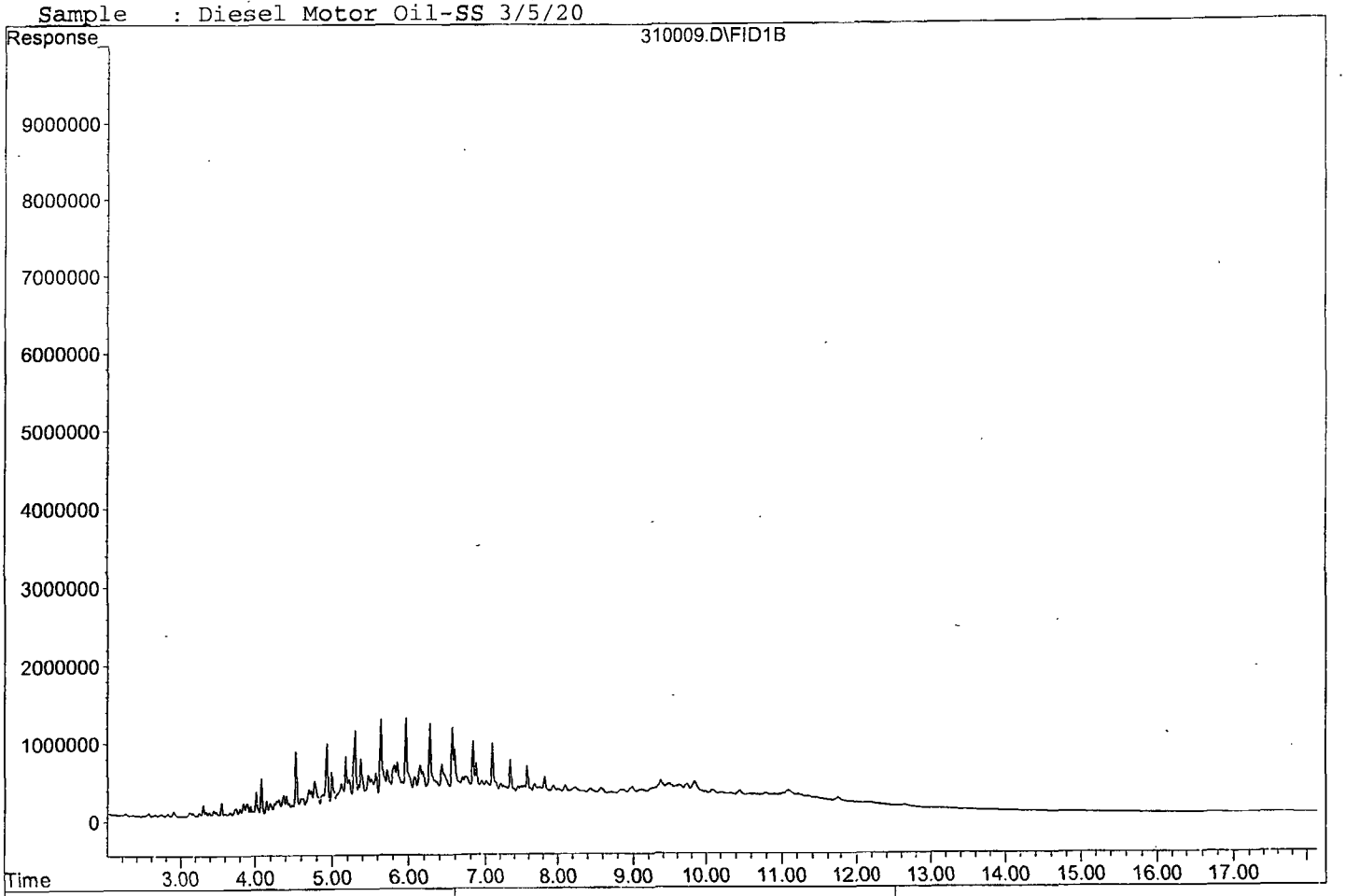
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

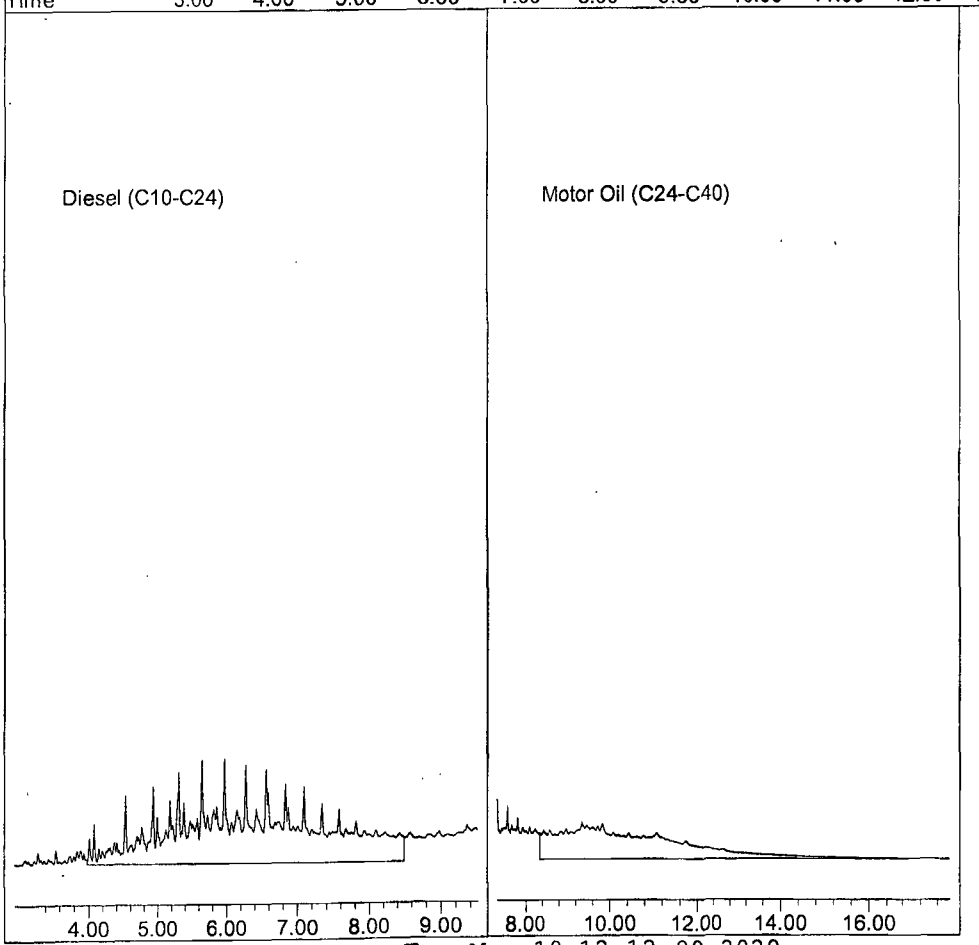
Compound	R.T.	Response	Conc	Units	
System Monitoring Compounds					
3) SA Ortho-Terphenyl(S)	0.00	0	N.D.	ppb	d
Surrogate Spike 30.000	Recovery	=	0.00%		
4) SA Octacosane(S)	0.00	0	N.D.	ppb	d
Surrogate Spike 30.000	Recovery	=	0.00%		
Target Compounds					
1) HATM Diesel (C10-C24)	6.24	1063920828	277.408	ppb	
2) HBTM Motor Oil (C24-C40)	12.60	767745055	260.359	ppb	

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310009.D
Sample : Diesel Motor Oil-SS 3/5/20





TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424095.D

		Compound	MEAN	CCRF	%D		%Drift
1	HATM	Diesel (C10-C24)	1917610	2067120	7.8	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1399240	5.1	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2451320	2.4	SA	
4	SA	Octacosane(S)	1746260	1836860	5.2	SA	
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		Average			5.1		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424095.D
Acq On : 5-4-20 15:02:27
Sample : Diesel Motor Oil-CCV 4/29/20
Misc : water
IntFile : events.e
Quant Time: May 5 11:08 2020 Quant Results File: DOC0310.RES

Vial: 95
Operator: SS
Inst : Apollo
Multiplr: 1.00

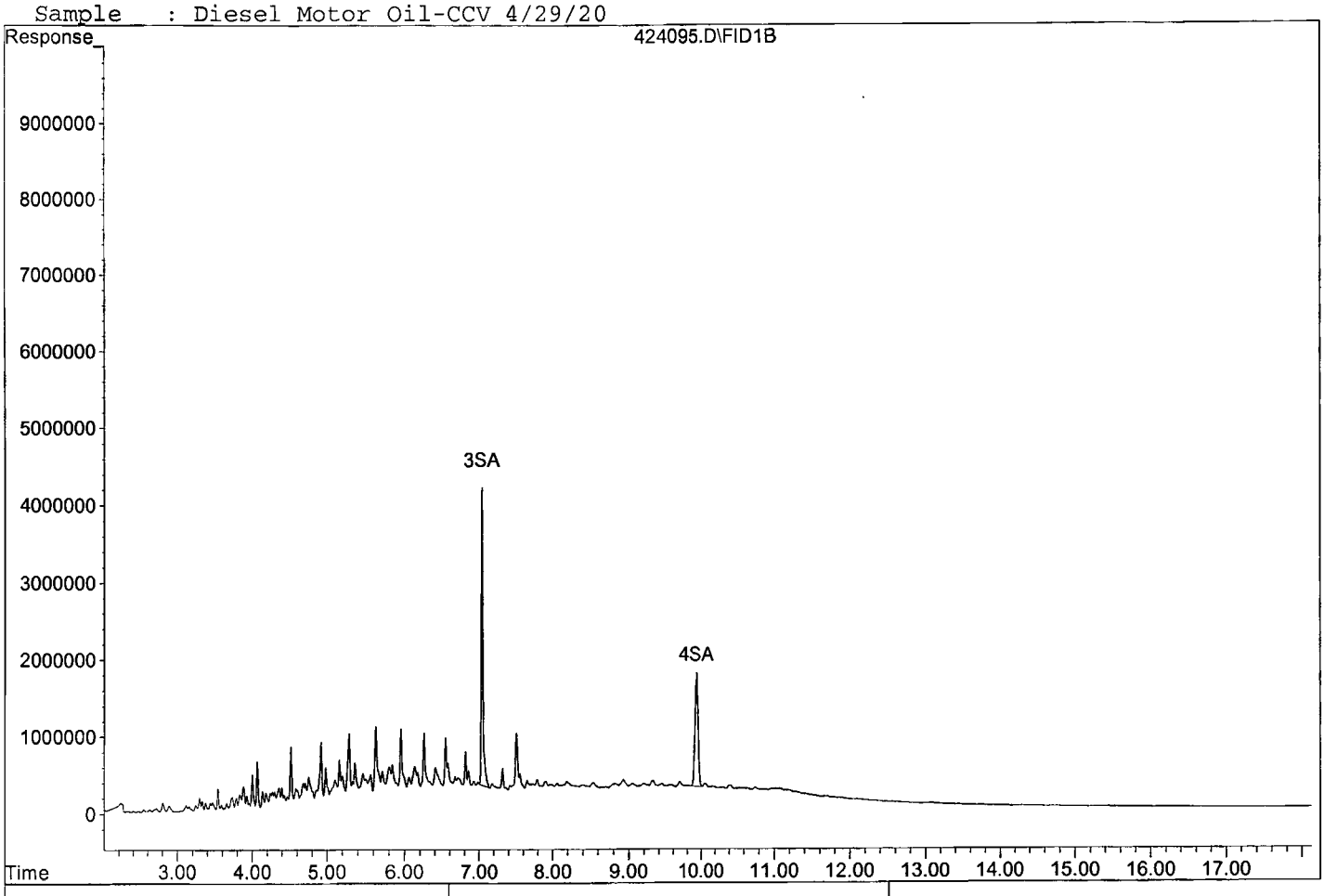
Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

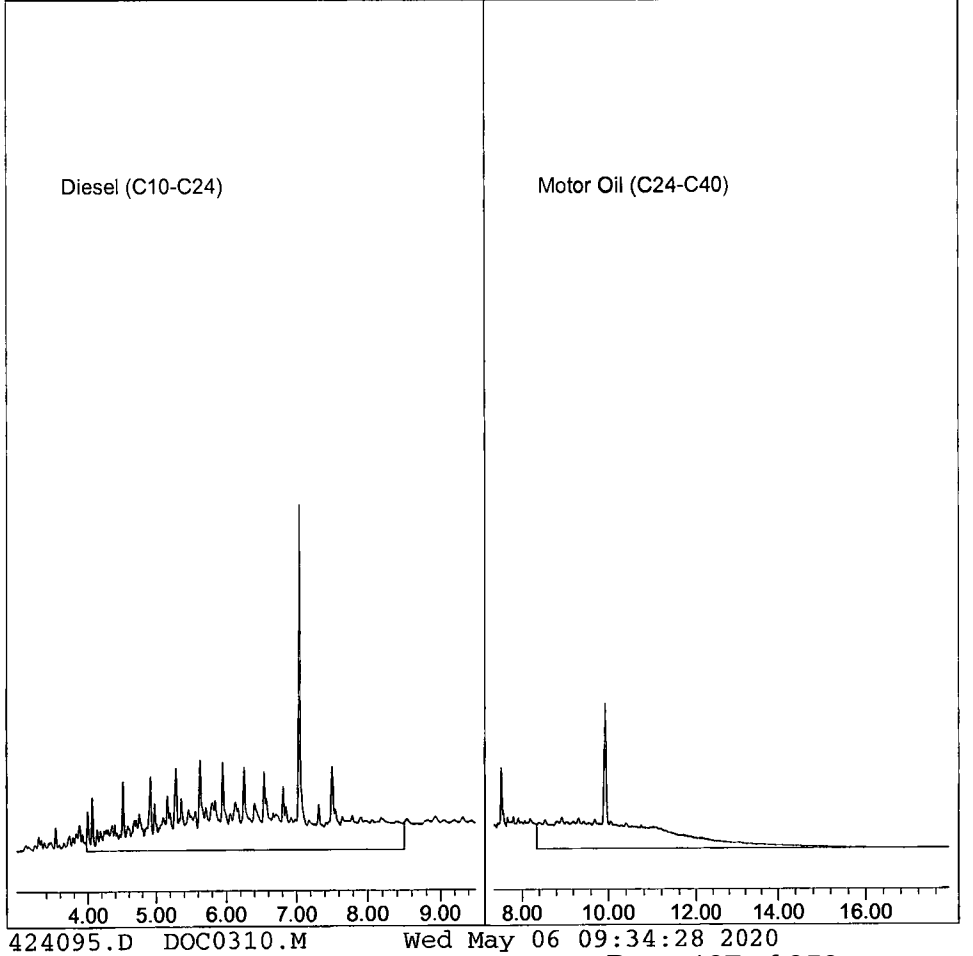
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	61283036	12.205 ppb
Surrogate Spike 30.000	Recovery =		40.68%
4) SA Octacosane(S)	9.93	45921597	13.149 ppb
Surrogate Spike 30.000	Recovery =		43.83%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1033560680	269.492 ppb
2) HBTM Motor Oil (C24-C40)	12.60	699618352	237.256 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424095.D
Sample : Diesel Motor Oil-CCV 4/29/20





424095.D DOC0310.M Wed May 06 09:34:28 2020

TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424109.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2178910	14	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1473420	0.07	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2592740	3.3	SA	
4	SA	Octacosane(S)	1746260	1917580	9.8	SA	
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		Average			6.8		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424109.D Vial: 9
Acq On : 5-4-20 20:22:31 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

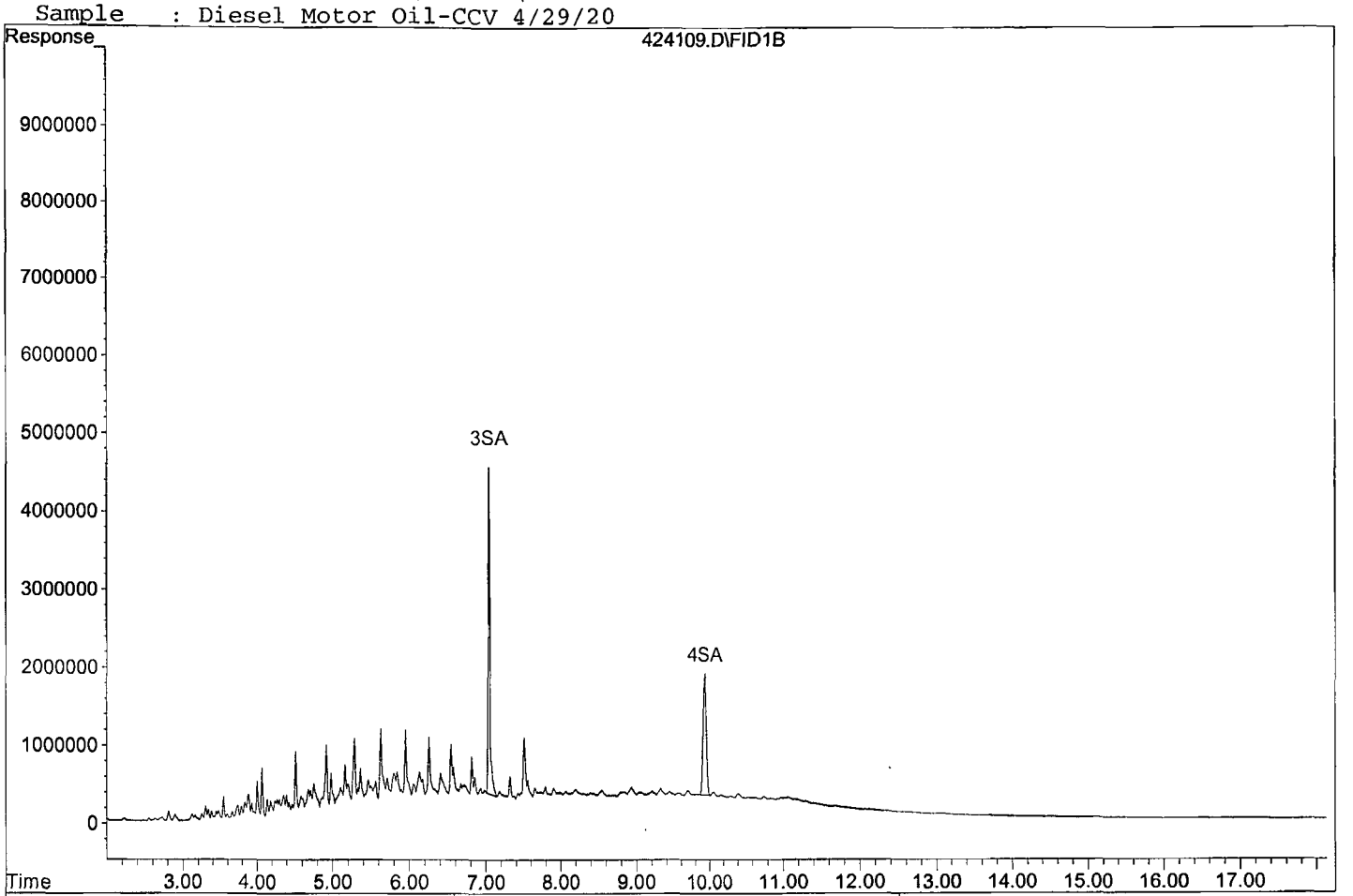
Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

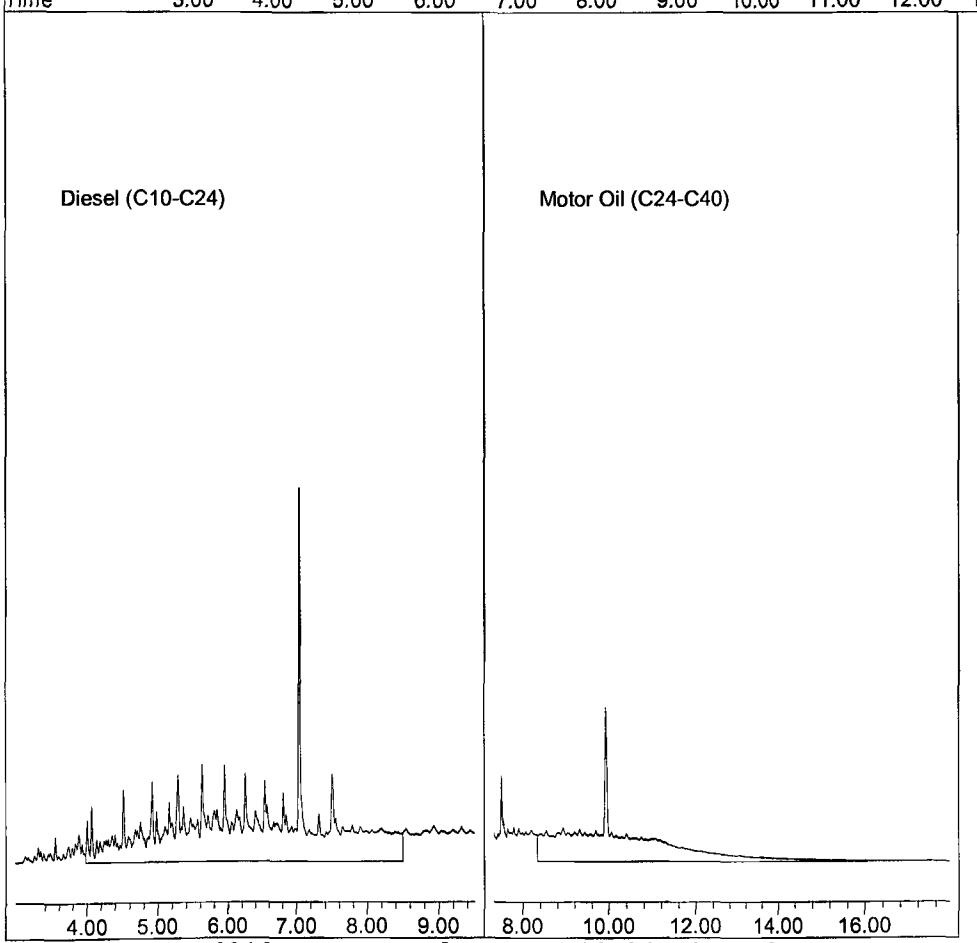
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	64818621	12.909 ppb
Surrogate Spike 30.000	Recovery =		43.03%
4) SA Octacosane(S)	9.93	47939624	13.726 ppb
Surrogate Spike 30.000	Recovery =		45.75%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1089454045	284.065 ppb
2) HBTM Motor Oil (C24-C40)	12.60	736709642	249.834 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424109.D
Sample : Diesel Motor Oil-CCV 4/29/20





424109.D DOC0310.M Wed May 06 09:34:39 2020

TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/05/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424121.D

		Compound	MEAN	CCRF	%D		%Drift
1	HATM	Diesel (C10-C24)	1917610	2168790	13	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1457010	1.2	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2564210	2.1	SA	
4	SA	Octacosane(S)	1746260	1922620	10	SA	
5							
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		Average			6.6		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424121.D Vial: 21
Acq On : 5-5-20 0:55:06 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

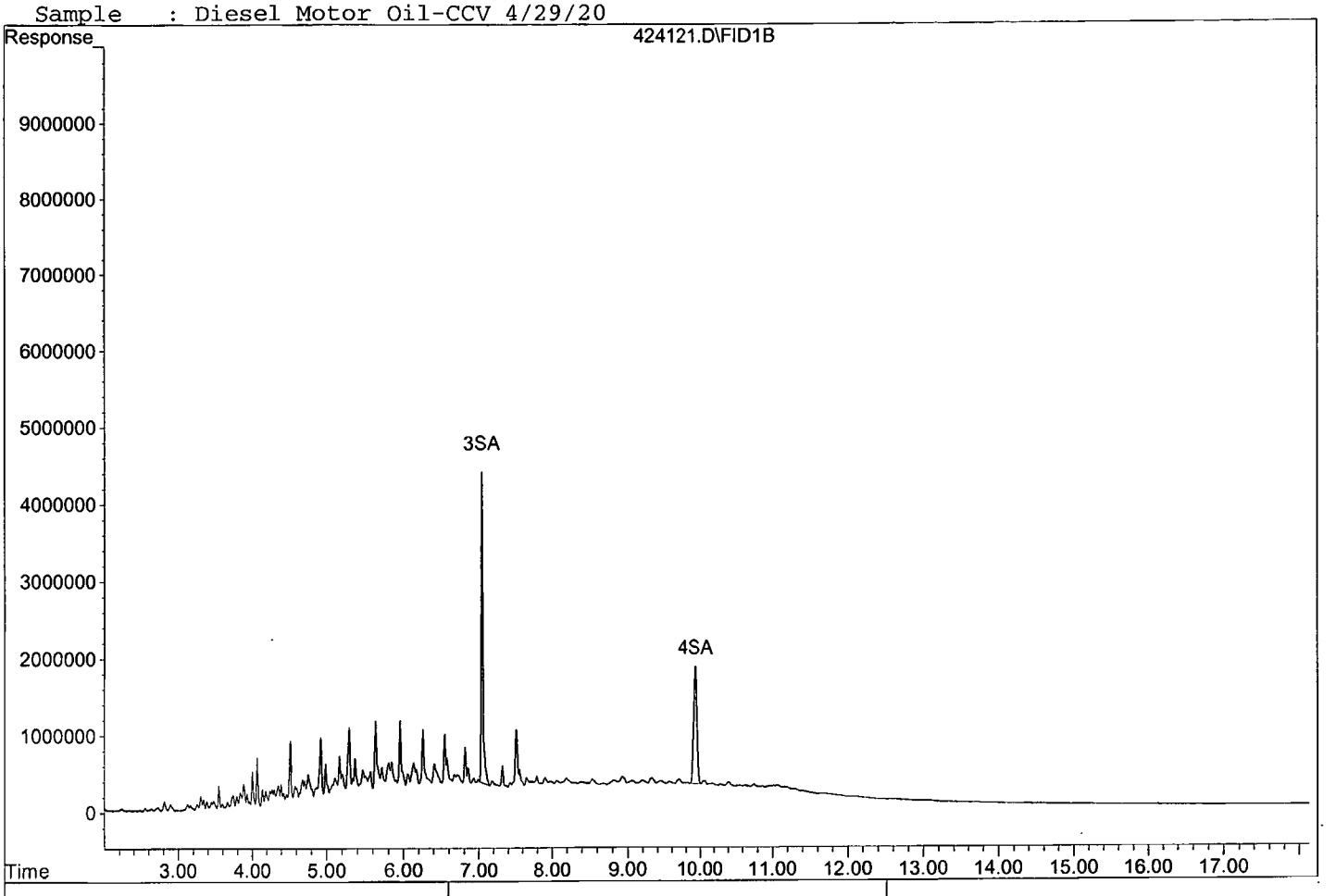
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

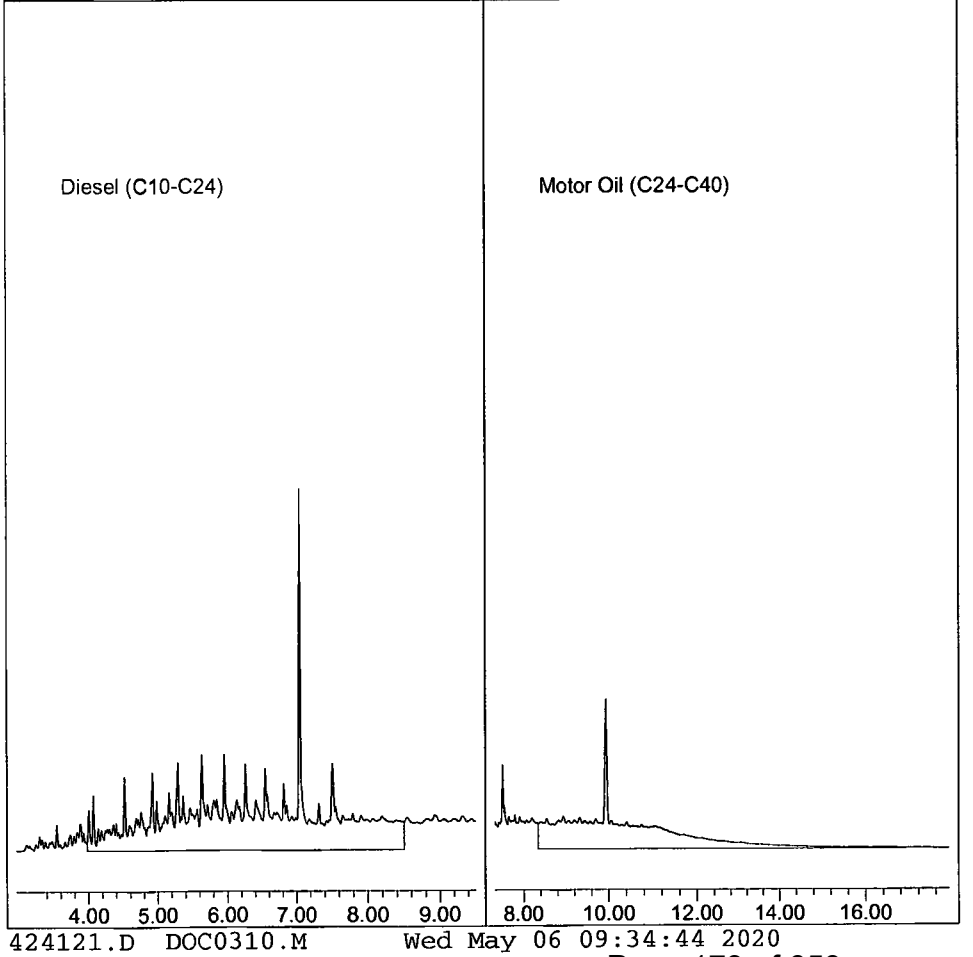
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	64105191	12.767 ppb
Surrogate Spike 30.000	Recovery =		42.56%
4) SA Octacosane(S)	9.93	48065454	13.762 ppb
Surrogate Spike 30.000	Recovery =		45.87%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1084393320	282.746 ppb
2) HBTM Motor Oil (C24-C40)	12.60	728506299	247.053 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424121.D
Sample : Diesel Motor Oil-CCV 4/29/20





424121.D DOC0310.M Wed May 06 09:34:44 2020

TPH Extractables
DEC0317

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 03/17/20
Matrix: Water Instrument: Apollo
Initials: SS/AV

		Compound	1	2	3	4	5	6					Avg	%RSD	Type	r^2	Q
			317002.D	317003.D	317004.D	317005.D	317006.D	317007.D									
1	SC	Decanoic Acid(S)	1325318	1449828	1357030	1682528	1897028	1689607					1566890	14	SC		
2																	
3																	
4																	
5																	
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FORM61

APPL 03/17/20 10:58 AM

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317002.D Vial: 2
Acq On : 3-17-20 8:14:08 Operator: SS
Sample : Decanoic Acid-1 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

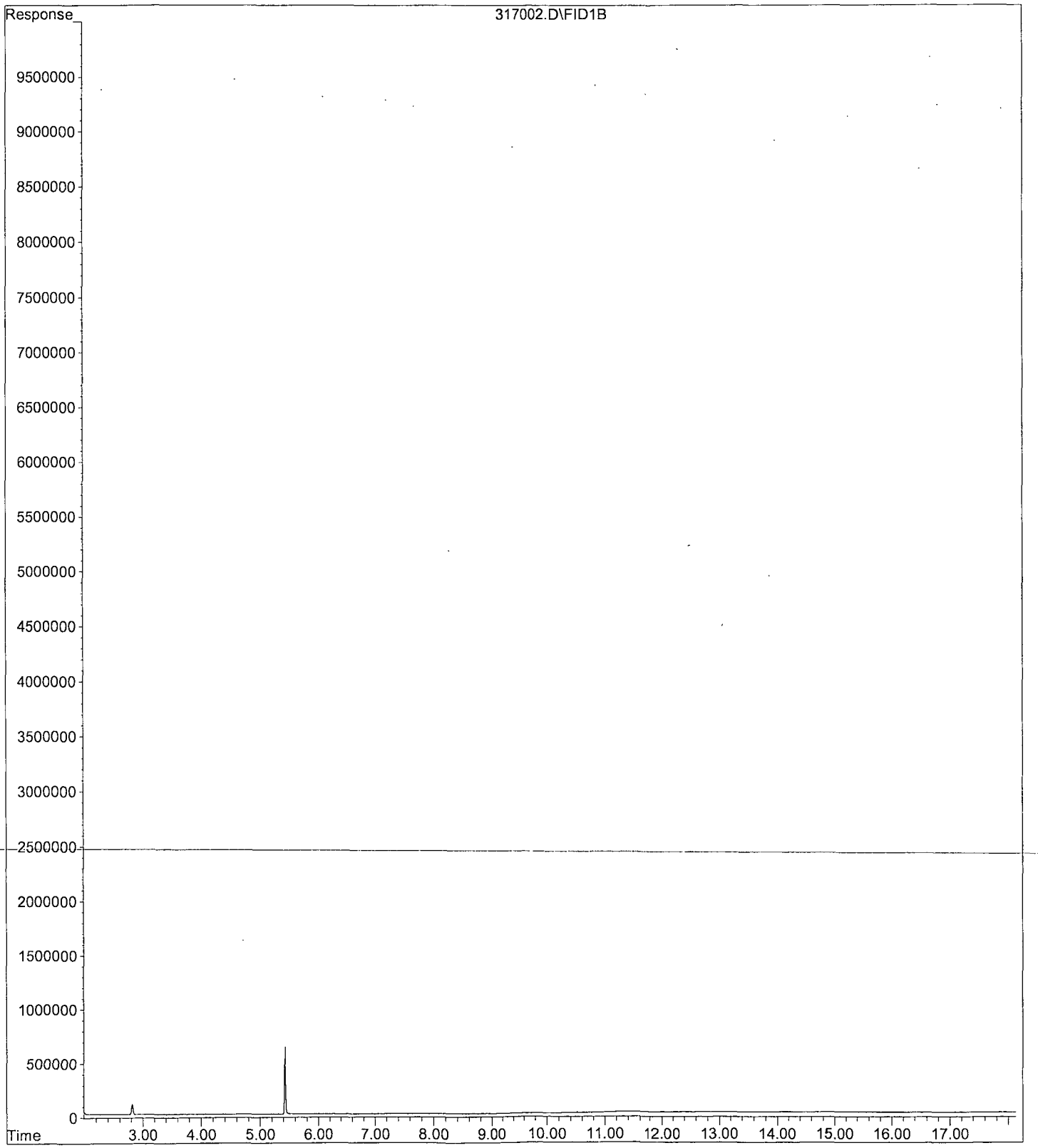
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.43	7951908	2.537 ppb
Surrogate Spike 24.000		Recovery =	10.57%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317002.D
Operator : SS
Acquired : 3-17-20 8:14:08 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-1 3/10/20
Misc Info : water
Vial Number: 2



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317003.D Vial: 3
Acq On : 3-17-20 8:36:27 Operator: SS
Sample : Decanoic Acid-2 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

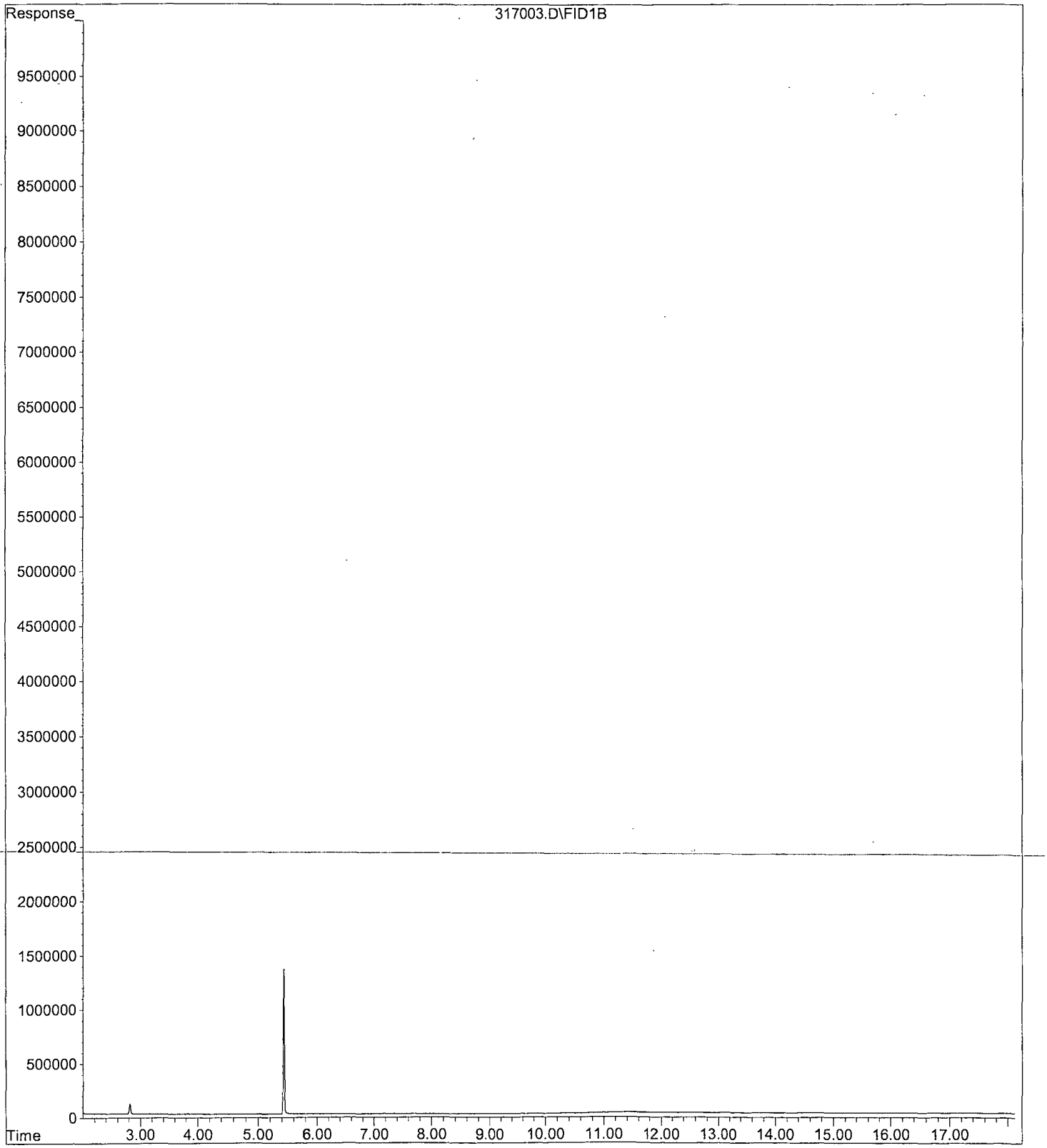
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.44	17397937	5.552 ppb
Surrogate Spike 24.000		Recovery =	23.13%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317003.D
Operator : SS
Acquired : 3-17-20 8:36:27 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-2 3/10/20
Misc Info : water
Vial Number: 3



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317004.D Vial: 4
Acq On : 3-17-20 8:58:53 Operator: SS
Sample : Decanoic Acid-3 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

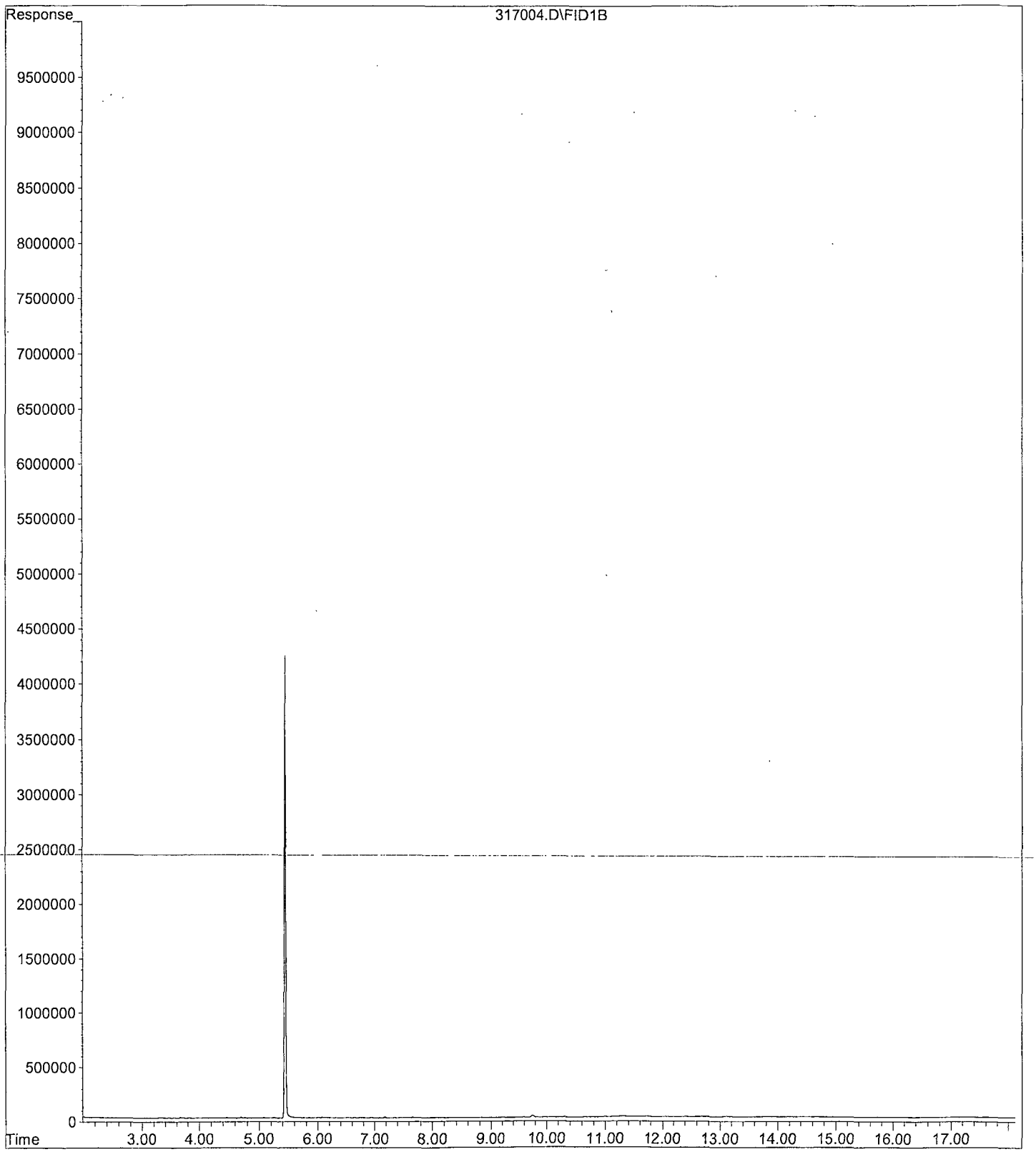
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.45	65137449	20.786 ppb
Surrogate Spike 24.000		Recovery =	86.61%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317004.D
Operator : SS
Acquired : 3-17-20 8:58:53 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-3 3/10/20
Misc Info : water
Vial Number: 4



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317005.D Vial: 5
Acq On : 3-17-20 9:21:15 Operator: SS
Sample : Decanoic Acid-4 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

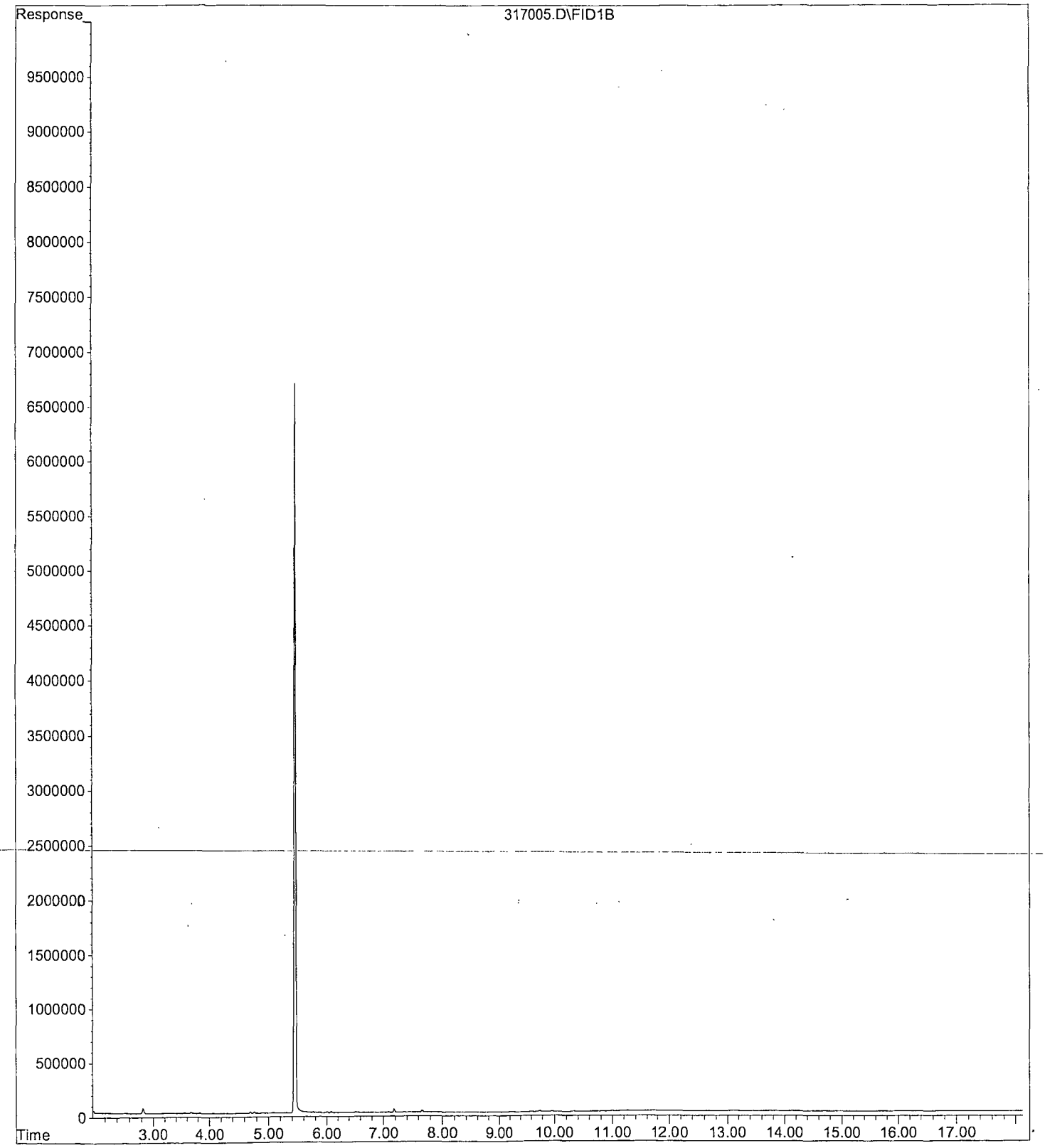
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.46	121142045	38.657 ppb
Surrogate Spike 24.000		Recovery =	161.07%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317005.D
Operator : SS
Acquired : 3-17-20 9:21:15 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-4 3/10/20
Misc Info : water
Vial Number: 5



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317006.D Vial: 6
Acq On : 3-17-20 9:43:41 Operator: SS
Sample : Decanoic Acid-5 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

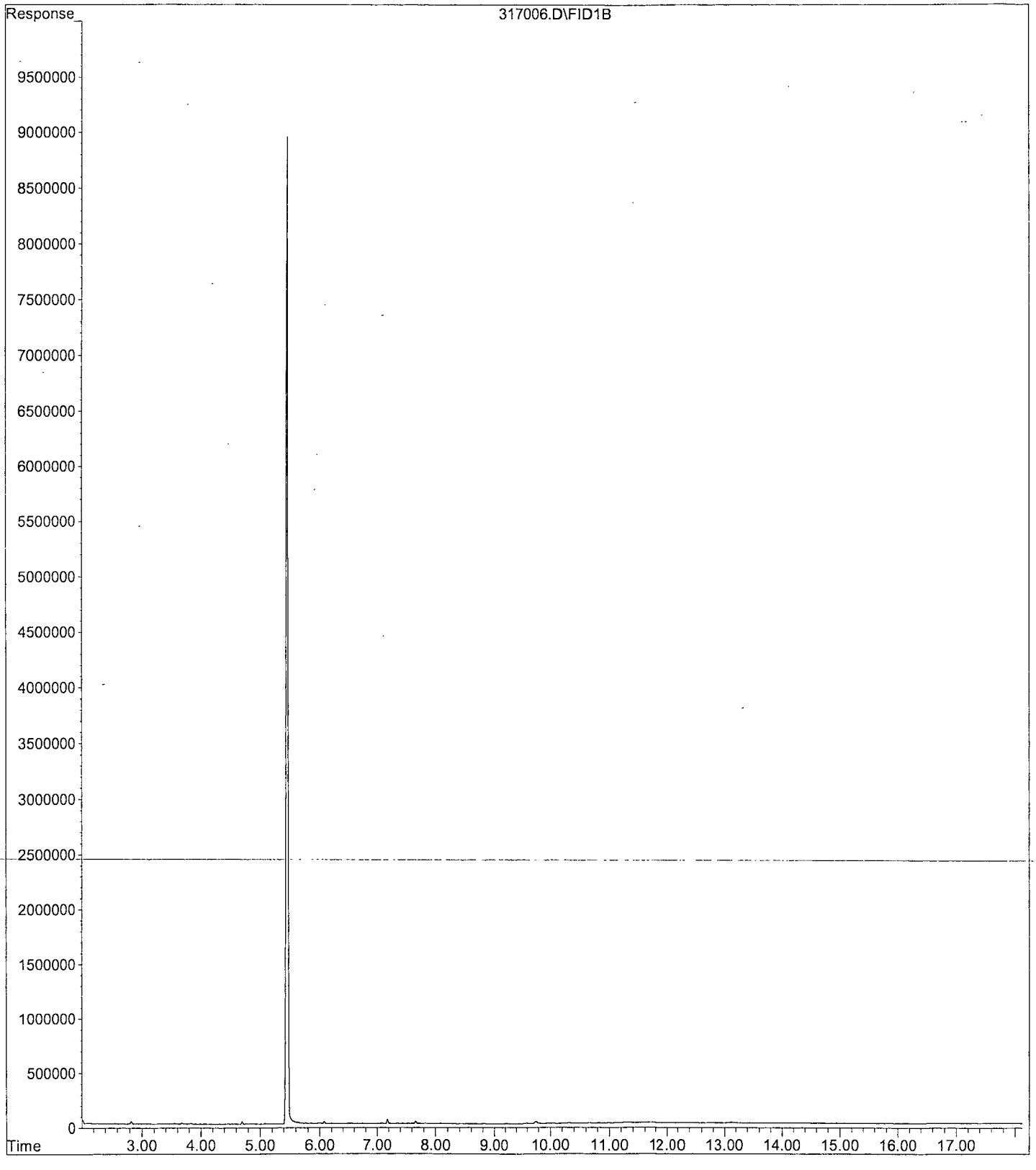
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.47	182114736	58.113 ppb
Surrogate Spike 24.000		Recovery =	242.14%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317006.D
Operator : SS
Acquired : 3-17-20 9:43:41 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-5 3/10/20
Misc Info : water
Vial Number: 6



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317007.D Vial: 7
Acq On : 3-17-20 10:06:06 Operator: SS
Sample : Decanoic Acid-6 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

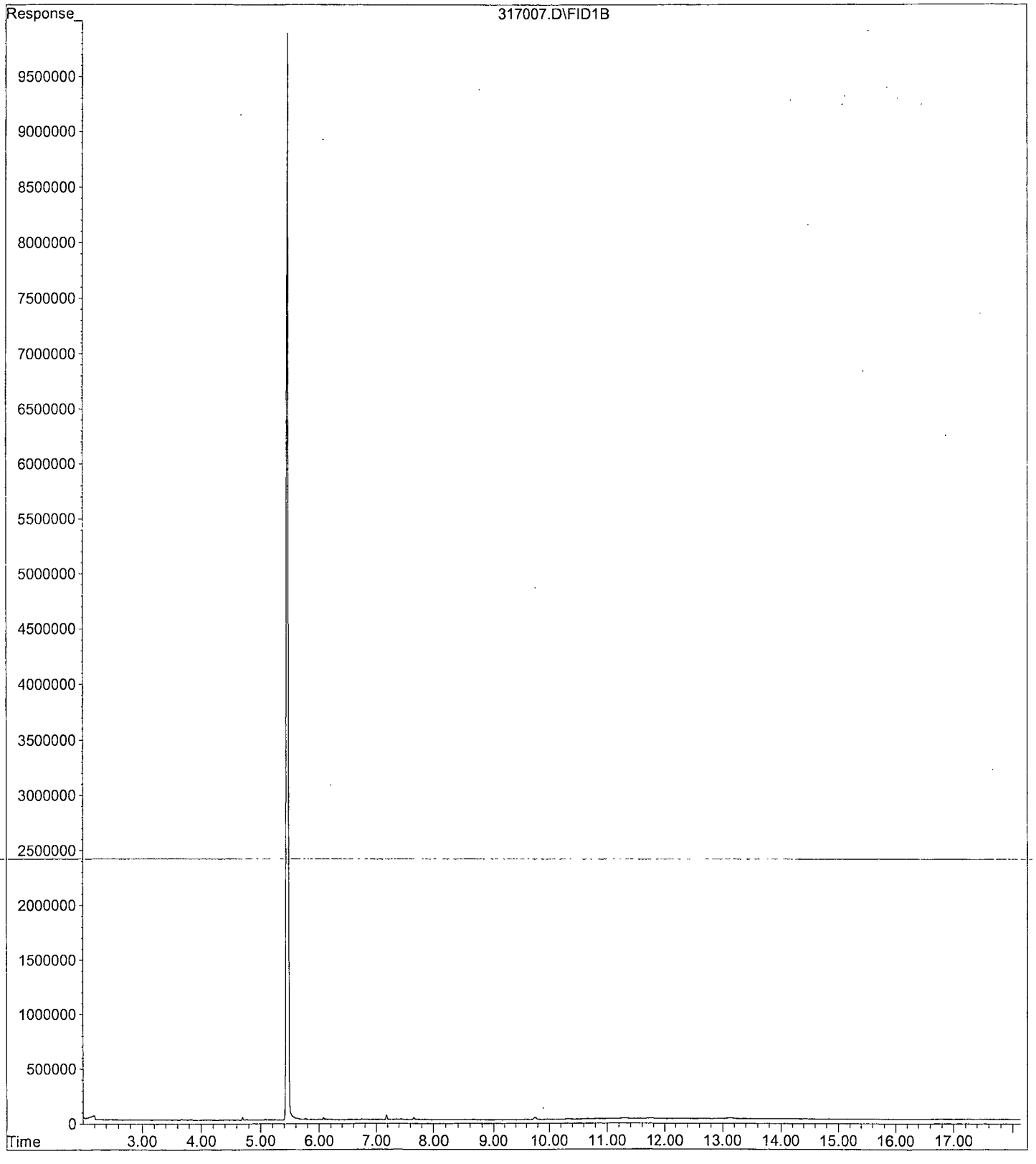
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.47	202752841	64.699 ppb
Surrogate Spike 24.000		Recovery =	269.58%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317007.D
Operator : SS
Acquired : 3-17-20 10:06:06 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-6 3/10/20
Misc Info : water
Vial Number: 7



TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/07/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424180.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2106300	9.8	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1414190	4.1	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2494060	0.66	SA	
4	SA	Octacosane(S)	1746260	1881780	7.8	SA	
5							
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38							
39							
40							
		Average			5.6		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424180.D Vial: 80
Acq On : 5-7-20 14:35:12 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 7 14:56 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

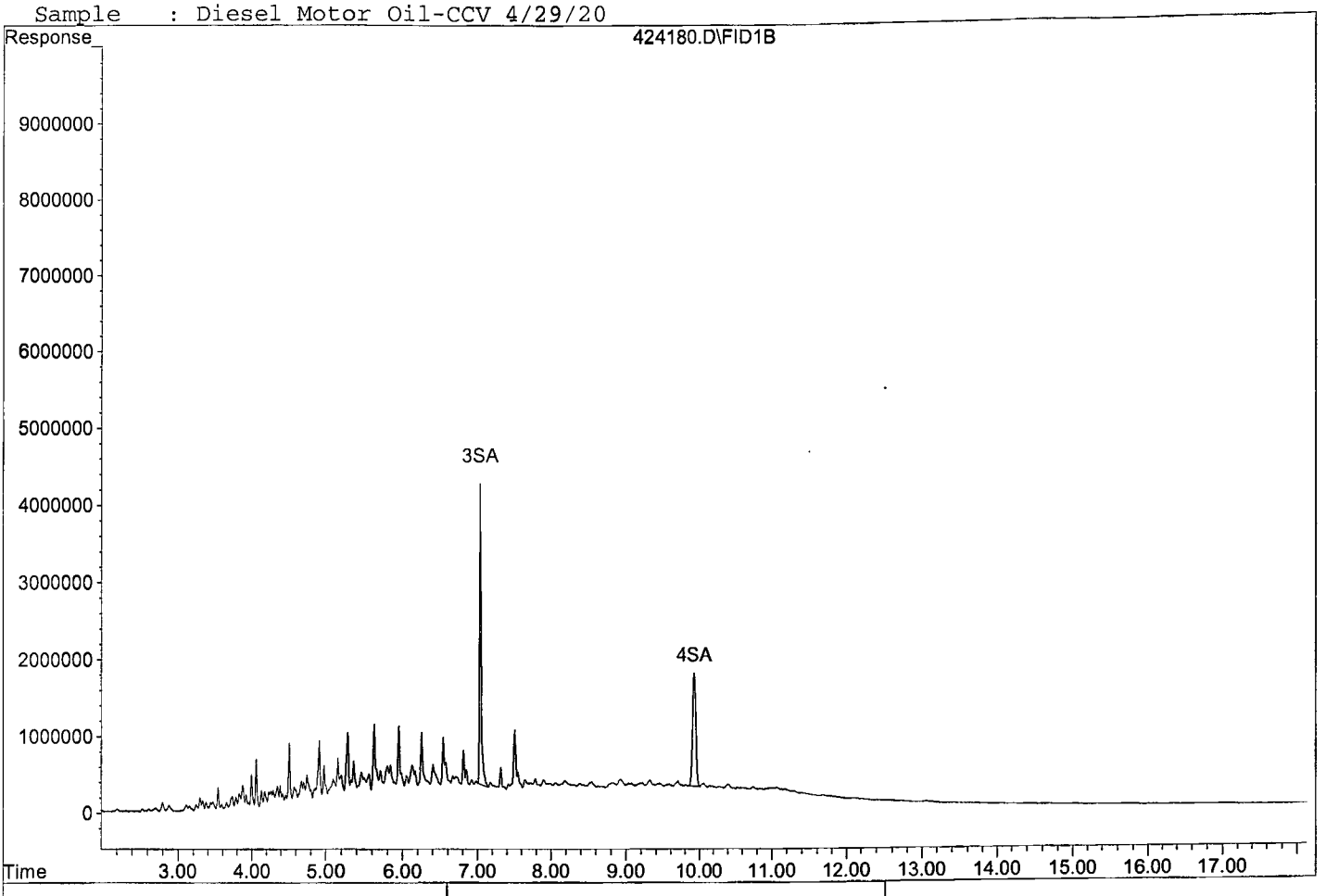
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

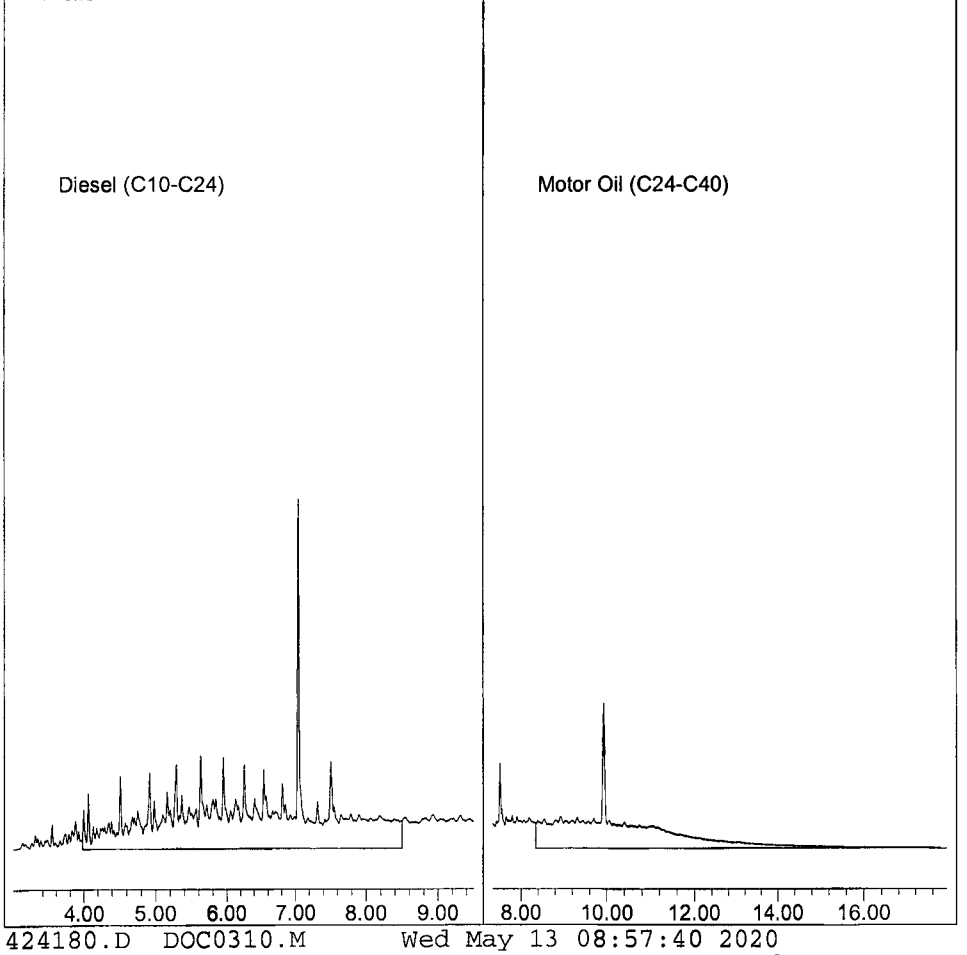
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	62351386	12.418 ppb
Surrogate Spike 30.000	Recovery =		41.39%
4) SA Octacosane(S)	9.93	47044435	13.470 ppb
Surrogate Spike 30.000	Recovery =		44.90%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1053149626	274.599 ppb
2) HBTM Motor Oil (C24-C40)	12.60	707097237	239.792 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424180.D
Sample : Diesel Motor Oil-CCV 4/29/20





TPH Extractables
DEC0317

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/07/20
Instrument: Apollo
Initial Cal. Date: 03/17/20
Data File: 424181.D

		Compound	MEAN	CCRF	%D		%Drift
1	SC	Decanoic Acid(S)	1566890	1557620	0.59	SC	
2							
3							
4							
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38							
39							
40							
		Average			0.6		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424181.D Vial: 81
Acq On : 5-7-20 15:24:14 Operator: SS
Sample : Decanoic Acid-CCV 3/20/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 9:11 2020 Quant Results File: DEC0317.RES

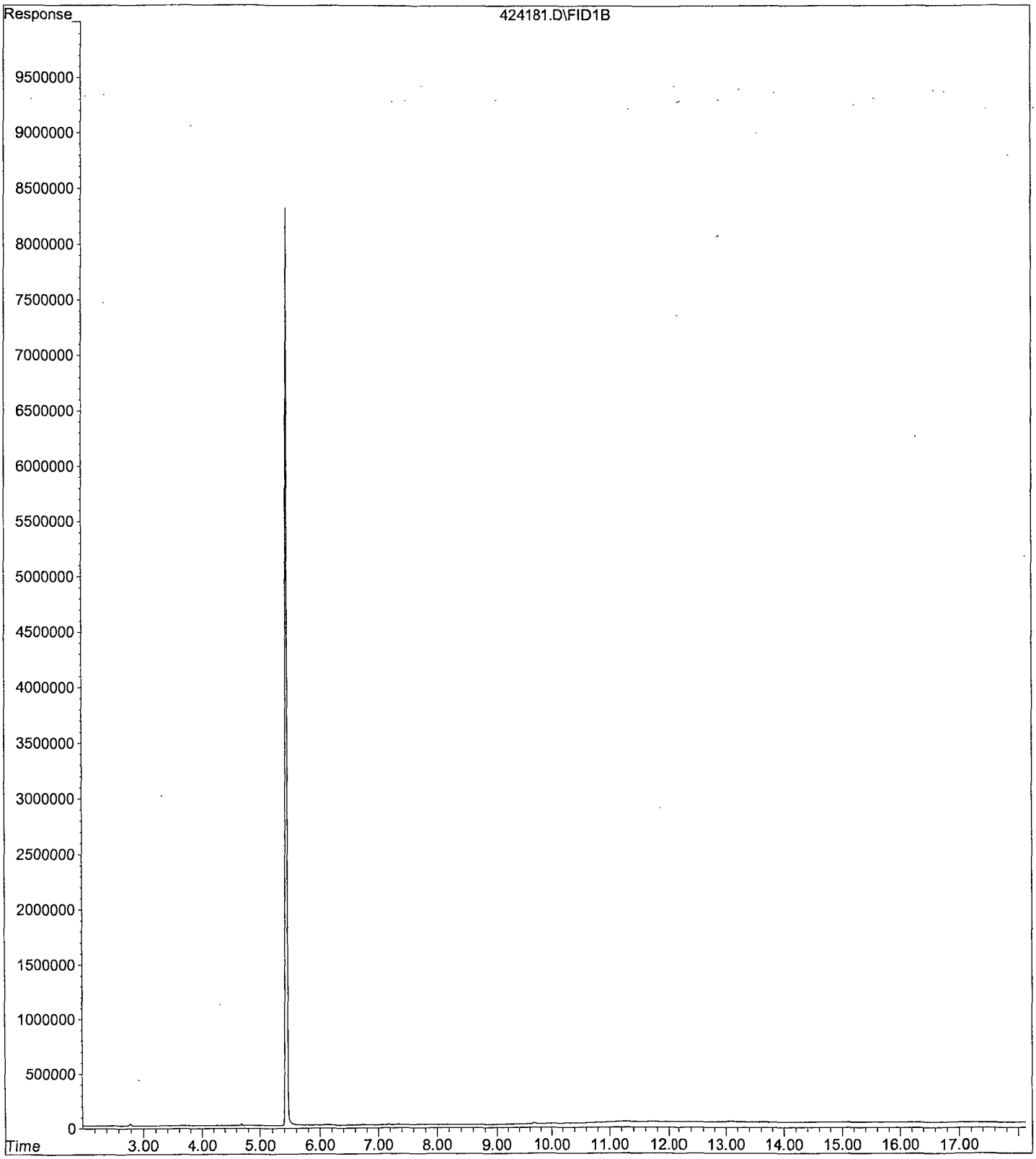
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.45	149531458	47.716 ppb
Surrogate Spike 24.000		Recovery =	198.82%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200424\424181.D
Operator : SS
Acquired : 5-7-20 15:24:14 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-CCV 3/20/20
Misc Info : water
Vial Number: 81



TPH Extractables
DEC0317

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/07/20
Instrument: Apollo
Initial Cal. Date: 03/17/20
Data File: 424192.D

		Compound	MEAN	CCRF	%D	%Drift	
1	SC	Decanoic Acid(S)	1566890	1603480	2.3	SC	
2							
3							
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39							
40							
		Average			2.3		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424192.D Vial: 92
Acq On : 5-7-20 19:49:42 Operator: SS
Sample : Decanoic Acid-CCV 3/20/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 9:13 2020 Quant Results File: DEC0317.RES

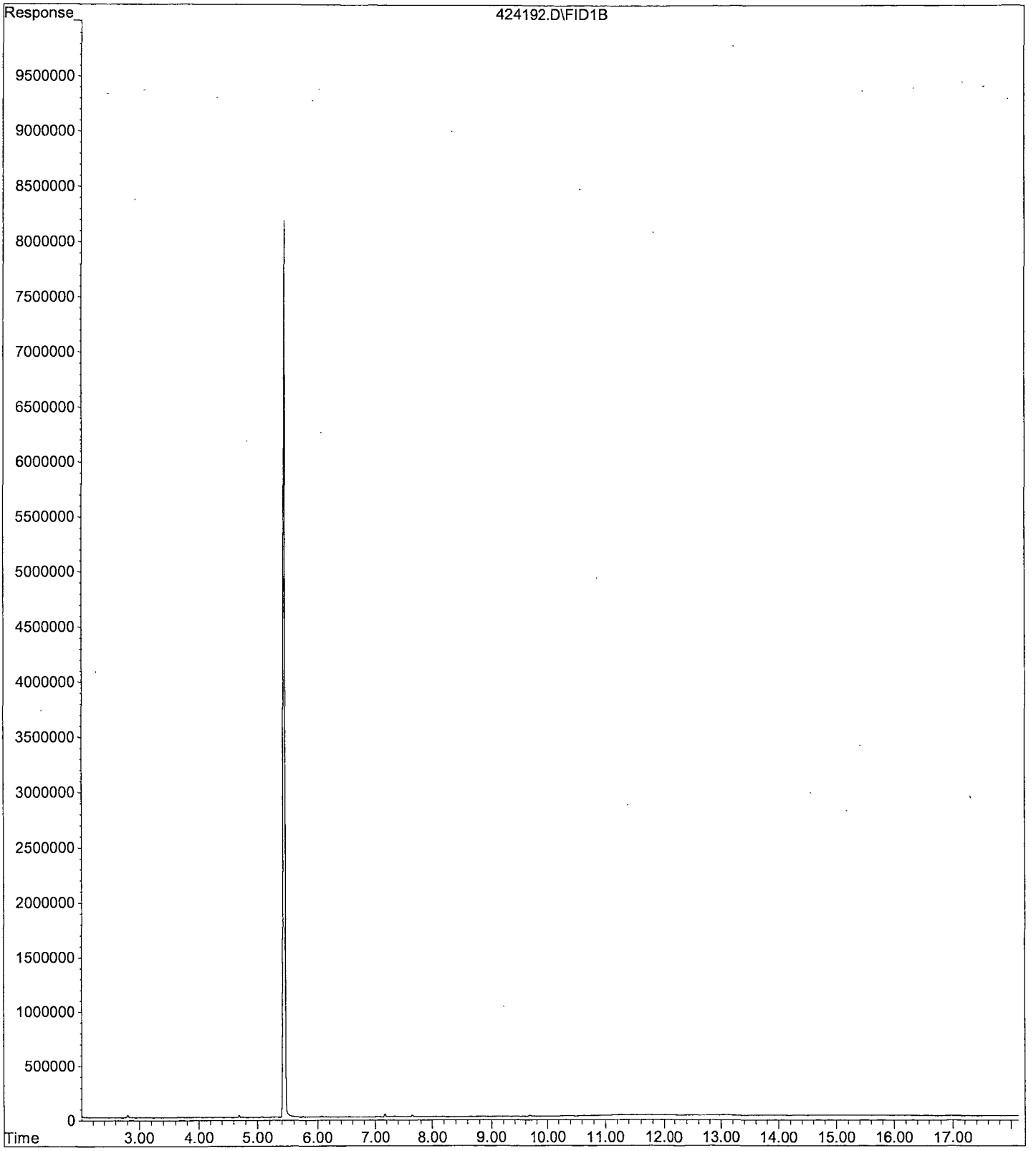
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.46	153933665	49.121 ppb
Surrogate Spike 24.000		Recovery =	204.67%
Target Compounds			

Target Compounds

File : G:\APOLLO\DATA\200424\424192.D
Operator : SS
Acquired : 5-7-20 19:49:42 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-CCV 3/20/20
Misc Info : water
Vial Number: 92



TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/07/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424193.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2104510	9.7	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1416120	4.0	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2495190	0.61	SA	
4	SA	Octacosane(S)	1746260	1863570	6.7	SA	
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39							
40							
		Average			5.3		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424193.D Vial: 93
Acq On : 5-7-20 20:12:24 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

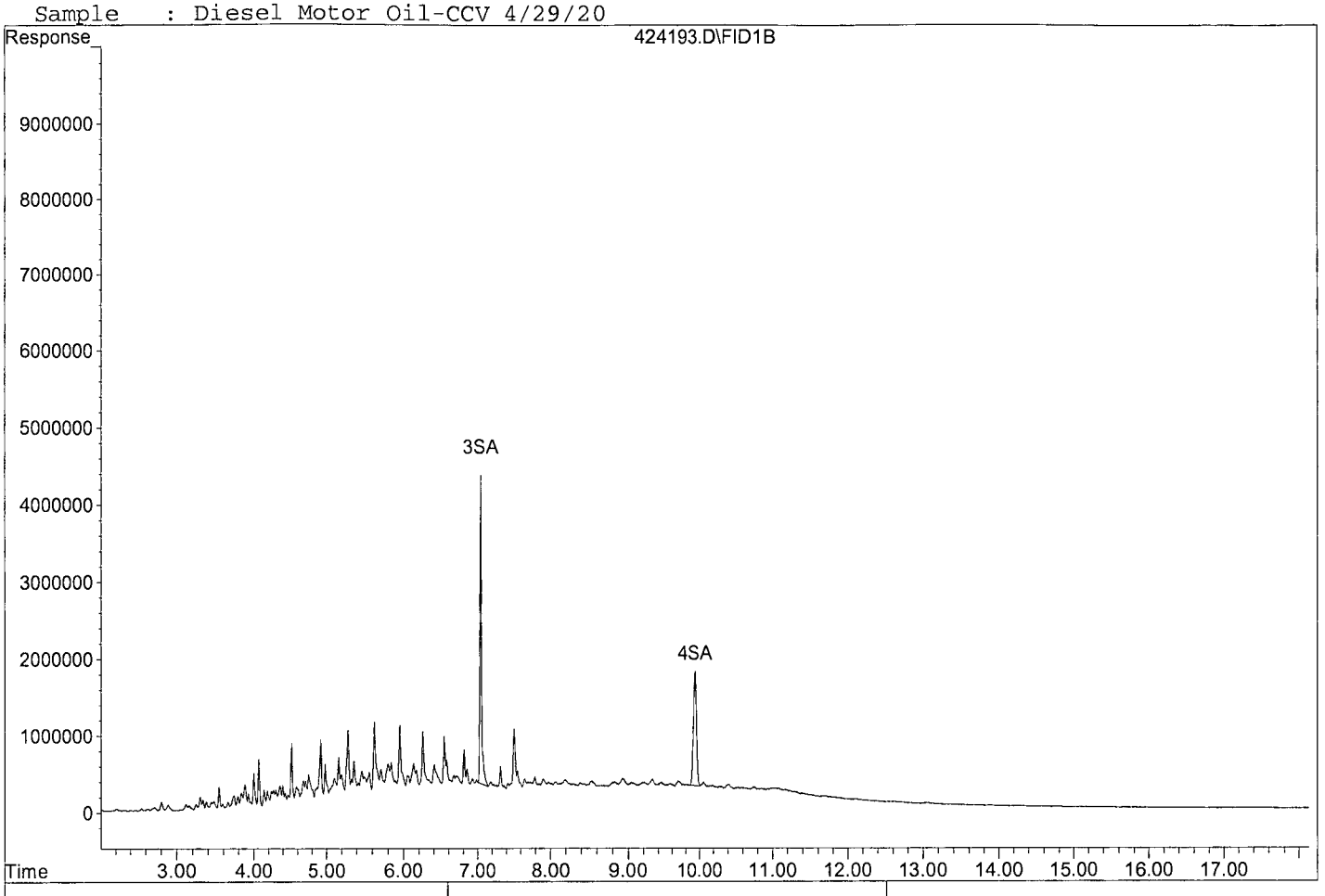
Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

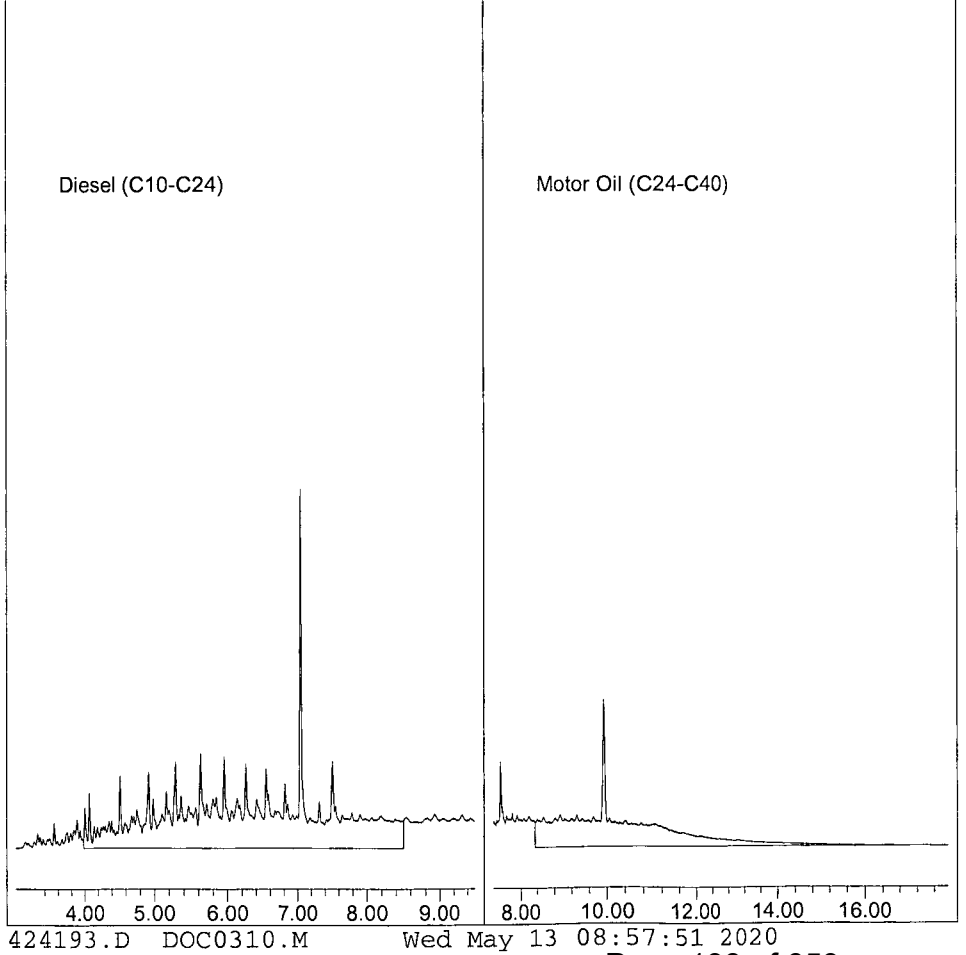
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	62379860	12.424 ppb
Surrogate Spike 30.000	Recovery =		41.41%
4) SA Octacosane(S)	9.93	46589171	13.340 ppb
Surrogate Spike 30.000	Recovery =		44.47%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1052255779	274.366 ppb
2) HBTM Motor Oil (C24-C40)	12.60	708061893	240.119 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424193.D
Sample : Diesel Motor Oil-CCV 4/29/20





424193.D DOC0310.M Wed May 13 08:57:51 2020

TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/12/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424254.D

		Compound	MEAN	CCRF	%D		%Drift
1	HATM	Diesel (C10-C24)	1917610	2065950	7.7	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1398630	5.1	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2441400	2.8	SA	
4	SA	Octacosane(S)	1746260	1851470	6.0	SA	
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38							
39							
40							
		Average			5.4		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424254.D Vial: 54
Acq On : 5-12-20 19:00:27 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

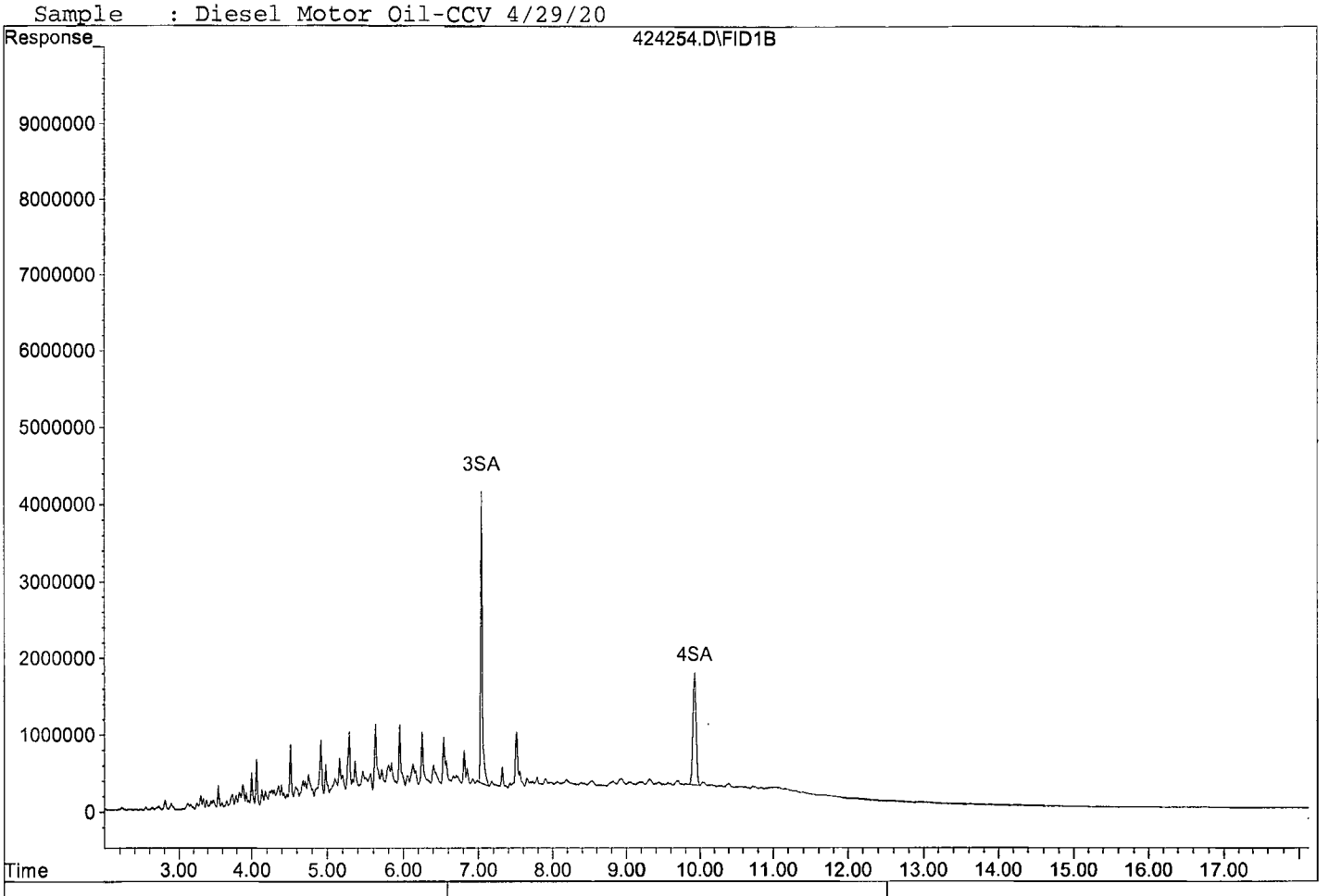
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

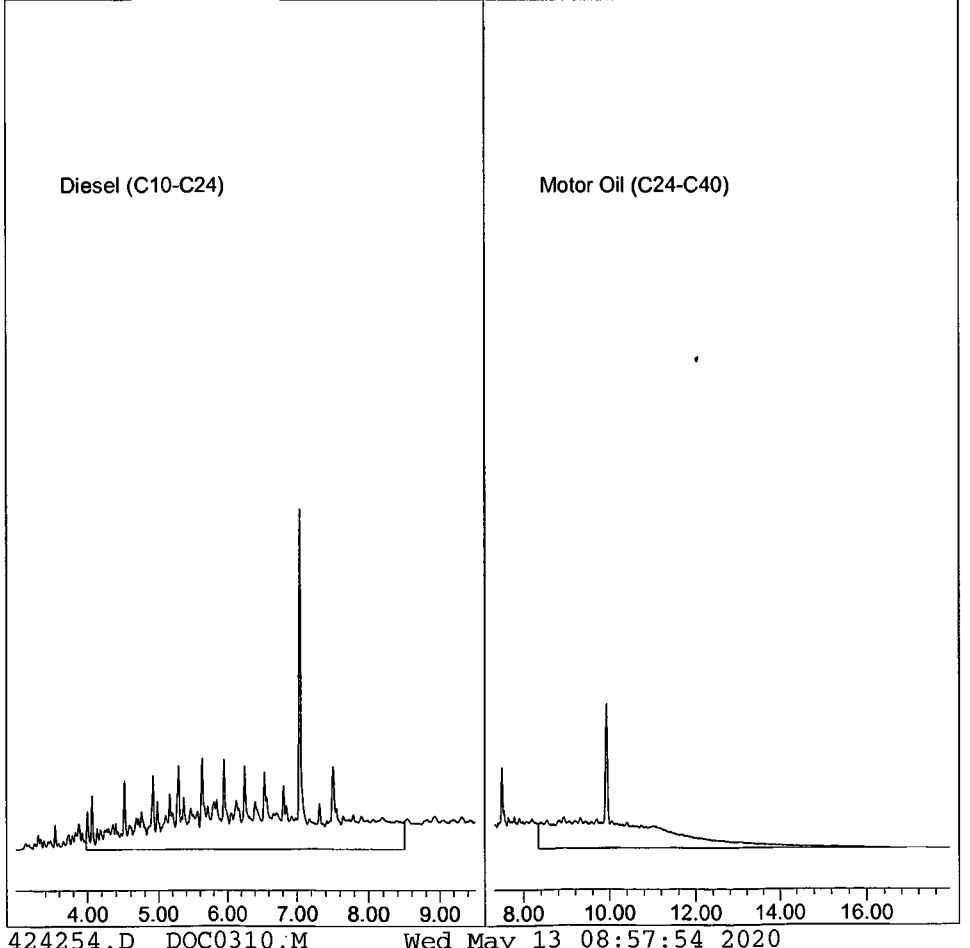
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	61035065	12.156 ppb
Surrogate Spike 30.000	Recovery =		40.52%
4) SA Octacosane(S)	9.93	46286714	13.253 ppb
Surrogate Spike 30.000	Recovery =		44.18%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1032974672	269.339 ppb
2) HBTM Motor Oil (C24-C40)	12.60	699317054	237.154 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424254.D
Sample : Diesel Motor Oil-CCV 4/29/20





TPH Extractables
DEC0317

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/12/20
Instrument: Apollo
Initial Cal. Date: 03/17/20
Data File: 424255.D

		Compound	MEAN	CCRF	%D	%Drift	
1	SC	Decanoic Acid(S)	1566890	1819110	16	SC	
2							
3							
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39							
40							
		Average			16.0		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424255.D Vial: 55
Acq On : 5-12-20 19:23:05 Operator: SS
Sample : Decanoic Acid-CCV 3/20/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 9:15 2020 Quant Results File: DEC0317.RES

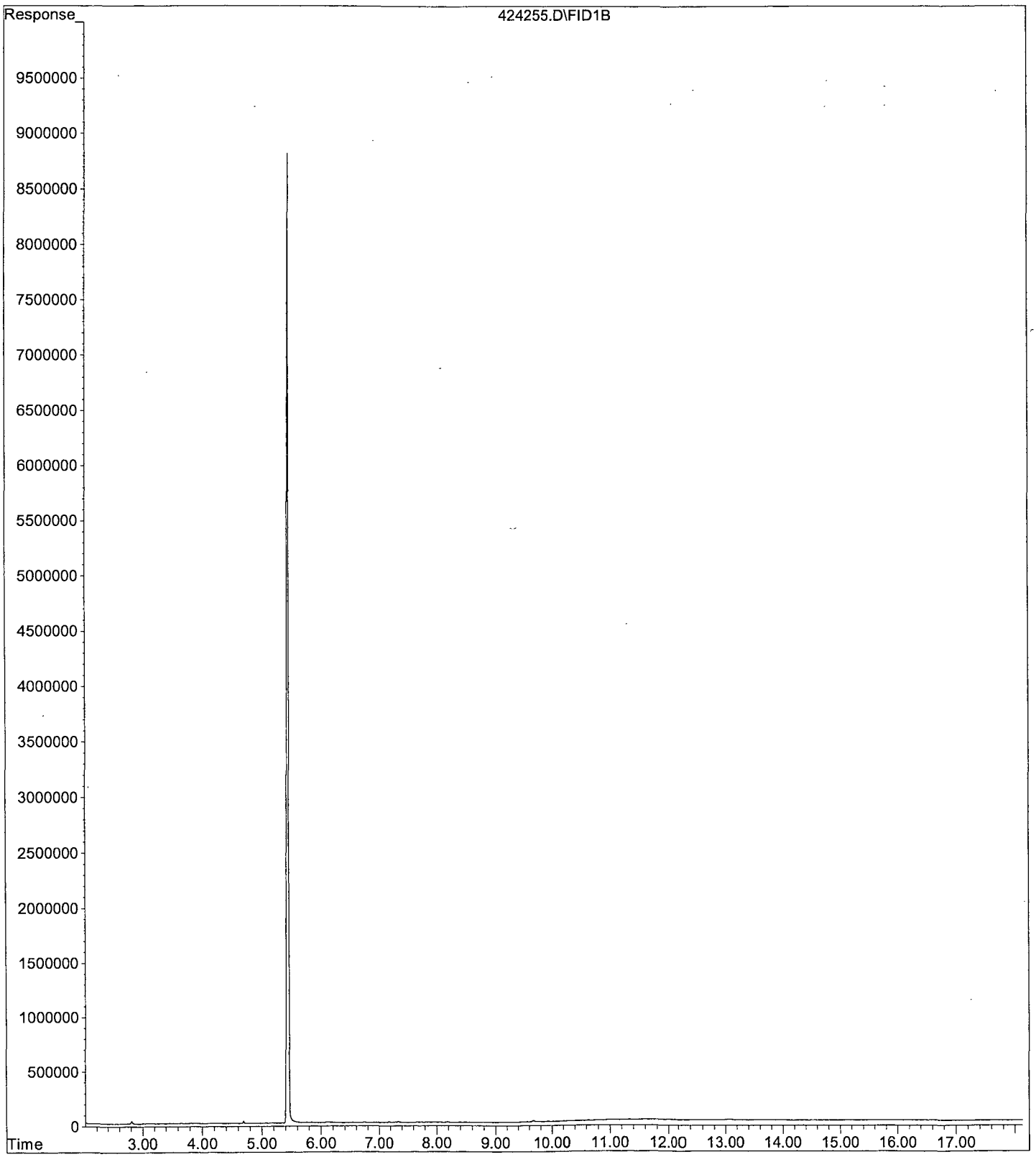
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.46	174634389	55.726 ppb
Surrogate Spike 24.000		Recovery =	232.19%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200424\424255.D
Operator : SS
Acquired : 5-12-20 19:23:05 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-CCV 3/20/20
Misc Info : water
Vial Number: 55



TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/12/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424266.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2204890	15	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1491910	1.2	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2615440	4.2	SA	
4	SA	Octacosane(S)	1746260	1954290	12	SA	
5							
6							
7							
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39							
40							
		Average			8.1		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424266.D Vial: 66
Acq On : 5-12-20 23:32:39 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

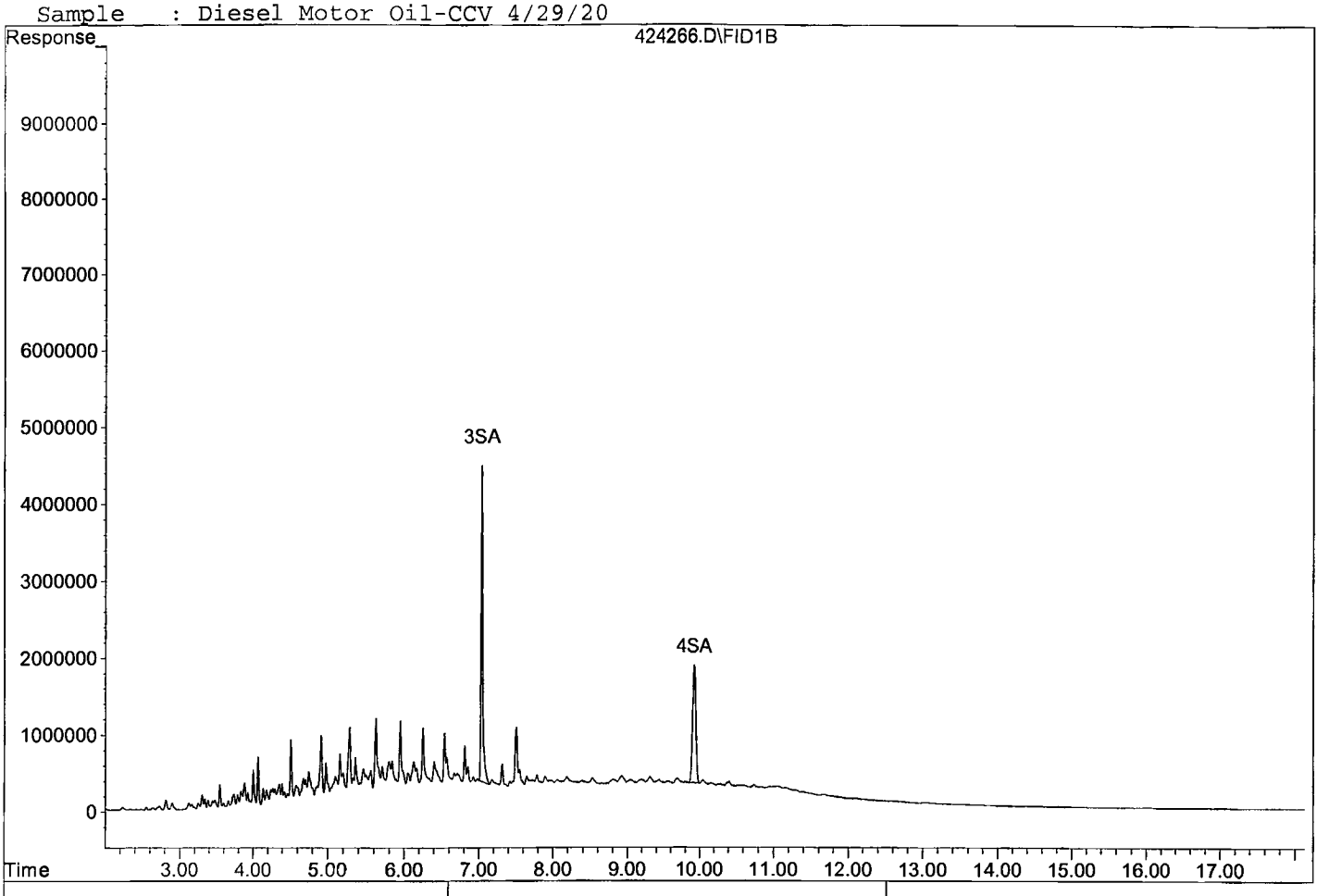
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

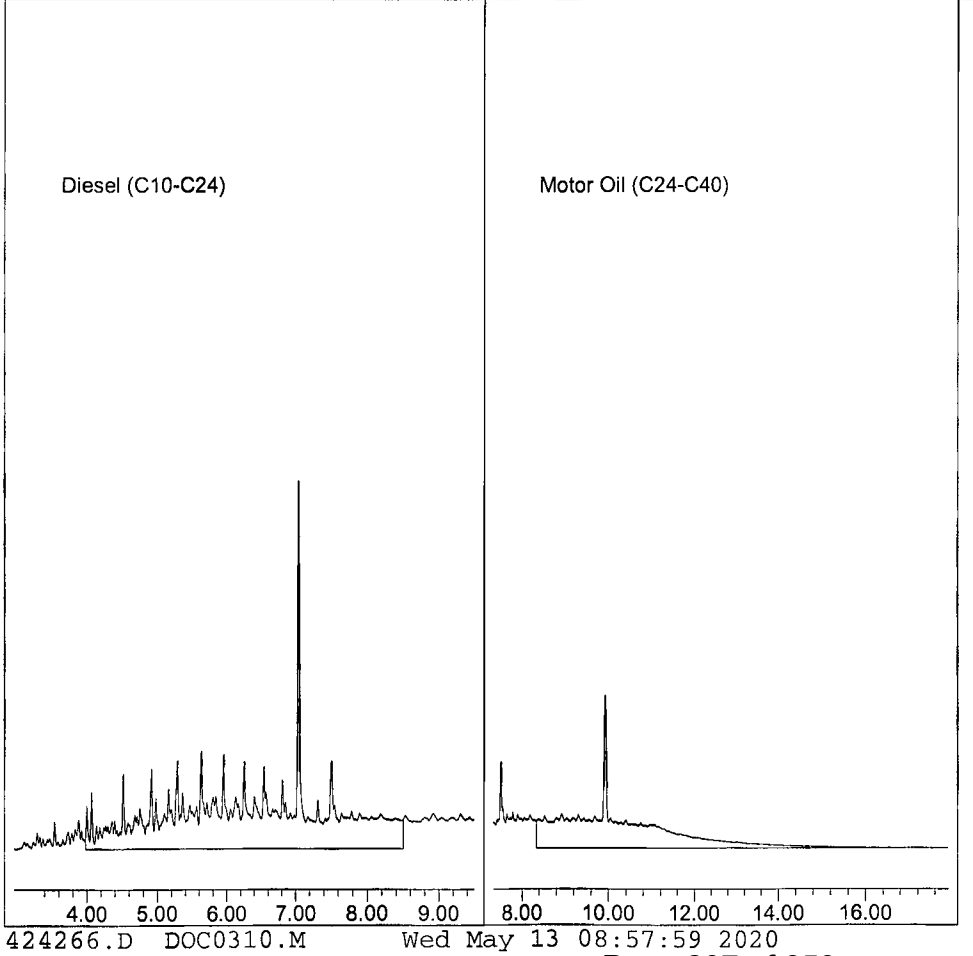
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	65385992	13.022 ppb
Surrogate Spike 30.000	Recovery =		43.41%
4) SA Octacosane(S)	9.92	48857258	13.989 ppb
Surrogate Spike 30.000	Recovery =		46.63%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1102443130	287.452 ppb
2) HBTM Motor Oil (C24-C40)	12.60	745952535	252.969 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424266.D
Sample : Diesel Motor Oil-CCV 4/29/20





TPH Extractables
DEC0317

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/12/20
Instrument: Apollo
Initial Cal. Date: 03/17/20
Data File: 424267.D

		Compound	MEAN	CCRF	%D	%Drift	
1	SC	Decanoic Acid(S)	1566890	1816440	16	SC	
2							
3							
4							
5							
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40							
		Average			16.0		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424267.D Vial: 67
Acq On : 5-12-20 23:55:17 Operator: SS
Sample : Decanoic Acid-CCV 3/20/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 9:16 2020 Quant Results File: DEC0317.RES

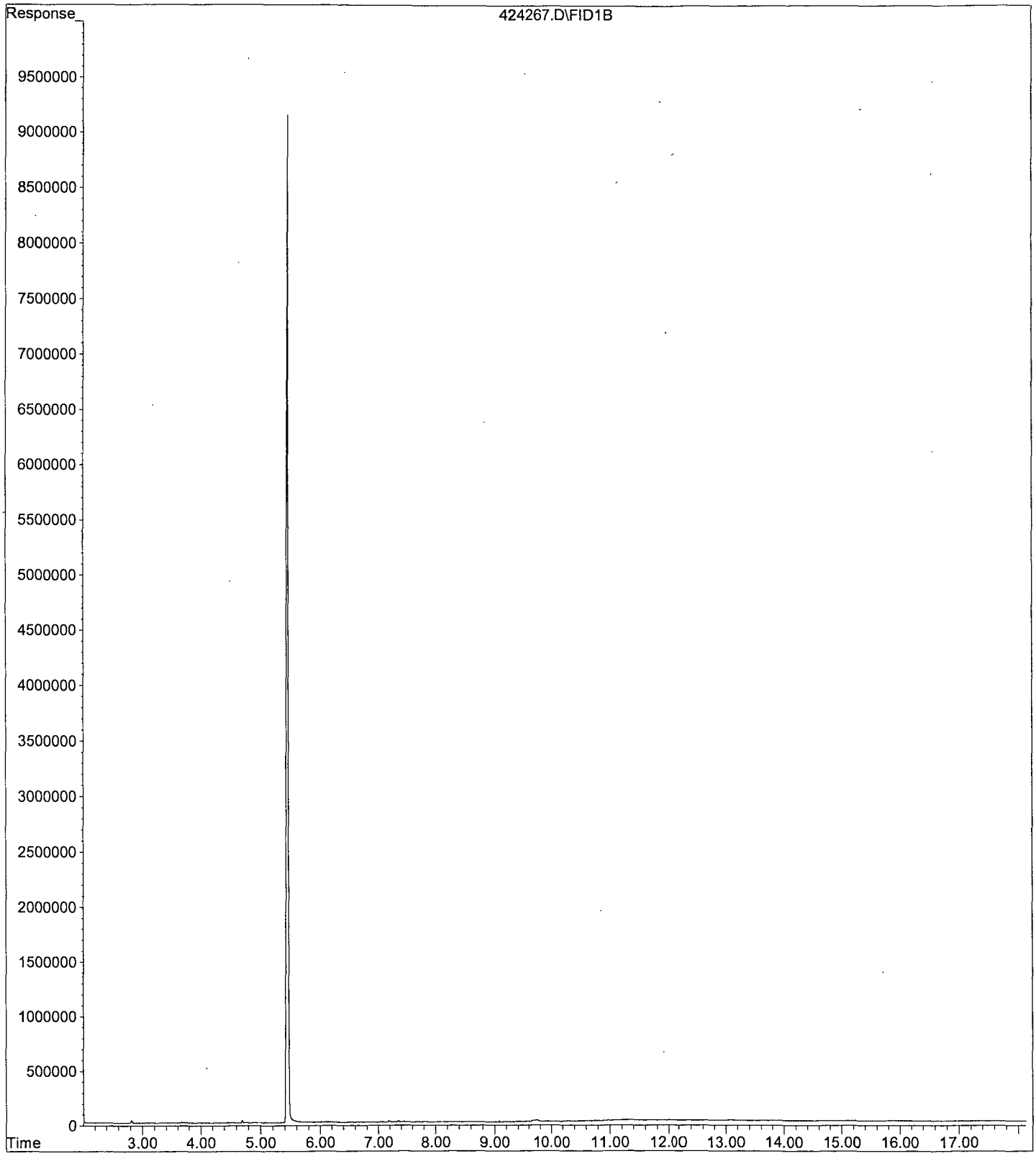
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.46	174378129	55.645 ppb
Surrogate Spike 24.000		Recovery =	231.85%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200424\424267.D
Operator : SS
Acquired : 5-12-20 23:55:17 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-CCV 3/20/20
Misc Info : water
Vial Number: 67



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424111.D Vial: 11
Acq On : 5-4-20 21:08:10 Operator: SS
Sample : BA10439W17 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

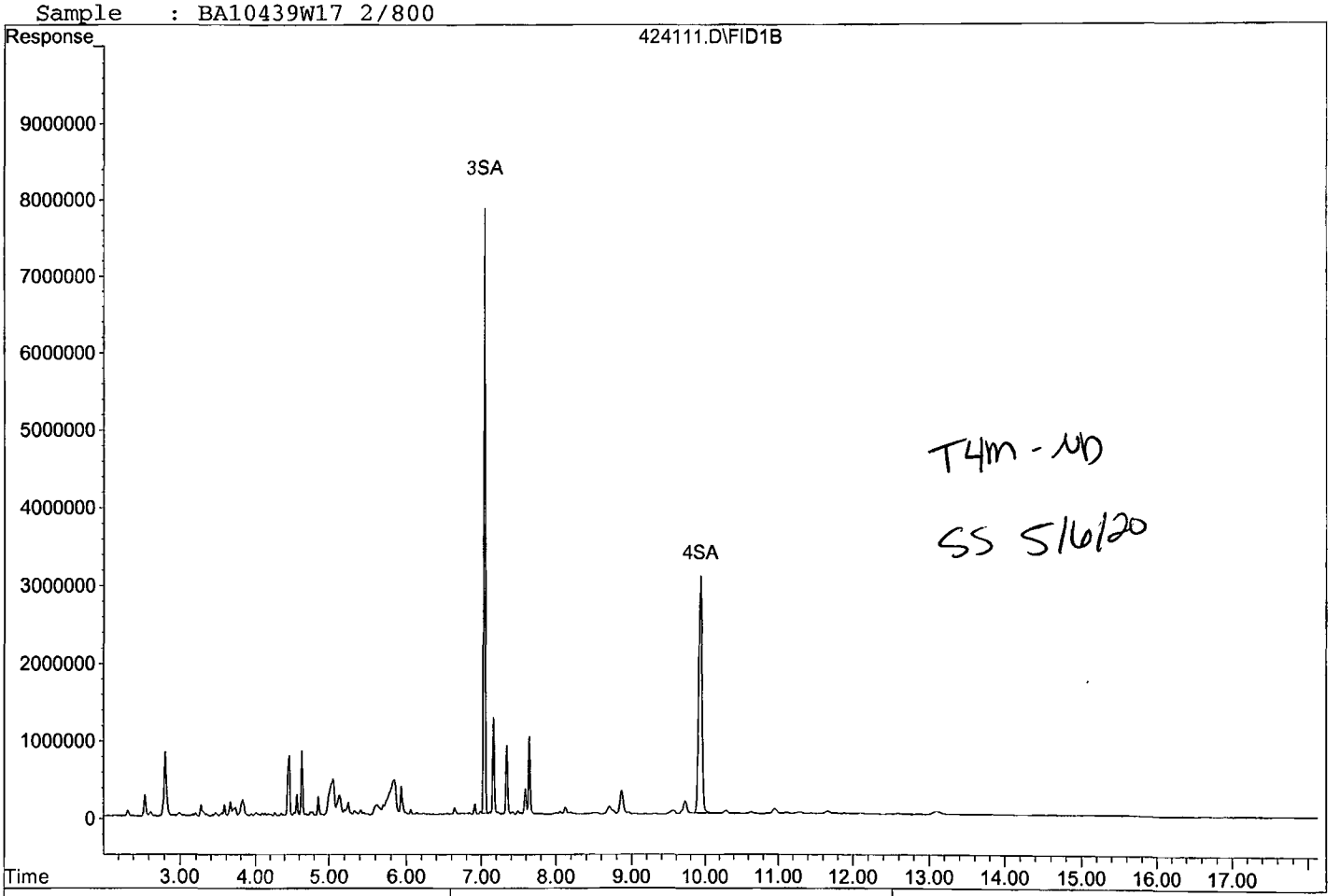
Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	111327312	55.430 ppb
Surrogate Spike 75.000	Recovery =		73.91%
4) SA Octacosane(S)	9.93	99642916	71.326 ppb
Surrogate Spike 75.000	Recovery =		95.10%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	244822702	159.588 ppb
2) HBTM Motor Oil (C24-C40)	12.60	77666938	65.846 ppb
Target Compounds			

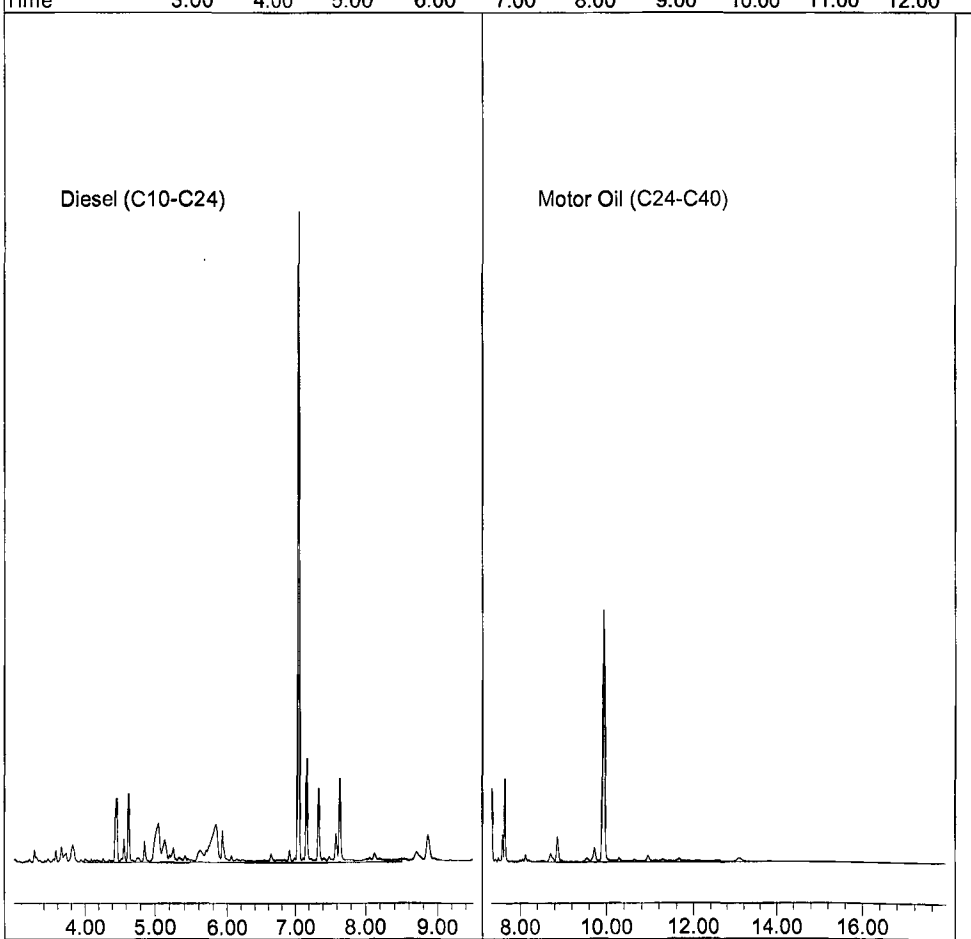
(f)=RT Delta > 1/2 Window (m)=manual int.
424111.D DOC0310.M Wed May 06 09:34:40 2020 Page 1

Data File: G:\APOLLO\DATA\200424\424111.D
Sample : BA10439W17 2/800



T4m - ND

SS 5/6/20



424111.D DOC0310.M Wed May 06 09:34:41 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424096.D Vial: 96
Acq On : 5-4-20 15:27:53 Operator: SS
Sample : 200430A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:48 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

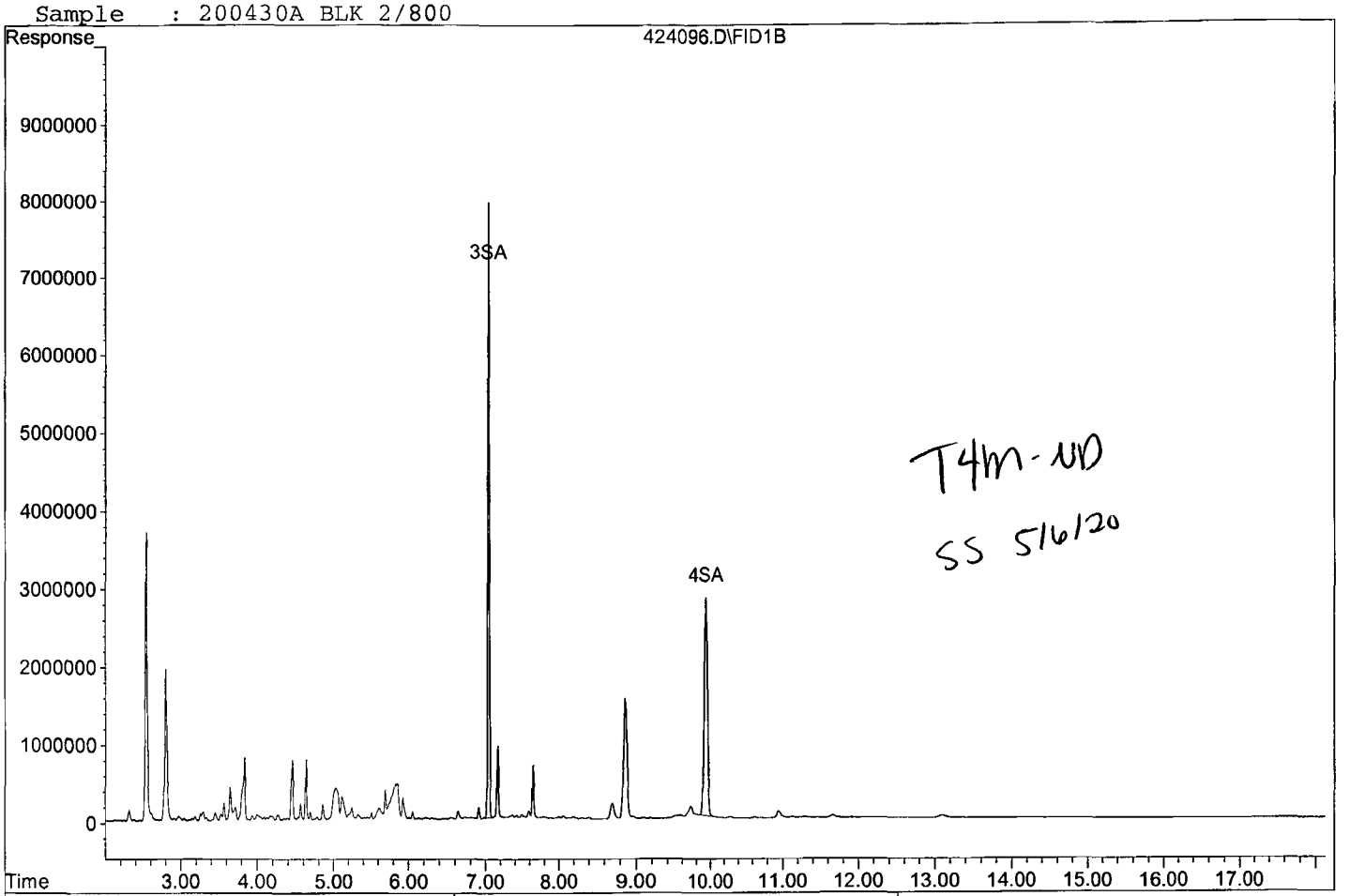
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	110088759	54.814 ppb
Surrogate Spike 75.000	Recovery =		73.09%
4) SA Octacosane(S)	9.93	91199024	65.282 ppb
Surrogate Spike 75.000	Recovery =		87.04%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	231719004	151.047 ppb
2) HBTM Motor Oil (C24-C40)	12.60	131413234	111.413 ppb

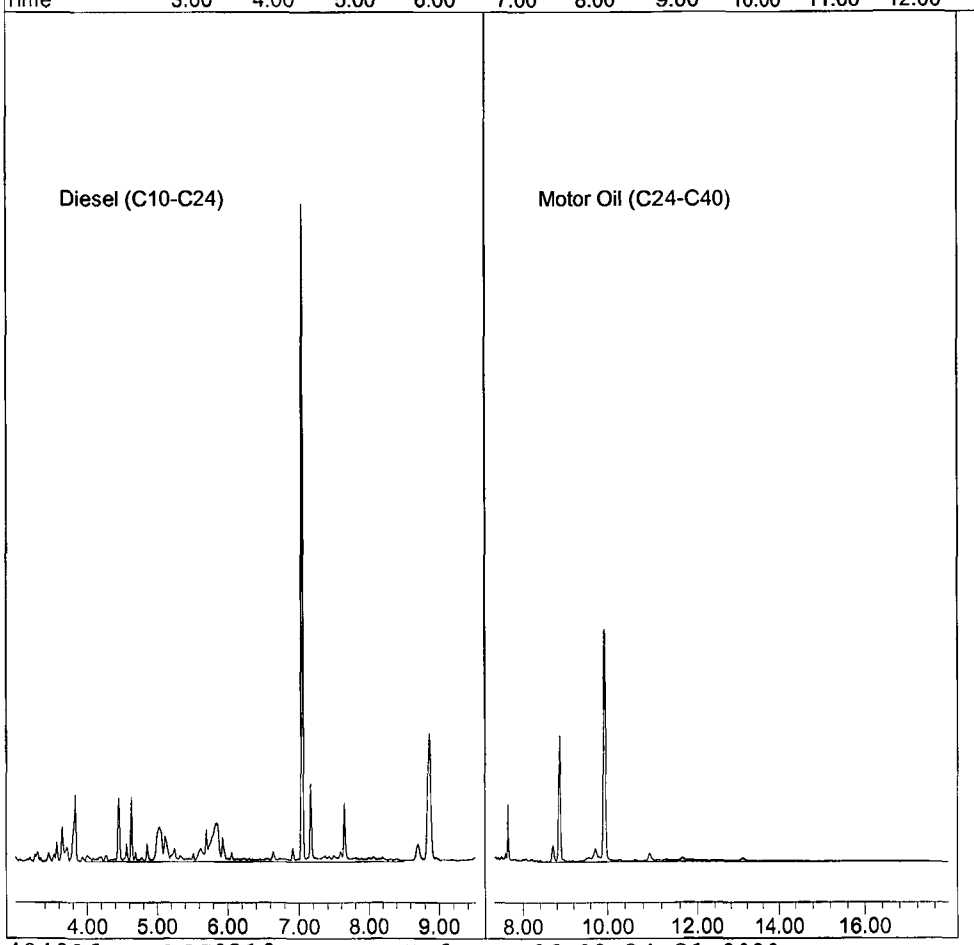
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424096.D
Sample : 200430A BLK 2/800



T4m-ND
SS 5/6/20



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424097.D Vial: 97
Acq On : 5-4-20 15:50:26 Operator: SS
Sample : 200430A LCS-1 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:47 2020 Quant Results File: DOC0310.RES

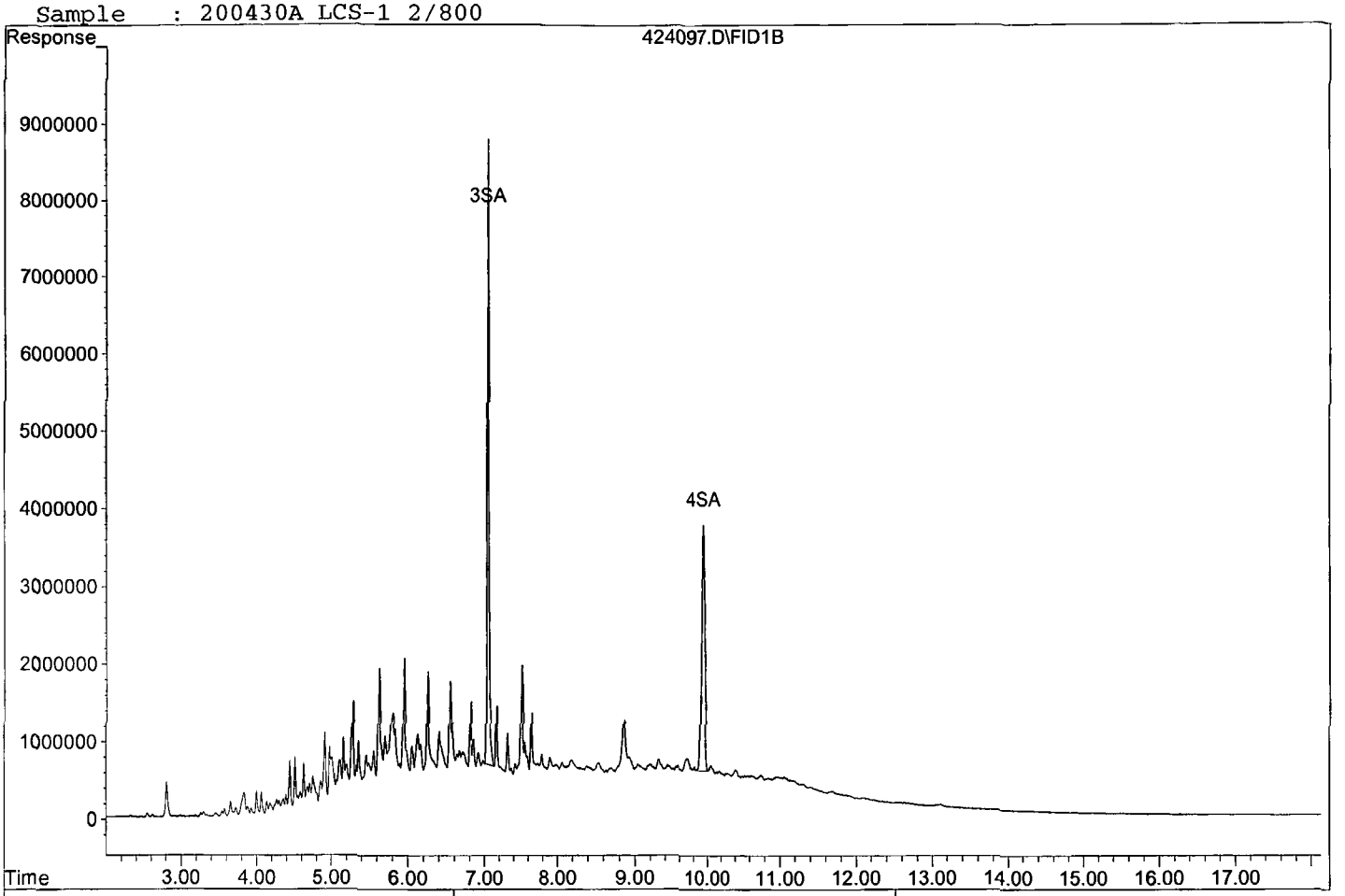
Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

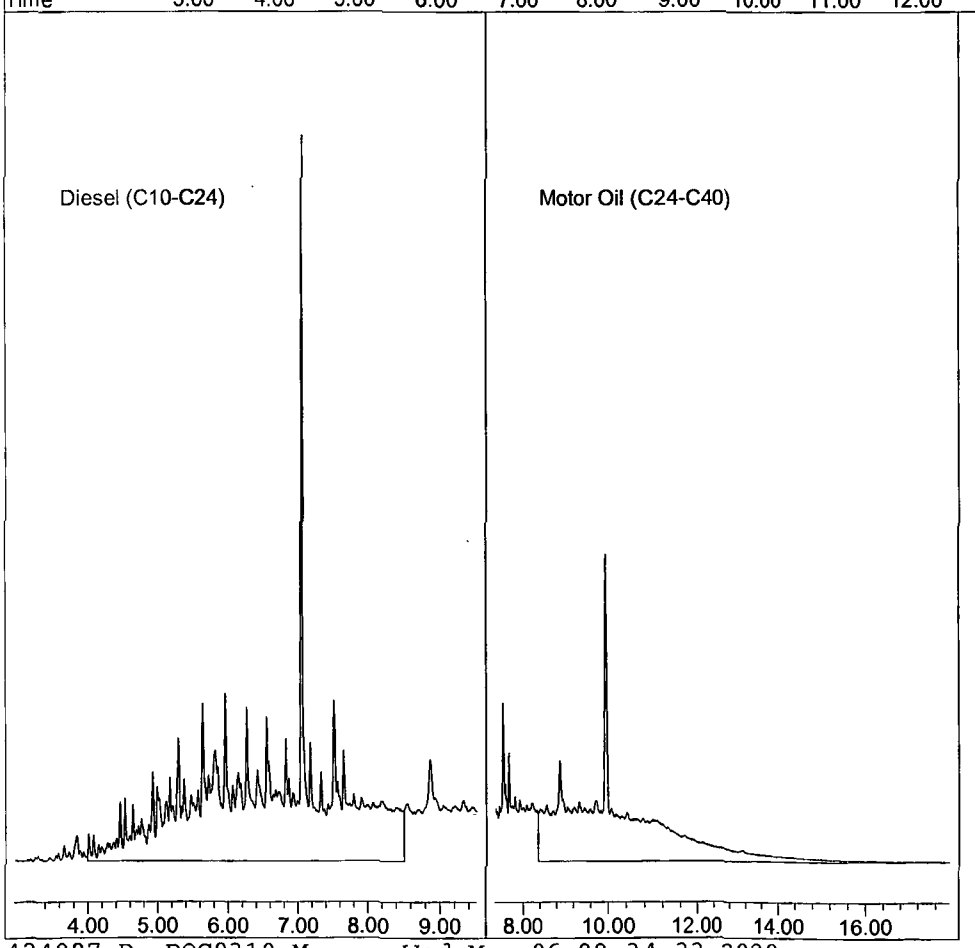
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	127306065	63.386 ppb
Surrogate Spike 75.000		Recovery =	84.51%
4) SA Octacosane(S)	9.94	99038275	70.893 ppb
Surrogate Spike 75.000		Recovery =	94.52%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1833419363	1195.119 ppb
2) HBTM Motor Oil (C24-C40)	12.60	1355486807	1149.189 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424097.D
Sample : 200430A LCS-1 2/800





424097.D DOC0310.M Wed May 06 09:34:33 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424098.D Vial: 98
Acq On : 5-4-20 16:13:05 Operator: SS
Sample : 200430A LCSD-1 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

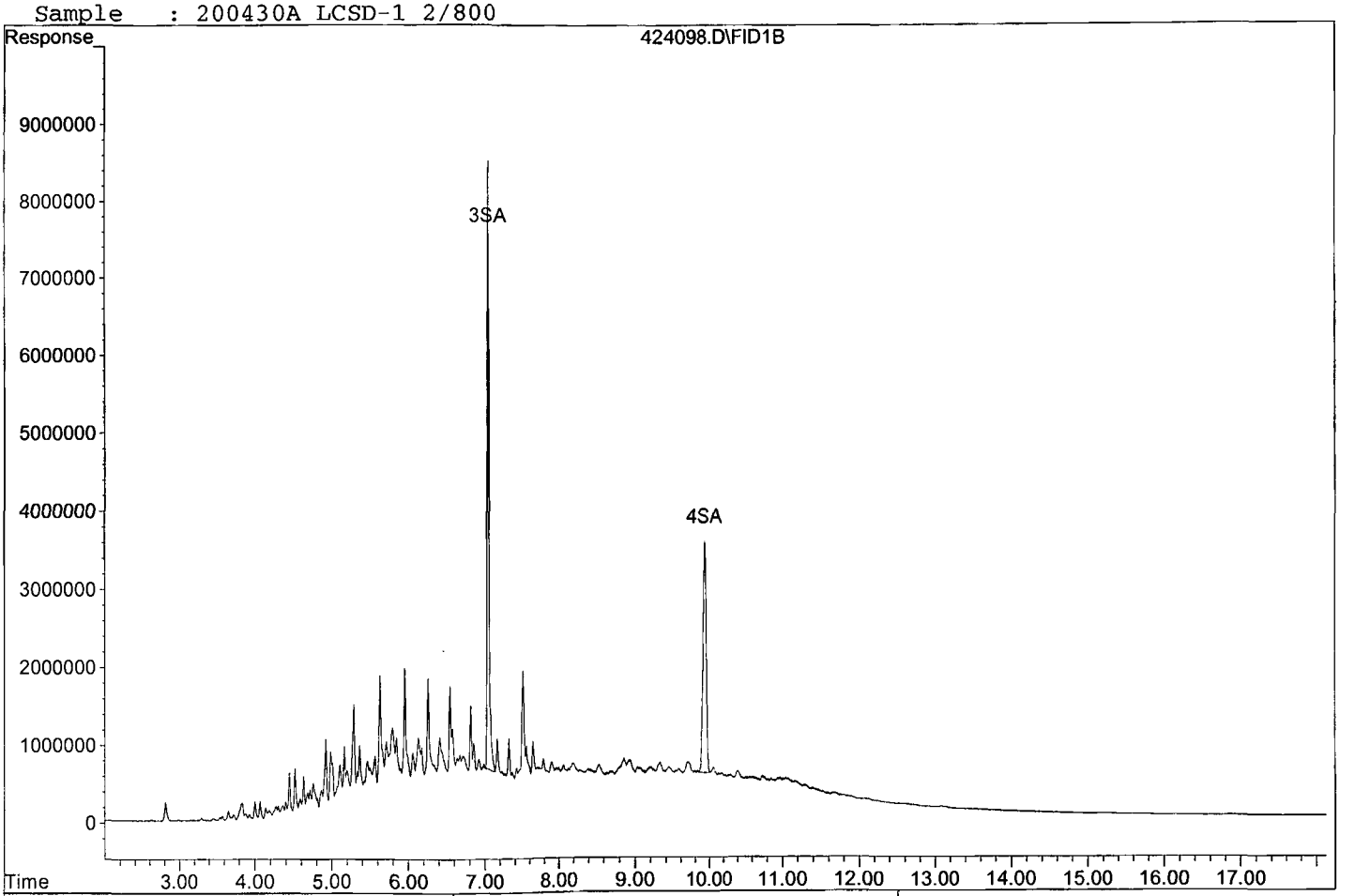
Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

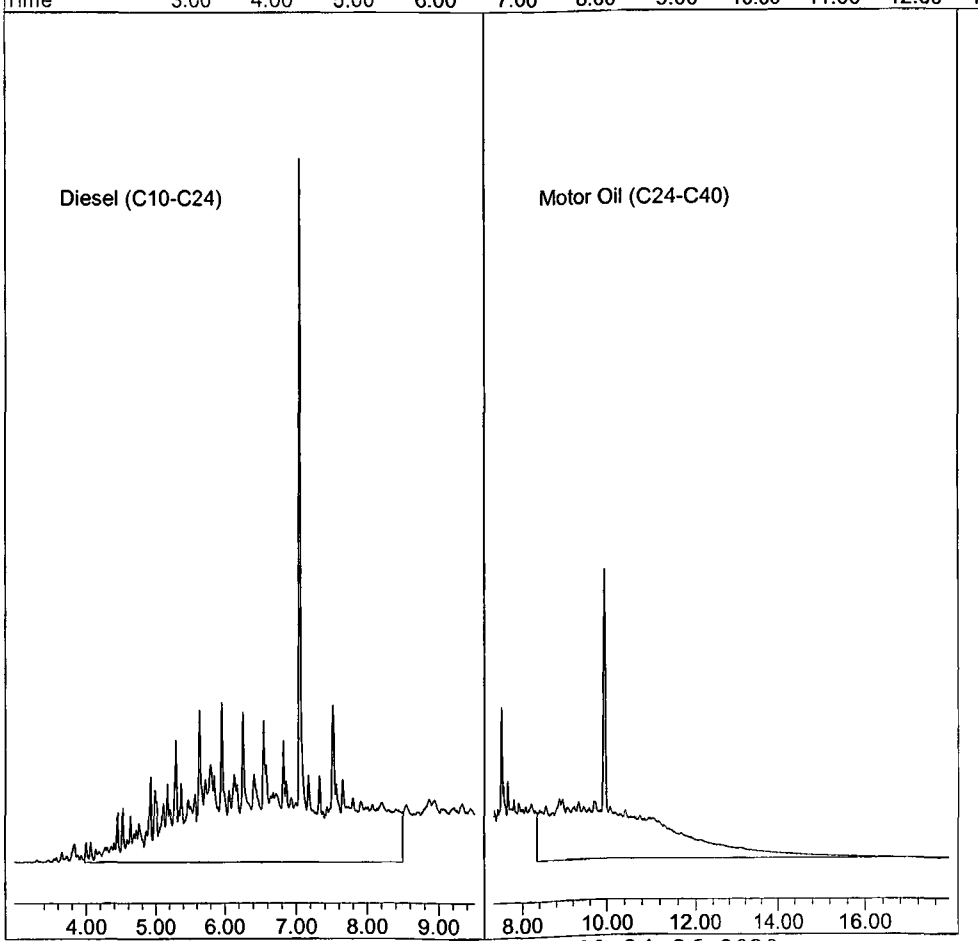
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	125367296	62.421 ppb
Surrogate Spike 75.000		Recovery =	83.23%
4) SA Octacosane(S)	9.94	95364544	68.263 ppb
Surrogate Spike 75.000		Recovery =	91.02%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1752873976	1142.615 ppb
2) HBTM Motor Oil (C24-C40)	12.60	1320919560	1119.882 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424098.D
Sample : 200430A LCSD-1 2/800





424098.D DOC0310.M Wed May 06 09:34:36 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424260.D Vial: 60
Acq On : 5-12-20 21:16:35 Operator: SS
Sample : BA10439W17 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	111972892	55.752 ppb
Surrogate Spike 75.000	Recovery =		74.34%
4) SA Octacosane(S)	9.93	104227200	74.607 ppb
Surrogate Spike 75.000	Recovery =		99.48%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	49687616	32.389 ppb
2) HBTM Motor Oil (C24-C40)	12.60	71383892	60.520 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424260.D Vial: 60
Acq On : 5-12-20 21:16:35 Operator: SS
Sample : BA10439W17 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:19 2020 Quant Results File: DEC0317.RES

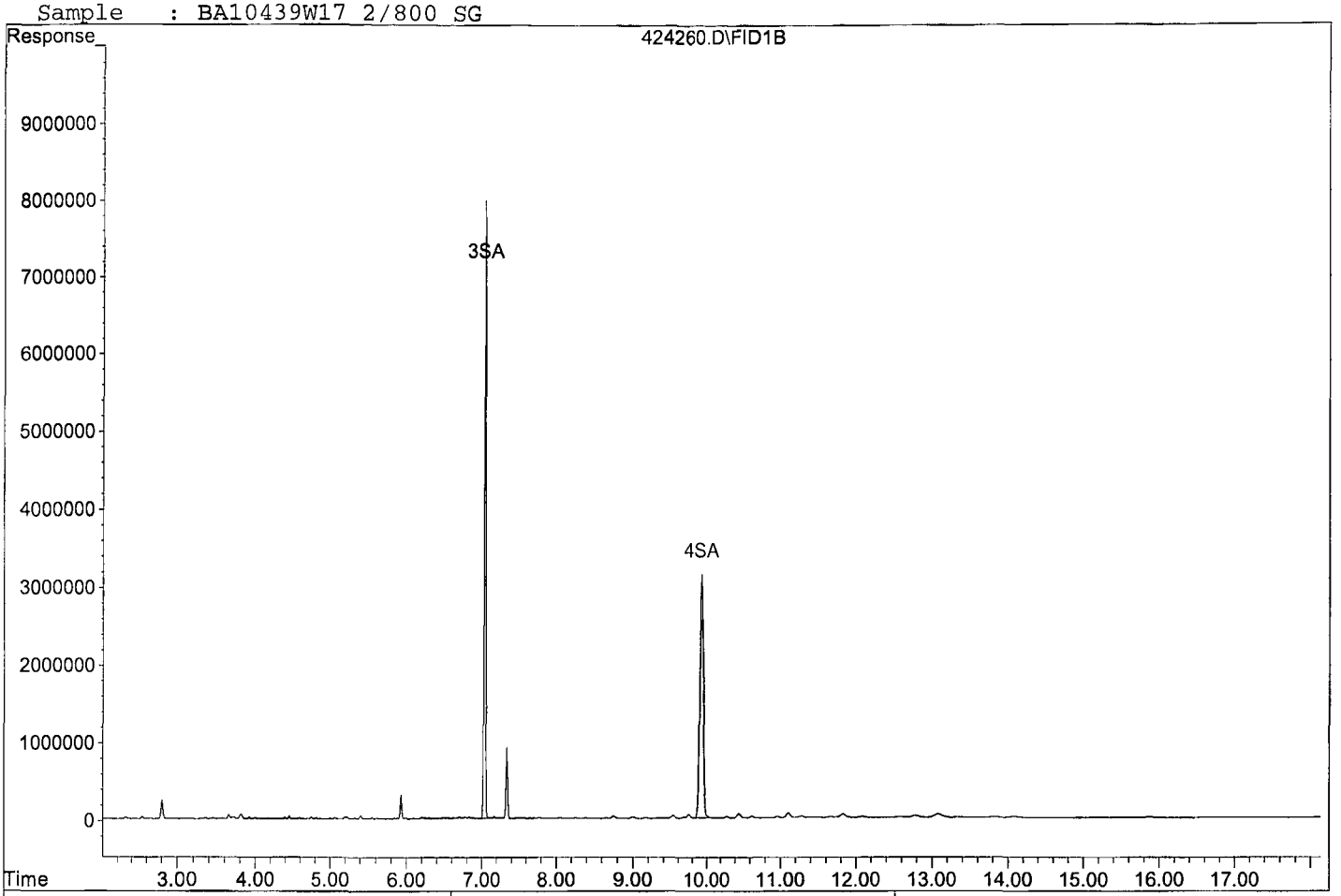
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

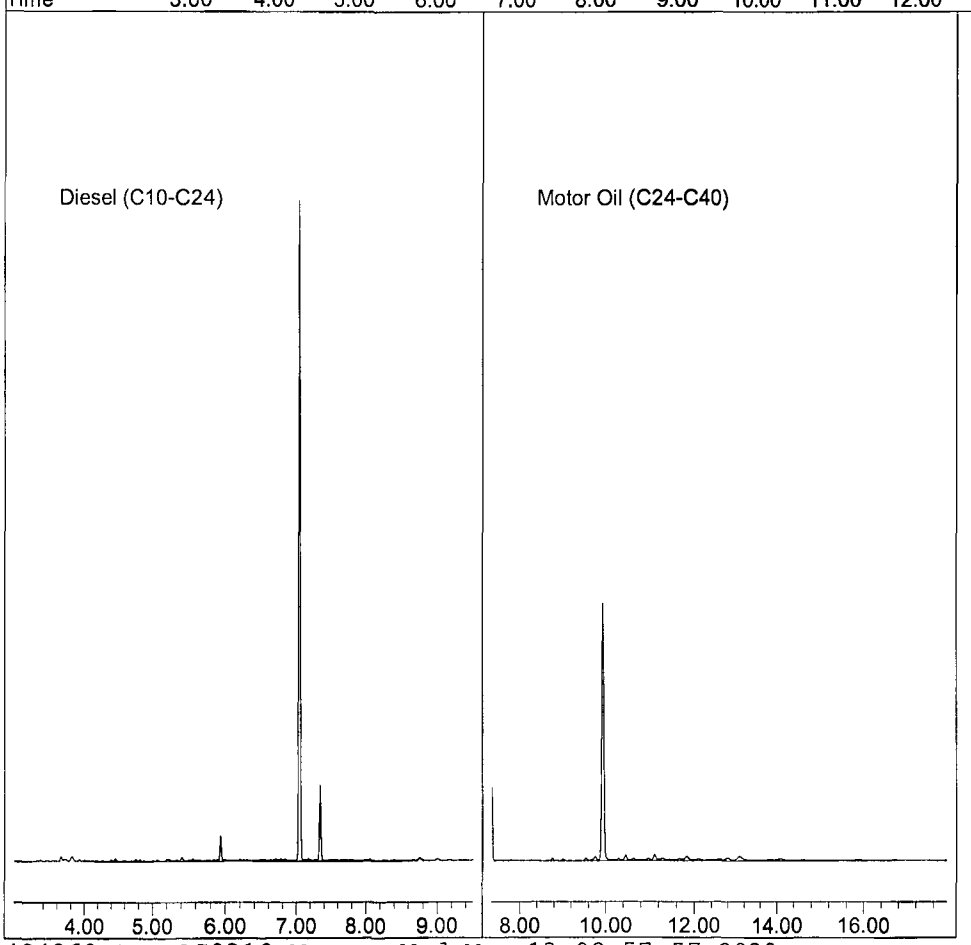
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
1) SC Decanoic Acid(S)	0.00	0	N.D.	ppb
Surrogate Spike 60.000	Recovery	=	0.00%	
Target Compounds				
Target Compounds				

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424260.D
Sample : BA10439W17 2/800 SG





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424187.D Vial: 87
Acq On : 5-7-20 17:55:57 Operator: SS
Sample : 200430A BLK 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	111197776	55.366 ppb
Surrogate Spike 75.000	Recovery =		73.82%
4) SA Octacosane(S)	9.93	92539528	66.241 ppb
Surrogate Spike 75.000	Recovery =		88.32%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	42725399	27.851 ppb
2) HBTM Motor Oil (C24-C40)	12.60	101446591	86.007 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424187.D Vial: 87
Acq On : 5-7-20 17:55:57 Operator: SS
Sample : 200430A BLK 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:18 2020 Quant Results File: DEC0317.RES

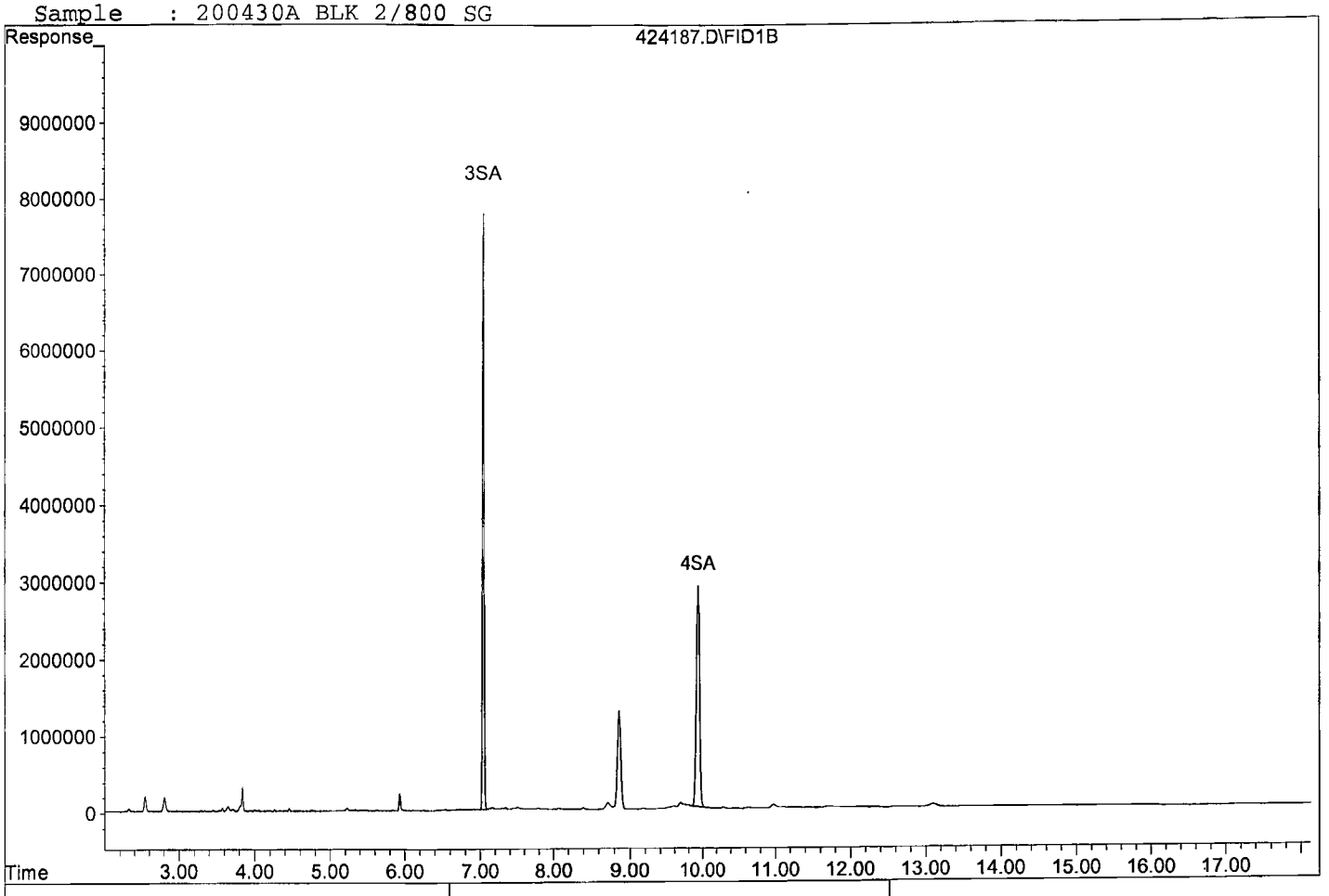
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

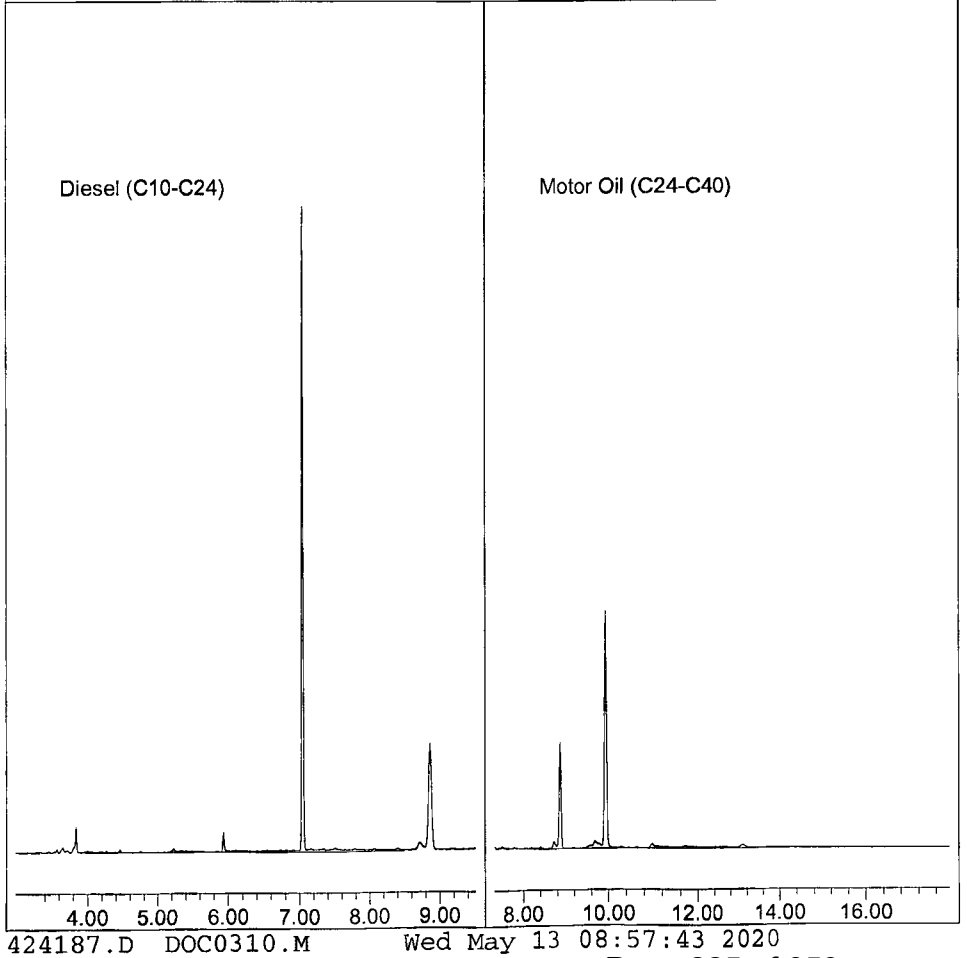
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	0.00	0	N.D. ppb
Surrogate Spike 60.000	Recovery	=	0.00%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424187.D
Sample : 200430A BLK 2/800 SG





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424188.D Vial: 88
Acq On : 5-7-20 18:18:45 Operator: SS
Sample : 200430A LCS-1 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	131559528	65.504 ppb
Surrogate Spike 75.000	Recovery =		87.34%
4) SA Octacosane(S)	9.93	101629696	72.748 ppb
Surrogate Spike 75.000	Recovery =		97.00%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1413147832	921.164 ppb
2) HBTM Motor Oil (C24-C40)	12.60	1374644914	1165.431 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424188.D Vial: 88
Acq On : 5-7-20 18:18:45 Operator: SS
Sample : 200430A LCS-1 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:23 2020 Quant Results File: DEC0317.RES

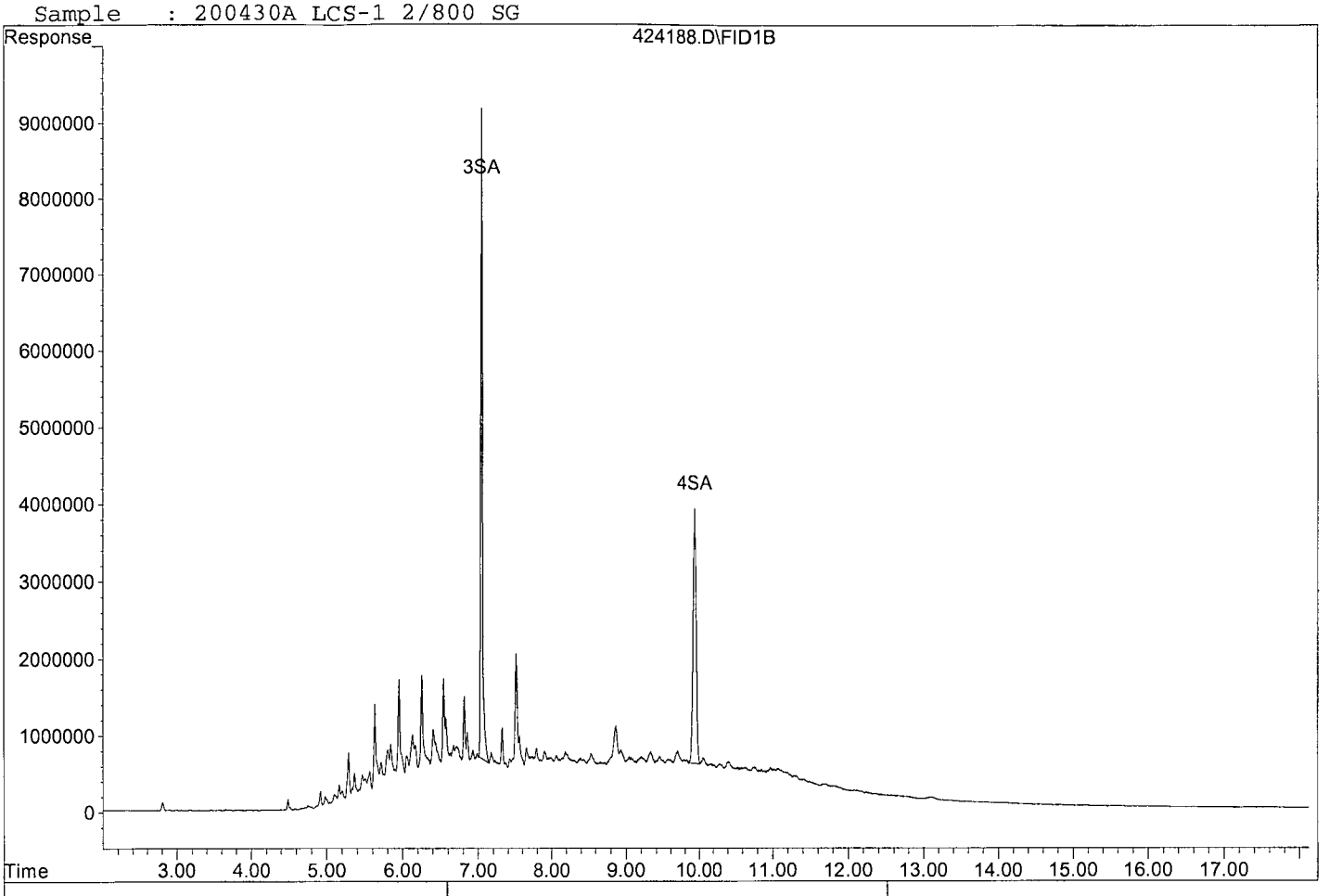
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

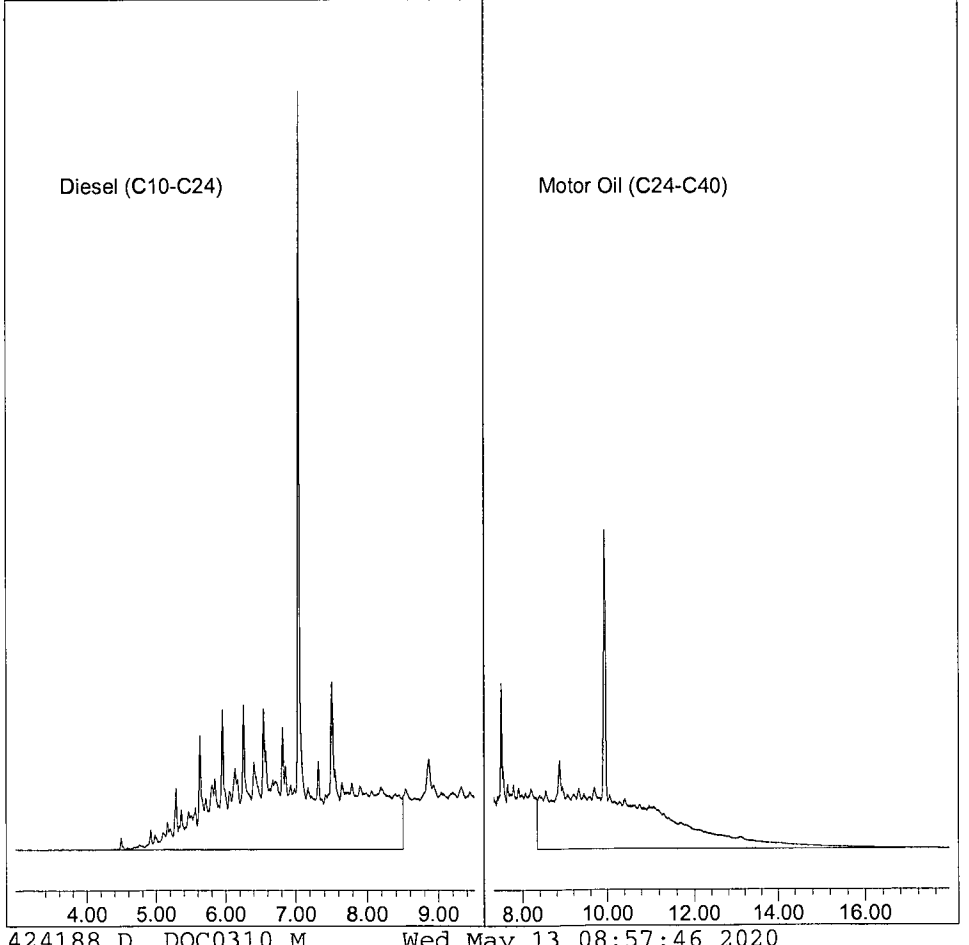
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc	Units	
System Monitoring Compounds					
1) SC Decanoic Acid(S)	0.00	0	N.D.	ppb	d
Surrogate Spike 60.000	Recovery	=	0.00%		
Target Compounds					
Target Compounds					

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424188.D
Sample : 200430A LCS-1 2/800 SG





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424189.D Vial: 89
Acq On : 5-7-20 18:41:29 Operator: SS
Sample : 200430A LCSD-1 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	116618319	58.065 ppb
Surrogate Spike 75.000		Recovery =	77.42%
4) SA Octacosane(S)	9.94	85853890	61.455 ppb
Surrogate Spike 75.000		Recovery =	81.94%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1329986388	866.955 ppb
2) HBTM Motor Oil (C24-C40)	12.60	1203263524	1020.133 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424189.D Vial: 89
Acq On : 5-7-20 18:41:29 Operator: SS
Sample : 200430A LCSD-1 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:23 2020 Quant Results File: DEC0317.RES

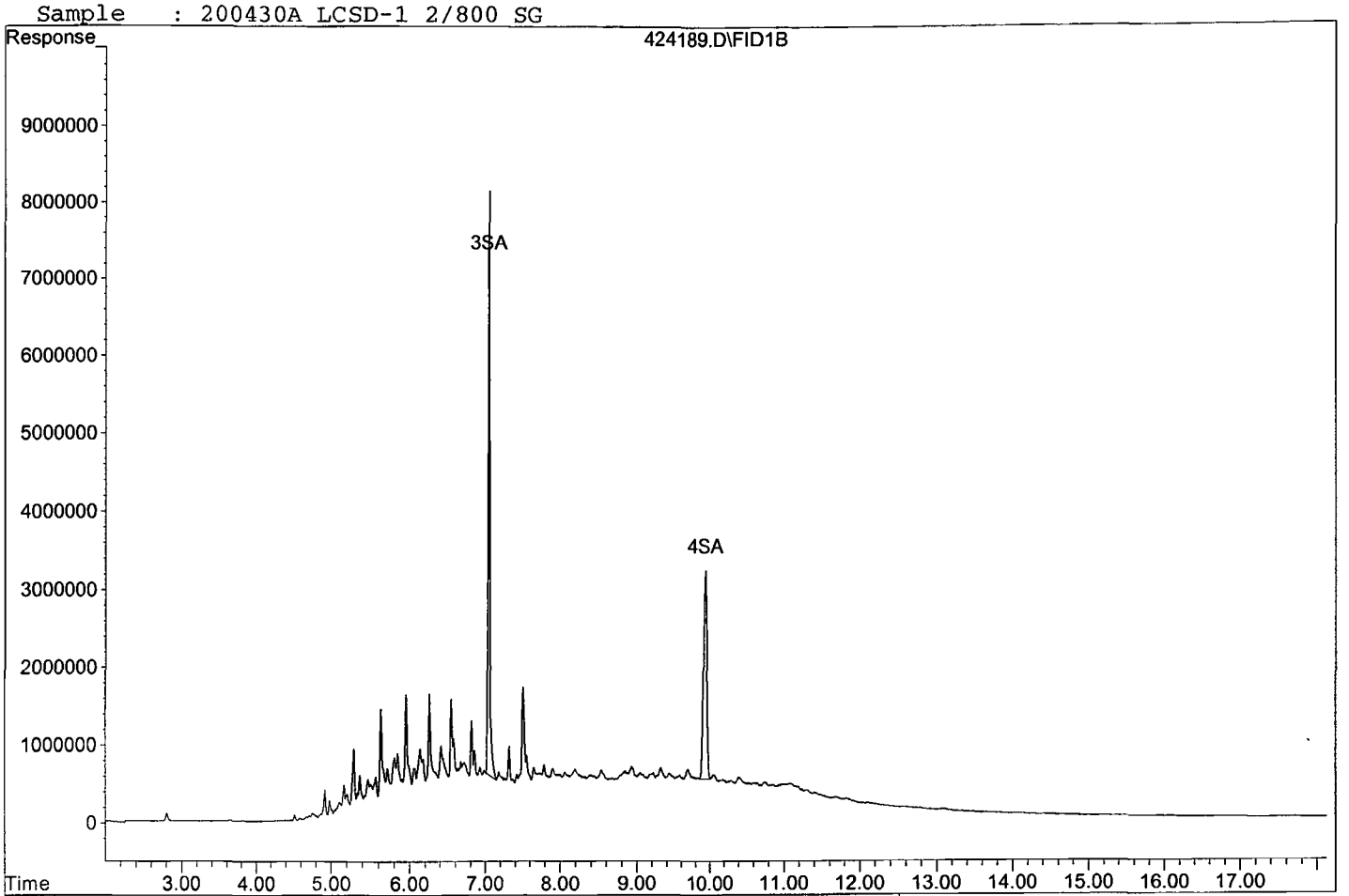
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

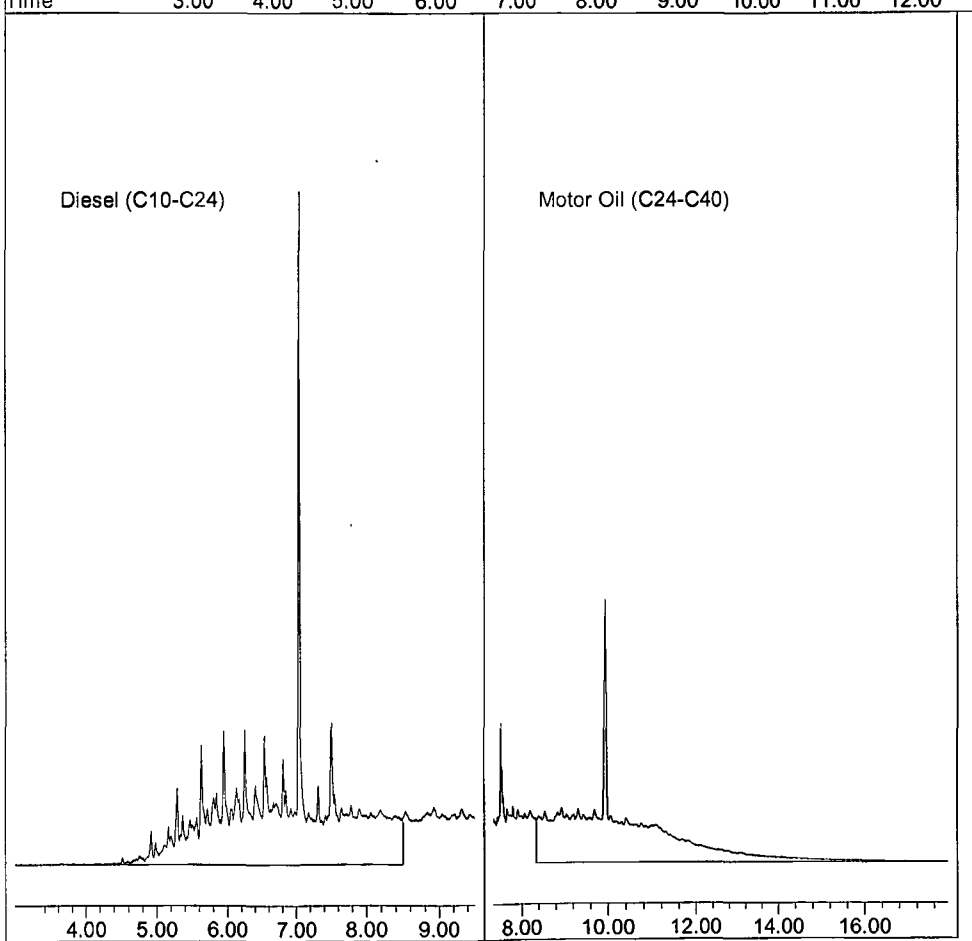
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc	Units	
System Monitoring Compounds					
1) SC Decanoic Acid(S)	0.00	0	N.D.	ppb	d
Surrogate Spike 60.000	Recovery	=	0.00%		
Target Compounds					
Target Compounds					

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424189.D
Sample : 200430A LCSD-1 2/800 SG





Decanoic Acid Spike

Prepared: 03/17/20

Expires: 03/17/21

Prepared By (Initials): SS

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Decanoic Acid Spike	O2SI	011729-01-05-5PAK	1,000	**371298-40661**	**12/11/20**	**03/31/21**	N/A	N/A	N/A	1,000

Decanoic Acid Calibration Curve

Prepared: 03/10/20

Expires: 01/24/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Decanoic Acid STD	O2SI	Decanoic Acid-1	60	Prepared 01/24/20	01/24/21	N/A	50uL	1mL	MC	3
Decanoic Acid STD	O2SI	Decanoic Acid-2	60	Prepared 01/24/20	01/24/21	N/A	100uL	1mL	MC	6
Decanoic Acid STD	O2SI	Decanoic Acid-3	60	Prepared 01/24/20	01/24/21	N/A	400uL	1mL	MC	24
Decanoic Acid STD	O2SI	Decanoic Acid-4	60	Prepared 01/24/20	01/24/21	N/A	600uL	1mL	MC	36
Decanoic Acid STD	O2SI	Decanoic Acid-5	60	Prepared 01/24/20	01/24/21	N/A	800uL	1mL	MC	48
Decanoic Acid STD	O2SI	Decanoic Acid-6	60	Prepared 01/24/20	01/24/21	N/A	100uL	100uL	N/A	60

Decanoic Acid Standard

Prepared: 01/24/20

Expires: 01/24/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Decanoic Acid	O2SI	011729-01-05-5PAK	1,000	**397380**	**01/24/21**	**12/30/21**	600uL	10mL	MC	60

Decanoic Acid CCV

Prepared: 03/21/20

Expires: 03/21/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Decanoic Acid	O2SI	011729-01-05-5PAK	1,000	**397380**	03/21/21	**12/30/21**	360uL	10mL	MC	36

Diesel Motor Oil Mix

Prepared: 04/01/20

Expires: 04/01/21

Prepared By (Initials): BT

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel Fuel #2	Restek	31258	50,000	**A0149066-41321, A0145169-49609, A0149169-49608**	**04/01/21**	**06/30/26**	3.5 mL	7.0 mL	NA	25,000
Motor Oil Composite	Restek	31464	50,000	**A0153599-49761, A0153599-49763, A0153577-49615**	**04/01/21**	**11/30/26**	3.5 mL			25,000

THC Surrogate

Prepared: 04/29/20 **Prepared By (Initials): LP**

Expires: 04/29/21

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
O-terphenyl / Octacosane Mix	Phenova	ALO-130161	600	**CL14921-49848**	**04/29/21**	**02/28/25**	N/A	N/A	N/A	600

Diesel / Motor Oil CCV

Prepared: 04/29/20

Expires: 02/13/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference to APPL Prep Date	Exp. Date	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel / Motor Oil STD	Restek	Diesel / Motor Oil CCV	2,000	04/13/20	03/25/21	03/25/21	1250uL	10mL	MC	250

Diesel / Motor Oil Second Source

Prepared: 03/05/20

Expires: 07/18/20

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel Fuel #2 Second Source	O2SI	G34-011598-03	50,000	**G34-319187-38959**	**10/13/20**	**09/29/21**	50uL	10mL	MC	250
Motor Oil Second Source	O2SI	116390-02-SS	50,000	**010918-39582**	**07/18/20**	**03/05/22**	50uL			

Diesel / Motor Oil Calibration Curve

Prepared: 03/05/20

Expires: 02/13/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference to APPL Prep Date	Exp. Date	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 1	2,000	Prepared 03/05/20	02/13/21	N/A	5uL	1mL	MC	10
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil -2	2,000	Prepared 03/05/20	02/13/21	N/A	25uL	1mL	MC	50
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 3	2,000	Prepared 03/05/20	02/13/21	N/A	125uL	1mL	MC	250
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 4	2,000	Prepared 03/05/20	02/13/21	N/A	500uL	1mL	MC	1000
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 5	2,000	Prepared 03/05/20	02/13/21	N/A	750uL	1mL	MC	1500
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 6	2,000	Prepared 03/05/20	02/13/21	N/A	100uL	100uL	N/A	2,000

Diesel / Motor Oil Calibration Standard

Prepared: 03/05/20

Expires: 03/05/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel Fuel #2	Restek	31258	50,000	**A0153536-49756**	**04/13/21**	**06/30/26**	400uL	10mL	MC	2000
Motor Oil	Restek	31464	50,000	**A0153577-49615**	**04/01/21**	**05/31/26**	400uL			2000
THC Surrogate	Phenova	ALO-130161	600	**CL14921-49845**	**03/25/21**	**11/28/24**	1666uL			**100**

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200430A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 4-1-20 4-1-21	Surrogate ID 1	THC Surrogate 4-29-20 4-29-21
Spiked ID 2		Surrogate ID 2	
Spiked ID 3		Surrogate ID 3	
Spiked ID 4		Surrogate ID 4	
Spiked ID 5		Surrogate ID 5	
Spiked ID 6		Sufficient Vol for Matrix QC:	NO
Spiked ID 7		Ext. Start Time:	04/30/20 14:35
Spiked ID 8		Ext. End Time:	05/01/20 8:30
		GC Requires Extract By:	

pH1	2	04/30/20 13:25	Water Bath Temp 1 °C	35/38.5 °C
pH2			Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: KY **Date** 04/30/20 **Witnessed By:** CFM **Date** 04/30/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200430A Blk				0.100	1	800	2	2	04/30/20 13:30	
						equip	E-HP51 E-WB1				
2	200430A LCS-1		0.040	1	0.100	1	800	2	2	04/30/20 13:30	
						equip	E-HP50 E-WB2				
3	200430A LCSD-1		0.040	1	0.100	1	800	2	2	04/30/20 13:30	
						equip	E-HP49 E-WB3				
4	BA09851	BA09851W13			0.100	1	800	2	2	04/30/20 13:30	91926
						equip	E-HP48 E-WB1				
5	BA09853	BA09853W13			0.100	1	800	2	2	04/30/20 13:30	91926
						equip	E-HP47 E-WB2				
6	BA09855	BA09855W16			0.100	1	800	2	2	04/30/20 13:30	91926
						equip	E-HP25 E-WB3				
7	BA09915	BA09915W13			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP26 E-WB1				
8	BA09917	BA09917W15			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP27 E-WB2				
9	BA09919	BA09919W15			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP28 E-WB3				
10	BA09921	BA09921W13			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP29 E-WB1				
11	BA09923	BA09923W11			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP30 E-WB2				
12	BA09924	BA09924W12			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP16 E-WB3				
13	BA09926	BA09926W13			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP15 E-WB1				
14	BA09928	BA09928W17			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP14 E-WB2				
15	BA10439	BA10439W17			0.100	1	800	2	2	04/30/20 13:30	92025
						equip	E-HP13 E-WB3				
16	BA10504	BA10504W19			0.100	1	800	2	2	04/30/20 13:30	92039
						equip	E-HP12 E-WB1				

Solvent and Lot#	
1+1 HCL Amber Liter	4-30-20
PH Strips	HC998032
Dicholormethane	59239
Filter Paper	400171
B. Sodium Sulfate	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	5/4/20
Time	14:15
Refrigerator	HOBART

	Technician's Initials
Scanned By	KY
Sample Preparation	KY,CD,CFM
Extraction	KY,CD,CFM
Concentration	DL

Modified	05/04/20 2:28:46 PM

Reviewed By: KY **Date** 05/04/20

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200430A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 4-1-20 4-1-21		Surrogate ID 1	THC Surrogate 4-29-20 4-29-21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	04/30/20 14:35	
Spiked ID 8			Ext. End Time:	05/01/20 8:30	
			GC Requires Extract By:		

pH1	2	04/30/20 13:25	Water Bath Temp 1 °C	35/38.5 °C
pH2			Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: KY **Date** 04/30/20 **Witnessed By:** CFM **Date** 04/30/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
17	BA10505	BA10505W14			0.100	1	800	2	2	04/30/20 13:30	92039
						equip	E-HP11 E-WB2				

Solvent and Lot#	
1+1 HCL Amber Liter	4-30-20
PH Strips	HC998032
Dicholormethane	59239
Filter Paper	400171
B. Sodium Sulfate	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	
Time	
Refrigerator	HOBART

	Technician's Initials
Scanned By	KY
Sample Preparation	KY,CD,CFM
Extraction	KY,CD,CFM
Concentration	DL

Modified	05/04/20 2:28:46 PM

Reviewed By: KY **Date** 05/04/20

Injection Log

Directory: G:\APOLLO\DATA\200310\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	3	310003.D	1	Diesel Motor Oil-1 3/5/20	water	3-10-20 9:37:22
2	4	310004.D	1	Diesel Motor Oil-2 3/5/20	water	3-10-20 9:59:49
3	5	310005.D	1	Diesel Motor Oil-3 3/5/20	water	3-10-20 10:22:19
4	6	310006.D	1	Diesel Motor Oil-4 3/5/20	water	3-10-20 10:44:50
5	7	310007.D	1	Diesel Motor Oil-5 3/5/20	water	3-10-20 11:07:20
6	8	310008.D	1	Diesel Motor Oil-6 3/5/20	water	3-10-20 11:29:51
7	9	310009.D	1	Diesel Motor Oil-SS 3/5/20	water	3-10-20 11:52:24
8	95	424095.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-4-20 15:02:27
9	96	424096.D	2.5	200430A BLK 2/800	water	5-4-20 15:27:53
10	97	424097.D	2.5	200430A LCS-1 2/800	water	5-4-20 15:50:26
11	98	424098.D	2.5	200430A LCSD-1 2/800	water	5-4-20 16:13:05
12	9	424109.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-4-20 20:22:31
13	11	424111.D	2.5	BA10439W17 2/800	water	5-4-20 21:08:10
14	21	424121.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-5-20 0:55:06

Injection Log

Directory: G:\APOLLO\DATA\200317\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	2	317002.D	1	Decanoic Acid-1 3/10/20	water	3-17-20 8:14:08
2	3	317003.D	1	Decanoic Acid-2 3/10/20	water	3-17-20 8:36:27
3	4	317004.D	1	Decanoic Acid-3 3/10/20	water	3-17-20 8:58:53
4	5	317005.D	1	Decanoic Acid-4 3/10/20	water	3-17-20 9:21:15
5	6	317006.D	1	Decanoic Acid-5 3/10/20	water	3-17-20 9:43:41
6	7	317007.D	1	Decanoic Acid-6 3/10/20	water	3-17-20 10:06:06
7	80	424180.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-7-20 14:35:12
8	81	424181.D	1	Decanoic Acid-CCV 3/20/20	water	5-7-20 15:24:14
9	87	424187.D	2.5	200430A BLK 2/800 SG	water	5-7-20 17:55:57
10	88	424188.D	2.5	200430A LCS-1 2/800 SG	water	5-7-20 18:18:45
11	89	424189.D	2.5	200430A LCSD-1 2/800 SG	water	5-7-20 18:41:29
12	92	424192.D	1	Decanoic Acid-CCV 3/20/20	water	5-7-20 19:49:42
13	93	424193.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-7-20 20:12:24
14	54	424254.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-12-20 19:00:27
15	55	424255.D	1	Decanoic Acid-CCV 3/20/20	water	5-12-20 19:23:05
16	60	424260.D	2.5	BA10439W17 2/800 SG	water	5-12-20 21:16:35
17	66	424266.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-12-20 23:32:39
18	67	424267.D	1	Decanoic Acid-CCV 3/20/20	water	5-12-20 23:55:17

ORGANICS
Calibration Data

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/20/20
Matrix: Instrument: Yoda
Initials: MA / [illegible]

			0420Y003 D	0420Y004.D	0420Y005 D	0420Y006.D	0420Y007 D	0420Y008.D	0420Y009.D	0420Y010.D	0420Y011.D							
		Compound	4	5	10	20	40	50	60	80	100		Avg	%RSD	Type	r^2	Q	MRF
1	I	1,4-dichlorobenzene-D4(IS)	ISTD															
2		1,4-Dioxane		0.5864	0.5354	0.4682	0.4345	0.4509	0.4717	0.4765	0.4405		0.48	11				
3	TM	n-Nitrosodimethylamine		0.6003	0.6335	0.7148	0.6880	0.6158	0.7455	0.7830	0.7263		0.69	9.6	TM			
4	TM	Pyridine		1.669	1.877	1.743	1.759	1.694	2.122	1.862	1.746		1.8	8.1	TM			
5	S	2-Fluorophenol (S)		1.147	1.301	1.366	1.513	1.454	1.750	1.661	1.571		1.5	13	S			
6	S	Phenol-D6 (S)		1.553	1.677	1.763	1.978	1.912	2.328	2.224	2.135		1.9	14	S			
7	*TM	Phenol		2.247	2.588	2.412	2.503	2.403	2.733	2.767	2.561		2.5	6.9	*TM			0.800
8	TM	Aniline		1.126	1.548	1.414	1.551	1.477	1.699	1.508	1.320		1.5	12	TM			
9	TM	Bis (2-chloroethyl) ether		0.9650	1.047	0.9876	1.011	0.9765	1.077	1.077	0.9908		1.0	4.4	TM			0.700
10	TM	2-Chlorophenol		1.743	1.964	1.828	1.896	1.816	2.039	2.036	1.886		1.9	5.6	TM			0.800
11	TM	1,3-DCB		1.908	2.144	1.964	2.023	1.970	2.176	2.164	2.027		2.0	5.0	TM			
12	*TM	1,4-DCB		2.002	2.203	2.006	2.055	1.986	2.188	2.187	2.061		2.1	4.4	*TM			
13	TM	Benzyl alcohol		0.8548	1.022	0.9933	1.053	1.025	1.159	1.189	1.104		1.0	10.0	TM			
14	TM	1,2-DCB		1.850	2.055	1.893	1.941	1.884	2.121	2.135	2.019		2.0	5.6	TM			
15	TM	2-Methylphenol		1.393	1.564	1.447	1.518	1.458	1.662	1.675	1.562		1.5	6.6	TM			0.700
16	TM	Bis (2-chloroisopropyl) ether		1.143	1.263	1.174	1.210	1.160	1.300	1.300	1.215		1.2	5.0	TM			0.010
17	TM	Acetophenone		2.153	2.437	2.279	2.378	2.295	2.599	2.592	2.421		2.4	6.4	TM			0.010
18	TM	3&4-Methylphenol		1.706	1.963	1.830	1.907	1.860	2.086	2.150	2.015		1.9	7.4	TM			0.600
19	**TM	n-Nitrosodi-n-propylamine		1.183	1.410	1.318	1.389	1.328	1.497	1.506	1.397		1.4	7.6	**TM			0.500
20	TM	Hexachloroethane		0.7178	0.8044	0.7414	0.7689	0.7504	0.8345	0.8254	0.7698		0.78	5.3	TM			0.300
21	I	Napthalene-D8(IS)	ISTD															
22	S	Nitrobenzene-D5(S)		0.3459	0.3683	0.3884	0.4101	0.4134	0.4847	0.4504	0.4080		0.41	11	S			
23	TM	Nitrobenzene		0.4241	0.4842	0.4590	0.4556	0.4666	0.5044	0.4976	0.4424		0.47	5.9	TM			0.200
24	TM	Isophorone		0.7098	0.7816	0.7688	0.7670	0.7856	0.8636	0.8464	0.7552		0.78	6.3	TM			0.400
25	*TM	2-Nitrophenol		0.2135	0.2402	0.2365	0.2367	0.2478	0.2667	0.2677	0.2403		0.24	7.2	*TM			0.100
26	TM	2,4-Dimethylphenol		0.3548	0.3853	0.3748	0.3693	0.3720	0.4138	0.4073	0.3680		0.38	5.3	TM			0.200
27	TM	Benzoic acid			0.2565	0.2948	0.3219	0.3275	0.3664	0.3449	0.3078		0.32	11	TM			
28	TM	Bis (2-chloroethoxy) methane		0.4396	0.4756	0.4462	0.4470	0.4546	0.4906	0.4818	0.4298		0.46	4.8	TM			0.300
29	*TM	2,4-Dichlorophenol		0.3429	0.3774	0.3615	0.3618	0.3670	0.4047	0.4062	0.3625		0.37	5.9	*TM			0.200
30	TM	1,2,4-Trichlorobenzene		0.3924	0.4320	0.4037	0.4024	0.4052	0.4449	0.4404	0.3956		0.41	5.1	TM			
31	TM	3,4-Dimethylphenol		0.5434	0.5880	0.5429	0.5343	0.5444	0.5953	0.5852	0.5254		0.56	4.9	TM			
32	TM	Naphthalene		1.173	1.283	1.200	1.185	1.222	1.314	1.309	1.166		1.2	5.0	TM			0.700
33	TM	4-Chloroaniline		0.4459	0.4956	0.4963	0.4786	0.4780	0.5335	0.5055	0.4230		0.48	7.2	TM			0.010
34	TM	2,6-Dichlorophenol		0.3343	0.3676	0.3541	0.3610	0.3646	0.4028	0.4098	0.3684		0.37	6.7	TM			
35	TM	Hexachloropropene		0.2703	0.3097	0.2957	0.3031	0.3151	0.3445	0.3447	0.3147		0.31	7.9	TM			

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/20/20
Matrix: Instrument: Yoda Initials:

		Compound	4	5	10	20	40	50	60	80	100		Avg	%RSD	Type		Q	
36	*TM	Hexachlorobutadiene		0.2424	0.2554	0.2430	0.2416	0.2436	0.2690	0.2657	0.2419		0.25	4.6	*TM			0.010
37	TM	Caprolactum		0.1057	0.1180	0.1235	0.1227	0.1236	0.1398	0.1344	0.1139		0.12	8.8	TM			0.010
38	*TM	4-Chloro-3-methylphenol		0.3679	0.4124	0.3998	0.4005	0.4039	0.4463	0.4428	0.3910		0.41	6.4	*TM			0.200
39	TM	2-Methylnaphthalene		0.7763	0.8452	0.7963	0.7956	0.8129	0.9082	0.8940	0.8003		0.83	5.9	TM			0.400
40	TM	1-Methylnaphthalene		0.8118	0.8571	0.8184	0.8211	0.8371	0.9112	0.9104	0.8199		0.85	4.8	TM			
41	I	Acenaphthene-D10(IS)	ISTD															
42	**TML	Hexachlorocyclopentadiene		0.2431	0.3477	0.3397	0.3969	0.4611	0.4652	0.4842			0.39	22	**TML	0.994		0.050
43	TM	1,2,4,5-Tetrachlorobenzene		0.6576	0.7065	0.6666	0.6567	0.6995	0.6969	0.7287	0.6844		0.69	3.7	TM			0.010
44	*TM	2,4,6-Trichlorophenol		0.4141	0.4673	0.4454	0.4436	0.4737	0.4731	0.4979	0.4641		0.46	5.5	*TM			0.200
45	TM	2,4,5-Trichlorophenol		0.4351	0.4940	0.4779	0.4634	0.4930	0.5031	0.5253	0.4882		0.49	5.6	TM			0.200
46	S	2-Fluorobiphenyl(S)		1.276	1.329	1.359	1.384	1.465	1.556	1.529	1.475		1.4	7.0	S			
47	TM	1,1'-Biphenyl		1.712	1.790	1.728	1.682	1.801	1.794	1.854	1.767		1.8	3.2	TM			0.010
48	TM	2-Chloronaphthalene		1.391	1.446	1.376	1.322	1.430	1.412	1.472	1.379		1.4	3.4	TM			0.800
49	TM	2-Nitroaniline		0.3352	0.3841	0.3938	0.3915	0.4105	0.4145	0.4227	0.3976		0.39	6.8	TM			0.010
50	TM	Dimethyl phthalate		1.639	1.710	1.652	1.615	1.714	1.730	1.768	1.648		1.7	3.2	TM			0.010
51	TM	2,6-DNT		0.3298	0.3649	0.3699	0.3693	0.3983	0.3969	0.4118	0.3832		0.38	6.8	TM			0.200
52	TM	Acenaphthylene		1.987	2.183	2.075	2.024	2.141	2.176	2.234	2.101		2.1	4.0	TM			0.900
53	TM	3-Nitroaniline		0.3682	0.4251	0.4382	0.4398	0.4675	0.4838	0.4968	0.4587		0.45	8.9	TM			0.010
54	*TM	Acenaphthene		1.340	1.417	1.318	1.270	1.361	1.369	1.439	1.331		1.4	4.0	*TM			0.900
55	**TML	2,4-Dinitrophenol		0.1256	0.1672	0.2087	0.2403	0.2577	0.2678	0.2801	0.2622		0.23	24	**TML	0.996		0.010
56	**TM	4-Nitrophenol		0.2449	0.2835	0.2976	0.3115	0.3318	0.3431	0.3536	0.3351		0.31	12	**TM			0.010
57	TM	Dibenzofuran		1.931	2.048	1.950	1.891	2.035	2.035	2.141	1.983		2.0	4.0	TM			0.800
58	TM	2,4-DNT		0.4480	0.5323	0.5354	0.5260	0.5578	0.5783	0.5931	0.5559		0.54	8.1	TM			0.200
59	TM	2,3,4,6-Tetrachlorophenol		0.3420	0.3829	0.3719	0.3728	0.3930	0.3993	0.4183	0.3871		0.38	5.9	TM			0.010
60	TM	Diethyl phthalate		1.614	1.736	1.621	1.566	1.668	1.663	1.703	1.611		1.6	3.4	TM			0.010
61	TM	4-Chlorophenyl phenyl ether		0.8543	0.8924	0.8560	0.8520	0.9144	0.9349	0.9779	0.9445		0.90	5.3	TM			0.400
62	TM	Fluorene		1.591	1.661	1.597	1.568	1.685	1.733	1.834	1.712		1.7	5.3	TM			0.900
63	TM	4-Nitroaniline		0.3161	0.3606	0.3604	0.3652	0.3806	0.3821	0.3821	0.3476		0.36	6.2	TM			0.010
64	S	2,4,6-Tribromophenol(S)		0.1648	0.1786	0.1856	0.2030	0.2078	0.2288	0.2385	0.2325		0.20	13	S			
65	I	Phenanthrene-D10(IS)	ISTD															
66	TM	4,6-Dinitro-2-methylphenol				0.1670	0.1752	0.1887	0.1828	0.2006	0.1915		0.18	6.5	TM			0.010
67	TM	Diphenyl amine		0.6352	0.6679	0.6304	0.6292	0.6704	0.6525	0.7076	0.6593		0.66	4.0	TM			
68	*TM	n-Nitrosodiphenylamine		0.6352	0.6679	0.6304	0.6292	0.6704	0.6525	0.7076	0.6593		0.66	4.0	*TM			0.010
69	TM	1,2-Diphenylhydrazine		0.7894	0.8393	0.7925	0.7895	0.8119	0.7763	0.9900	0.9199		0.84	9.1	TM			
70	TM	4-Bromophenyl phenyl ether		0.2322	0.2542	0.2372	0.2468	0.2645	0.2498	0.2744	0.2584		0.25	5.5	TM			0.100

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/20/20
Matrix: Instrument: Yoda Initials:

		Compound	4	5	10	20	40	50	60	80	100		Avg	%RSD	Type		Q	
71	TM	Hexachlorobenzene		0.2436	0.2617	0.2489	0.2492	0.2651	0.2551	0.2743	0.2625		0.26	4.0	TM			0.100
72	TM	Atrazine		0.2268	0.2477	0.2316	0.2397	0.2506	0.2369	0.2626	0.2396		0.24	4.7	TM			0.010
73	*TM	Pentachlorophenol		0.1244	0.1372	0.1458	0.1543	0.1647	0.1656	0.1845	0.1735		0.16	13	*TM			0.050
74	TM	Phenanthrene		1.200	1.270	1.186	1.184	1.233	1.183	1.264	1.200		1.2	3.0	TM			0.700
75	TM	Anthracene		1.241	1.329	1.236	1.208	1.277	1.231	1.348	1.260		1.3	3.9	TM			0.700
76	TM	Carbazol		1.114	1.184	1.099	1.105	1.169	1.132	1.198	1.141		1.1	3.3	TM			0.010
77	TM	Di-n-butylphthalate		1.334	1.469	1.415	1.447	1.517	1.476	1.577	1.423		1.5	5.0	TM			0.010
78		2-Nitrodiphenylamine				0.2897	0.3175	0.3385	0.3354	0.3603	0.3395		0.33	7.3				
79	*TM	Fluoranthene		1.346	1.443	1.356	1.352	1.434	1.393	1.478	1.389		1.4	3.5	*TM			0.600
80	I	Chrysene-D12(IS)	ISTD															
81	TM	Benzidine		0.3038	0.3700	0.3956	0.3288	0.3260	0.3178	0.2977	0.2740		0.33	12	TM			
82	TM	Pyrene		1.443	1.562	1.441	1.319	1.395	1.296	1.310	1.238		1.4	7.6	TM			0.600
83	S	Terphenyl-D14(S)		0.8981	0.9238	0.9229	0.8968	0.9160	0.9330	0.9065	0.8900		0.91	1.7	S			
84	TM	Butyl benzylphthalate		0.6203	0.6945	0.6643	0.6142	0.6462	0.6119	0.6206	0.6047		0.63	4.9	TM			0.010
85	TM	3,3'-Dichlorobenzidine		0.4443	0.5032	0.4675	0.4227	0.4341	0.4097	0.3992			0.44	8.1	TM			0.010
86	TM	Benz (a) anthracene		1.433	1.513	1.415	1.297	1.451	1.334	1.356	1.287		1.4	5.8	TM			0.800
87	TM	Bis (2-ethylhexyl) phthalate		0.9844	1.015	0.9906	0.9182	0.9908	0.9387	0.9518	0.8936		0.96	4.3	TM			0.010
88	TM	Chrysene		1.358	1.456	1.339	1.221	1.254	1.182	1.212	1.158		1.3	8.0	TM			0.700
89	*TM	Di-n-octylphthalate		1.555	1.678	1.580	1.514	1.607	1.478	1.456	1.419		1.5	5.6	*TM			0.010
90	I	Perylene-D12(IS)	ISTD															
91	TM	Benzo (b) fluoranthene		1.503	1.414	1.436	1.569	1.520	1.400	1.644	1.517		1.5	5.5	TM			0.700
92	TM	Benzo (k) fluoranthene		1.200	1.528	1.430	1.212	1.395	1.414	1.300	1.409		1.4	8.4	TM			0.700
93	*TM	Benzo (a) pyrene	0.9739	1.253	1.351	1.326	1.321	1.371	1.331	1.376	1.358		1.3	9.7	*TM			0.700
94	TM	Indeno (1,2,3-cd) pyrene		1.489	1.594	1.550	1.508	1.580	1.519	1.577	1.544		1.5	2.4	TM			0.500
95	TM	Dibenz (a,h) anthracene	1.025	1.296	1.405	1.370	1.338	1.398	1.356	1.417	1.393		1.3	9.1	TM			0.400
96	TM	Benzo (g,h,i) perylene		1.194	1.284	1.245	1.200	1.248	1.197	1.235	1.206		1.2	2.6	TM			0.500
97																		
98																		
99																		
100																		
101																		
102																		
103																		
104																		
105																		

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y003.D Vial: 3
Acq On : 20 Apr 20 9:28 Operator: MA
Sample : 4ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:49 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri Apr 17 16:03:50 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	455328	40.00000 ppb	0.00
21) Napthalene-D8(IS)	6.72	136	1940113	40.00000 ppb	0.00
41) Acenaphthene-D10(IS)	8.74	164	1151456	40.00000 ppb	0.00
65) Phenanthrene-D10(IS)	10.48	188	2224606	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.56	240	2167465	40.00000 ppb	0.00
90) Perylene-D12(IS)	15.35	264	2168500	40.00000 ppb	0.00
System Monitoring Compounds					
5) 2-Fluorophenol (S)	0.00	112	0d	0.00000 ppb	
Spiked Amount 200.000			Recovery	= 0.000%	
6) Phenol-D6 (S)	0.00	99	0d	0.00000 ppb	
Spiked Amount 200.000			Recovery	= 0.000%	
22) Nitrobenzene-D5(S)	0.00	82	0d	0.00000 ppb	
Spiked Amount 100.000			Recovery	= 0.000%	
46) 2-Fluorobiphenyl(S)	0.00	172	0d	0.00000 ppb	
Spiked Amount 100.000			Recovery	= 0.000%	
64) 2,4,6-Tribromophenol(S)	0.00	330	0d	0.00000 ppb	
Spiked Amount 200.000			Recovery	= 0.000%	
83) Terphenyl-D14(S)	0.00	244	0d	0.00000 ppb	
Spiked Amount 100.000			Recovery	= 0.000%	
Target Compounds					Qvalue
93) Benzo (a) pyrene	15.28	252	211187	2.97197 ppb	98
95) Dibenz (a,h) anthracene	17.19	278	222253	3.12409 ppb	98

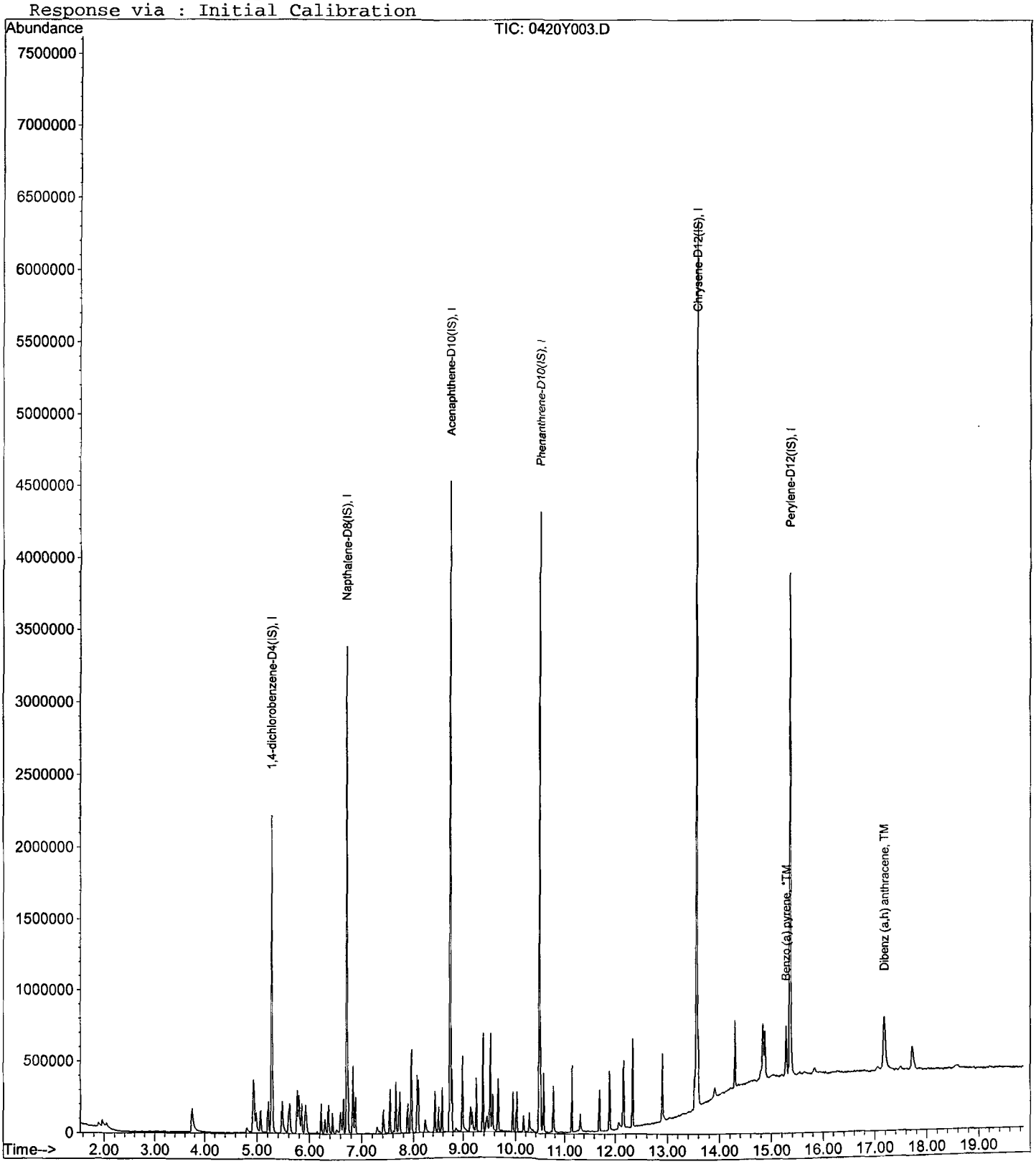
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y003.D Vial: 3
Acq On : 20 Apr 20 9:28 Operator: MA
Sample : 4ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:49 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y004.D Vial: 4
Acq On : 20 Apr 20 9:57 Operator: MA
Sample : 5ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:47 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri Apr 17 16:03:50 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	485305	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.72	136	2056071	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1224741	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.47	188	2325192	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.56	240	2299828	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.35	264	2263400	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.74	112	139102	7.38925	ppb		0.00
Spiked Amount 200.000			Recovery	= 3.695%			
6) Phenol-D6 (S)	4.92	99	188414	7.38130	ppb		0.00
Spiked Amount 200.000			Recovery	= 3.691%			
22) Nitrobenzene-D5(S)	5.92	82	88890	3.66922	ppb		0.00
Spiked Amount 100.000			Recovery	= 3.669%			
46) 2-Fluorobiphenyl(S)	7.96	172	195340	4.50559	ppb		0.00
Spiked Amount 100.000			Recovery	= 4.506%			
64) 2,4,6-Tribromophenol(S)	9.67	330	50444	8.97320	ppb		0.00
Spiked Amount 200.000			Recovery	= 4.487%			
83) Terphenyl-D14(S)	12.33	244	258181	5.13166	ppb		0.00
Spiked Amount 100.000			Recovery	= 5.132%			
Target Compounds							Qvalue
2) 1,4-Dioxane	1.65	58	3557	0.47324			63
3) n-Nitrosodimethylamine	1.89	42	36415	3.58785	ppb		93
4) Pyridine	1.95	79	101246	3.81947	ppb		99
7) Phenol	4.94	94	136305	4.10346	ppb		95
8) Aniline	4.92	93	68288	3.07178	ppb		88
9) Bis (2-chloroethyl) ether	4.99	63	58540	4.00795	ppb		99
10) 2-Chlorophenol	5.06	128	105741	4.47011	ppb		95
11) 1,3-DCB	5.21	146	115758	4.54967	ppb		98
12) 1,4-DCB	5.29	146	121425	4.67009	ppb		98
13) Benzyl alcohol	5.48	108	51857	3.73975	ppb		97
14) 1,2-DCB	5.47	146	112232	4.60728	ppb		99
15) 2-Methylphenol	5.61	107	84528	4.22315	ppb		95
16) Bis (2-chloroisopropyl) et	5.59	45	69360	3.79621	ppb	#	44
17) Acetophenone	5.76	105	130626	4.03445	ppb		97
18) 3&4-Methylphenol	5.79	107	206927	8.07643	ppb		96
19) n-Nitrosodi-n-propylamine	5.76	70	71755	3.56051	ppb		95
20) Hexachloroethane	5.84	117	43543	4.17246	ppb		84
23) Nitrobenzene	5.93	77	108990	3.94905	ppb		93
24) Isophorone	6.22	82	182430	3.95761	ppb		95
25) 2-Nitrophenol	6.30	139	54871	4.29915	ppb		97
26) 2,4-Dimethylphenol	6.36	122	91194	4.54434	ppb		99
27) Benzoic acid	6.52	105	49446	3.10954	ppb		92
28) Bis (2-chloroethoxy) metha	6.45	93	112980	4.37945	ppb		98
29) 2,4-Dichlorophenol	6.59	162	88132	4.68687	ppb		98
30) 1,2,4-Trichlorobenzene	6.66	180	100862	4.91827	ppb		96
31) 3,4-Dimethylphenol	6.71	107	139667	4.50710	ppb		99
32) Naphthalene	6.74	128	301529	4.63765	ppb		98
33) 4-Chloroaniline	6.83	127	114595	4.38024	ppb		97
34) 2,6-Dichlorophenol	6.83	162	85911	4.60939	ppb		97
35) Hexachloropropene	6.84	213	69461	4.36668	ppb		97
36) Hexachlorobutadiene	6.88	225	62299	5.00268	ppb		99
37) Caprolactum	7.28	55	27154	3.38198	ppb		93

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y004.D Vial: 4
Acq On : 20 Apr 20 9:57 Operator: MA
Sample : 5ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:47 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri Apr 17 16:03:50 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	94548	4.23772	ppb		99
39)	2-Methylnaphthalene	7.54	142	199522	4.68836	ppb		99
40)	1-Methylnaphthalene	7.65	142	208627	4.79123	ppb		100
42)	Hexachlorocyclopentadiene	7.72	237	37216	8.67075	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	100673	5.02789	ppb		96
44)	2,4,6-Trichlorophenol	7.88	196	63397	4.77454	ppb		97
45)	2,4,5-Trichlorophenol	7.94	196	66618	4.70475	ppb	#	88
47)	1,1'-Biphenyl	8.07	154	262111	4.75810	ppb		97
48)	2-Chloronaphthalene	8.10	162	212882	4.94071	ppb		96
49)	2-Nitroaniline	8.24	65	51318	3.42456	ppb		89
50)	Dimethyl phthalate	8.44	163	250866	4.78899	ppb		99
51)	2,6-DNT	8.51	165	50484	4.26956	ppb		89
52)	Acenaphthylene	8.58	152	304219	4.58642	ppb		99
53)	3-Nitroaniline	8.24	138	56373	3.83644	ppb		88
54)	Acenaphthene	8.78	154	205134	4.83577	ppb		100
55)	2,4-Dinitrophenol	8.86	184	19235	8.75628	ppb		93
56)	4-Nitrophenol	8.99	65	37486	3.79923	ppb		81
57)	Dibenzofuran	8.98	168	295588	4.77235	ppb		100
58)	2,4-DNT	8.98	165	68587	4.03425	ppb	#	55
59)	2,3,4,6-Tetrachlorophenol	9.15	232	52362	4.97711	ppb	#	89
60)	Diethyl phthalate	9.25	149	247071	4.62888	ppb		99
61)	4-Chlorophenyl phenyl ethe	9.38	204	130794	4.77103	ppb		98
62)	Fluorene	9.38	166	243509	4.66236	ppb		98
63)	4-Nitroaniline	8.72	138	48390	3.98643	ppb	#	93
66)	4,6-Dinitro-2-methylphenol	9.46	198	38206	3.86312	ppb		94
67)	Diphenyl amine	9.52	169	369221	9.34910	ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	369221	9.34910	ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	229449	3.80899	ppb		93
70)	4-Bromophenyl phenyl ether	9.95	248	67488	4.83215	ppb		95
71)	Hexachlorobenzene	10.02	284	70803	5.12457	ppb	#	81
72)	Atrazine	10.16	200	32953	2.21238	ppb		97
73)	Pentachlorophenol	10.27	266	36146	4.92955	ppb		98
74)	Phenanthrene	10.50	178	348718	4.81638	ppb		99
75)	Anthracene	10.56	178	360825	4.74046	ppb		99
76)	Carbazol	10.76	167	323829	4.65797	ppb		98
77)	Di-n-butylphthalate	11.15	149	387592	4.25911	ppb		99
78)	2-Nitrodiphenylamine	11.33	167	32416	1.54869	ppb	#	88
79)	Fluoranthene	11.89	202	391335	4.79410	ppb	#	97
81)	Benzidine	12.06	184	87338	3.42242	ppb		96
82)	Pyrene	12.15	202	414898	5.14364	ppb		99
84)	Butyl benzylphthalate	12.90	149	178322	4.43257	ppb		93
85)	3,3'-Dichlorobenzidine	13.52	252	127727	5.19403	ppb		99
86)	Benz (a) anthracene	13.55	228	411997	5.11495	ppb		98
87)	Bis (2-ethylhexyl) phthala	13.56	149	282988	4.53966	ppb		97
88)	Chrysene	13.58	228	390448	5.53262	ppb		98
89)	Di-n-octylphthalate	14.29	149	447028	4.63195	ppb		96
91)	Benzo (b) fluoranthene	14.83	252	425367	4.98944	ppb		98
92)	Benzo (k) fluoranthene	14.86	252	339399	4.24236	ppb		100
93)	Benzo (a) pyrene	15.27	252	354632	4.78137	ppb		99
94)	Indeno (1,2,3-cd) pyrene	17.16	276	421365	4.87996	ppb		98
95)	Dibenz (a,h) anthracene	17.19	278	366544	4.93628	ppb		98
96)	Benzo (g,h,i) perylene	17.71	276	337705	4.98869	ppb		99

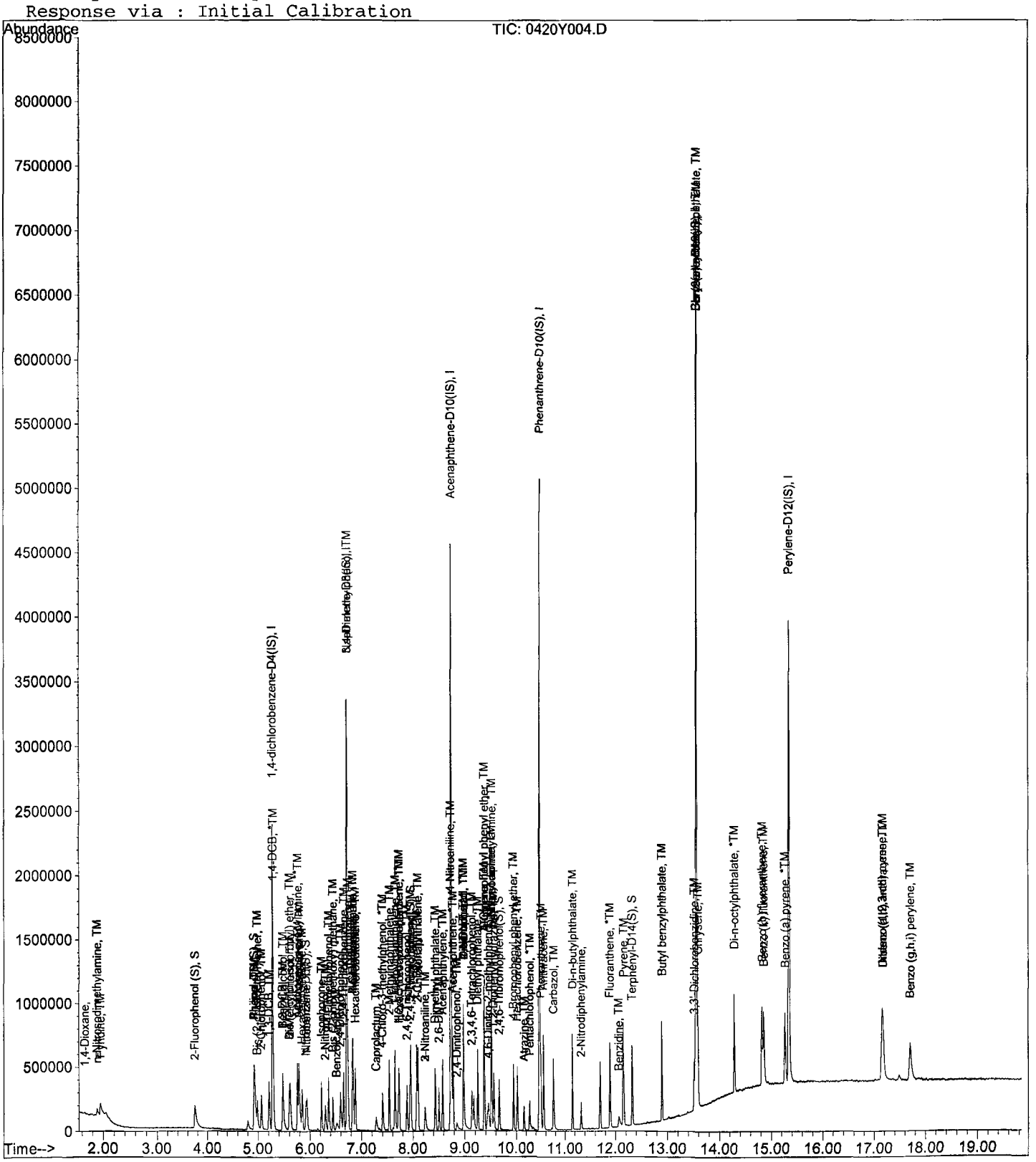
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y004.D Vial: 4
Acq On : 20 Apr 20 9:57 Operator: MA
Sample : 5ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:47 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y005.D Vial: 5
Acq On : 20 Apr 20 10:31 Operator: MA
Sample : 10ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:35 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:30:40 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	411517	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.72	136	1787905	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1077923	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.47	188	2053303	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.56	240	1987380	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.36	264	1938494	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.73	112	267768	17.70025	ppb		0.00
Spiked Amount 200.000			Recovery =	8.850%			
6) Phenol-D6 (S)	4.92	99	344978	17.23074	ppb		0.00
Spiked Amount 200.000			Recovery =	8.616%			
22) Nitrobenzene-D5(S)	5.92	82	164606	9.01156	ppb		0.00
Spiked Amount 100.000			Recovery =	9.012%			
46) 2-Fluorobiphenyl(S)	7.96	172	358099	9.34832	ppb		0.00
Spiked Amount 100.000			Recovery =	9.348%			
64) 2,4,6-Tribromophenol(S)	9.67	330	96267	17.43082	ppb		0.00
Spiked Amount 200.000			Recovery =	8.716%			
83) Terphenyl-D14(S)	12.33	244	459003	10.14184	ppb		0.00
Spiked Amount 100.000			Recovery =	10.142%			
Target Compounds							Qvalue
2) 1,4-Dioxane	1.65	58	5508m	1.11006			23
3) n-Nitrosodimethylamine	1.88	42	65173	9.20259	ppb		89
4) Pyridine	1.93	79	193080	10.37468	ppb		99
7) Phenol	4.93	94	266236	10.24195	ppb		86
8) Aniline	4.92	93	159232	10.63571	ppb		92
9) Bis (2-chloroethyl) ether	4.99	63	107729	10.30174	ppb		90
10) 2-Chlorophenol	5.06	128	202043	10.33126	ppb		97
11) 1,3-DCB	5.21	146	220621	10.47519	ppb		99
12) 1,4-DCB	5.29	146	226661	10.56157	ppb		97
13) Benzyl alcohol	5.47	108	105103	9.73097	ppb		96
14) 1,2-DCB	5.47	146	211415	10.34100	ppb		96
15) 2-Methylphenol	5.60	107	160916	10.19033	ppb		99
16) Bis (2-chloroisopropyl) et	5.59	45	129965	10.34754	ppb	#	49
17) Acetophenone	5.75	105	250669	10.17705	ppb		93
18) 3&4-Methylphenol	5.78	107	404001	20.24692	ppb		98
19) n-Nitrosodi-n-propylamine	5.75	70	145081	10.23017	ppb		98
20) Hexachloroethane	5.84	117	82754	10.35815	ppb		83
23) Nitrobenzene	5.93	77	216430	10.37437	ppb		96
24) Isophorone	6.22	82	349370	9.96039	ppb		98
25) 2-Nitrophenol	6.30	139	107342	9.85589	ppb		96
26) 2,4-Dimethylphenol	6.36	122	172223	10.12163	ppb		98
27) Benzoic acid	6.51	105	114649	8.08854	ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	212602	10.38199	ppb		98
29) 2,4-Dichlorophenol	6.59	162	168670	10.11668	ppb		96
30) 1,2,4-Trichlorobenzene	6.66	180	193098	10.42008	ppb		99
31) 3,4-Dimethylphenol	6.70	107	262842	10.55028	ppb		96
32) Naphthalene	6.74	128	573540	10.41828	ppb		99
33) 4-Chloroaniline	6.83	127	221542	10.28185	ppb		97
34) 2,6-Dichlorophenol	6.83	162	164290	9.92548	ppb		99
35) Hexachloropropene	6.84	213	138413	9.91819	ppb		98
36) Hexachlorobutadiene	6.88	225	114154	10.20203	ppb		98
37) Caprolactum	7.27	55	52746	9.61756	ppb		89

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y005.D
Acq On : 20 Apr 20 10:31
Sample : 10ug/ml 8270 3/4/20
Misc :

Vial: 5
Operator: MA
Inst : Yoda
Multiplr: 1.00

Quant Time: Apr 20 14:35 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:30:40 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	184351	10.10697	ppb		96
39)	2-Methylnaphthalene	7.54	142	377779	10.20026	ppb		99
40)	1-Methylnaphthalene	7.65	142	383100	10.10286	ppb		98
42)	Hexachlorocyclopentadiene	7.72	237	93696	11.47811	ppb		99
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	190382	10.28200	ppb		96
44)	2,4,6-Trichlorophenol	7.88	196	125929	10.16069	ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	133127	10.18579	ppb		95
47)	1,1'-Biphenyl	8.07	154	482438	10.13662	ppb	#	96
48)	2-Chloronaphthalene	8.10	162	389751	10.30456	ppb		96
49)	2-Nitroaniline	8.24	65	103517	9.75574	ppb		95
50)	Dimethyl phthalate	8.44	163	460735	10.14981	ppb		99
51)	2,6-DNT	8.51	165	98326	9.65272	ppb	#	80
52)	Acenaphthylene	8.58	152	588203	10.32058	ppb		99
53)	3-Nitroaniline	8.24	138	114565	9.50532	ppb		96
54)	Acenaphthene	8.78	154	381896	10.45441	ppb		99
55)	2,4-Dinitrophenol	8.85	184	45060	9.86539	ppb		93
56)	4-Nitrophenol	8.98	65	76411	9.06950	ppb		81
57)	Dibenzofuran	8.98	168	551906	10.23219	ppb		96
58)	2,4-DNT	8.98	165	143436	9.84144	ppb	#	68
59)	2,3,4,6-Tetrachlorophenol	9.14	232	103187	9.98710	ppb		98
60)	Diethyl phthalate	9.25	149	467864	10.53681	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	240472	9.87872	ppb		99
62)	Fluorene	9.38	166	447706	9.93273	ppb		99
63)	4-Nitroaniline	8.72	138	97168	9.96508	ppb		96
66)	4,6-Dinitro-2-methylphenol	9.46	198	81447	9.09343	ppb		96
67)	Diphenyl amine	9.52	169	685707	20.34571	ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	685707	20.34571	ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	430809	10.00765	ppb	#	91
70)	4-Bromophenyl phenyl ether	9.94	248	130473	10.07873	ppb		94
71)	Hexachlorobenzene	10.02	284	134313	10.15931	ppb	#	82
72)	Atrazine	10.16	200	63588	5.11970	ppb		97
73)	Pentachlorophenol	10.27	266	70414	8.77873	ppb		95
74)	Phenanthrene	10.50	178	652123	10.45729	ppb		100
75)	Anthracene	10.56	178	681997	10.49054	ppb		99
76)	Carbazol	10.76	167	607585	10.35739	ppb		100
77)	Di-n-butylphthalate	11.15	149	753847	10.07823	ppb		99
78)	2-Nitrodiphenylamine	11.33	167	70186	4.41517	ppb		93
79)	Fluoranthene	11.89	202	740853	10.31566	ppb	#	97
81)	Benzidine	12.06	184	183847	11.32570	ppb		99
82)	Pyrene	12.15	202	775988	11.35435	ppb		99
84)	Butyl benzylphthalate	12.90	149	345065	10.94434	ppb		93
85)	3,3'-Dichlorobenzidine	13.52	252	250001	11.65740	ppb		100
86)	Benz (a) anthracene	13.55	228	751595	10.91705	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.56	149	504381	10.57024	ppb		98
88)	Chrysene	13.58	228	723217	11.43853	ppb		99
89)	Di-n-octylphthalate	14.29	149	833555	10.92357	ppb	#	94
91)	Benzo (b) fluoranthene	14.83	252	685042	9.42031	ppb		98
92)	Benzo (k) fluoranthene	14.86	252	740283	11.22519	ppb		99
93)	Benzo (a) pyrene	15.27	252	654589	10.42513	ppb		98
94)	Indeno (1,2,3-cd) pyrene	17.16	276	772343	10.31389	ppb		98
95)	Dibenz (a,h) anthracene	17.18	278	681025	10.54134	ppb		97
96)	Benzo (g,h,i) perylene	17.71	276	622415	10.47443	ppb		99

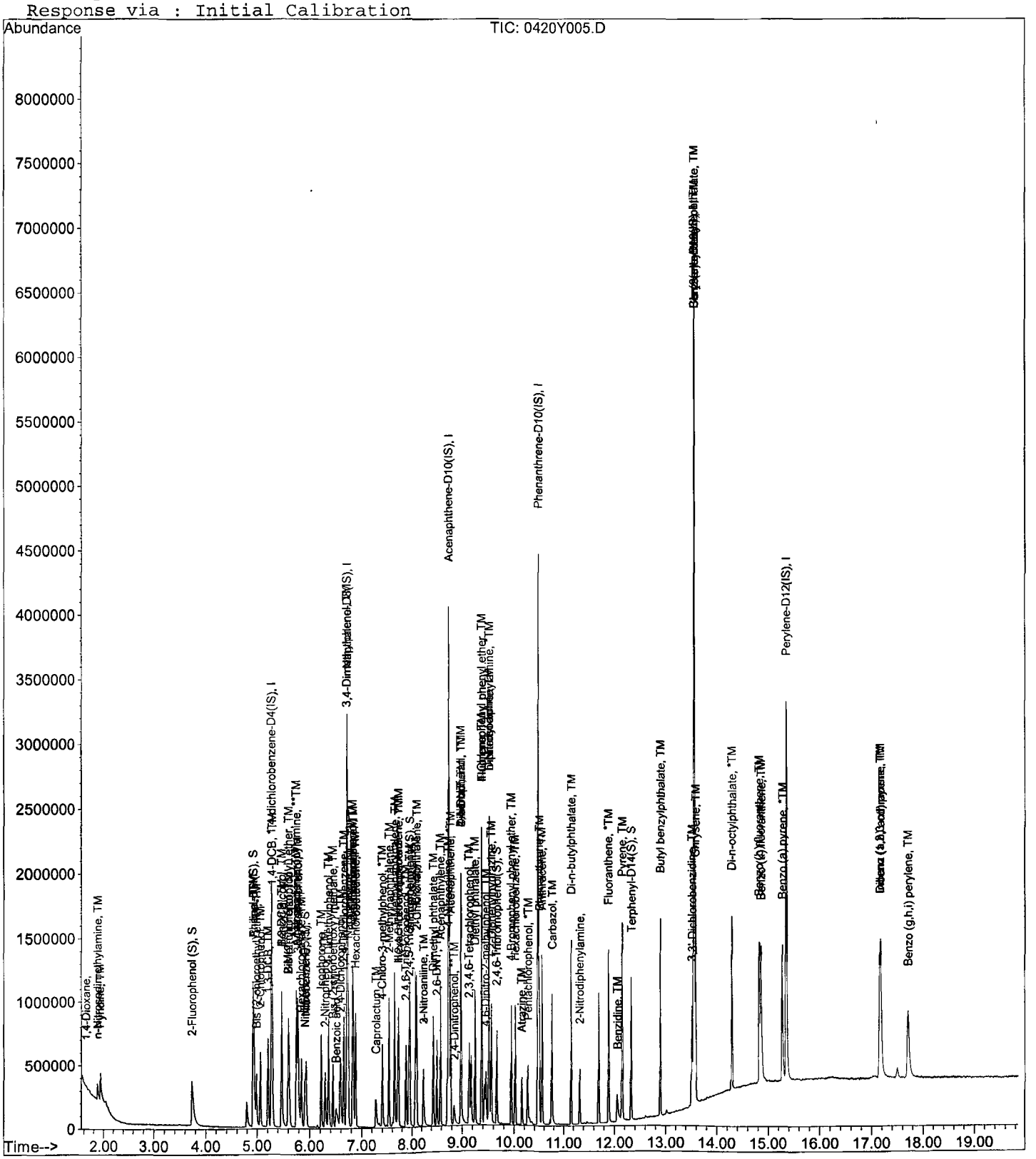
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y005.D Vial: 5
Acq On : 20 Apr 20 10:31 Operator: MA
Sample : 10ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:35 2020 Quant Results File: Y0420.RES

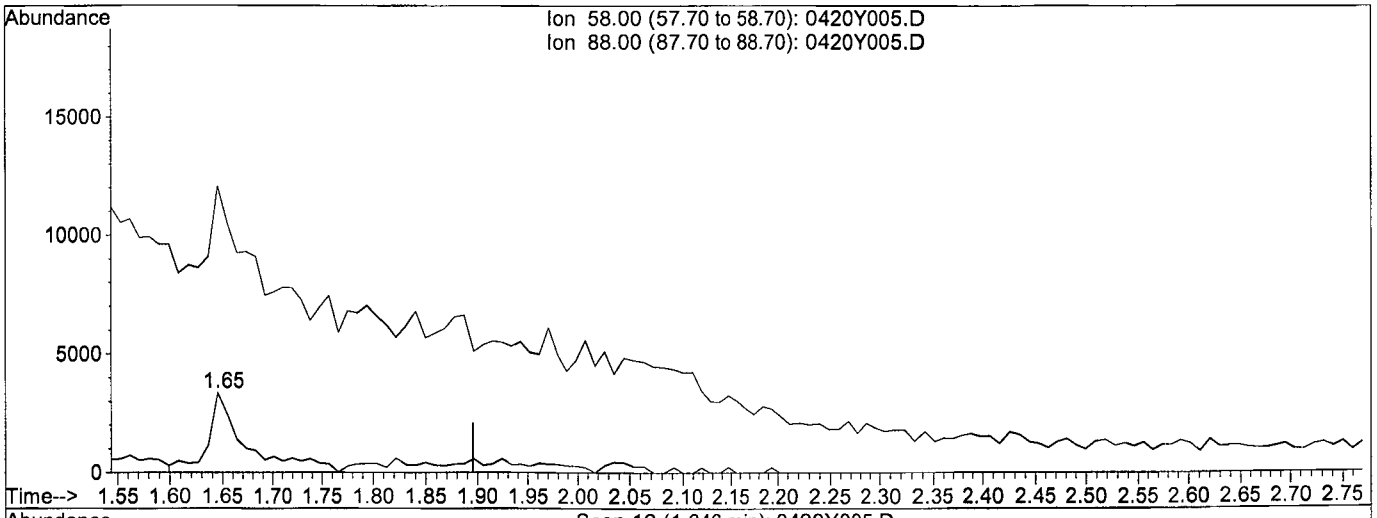
Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration

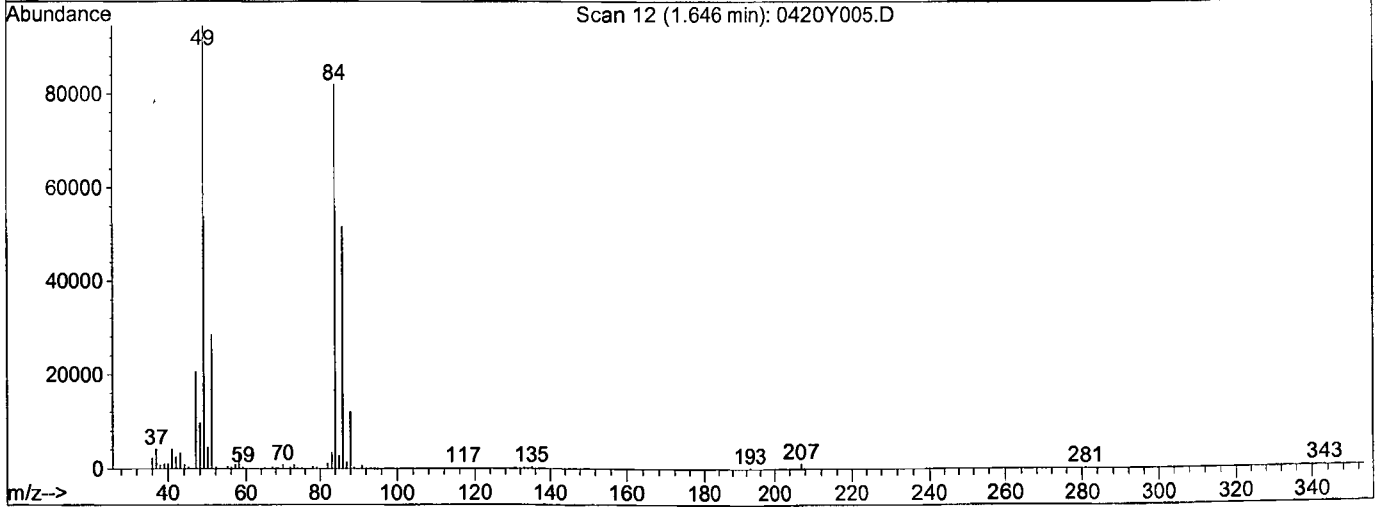


Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y005.D Vial: 5
Acq On : 20 Apr 20 10:31 Operator: MA
Sample : 10ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: Apr 20 14:31 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:32:11 2020
Response via : Multiple Level Calibration





TIC: 0420Y005.D

(2) 1,4-Dioxane

1.65min 1.7701

response 8783

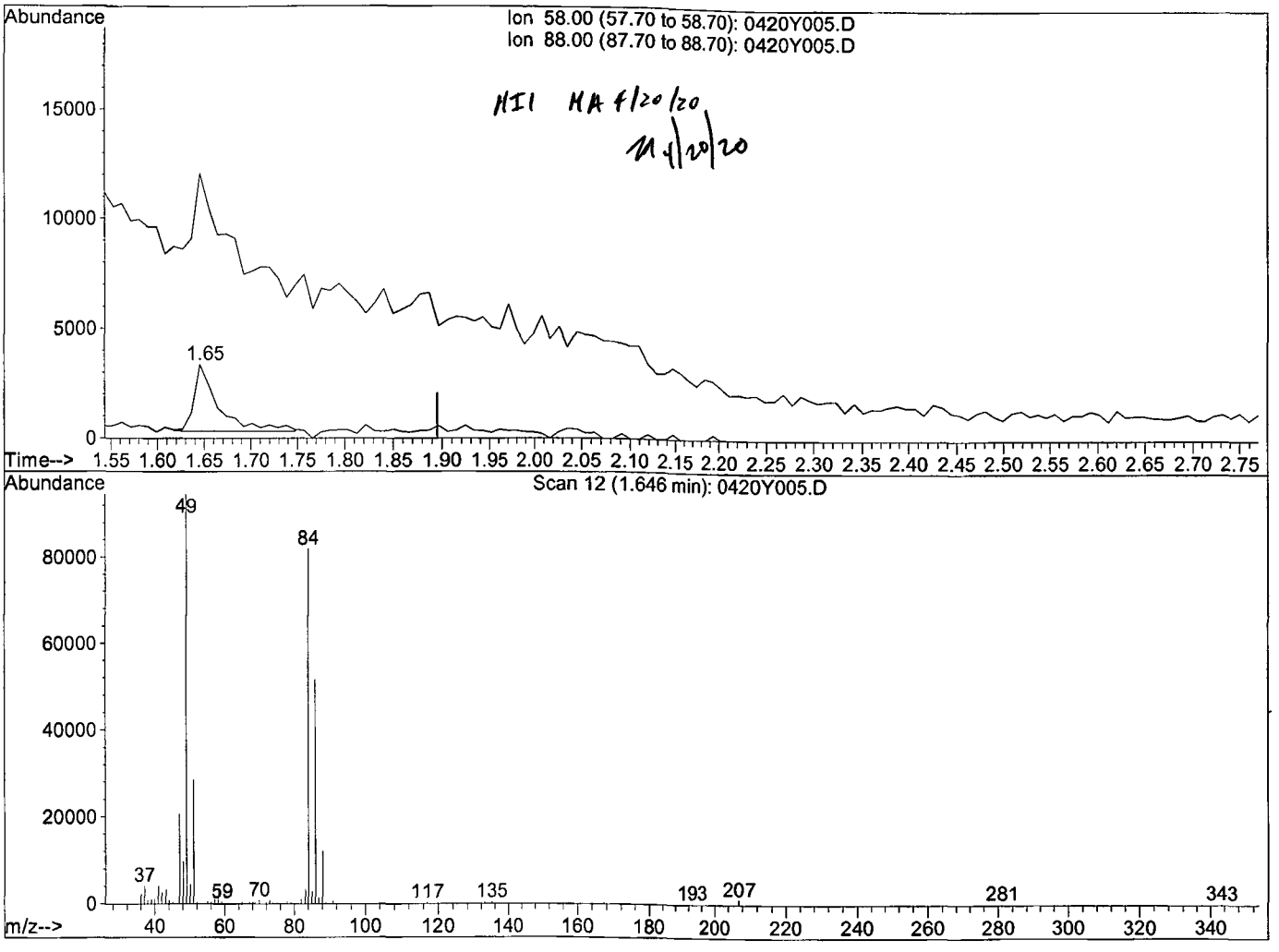
Ion	Exp%	Act%
58.00	100	100
88.00	205.20	85.96#
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y005.D
Acq On : 20 Apr 20 10:31
Sample : 10ug/ml 8270 3/4/20
Misc :
Quant Time: Apr 20 14:35 2020

Vial: 5
Operator: MA
Inst : Yoda
Multiplr: 1.00
Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:32:11 2020
Response via : Multiple Level Calibration



TIC: 0420Y005.D

(2) 1,4-Dioxane

1.65min 1.1101 m

response 5508

Ion	Exp%	Act%
58.00	100	100
88.00	205.20	137.07
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y006.D Vial: 6
Acq On : 20 Apr 20 11:00 Operator: MA
Sample : 20ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	443176	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.73	136	1886740	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1143699	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.48	188	2205691	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.56	240	2177433	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.35	264	2036694	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.74	112	605572	37.17047	ppb		0.00
Spiked Amount 200.000			Recovery = 18.585%				
6) Phenol-D6 (S)	4.92	99	781388	36.24021	ppb		0.00
Spiked Amount 200.000			Recovery = 18.120%				
22) Nitrobenzene-D5(S)	5.92	82	366441	19.01038	ppb		0.00
Spiked Amount 100.000			Recovery = 19.010%				
46) 2-Fluorobiphenyl(S)	7.96	172	776977	19.11677	ppb		0.00
Spiked Amount 100.000			Recovery = 19.117%				
64) 2,4,6-Tribromophenol(S)	9.67	330	212252	36.22165	ppb		0.00
Spiked Amount 200.000			Recovery = 18.111%				
83) Terphenyl-D14(S)	12.33	244	1004778	20.26318	ppb		0.00
Spiked Amount 100.000			Recovery = 20.263%				
Target Compounds							Qvalue
2) 1,4-Dioxane	1.65	58	10375	1.94157			52
3) n-Nitrosodimethylamine	1.87	42	158390	20.76737	ppb		88
4) Pyridine	1.93	79	386292	19.27368	ppb		99
7) Phenol	4.93	94	534526	19.09397	ppb		96
8) Aniline	4.92	93	313280	19.43034	ppb		91
9) Bis (2-chloroethyl) ether	4.99	63	218851	19.43292	ppb		93
10) 2-Chlorophenol	5.06	128	405018	19.23072	ppb		98
11) 1,3-DCB	5.21	146	435270	19.19045	ppb		99
12) 1,4-DCB	5.30	146	444445	19.23008	ppb		99
13) Benzyl alcohol	5.47	108	220095	18.92181	ppb		97
14) 1,2-DCB	5.47	146	419544	19.05530	ppb		99
15) 2-Methylphenol	5.60	107	320585	18.85141	ppb		99
16) Bis (2-chloroisopropyl) et	5.59	45	260241	19.23969	ppb	#	66
17) Acetophenone	5.75	105	504953	19.03636	ppb		96
18) 3&4-Methylphenol	5.78	107	811203	37.75006	ppb		97
19) n-Nitrosodi-n-propylamine	5.76	70	292054	19.12261	ppb		94
20) Hexachloroethane	5.84	117	164276	19.09321	ppb		84
23) Nitrobenzene	5.94	77	433002	19.66830	ppb		95
24) Isophorone	6.22	82	725259	19.59369	ppb		99
25) 2-Nitrophenol	6.30	139	223124	19.41354	ppb		98
26) 2,4-Dimethylphenol	6.36	122	353585	19.69180	ppb		97
27) Benzoic acid	6.52	105	278076	18.59070	ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	420893	19.47679	ppb		98
29) 2,4-Dichlorophenol	6.59	162	341037	19.38359	ppb		99
30) 1,2,4-Trichlorobenzene	6.66	180	380839	19.47454	ppb		99
31) 3,4-Dimethylphenol	6.71	107	512127	19.47957	ppb		99
32) Naphthalene	6.74	128	1132470	19.49357	ppb		99
33) 4-Chloroaniline	6.82	127	468213	20.59165	ppb		95
34) 2,6-Dichlorophenol	6.83	162	334028	19.12299	ppb		95
35) Hexachloropropene	6.85	213	278972	18.94299	ppb		99
36) Hexachlorobutadiene	6.88	225	229269	19.41659	ppb		98
37) Caprolactum	7.27	55	116487	20.12729	ppb		94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y006.D Vial: 6
Acq On : 20 Apr 20 11:00 Operator: MA
Sample : 20ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	377120	19.59240	ppb		92
39)	2-Methylnaphthalene	7.53	142	751200	19.22035	ppb		97
40)	1-Methylnaphthalene	7.65	142	772050	19.29345	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	194240	18.08220	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	381178	19.40240	ppb		98
44)	2,4,6-Trichlorophenol	7.88	196	254711	19.36963	ppb		98
45)	2,4,5-Trichlorophenol	7.93	196	273305	19.70843	ppb	#	91
47)	1,1'-Biphenyl	8.07	154	988227	19.56970	ppb		98
48)	2-Chloronaphthalene	8.10	162	786722	19.60377	ppb		97
49)	2-Nitroaniline	8.23	65	225189	20.00193	ppb		87
50)	Dimethyl phthalate	8.43	163	944738	19.61527	ppb		99
51)	2,6-DNT	8.51	165	211533	19.57201	ppb		88
52)	Acenaphthylene	8.58	152	1186565	19.62204	ppb		99
53)	3-Nitroaniline	8.24	138	250585	19.59503	ppb		97
54)	Acenaphthene	8.78	154	753935	19.45201	ppb		98
55)	2,4-Dinitrophenol	8.84	184	119317	18.77672	ppb		93
56)	4-Nitrophenol	8.96	65	170165	19.03592	ppb		97
57)	Dibenzofuran	8.98	168	1115152	19.48559	ppb		99
58)	2,4-DNT	8.98	165	306156	19.79790	ppb		84
59)	2,3,4,6-Tetrachlorophenol	9.14	232	212675	19.40023	ppb		95
60)	Diethyl phthalate	9.25	149	926918	19.67465	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	489487	18.95193	ppb		94
62)	Fluorene	9.38	166	913187	19.09464	ppb		99
63)	4-Nitroaniline	8.71	138	206111	19.92207	ppb		88
66)	4,6-Dinitro-2-methylphenol	9.46	198	184193	19.14407	ppb		98
67)	Diphenyl amine	9.52	169	1390429	38.40533	ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	1390429	38.40533	ppb		100
69)	1,2-Diphenylhydrazine	9.57	77	873967	18.89952	ppb	#	89
70)	4-Bromophenyl phenyl ether	9.95	248	261557	18.80874	ppb		92
71)	Hexachlorobenzene	10.02	284	274478	19.32689	ppb	#	84
72)	Atrazine	10.15	200	127725	9.57313	ppb		95
73)	Pentachlorophenol	10.26	266	160842	18.66726	ppb		98
74)	Phenanthrene	10.50	178	1307537	19.51874	ppb		99
75)	Anthracene	10.56	178	1363551	19.52518	ppb		100
76)	Carbazol	10.76	167	1212012	19.23352	ppb		99
77)	Di-n-butylphthalate	11.15	149	1560218	19.41756	ppb		99
78)	2-Nitrodiphenylamine	11.32	167	159748	9.35494	ppb		86
79)	Fluoranthene	11.89	202	1495955	19.39063	ppb		98
81)	Benzidine	12.05	184	430743	24.21938	ppb		98
82)	Pyrene	12.16	202	1568719	20.95022	ppb		100
84)	Butyl benzylphthalate	12.90	149	723202	20.93556	ppb		91
85)	3,3'-Dichlorobenzidine	13.51	252	509016	21.66345	ppb	#	98
86)	Benz (a) anthracene	13.55	228	1540003	20.41641	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.56	149	1078473	20.62868	ppb		99
88)	Chrysene	13.59	228	1457536	21.04054	ppb		100
89)	Di-n-octylphthalate	14.29	149	1720241	20.57576	ppb	#	95
91)	Benzo (b) fluoranthene	14.82	252	1462840	19.14625	ppb		99
92)	Benzo (k) fluoranthene	14.86	252	1456250	21.01700	ppb		100
93)	Benzo (a) pyrene	15.28	252	1350265	20.46777	ppb		100
94)	Indeno (1,2,3-cd) pyrene	17.16	276	1578287	20.06028	ppb		98
95)	Dibenz (a,h) anthracene	17.18	278	1395501	20.55899	ppb		99
96)	Benzo (g,h,i) perylene	17.70	276	1267475	20.30152	ppb		99

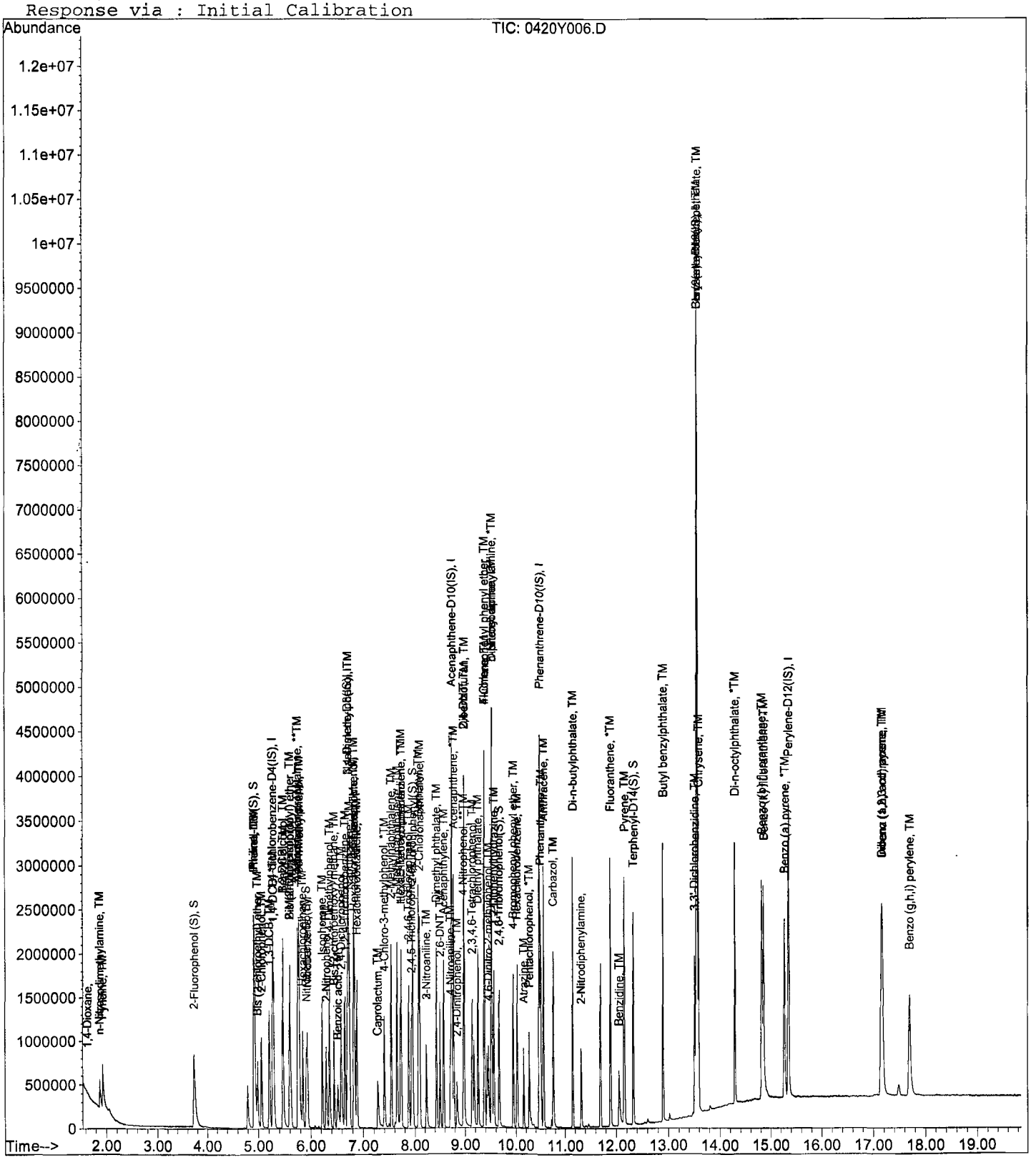
(#) = qualifier out of range (m) = manual integration
0420Y006.D Y0420.M Mon Apr 20 14:48:48 2020

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y006.D Vial: 6
Acq On : 20 Apr 20 11:00 Operator: MA
Sample : 20ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y007.D Vial: 7
Acq On : 20 Apr 20 11:28 Operator: MA
Sample : 40ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	478543	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.73	136	2109187	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1307414	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.48	188	2474116	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.56	240	2659220	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.35	264	2349652	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.73	112	1448204	82.32226	ppb		0.00
Spiked Amount 200.000			Recovery = 41.161%				
6) Phenol-D6 (S)	4.92	99	1893197	81.31582	ppb		0.00
Spiked Amount 200.000			Recovery = 40.658%				
22) Nitrobenzene-D5(S)	5.92	82	865065	40.14510	ppb		0.00
Spiked Amount 100.000			Recovery = 40.145%				
46) 2-Fluorobiphenyl(S)	7.96	172	1809860	38.95381	ppb		0.00
Spiked Amount 100.000			Recovery = 38.954%				
64) 2,4,6-Tribromophenol(S)	9.67	330	530816	79.24266	ppb		0.00
Spiked Amount 200.000			Recovery = 39.622%				
83) Terphenyl-D14(S)	12.33	244	2384888	39.38183	ppb		0.00
Spiked Amount 100.000			Recovery = 39.382%				
Target Compounds							Qvalue
2) 1,4-Dioxane	1.65	58	20792	3.60344			76
3) n-Nitrosodimethylamine	1.87	42	329220	39.97562	ppb		99
4) Pyridine	1.92	79	841711	38.89262	ppb		99
7) Phenol	4.94	94	1197920	39.62875	ppb		94
8) Aniline	4.92	93	742208	42.63131	ppb		89
9) Bis (2-chloroethyl) ether	4.99	63	483623	39.76964	ppb		96
10) 2-Chlorophenol	5.06	128	907204	39.89160	ppb		95
11) 1,3-DCB	5.21	146	968171	39.53063	ppb		99
12) 1,4-DCB	5.30	146	983410	39.40515	ppb		98
13) Benzyl alcohol	5.47	108	503829	40.11354	ppb		99
14) 1,2-DCB	5.47	146	928743	39.06511	ppb		99
15) 2-Methylphenol	5.60	107	726322	39.55351	ppb		96
16) Bis (2-chloroisopropyl) et	5.59	45	579155	39.65266	ppb	#	71
17) Acetophenone	5.75	105	1137854	39.72599	ppb		93
18) 3&4-Methylphenol	5.78	107	1824689	78.63796	ppb		97
19) n-Nitrosodi-n-propylamine	5.76	70	664556	40.29682	ppb		96
20) Hexachloroethane	5.84	117	367955	39.60545	ppb		83
23) Nitrobenzene	5.94	77	960962	39.04631	ppb		95
24) Isophorone	6.23	82	1617712	39.09501	ppb		97
25) 2-Nitrophenol	6.30	139	499310	38.86204	ppb		97
26) 2,4-Dimethylphenol	6.36	122	778841	38.80050	ppb		96
27) Benzoic acid	6.55	105	679024	40.60825	ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	942706	39.02284	ppb		98
29) 2,4-Dichlorophenol	6.59	162	763131	38.79973	ppb		98
30) 1,2,4-Trichlorobenzene	6.66	180	848841	38.82837	ppb		99
31) 3,4-Dimethylphenol	6.71	107	1126965	38.34504	ppb		98
32) Naphthalene	6.75	128	2500115	38.49653	ppb		99
33) 4-Chloroaniline	6.82	127	1009533	39.71597	ppb		96
34) 2,6-Dichlorophenol	6.83	162	761439	38.99464	ppb		97
35) Hexachloropropene	6.85	213	639320	38.83320	ppb		99
36) Hexachlorobutadiene	6.88	225	509616	38.60715	ppb		98
37) Caprolactum	7.29	55	258802	40.00115	ppb		94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y007.D Vial: 7
Acq On : 20 Apr 20 11:28 Operator: MA
Sample : 40ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	844704	39.25632	ppb		94
39)	2-Methylnaphthalene	7.53	142	1677984	38.40524	ppb		99
40)	1-Methylnaphthalene	7.66	142	1731748	38.71205	ppb		98
42)	Hexachlorocyclopentadiene	7.72	237	518912	36.16827	ppb		99
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	858527	38.22788	ppb		99
44)	2,4,6-Trichlorophenol	7.88	196	579963	38.58091	ppb		99
45)	2,4,5-Trichlorophenol	7.93	196	605796	38.21461	ppb		92
47)	1,1'-Biphenyl	8.07	154	2198445	38.08393	ppb		98
48)	2-Chloronaphthalene	8.10	162	1728910	37.68679	ppb		97
49)	2-Nitroaniline	8.24	65	511828	39.76924	ppb		93
50)	Dimethyl phthalate	8.44	163	2111991	38.35955	ppb		99
51)	2,6-DNT	8.51	165	482775	39.07515	ppb	#	77
52)	Acenaphthylene	8.58	152	2645664	38.27242	ppb		99
53)	3-Nitroaniline	8.24	138	574989	39.33227	ppb		97
54)	Acenaphthene	8.78	154	1660209	37.47071	ppb		98
55)	2,4-Dinitrophenol	8.84	184	314165	38.15631	ppb		92
56)	4-Nitrophenol	8.95	65	407295	39.85761	ppb		92
57)	Dibenzofuran	8.98	168	2471698	37.78101	ppb		97
58)	2,4-DNT	8.98	165	687672	38.90061	ppb	#	73
59)	2,3,4,6-Tetrachlorophenol	9.14	232	487370	38.89090	ppb		96
60)	Diethyl phthalate	9.26	149	2047374	38.01556	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	1113936	37.72864	ppb		94
62)	Fluorene	9.38	166	2050012	37.49788	ppb		99
63)	4-Nitroaniline	8.71	138	477430	40.36841	ppb		85
66)	4,6-Dinitro-2-methylphenol	9.47	198	433550	40.17214	ppb	#	81
67)	Diphenyl amine	9.53	169	3113288	76.66314	ppb		100
68)	n-Nitrosodiphenylamine	9.53	169	3113288	76.66314	ppb		100
69)	1,2-Diphenylhydrazine	9.57	77	1953303	37.65736	ppb		95
70)	4-Bromophenyl phenyl ether	9.95	248	610642	39.14756	ppb		92
71)	Hexachlorobenzene	10.02	284	616540	38.70262	ppb	#	80
72)	Atrazine	10.16	200	296564	19.81623	ppb		98
73)	Pentachlorophenol	10.27	266	381705	39.49422	ppb		97
74)	Phenanthrene	10.51	178	2929901	38.99199	ppb		100
75)	Anthracene	10.56	178	2989528	38.16373	ppb		100
76)	Carbazol	10.76	167	2734506	38.68613	ppb		98
77)	Di-n-butylphthalate	11.15	149	3580869	39.73036	ppb		99
78)	2-Nitrodiphenylamine	11.32	167	392790	20.50646	ppb		87
79)	Fluoranthene	11.89	202	3345765	38.66281	ppb	#	97
81)	Benzidine	12.06	184	874294	40.25249	ppb		99
82)	Pyrene	12.16	202	3507174	38.35229	ppb		100
84)	Butyl benzylphthalate	12.90	149	1633249	38.71399	ppb		90
85)	3,3'-Dichlorobenzidine	13.51	252	1124049	39.17166	ppb	#	98
86)	Benz (a) anthracene	13.55	228	3448772	37.43801	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.56	149	2441659	38.24175	ppb		99
88)	Chrysene	13.60	228	3248232	38.39504	ppb		100
89)	Di-n-octylphthalate	14.29	149	4025742	39.42784	ppb	#	95
91)	Benzo (b) fluoranthene	14.83	252	3687014	41.82961	ppb		98
92)	Benzo (k) fluoranthene	14.87	252	2848022	35.62873	ppb		98
93)	Benzo (a) pyrene	15.28	252	3104017	40.78475	ppb		98
94)	Indeno (1,2,3-cd) pyrene	17.17	276	3544043	39.04562	ppb		100
95)	Dibenz (a,h) anthracene	17.19	278	3143980	40.14890	ppb		99
96)	Benzo (g,h,i) perylene	17.71	276	2819420	39.14453	ppb		99

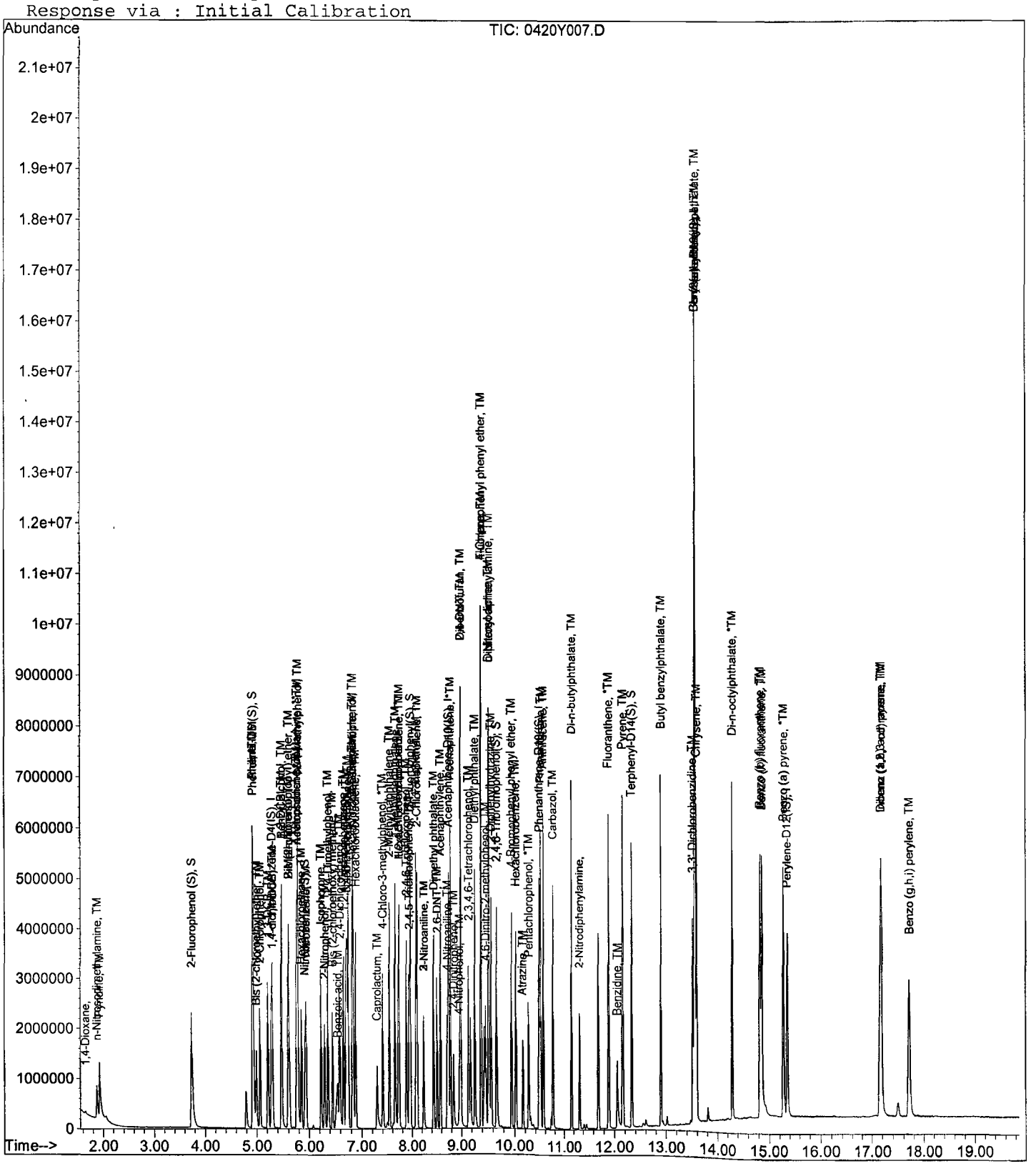
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y007.D Vial: 7
Acq On : 20 Apr 20 11:28 Operator: MA
Sample : 40ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y008.D Vial: 8
Acq On : 20 Apr 20 11:57 Operator: MA
Sample : 50ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	464082	40.00000 ppb	0.00
21) Napthalene-D8(IS)	6.72	136	1945448	40.00000 ppb	0.00
41) Acenaphthene-D10(IS)	8.74	164	1146170	40.00000 ppb	0.00
65) Phenanthrene-D10(IS)	10.47	188	2180724	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.57	240	2320927	40.00000 ppb	0.00
90) Perylene-D12(IS)	15.36	264	2075407	40.00000 ppb	0.00
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.73	112	1687452	98.91114 ppb	0.00
Spiked Amount 200.000			Recovery = 49.456%		
6) Phenol-D6 (S)	4.92	99	2217810	98.22677 ppb	0.00
Spiked Amount 200.000			Recovery = 49.114%		
22) Nitrobenzene-D5(S)	5.92	82	1005399	50.58452 ppb	0.00
Spiked Amount 100.000			Recovery = 50.585%		
46) 2-Fluorobiphenyl(S)	7.96	172	2099495	51.54469 ppb	0.00
Spiked Amount 100.000			Recovery = 51.545%		
64) 2,4,6-Tribromophenol(S)	9.68	330	595407	101.38952 ppb	0.00
Spiked Amount 200.000			Recovery = 50.695%		
83) Terphenyl-D14(S)	12.33	244	2657586	50.28148 ppb	0.00
Spiked Amount 100.000			Recovery = 50.281%		
Target Compounds					Qvalue
2) 1,4-Dioxane	1.65	58	26158	4.67468	100
3) n-Nitrosodimethylamine	1.87	42	357205	44.72525 ppb	100
4) Pyridine	1.91	79	982452	46.81034 ppb	100
7) Phenol	4.93	94	1393874	47.54801 ppb	100
8) Aniline	4.92	93	856768	50.74492 ppb	100
9) Bis (2-chloroethyl) ether	4.99	63	566496	48.03611 ppb	100
10) 2-Chlorophenol	5.06	128	1053302	47.75904 ppb	100
11) 1,3-DCB	5.21	146	1142818	48.11550 ppb	100
12) 1,4-DCB	5.30	146	1152364	47.61396 ppb	100
13) Benzyl alcohol	5.47	108	594585	48.81440 ppb	100
14) 1,2-DCB	5.47	146	1092963	47.40511 ppb	100
15) 2-Methylphenol	5.60	107	845527	47.47988 ppb	100
16) Bis (2-chloroisopropyl) et	5.60	45	672884	47.50551 ppb	100
17) Acetophenone	5.76	105	1331190	47.92416 ppb	100
18) 3&4-Methylphenol	5.78	107	2158011	95.90104 ppb	100
19) n-Nitrosodi-n-propylamine	5.76	70	770346	48.16719 ppb	100
20) Hexachloroethane	5.85	117	435299	48.31412 ppb	100
23) Nitrobenzene	5.94	77	1134639	49.98354 ppb	100
24) Isophorone	6.23	82	1910371	50.05337 ppb	100
25) 2-Nitrophenol	6.30	139	602537	50.84339 ppb	100
26) 2,4-Dimethylphenol	6.36	122	904670	48.86232 ppb	100
27) Benzoic acid	6.56	105	796444	51.63924 ppb	100
28) Bis (2-chloroethoxy) metha	6.45	93	1105565	49.61607 ppb	100
29) 2,4-Dichlorophenol	6.58	162	892544	49.19882 ppb	100
30) 1,2,4-Trichlorobenzene	6.66	180	985399	48.86865 ppb	100
31) 3,4-Dimethylphenol	6.71	107	1323759	48.83185 ppb	100
32) Naphthalene	6.75	128	2971757	49.61013 ppb	100
33) 4-Chloroaniline	6.83	127	1162424	49.57979 ppb	100
34) 2,6-Dichlorophenol	6.83	162	886600	49.22583 ppb	100
35) Hexachloropropene	6.84	213	766208	50.45765 ppb	100
36) Hexachlorobutadiene	6.88	225	592381	48.65430 ppb	100
37) Caprolactum	7.30	55	300663	50.38256 ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y008.D Vial: 8
Acq On : 20 Apr 20 11:57 Operator: MA
Sample : 50ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	982234	49.48977	ppb	100
39)	2-Methylnaphthalene	7.54	142	1976795	49.05235	ppb	100
40)	1-Methylnaphthalene	7.65	142	2035778	49.33866	ppb	100
42)	Hexachlorocyclopentadiene	7.72	237	660672	50.46713	ppb	100
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	1002192	50.90276	ppb	100
44)	2,4,6-Trichlorophenol	7.88	196	678711	51.50165	ppb	100
45)	2,4,5-Trichlorophenol	7.94	196	706356	50.82657	ppb	100
47)	1,1'-Biphenyl	8.08	154	2580728	50.99557	ppb	100
48)	2-Chloronaphthalene	8.11	162	2049050	50.94874	ppb	100
49)	2-Nitroaniline	8.24	65	588162	52.12959	ppb	100
50)	Dimethyl phthalate	8.44	163	2455281	50.86824	ppb	100
51)	2,6-DNT	8.52	165	570683	52.68839	ppb	100
52)	Acenaphthylene	8.58	152	3066777	50.60548	ppb	100
53)	3-Nitroaniline	8.24	138	669741	52.25893	ppb	100
54)	Acenaphthene	8.78	154	1949594	50.19234	ppb	100
55)	2,4-Dinitrophenol	8.84	184	369165	49.81386	ppb	100
56)	4-Nitrophenol	8.96	65	475348	53.06131	ppb	100
57)	Dibenzofuran	8.98	168	2915234	50.82949	ppb	100
58)	2,4-DNT	8.99	165	799228	51.57151	ppb	100
59)	2,3,4,6-Tetrachlorophenol	9.14	232	563014	51.24747	ppb	100
60)	Diethyl phthalate	9.26	149	2390030	50.62111	ppb	100
61)	4-Chlorophenyl phenyl ethe	9.38	204	1310131	50.61622	ppb	100
62)	Fluorene	9.38	166	2413683	50.36103	ppb	100
63)	4-Nitroaniline	8.72	138	545323	52.59566	ppb	100
66)	4,6-Dinitro-2-methylphenol	9.47	198	514339	54.06978	ppb	100
67)	Diphenyl amine	9.53	169	3654802	102.10583	ppb	100
68)	n-Nitrosodiphenylamine	9.53	169	3654802	102.10583	ppb	100
69)	1,2-Diphenylhydrazine	9.56	77	2213256	48.40958	ppb	100
70)	4-Bromophenyl phenyl ether	9.94	248	720976	52.43945	ppb	100
71)	Hexachlorobenzene	10.03	284	722770	51.47526	ppb	100
72)	Atrazine	10.16	200	341616	25.89764	ppb	100
73)	Pentachlorophenol	10.27	266	449056	52.71395	ppb	100
74)	Phenanthrene	10.50	178	3359807	50.72899	ppb	100
75)	Anthracene	10.57	178	3482202	50.43378	ppb	100
76)	Carbazol	10.76	167	3186921	51.15253	ppb	100
77)	Di-n-butylphthalate	11.15	149	4134400	52.04343	ppb	100
78)	2-Nitrodiphenylamine	11.33	167	461312	27.32400	ppb	100
79)	Fluoranthene	11.89	202	3908833	51.24653	ppb	100
81)	Benzidine	12.05	184	945762	49.88959	ppb	100
82)	Pyrene	12.15	202	4047593	50.71351	ppb	100
84)	Butyl benzylphthalate	12.90	149	1874606	50.91178	ppb	100
85)	3,3'-Dichlorobenzidine	13.52	252	1259534	50.29090	ppb	100
86)	Benz (a) anthracene	13.55	228	4208919	52.34939	ppb	100
87)	Bis (2-ethylhexyl) phthala	13.56	149	2874442	51.58211	ppb	100
88)	Chrysene	13.59	228	3638508	49.27699	ppb	100
89)	Di-n-octylphthalate	14.30	149	4661995	52.31445	ppb	100
91)	Benzo (b) fluoranthene	14.83	252	3942453	50.63792	ppb	100
92)	Benzo (k) fluoranthene	14.87	252	3619140	51.25812	ppb	100
93)	Benzo (a) pyrene	15.28	252	3556612	52.90667	ppb	100
94)	Indeno (1,2,3-cd) pyrene	17.18	276	4098411	51.11979	ppb	100
95)	Dibenz (a,h) anthracene	17.20	278	3627606	52.44622	ppb	100
96)	Benzo (g,h,i) perylene	17.72	276	3237849	50.89419	ppb	100

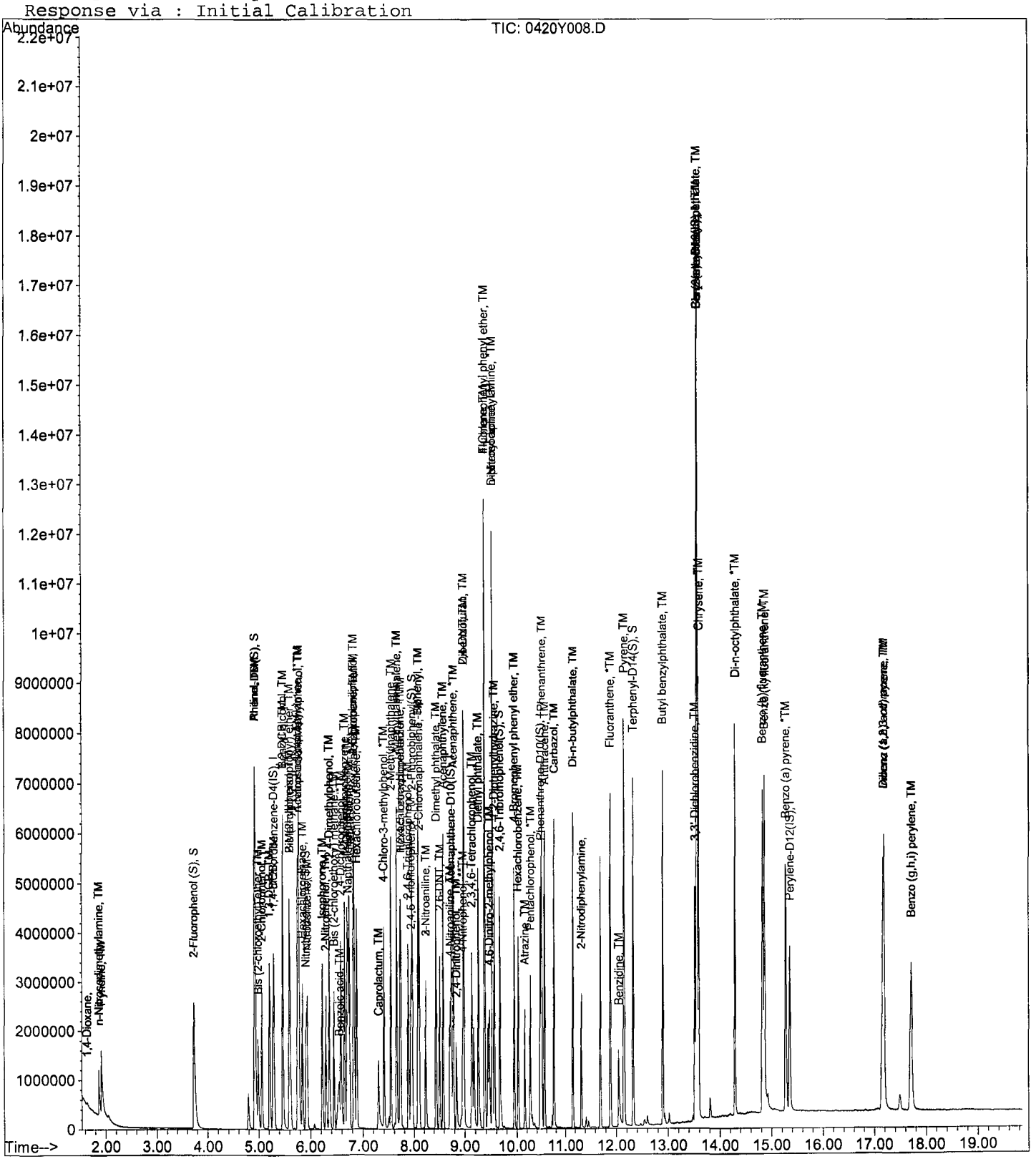
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y008.D Vial: 8
Acq On : 20 Apr 20 11:57 Operator: MA
Sample : 50ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y009.D Vial: 9
Acq On : 20 Apr 20 12:26 Operator: MA
Sample : 60ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	436364	40.00000	ppb	0.00
21) Napthalene-D8(IS)	6.72	136	1873852	40.00000	ppb	0.00
41) Acenaphthene-D10(IS)	8.75	164	1215037	40.00000	ppb	0.00
65) Phenanthrene-D10(IS)	10.47	188	2435855	40.00000	ppb	0.00
80) Chrysene-D12(IS)	13.57	240	2704658	40.00000	ppb	0.00
90) Perylene-D12(IS)	15.36	264	2324834	40.00000	ppb	0.00
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.72	112	2290754	142.80323	ppb	0.00
Spiked Amount 200.000			Recovery = 71.402%			
6) Phenol-D6 (S)	4.92	99	3046911	143.51956	ppb	0.00
Spiked Amount 200.000			Recovery = 71.760%			
22) Nitrobenzene-D5(S)	5.93	82	1362396	71.16508	ppb	0.00
Spiked Amount 100.000			Recovery = 71.165%			
46) 2-Fluorobiphenyl(S)	7.96	172	2835015	65.65745	ppb	0.00
Spiked Amount 100.000			Recovery = 65.657%			
64) 2,4,6-Tribromophenol(S)	9.68	330	834117	133.98792	ppb	0.00
Spiked Amount 200.000			Recovery = 66.994%			
83) Terphenyl-D14(S)	12.33	244	3785280	61.45651	ppb	0.00
Spiked Amount 100.000			Recovery = 61.457%			
Target Compounds						Qvalue
2) 1,4-Dioxane	1.65	58	30878	5.86871		91
3) n-Nitrosodimethylamine	1.87	42	487954	64.97705	ppb	99
4) Pyridine	1.91	79	1389157	70.39269	ppb	95
7) Phenol	4.93	94	1788637	64.88986	ppb	93
8) Aniline	4.92	93	1112064	70.04948	ppb	94
9) Bis (2-chloroethyl) ether	4.99	63	704999	63.57777	ppb	98
10) 2-Chlorophenol	5.06	128	1334652	64.36007	ppb	99
11) 1,3-DCB	5.21	146	1423967	63.76078	ppb	98
12) 1,4-DCB	5.30	146	1431999	62.92643	ppb	99
13) Benzyl alcohol	5.47	108	758761	66.24984	ppb	98
14) 1,2-DCB	5.47	146	1388054	64.02829	ppb	99
15) 2-Methylphenol	5.60	107	1087943	64.97317	ppb	98
16) Bis (2-chloroisopropyl) et	5.60	45	851154	63.90837	ppb	94
17) Acetophenone	5.76	105	1700883	65.12305	ppb	99
18) 3&4-Methylphenol	5.79	107	2730310	129.04091	ppb	94
19) n-Nitrosodi-n-propylamine	5.77	70	980125	65.17676	ppb	94
20) Hexachloroethane	5.85	117	546249	64.47968	ppb	99
23) Nitrobenzene	5.94	77	1417690	64.83879	ppb	98
24) Isophorone	6.23	82	2427271	66.02649	ppb	97
25) 2-Nitrophenol	6.30	139	749560	65.66615	ppb	95
26) 2,4-Dimethylphenol	6.36	122	1163119	65.22175	ppb	99
27) Benzoic acid	6.57	105	1029933	69.32948	ppb	99
28) Bis (2-chloroethoxy) metha	6.45	93	1378851	64.24506	ppb	99
29) 2,4-Dichlorophenol	6.58	162	1137617	65.10367	ppb	98
30) 1,2,4-Trichlorobenzene	6.66	180	1250463	64.38333	ppb	99
31) 3,4-Dimethylphenol	6.70	107	1673256	64.08272	ppb	100
32) Naphthalene	6.75	128	3694094	64.02496	ppb	99
33) 4-Chloroaniline	6.83	127	1499581	66.40402	ppb	99
34) 2,6-Dichlorophenol	6.83	162	1132074	65.25660	ppb	94
35) Hexachloropropene	6.84	213	968406	66.20979	ppb	99
36) Hexachlorobutadiene	6.88	225	756000	64.46534	ppb	100
37) Caprolactum	7.31	55	392980	68.36834	ppb	99

(#) = qualifier out of range (m) = manual integration

Data File : M:\YODA\DATA\Y200420\0420Y009.D Vial: 9
Acq On : 20 Apr 20 12:26 Operator: MA
Sample : 60ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	1254539	65.62495	ppb		97
39)	2-Methylnaphthalene	7.54	142	2552843	65.76678	ppb		99
40)	1-Methylnaphthalene	7.65	142	2561184	64.44393	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	847872	60.13674	ppb		99
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	1270197	60.85847	ppb		100
44)	2,4,6-Trichlorophenol	7.88	196	862309	61.72466	ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	916998	62.24365	ppb		98
47)	1,1'-Biphenyl	8.08	154	3269599	60.94586	ppb		99
48)	2-Chloronaphthalene	8.11	162	2573329	60.35813	ppb		99
49)	2-Nitroaniline	8.24	65	755474	63.16353	ppb		96
50)	Dimethyl phthalate	8.44	163	3153562	61.63203	ppb		99
51)	2,6-DNT	8.52	165	723384	63.00114	ppb		91
52)	Acenaphthylene	8.58	152	3965447	61.72585	ppb		99
53)	3-Nitroaniline	8.24	138	881704	64.89869	ppb		97
54)	Acenaphthene	8.78	154	2494385	60.57819	ppb		100
55)	2,4-Dinitrophenol	8.85	184	488003	61.15213	ppb		85
56)	4-Nitrophenol	8.96	65	625328	65.84665	ppb		98
57)	Dibenzofuran	8.99	168	3709254	61.00823	ppb		93
58)	2,4-DNT	8.99	165	1053960	64.15386	ppb		93
59)	2,3,4,6-Tetrachlorophenol	9.15	232	727683	62.48201	ppb		90
60)	Diethyl phthalate	9.27	149	3030096	60.54025	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	1703996	62.10165	ppb		96
62)	Fluorene	9.39	166	3158644	62.16910	ppb		99
63)	4-Nitroaniline	8.72	138	696363	63.35651	ppb		92
66)	4,6-Dinitro-2-methylphenol	9.47	198	667804	62.84973	ppb	#	83
67)	Diphenyl amine	9.53	169	4768523	119.26688	ppb		100
68)	n-Nitrosodiphenylamine	9.53	169	4768523	119.26688	ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	2836579	55.54485	ppb		96
70)	4-Bromophenyl phenyl ether	9.95	248	912850	59.44099	ppb	#	83
71)	Hexachlorobenzene	10.03	284	932164	59.43469	ppb		92
72)	Atrazine	10.16	200	432801	29.37376	ppb		99
73)	Pentachlorophenol	10.27	266	605108	63.59269	ppb		97
74)	Phenanthrene	10.50	178	4320899	58.40705	ppb		99
75)	Anthracene	10.57	178	4496066	58.29745	ppb		100
76)	Carbazol	10.76	167	4135479	59.42523	ppb		99
77)	Di-n-butylphthalate	11.16	149	5393506	60.78184	ppb		98
78)	2-Nitrodiphenylamine	11.33	167	612797	32.49492	ppb		96
79)	Fluoranthene	11.89	202	5089956	59.74212	ppb		99
81)	Benzidine	12.05	184	1289227	58.35883	ppb		99
82)	Pyrene	12.15	202	5258838	56.54129	ppb		100
84)	Butyl benzylphthalate	12.91	149	2482533	57.85653	ppb		80
85)	3,3'-Dichlorobenzidine	13.52	252	1662033	56.94666	ppb		99
86)	Benz (a) anthracene	13.56	228	5410816	57.75012	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.57	149	3808428	58.64628	ppb	#	94
88)	Chrysene	13.59	228	4795255	55.72905	ppb		99
89)	Di-n-octylphthalate	14.30	149	5995928	57.73715	ppb		99
91)	Benzo (b) fluoranthene	14.84	252	4883355	55.99367	ppb		99
92)	Benzo (k) fluoranthene	14.87	252	4929989	62.33250	ppb		97
93)	Benzo (a) pyrene	15.28	252	4642725	61.65357	ppb		99
94)	Indeno (1,2,3-cd) pyrene	17.18	276	5297580	58.98783	ppb		98
95)	Dibenz (a,h) anthracene	17.20	278	4729500	61.04086	ppb		97
96)	Benzo (g,h,i) perylene	17.72	276	4174992	58.58394	ppb		99

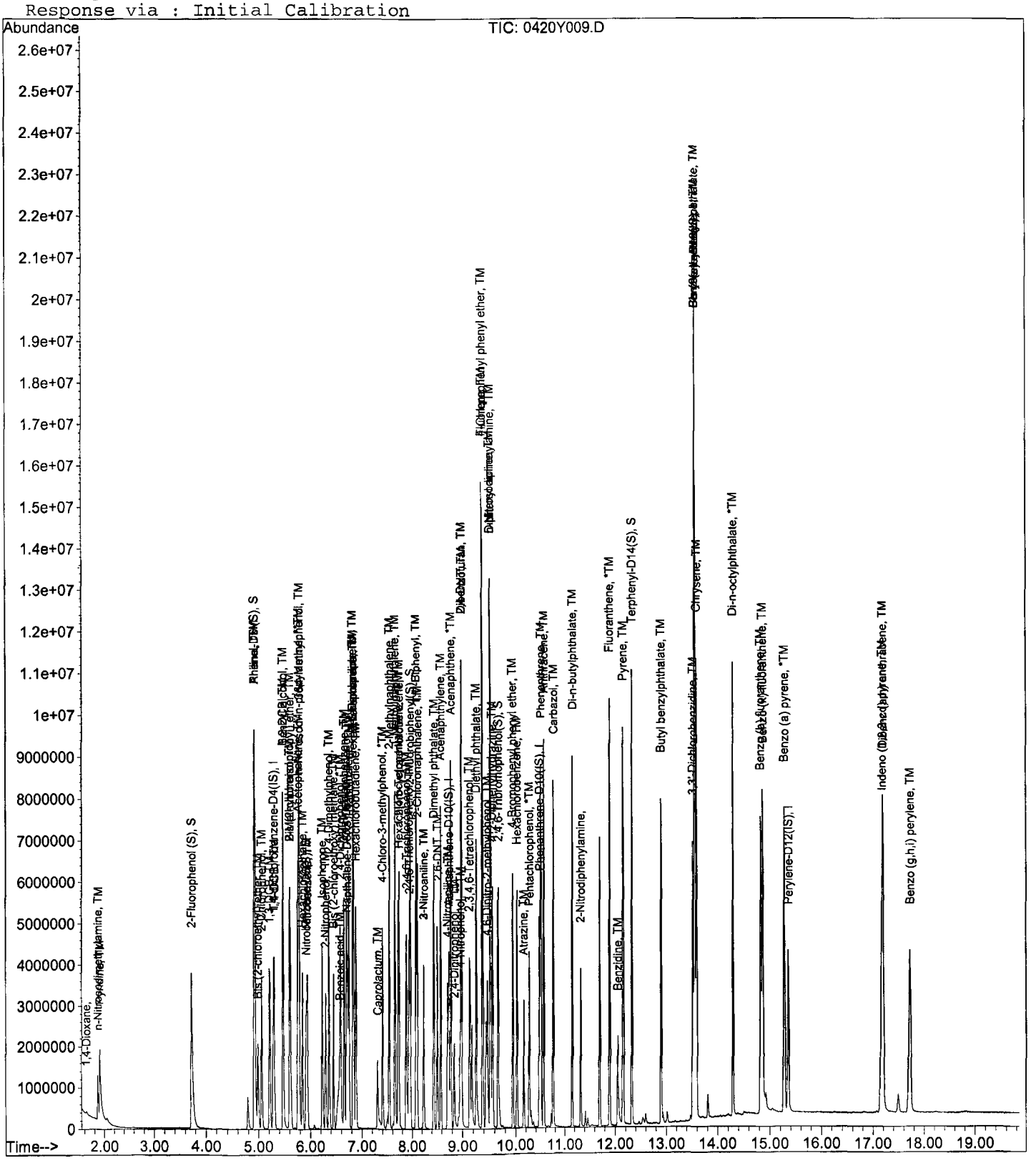
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y009.D Vial: 9
Acq On : 20 Apr 20 12:26 Operator: MA
Sample : 60ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y010.D Vial: 10
Acq On : 20 Apr 20 12:55 Operator: MA
Sample : 80ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.29	152	452784	40.00000	ppb	0.00
21) Napthalene-D8(IS)	6.73	136	1977757	40.00000	ppb	0.00
41) Acenaphthene-D10(IS)	8.75	164	1230776	40.00000	ppb	0.01
65) Phenanthrene-D10(IS)	10.48	188	2370466	40.00000	ppb	0.00
80) Chrysene-D12(IS)	13.57	240	2794538	40.00000	ppb	0.00
90) Perylene-D12(IS)	15.36	264	2317807	40.00000	ppb	0.00
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.73	112	3008842	180.76603	ppb	0.00
Spiked Amount 200.000			Recovery =	90.383%		
6) Phenol-D6 (S)	4.92	99	4027615	182.83406	ppb	0.00
Spiked Amount 200.000			Recovery =	91.417%		
22) Nitrobenzene-D5(S)	5.93	82	1781724	88.17924	ppb	0.01
Spiked Amount 100.000			Recovery =	88.179%		
46) 2-Fluorobiphenyl(S)	7.97	172	3762552	86.02440	ppb	0.01
Spiked Amount 100.000			Recovery =	86.024%		
64) 2,4,6-Tribromophenol(S)	9.68	330	1174080	186.18592	ppb	0.00
Spiked Amount 200.000			Recovery =	93.093%		
83) Terphenyl-D14(S)	12.33	244	5066753	79.61629	ppb	0.00
Spiked Amount 100.000			Recovery =	79.616%		
Target Compounds						Qvalue
2) 1,4-Dioxane	1.64	58	43148	7.90336		65
3) n-Nitrosodimethylamine	1.86	42	709089	90.99964	ppb	85
4) Pyridine	1.91	79	1686334	82.35267	ppb	99
7) Phenol	4.94	94	2506107	87.62178	ppb	84
8) Aniline	4.92	93	1365504	82.89454	ppb	92
9) Bis (2-chloroethyl) ether	4.99	63	975240	84.75906	ppb	100
10) 2-Chlorophenol	5.06	128	1843861	85.69086	ppb	99
11) 1,3-DCB	5.21	146	1960017	84.58072	ppb	97
12) 1,4-DCB	5.30	146	1980642	83.87919	ppb	100
13) Benzyl alcohol	5.47	108	1076387	90.57454	ppb	99
14) 1,2-DCB	5.47	146	1933356	85.94789	ppb	100
15) 2-Methylphenol	5.61	107	1517234	87.32494	ppb	94
16) Bis (2-chloroisopropyl) et	5.60	45	1177311	85.19197	ppb	93
17) Acetophenone	5.76	105	2347582	86.62413	ppb	97
18) 3&4-Methylphenol	5.79	107	3893930	177.36235	ppb	95
19) n-Nitrosodi-n-propylamine	5.77	70	1363675	87.39367	ppb	96
20) Hexachloroethane	5.85	117	747477	85.03308	ppb	98
23) Nitrobenzene	5.95	77	1968426	85.29726	ppb	96
24) Isophorone	6.23	82	3347838	86.28330	ppb	95
25) 2-Nitrophenol	6.30	139	1058730	87.87851	ppb	96
26) 2,4-Dimethylphenol	6.37	122	1611248	85.60380	ppb	96
27) Benzoic acid	6.59	105	1364255	87.00954	ppb	97
28) Bis (2-chloroethoxy) metha	6.46	93	1905828	84.13341	ppb	99
29) 2,4-Dichlorophenol	6.59	162	1606545	87.10932	ppb	98
30) 1,2,4-Trichlorobenzene	6.66	180	1742176	84.98787	ppb	100
31) 3,4-Dimethylphenol	6.71	107	2314909	83.99914	ppb	100
32) Naphthalene	6.75	128	5178136	85.03098	ppb	99
33) 4-Chloroaniline	6.83	127	1999533	83.89100	ppb	98
34) 2,6-Dichlorophenol	6.84	162	1621140	88.53857	ppb	95
35) Hexachloropropene	6.85	213	1363366	88.31603	ppb	99
36) Hexachlorobutadiene	6.88	225	1051175	84.92623	ppb	99
37) Caprolactum	7.32	55	531480	87.60601	ppb	97

(#) = qualifier out of range (m) = manual integration
0420Y010.D Y0420.M Mon Apr 20 14:49:16 2020 Page 1

Data File : M:\YODA\DATA\Y200420\0420Y010.D Vial: 10
Acq On : 20 Apr 20 12:55 Operator: MA
Sample : 80ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

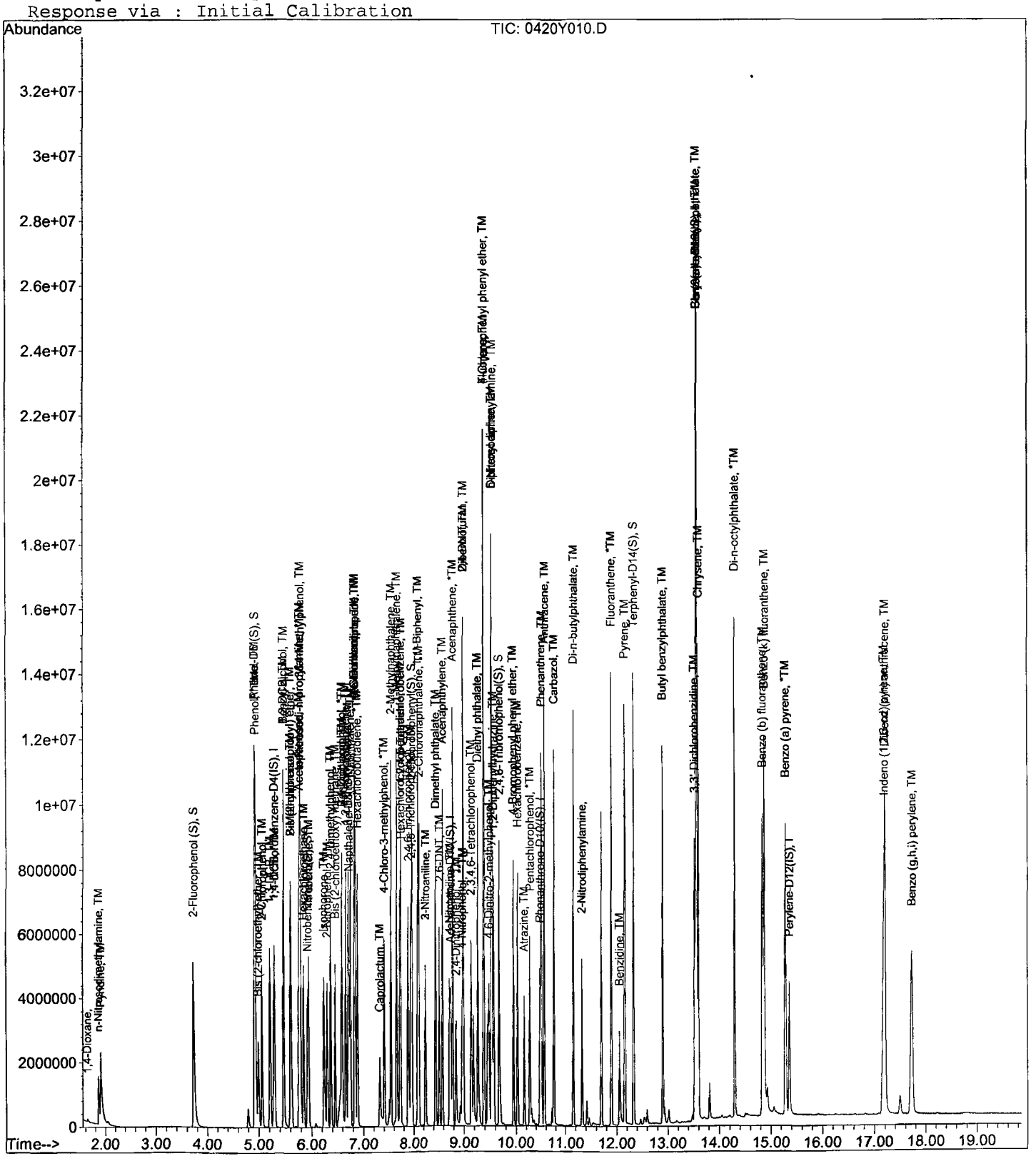
	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.41	107	1751478	86.80642	ppb		92
39)	2-Methylnaphthalene	7.54	142	3536264	86.31565	ppb		100
40)	1-Methylnaphthalene	7.65	142	3601084	85.84932	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	1191936	81.69261	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	1793743	84.84390	ppb		99
44)	2,4,6-Trichlorophenol	7.89	196	1225719	86.61581	ppb		100
45)	2,4,5-Trichlorophenol	7.94	196	1292942	86.63956	ppb		98
47)	1,1'-Biphenyl	8.08	154	4564938	84.00306	ppb		99
48)	2-Chloronaphthalene	8.11	162	3624398	83.92412	ppb		99
49)	2-Nitroaniline	8.24	65	1040554	85.88593	ppb		94
50)	Dimethyl phthalate	8.44	163	4351564	83.95778	ppb		100
51)	2,6-DNT	8.52	165	1013664	87.15334	ppb		87
52)	Acenaphthylene	8.58	152	5498405	84.49327	ppb		99
53)	3-Nitroaniline	8.24	138	1222808	88.85501	ppb		96
54)	Acenaphthene	8.79	154	3541529	84.90907	ppb		99
55)	2,4-Dinitrophenol	8.85	184	689451	83.74861	ppb		87
56)	4-Nitrophenol	8.96	65	870397	90.48023	ppb		99
57)	Dibenzofuran	8.99	168	5268974	85.55362	ppb		92
58)	2,4-DNT	8.99	165	1460028	87.73449	ppb		84
59)	2,3,4,6-Tetrachlorophenol	9.15	232	1029581	87.27378	ppb	#	89
60)	Diethyl phthalate	9.27	149	4192098	82.68558	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	2407029	86.60169	ppb		98
62)	Fluorene	9.39	166	4514876	87.72639	ppb		100
63)	4-Nitroaniline	8.72	138	940606	84.48387	ppb		89
66)	4,6-Dinitro-2-methylphenol	9.48	198	950855	91.95735	ppb		96
67)	Diphenyl amine	9.54	169	6709428	172.44045	ppb		99
68)	n-Nitrosodiphenylamine	9.54	169	6709428	172.44045	ppb		99
69)	1,2-Diphenylhydrazine	9.57	77	4693590	94.44344	ppb		97
70)	4-Bromophenyl phenyl ether	9.96	248	1300852	87.04267	ppb	#	84
71)	Hexachlorobenzene	10.03	284	1300583	85.21253	ppb		91
72)	Atrazine	10.16	200	622536	43.41636	ppb		97
73)	Pentachlorophenol	10.27	266	874821	94.47376	ppb		97
74)	Phenanthrene	10.50	178	5991749	83.22666	ppb		100
75)	Anthracene	10.57	178	6392996	85.18026	ppb		100
76)	Carbazol	10.76	167	5681395	83.89146	ppb		99
77)	Di-n-butylphthalate	11.16	149	7477407	86.59073	ppb		98
78)	2-Nitrodiphenylamine	11.33	167	854111	46.54047	ppb		97
79)	Fluoranthene	11.90	202	7008686	84.53196	ppb		98
81)	Benzidine	12.05	184	1664108	72.90562	ppb		100
82)	Pyrene	12.16	202	7321650	76.18811	ppb		99
84)	Butyl benzylphthalate	12.90	149	3468723	78.24009	ppb		99
85)	3,3'-Dichlorobenzidine	13.52	252	2231267	73.99161	ppb		99
86)	Benz (a) anthracene	13.56	228	7580340	78.30350	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.57	149	5319516	79.28100	ppb	#	92
88)	Chrysene	13.60	228	6774081	76.19433	ppb		99
89)	Di-n-octylphthalate	14.30	149	8137690	75.84072	ppb		98
91)	Benzo (b) fluoranthene	14.84	252	7622010	87.66069	ppb		99
92)	Benzo (k) fluoranthene	14.88	252	6024028	76.39594	ppb		99
93)	Benzo (a) pyrene	15.28	252	6377422	84.94642	ppb		98
94)	Indeno (1,2,3-cd) pyrene	17.19	276	7312568	81.67131	ppb		99
95)	Dibenz (a,h) anthracene	17.22	278	6566929	85.01243	ppb		97
96)	Benzo (g,h,i) perylene	17.74	276	5724960	80.57681	ppb		98

(#) = qualifier out of range (m) = manual integration

Data File : M:\YODA\DATA\Y200420\0420Y010.D Vial: 10
Acq On : 20 Apr 20 12:55 Operator: MA
Sample : 80ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y011.D Vial: 11
Acq On : 20 Apr 20 13:24 Operator: MA
Sample : 100ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	467031	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.72	136	2117800	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.75	164	1252418	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.47	188	2386542	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.57	240	2768036	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.36	264	2214064	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.73	112	3667481	213.61447	ppb		0.00
Spiked Amount 200.000			Recovery	= 106.807%			
6) Phenol-D6 (S)	4.93	99	4985381	219.40821	ppb		0.00
Spiked Amount 200.000			Recovery	= 109.704%			
22) Nitrobenzene-D5(S)	5.92	82	2160063	99.83442	ppb		0.00
Spiked Amount 100.000			Recovery	= 99.834%			
46) 2-Fluorobiphenyl(S)	7.97	172	4617050	103.73694	ppb		0.00
Spiked Amount 100.000			Recovery	= 103.737%			
64) 2,4,6-Tribromophenol(S)	9.68	330	1455823	226.87542	ppb		0.00
Spiked Amount 200.000			Recovery	= 113.438%			
83) Terphenyl-D14(S)	12.33	244	6159158	97.70839	ppb		0.00
Spiked Amount 100.000			Recovery	= 97.708%			
Target Compounds							Qvalue
2) 1,4-Dioxane	1.64	58	51428	9.13263			77
3) n-Nitrosodimethylamine	1.87	42	847956	105.50125	ppb		98
4) Pyridine	1.91	79	2038407	96.50956	ppb		100
7) Phenol	4.94	94	2989652	101.33943	ppb		93
8) Aniline	4.92	93	1541120	90.70157	ppb		88
9) Bis (2-chloroethyl) ether	5.00	63	1156820	97.47333	ppb		96
10) 2-Chlorophenol	5.06	128	2201912	99.20914	ppb		97
11) 1,3-DCB	5.22	146	2367137	99.03309	ppb		97
12) 1,4-DCB	5.30	146	2406688	98.81285	ppb		98
13) Benzyl alcohol	5.48	108	1288433	105.11021	ppb		98
14) 1,2-DCB	5.47	146	2357182	101.59255	ppb		99
15) 2-Methylphenol	5.61	107	1823863	101.77083	ppb		95
16) Bis (2-chloroisopropyl) et	5.60	45	1418682	99.52630	ppb	#	73
17) Acetophenone	5.77	105	2826815	101.12554	ppb		98
18) 3&4-Methylphenol	5.79	107	4704377	207.74031	ppb		93
19) n-Nitrosodi-n-propylamine	5.78	70	1630899	101.33082	ppb		95
20) Hexachloroethane	5.85	117	898747	99.12265	ppb		97
23) Nitrobenzene	5.95	77	2342307	94.78678	ppb		98
24) Isophorone	6.24	82	3998243	96.23199	ppb		97
25) 2-Nitrophenol	6.31	139	1272264	98.61948	ppb		93
26) 2,4-Dimethylphenol	6.37	122	1948607	96.68139	ppb		97
27) Benzoic acid	6.59	105	1629448	97.05095	ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	2275587	93.81369	ppb		98
29) 2,4-Dichlorophenol	6.59	162	1919439	97.19279	ppb		98
30) 1,2,4-Trichlorobenzene	6.66	180	2094526	95.41984	ppb		99
31) 3,4-Dimethylphenol	6.71	107	2781939	94.27065	ppb		97
32) Naphthalene	6.75	128	6170977	94.63366	ppb		99
33) 4-Chloroaniline	6.83	127	2239400	87.74179	ppb		96
34) 2,6-Dichlorophenol	6.83	162	1950680	99.49150	ppb		97
35) Hexachloropropene	6.84	213	1666221	100.79701	ppb		99
36) Hexachlorobutadiene	6.89	225	1280857	96.63967	ppb		98
37) Caprolactum	7.33	55	603224	92.85677	ppb		96

(#) = qualifier out of range (m) = manual integration

Data File : M:\YODA\DATA\Y200420\0420Y011.D Vial: 11
Acq On : 20 Apr 20 13:24 Operator: MA
Sample : 100ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.41	107	2070139	95.81526	ppb		98
39)	2-Methylnaphthalene	7.54	142	4236980	96.58045	ppb		100
40)	1-Methylnaphthalene	7.66	142	4340964	96.64464	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	1172480	79.12228	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	2142767	99.60132	ppb		98
44)	2,4,6-Trichlorophenol	7.88	196	1453027	100.90430	ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	1528443	100.65055	ppb	#	91
47)	1,1'-Biphenyl	8.09	154	5533265	100.06251	ppb		99
48)	2-Chloronaphthalene	8.11	162	4317529	98.24623	ppb		97
49)	2-Nitroaniline	8.25	65	1245049	100.98888	ppb		96
50)	Dimethyl phthalate	8.45	163	5160425	97.84322	ppb		100
51)	2,6-DNT	8.52	165	1199699	101.36594	ppb		99
52)	Acenaphthylene	8.59	152	6578257	99.34041	ppb		99
53)	3-Nitroaniline	8.25	138	1436226	102.55956	ppb		99
54)	Acenaphthene	8.78	154	4167355	98.18689	ppb		99
55)	2,4-Dinitrophenol	8.85	184	821014	97.34121	ppb		96
56)	4-Nitrophenol	8.96	65	1049316	107.19446	ppb		91
57)	Dibenzofuran	8.99	168	6207595	99.05249	ppb		97
58)	2,4-DNT	9.00	165	1740398	102.77499	ppb		95
59)	2,3,4,6-Tetrachlorophenol	9.15	232	1212086	100.96862	ppb		95
60)	Diethyl phthalate	9.28	149	5044263	97.77454	ppb		96
61)	4-Chlorophenyl phenyl ethe	9.39	204	2957398	104.56456	ppb		92
62)	Fluorene	9.39	166	5360800	102.36317	ppb		100
63)	4-Nitroaniline	8.73	138	1088440	96.07276	ppb		98
66)	4,6-Dinitro-2-methylphenol	9.49	198	1142448	109.74209	ppb		97
67)	Diphenyl amine	9.54	169	7867178	200.83402	ppb		98
68)	n-Nitrosodiphenylamine	9.54	169	7867178	200.83402	ppb		98
69)	1,2-Diphenylhydrazine	9.57	77	5488668	109.69788	ppb		97
70)	4-Bromophenyl phenyl ether	9.95	248	1541887	102.47585	ppb		93
71)	Hexachlorobenzene	10.03	284	1565936	101.90701	ppb	#	80
72)	Atrazine	10.17	200	714815	49.51620	ppb		99
73)	Pentachlorophenol	10.27	266	1035226	111.04317	ppb		97
74)	Phenanthrene	10.51	178	7157932	98.75545	ppb		99
75)	Anthracene	10.57	178	7520586	99.52928	ppb		99
76)	Carbazol	10.77	167	6807094	99.83646	ppb		99
77)	Di-n-butylphthalate	11.16	149	8490383	97.65901	ppb		99
78)	2-Nitrodiphenylamine	11.33	167	1012711	54.81087	ppb		92
79)	Fluoranthene	11.89	202	8286368	99.26890	ppb	#	97
81)	Benzidine	12.05	184	1895787	83.85083	ppb		99
82)	Pyrene	12.16	202	8567473	90.00555	ppb		99
84)	Butyl benzylphthalate	12.91	149	4184742	95.29425	ppb		87
85)	3,3'-Dichlorobenzidine	13.53	252	2576658	86.26329	ppb		99
86)	Benz (a) anthracene	13.56	228	8907876	92.89770	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.57	149	6183758	93.04388	ppb	#	94
88)	Chrysene	13.60	228	8015189	91.01738	ppb		98
89)	Di-n-octylphthalate	14.30	149	9821626	92.41085	ppb	#	95
91)	Benzo (b) fluoranthene	14.84	252	8398942	101.12232	ppb		100
92)	Benzo (k) fluoranthene	14.87	252	7798903	103.53899	ppb		99
93)	Benzo (a) pyrene	15.29	252	7514718	104.78515	ppb		99
94)	Indeno (1,2,3-cd) pyrene	17.20	276	8546059	99.92004	ppb		96
95)	Dibenz (a,h) anthracene	17.22	278	7708096	104.46104	ppb		98
96)	Benzo (g,h,i) perylene	17.74	276	6677747	98.39084	ppb		100

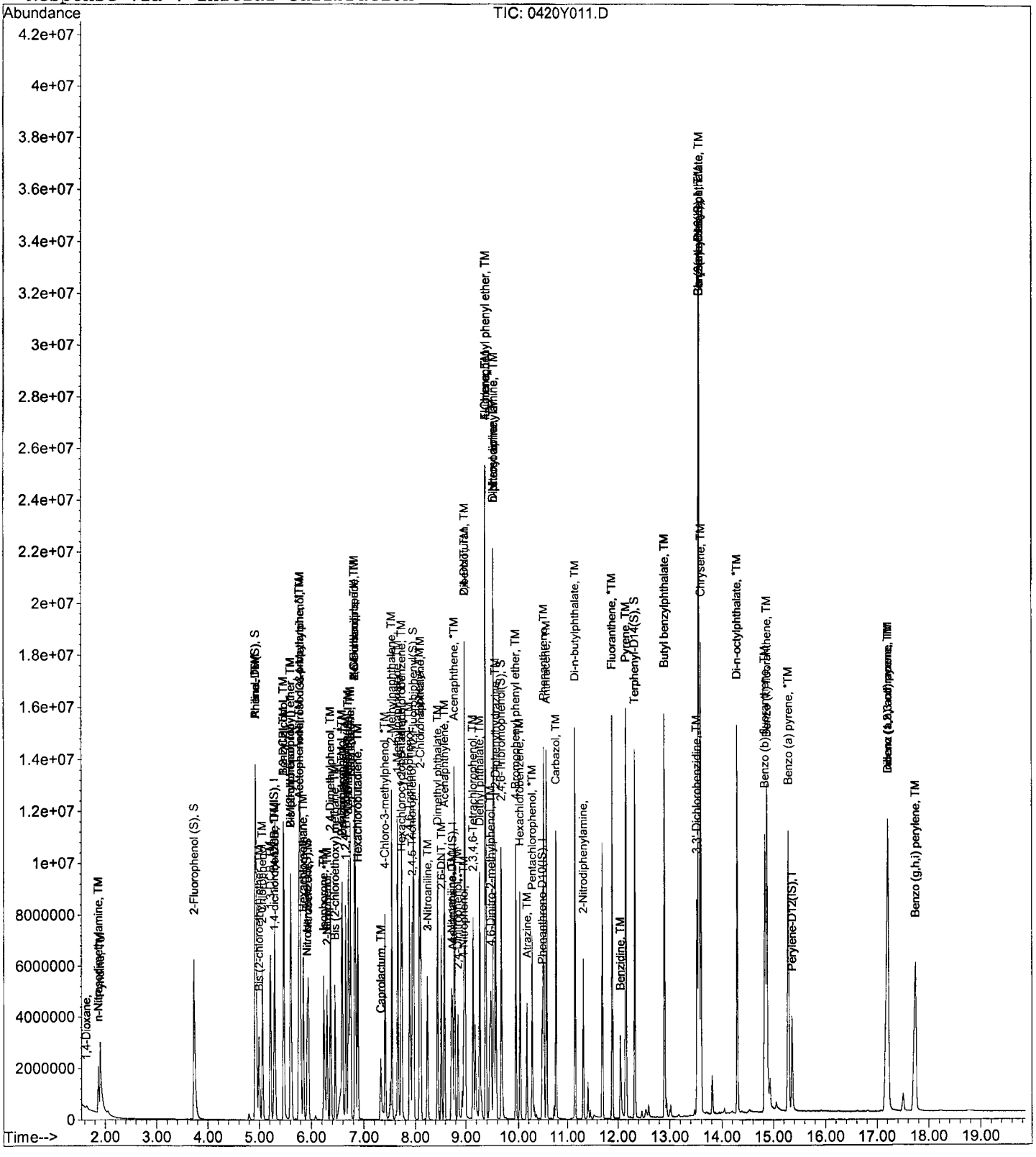
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y011.D Vial: 11
Acq On : 20 Apr 20 13:24 Operator: MA
Sample : 100ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/20/20
Instrument: Yoda
Initial Cal. Date: 04/20/20
Data File: 0420Y012.D

		Compound	MEAN	CCRF	%D		%Drift
1		1,4-Dioxane	0.4830	0.4696	2.8		
2	TM	n-Nitrosodimethylamine	0.6884	0.7485	8.7	TM	
3	TM	Pyridine	1.809	1.792	0.95	TM	
4	*TM	Phenol	2.527	2.512	0.58	*TM	
5	TM	Aniline	1.455	1.444	0.78	TM	
6	TM	Bis (2-chloroethyl) ether	1.016	0.9778	3.8	TM	
7	TM	2-Chlorophenol	1.901	1.841	3.2	TM	
8	TM	1,3-DCB	2.047	1.947	4.9	TM	
9	*TM	1,4-DCB	2.086	1.992	4.5	*TM	
10	TM	Benzyl alcohol	1.050	1.097	4.5	TM	
11	TM	1,2-DCB	1.987	1.914	3.7	TM	
12	TM	2-Methylphenol	1.535	1.518	1.1	TM	
13	TM	Bis (2-chloroisopropyl) ether	1.221	1.198	1.9	TM	
14	TM	Acetophenone	2.394	2.399	0.19	TM	
15	TM	3&4-Methylphenol	1.940	1.889	2.6	TM	
16	**TM	n-Nitrosodi-n-propylamine	1.378	1.356	1.7	**TM	
17	TM	Hexachloroethane	0.7766	0.7531	3.0	TM	
18	TM	Nitrobenzene	0.4667	0.4529	3.0	TM	
19	TM	Isophorone	0.7847	0.7601	3.1	TM	
20	*TM	2-Nitrophenol	0.2437	0.2398	1.6	*TM	
21	TM	2,4-Dimethylphenol	0.3807	0.3700	2.8	TM	
22	TM	Benzoic acid	0.3171	0.3339	5.3	TM	
23	TM	Bis (2-chloroethoxy) methane	0.4581	0.4444	3.0	TM	
24	*TM	2,4-Dichlorophenol	0.3730	0.3595	3.6	*TM	
25	TM	1,2,4-Trichlorobenzene	0.4146	0.3917	5.5	TM	
26	TM	3,4-Dimethylphenol	0.5574	0.5419	2.8	TM	
27	TM	Naphthalene	1.232	1.208	1.9	TM	
28	TM	4-Chloroaniline	0.4821	0.4736	1.7	TM	
29	TM	2,6-Dichlorophenol	0.3703	0.3565	3.7	TM	
30	TM	Hexachloropropene	0.3122	0.3024	3.1	TM	
31	*TM	Hexachlorobutadiene	0.2503	0.2390	4.5	*TM	
32	TM	Caprolactum	0.1227	0.1245	1.5	TM	
33	*TM	4-Chloro-3-methylphenol	0.4081	0.3945	3.3	*TM	
34	TM	2-Methylnaphthalene	0.8286	0.8297	0.14	TM	
35	TM	1-Methylnaphthalene	0.8484	0.8187	3.5	TM	
36	**TML	Hexachlorocyclopentadiene	0.3911	0.4295	9.8	**TML	5.4
37	TM	1,2,4,5-Tetrachlorobenzene	0.6871	0.6662	3.0	TM	
38	*TM	2,4,6-Trichlorophenol	0.4599	0.4556	0.94	*TM	
39	TM	2,4,5-Trichlorophenol	0.4850	0.4809	0.84	TM	
40	TM	1,1'-Biphenyl	1.766	1.710	3.2	TM	
		Average			3.0		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 04/20/20
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y012.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	2-Chloronaphthalene	1.404	1.339	4.6	TM	
42	TM	2-Nitroaniline	0.3938	0.4185	6.3	TM	
43	TM	Dimethyl phthalate	1.684	1.634	3.0	TM	
44	TM	2,6-DNT	0.3780	0.3798	0.47	TM	
45	TM	Acenaphthylene	2.115	2.097	0.84	TM	
46	TM	3-Nitroaniline	0.4473	0.4783	6.9	TM	
47	*TM	Acenaphthene	1.356	1.335	1.5	*TM	
48	**TML	2,4-Dinitrophenol	0.2262	0.2483	9.8	**TML	3.7
49	**TM	4-Nitrophenol	0.3126	0.3281	4.9	**TM	
50	TM	Dibenzofuran	2.002	2.050	2.4	TM	
51	TM	2,4-DNT	0.5408	0.5427	0.34	TM	
52	TM	2,3,4,6-Tetrachlorophenol	0.3834	0.3804	0.77	TM	
53	TM	Diethyl phthalate	1.648	1.593	3.3	TM	
54	TM	4-Chlorophenyl phenyl ether	0.9033	0.8837	2.2	TM	
55	TM	Fluorene	1.673	1.648	1.5	TM	
56	TM	4-Nitroaniline	0.3618	0.3808	5.2	TM	
57	TM	4,6-Dinitro-2-methylphenol	0.1843	0.1866	1.2	TM	
58	TM	Diphenyl amine	0.6566	0.6862	4.5	TM	
59	*TM	n-Nitrosodiphenylamine	0.6566	0.6862	4.5	*TM	
60	TM	1,2-Diphenylhydrazine	0.8386	0.7749	7.6	TM	
61	TM	4-Bromophenyl phenyl ether	0.2522	0.2470	2.0	TM	
62	TM	Hexachlorobenzene	0.2576	0.2593	0.68	TM	
63	TM	Atrazine	0.2420	0.2350	2.9	TM	
64	*TM	Pentachlorophenol	0.1563	0.1539	1.5	*TM	
65	TM	Phenanthrene	1.215	1.207	0.65	TM	
66	TM	Anthracene	1.266	1.260	0.51	TM	
67	TM	Carbazol	1.143	1.141	0.16	TM	
68	TM	Di-n-butylphthalate	1.457	1.462	0.30	TM	
69		2-Nitrodiphenylamine	0.3302	0.3242	1.8		
70	*TM	Fluoranthene	1.399	1.406	0.48	*TM	
71	TM	Benzidine	0.3267	0.3067	6.1	TM	
72	TM	Pyrene	1.376	1.349	1.9	TM	
73	TM	Butyl benzylphthalate	0.6346	0.6170	2.8	TM	
74	TM	3,3'-Dichlorobenzidine	0.4401	0.4376	0.56	TM	
75	TM	Benz (a) anthracene	1.386	1.384	0.13	TM	
76	TM	Bis (2-ethylhexyl) phthalate	0.9604	0.9242	3.8	TM	
77	TM	Chrysene	1.273	1.199	5.8	TM	
78	*TM	Di-n-octylphthalate	1.536	1.521	0.99	*TM	
79	TM	Benzo (b) fluoranthene	1.501	1.489	0.77	TM	
80	TM	Benzo (k) fluoranthene	1.361	1.345	1.1	TM	
		Average			2.7		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 04/20/20
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y012.D

		Compound	MEAN	CCRF	%D	%Drift	
81	*TM	Benzo (a) pyrene	1.296	1.329	2.6	*TM	
82	TM	Indeno (1,2,3-cd) pyrene	1.545	1.454	5.9	TM	
83	TM	Dibenz (a,h) anthracene	1.333	1.347	1.1	TM	
84	TM	Benzo (g,h,i) perylene	1.226	1.268	3.5	TM	
85							
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118							
119							
120							
		Average			3.3		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y012.D Vial: 12
Acq On : 20 Apr 20 13:53 Operator: MA
Sample : SS 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 21 10:39 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	460635	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.72	136	2017163	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1209528	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.47	188	2303576	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.57	240	2505055	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.36	264	2209029	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.72	112	3807650	224.85813	ppb		0.00
Spiked Amount 200.000			Recovery	= 112.429%			
6) Phenol-D6 (S)	4.92	99	5026037	224.26886	ppb		0.00
Spiked Amount 200.000			Recovery	= 112.135%			
22) Nitrobenzene-D5(S)	5.92	82	2241284	108.75638	ppb		0.00
Spiked Amount 100.000			Recovery	= 108.756%			
46) 2-Fluorobiphenyl(S)	7.97	172	4771488	111.00845	ppb		0.00
Spiked Amount 100.000			Recovery	= 111.008%			
64) 2,4,6-Tribromophenol(S)	9.68	330	1494454	241.15418	ppb		0.00
Spiked Amount 200.000			Recovery	= 120.577%			
83) Terphenyl-D14(S)	12.33	244	6329316	110.94858	ppb		0.00
Spiked Amount 100.000			Recovery	= 110.949%			
Target Compounds							Qvalue
2) 1,4-Dioxane	1.64	58	27041	4.86154			94
3) n-Nitrosodimethylamine	1.87	42	430996	54.36837	ppb		100
4) Pyridine	1.91	79	1031727	49.52597	ppb		100
7) Phenol	4.93	94	1446483	49.71185	ppb		92
8) Aniline	4.92	93	831424	49.61233	ppb	#	88
9) Bis (2-chloroethyl) ether	4.99	63	562987	48.09580	ppb		98
10) 2-Chlorophenol	5.06	128	1059962	48.42067	ppb		99
11) 1,3-DCB	5.21	146	1120940	47.54754	ppb		99
12) 1,4-DCB	5.30	146	1146747	47.73644	ppb		99
13) Benzyl alcohol	5.47	108	631662	52.24643	ppb		98
14) 1,2-DCB	5.47	146	1101886	48.14977	ppb		100
15) 2-Methylphenol	5.60	107	873986	49.44522	ppb		99
16) Bis (2-chloroisopropyl) et	5.60	45	689531	49.04507	ppb		99
17) Acetophenone	5.76	105	1381133	50.09424	ppb		100
18) 3&4-Methylphenol	5.78	107	2175292	97.39239	ppb		100
19) n-Nitrosodi-n-propylamine	5.77	70	780569	49.17162	ppb		93
20) Hexachloroethane	5.85	117	433627	48.48870	ppb		100
23) Nitrobenzene	5.94	77	1141858	48.51321	ppb		100
24) Isophorone	6.22	82	1916528	48.42944	ppb		95
25) 2-Nitrophenol	6.30	139	604602	49.20384	ppb		99
26) 2,4-Dimethylphenol	6.36	122	933031	48.60250	ppb		98
27) Benzoic acid	6.56	105	841898	52.64568	ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	1120421	48.49511	ppb		100
29) 2,4-Dichlorophenol	6.58	162	906505	48.19188	ppb		99
30) 1,2,4-Trichlorobenzene	6.66	180	987748	47.24361	ppb		99
31) 3,4-Dimethylphenol	6.70	107	1366327	48.61021	ppb		99
32) Naphthalene	6.75	128	3046750	49.05378	ppb		100
33) 4-Chloroaniline	6.83	127	1194266	49.12695	ppb		99
34) 2,6-Dichlorophenol	6.83	162	898883	48.13346	ppb		99
35) Hexachloropropene	6.84	213	762467	48.42616	ppb		100
36) Hexachlorobutadiene	6.88	225	602576	47.73210	ppb		99
37) Caprolactum	7.29	55	313945	50.73790	ppb		95

(#) = qualifier out of range (m) = manual integration

Data File : M:\YODA\DATA\Y200420\0420Y012.D Vial: 12
Acq On : 20 Apr 20 13:53 Operator: MA
Sample : SS 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 21 10:39 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	994721	48.33708	ppb		99
39)	2-Methylnaphthalene	7.54	142	2092125	50.06848	ppb		99
40)	1-Methylnaphthalene	7.65	142	2064257	48.25022	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	649408	47.32035	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	1007203	48.47753	ppb		99
44)	2,4,6-Trichlorophenol	7.88	196	688836	49.53192	ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	727143	49.58155	ppb		96
47)	1,1'-Biphenyl	8.08	154	2585858	48.42036	ppb		99
48)	2-Chloronaphthalene	8.11	162	2023815	47.68533	ppb		99
49)	2-Nitroaniline	8.24	65	632800	53.14800	ppb		100
50)	Dimethyl phthalate	8.44	163	2470849	48.50928	ppb		100
51)	2,6-DNT	8.51	165	574192	50.23544	ppb		97
52)	Acenaphthylene	8.58	152	3170565	49.57756	ppb		99
53)	3-Nitroaniline	8.24	138	723169	53.47201	ppb		99
54)	Acenaphthene	8.78	154	2019070	49.25811	ppb		99
55)	2,4-Dinitrophenol	8.84	184	375458	48.15072	ppb		99
56)	4-Nitrophenol	8.95	65	496069	52.47368	ppb		89
57)	Dibenzofuran	8.98	168	3099167	51.20595	ppb		99
58)	2,4-DNT	8.99	165	820469	50.16888	ppb		99
59)	2,3,4,6-Tetrachlorophenol	9.14	232	575204	49.61446	ppb		100
60)	Diethyl phthalate	9.27	149	2407964	48.32940	ppb		96
61)	4-Chlorophenyl phenyl ethe	9.38	204	1336146	48.91725	ppb		99
62)	Fluorene	9.38	166	2491835	49.26821	ppb		99
63)	4-Nitroaniline	8.72	138	575778	52.62405	ppb		99
66)	4,6-Dinitro-2-methylphenol	9.47	198	537205	50.61641	ppb		92
67)	Diphenyl amine	9.53	169	3951790	104.51502	ppb		100
68)	n-Nitrosodiphenylamine	9.53	169	3951790	104.51502	ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	2231212	46.19965	ppb		100
70)	4-Bromophenyl phenyl ether	9.94	248	711342	48.97946	ppb		94
71)	Hexachlorobenzene	10.03	284	746662	50.34086	ppb		97
72)	Atrazine	10.16	200	338327	24.28045	ppb		99
73)	Pentachlorophenol	10.27	266	443187	49.25045	ppb		99
74)	Phenanthrene	10.50	178	3475244	49.67356	ppb		100
75)	Anthracene	10.57	178	3628033	49.74357	ppb		100
76)	Carbazol	10.76	167	3285414	49.92109	ppb		100
77)	Di-n-butylphthalate	11.16	149	4208371	50.14938	ppb		98
78)	2-Nitrodiphenylamine	11.33	167	466724	24.54738	ppb		99
79)	Fluoranthene	11.89	202	4047928	50.23985	ppb		100
81)	Benzidine	12.05	184	960440	46.93994	ppb		99
82)	Pyrene	12.15	202	4224931	49.04454	ppb		100
84)	Butyl benzylphthalate	12.90	149	1932102	48.61637	ppb		99
85)	3,3'-Dichlorobenzidine	13.52	252	1370351	49.71822	ppb		99
86)	Benz (a) anthracene	13.55	228	4333439	49.93648	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.56	149	2893922	48.11457	ppb		99
88)	Chrysene	13.59	228	3754529	47.11080	ppb		100
89)	Di-n-octylphthalate	14.30	149	4761432	49.50301	ppb		97
91)	Benzo (b) fluoranthene	14.83	252	4111371	49.61327	ppb		99
92)	Benzo (k) fluoranthene	14.86	252	3715241	49.43632	ppb		100
93)	Benzo (a) pyrene	15.27	252	3669419	51.28296	ppb	#	97
94)	Indeno (1,2,3-cd) pyrene	17.17	276	4014423	47.04339	ppb		99
95)	Dibenz (a,h) anthracene	17.19	278	3719968	50.52836	ppb		99
96)	Benzo (g,h,i) perylene	17.71	276	3502576	51.72506	ppb		98

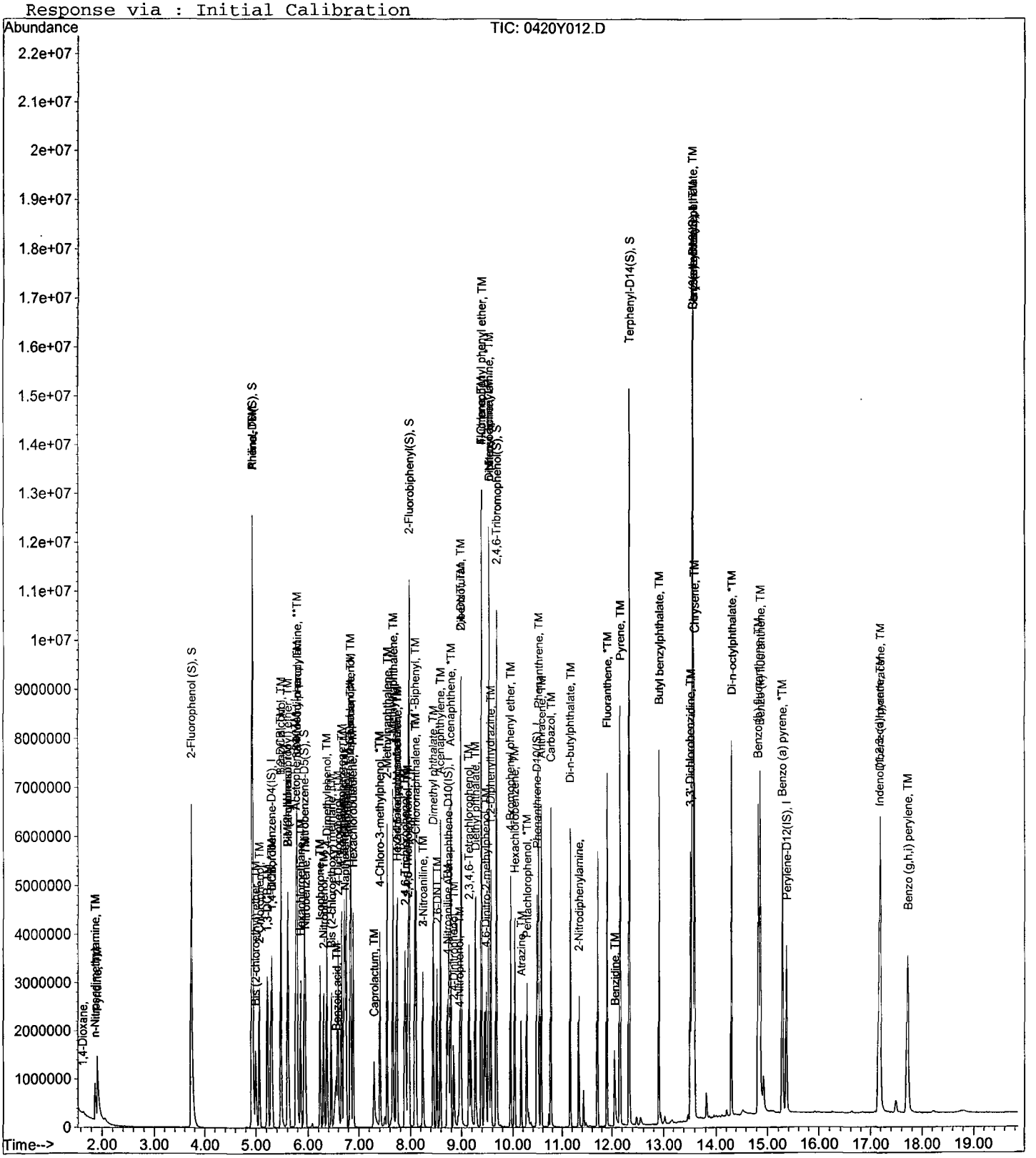
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y012.D Vial: 12
Acq On : 20 Apr 20 13:53 Operator: MA
Sample : SS 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 21 10:39 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 6 May 20 10:10
Instrument: Yoda
Initial Cal. Date: 04/20/20
Data File: 0420Y191.D

		Compound	MEAN	CCRF	%D	%Drift	
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2		1,4-Dioxane	0.4830	0.4677	3.2		
3	TM	n-Nitrosodimethylamine	0.6884	0.8564	24	TM	*NT
4	TM	Pyridine	1.809	2.179	20	TM	
5	S	2-Fluorophenol (S)	1.470	1.563	6.3	S	
6	S	Phenol-D6 (S)	1.946	2.152	11	S	
7	*TM	Phenol	2.527	2.628	4.0	*TM	
8	TM	Aniline	1.455	1.427	1.9	TM	
9	TM	Bis (2-chloroethyl) ether	1.016	1.059	4.2	TM	
10	TM	2-Chlorophenol	1.901	1.892	0.49	TM	
11	TM	1,3-DCB	2.047	1.965	4.0	TM	
12	*TM	1,4-DCB	2.086	2.030	2.7	*TM	
13	TM	Benzyl alcohol	1.050	1.129	7.5	TM	
14	TM	1,2-DCB	1.987	1.972	0.77	TM	
15	TM	2-Methylphenol	1.535	1.606	4.6	TM	
16	TM	Bis (2-chloroisopropyl) ether	1.221	1.259	3.1	TM	
17	TM	Acetophenone	2.394	2.576	7.6	TM	
18	TM	3&4-Methylphenol	1.940	2.056	6.0	TM	
19	**TM	n-Nitrosodi-n-propylamine	1.378	1.522	10	**TM	
20	TM	Hexachloroethane	0.7766	0.7888	1.6	TM	
21	I	Napthalene-D8(IS)	ISTD			I	
22	S	Nitrobenzene-D5(S)	0.4087	0.4532	11	S	
23	TM	Nitrobenzene	0.4667	0.4909	5.2	TM	
24	TM	Isophorone	0.7847	0.8310	5.9	TM	
25	*TM	2-Nitrophenol	0.2437	0.2468	1.3	*TM	
26	TM	2,4-Dimethylphenol	0.3807	0.3885	2.1	TM	
27	TM	Benzoic acid	0.3171	0.1832	42	TM	*NT
28	TM	Bis (2-chloroethoxy) methane	0.4581	0.4709	2.8	TM	
29	*TM	2,4-Dichlorophenol	0.3730	0.3685	1.2	*TM	
30	TM	1,2,4-Trichlorobenzene	0.4146	0.3979	4.0	TM	
31	TM	3,4-Dimethylphenol	0.5574	0.5831	4.6	TM	
32	TM	Naphthalene	1.232	1.230	0.11	TM	
33	TM	4-Chloroaniline	0.4821	0.4937	2.4	TM	
34	TM	2,6-Dichlorophenol	0.3703	0.3789	2.3	TM	
35	TM	Hexachloropropene	0.3122	0.3190	2.2	TM	
36	*TM	Hexachlorobutadiene	0.2503	0.2470	1.3	*TM	
37	TM	Caprolactum	0.1227	0.1385	13	TM	
38	*TM	4-Chloro-3-methylphenol	0.4081	0.4167	2.1	*TM	
39	TM	2-Methylnaphthalene	0.8286	0.8266	0.24	TM	
40	TM	1-Methylnaphthalene	0.8484	0.8394	1.1	TM	
		Average			6.0		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 6 May 20 10:10
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y191.D

		Compound	MEAN	CCRF	%D		%Drift	
41	I	Acenaphthene-D10(IS)	ISTD			I		
42	**TML	Hexachlorocyclopentadiene	0.3911	0.3298	16	**TML	25	*NT
43	TM	1,2,4,5-Tetrachlorobenzene	0.6871	0.6626	3.6	TM		
44	*TM	2,4,6-Trichlorophenol	0.4599	0.4574	0.54	*TM		
45	TM	2,4,5-Trichlorophenol	0.4850	0.4823	0.57	TM		
46	S	2-Fluorobiphenyl(S)	1.421	1.483	4.3	S		
47	TM	1,1'-Biphenyl	1.766	1.763	0.17	TM		
48	TM	2-Chloronaphthalene	1.404	1.384	1.4	TM		
49	TM	2-Nitroaniline	0.3938	0.4509	15	TM		
50	TM	Dimethyl phthalate	1.684	1.685	0.00	TM		
51	TM	2,6-DNT	0.3780	0.3873	2.5	TM		
52	TM	Acenaphthylene	2.115	2.154	1.8	TM		
53	TM	3-Nitroaniline	0.4473	0.4808	7.5	TM		
54	*TM	Acenaphthene	1.356	1.354	0.11	*TM		
55	**TML	2,4-Dinitrophenol	0.2262	0.1606	29	**TML	35	*NT
56	**TM	4-Nitrophenol	0.3126	0.3217	2.9	**TM		
57	TM	Dibenzofuran	2.002	2.069	3.4	TM		
58	TM	2,4-DNT	0.5408	0.5794	7.1	TM		
59	TM	2,3,4,6-Tetrachlorophenol	0.3834	0.3597	6.2	TM		
60	TM	Diethyl phthalate	1.648	1.688	2.4	TM		
61	TM	4-Chlorophenyl phenyl ether	0.9033	0.9526	5.5	TM		
62	TM	Fluorene	1.673	1.773	6.0	TM		
63	TM	4-Nitroaniline	0.3618	0.3793	4.8	TM		
64	S	2,4,6-Tribromophenol(S)	0.2049	0.2094	2.2	S		
65	I	Phenanthrene-D10(IS)	ISTD			I		
66	TM	4,6-Dinitro-2-methylphenol	0.1843	0.1706	7.4	TM		
67	TM	Diphenyl amine	0.6566	0.7049	7.4	TM		
68	*TM	n-Nitrosodiphenylamine	0.6566	0.7049	7.4	*TM		
69	TM	1,2-Diphenylhydrazine	0.8386	0.8647	3.1	TM		
70	TM	4-Bromophenyl phenyl ether	0.2522	0.2560	1.5	TM		
71	TM	Hexachlorobenzene	0.2576	0.2533	1.7	TM		
72	TM	Atrazine	0.2420	0.1953	19	TM		
73	*TM	Pentachlorophenol	0.1563	0.1401	10	*TM		
74	TM	Phenanthrene	1.215	1.241	2.2	TM		
75	TM	Anthracene	1.266	1.293	2.1	TM		
76	TM	Carbazol	1.143	1.205	5.5	TM		
77	TM	Di-n-butylphthalate	1.457	1.571	7.8	TM		
78		2-Nitrodiphenylamine	0.3302	0.3734	13			
79	*TM	Fluoranthene	1.399	1.454	4.0	*TM		
80	I	Chrysene-D12(IS)	ISTD			I		
		Average			5.8			

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 6 May 20 10:10
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y191.D

		Compound	MEAN	CCRF	%D		%Drift
81	TM	Benzidine	0.3267	0.2932	10	TM	
82	TM	Pyrene	1.376	1.305	5.2	TM	
83	S	Terphenyl-D14(S)	0.9109	0.8449	7.2	S	
84	TM	Butyl benzylphthalate	0.6346	0.6229	1.8	TM	
85	TM	3,3'-Dichlorobenzidine	0.4401	0.4663	6.0	TM	
86	TM	Benz (a) anthracene	1.386	1.380	0.42	TM	
87	TM	Bis (2-ethylhexyl) phthalate	0.9604	1.035	7.8	TM	
88	TM	Chrysene	1.273	1.195	6.1	TM	
89	*TM	Di-n-octylphthalate	1.536	1.565	1.9	*TM	
90	I	Perylene-D12(IS)	ISTD			I	
91	TM	Benzo (b) fluoranthene	1.501	1.455	3.0	TM	
92	TM	Benzo (k) fluoranthene	1.361	1.477	8.6	TM	
93	*TM	Benzo (a) pyrene	1.296	1.378	6.3	*TM	
94	TM	Indeno (1,2,3-cd) pyrene	1.545	1.549	0.23	TM	
95	TM	Dibenz (a,h) anthracene	1.333	1.396	4.7	TM	
96	TM	Benzo (g,h,i) perylene	1.226	1.180	3.8	TM	
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
		Average			4.9		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y191.D Vial: 91
Acq On : 6 May 20 10:10 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (3) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 10:36 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	560488	40.00000 ppb		0.00
21) Napthalene-D8(IS)	6.71	136	2480989	40.00000 ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1519105	40.00000 ppb		0.00
65) Phenanthrene-D10(IS)	10.46	188	2861197	40.00000 ppb		0.00
80) Chrysene-D12(IS)	13.56	240	3331175	40.00000 ppb		0.00
90) Perylene-D12(IS)	15.35	264	2679200	40.00000 ppb		0.00
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.72	112	2190390	106.30743 ppb		-0.02
Spiked Amount 200.000				Recovery = 53.154%		
6) Phenol-D6 (S)	4.91	99	3015953	110.60085 ppb		0.00
Spiked Amount 200.000				Recovery = 55.301%		
22) Nitrobenzene-D5(S)	5.92	82	1405582	55.45366 ppb		0.00
Spiked Amount 100.000				Recovery = 55.454%		
46) 2-Fluorobiphenyl(S)	7.96	172	2816368	52.16987 ppb		0.00
Spiked Amount 100.000				Recovery = 52.170%		
64) 2,4,6-Tribromophenol(S)	9.67	330	795138	102.16047 ppb		0.00
Spiked Amount 200.000				Recovery = 51.080%		
83) Terphenyl-D14(S)	12.32	244	3518153	46.37666 ppb		0.00
Spiked Amount 100.000				Recovery = 46.377%		
Target Compounds						Qvalue
2) 1,4-Dioxane	1.65	58	32764	4.84104		71
3) n-Nitrosodimethylamine	1.86	42	600006	62.20414 ppb		92
4) Pyridine	1.88	79	1526531	60.22329 ppb		99
7) Phenol	4.92	94	1841239	52.00527 ppb		98
8) Aniline	4.90	93	999744	49.02827 ppb	#	87
9) Bis (2-chloroethyl) ether	4.98	63	742038	52.09854 ppb		97
10) 2-Chlorophenol	5.05	128	1325220	49.75298 ppb		96
11) 1,3-DCB	5.21	146	1377044	48.00474 ppb		98
12) 1,4-DCB	5.29	146	1422391	48.66223 ppb		98
13) Benzyl alcohol	5.46	108	790863	53.76055 ppb		99
14) 1,2-DCB	5.47	146	1381528	49.61441 ppb		99
15) 2-Methylphenol	5.60	107	1125319	52.32222 ppb		96
16) Bis (2-chloroisopropyl) et	5.59	45	881825	51.54833 ppb		91
17) Acetophenone	5.74	105	1804948	53.80313 ppb		96
18) 3&4-Methylphenol	5.78	107	2881348	106.02146 ppb		93
19) n-Nitrosodi-n-propylamine	5.75	70	1066488	55.21408 ppb		99
20) Hexachloroethane	5.84	117	552618	50.78552 ppb		87
23) Nitrobenzene	5.93	77	1522327	52.58623 ppb		94
24) Isophorone	6.21	82	2577189	52.94887 ppb		99
25) 2-Nitrophenol	6.29	139	765320	50.63941 ppb		89
26) 2,4-Dimethylphenol	6.35	122	1204944	51.03235 ppb		98
27) Benzoic acid	6.53	105	568291	28.89284 ppb		98
28) Bis (2-chloroethoxy) metha	6.44	93	1460287	51.38911 ppb		99
29) 2,4-Dichlorophenol	6.57	162	1142886	49.39952 ppb		97
30) 1,2,4-Trichlorobenzene	6.65	180	1233895	47.98342 ppb		98
31) 3,4-Dimethylphenol	6.70	107	1808361	52.30873 ppb		98
32) Naphthalene	6.74	128	3815221	49.94264 ppb		99
33) 4-Chloroaniline	6.82	127	1531176	51.21062 ppb		96
34) 2,6-Dichlorophenol	6.83	162	1174914	51.15242 ppb		95
35) Hexachloropropene	6.83	213	989218	51.08192 ppb		99
36) Hexachlorobutadiene	6.88	225	766029	49.33557 ppb		98
37) Caprolactum	7.27	55	429491	56.43508 ppb		94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y191.D Vial: 91
Acq On : 6 May 20 10:10 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (3) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 10:36 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.39	107	1292193	51.05316	ppb		94
39)	2-Methylnaphthalene	7.53	142	2563410	49.87823	ppb		99
40)	1-Methylnaphthalene	7.64	142	2603045	49.46903	ppb		99
42)	Hexachlorocyclopentadiene	7.71	237	626176	37.38702	ppb		97
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	1258110	48.21368	ppb		99
44)	2,4,6-Trichlorophenol	7.87	196	868594	49.72953	ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	915735	49.71623	ppb		97
47)	1,1'-Biphenyl	8.07	154	3347884	49.91394	ppb		98
48)	2-Chloronaphthalene	8.10	162	2627825	49.29905	ppb		97
49)	2-Nitroaniline	8.23	65	856115	57.25069	ppb		88
50)	Dimethyl phthalate	8.43	163	3198680	50.00087	ppb		100
51)	2,6-DNT	8.51	165	735467	51.23237	ppb	#	77
52)	Acenaphthylene	8.57	152	4089613	50.91653	ppb		99
53)	3-Nitroaniline	8.23	138	913009	53.75142	ppb		93
54)	Acenaphthene	8.78	154	2571335	49.94743	ppb		99
55)	2,4-Dinitrophenol	8.84	184	304986	32.52241	ppb		96
56)	4-Nitrophenol	8.96	65	610964	51.45685	ppb		98
57)	Dibenzofuran	8.98	168	3929510	51.69422	ppb		96
58)	2,4-DNT	8.98	165	1100118	53.55989	ppb	#	80
59)	2,3,4,6-Tetrachlorophenol	9.14	232	683103	46.91381	ppb		96
60)	Diethyl phthalate	9.25	149	3205304	51.22227	ppb		99
61)	4-Chlorophenyl phenyl ethe	9.37	204	1808923	52.72983	ppb		94
62)	Fluorene	9.38	166	3366411	52.99596	ppb		99
63)	4-Nitroaniline	8.71	138	720244	52.41275	ppb		83
66)	4,6-Dinitro-2-methylphenol	9.47	198	610021	46.27547	ppb		94
67)	Diphenyl amine	9.52	169	5041963	107.35920	ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	5041963	107.35920	ppb		100
69)	1,2-Diphenylhydrazine	9.55	77	3092559	51.55498	ppb		93
70)	4-Bromophenyl phenyl ether	9.94	248	915427	50.74742	ppb		89
71)	Hexachlorobenzene	10.02	284	905773	49.16666	ppb	#	81
72)	Atrazine	10.14	200	349212	20.17735	ppb		97
73)	Pentachlorophenol	10.26	266	500966	44.82149	ppb		97
74)	Phenanthrene	10.49	178	4439030	51.08376	ppb		99
75)	Anthracene	10.56	178	4625786	51.06297	ppb		100
76)	Carbazol	10.75	167	4311349	52.74265	ppb		99
77)	Di-n-butylphthalate	11.14	149	5619946	53.91859	ppb		99
78)	2-Nitrodiphenylamine	11.32	167	667683	28.27288	ppb		93
79)	Fluoranthene	11.89	202	5201632	51.97685	ppb		99
81)	Benzidine	12.04	184	1221077	44.87817	ppb		99
82)	Pyrene	12.15	202	5432653	47.42450	ppb		99
84)	Butyl benzylphthalate	12.89	149	2593780	49.08010	ppb		99
85)	3,3'-Dichlorobenzidine	13.51	252	1941795	52.97938	ppb	#	98
86)	Benz (a) anthracene	13.55	228	5745740	49.79102	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.55	149	4310072	53.88825	ppb		100
88)	Chrysene	13.58	228	4976619	46.95905	ppb		99
89)	Di-n-octylphthalate	14.29	149	6515040	50.93672	ppb		99
91)	Benzo (b) fluoranthene	14.83	252	4873749	48.49206	ppb		99
92)	Benzo (k) fluoranthene	14.87	252	4947592	54.28118	ppb		98
93)	Benzo (a) pyrene	15.27	252	4613965	53.16752	ppb		100
94)	Indeno (1,2,3-cd) pyrene	17.17	276	5186844	50.11583	ppb		98
95)	Dibenz (a,h) anthracene	17.19	278	4676146	52.36973	ppb		99
96)	Benzo (g,h,i) perylene	17.71	276	3952060	48.12085	ppb		98

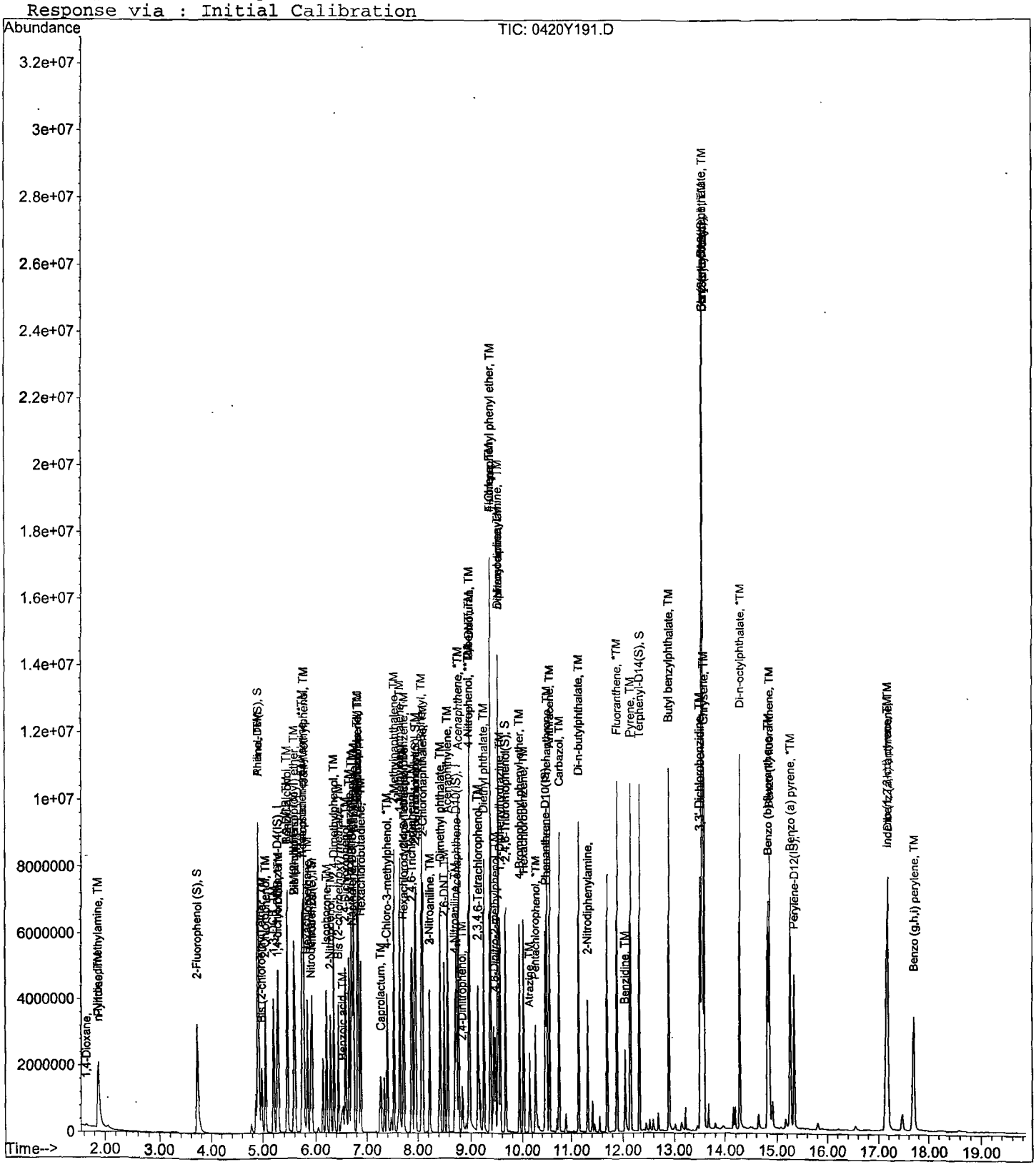
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y191.D Vial: 91
Acq On : 6 May 20 10:10 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (3) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 10:36 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 6 May 20 13:32
Instrument: Yoda
Initial Cal. Date: 04/20/20
Data File: 0420Y198.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2		1,4-Dioxane	0.4830	0.4752	1.6		
3	TM	n-Nitrosodimethylamine	0.6884	0.8079	17	TM	
4	TM	Pyridine	1.809	2.103	16	TM	
5	S	2-Fluorophenol (S)	1.470	1.473	0.14	S	
6	S	Phenol-D6 (S)	1.946	1.990	2.2	S	
7	*TM	Phenol	2.527	2.412	4.5	*TM	
8	TM	Aniline	1.455	1.456	0.08	TM	
9	TM	Bis (2-chloroethyl) ether	1.016	0.9900	2.6	TM	
10	TM	2-Chlorophenol	1.901	1.790	5.9	TM	
11	TM	1,3-DCB	2.047	1.902	7.1	TM	
12	*TM	1,4-DCB	2.086	1.958	6.2	*TM	
13	TM	Benzyl alcohol	1.050	1.026	2.3	TM	
14	TM	1,2-DCB	1.987	1.855	6.6	TM	
15	TM	2-Methylphenol	1.535	1.477	3.8	TM	
16	TM	Bis (2-chloroisopropyl) ether	1.221	1.154	5.5	TM	
17	TM	Acetophenone	2.394	2.395	0.06	TM	
18	TM	3&4-Methylphenol	1.940	1.849	4.7	TM	
19	**TM	n-Nitrosodi-n-propylamine	1.378	1.404	1.8	**TM	
20	TM	Hexachloroethane	0.7766	0.7631	1.7	TM	
21	I	Napthalene-D8(IS)	ISTD			I	
22	S	Nitrobenzene-D5(S)	0.4087	0.4595	12	S	
23	TM	Nitrobenzene	0.4667	0.4975	6.6	TM	
24	TM	Isophorone	0.7847	0.8291	5.7	TM	
25	*TM	2-Nitrophenol	0.2437	0.2423	0.54	*TM	
26	TM	2,4-Dimethylphenol	0.3807	0.3857	1.3	TM	
27	TM	Benzoic acid	0.3171	0.3093	2.5	TM	
28	TM	Bis (2-chloroethoxy) methane	0.4581	0.4588	0.15	TM	
29	*TM	2,4-Dichlorophenol	0.3730	0.3641	2.4	*TM	
30	TM	1,2,4-Trichlorobenzene	0.4146	0.4011	3.2	TM	
31	TM	3,4-Dimethylphenol	0.5574	0.5689	2.1	TM	
32	TM	Naphthalene	1.232	1.235	0.28	TM	
33	TM	4-Chloroaniline	0.4821	0.4686	2.8	TM	
34	TM	2,6-Dichlorophenol	0.3703	0.3704	0.03	TM	
35	TM	Hexachloropropene	0.3122	0.3229	3.4	TM	
36	*TM	Hexachlorobutadiene	0.2503	0.2465	1.5	*TM	
37	TM	Caprolactum	0.1227	0.1360	11	TM	
38	*TM	4-Chloro-3-methylphenol	0.4081	0.4141	1.5	*TM	
39	TM	2-Methylnaphthalene	0.8286	0.8232	0.66	TM	
40	TM	1-Methylnaphthalene	0.8484	0.8448	0.42	TM	
		Average			3.9		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 6 May 20 13:32
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y198.D

		Compound	MEAN	CCRF	%D		%Drift
41	I	Acenaphthene-D10(IS)	ISTD			I	
42	**TML	Hexachlorocyclopentadiene	0.3911	0.3685	5.8	**TML	18
43	TM	1,2,4,5-Tetrachlorobenzene	0.6871	0.6850	0.31	TM	
44	*TM	2,4,6-Trichlorophenol	0.4599	0.4685	1.9	*TM	
45	TM	2,4,5-Trichlorophenol	0.4850	0.4901	1.1	TM	
46	S	2-Fluorobiphenyl(S)	1.421	1.563	9.9	S	
47	TM	1,1'-Biphenyl	1.766	1.834	3.9	TM	
48	TM	2-Chloronaphthalene	1.404	1.442	2.7	TM	
49	TM	2-Nitroaniline	0.3938	0.4565	16	TM	
50	TM	Dimethyl phthalate	1.684	1.741	3.4	TM	
51	TM	2,6-DNT	0.3780	0.3969	5.0	TM	
52	TM	Acenaphthylene	2.115	2.195	3.8	TM	
53	TM	3-Nitroaniline	0.4473	0.4850	8.4	TM	
54	*TM	Acenaphthene	1.356	1.400	3.3	*TM	
55	**TML	2,4-Dinitrophenol	0.2262	0.2169	4.1	**TML	15
56	**TM	4-Nitrophenol	0.3126	0.3198	2.3	**TM	
57	TM	Dibenzofuran	2.002	2.118	5.8	TM	
58	TM	2,4-DNT	0.5408	0.5990	11	TM	
59	TM	2,3,4,6-Tetrachlorophenol	0.3834	0.3608	5.9	TM	
60	TM	Diethyl phthalate	1.648	1.762	7.0	TM	
61	TM	4-Chlorophenyl phenyl ether	0.9033	0.9563	5.9	TM	
62	TM	Fluorene	1.673	1.799	7.6	TM	
63	TM	4-Nitroaniline	0.3618	0.3987	10	TM	
64	S	2,4,6-Tribromophenol(S)	0.2049	0.2122	3.5	S	
65	I	Phenanthrene-D10(IS)	ISTD			I	
66	TM	4,6-Dinitro-2-methylphenol	0.1843	0.1852	0.49	TM	
67	TM	Diphenyl amine	0.6566	0.7164	9.1	TM	
68	*TM	n-Nitrosodiphenylamine	0.6566	0.7164	9.1	*TM	
69	TM	1,2-Diphenylhydrazine	0.8386	0.9263	10	TM	
70	TM	4-Bromophenyl phenyl ether	0.2522	0.2593	2.8	TM	
71	TM	Hexachlorobenzene	0.2576	0.2586	0.42	TM	
72	TM	Atrazine	0.2420	0.2358	2.6	TM	
73	*TM	Pentachlorophenol	0.1563	0.1361	13	*TM	
74	TM	Phenanthrene	1.215	1.289	6.1	TM	
75	TM	Anthracene	1.266	1.365	7.8	TM	
76	TM	Carbazol	1.143	1.226	7.3	TM	
77	TM	Di-n-butylphthalate	1.457	1.591	9.2	TM	
78		2-Nitrodiphenylamine	0.3302	0.3831	16		
79	*TM	Fluoranthene	1.399	1.496	6.9	*TM	
80	I	Chrysene-D12(IS)	ISTD			I	
		Average			6.2		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 6 May 20 13:32
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y198.D

		Compound	MEAN	CCRF	%D	%Drift		
81	TM	Benzidine	0.3267	0.2126	35	TM		*NT
82	TM	Pyrene	1.376	1.392	1.2	TM		
83	S	Terphenyl-D14(S)	0.9109	0.9381	3.0	S		
84	TM	Butyl benzylphthalate	0.6346	0.6747	6.3	TM		
85	TM	3,3'-Dichlorobenzidine	0.4401	0.4608	4.7	TM		
86	TM	Benz (a) anthracene	1.386	1.470	6.1	TM		
87	TM	Bis (2-ethylhexyl) phthalate	0.9604	1.053	9.6	TM		
88	TM	Chrysene	1.273	1.206	5.2	TM		
89	*TM	Di-n-octylphthalate	1.536	1.629	6.1	*TM		
90	I	Perylene-D12(IS)	ISTD			I		
91	TM	Benzo (b) fluoranthene	1.501	1.636	9.1	TM		
92	TM	Benzo (k) fluoranthene	1.361	1.411	3.7	TM		
93	*TM	Benzo (a) pyrene	1.296	1.417	9.3	*TM		
94	TM	Indeno (1,2,3-cd) pyrene	1.545	1.591	3.0	TM		
95	TM	Dibenz (a,h) anthracene	1.333	1.415	6.2	TM		
96	TM	Benzo (g,h,i) perylene	1.226	1.211	1.2	TM		
97								
98								
99								
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
		Average			7.3			

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 14:21 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	400214	40.00000 ppb	0.00
21) Napthalene-D8(IS)	6.71	136	1651962	40.00000 ppb	0.00
41) Acenaphthene-D10(IS)	8.74	164	974422	40.00000 ppb	0.00
65) Phenanthrene-D10(IS)	10.47	188	1820287	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.56	240	2031760	40.00000 ppb	0.00
90) Perylene-D12(IS)	15.34	264	1660394	40.00000 ppb	-0.02
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.72	112	1473354	100.14363 ppb	-0.02
Spiked Amount 200.000			Recovery = 50.072%		
6) Phenol-D6 (S)	4.90	99	1990893	102.24825 ppb	-0.02
Spiked Amount 200.000			Recovery = 51.124%		
22) Nitrobenzene-D5(S)	5.91	82	948804	56.21799 ppb	0.00
Spiked Amount 100.000			Recovery = 56.218%		
46) 2-Fluorobiphenyl(S)	7.95	172	1903570	54.97179 ppb	0.00
Spiked Amount 100.000			Recovery = 54.972%		
64) 2,4,6-Tribromophenol(S)	9.67	330	516864	103.52789 ppb	0.00
Spiked Amount 200.000			Recovery = 51.764%		
83) Terphenyl-D14(S)	12.32	244	2382514	51.49265 ppb	0.00
Spiked Amount 100.000			Recovery = 51.493%		
Target Compounds					Qvalue
2) 1,4-Dioxane	1.64	58	23771	4.91884	91
3) n-Nitrosodimethylamine	1.85	42	404149m	58.67853 ppb	88
4) Pyridine	1.87	79	1051906	58.11789 ppb	100
7) Phenol	4.92	94	1206783	47.73539 ppb	95
8) Aniline	4.90	93	728576	50.03877 ppb	89
9) Bis (2-chloroethyl) ether	4.98	63	495288	48.70025 ppb	98
10) 2-Chlorophenol	5.05	128	895231	47.06957 ppb	99
11) 1,3-DCB	5.21	146	951264	46.44205 ppb	98
12) 1,4-DCB	5.29	146	979360	46.92339 ppb	99
13) Benzyl alcohol	5.45	108	513243	48.86068 ppb	85
14) 1,2-DCB	5.46	146	928071	46.67705 ppb	98
15) 2-Methylphenol	5.59	107	738906	48.11425 ppb	97
16) Bis (2-chloroisopropyl) et	5.59	45	577353	47.26587 ppb	97
17) Acetophenone	5.74	105	1198375	50.02760 ppb	96
18) 3&4-Methylphenol	5.77	107	1850291	95.34812 ppb	98
19) n-Nitrosodi-n-propylamine	5.75	70	702136	50.90837 ppb	96
20) Hexachloroethane	5.84	117	381751	49.13252 ppb	88
23) Nitrobenzene	5.94	77	1027267	53.29325 ppb	97
24) Isophorone	6.20	82	1712061	52.82681 ppb	97
25) 2-Nitrophenol	6.29	139	500417	49.72816 ppb	89
26) 2,4-Dimethylphenol	6.35	122	796445	50.65931 ppb	100
27) Benzoic acid	6.53	105	638617m	48.76235 ppb	97
28) Bis (2-chloroethoxy) metha	6.45	93	947501	50.07689 ppb	99
29) 2,4-Dichlorophenol	6.58	162	751826	48.80474 ppb	97
30) 1,2,4-Trichlorobenzene	6.65	180	828318	48.37655 ppb	98
31) 3,4-Dimethylphenol	6.70	107	1174847	51.03817 ppb	98
32) Naphthalene	6.74	128	2550442	50.14089 ppb	99
33) 4-Chloroaniline	6.82	127	967646	48.60447 ppb	99
34) 2,6-Dichlorophenol	6.83	162	764954	50.01729 ppb	96
35) Hexachloropropene	6.84	213	666791	51.71180 ppb	99
36) Hexachlorobutadiene	6.88	225	508934	49.22675 ppb	98
37) Caprolactum	7.25	55	280878	55.42907 ppb	96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 14:21 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.39	107	854996	50.73225 ppb		95
39)	2-Methylnaphthalene	7.53	142	1699795	49.67230 ppb		99
40)	1-Methylnaphthalene	7.64	142	1744555	49.79218 ppb		100
42)	Hexachlorocyclopentadiene	7.71	237	448896	41.24843 ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	834298	49.84408 ppb		99
44)	2,4,6-Trichlorophenol	7.88	196	570668	50.93564 ppb		99
45)	2,4,5-Trichlorophenol	7.93	196	596969	50.52670 ppb	#	89
47)	1,1'-Biphenyl	8.07	154	2234396	51.93406 ppb		99
48)	2-Chloronaphthalene	8.10	162	1756296	51.36657 ppb		98
49)	2-Nitroaniline	8.23	65	556033	57.96821 ppb		97
50)	Dimethyl phthalate	8.43	163	2120568	51.67729 ppb		99
51)	2,6-DNT	8.51	165	483493	52.50639 ppb		93
52)	Acenaphthylene	8.57	152	2673920	51.89981 ppb		99
53)	3-Nitroaniline	8.23	138	590798	54.22438 ppb		97
54)	Acenaphthene	8.78	154	1705410	51.64449 ppb		99
55)	2,4-Dinitrophenol	8.84	184	264131	42.54183 ppb		99
56)	4-Nitrophenol	8.97	65	389472	51.13809 ppb		80
57)	Dibenzofuran	8.97	168	2579740	52.90786 ppb		93
58)	2,4-DNT	8.98	165	729619	55.37800 ppb		93
59)	2,3,4,6-Tetrachlorophenol	9.14	232	439513	47.05729 ppb		92
60)	Diethyl phthalate	9.25	149	2146641	53.47979 ppb		97
61)	4-Chlorophenyl phenyl ethe	9.37	204	1164775	52.93209 ppb		98
62)	Fluorene	9.37	166	2191369	53.78137 ppb		99
63)	4-Nitroaniline	8.71	138	485664	55.09776 ppb		100
66)	4,6-Dinitro-2-methylphenol	9.46	198	421398	50.24657 ppb		87
67)	Diphenyl amine	9.52	169	3260082	109.11289 ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	3260082	109.11289 ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	2107626	55.22733 ppb		95
70)	4-Bromophenyl phenyl ether	9.94	248	590062	51.41571 ppb		92
71)	Hexachlorobenzene	10.02	284	588460	50.20838 ppb	#	89
72)	Atrazine	10.14	200	268234	24.36109 ppb		99
73)	Pentachlorophenol	10.26	266	309693	43.55292 ppb		97
74)	Phenanthrene	10.49	178	2932196	53.03904 ppb		100
75)	Anthracene	10.55	178	3106550	53.90223 ppb		99
76)	Carbazol	10.75	167	2788785	53.62554 ppb		100
77)	Di-n-butylphthalate	11.14	149	3621001	54.60632 ppb		100
78)	2-Nitrodiphenylamine	11.32	167	435883	29.01200 ppb		96
79)	Fluoranthene	11.89	202	3403882	53.46292 ppb		99
81)	Benzidine	12.04	184	539891	32.53293 ppb		97
82)	Pyrene	12.15	202	3534902	50.59333 ppb		100
84)	Butyl benzylphthalate	12.89	149	1713580	53.16205 ppb		95
85)	3,3'-Dichlorobenzidine	13.51	252	1170387	52.35499 ppb		99
86)	Benz (a) anthracene	13.54	228	3732515	53.03123 ppb		99
87)	Bis (2-ethylhexyl) phthala	13.55	149	2674498	54.82478 ppb		99
88)	Chrysene	13.58	228	3063272	47.39096 ppb		100
89)	Di-n-octylphthalate	14.28	149	4138101	53.04446 ppb	#	94
91)	Benzo (b) fluoranthene	14.82	252	3396460	54.52905 ppb		100
92)	Benzo (k) fluoranthene	14.86	252	2927936	51.83356 ppb		99
93)	Benzo (a) pyrene	15.27	252	2940484	54.67451 ppb		98
94)	Indeno (1,2,3-cd) pyrene	17.16	276	3302610	51.49001 ppb		99
95)	Dibenz (a,h) anthracene	17.18	278	2937215	53.07891 ppb		99
96)	Benzo (g,h,i) perylene	17.70	276	2514046	49.39431 ppb		99

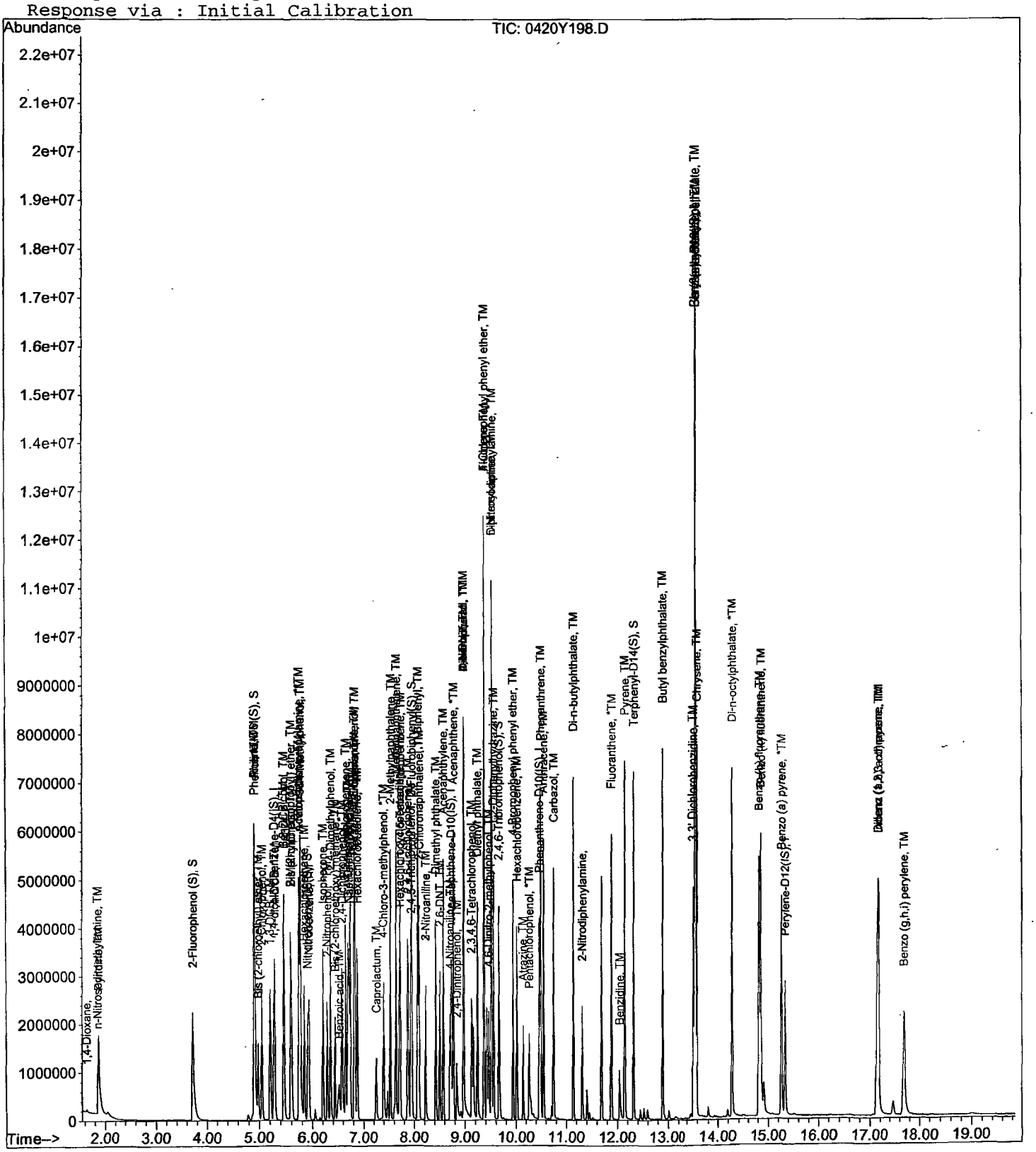
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 14:21 2020 Quant Results File: Y0420.RES

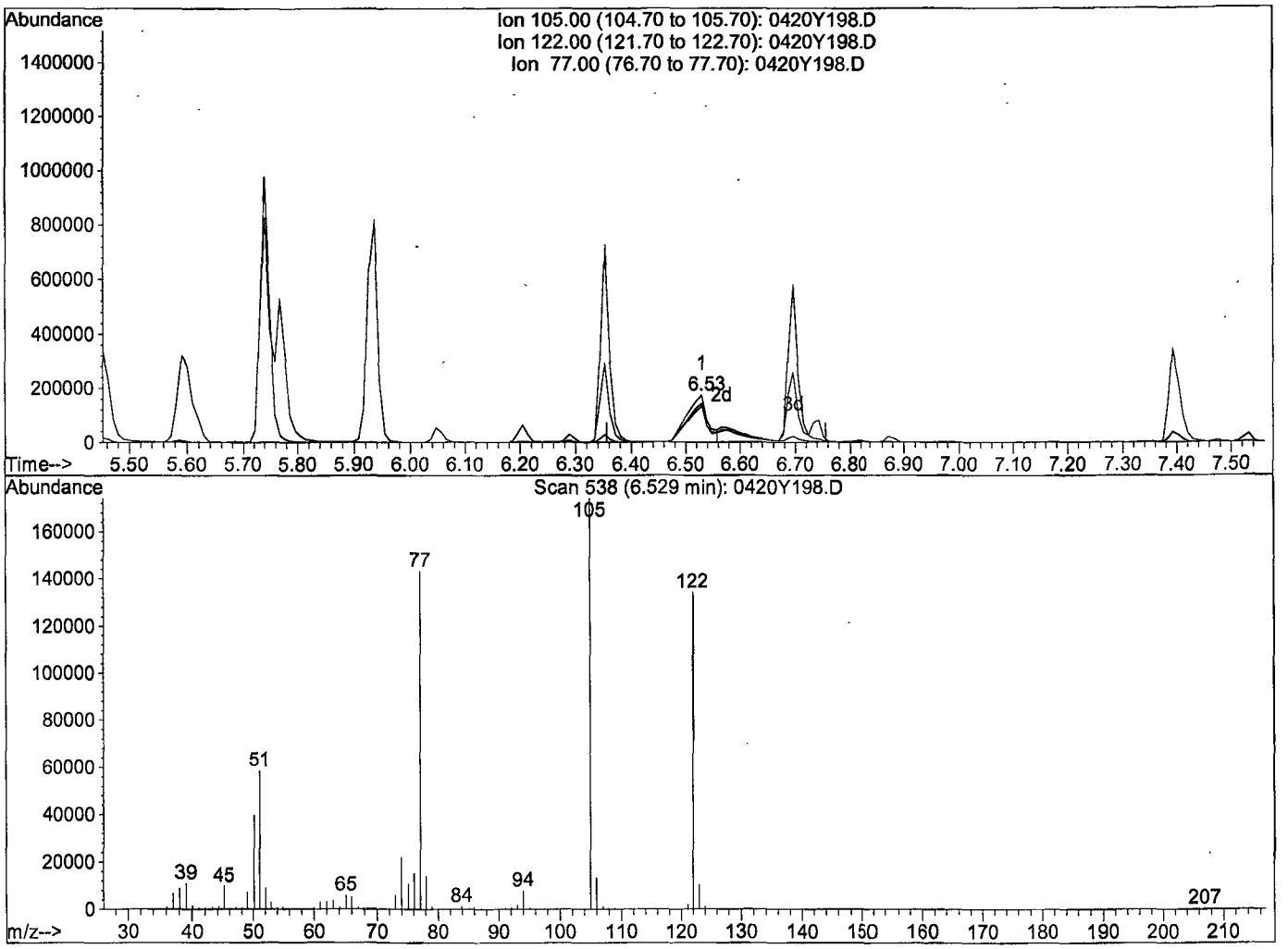
Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 14:16 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Multiple Level Calibration



TIC: 0420Y198.D

(27) Benzoic acid (TM)

6.53min 35.8588ppb

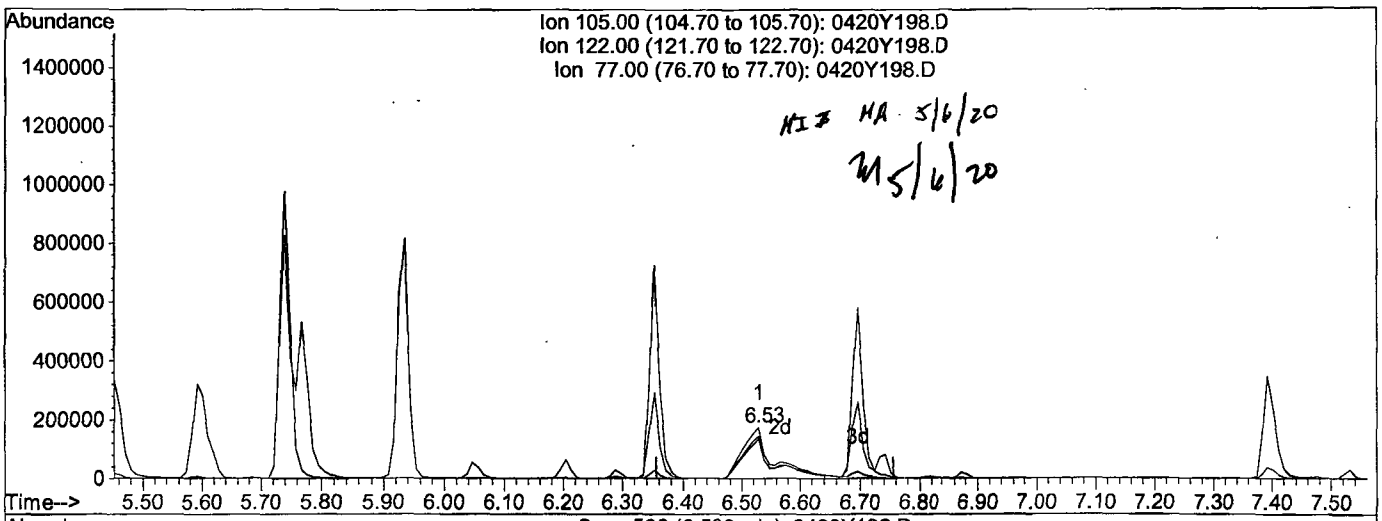
response 469625

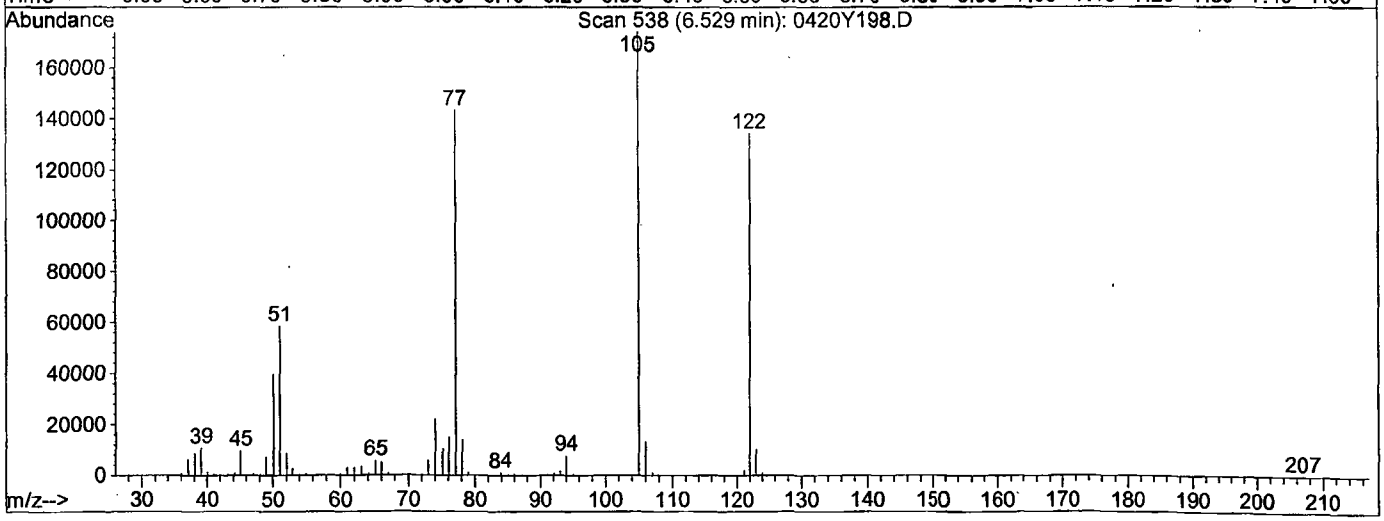
Ion	Exp%	Act%
105.00	100	100
122.00	76.00	76.48
77.00	76.90	81.70
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 14:17 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Multiple Level Calibration





TIC: 0420Y198.D

(27) Benzoic acid (TM)

6.53min 48.7624ppb m

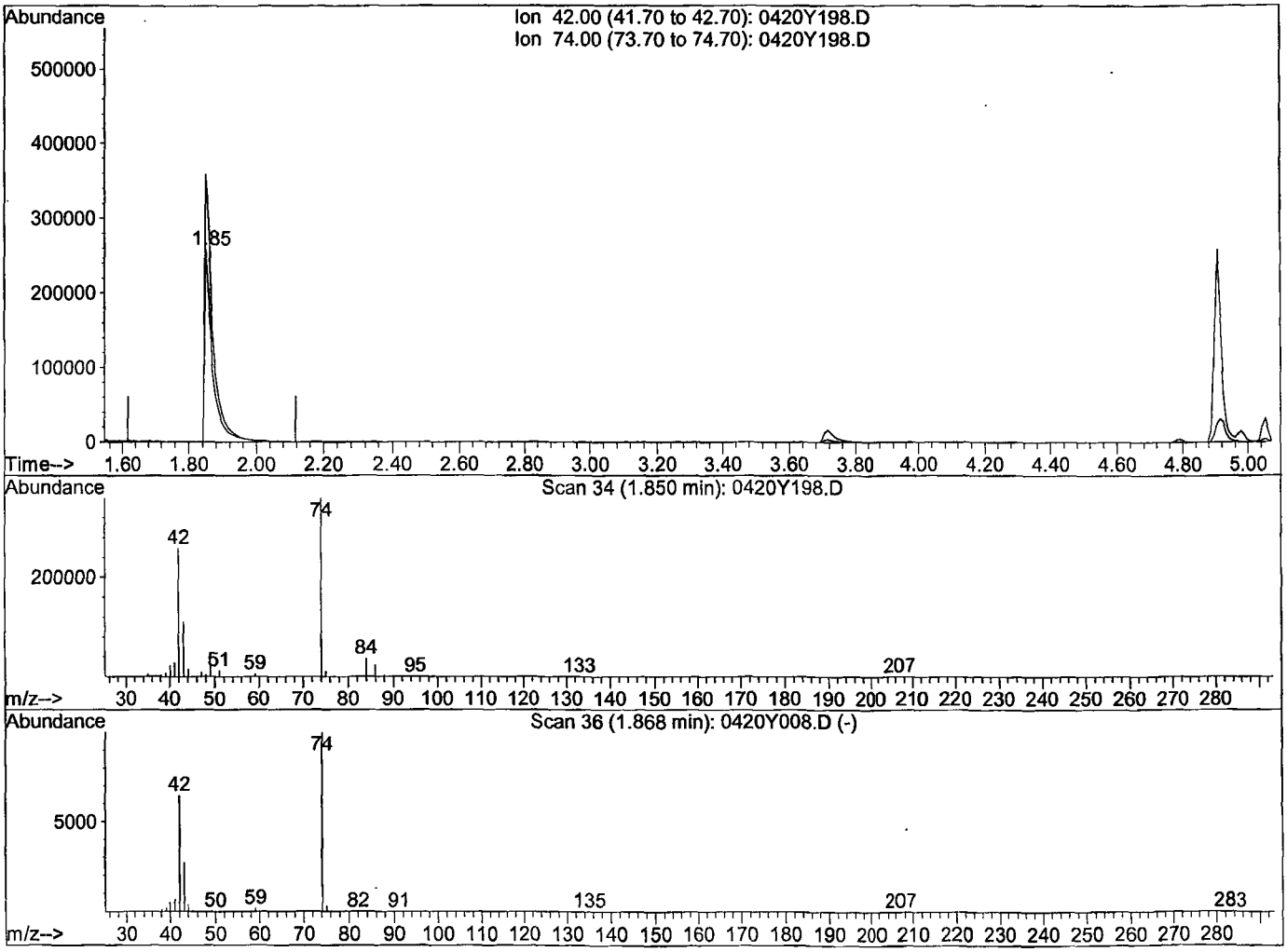
response 638617

Ion	Exp%	Act%
105.00	100	100
122.00	76.00	77.16
77.00	76.90	82.35
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 14:17 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Multiple Level Calibration



TIC: 0420Y198.D

(3) n-Nitrosodimethylamine (TM)

1.85min 61.3256ppb

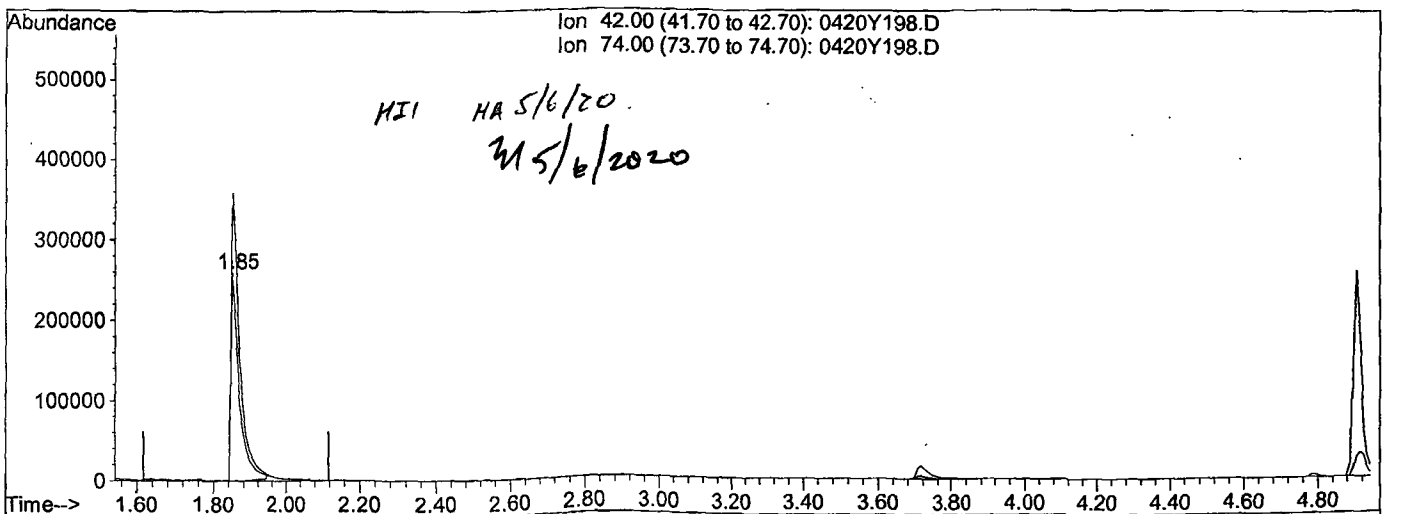
response 422381

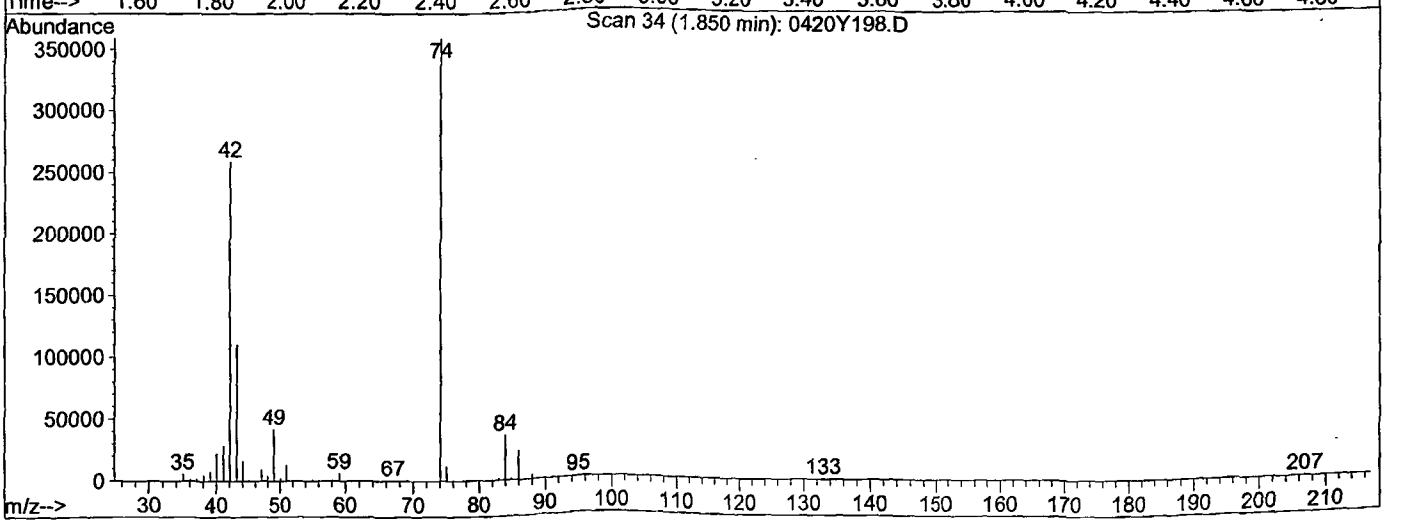
Ion	Exp%	Act%
42.00	100	100
74.00	154.30	139.29
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 14:21 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Multiple Level Calibration





TIC: 0420Y198.D

(3) n-Nitrosodimethylamine (TM)

1.85min 58.6785ppb m

response 404149

Ion	Exp%	Act%
42.00	100	100
74.00	154.30	138.76
0.00	0.00	0.00
0.00	0.00	0.00

ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y195.D Vial: 95
Acq On : 6 May 20 12:06 Operator: MA
Sample : BA10439W19 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 12:32 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.27	152	463675	40.00000 ppb	-0.01
21) Napthalene-D8(IS)	6.71	136	1945165	40.00000 ppb	-0.01
41) Acenaphthene-D10(IS)	8.73	164	1133046	40.00000 ppb	-0.01
65) Phenanthrene-D10(IS)	10.46	188	2142731	40.00000 ppb	-0.01
80) Chrysene-D12(IS)	13.55	240	2181243	40.00000 ppb	-0.02
90) Perylene-D12(IS)	15.34	264	1794202	40.00000 ppb	-0.02
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.71	112	2345870	172.03182 ppb	-0.03
Spiked Amount 250.000			Recovery =	68.813%	
6) Phenol-D6 (S)	4.90	99	3113518	172.52337 ppb	-0.02
Spiked Amount 250.000			Recovery =	69.009%	
22) Nitrobenzene-D5(S)	5.91	82	1686110	106.05675 ppb	-0.01
Spiked Amount 125.000			Recovery =	84.846%	
46) 2-Fluorobiphenyl(S)	7.95	172	3368307	104.56643 ppb	-0.01
Spiked Amount 125.000			Recovery =	83.653%	
64) 2,4,6-Tribromophenol(S)	9.66	330	966299	208.06651 ppb	-0.02
Spiked Amount 250.000			Recovery =	83.227%	
83) Terphenyl-D14(S)	12.32	244	4352946	109.53968 ppb	-0.01
Spiked Amount 125.000			Recovery =	87.632%	

Target Compounds Qvalue

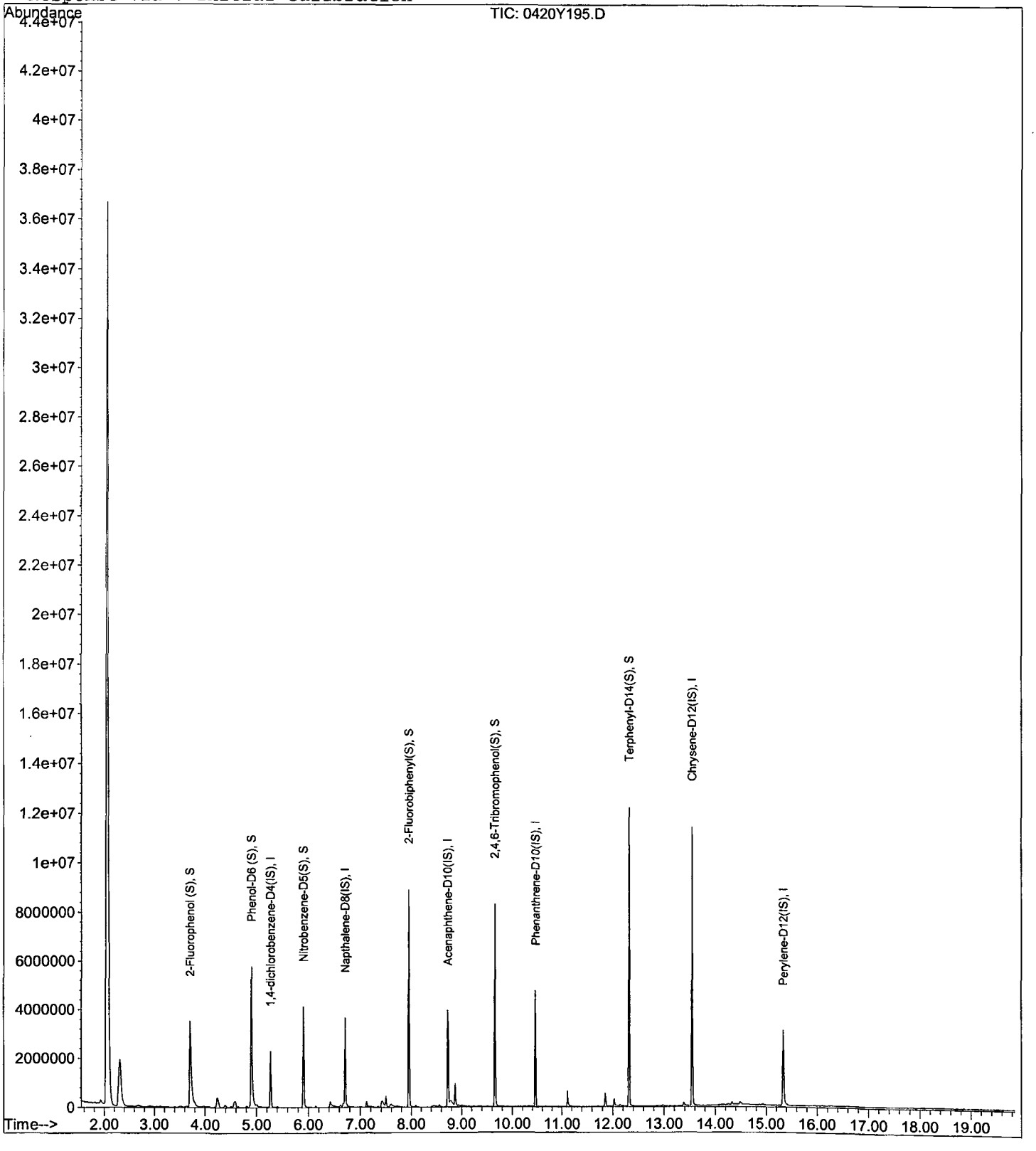
(#) = qualifier out of range (m) = manual integration
0420Y195.D Y0420.M Wed May 06 17:47:31 2020 Page 1

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y195.D Vial: 95
Acq On : 6 May 20 12:06 Operator: MA
Sample : BA10439W19 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 12:32 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y192.D Vial: 92
Acq On : 6 May 20 10:40 Operator: MA
Sample : 200504A BLK 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:42 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.27	152	490692	40.00000 ppb	-0.01
21) Napthalene-D8(IS)	6.71	136	2027577	40.00000 ppb	-0.01
41) Acenaphthene-D10(IS)	8.73	164	1094664	40.00000 ppb	0.00
65) Phenanthrene-D10(IS)	10.46	188	2246300	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.55	240	2168050	40.00000 ppb	-0.02
90) Perylene-D12(IS)	15.34	264	445281	40.00000 ppb	-0.02
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.72	112	2344003	162.43054 ppb	-0.02
Spiked Amount 250.000			Recovery =	64.972%	
6) Phenol-D6 (S)	4.90	99	2734234	143.16503 ppb	-0.02
Spiked Amount 250.000			Recovery =	57.266%	
22) Nitrobenzene-D5(S)	5.91	82	1681293	101.45534 ppb	0.00
Spiked Amount 125.000			Recovery =	81.164%	
46) 2-Fluorobiphenyl(S)	7.95	172	3310067	106.36141 ppb	-0.01
Spiked Amount 125.000			Recovery =	85.089%	
64) 2,4,6-Tribromophenol(S)	9.66	330	927091	206.62350 ppb	-0.02
Spiked Amount 250.000			Recovery =	82.650%	
83) Terphenyl-D14(S)	12.32	244	4413538	111.74030 ppb	-0.01
Spiked Amount 125.000			Recovery =	89.392%	

Target Compounds Qvalue

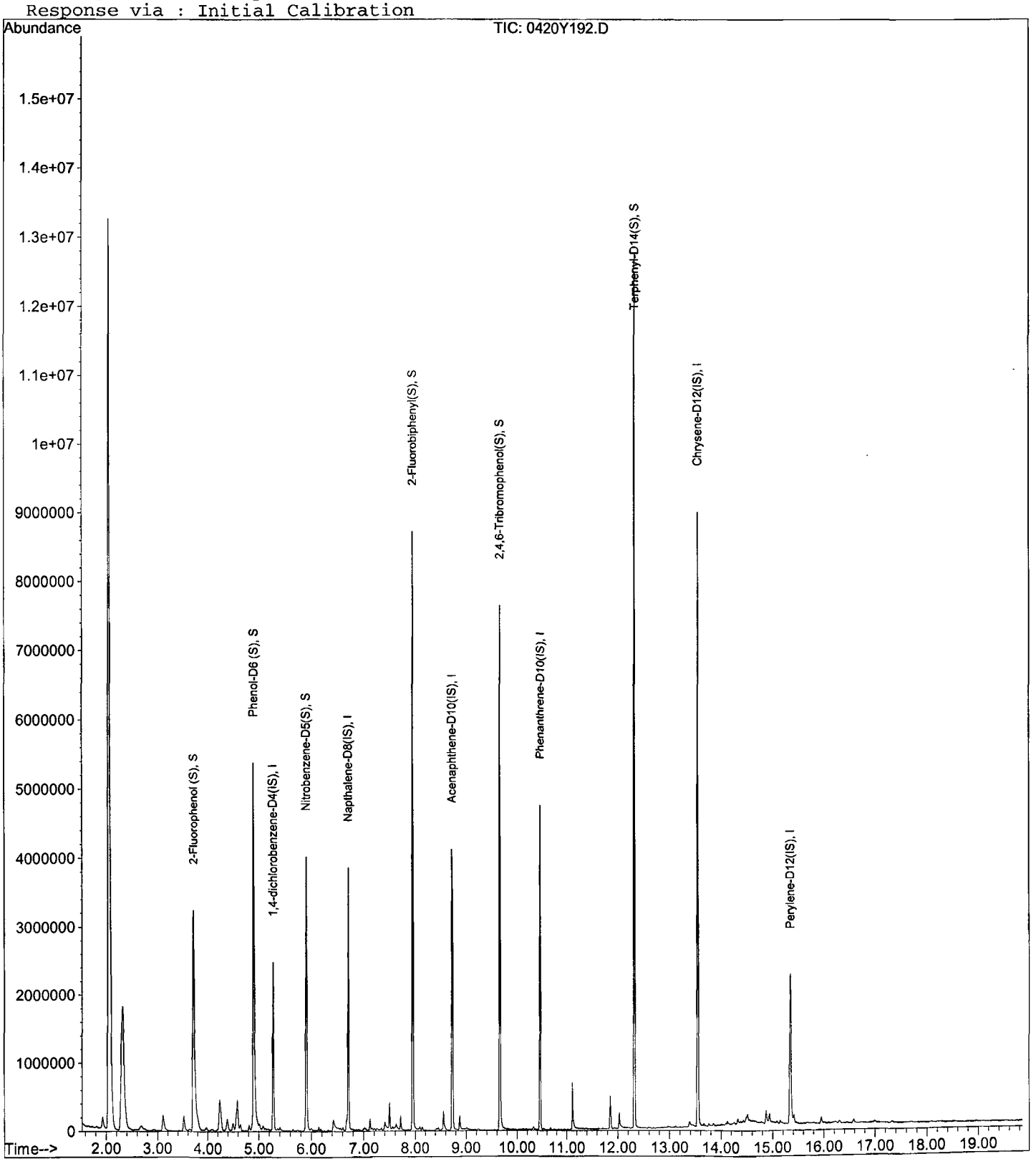
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y192.D Vial: 92
Acq On : 6 May 20 10:40 Operator: MA
Sample : 200504A BLK 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:42 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y193.D Vial: 93
Acq On : 6 May 20 11:09 Operator: MA
Sample : 200504A LCS-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	429277	40.00000 ppb		0.00
21) Napthalene-D8(IS)	6.71	136	1870437	40.00000 ppb		0.00
41) Acenaphthene-D10(IS)	8.73	164	552807	40.00000 ppb		0.00
65) Phenanthrene-D10(IS)	10.46	188	1989455	40.00000 ppb		0.00
80) Chrysene-D12(IS)	13.55	240	1946171	40.00000 ppb		-0.02
90) Perylene-D12(IS)	15.34	264	21401	40.00000 ppb		-0.02
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.72	112	2365801	187.39548 ppb		-0.02
Spiked Amount 250.000				Recovery = 74.958%		
6) Phenol-D6 (S)	4.90	99	2167501	129.72746 ppb		-0.02
Spiked Amount 250.000				Recovery = 51.891%		
22) Nitrobenzene-D5(S)	5.91	82	1633287	106.83862 ppb		0.00
Spiked Amount 125.000				Recovery = 85.471%		
46) 2-Fluorobiphenyl(S)	7.96	172	3317651	211.09858 ppb		0.00
Spiked Amount 125.000				Recovery = 168.879%		
64) 2,4,6-Tribromophenol(S)	9.67	330	971223	428.63103 ppb		0.00
Spiked Amount 250.000				Recovery = 171.452%		
83) Terphenyl-D14(S)	12.32	244	4251129	119.89899 ppb		0.00
Spiked Amount 125.000				Recovery = 95.919%		
Target Compounds						Qvalue
2) 1,4-Dioxane	1.65	58	23367	5.63486		63
3) n-Nitrosodimethylamine	1.87	42	206617	34.95976 ppb		95
4) Pyridine	1.95	79	104407	6.72244 ppb		98
7) Phenol	4.92	94	811386	37.40274 ppb		88
8) Aniline	4.92	93	45136	3.61260 ppb	#	1
9) Bis (2-chloroethyl) ether	4.98	63	410493	47.03746 ppb		96
10) 2-Chlorophenol	5.05	128	704281	43.15348 ppb		98
11) 1,3-DCB	5.21	146	713145	40.57447 ppb		98
12) 1,4-DCB	5.29	146	732143	40.87969 ppb		97
13) Benzyl alcohol	5.46	108	25853	2.86822 ppb		83
14) 1,2-DCB	5.47	146	691908	40.55414 ppb		98
15) 2-Methylphenol	5.59	107	495343	37.58852 ppb		96
16) Bis (2-chloroisopropyl) et	5.59	45	463777	44.24662 ppb		88
17) Acetophenone	5.74	105	993707	48.34371 ppb		97
18) 3&4-Methylphenol	5.77	107	1203538	72.27641 ppb		98
19) n-Nitrosodi-n-propylamine	5.75	70	519891	43.92835 ppb		95
20) Hexachloroethane	5.84	117	261428	39.21080 ppb		88
23) Nitrobenzene	5.93	77	878869	50.33615 ppb		97
24) Isophorone	6.20	82	1365332	46.50937 ppb		98
25) 2-Nitrophenol	6.29	139	408831	44.85193 ppb		92
26) 2,4-Dimethylphenol	6.35	122	526584	36.97755 ppb		99
27) Benzoic acid	6.52	105	505944	42.64947 ppb		97
28) Bis (2-chloroethoxy) metha	6.44	93	20046	1.16964 ppb		97
29) 2,4-Dichlorophenol	6.57	162	601884	43.13446 ppb		96
30) 1,2,4-Trichlorobenzene	6.65	180	640448	41.29416 ppb		98
31) 3,4-Dimethylphenol	6.70	107	480174	23.02923 ppb		100
32) Naphthalene	6.74	128	2013783	43.70753 ppb		100
33) 4-Chloroaniline	6.82	127	73672	4.08535 ppb	#	80
34) 2,6-Dichlorophenol	6.82	162	577817	41.71019 ppb		99
35) Hexachloropropene	6.83	213	189609	16.23401 ppb		99
36) Hexachlorobutadiene	6.87	225	330487	35.29076 ppb		98
37) Caprolactum	7.24	55	196503	42.81106 ppb		95

(#) = qualifier out of range (m) = manual integration

Data File : M:\YODA\DATA\Y200420\0420Y193.D Vial: 93
Acq On : 6 May 20 11:09 Operator: MA
Sample : 200504A LCS-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.39	107	649831	42.56841	ppb		95
39)	2-Methylnaphthalene	7.53	142	1324589	42.73324	ppb		97
40)	1-Methylnaphthalene	7.64	142	1337384	42.14049	ppb		98
42)	Hexachlorocyclopentadiene	7.71	237	56224	15.81957	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	623894	82.12714	ppb		99
44)	2,4,6-Trichlorophenol	7.87	196	454403	89.36407	ppb		100
45)	2,4,5-Trichlorophenol	7.93	196	472007	88.02400	ppb	#	89
47)	1,1'-Biphenyl	8.07	154	1763060	90.29066	ppb		99
48)	2-Chloronaphthalene	8.10	162	1420675	91.55059	ppb		98
49)	2-Nitroaniline	8.23	65	78296	17.98508	ppb		92
50)	Dimethyl phthalate	8.42	163	1725317	92.64030	ppb		99
51)	2,6-DNT	8.51	165	398713	95.40385	ppb		99
52)	Acenaphthylene	8.57	152	241556	10.33044	ppb		99
53)	3-Nitroaniline	8.23	138	82039	16.59050	ppb		93
54)	Acenaphthene	8.77	154	953780	63.63953	ppb		100
55)	2,4-Dinitrophenol	8.84	184	221820	76.37333	ppb		90
56)	4-Nitrophenol	8.97	65	307114	88.84877	ppb	#	68
57)	Dibenzofuran	8.97	168	2069565	93.52052	ppb		97
58)	2,4-DNT	8.98	165	598012	100.00796	ppb		98
59)	2,3,4,6-Tetrachlorophenol	9.14	232	352910	83.25354	ppb		94
60)	Diethyl phthalate	9.24	149	1631017	89.53077	ppb		100
61)	4-Chlorophenyl phenyl ethe	9.37	204	935827	93.70356	ppb		97
62)	Fluorene	9.37	166	1685528	91.14564	ppb		99
63)	4-Nitroaniline	8.72	138	12843	3.21032	ppb	#	49
66)	4,6-Dinitro-2-methylphenol	9.45	198	340239	46.39955	ppb	#	82
67)	Diphenyl amine	9.51	169	194487	7.44481	ppb		99
68)	n-Nitrosodiphenylamine	9.51	169	194487	7.44481	ppb		99
69)	1,2-Diphenylhydrazine	9.55	77	28701	0.86015	ppb		91
70)	4-Bromophenyl phenyl ether	9.94	248	481939	48.02927	ppb		94
71)	Hexachlorobenzene	10.02	284	487064	47.52926	ppb		92
72)	Atrazine	10.26	200	55435	5.75815	ppb	#	33
73)	Pentachlorophenol	10.26	266	262017	42.14355	ppb		98
74)	Phenanthrene	10.49	178	2312782	47.84683	ppb		99
75)	Anthracene	10.55	178	1951261	38.72216	ppb		95
77)	Di-n-butylphthalate	11.14	149	2718397	46.88597	ppb		99
79)	Fluoranthene	11.88	202	2453806	44.07925	ppb	#	96
82)	Pyrene	12.14	202	1391011	25.98052	ppb		95
84)	Butyl benzylphthalate	12.89	149	113480	4.59429	ppb		85
86)	Benz (a) anthracene	13.54	228	2284425	42.35537	ppb		95
87)	Bis (2-ethylhexyl) phthala	13.56	149	6546815	175.13225	ppb	#	90
88)	Chrysene	13.58	228	2318902	46.81594	ppb		99
89)	Di-n-octylphthalate	14.28	149	2939532	49.17207	ppb		95
91)	Benzo (b) fluoranthene	14.82	252	2428062	3780.49213	ppb		98
92)	Benzo (k) fluoranthene	14.85	252	1254319	2153.49825	ppb		95
93)	Benzo (a) pyrene	15.26	252	826276	1489.97263	ppb		93
94)	Indeno (1,2,3-cd) pyrene	17.15	276	1024041	1548.35363	ppb	#	84
95)	Dibenz (a,h) anthracene	17.16	278	1812762	3176.97735	ppb		92
96)	Benzo (g,h,i) perylene	17.68	276	785332	1496.38762	ppb	#	90

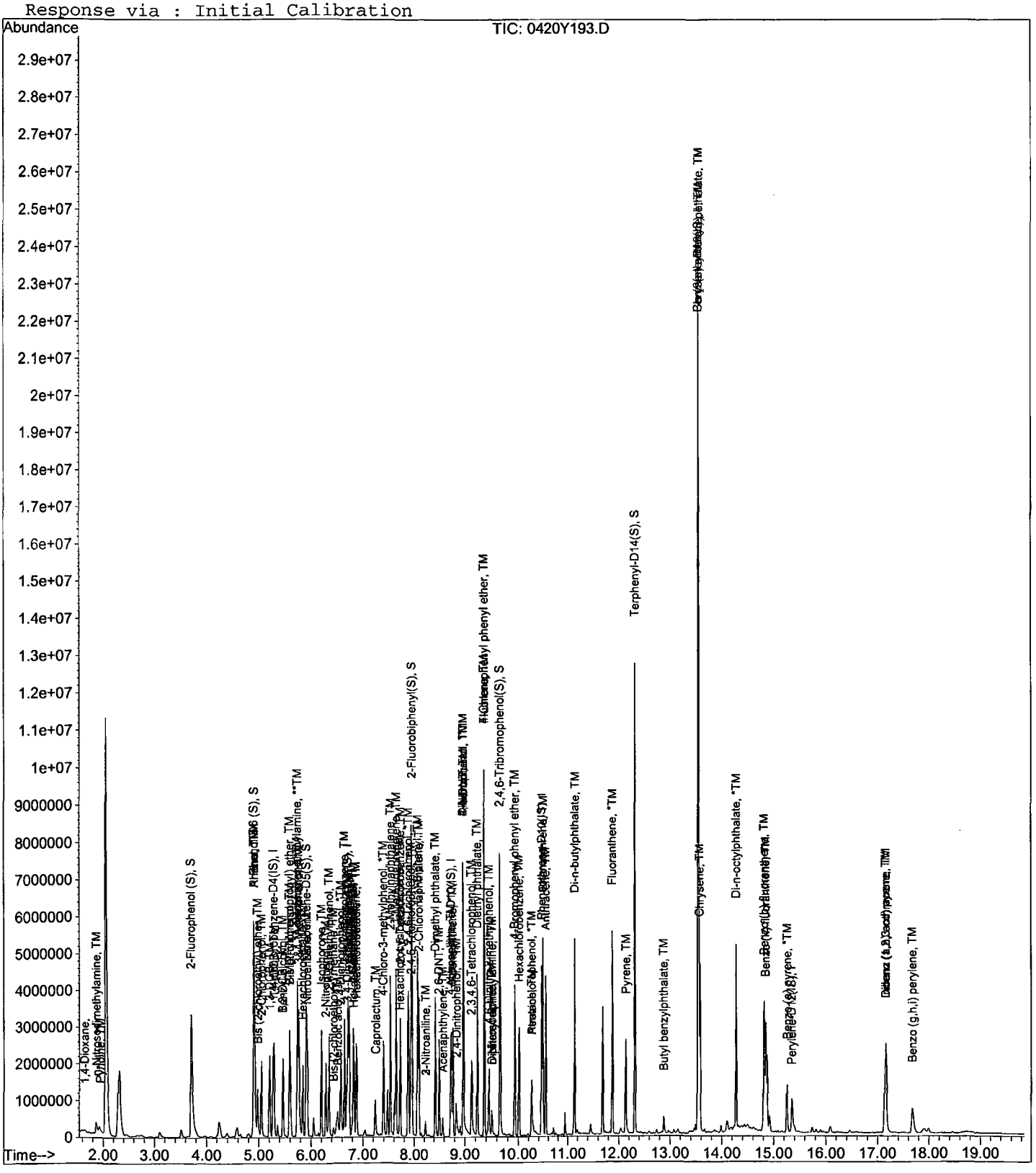
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y193.D Vial: 93
Acq On : 6 May 20 11:09 Operator: MA
Sample : 200504A LCS-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y194.D Vial: 94
Acq On : 6 May 20 11:37 Operator: MA
Sample : 200504A LCSD-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	451589	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.71	136	1898693	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.73	164	216990	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.46	188	1695321	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.55	240	699718	40.00000	ppb		-0.02
90) Perylene-D12(IS)	15.34	264	4267	40.00000	ppb		-0.02
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.71	112	2422570	182.41120	ppb		-0.03
Spiked Amount 250.000			Recovery = 72.964%				
6) Phenol-D6 (S)	4.90	99	1197423	68.12625	ppb		-0.02
Spiked Amount 250.000			Recovery = 27.250%				
22) Nitrobenzene-D5(S)	5.91	82	1667221	107.43537	ppb		0.00
Spiked Amount 125.000			Recovery = 85.948%				
46) 2-Fluorobiphenyl(S)	7.96	172	3337004	540.93510	ppb		0.00
Spiked Amount 125.000			Recovery = 432.748%				
64) 2,4,6-Tribromophenol(S)	9.66	330	977090	1098.58340	ppb		-0.02
Spiked Amount 250.000			Recovery = 439.433%				
83) Terphenyl-D14(S)	12.32	244	3756832	294.70735	ppb		0.00
Spiked Amount 125.000			Recovery = 235.766%				
Target Compounds							Qvalue
2) 1,4-Dioxane	1.64	58	25561	5.85939			80
3) n-Nitrosodimethylamine	1.87	42	91313	14.68687	ppb		86
7) Phenol	4.91	94	760985	33.34620	ppb	#	95
8) Aniline	4.92	93	24992	1.90148	ppb	#	1
9) Bis (2-chloroethyl) ether	4.98	63	420604	45.81480	ppb		98
10) 2-Chlorophenol	5.05	128	718139	41.82853	ppb		99
11) 1,3-DCB	5.21	146	730985	39.53464	ppb		97
12) 1,4-DCB	5.29	146	761072	40.39538	ppb		98
13) Benzyl alcohol	5.59	108	446952	47.13639	ppb	#	56
14) 1,2-DCB	5.46	146	714102	39.78702	ppb		99
15) 2-Methylphenol	5.59	107	432008	31.16271	ppb		93
16) Bis (2-chloroisopropyl) et	5.59	45	480370	43.56534	ppb		81
17) Acetophenone	5.74	105	1009045	46.66448	ppb		98
18) 3&4-Methylphenol	5.77	107	1048567	59.85869	ppb		96
19) n-Nitrosodi-n-propylamine	5.74	70	492243	39.53724	ppb		97
20) Hexachloroethane	5.84	117	264790	37.75282	ppb		93
23) Nitrobenzene	5.93	77	908152	51.23925	ppb		99
24) Isophorone	6.20	82	1358038	45.57245	ppb		98
25) 2-Nitrophenol	6.29	139	416129	44.97319	ppb		91
26) 2,4-Dimethylphenol	6.35	122	451892	31.26032	ppb		97
27) Benzoic acid	6.52	105	535596	44.47714	ppb		97
29) 2,4-Dichlorophenol	6.58	162	617146	43.57003	ppb		98
30) 1,2,4-Trichlorobenzene	6.65	180	651215	41.36352	ppb		99
31) 3,4-Dimethylphenol	6.70	107	425535	20.10502	ppb		100
32) Naphthalene	6.74	128	2066975	44.19439	ppb		100
33) 4-Chloroaniline	6.82	127	46064	2.51638	ppb	#	55
34) 2,6-Dichlorophenol	6.82	162	594049	42.24375	ppb		98
35) Hexachloropropene	6.84	213	200339	16.89743	ppb		99
36) Hexachlorobutadiene	6.87	225	342144	35.99183	ppb		99
37) Caprolactum	7.24	55	187532	40.24858	ppb		95
38) 4-Chloro-3-methylphenol	7.39	107	646121	41.69550	ppb		91
39) 2-Methylnaphthalene	7.53	142	1333602	42.38374	ppb		99

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y194.D Vial: 94
Acq On : 6 May 20 11:37 Operator: MA
Sample : 200504A LCSD-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
40)	1-Methylnaphthalene	7.64	142	1357228	42.12933	ppb		98
42)	Hexachlorocyclopentadiene	7.71	237	76192	40.65345	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	640722	214.87177	ppb		100
44)	2,4,6-Trichlorophenol	7.87	196	461892	231.41740	ppb		99
45)	2,4,5-Trichlorophenol	7.93	196	491895	233.70010	ppb	#	91
47)	1,1'-Biphenyl	8.07	154	1785012	232.88991	ppb		99
48)	2-Chloronaphthalene	8.10	162	1424567	233.87463	ppb		98
49)	2-Nitroaniline	8.23	65	67856	39.70955	ppb		90
50)	Dimethyl phthalate	8.42	163	1529376	209.20841	ppb		99
51)	2,6-DNT	8.50	165	407042	248.12959	ppb	#	70
52)	Acenaphthylene	8.57	152	84016	9.15370	ppb		100
53)	3-Nitroaniline	8.23	138	71247	36.70621	ppb	#	91
54)	Acenaphthene	8.77	154	651076	110.67366	ppb		98
55)	2,4-Dinitrophenol	8.84	184	249983	210.13453	ppb		90
56)	4-Nitrophenol	8.97	65	317527	234.02718	ppb		73
57)	Dibenzofuran	8.97	168	2054520	236.52225	ppb		97
58)	2,4-DNT	8.98	165	603336	257.05006	ppb		98
59)	2,3,4,6-Tetrachlorophenol	9.13	232	367270	220.72830	ppb		96
60)	Diethyl phthalate	9.24	149	970285	135.68973	ppb		99
61)	4-Chlorophenyl phenyl ethe	9.37	204	937502	239.14789	ppb		99
62)	Fluorene	9.37	166	1593864	219.57606	ppb		100
63)	4-Nitroaniline	8.71	138	13008	8.28373	ppb	#	69
66)	4,6-Dinitro-2-methylphenol	9.45	198	348958	55.84509	ppb		87
67)	Diphenyl amine	9.51	169	106706	4.79330	ppb		99
68)	n-Nitrosodiphenylamine	9.51	169	106706	4.79330	ppb		99
70)	4-Bromophenyl phenyl ether	9.94	248	475914	55.65762	ppb		96
71)	Hexachlorobenzene	10.02	284	488643	55.95628	ppb		94
72)	Atrazine	10.26	200	56782	6.92136	ppb	#	33
73)	Pentachlorophenol	10.26	266	275807	52.05820	ppb		97
74)	Phenanthrene	10.49	178	2252796	54.69184	ppb		99
75)	Anthracene	10.55	178	1608824	37.46579	ppb	#	94
77)	Di-n-butylphthalate	11.14	149	1380418	27.93977	ppb		99
79)	Fluoranthene	11.88	202	2013110	42.43690	ppb	#	93
82)	Pyrene	12.15	202	1214962	63.11578	ppb		94
84)	Butyl benzylphthalate	12.89	149	14173	1.59595	ppb		82
85)	3,3'-Dichlorobenzidine	13.50	252	4949	0.80354	ppb	#	44
86)	Benz (a) anthracene	13.54	228	1485762	76.61940	ppb		94
87)	Bis (2-ethylhexyl) phthala	13.55	149	1281656	95.35983	ppb		99
88)	Chrysene	13.58	228	1975641	110.93723	ppb		98
89)	Di-n-octylphthalate	14.28	149	1088544	50.64590	ppb		99
91)	Benzo (b) fluoranthene	14.81	252	2155888	16835.50644	ppb		94
92)	Benzo (k) fluoranthene	14.81	252	2158820	18589.35746	ppb		94
93)	Benzo (a) pyrene	15.26	252	475866	4303.77196	ppb		91
94)	Indeno (1,2,3-cd) pyrene	17.15	276	575957	4367.71506	ppb	#	85
95)	Dibenz (a,h) anthracene	17.16	278	1167033	10258.12272	ppb		92
96)	Benzo (g,h,i) perylene	17.69	276	459610	4392.29707	ppb	#	90

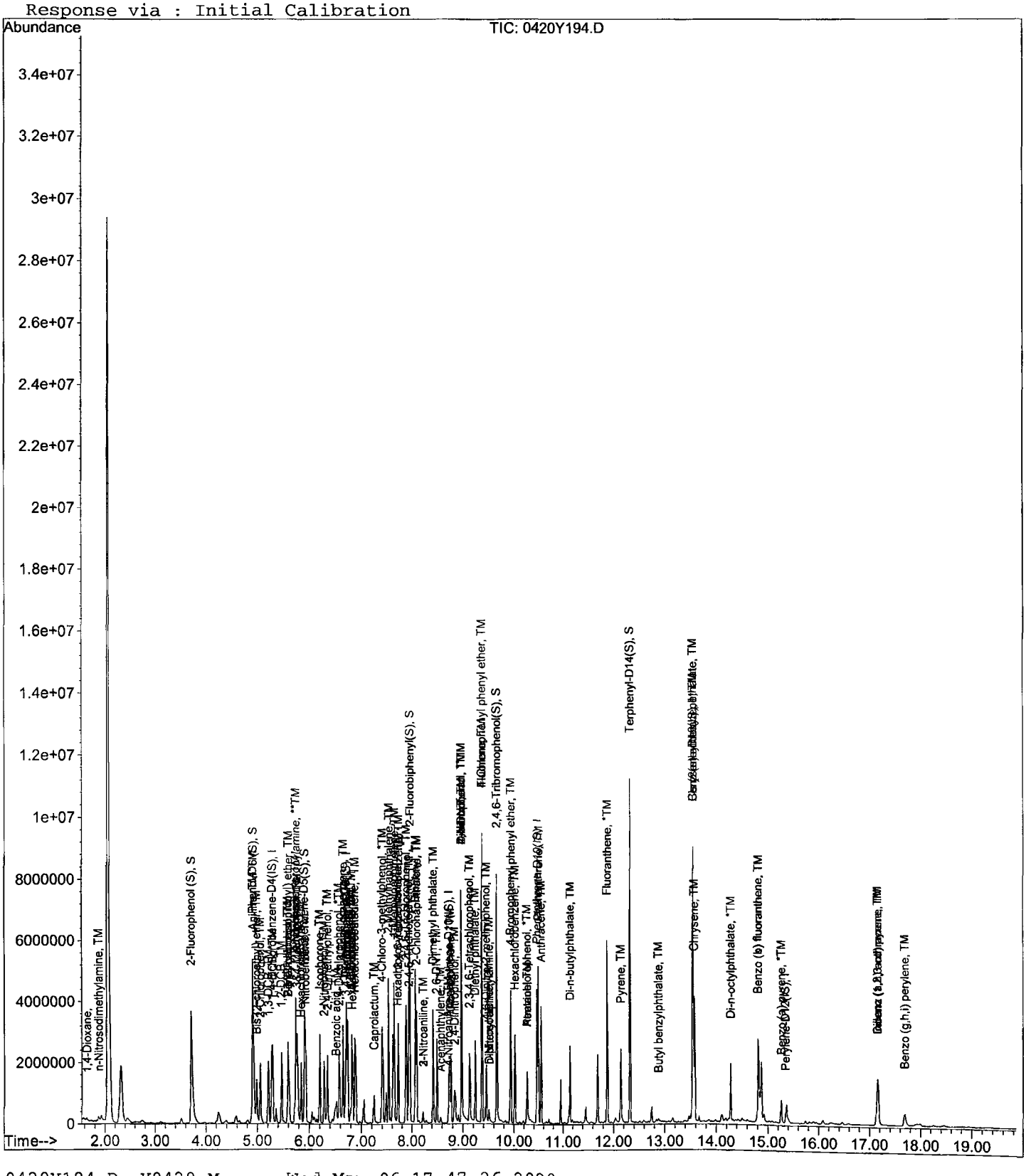
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y194.D Vial: 94
Acq On : 6 May 20 11:37 Operator: MA
Sample : 200504A LCSD-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

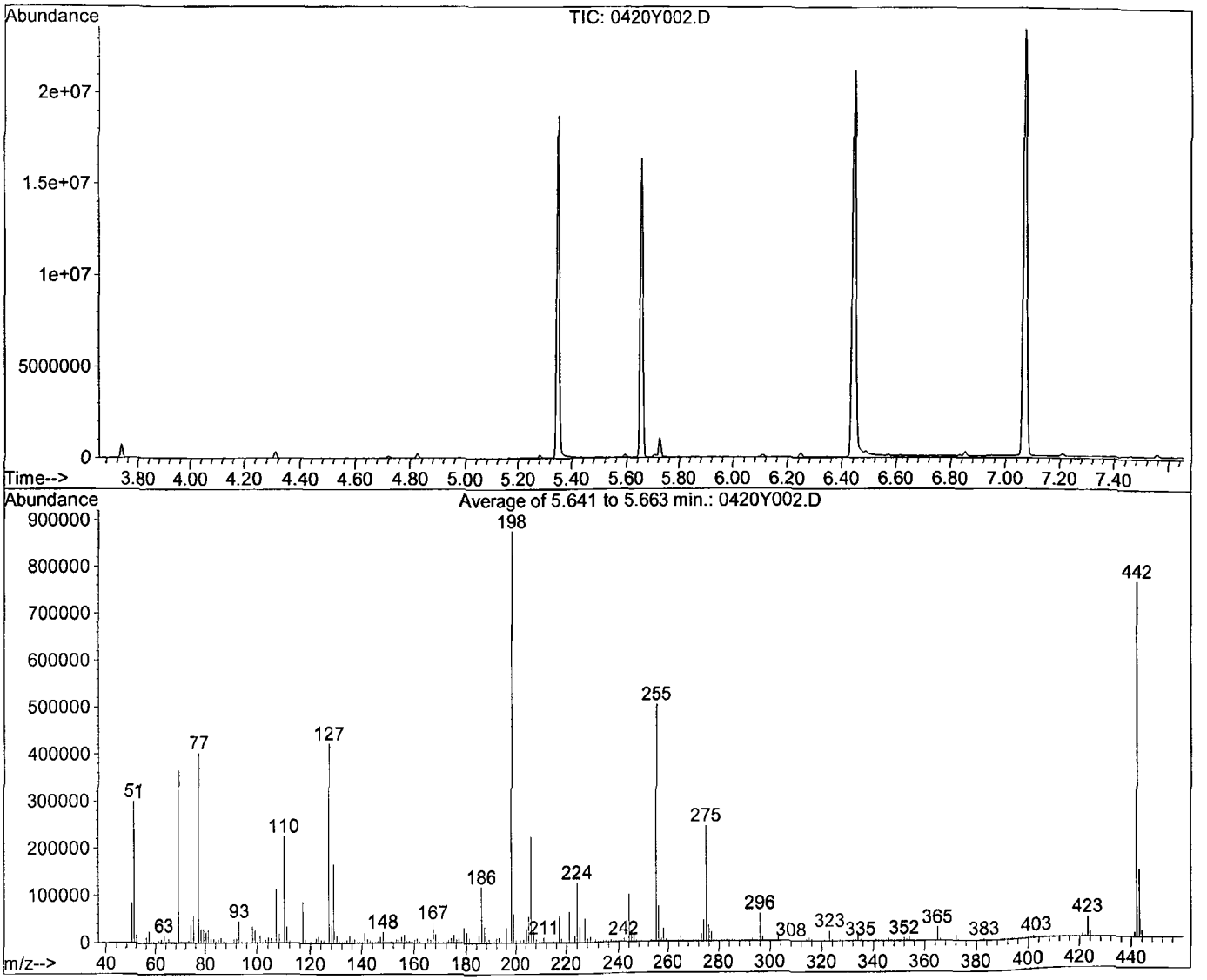
Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Data File : M:\YODA\DATA\Y200420\0420Y002.D
Acq On : 20 Apr 20 9:12
Sample : SV TUNE 10/01/19
Misc :

Vial: 2
Operator: MA
Inst : Yoda
Multiplr: 1.00

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C



Spectrum Information: Average of 5.641 to 5.663 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	34.1	299140	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.8	2967	PASS
127	198	10	80	48.2	422251	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	876450	PASS
199	198	5	9	6.9	60492	PASS
275	198	10	60	27.9	244772	PASS
365	198	1	100	3.2	28377	PASS
441	442	0.01	24	1.3	10096	PASS
442	198	50	500	87.6	767865	PASS
443	442	15	24	19.0	145807	PASS

Data File Name:	**0420Y002.D**
Data File Path:	**M:\YODA\DATA\Y200420**
Operator:	**MA**
Date Acquired:	**20 Apr 2020 09:12**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/01/19**
Vial Number:	**2**
Instrument Name:	**Yoda**

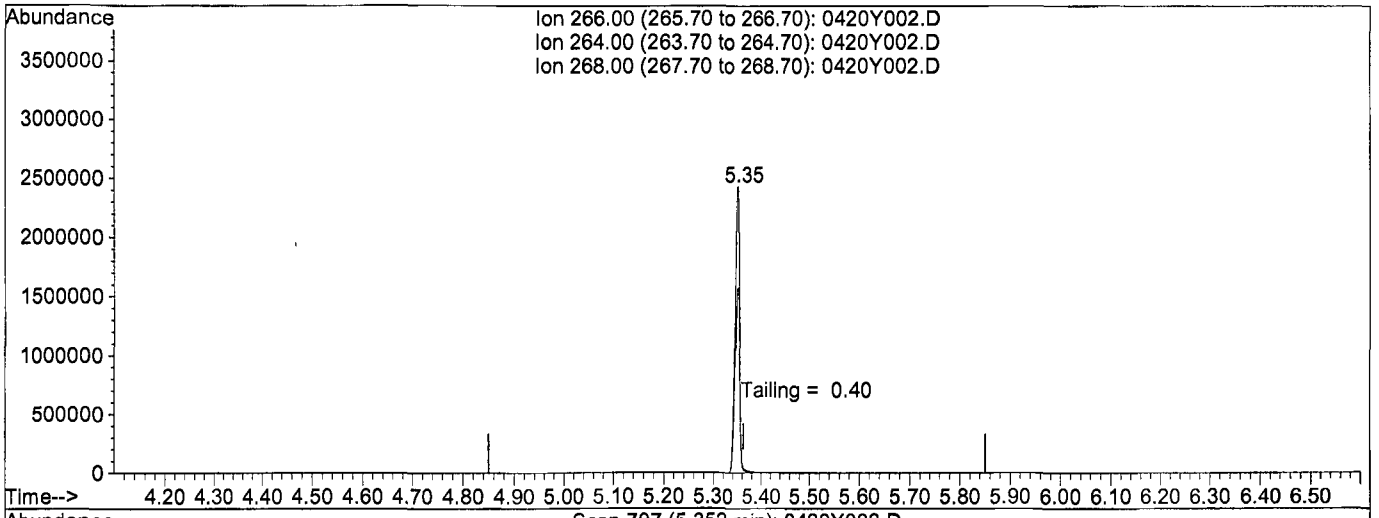
#	Name	Ret Time	Target Response
1)	DDT	7.07	213156000
2)	DDD	6.83	776778
3)	DDE	6.57	433718

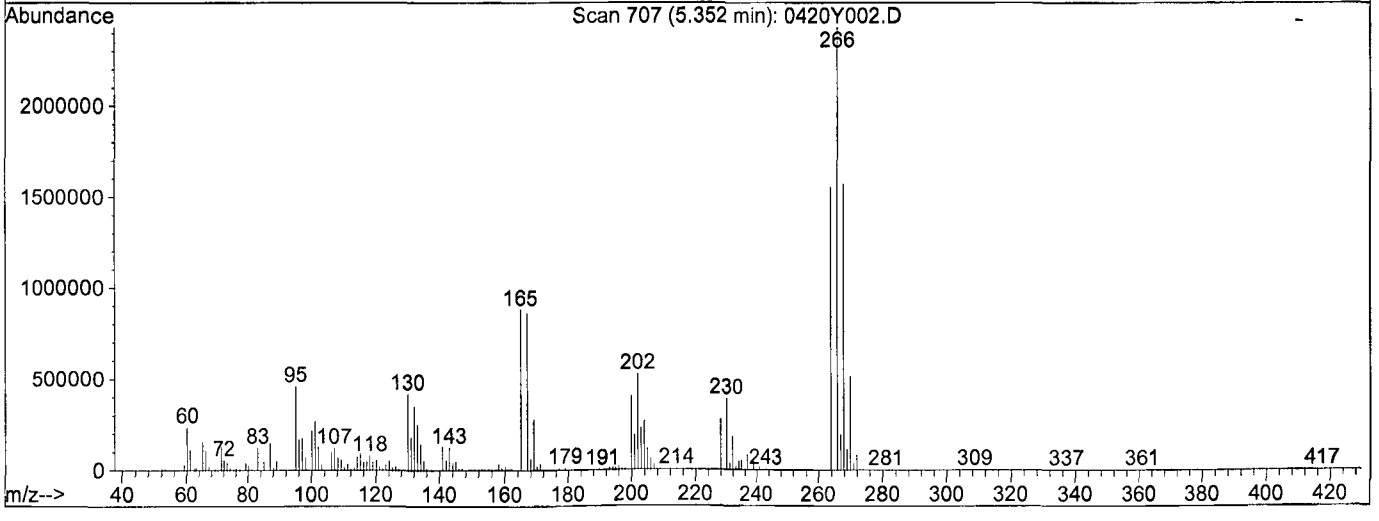
Breakdown **0.56**

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y002.D Vial: 2
Acq On : 20 Apr 20 9:12 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: Apr 20 9:43 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200327\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 20 09:43:48 2020
Response via : Single Level Calibration





TIC: 0420Y002.D

(5) Pentachlorophenol

5.35min 0.0000

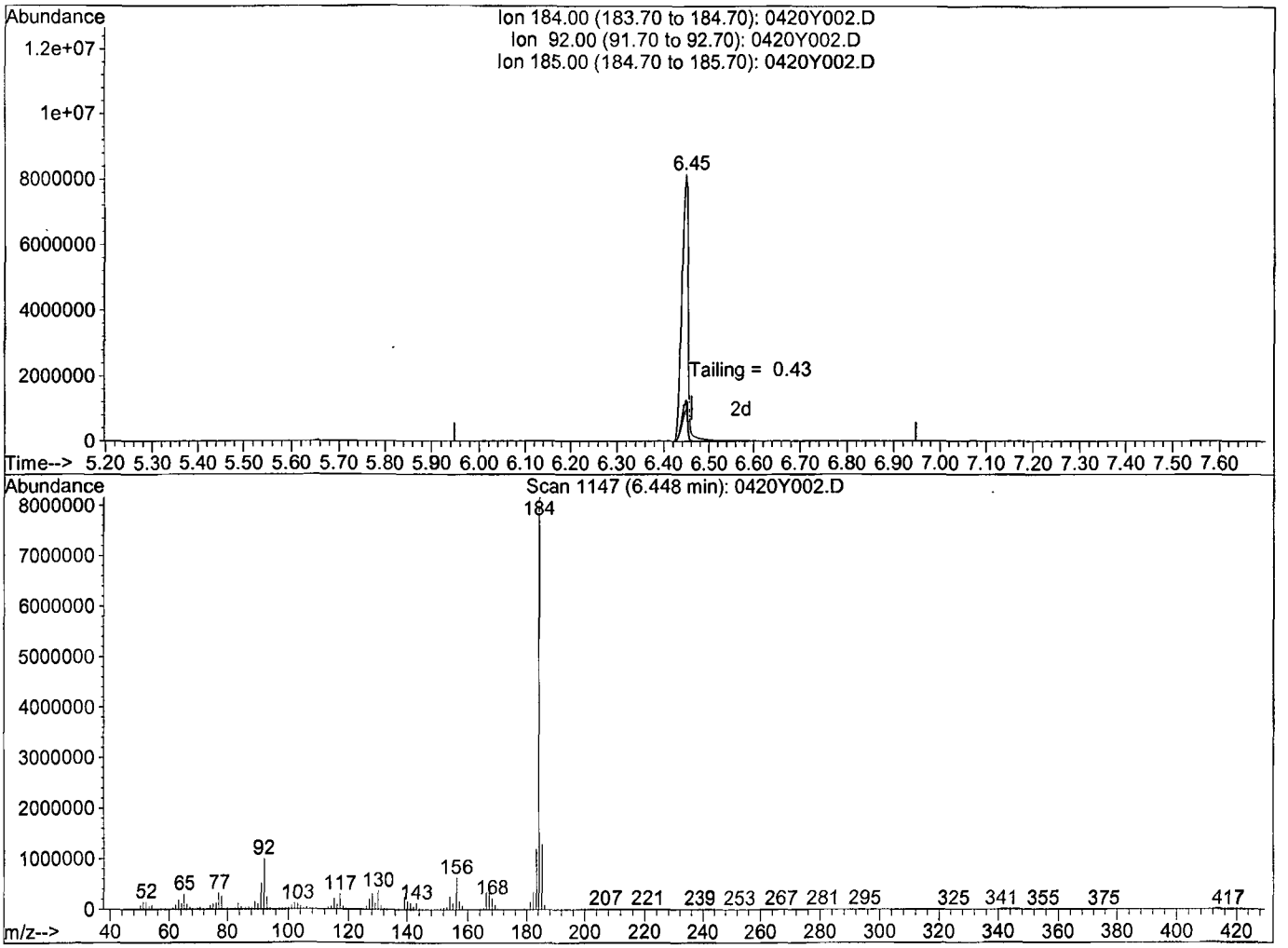
response 17135451

Ion	Exp%	Act%
266.00	100	100
264.00	63.90	62.86
268.00	64.60	63.17
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y002.D Vial: 2
Acq On : 20 Apr 20 9:12 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: Apr 20 9:43 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200327\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 20 09:43:48 2020
Response via : Single Level Calibration



TIC: 0420Y002.D

(6) Benzidine

6.45min 0.0000

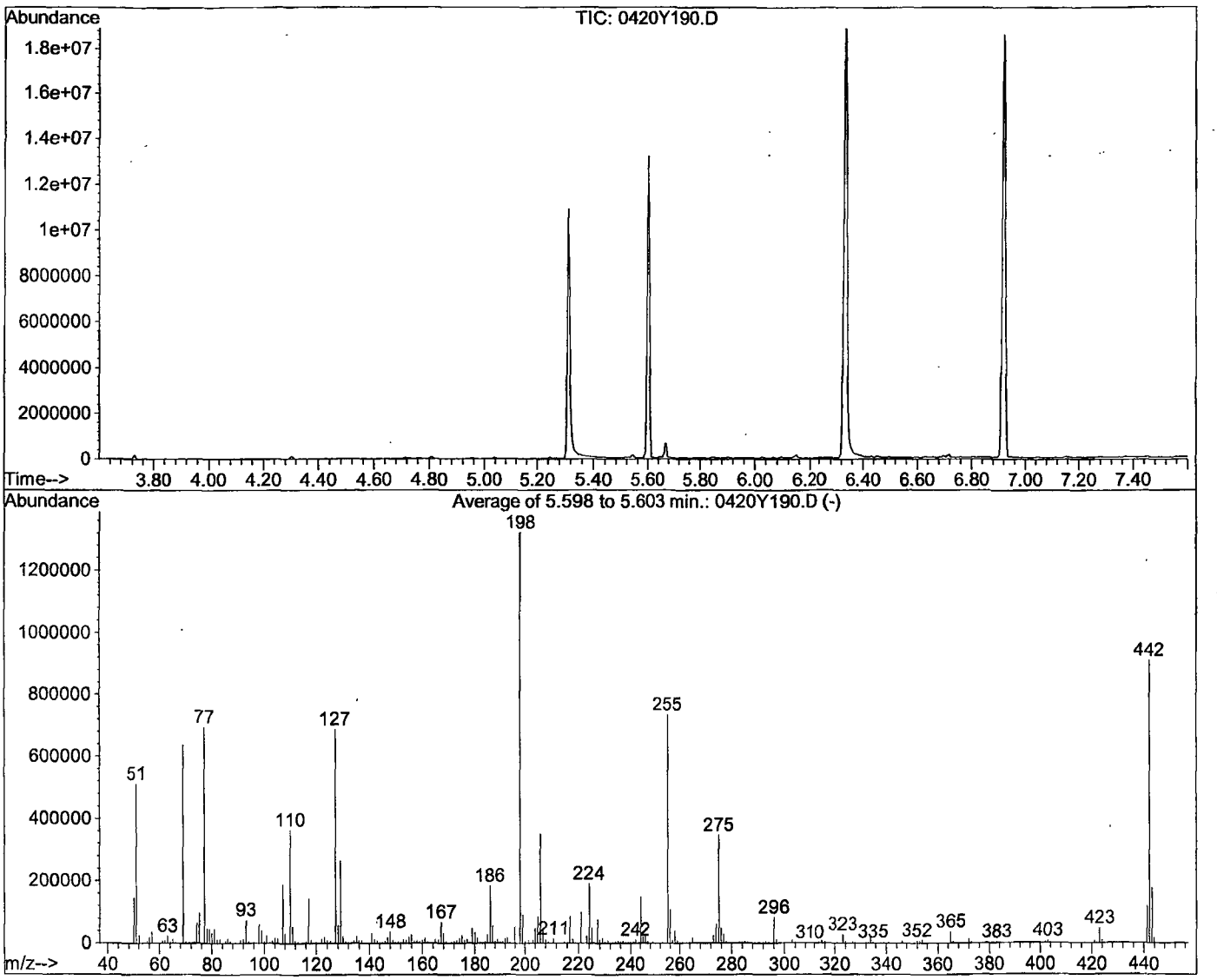
response 81506245

Ion	Exp%	Act%
184.00	100	100
92.00	12.10	10.47
185.00	15.70	14.64
0.00	0.00	0.00

DFTPP

Data File : M:\YODA\DATA\Y200420\0420Y190.D Vial: 90
Acq On : 6 May 20 9:54 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C



AutoFind: Scans 806, 807, 808; Background Corrected with Scan 798

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	38.7	511207	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.6	3836	PASS
127	198	10	80	51.9	686912	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	1322496	PASS
199	198	5	9	6.9	90592	PASS
275	198	10	60	26.2	345920	PASS
365	198	1	100	2.8	37157	PASS
441	442	0.01	24	12.8	116907	PASS
442	198	50	500	68.8	910144	PASS
443	442	15	24	19.5	177045	PASS

Data File Name:	**0420Y190.D**
Data File Path:	**M:\YODA\DATA\Y200420**
Operator:	**MA**
Date Acquired:	**6 May 20 9:54**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/01/19**
Vial Number:	**90**
Instrument Name:	**Yoda**

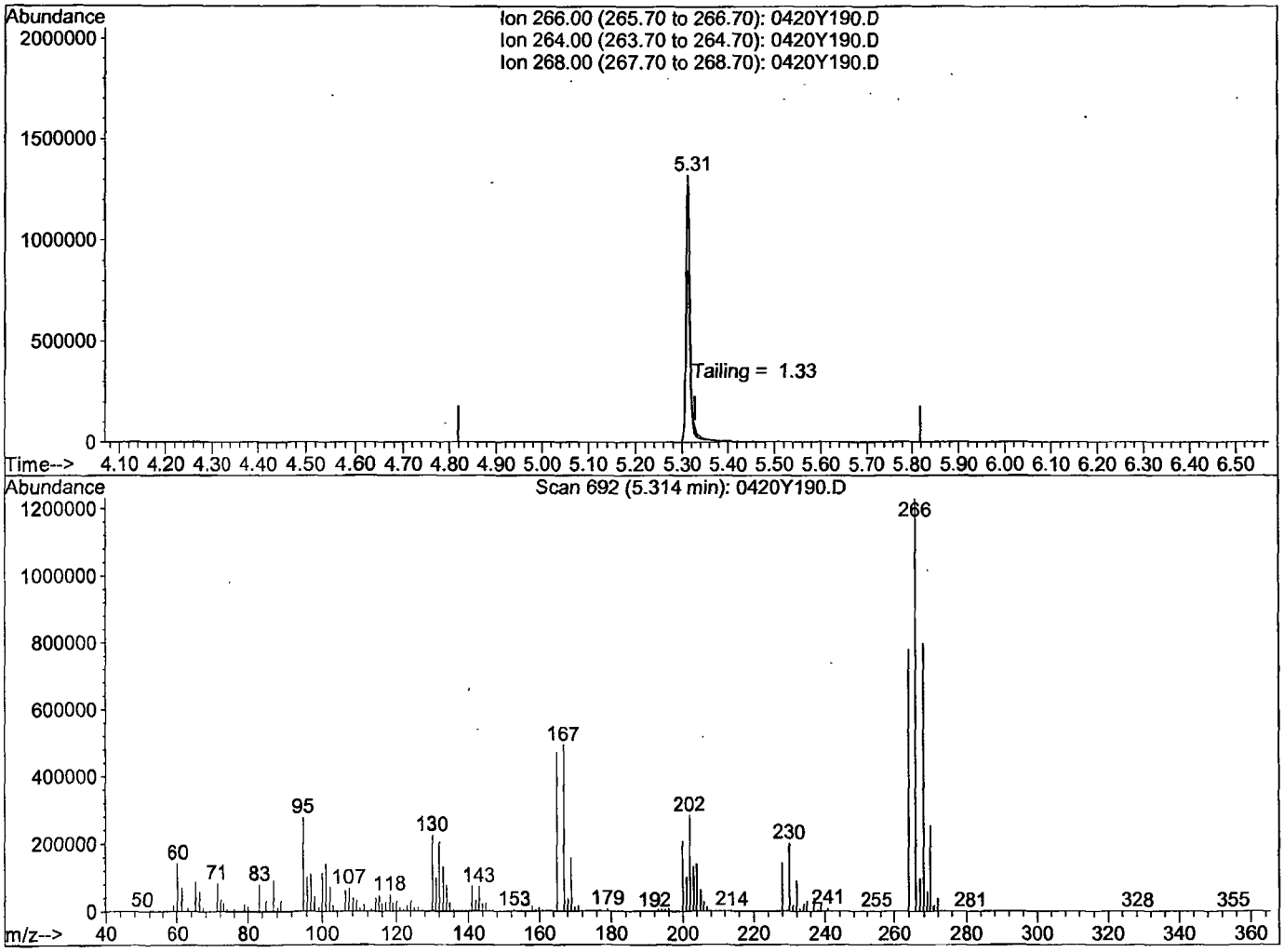
#	Name	Ret Time	Target Response
1)	DDT	6.96	136004000
2)	DDD	6.73	1179160
3)	DDE	6.48	189143

Breakdown **1.00**

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y190.D Vial: 90
Acq On : 6 May 20 9:54 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 9:48 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Tue May 05 14:09:36 2020
Response via : Single Level Calibration



TIC: 0420Y190.D

(5) Pentachlorophenol

5.31min 0.0000

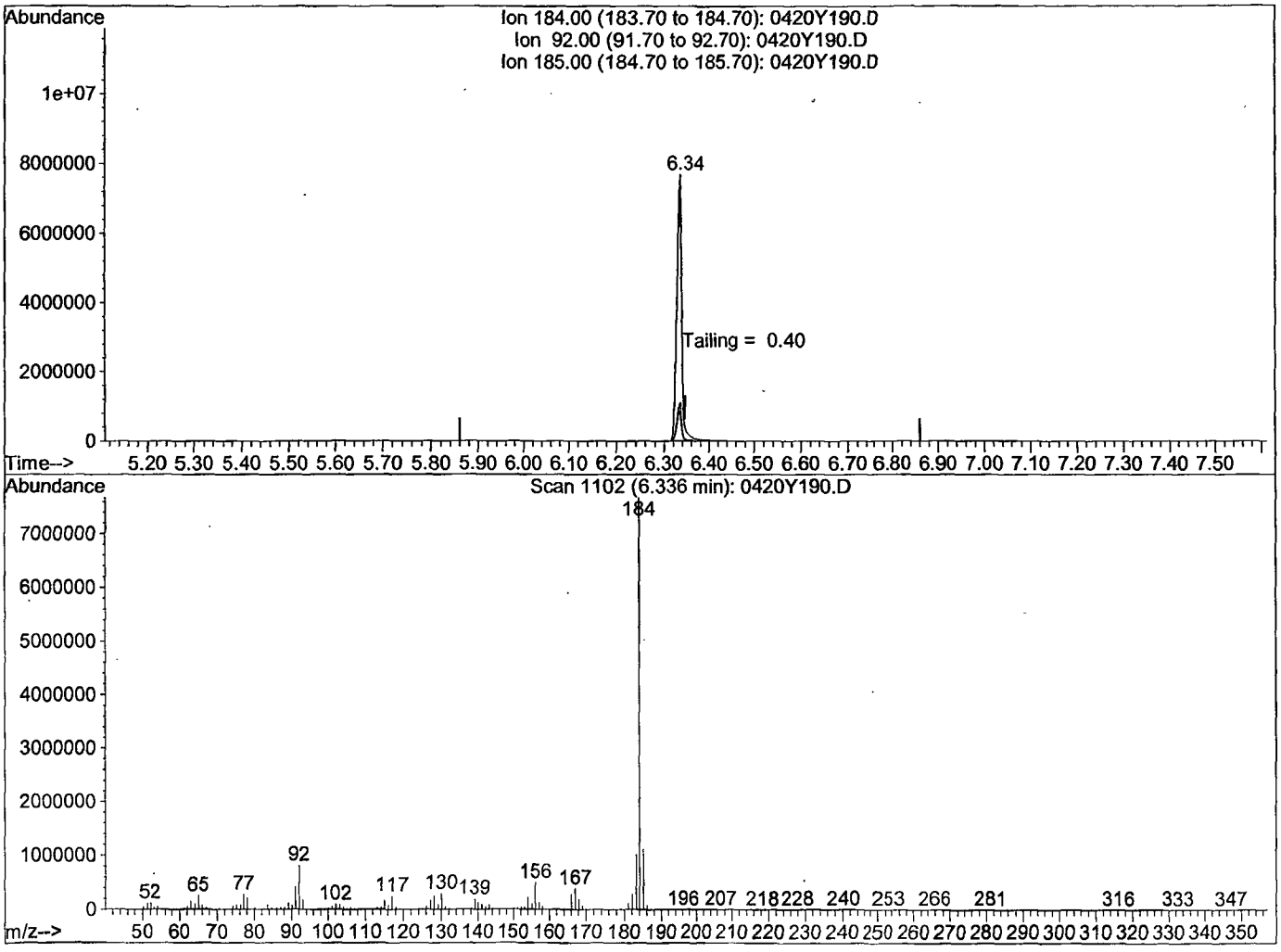
response 8641789

Ion	Exp%	Act%
266.00	100	100
264.00	63.70	63.20
268.00	63.60	63.10
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y190.D Vial: 90
Acq On : 6 May 20 9:54 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 9:48 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Tue May 05 14:09:36 2020
Response via : Single Level Calibration



TIC: 0420Y190.D

(6) Benzidine

6.34min 0.0000

response 59996713

Ion	Exp%	Act%
184.00	100	100
92.00	11.50	10.52
185.00	14.60	14.28
0.00	0.00	0.00

Name of Final Standard: **8270 Full Scan Standard Curve** Prep'd By (initials): JP

Prep Date: 03/04/20
Exp Date: 03/03/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
8270 Working Stock	APPL	8270 Working Stock	50:100 ug/mL	03/03/20	03/03/21	8 uL	200uL	MC DW717 188 uL	4 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	8 uL	200uL	MC DW717 187 uL	5 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	5 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	8 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	8 uL	100uL	MC DW717 87 uL	10 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	5 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	16 uL	100uL	MC DW717 74 uL	20 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	10 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	32 uL	100uL	MC DW717 48 uL	40 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	20 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	80 uL	200 uL	MC DW717 70 uL	50 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	50 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	48 uL	100uL	MC DW717 22 uL	60 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	30 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	64 uL	100uL	MC DW717 28 uL	80 ug/mL
8270 Surrogate Stock	APPL	8270 Surrogate Stock	1000:2000 ug/mL	03/03/20	03/03/21	8 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	80 uL	100uL	MC DW717 10 uL	100 ug/mL
8270 Surrogate Stock	APPL	8270 Surrogate Stock	1000:2000 ug/mL	03/03/20	03/03/21	10 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"

Name of Final Standard: **8270 Full Scan Second Source** Prep'd By (Initials): JP

Prep Date: 03/04/20
Exp Date: 06/30/20

Initial Standard Information						Final Standard Information			
(from container Label)	Supplier	APPL Mix Name)	Conc.(range)	APPL prep date)	Exp Date	Stock	Volume	APPL Prep Date)	Conc (range)
8270 SS Stock	APPL	8270 SS Stock	100:50 ug/mL	11/20/19	06/30/20	100 uL	200uL	MC DW717 100uL	50:25 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	50 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"

Name of Final Standard	8270 Stock	Prep'd By (Initials)	JP
Prep Date	03/03/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
10001	Absolute	10001	2000	081419-49297	08/14/22	1.0 mL	16 mL	MC DW717 5mL	125 ug/mL
10002	Absolute	10002	2000	90919-49206	09/09/22	1.0 mL	*	*	125 ug/mL
10004	Absolute	10004	2000	071618-49216	07/16/23	1.0 mL	*	*	125 ug/mL
10005	Absolute	10005	2000	032018-40226	03/20/23	1.0 mL	*	*	125 ug/mL
10006	Absolute	10006	2000	030119-49237	03/01/22	1.0 mL	*	*	125 ug/mL
10007	Absolute	10007	2000	080116-40247	08/01/21	1.0 mL	*	*	125 ug/mL
10018	Absolute	10018	2000	021719-49257	05/17/24	1.0 mL	*	*	125 ug/mL
70023	Absolute	70023	1000	012819-49273	01/28/24	1.0 mL	*	*	62.5 ug/mL
82705	Absolute	82705	2000	090919-49288	09/09/22	1.0 mL	*	*	125 ug/mL
94552	Absolute	94552	various	111319-49576	05/31/21	1.0 mL	*	*	various
72304	Absolute	70023	1000	090519-49479	09/05/24	1.0 mL	*	*	62.5 ug/mL

Name of Final Standard	8270 Working Stock	Prep'd By (Initials)	JP
Prep Date	03/03/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	2.5 mL	4 mL	MC DW717 1.5 mL	100 ug/mL

Name of Final Standard	8270 Surrogate Stock	Prep'd By (Initials)	JP
Prep Date	03/03/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
8270 Acid Surrogate Mix	Restek	33029	10,000 ug/mL	A0152714-49437	09/30/27	10 mL	50 mL	MC DW717 30 mL	2000 ug/mL
8270 B/N Surrogate Mix	Restek	31086	5000 ug/mL	A0153473-49443	08/31/25	10 mL	*	*	1000 ug/mL

Name of Final Standard	8270 Working Surrogate Stock	Prep'd By (Initials)	JP
Prep Date	03/03/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
8270 Surrogate Stock	APPL	8270 Surrogate Stock	2000:1000 ug/mL	03/03/20	03/03/21	1.5 mL	7.5 mL	MC DW717 6 mL	400 200 ug/mL

Name of Final Standard	8270 Internal Standard Ampules (2)	Prep'd By (Initials)	MA
Prep Date	11/20/19		
Exp Date	11/20/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Semivolatile Internal Standard	Restek	31206	2000 ug/mL	AO157142-49871,872,873	07/31/25	3 mL	3 mL	NA	2000ug/mL

Name of Final Standard	8270 SS STOCK	Prep'd By (Initials)	JP
Prep Date	11/20/19		
Exp Date	06/30/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
10001	Absolute	10001	2000 ug/mL	051019-40534	05/10/21	1.0 mL	20 mL	**Methanol Lot 208858**	100 ug/mL
10002	Absolute	10002	2000 ug/mL	020217-39199	06/30/20	1.0 mL	*	*	100 ug/mL
10004	Absolute	10004	2000 ug/mL	051018-39196	05/10/21	1.0 mL	*	*	100 ug/mL
10005	Absolute	10005	2000 ug/mL	031618-39207	03/16/23	1.0 mL	*	*	100 ug/mL
10006	Absolute	10006	2000 ug/mL	011718-39208	01/17/21	1.0 mL	*	*	100 ug/mL
10007	Absolute	10007	2000 ug/mL	060118-39213	06/01/23	1.0 mL	*	*	100 ug/mL
10018	Absolute	10018	2000 ug/mL	062718-40535	06/27/23	1.0 mL	*	*	100 ug/mL
70023	Absolute	70023	1000 ug/mL	051618-39214	05/16/23	1.0 mL	*	*	50 ug/mL
82705	Absolute	82705	2000 ug/mL	090617-40540	09/06/20	1.0 mL	*	*	100 ug/mL
94552	Absolute	94552	various	013118-40542	06/30/20	1.0 mL	*	*	various
72304	Absolute	72304	1000 ug/mL	110719-49477	11/07/24	1.0 mL	*	*	50 ug/mL

10002 lot 020217-39199 was re-certified with 10002 lot 90919-49206, injected in Yoda Seq Y200327/0327Y013

94552 lot 013118-40542was re-certified with 94552 lot 111319-49576, injected in Yoda Seq Y200327/0327Y013

Name of Final Standard	8270 Full Scan CCV	Prop'd By (Initials)	MA
Prop Date	03/30/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	80 uL	200 uL	MC DW717 70 uL	50 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	50 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"

Name of Final Standard	Semivolatile (SV) Tuning Solution	Prep'd By (Initials)	JP
Prep Date	10/01/19		
Exp Date	11/30/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Semivolatile GC/MS Tuning Standard	Ultra Scientific	GCM-150-1	1,000 ug/mL	CR3789A-41241	11/30/20	1,250 uL	25 mL	MC #58240	50 ug/mL

Name of Final Standard	**8270 Full Scan Spike**	Prep'd By (Initials)	**MA**
Prep Date	04/01/20		
Exp Date	04/01/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
10001	Absolute	10001	2000	081419 - 49569, 49570	08/14/22	2.0 mL	80 mL	**Methanol Lot# 235140**	50 ug/mL
10002	Absolute	10002	2000	090919-49205, 49810	09/09/22	2.0 mL	*	*	50 ug/mL
10004	Absolute	10004	2000	071618-49215, 103119-49814	07/16/23	2.0 mL	*	*	50 ug/mL
10005	Absolute	10005	2000	032018-40225, 49800	03/20/23	2.0 mL	*	*	50 ug/mL
10006	Absolute	10006	2000	030119-49236, 110119-49818	03/01/22	2.0 mL	*	*	50 ug/mL
10007	Absolute	10007	2000	080116-40246, 080116-49805	08/01/21	2.0 mL	*	*	50 ug/mL
10018	Absolute	10018	2000	091919-49564, 49565	01/19/24	2.0 mL	*	*	50 ug/mL
70023	Absolute	70023	1000	012819-49272, 112119-49822	01/28/24	2.0 mL	*	*	25 ug/mL
82705	Absolute	82705	2000	090919--49287, 49826	09/09/22	2.0 mL	*	*	50 ug/mL
94552	Absolute	94552	various	111319-49577, 49799	11/13/21	2.0 mL	*	*	various

_LIQ003

Organic Extraction Worksheet

Method	Continuous Liquid/Liquid SVOC 3520C	Extraction Set	200504A	Extraction Method	LIQ003	Units	mL

Spiked ID 1	8270T Spike 4-1-20 4-1-21	Surrogate ID 1	8270 Surrogate 4-15-20 3-2-21		
Spiked ID 2	Sim Spike 4-1-20 4-1-21	Surrogate ID 2	SIM Surrogate 4-1-20 4-1-21		
Spiked ID 3		Surrogate ID 3			
Spiked ID 4		Surrogate ID 4			
Spiked ID 5		Surrogate ID 5			
Spiked ID 6		Sufficient Vol for Matrix QC:	NO		
Spiked ID 7		Ext. Start Time:	05/04/20 12:20		
Spiked ID 8		Ext. End Time:	05/05/20 7:00		
		GC Requires Extract By:			

pH1	2	05/04/20 11:15	Water Bath Temp 1 °C	75/74.9 E-WB6 °
pH2	14	05/05/20 10:15	Water Bath Temp 2 °C	
pH3			Water Bath Temp 3 °C	

Spiked By: KY **Date** 05/04/20 **Witnessed By:** CFM **Date** 05/04/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200504A Blk				1,0.050	1,2	800	1	2/1	05/04/20 11:00	
						equip	E-HP51 E-WB6				
2	200504A LCS-1		1	1	1	1	800	1	2/1	05/04/20 11:00	
						equip	E-HP50 E-WB6				
3	200504A LCS-2		0.125	2	0.050	2	800	1	2/1	05/04/20 11:00	
						equip	E-HP49 E-WB6				
4	200504A LCSD-1		1	1	1	1	800	1	2/1	05/04/20 11:00	
						equip	E-HP48 E-WB6				
5	200504A LCSD-2		0.125	2	0.050	2	800	1	2/1	05/04/20 11:00	
						equip	E-HP47 E-WB6				
6	BA10439	BA10439W19			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92025
						equip	E-HP25 E-WB6				
7	BA10504	BA10504W18			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92039
						equip	E-HP26 E-WB6				
8	BA10505	BA10505W11			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92039
						equip	E-HP27 E-WB6				

Solvent and Lot#	
PH Strips	HC998032
Dichloromethane (DCM)	59239
1+1 H2SO4	4-2-20
10N NaOH	4-2-20
Filter Paper	400171
Na2SO4	2019070279

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	05/05/20
Time	7:30
Refrigerator	GC-C

	Technician's Initials
Scanned By	DL
Sample Preparation	KY,DL
Extraction	KY,DL
Concentration	DL

Modified	05/07/20 8:44:51 AM

Reviewed By: KY **Date** 05/07/20

05/12/20 2:26:31 PM Ext_ID 66880

Injection Log

Directory: M:\YODA\DATA\Y200420\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
2	0420Y002.D	1	SV TUNE 10/01/19		20 Apr 20 9:12
3	0420Y003.D	1	4ug/ml 8270 3/4/20		20 Apr 20 9:28
4	0420Y004.D	1	5ug/ml 8270 3/4/20		20 Apr 20 9:57
5	0420Y005.D	1	10ug/ml 8270 3/4/20		20 Apr 20 10:31
6	0420Y006.D	1	20ug/ml 8270 3/4/20		20 Apr 20 11:00
7	0420Y007.D	1	40ug/ml 8270 3/4/20		20 Apr 20 11:28
8	0420Y008.D	1	50ug/ml 8270 3/4/20		20 Apr 20 11:57
9	0420Y009.D	1	60ug/ml 8270 3/4/20		20 Apr 20 12:26
10	0420Y010.D	1	80ug/ml 8270 3/4/20		20 Apr 20 12:55
11	0420Y011.D	1	100ug/ml 8270 3/4/20		20 Apr 20 13:24
12	0420Y012.D	1	SS 8270 3/4/20		20 Apr 20 13:53
90	0420Y190.D	1	SV TUNE 10/01/19		6 May 20 9:54
91	0420Y191.D	1	50ug/ml 8270 3/30/20 (3)		6 May 20 10:10
92	0420Y192.D	1.25	200504A BLK 1/800		6 May 20 10:40
93	0420Y193.D	1.25	200504A LCS-1 1/800		6 May 20 11:09
94	0420Y194.D	1.25	200504A LCSD-1 1/800		6 May 20 11:37
95	0420Y195.D	1.25	BA10439W19 1/800		6 May 20 12:06
98	0420Y198.D	1	50ug/ml 8270 3/30/20 (5)		6 May 20 13:32

ORGANICS
Calibration Data

PAH by GCMS SIM
EPA 8270 SIM

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 02/04/20
Matrix: Instrument: Linus Initials: MA

0204L003.D 0204L004.D 0204L005.D 0204L006.D 0204L007.D 0204L008.D 0204L009.D 0204L010.D

		Compound	0.1	0.2	0.5	1	5	10	50	100			Avg	%RSD	Type	r^2	Q	MRF
1	I	Napthalene-D8(IS)																
2	TM	Naphthalene	1.120	1.131	1.072	1.083	1.129	1.047	0.9772	0.9334			1.1	6.9	TM			0.700
3	S	2-Methylnaphthalene-D10 (2M	1.257	1.211	1.175	1.198	1.255	1.218	1.180	1.133			1.2	3.5	S			
4	TM	2-Methylnaphthalene	0.6849	0.6892	0.6742	0.6957	0.7468	0.6960	0.6554	0.6145			0.68	5.5	TM			0.400
5	TM	1-Methylnaphthalene	0.7412	0.7479	0.7192	0.7336	0.7676	0.7029	0.6628	0.6175			0.71	7.0	TM			
6	I	Acenaphthene-D10(IS)																
7	TM	Acenaphthylene	3.869	3.855	3.806	3.892	4.393	4.113	3.818	3.434			3.9	7.0	TM			0.900
8	*TM	Acenaphthene	1.372	1.277	1.234	1.238	1.309	1.218	1.155	1.036			1.2	8.3	*TM			0.900
9	TM	Fluorene	1.476	1.471	1.412	1.485	1.636	1.549	1.427	1.385			1.5	5.5	TM			0.900
10	I	Phenanthrene-D10(IS)																
11	TM	Phenanthrene	1.231	1.222	1.179	1.198	1.290	1.205	1.041	0.9371			1.2	9.9	TM			0.700
12	TM	Anthracene	1.002	1.028	0.9886	1.045	1.160	1.099	0.9848	0.8800			1.0	8.1	TM			0.700
13	S	Fluoranthene-D10 (FRT)	1.457	1.470	1.320	1.355	1.491	1.476	1.437	1.389			1.4	4.4	S			
14	*TM	Fluoranthene	1.604	1.635	1.531	1.601	1.817	1.668	1.480	1.357			1.6	8.6	*TM			0.600
15	I	Chrysene-D12(IS)																
16	TM	Pyrene	1.291	1.315	1.240	1.301	1.386	1.308	1.220	1.113			1.3	6.4	TM			0.600
17	TM	Benz (a) anthracene	1.177	1.123	1.047	1.077	1.191	1.159	1.141	1.081			1.1	4.6	TM			0.800
18	TM	Chrysene	1.461	1.411	1.370	1.360	1.367	1.267	1.174	1.065			1.3	10	TM			0.700
19	TM	Indeno (1,2,3-cd) pyrene	1.438	1.382	1.382	1.402	1.574	1.526	1.551	1.517			1.5	5.4	TM			0.500
20	I	Perylene-D12(IS)																
21	TM	Benzo (b) fluoranthene	0.8206	0.8277	0.8502	0.9180	1.141	1.084	1.118	1.129			0.99	15	TM			0.700
22	TM	Benzo (k) fluoranthene	1.252	1.341	1.294	1.323	1.396	1.330	1.094	1.089			1.3	9.1	TM			0.700
23	*TM	Benzo (a) pyrene	0.8229	0.8399	0.9301	0.9711	1.126	1.087	1.069	1.029			0.98	12	*TM			0.700
24	TM	Dibenz (a,h) anthracene	0.9746	0.9893	0.9980	1.034	1.209	1.157	1.169	1.136			1.1	8.7	TM			0.400
25	TM	Benzo (g,h,i) perylene	1.063	1.069	1.094	1.118	1.274	1.216	1.188	1.145			1.1	6.5	TM			0.500
26																		
27																		
28																		
29																		
30																		
31																		
32																		
33																		
34																		
35																		

Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L003.D Vial: 3
Acq On : 4 Feb 20 9:48 Operator: MA
Sample : 0.1 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:38:46 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	98990	2.50000 ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	52942	2.50000 ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	98572	2.50000 ppb		0.00
15) Chrysene-D12(IS)	11.01	240	123137	2.50000 ppb		0.00
20) Perylene-D12(IS)	13.43	264	142515	2.50000 ppb		0.00
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.96	152	2488	0.05046 ppb		0.00
Spiked Amount 5.000			Recovery =	1.000%		
13) Fluoranthene-D10 (FRT)	9.28	212	2873	0.04174 ppb		0.00
Spiked Amount 5.000			Recovery =	0.840%		
Target Compounds						Qvalue
2) Naphthalene	4.21	128	4434	0.09312 ppb		99
4) 2-Methylnaphthalene	5.00	142	2712	0.09372 ppb		100
5) 1-Methylnaphthalene	5.11	142	2935	0.09787 ppb		97
7) Acenaphthylene	6.02	152	8194	0.08489 ppb		100
8) Acenaphthene	6.22	154	2905	0.10261 ppb		96
9) Fluorene	6.82	166	3126	0.09002 ppb		94
11) Phenanthrene	7.93	178	4855	0.08909 ppb		99
12) Anthracene	7.99	178	3951	0.08269 ppb		98
14) Fluoranthene	9.30	202	6323	0.08364 ppb	#	92
16) Pyrene	9.57	202	6359	0.07717 ppb	#	94
17) Benz (a) anthracene	11.00	228	5798	0.08414 ppb		99
18) Chrysene	11.04	228	7198	0.09744 ppb		99
19) Indeno (1,2,3-cd) pyrene	14.93	276	7083	0.09610 ppb	#	99
21) Benzo (b) fluoranthene	12.79	252	4678	0.06579 ppb	#	99
22) Benzo (k) fluoranthene	12.85	252	7135	0.09052 ppb		98
23) Benzo (a) pyrene	13.35	252	4691	0.07030 ppb		98
24) Dibenz (a,h) anthracene	14.97	278	5556	0.08385 ppb		99
25) Benzo (g,h,i) perylene	15.29	276	6060	0.08386 ppb		97

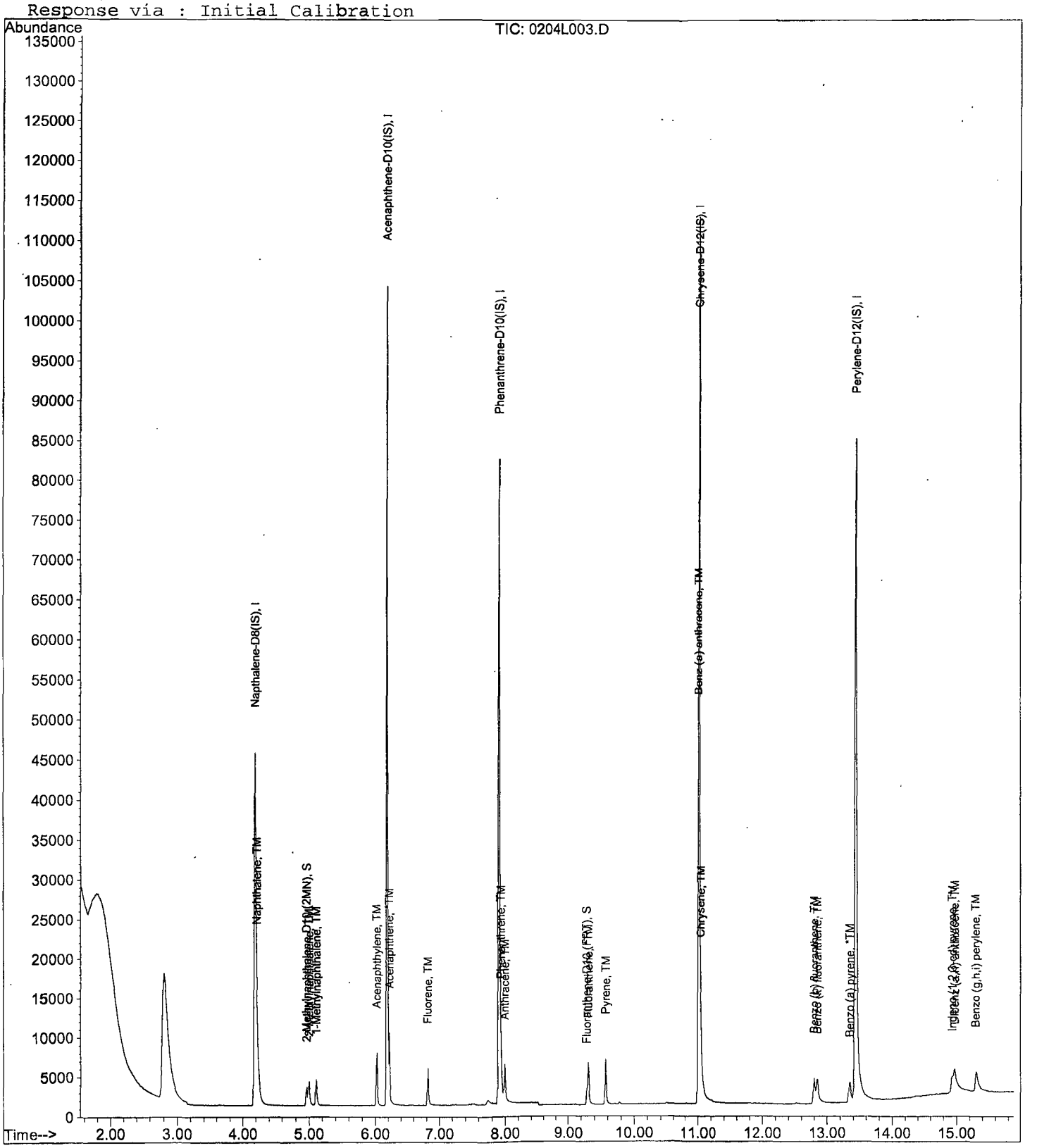
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L003.D Vial: 3
Acq On : 4 Feb 20 9:48 Operator: MA
Sample : 0.1 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L004.D Vial: 4
Acq On : 4 Feb 20 10:09 Operator: MA
Sample : 0.2 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	95871	2.50000	ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	51059	2.50000	ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	94452	2.50000	ppb		0.00
15) Chrysene-D12(IS)	11.01	240	119835	2.50000	ppb		0.00
20) Perylene-D12(IS)	13.43	264	136582	2.50000	ppb		0.00
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.96	152	4644	0.09724	ppb		0.00
Spiked Amount 5.000			Recovery = 1.940%				
13) Fluoranthene-D10 (FRT)	9.28	212	5554	0.08422	ppb		0.00
Spiked Amount 5.000			Recovery = 1.680%				
Target Compounds							Qvalue
2) Naphthalene	4.21	128	8673	0.18807	ppb		99
4) 2-Methylnaphthalene	5.00	142	5286	0.18862	ppb		99
5) 1-Methylnaphthalene	5.11	142	5736	0.19749	ppb		100
7) Acenaphthylene	6.02	152	15747	0.16915	ppb		99
8) Acenaphthene	6.22	154	5216	0.19104	ppb		99
9) Fluorene	6.82	166	6007	0.17936	ppb		96
11) Phenanthrene	7.93	178	9231	0.17678	ppb		99
12) Anthracene	7.99	178	7770	0.16971	ppb		99
14) Fluoranthene	9.30	202	12353	0.17053	ppb	#	93
16) Pyrene	9.57	202	12608	0.15723	ppb	#	91
17) Benz (a) anthracene	11.00	228	10767	0.16055	ppb		99
18) Chrysene	11.04	228	13529	0.18818	ppb		99
19) Indeno (1,2,3-cd) pyrene	14.92	276	13247	0.18469	ppb	#	100
21) Benzo (b) fluoranthene	12.79	252	9044	0.13271	ppb		99
22) Benzo (k) fluoranthene	12.85	252	14654	0.19398	ppb		98
23) Benzo (a) pyrene	13.35	252	9177	0.14350	ppb	#	97
24) Dibenz (a,h) anthracene	14.97	278	10810	0.17022	ppb		99
25) Benzo (g,h,i) perylene	15.29	276	11681	0.16867	ppb		98

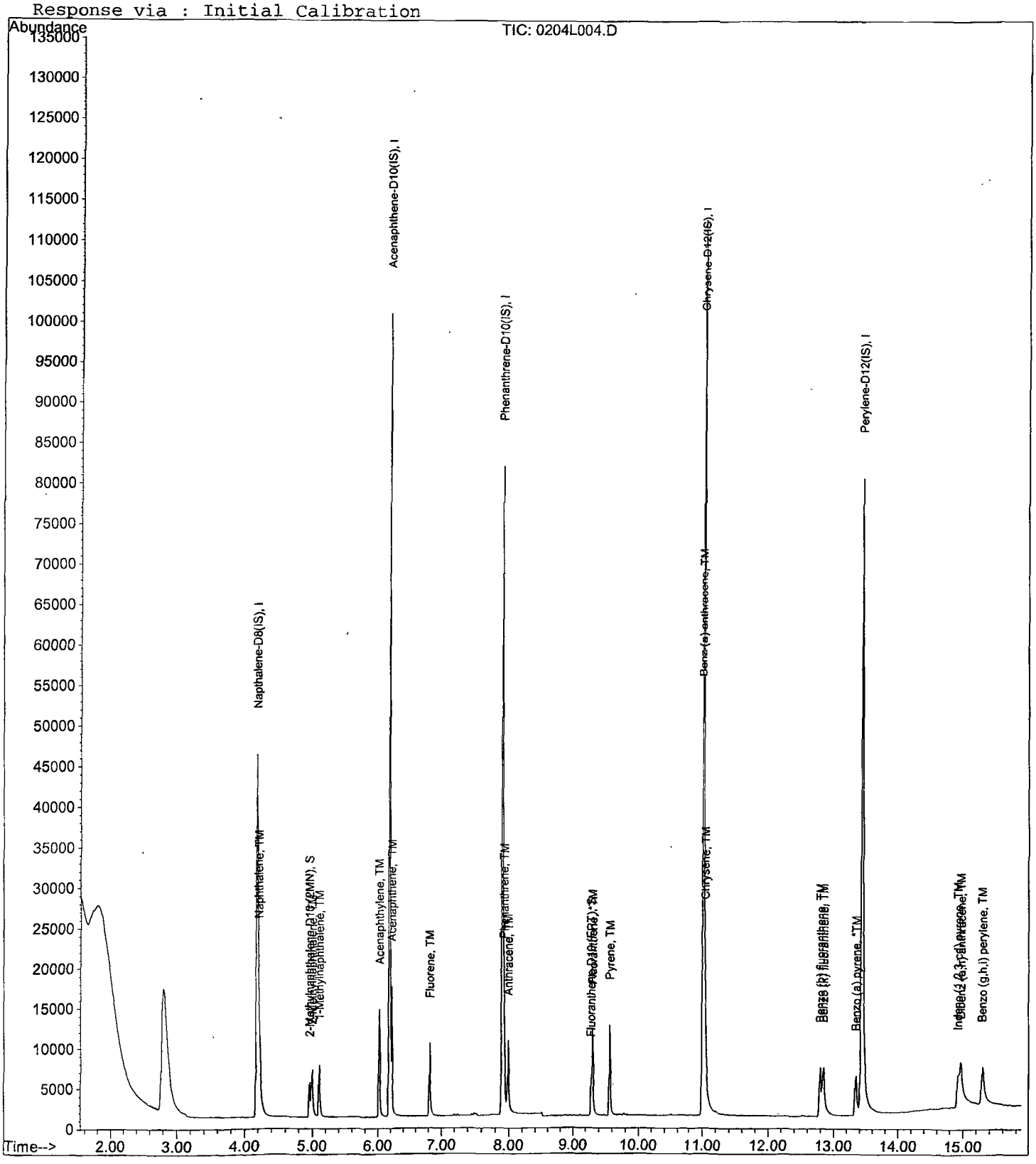
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L004.D Vial: 4
Acq On : 4 Feb 20 10:09 Operator: MA
Sample : 0.2 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L005.D Vial: 5
Acq On : 4 Feb 20 10:31 Operator: MA
Sample : 0.5 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	93485	2.50000 ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	49653	2.50000 ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	91991	2.50000 ppb		0.00
15) Chrysene-D12(IS)	11.01	240	112785	2.50000 ppb		0.00
20) Perylene-D12(IS)	13.43	264	128599	2.50000 ppb		0.00
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.96	152	10986	0.23591 ppb		0.00
Spiked Amount 5.000			Recovery	= 4.720%		
13) Fluoranthene-D10 (FRT)	9.28	212	12142	0.18904 ppb		0.00
Spiked Amount 5.000			Recovery	= 3.780%		
Target Compounds						Qvalue
2) Naphthalene	4.21	128	20052	0.44592 ppb		100
4) 2-Methylnaphthalene	5.00	142	12606	0.46129 ppb		100
5) 1-Methylnaphthalene	5.11	142	13447	0.47479 ppb		99
7) Acenaphthylene	6.02	152	37792	0.41744 ppb		100
8) Acenaphthene	6.22	154	12256	0.46158 ppb		99
9) Fluorene	6.82	166	14018	0.43041 ppb		96
11) Phenanthrene	7.93	178	21699	0.42667 ppb		98
12) Anthracene	7.99	178	18188	0.40788 ppb		98
14) Fluoranthene	9.30	202	28175	0.39935 ppb	#	93
16) Pyrene	9.57	202	27975	0.37067 ppb	#	93
17) Benz (a) anthracene	11.00	228	23610	0.37407 ppb		100
18) Chrysene	11.04	228	30897	0.45662 ppb		99
19) Indeno (1,2,3-cd) pyrene	14.92	276	31178	0.46186 ppb	#	100
21) Benzo (b) fluoranthene	12.79	252	21866	0.34077 ppb		98
22) Benzo (k) fluoranthene	12.85	252	33289	0.46801 ppb		98
23) Benzo (a) pyrene	13.35	252	23923	0.39730 ppb		98
24) Dibenz (a,h) anthracene	14.96	278	25669	0.42930 ppb	#	95
25) Benzo (g,h,i) perylene	15.29	276	28135	0.43148 ppb		99

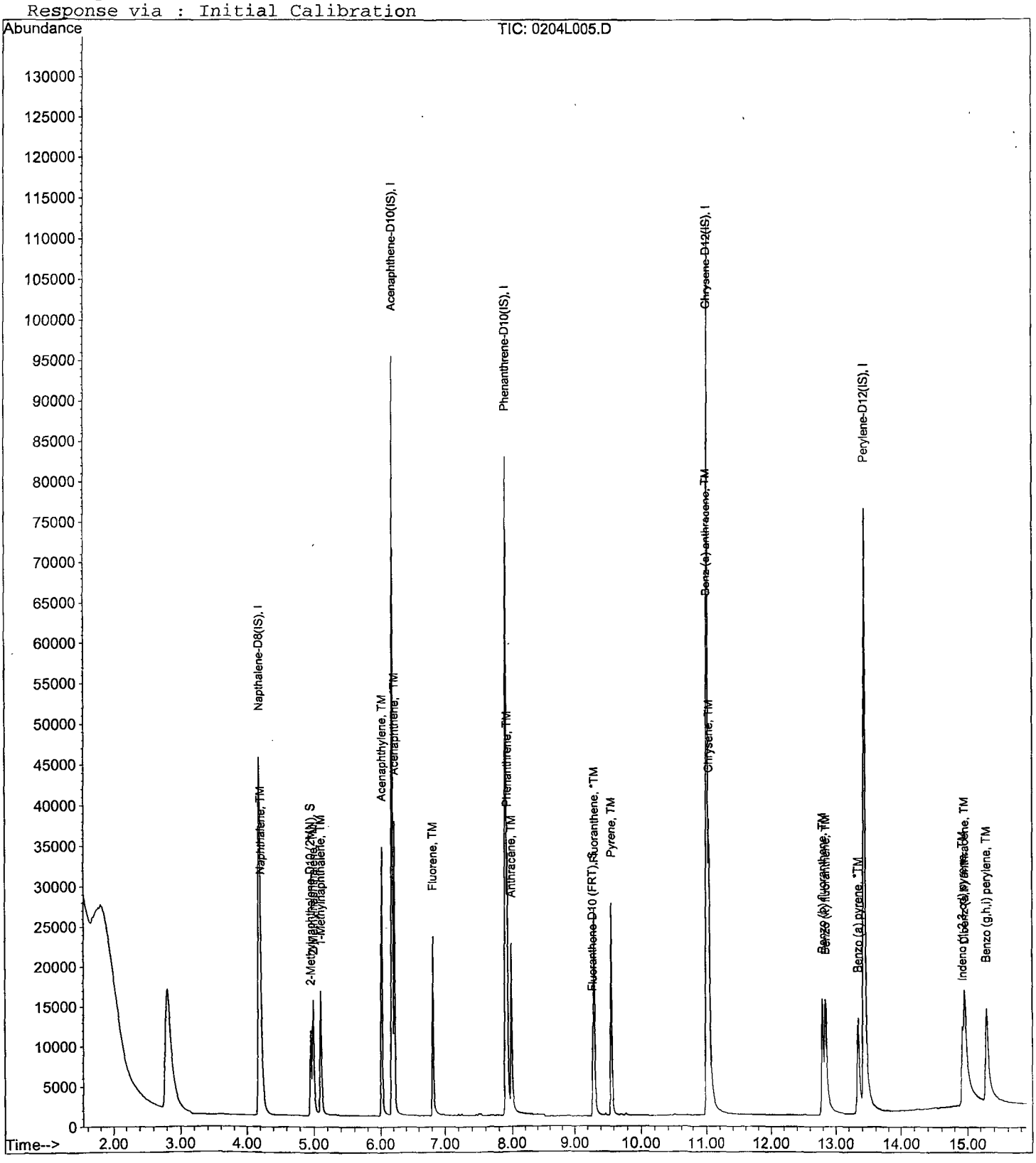
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L005.D Vial: 5
Acq On : 4 Feb 20 10:31 Operator: MA
Sample : 0.5 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L006.D Vial: 6
Acq On : 4 Feb 20 10:53 Operator: MA
Sample : 1 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Napthalene-D8(IS)	4.19	136	95074	2.50000	ppb	0.00
6) Acenaphthene-D10(IS)	6.18	164	50320	2.50000	ppb	0.00
10) Phenanthrene-D10(IS)	7.91	188	93982	2.50000	ppb	0.00
15) Chrysene-D12(IS)	11.01	240	115986	2.50000	ppb	0.00
20) Perylene-D12(IS)	13.43	264	130643	2.50000	ppb	0.00
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.96	152	22777	0.48093	ppb	0.00
Spiked Amount 5.000			Recovery =	9.620%		
13) Fluoranthene-D10 (FRT)	9.28	212	25468	0.38812	ppb	0.00
Spiked Amount 5.000			Recovery =	7.760%		
Target Compounds						Qvalue
2) Naphthalene	4.21	128	41177	0.90039	ppb	100
4) 2-Methylnaphthalene	5.00	142	26456	0.95192	ppb	99
5) 1-Methylnaphthalene	5.11	142	27900	0.96864	ppb	98
7) Acenaphthylene	6.02	152	78337	0.85382	ppb	100
8) Acenaphthene	6.22	154	24913	0.92584	ppb	99
9) Fluorene	6.82	166	29892	0.90564	ppb	99
11) Phenanthrene	7.93	178	45036	0.86678	ppb	99
12) Anthracene	7.99	178	39270	0.86199	ppb	99
14) Fluoranthene	9.30	202	60200	0.83519	ppb	97
16) Pyrene	9.57	202	60381	0.77797	ppb	96
17) Benz (a) anthracene	11.00	228	49969	0.76984	ppb	99
18) Chrysene	11.04	228	63085	0.90659	ppb	99
19) Indeno (1,2,3-cd) pyrene	14.92	276	65048	0.93700	ppb	98
21) Benzo (b) fluoranthene	12.79	252	47971	0.73591	ppb	99
22) Benzo (k) fluoranthene	12.84	252	69126	0.95663	ppb	98
23) Benzo (a) pyrene	13.35	252	50746	0.82958	ppb	97
24) Dibenz (a,h) anthracene	14.96	278	54045	0.88973	ppb	97
25) Benzo (g,h,i) perylene	15.29	276	58422	0.88195	ppb	99

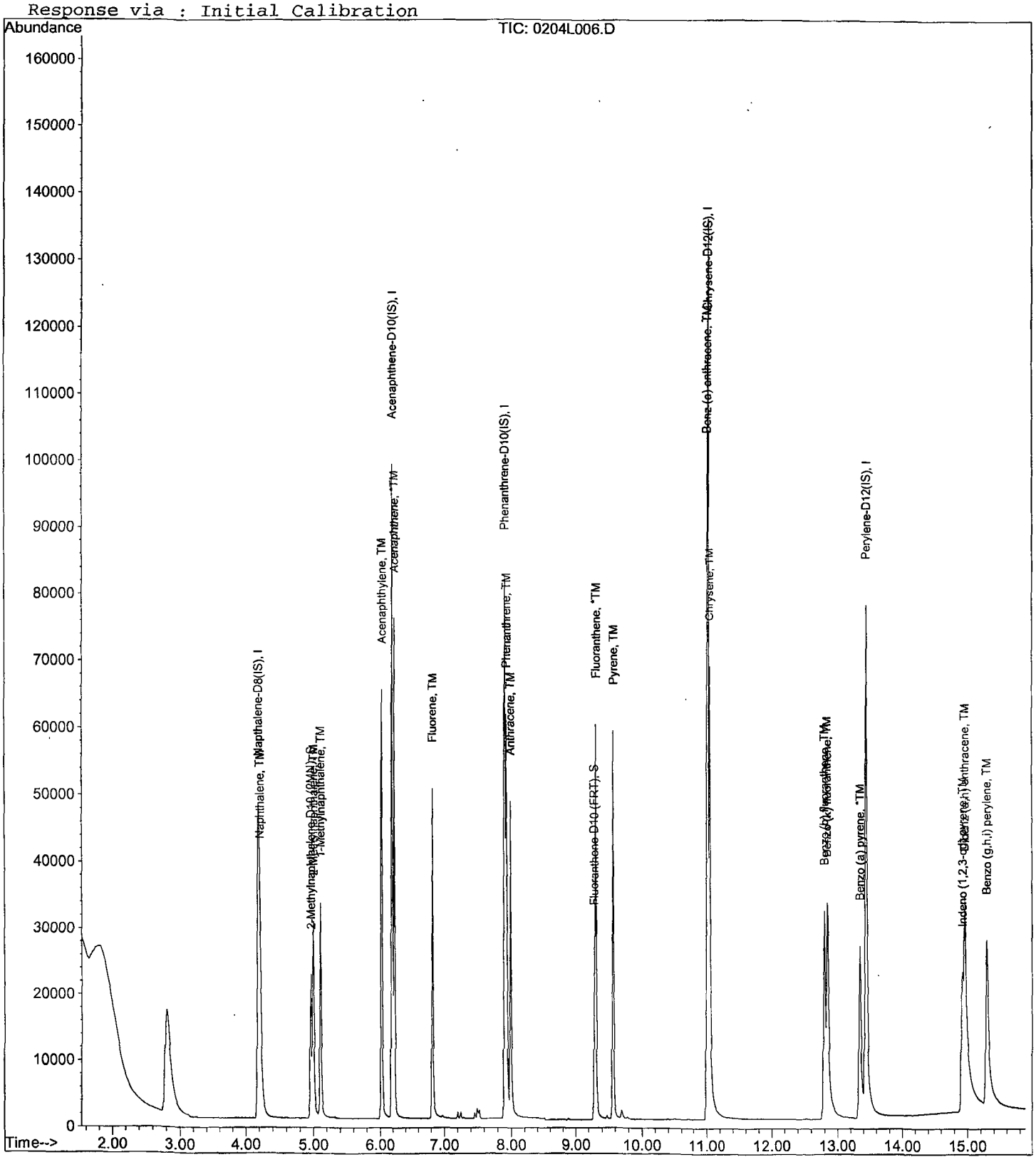
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L006.D Vial: 6
Acq On : 4 Feb 20 10:53 Operator: MA
Sample : 1 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L007.D Vial: 7
Acq On : 4 Feb 20 11:15 Operator: MA
Sample : 5 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	93559	2.50000	ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	49173	2.50000	ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	92273	2.50000	ppb		0.00
15) Chrysene-D12(IS)	11.01	240	120189	2.50000	ppb		0.00
20) Perylene-D12(IS)	13.43	264	131131	2.50000	ppb		0.00
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.96	152	117393	2.51887	ppb		0.00
Spiked Amount 5.000			Recovery	= 50.380%			
13) Fluoranthene-D10 (FRT)	9.28	212	137624	2.13617	ppb		0.00
Spiked Amount 5.000			Recovery	= 42.720%			
Target Compounds							Qvalue
2) Naphthalene	4.21	128	211249	4.69404	ppb		100
4) 2-Methylnaphthalene	5.00	142	139742	5.10952	ppb		100
5) 1-Methylnaphthalene	5.11	142	143640	5.06770	ppb		100
7) Acenaphthylene	6.02	152	431994	4.81826	ppb		100
8) Acenaphthene	6.22	154	128780	4.89745	ppb		100
9) Fluorene	6.82	166	160921	4.98915	ppb		100
11) Phenanthrene	7.93	178	238077	4.66698	ppb		100
12) Anthracene	7.99	178	213985	4.78406	ppb		100
14) Fluoranthene	9.30	202	335331	4.73840	ppb		100
16) Pyrene	9.57	202	333150	4.14232	ppb		100
17) Benz (a) anthracene	11.00	228	286178	4.25478	ppb		100
18) Chrysene	11.04	228	328507	4.55588	ppb		100
19) Indeno (1,2,3-cd) pyrene	14.91	276	378390	5.26003	ppb	#	100
21) Benzo (b) fluoranthene	12.79	252	299210	4.57302	ppb		100
22) Benzo (k) fluoranthene	12.84	252	366067	5.04713	ppb		100
23) Benzo (a) pyrene	13.34	252	295305	4.80957	ppb		100
24) Dibenz (a,h) anthracene	14.96	278	317098	5.20088	ppb		100
25) Benzo (g,h,i) perylene	15.28	276	334159	5.02577	ppb		100

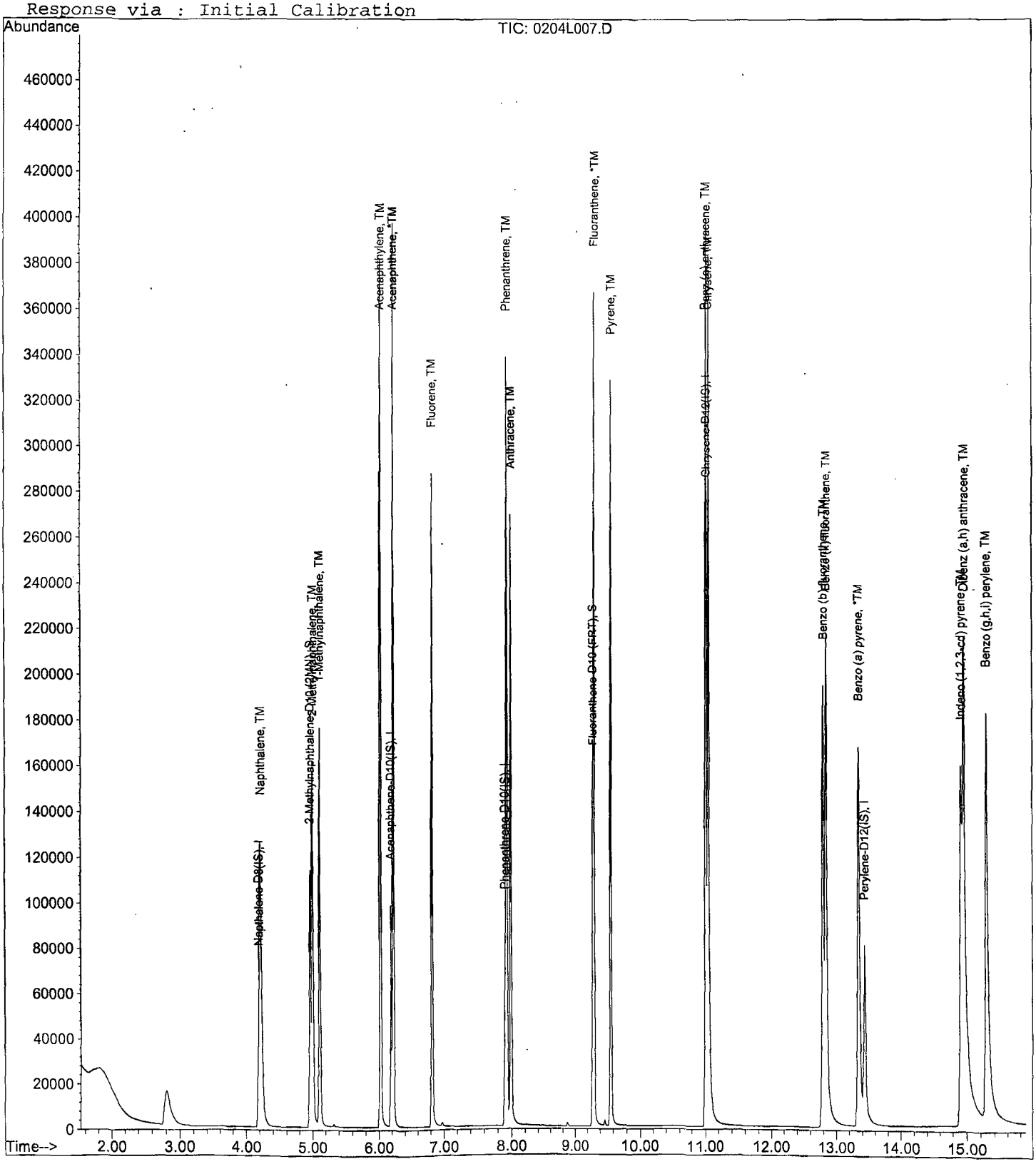
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L007.D Vial: 7
Acq On : 4 Feb 20 11:15 Operator: MA
Sample : 5 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L008.D Vial: 8
Acq On : 4 Feb 20 11:37 Operator: MA
Sample : 10 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	98020	2.50000	ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	51392	2.50000	ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	97154	2.50000	ppb		0.00
15) Chrysene-D12(IS)	11.01	240	126338	2.50000	ppb		0.00
20) Perylene-D12(IS)	13.43	264	139162	2.50000	ppb		0.00
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.96	152	238748	4.88961	ppb		0.00
Spiked Amount 5.000			Recovery	= 97.800%			
13) Fluoranthene-D10 (FRT)	9.28	212	286889	4.22932	ppb		0.00
Spiked Amount 5.000			Recovery	= 84.580%			
Target Compounds							Qvalue
2) Naphthalene	4.21	128	410435	8.70497	ppb		100
4) 2-Methylnaphthalene	5.00	142	272886	9.52368	ppb		99
5) 1-Methylnaphthalene	5.11	142	275593	9.28058	ppb		98
7) Acenaphthylene	6.02	152	845596	9.02415	ppb		99
8) Acenaphthene	6.22	154	250345	9.10944	ppb		98
9) Fluorene	6.82	166	318435	9.44639	ppb		99
11) Phenanthrene	7.93	178	468302	8.71883	ppb		100
12) Anthracene	7.99	178	427236	9.07184	ppb		100
14) Fluoranthene	9.30	202	648356	8.70132	ppb		99
16) Pyrene	9.57	202	660769	7.81599	ppb		100
17) Benz (a) anthracene	11.00	228	585928	8.28736	ppb		99
18) Chrysene	11.04	228	640149	8.44578	ppb		99
19) Indeno (1,2,3-cd) pyrene	14.92	276	770951	10.19544	ppb	#	94
21) Benzo (b) fluoranthene	12.79	252	603563	8.69229	ppb		99
22) Benzo (k) fluoranthene	12.84	252	740450	9.61977	ppb		99
23) Benzo (a) pyrene	13.35	252	605339	9.29007	ppb	#	96
24) Dibenz (a,h) anthracene	14.96	278	643860	9.95084	ppb		99
25) Benzo (g,h,i) perylene	15.28	276	676724	9.59060	ppb		97

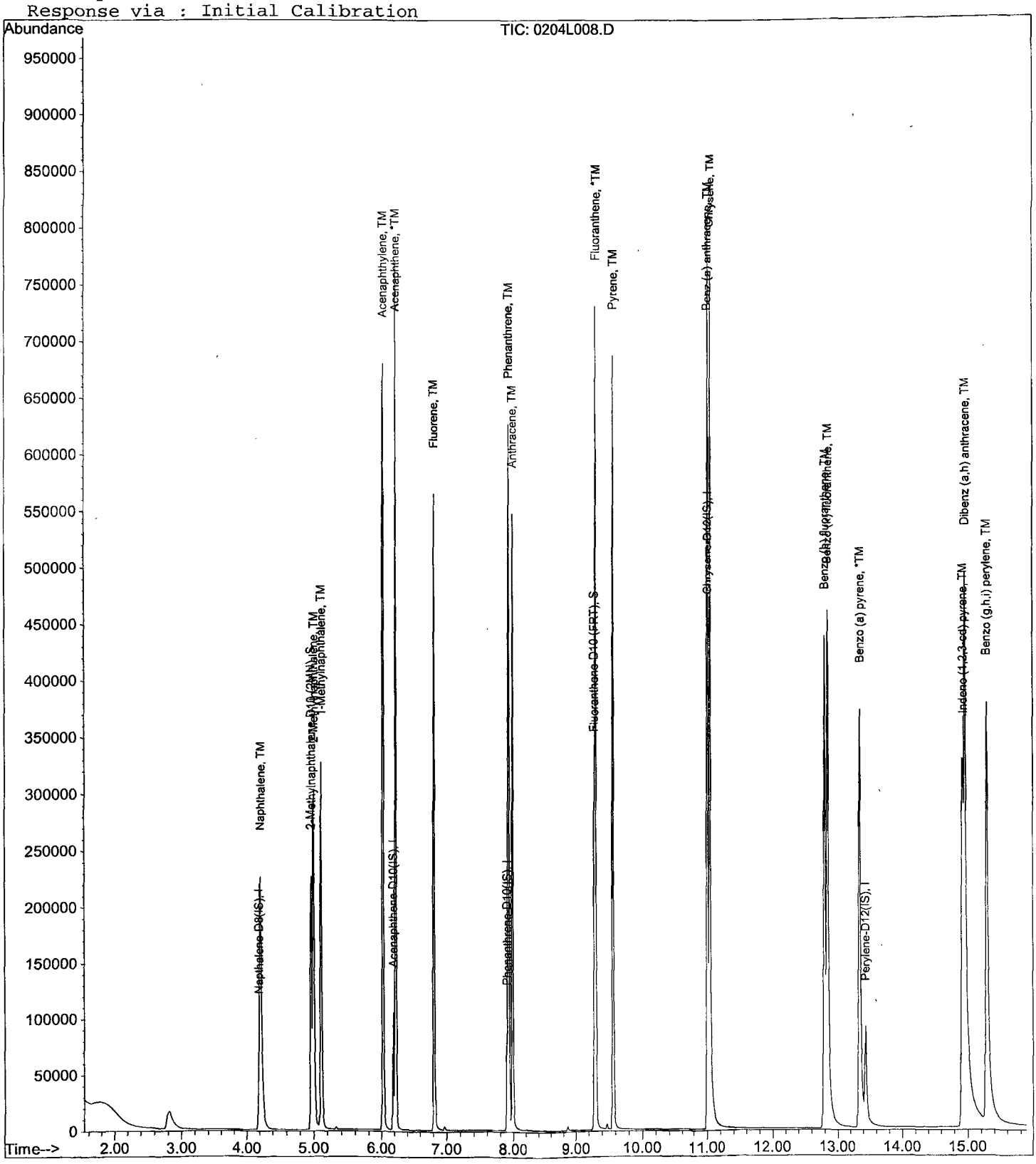
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L008.D Vial: 8
Acq On : 4 Feb 20 11:37 Operator: MA
Sample : 10 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L009.D Vial: 9
Acq On : 4 Feb 20 11:59 Operator: MA
Sample : 50 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 13:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	91741	2.50000 ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	48249	2.50000 ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	92859	2.50000 ppb		0.00
15) Chrysene-D12(IS)	11.02	240	119843	2.50000 ppb		0.01
20) Perylene-D12(IS)	13.43	264	135287	2.50000 ppb		0.00
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.96	152	1082689	23.69132 ppb		0.00
Spiked Amount 5.000			Recovery	= 473.820%		
13) Fluoranthene-D10 (FRT)	9.28	212	1334204	20.57858 ppb		0.00
Spiked Amount 5.000			Recovery	= 411.580%		
Target Compounds						Qvalue
2) Naphthalene	4.21	128	1792980	40.63028 ppb		99
4) 2-Methylnaphthalene	5.00	142	1202511	44.83983 ppb		98
5) 1-Methylnaphthalene	5.11	142	1216206	43.75878 ppb		98
7) Acenaphthylene	6.02	152	3684033	41.87685 ppb		98
8) Acenaphthene	6.22	154	1114731	43.20461 ppb		98
9) Fluorene	6.82	166	1376652	43.49873 ppb		99
11) Phenanthrene	7.93	178	1932753	37.64827 ppb		97
12) Anthracene	7.99	178	1828963	40.63210 ppb		97
14) Fluoranthene	9.32	202	2749439	38.60579 ppb		97
16) Pyrene	9.58	202	2924684	36.46993 ppb		98
17) Benz (a) anthracene	11.01	228	2735399	40.78626 ppb		97
18) Chrysene	11.07	228	2813476	39.13121 ppb		97
19) Indeno (1,2,3-cd) pyrene	14.95	276	3717110	51.82101 ppb		98
21) Benzo (b) fluoranthene	12.82	252	3024809	44.80994 ppb		97
22) Benzo (k) fluoranthene	12.82	252	2960397	39.56247 ppb		97
23) Benzo (a) pyrene	13.36	252	2893742	45.68194 ppb		97
24) Dibenz (a,h) anthracene	14.99	278	3162117	50.27021 ppb	#	95
25) Benzo (g,h,i) perylene	15.32	276	3213468	46.84602 ppb		94

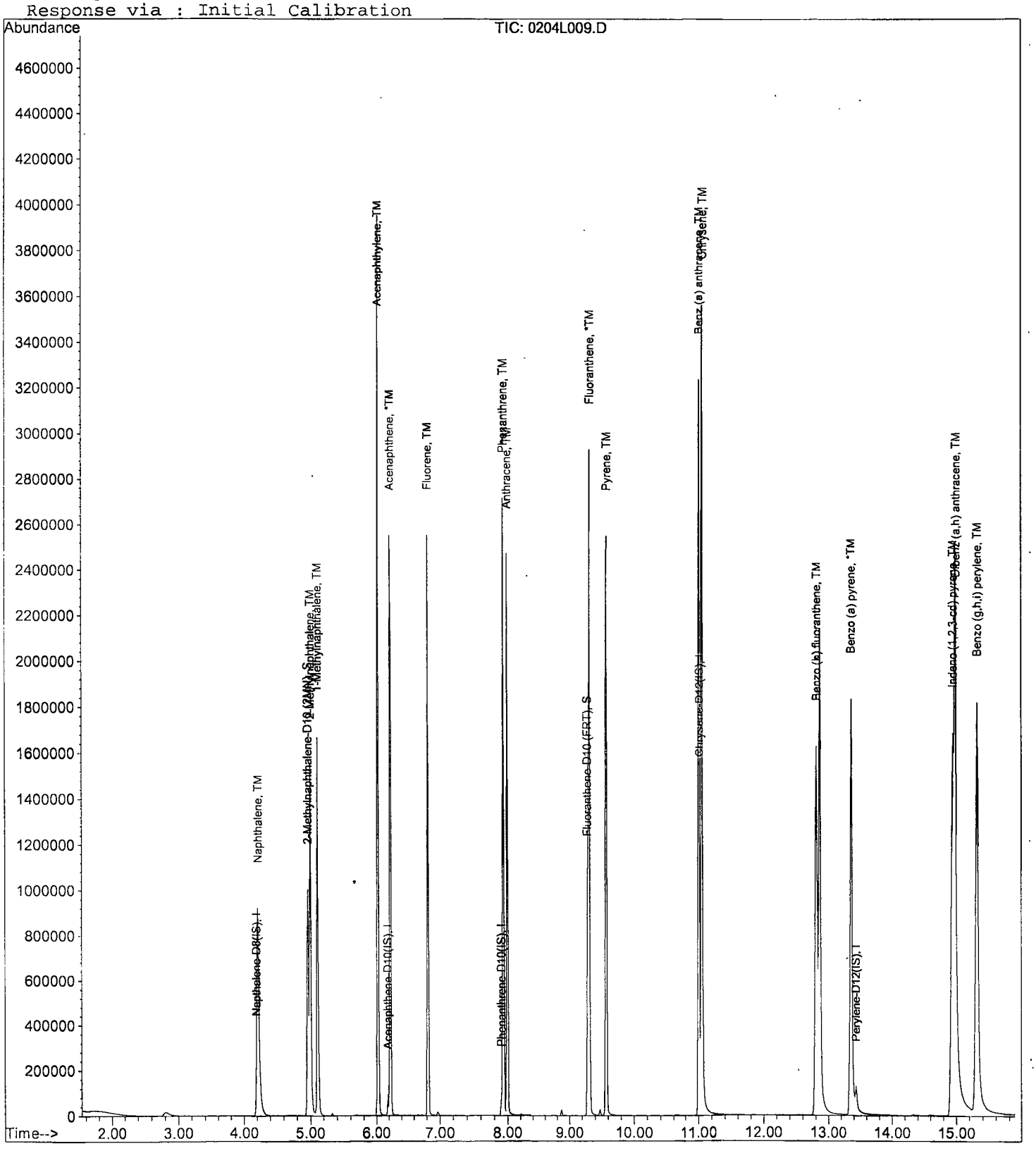
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L009.D Vial: 9
Acq On : 4 Feb 20 11:59 Operator: MA
Sample : 50 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 13:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L010.D Vial: 10
Acq On : 4 Feb 20 12:21 Operator: MA
Sample : 100 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:49 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:48:59 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	94154	2.50000 ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	49526	2.50000 ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	95687	2.50000 ppb		0.00
15) Chrysene-D12(IS)	11.03	240	125316	2.50000 ppb		0.02
20) Perylene-D12(IS)	13.45	264	141618	2.50000 ppb		0.01
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.96	152	2132841	47.06510 ppb		0.00
Spiked Amount 5.000			Recovery = 941.300%			
13) Fluoranthene-D10 (FRT)	9.29	212	2657919	48.74975 ppb		0.01
Spiked Amount 5.000			Recovery = 975.000%			
Target Compounds						Qvalue
2) Naphthalene	4.21	128	3515265	87.92823 ppb		98
4) 2-Methylnaphthalene	5.00	142	2314267	90.08958 ppb		99
5) 1-Methylnaphthalene	5.11	142	2325445	86.77018 ppb		99
7) Acenaphthylene	6.02	152	6802585	88.10489 ppb		97
8) Acenaphthene	6.23	154	2052134	84.22717 ppb		97
9) Fluorene	6.83	166	2744719	93.60760 ppb		100
11) Phenanthrene	7.94	178	3586911	80.58577 ppb		95
12) Anthracene	8.00	178	3368369	85.99155 ppb		95
14) Fluoranthene	9.33	202	5194710	85.53200 ppb		95
16) Pyrene	9.58	202	5580274	87.52935 ppb	#	84
17) Benz (a) anthracene	11.02	228	5418653	96.12929 ppb		94
18) Chrysene	11.08	228	5338591	81.34404 ppb		95
19) Indeno (1,2,3-cd) pyrene	14.99	276	7605000	103.10512 ppb	#	84
21) Benzo (b) fluoranthene	12.84	252	6397741	114.52991 ppb		95
22) Benzo (k) fluoranthene	12.90	252	6168270	86.51444 ppb		100
23) Benzo (a) pyrene	13.38	252	5827644	104.49972 ppb		95
24) Dibenz (a,h) anthracene	15.01	278	6436791	104.88555 ppb	#	94
25) Benzo (g,h,i) perylene	15.35	276	6483695	99.89693 ppb	#	93

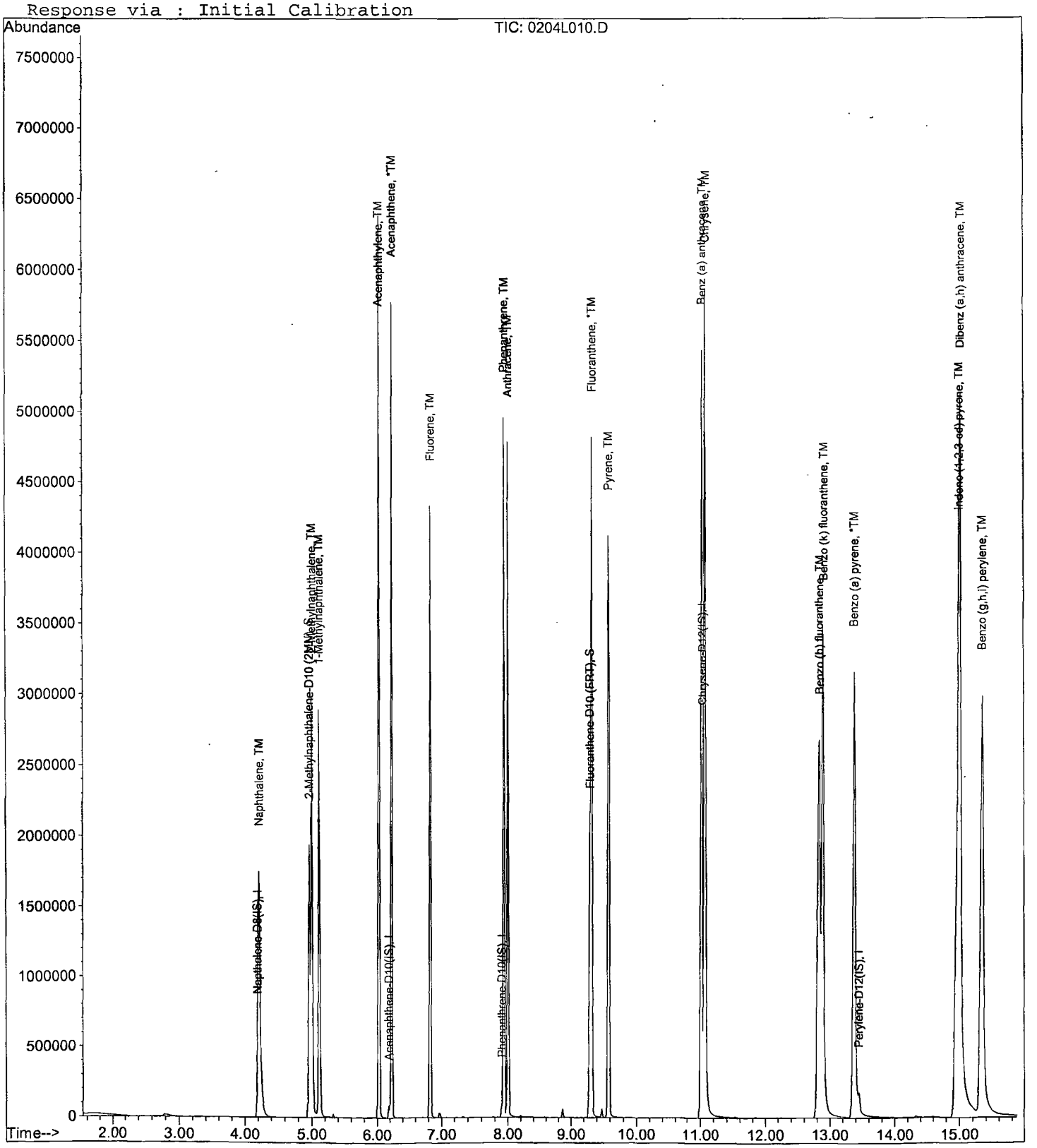
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L010.D Vial: 10
Acq On : 4 Feb 20 12:21 Operator: MA
Sample : 100 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:49 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



PAH by GCMS SIM
EPA 8270 SIM

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 4 Feb 20 13:21
Instrument: Linus
Initial Cal. Date: 02/04/20
Data File: 0204L011.D

		Compound	MEAN	CCRF	%D		%Drift
1	TM	Naphthalene	1.062	1.033	2.7	TM	
2	TM	2-Methylnaphthalene	0.6821	0.6822	0.02	TM	
3	TM	1-Methylnaphthalene	0.7116	0.6901	3.0	TM	
4	TM	Acenaphthylene	3.897	3.871	0.68	TM	
5	*TM	Acenaphthene	1.230	1.178	4.2	*TM	
6	TM	Fluorene	1.480	1.459	1.5	TM	
7	TM	Phenanthrene	1.163	1.148	1.3	TM	
8	TM	Anthracene	1.023	1.104	7.8	TM	
9	*TM	Fluoranthene	1.587	1.568	1.2	*TM	
10	TM	Pyrene	1.272	1.242	2.3	TM	
11	TM	Benz (a) anthracene	1.125	1.066	5.2	TM	
12	TM	Chrysene	1.309	1.222	6.7	TM	
13	TM	Indeno (1,2,3-cd) pyrene	1.471	1.421	3.4	TM	
14	TM	Benzo (b) fluoranthene	0.9861	0.9690	1.7	TM	
15	TM	Benzo (k) fluoranthene	1.265	1.329	5.1	TM	
16	*TM	Benzo (a) pyrene	0.9845	1.048	6.4	*TM	
17	TM	Dibenz (a,h) anthracene	1.083	1.080	0.29	TM	
18	TM	Benzo (g,h,i) perylene	1.146	1.138	0.70	TM	
19							
20							
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38							
39							
40							
		Average			3.0		

Quantitation Report (QT Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L011.D Vial: 11
Acq On : 4 Feb 20 13:21 Operator: MA
Sample : SS SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 13:39 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	96451	2.50000	ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	52672	2.50000	ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	97686	2.50000	ppb		0.00
15) Chrysene-D12(IS)	11.01	240	126057	2.50000	ppb		0.00
20) Perylene-D12(IS)	13.43	264	136401	2.50000	ppb		0.00
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	0.00	152	0d	0.00000	ppb		
Spiked Amount 5.000			Recovery =	0.000%			
13) Fluoranthene-D10 (FRT)	0.00	212	0d	0.00000	ppb		
Spiked Amount 5.000			Recovery =	0.000%			
Target Compounds							Qvalue
2) Naphthalene	4.21	128	199297	4.86635	ppb		100
4) 2-Methylnaphthalene	5.00	142	131606	5.00114	ppb		100
5) 1-Methylnaphthalene	5.11	142	133123	4.84897	ppb		100
7) Acenaphthylene	6.02	152	407798	4.96620	ppb		100
8) Acenaphthene	6.22	154	124072	4.78822	ppb		100
9) Fluorene	6.82	166	153651	4.92722	ppb		99
11) Phenanthrene	7.93	178	224305	4.93625	ppb		99
12) Anthracene	7.99	178	215622	5.39200	ppb		100
14) Fluoranthene	9.30	202	306319	4.94040	ppb		98
16) Pyrene	9.57	202	313161	4.88321	ppb		98
17) Benz (a) anthracene	11.00	228	268691	4.73868	ppb		100
18) Chrysene	11.05	228	308124	4.66728	ppb	#	96
19) Indeno (1,2,3-cd) pyrene	14.92	276	358273	4.82875	ppb	#	95
21) Benzo (b) fluoranthene	12.79	252	264332	4.91296	ppb		99
22) Benzo (k) fluoranthene	12.84	252	362562	5.25367	ppb		99
23) Benzo (a) pyrene	13.35	252	285781	5.32055	ppb		97
24) Dibenz (a,h) anthracene	14.96	278	294697	4.98566	ppb		98
25) Benzo (g,h,i) perylene	15.29	276	310388	4.96518	ppb		99

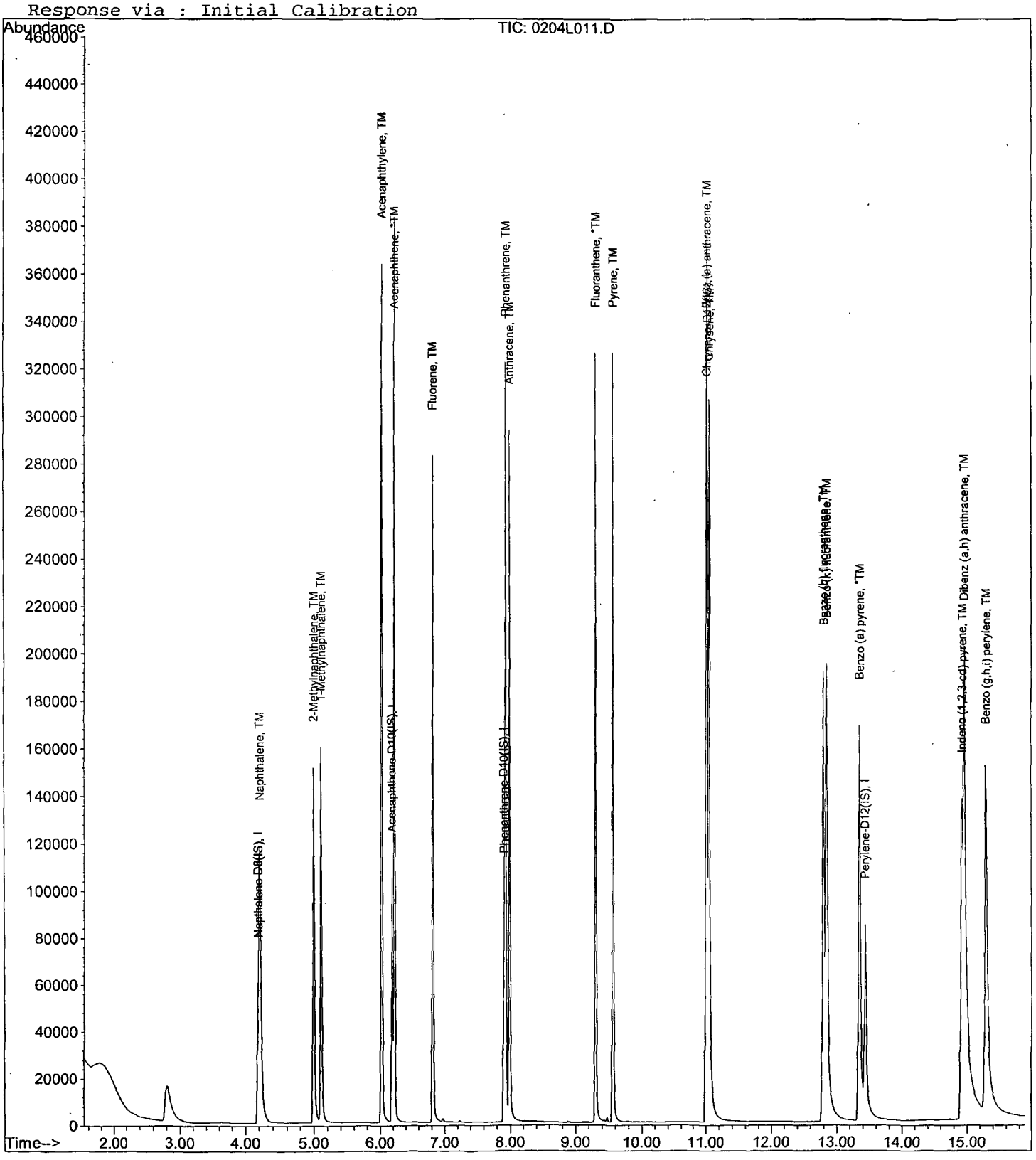
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L011.D Vial: 11
Acq On : 4 Feb 20 13:21 Operator: MA
Sample : SS SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 13:39 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



PAH by GCMS SIM
EPA 8270 SIM

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 6 May 20 8:54
Instrument: Linus
Initial Cal. Date: 02/04/20
Data File: 0424L171.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Napthalene-D8(IS)	ISTD			I	
2	TM	Naphthalene	1.062	1.030	3.0	TM	
3	S	2-Methylnaphthalene-D10 (2MN)	1.203	1.303	8.3	S	
4	TM	2-Methylnaphthalene	0.6821	0.6957	2.0	TM	
5	TM	1-Methylnaphthalene	0.7116	0.7245	1.8	TM	
6	I	Acenaphthene-D10(IS)	ISTD			I	
7	TM	Acenaphthylene	3.897	3.981	2.1	TM	
8	*TM	Acenaphthene	1.230	1.168	5.1	*TM	
9	TM	Fluorene	1.480	1.523	2.9	TM	
10	I	Phenanthrene-D10(IS)	ISTD			I	
11	TM	Phenanthrene	1.163	1.111	4.5	TM	
12	TM	Anthracene	1.023	1.042	1.8	TM	
13	S	Fluoranthene-D10 (FRT)	1.424	1.487	4.4	S	
14	*TM	Fluoranthene	1.587	1.559	1.8	*TM	
15	I	Chrysene-D12(IS)	ISTD			I	
16	TM	Pyrene	1.272	1.212	4.7	TM	
17	TM	Benz (a) anthracene	1.125	1.258	12	TM	
18	TM	Chrysene	1.309	1.170	11	TM	
19	TM	Indeno (1,2,3-cd) pyrene	1.471	1.720	17	TM	
20	I	Perylene-D12(IS)	ISTD			I	
21	TM	Benzo (b) fluoranthene	0.9861	1.052	6.7	TM	
22	TM	Benzo (k) fluoranthene	1.265	1.192	5.8	TM	
23	*TM	Benzo (a) pyrene	0.9845	1.051	6.8	*TM	
24	TM	Dibenz (a,h) anthracene	1.083	1.209	12	TM	
25	TM	Benzo (g,h,i) perylene	1.146	1.218	6.3	TM	
26							
27							
28							
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31							
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33							
34							
35							
36							
37							
38							
39							
40							
		Average			6.0		

Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L171.D Vial: 71
Acq On : 6 May 20 8:54 Operator: MA
Sample : 5 SIM 2/4/20 (3) Inst : Linus
Misc : Multiplr: 1.00

Quant Time: May 6 9:16 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.14	136	92595	2.500	ppb		-0.01
6) Acenaphthene-D10(IS)	6.13	164	51356	2.500	ppb		-0.02
10) Phenanthrene-D10(IS)	7.87	188	99414	2.500	ppb		-0.01
15) Chrysene-D12(IS)	10.99	240	128459	2.500	ppb		-0.01
20) Perylene-D12(IS)	13.42	264	157407	2.500	ppb		0.01
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.91	152	120647	2.707	ppb		0.00
Spiked Amount 5.000			Recovery =	54.140%			
13) Fluoranthene-D10 (FRT)	9.25	212	147788	2.609	ppb		0.00
Spiked Amount 5.000			Recovery =	52.180%			
Target Compounds							Qvalue
2) Naphthalene	4.15	128	190783	4.852	ppb		99
4) 2-Methylnaphthalene	4.95	142	128837	5.100	ppb		98
5) 1-Methylnaphthalene	5.06	142	134176	5.091	ppb		97
7) Acenaphthylene	5.98	152	408888	5.107	ppb		99
8) Acenaphthene	6.17	154	119942	4.747	ppb		98
9) Fluorene	6.77	166	156477	5.146	ppb		95
11) Phenanthrene	7.89	178	220868	4.776	ppb		100
12) Anthracene	7.95	178	207142	5.090	ppb		100
14) Fluoranthene	9.27	202	309929	4.912	ppb		96
16) Pyrene	9.53	202	311430	4.765	ppb		94
17) Benz (a) anthracene	10.97	228	323238	5.594	ppb		99
18) Chrysene	11.02	228	300570	4.468	ppb	#	97
19) Indeno (1,2,3-cd) pyrene	14.91	276	442015	5.846	ppb		97
21) Benzo (b) fluoranthene	12.76	252	331216	5.335	ppb	#	99
22) Benzo (k) fluoranthene	12.82	252	375164	4.711	ppb		100
23) Benzo (a) pyrene	13.33	252	330956	5.339	ppb		98
24) Dibenz (a,h) anthracene	14.95	278	380514	5.578	ppb		99
25) Benzo (g,h,i) perylene	15.29	276	383337	5.314	ppb	#	96

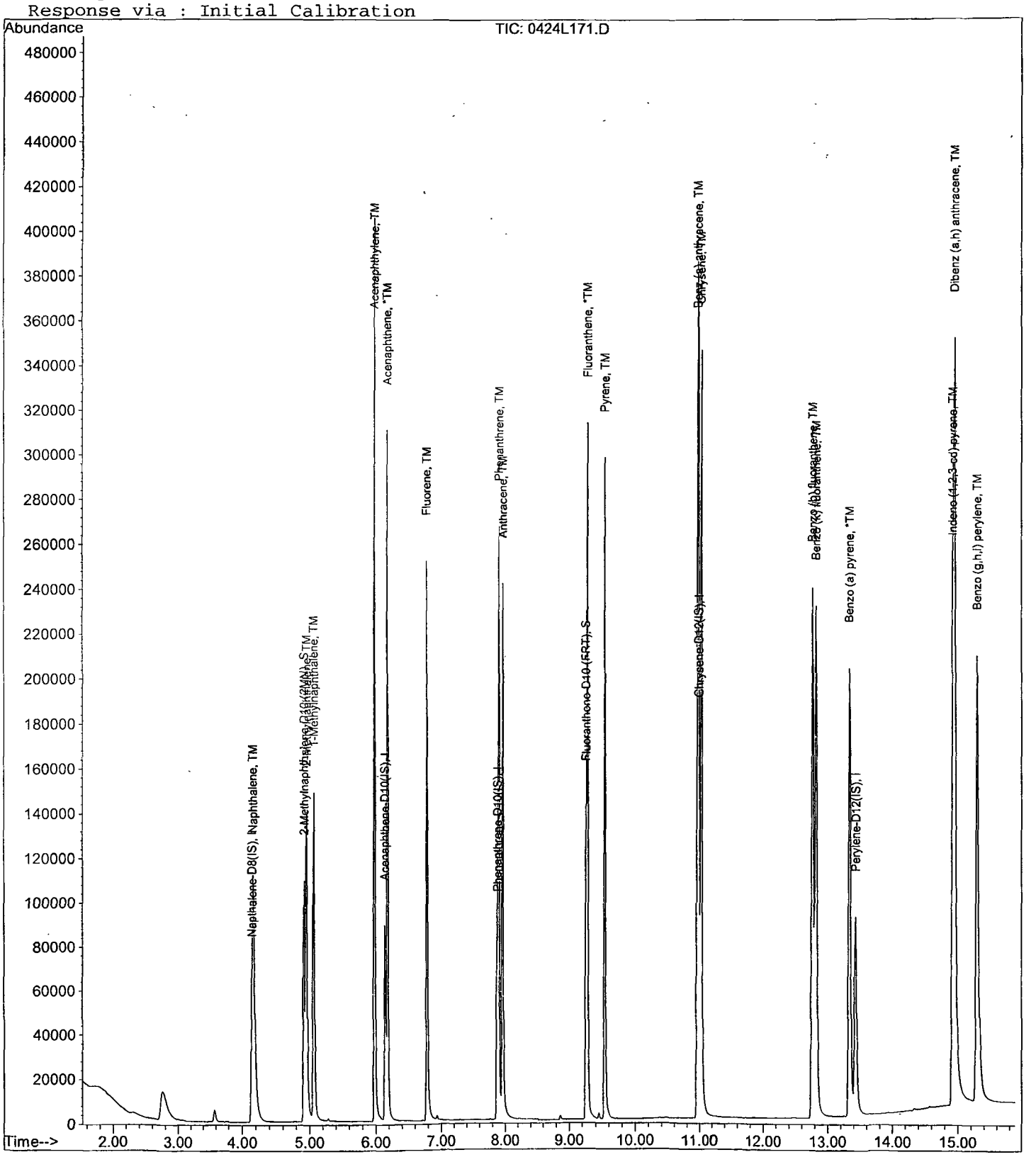
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L171.D Vial: 71
Acq On : 6 May 20 8:54 Operator: MA
Sample : 5 SIM 2/4/20 (3) Inst : Linus
Misc : Multiplr: 1.00

Quant Time: May 6 9:16 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



PAH by GCMS SIM
EPA 8270 SIM

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 6 May 20 12:52
Instrument: Linus
Initial Cal. Date: 02/04/20
Data File: 0424L178.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Napthalene-D8(IS)	ISTD			I	
2	TM	Naphthalene	1.062	0.9711	8.5	TM	
3	S	2-Methylnaphthalene-D10 (2MN)	1.203	1.208	0.39	S	
4	TM	2-Methylnaphthalene	0.6821	0.6459	5.3	TM	
5	TM	1-Methylnaphthalene	0.7116	0.6802	4.4	TM	
6	I	Acenaphthene-D10(IS)	ISTD			I	
7	TM	Acenaphthylene	3.897	3.719	4.6	TM	
8	*TM	Acenaphthene	1.230	1.102	10	*TM	
9	TM	Fluorene	1.480	1.404	5.2	TM	
10	I	Phenanthrene-D10(IS)	ISTD			I	
11	TM	Phenanthrene	1.163	1.030	11	TM	
12	TM	Anthracene	1.023	0.9855	3.7	TM	
13	S	Fluoranthene-D10 (FRT)	1.424	1.377	3.4	S	
14	*TM	Fluoranthene	1.587	1.452	8.5	*TM	
15	I	Chrysene-D12(IS)	ISTD			I	
16	TM	Pyrene	1.272	1.143	10	TM	
17	TM	Benz (a) anthracene	1.125	1.118	0.59	TM	
18	TM	Chrysene	1.309	1.149	12	TM	
19	TM	Indeno (1,2,3-cd) pyrene	1.471	1.587	7.8	TM	
20	I	Perylene-D12(IS)	ISTD			I	
21	TM	Benzo (b) fluoranthene	0.9861	0.9998	1.4	TM	
22	TM	Benzo (k) fluoranthene	1.265	1.116	12	TM	
23	*TM	Benzo (a) pyrene	0.9845	0.9875	0.31	*TM	
24	TM	Dibenz (a,h) anthracene	1.083	1.132	4.5	TM	
25	TM	Benzo (g,h,i) perylene	1.146	1.109	3.2	TM	
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			5.8		

Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L178.D Vial: 78
Acq On : 6 May 20 12:52 Operator: MA
Sample : 5 SIM 2/4/20 (4) Inst : Linus
Misc : Multiplr: 1.00

Quant Time: May 6 14:32 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.14	136	73064	2.50000	ppb		-0.01
6) Acenaphthene-D10(IS)	6.14	164	40148	2.50000	ppb		-0.01
10) Phenanthrene-D10(IS)	7.87	188	78468	2.50000	ppb		-0.01
15) Chrysene-D12(IS)	10.99	240	100616	2.50000	ppb		-0.01
20) Perylene-D12(IS)	13.43	264	122260	2.50000	ppb		0.02
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.91	152	88257	2.50972	ppb		0.00
Spiked Amount 5.000			Recovery = 50.200%				
13) Fluoranthene-D10 (FRT)	9.26	212	108012	2.41581	ppb		0.00
Spiked Amount 5.000			Recovery = 48.320%				
Target Compounds							Qvalue
2) Naphthalene	4.17	128	141911	4.57427	ppb		100
4) 2-Methylnaphthalene	4.95	142	94389	4.73498	ppb		99
5) 1-Methylnaphthalene	5.06	142	99391	4.77911	ppb		98
7) Acenaphthylene	5.98	152	298630	4.77121	ppb		98
8) Acenaphthene	6.18	154	88503	4.48099	ppb		93
9) Fluorene	6.78	166	112707	4.74169	ppb		100
11) Phenanthrene	7.89	178	161711	4.43035	ppb		99
12) Anthracene	7.95	178	154668	4.81501	ppb		99
14) Fluoranthene	9.28	202	227856	4.57497	ppb		96
16) Pyrene	9.54	202	229907	4.49148	ppb		99
17) Benz (a) anthracene	10.98	228	224953	4.97045	ppb		99
18) Chrysene	11.02	228	231272	4.38896	ppb	#	96
19) Indeno (1,2,3-cd) pyrene	14.93	276	319262	5.39098	ppb		100
21) Benzo (b) fluoranthene	12.77	252	244463	5.06920	ppb	#	99
22) Benzo (k) fluoranthene	12.82	252	272771	4.40973	ppb		99
23) Benzo (a) pyrene	13.34	252	241467	5.01550	ppb		98
24) Dibenz (a,h) anthracene	14.96	278	276876	5.22595	ppb		99
25) Benzo (g,h,i) perylene	15.30	276	271132	4.83888	ppb	#	95

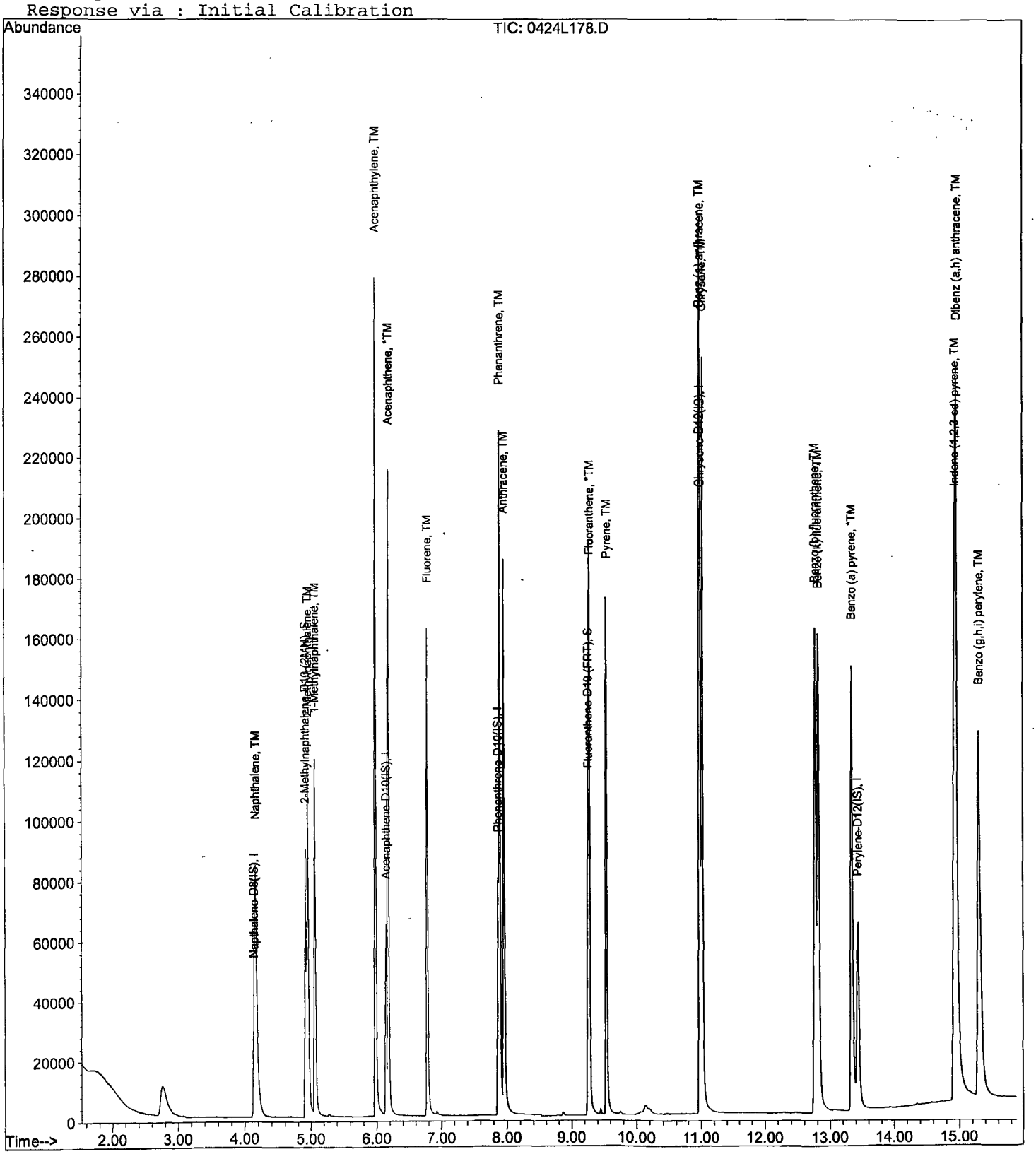
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L178.D Vial: 78
Acq On : 6 May 20 12:52 Operator: MA
Sample : 5 SIM 2/4/20 (4) Inst : Linus
Misc : Multiplr: 1.00

Quant Time: May 6 14:32 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L175.D Vial: 75
Acq On : 6 May 20 11:29 Operator: MA
Sample : BA10439W19 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:47 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Napthalene-D8(IS)	4.14	136	82324	2.50000 ppb	-0.01
6) Acenaphthene-D10(IS)	6.13	164	45613	2.50000 ppb	-0.02
10) Phenanthrene-D10(IS)	7.87	188	87808	2.50000 ppb	-0.01
15) Chrysene-D12(IS)	10.99	240	117548	2.50000 ppb	-0.01
20) Perylene-D12(IS)	13.43	264	144212	2.50000 ppb	0.02
System Monitoring Compounds					
3) 2-Methylnaphthalene-D10 (2	4.91	152	154438	4.87211 ppb	0.00
Spiked Amount 6.250			Recovery =	77.952%	
13) Fluoranthene-D10 (FRT)	9.25	212	199417	4.98221 ppb	0.00
Spiked Amount 6.250			Recovery =	79.712%	

Target Compounds Qvalue

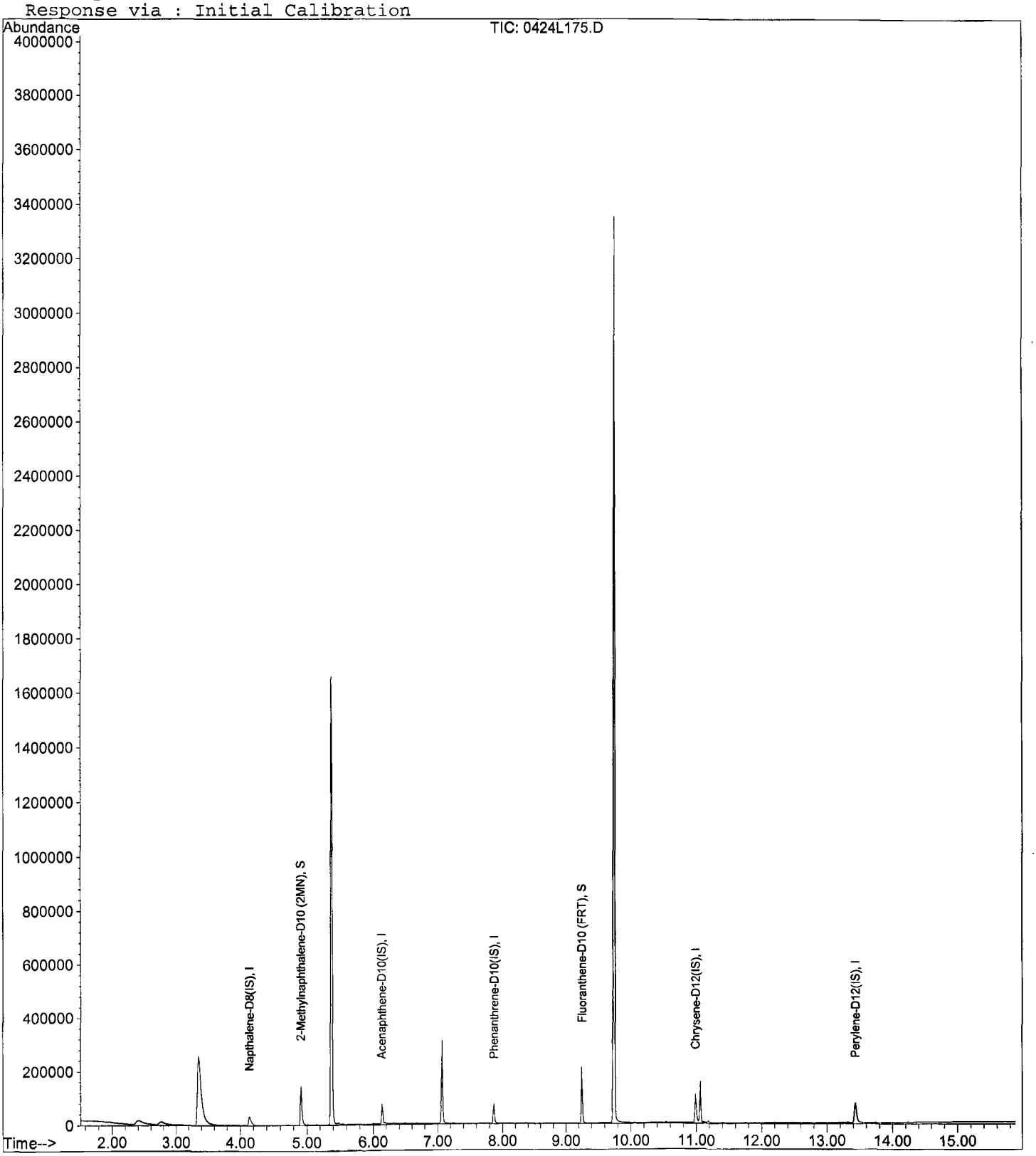
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L175.D Vial: 75
Acq On : 6 May 20 11:29 Operator: MA
Sample : BA10439W19 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:47 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L172.D Vial: 72
Acq On : 6 May 20 10:23 Operator: MA
Sample : 200504A BLK 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:39 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Napthalene-D8(IS)	4.14	136	80484	2.50000	ppb	-0.01
6) Acenaphthene-D10(IS)	6.13	164	42134	2.50000	ppb	-0.02
10) Phenanthrene-D10(IS)	7.87	188	91708	2.50000	ppb	-0.01
15) Chrysene-D12(IS)	10.99	240	114406	2.50000	ppb	-0.01
20) Perylene-D12(IS)	13.43	264	19823	2.50000	ppb	0.02
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.91	152	162227	5.23483	ppb	0.00
Spiked Amount 6.250			Recovery =	83.760%		
13) Fluoranthene-D10 (FRT)	9.25	212	195922	4.68673	ppb	0.00
Spiked Amount 6.250			Recovery =	74.992%		

Target Compounds	Qvalue

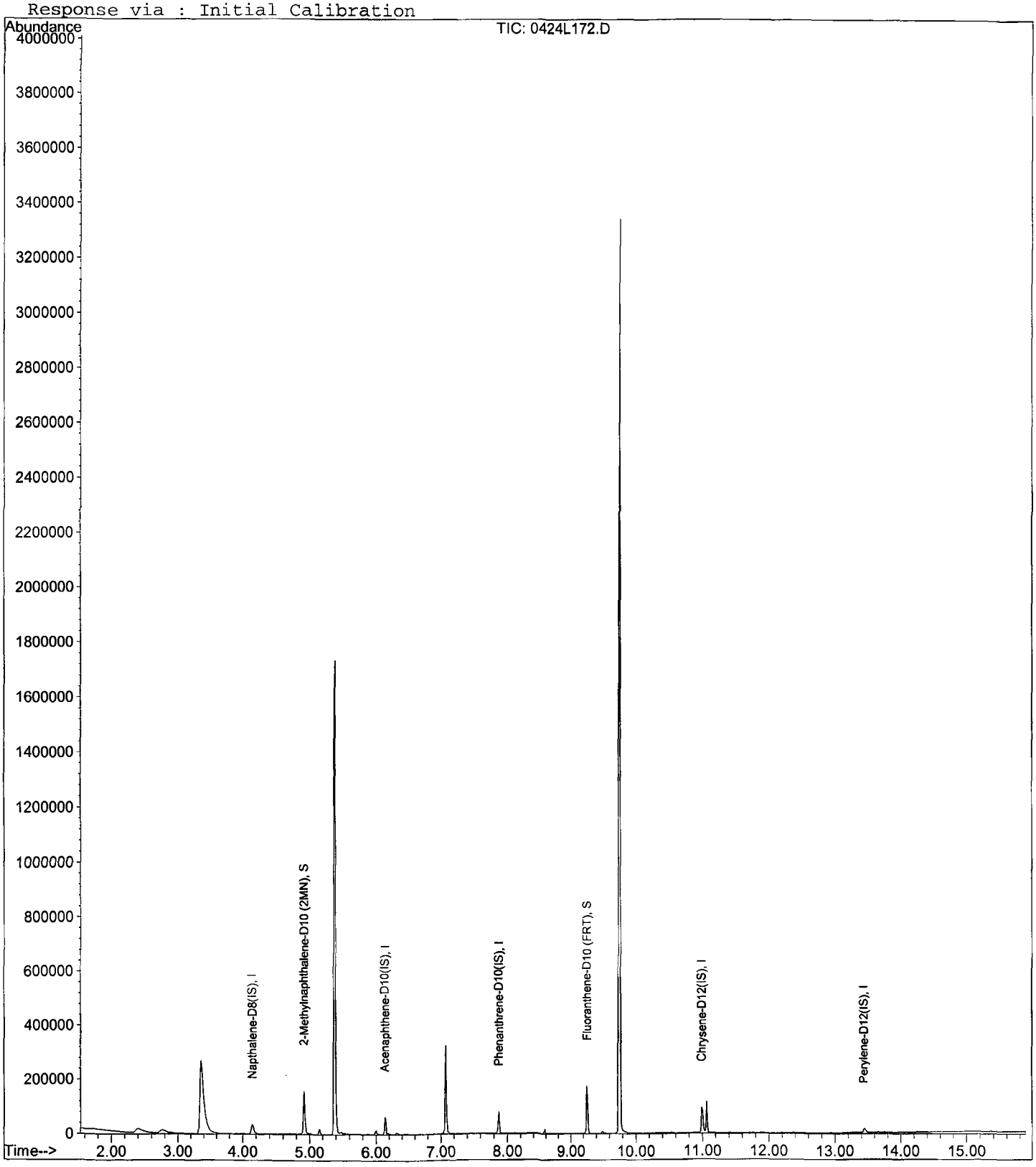
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L172.D Vial: 72
Acq On : 6 May 20 10:23 Operator: MA
Sample : 200504A BLK 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:39 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L173.D Vial: 73
Acq On : 6 May 20 10:45 Operator: MA
Sample : 200504A LCS-2 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:39 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.14	136	82766	2.50000	ppb		-0.01
6) Acenaphthene-D10(IS)	6.13	164	30697	2.50000	ppb		-0.02
10) Phenanthrene-D10(IS)	7.86	188	87731	2.50000	ppb		-0.02
15) Chrysene-D12(IS)	10.99	240	99404	2.50000	ppb		-0.01
20) Perylene-D12(IS)	13.43	264	5072	2.50000	ppb		0.02
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.91	152	149089	4.67824	ppb		0.00
Spiked Amount 6.250			Recovery = 74.848%				
13) Fluoranthene-D10 (FRT)	9.25	212	172653	4.31732	ppb		0.00
Spiked Amount 6.250			Recovery = 69.072%				
Target Compounds							Qvalue
2) Naphthalene	4.17	128	125746	4.47261	ppb		100
4) 2-Methylnaphthalene	4.95	142	83558	4.62536	ppb		97
5) 1-Methylnaphthalene	5.06	142	84206	4.46791	ppb		96
7) Acenaphthylene	5.98	152	77425	2.02234	ppb		100
8) Acenaphthene	6.17	154	67255	5.56696	ppb		99
9) Fluorene	6.77	166	103418	7.11306	ppb		95
11) Phenanthrene	7.89	178	146947	4.50099	ppb		100
12) Anthracene	7.95	178	109041	3.79521	ppb		100
14) Fluoranthene	9.27	202	201595	4.52540	ppb		99
16) Pyrene	9.53	202	148387	3.66781	ppb		97
17) Benz (a) anthracene	10.97	228	191959	5.36643	ppb		99
18) Chrysene	11.02	228	195234	4.68778	ppb	#	98
19) Indeno (1,2,3-cd) pyrene	14.93	276	207636	4.43605	ppb	#	91
21) Benzo (b) fluoranthene	12.77	252	226755	141.67667	ppb		99
22) Benzo (k) fluoranthene	12.82	252	201144	97.97967	ppb		99
23) Benzo (a) pyrene	13.34	252	71686	44.86479	ppb		98
24) Dibenz (a,h) anthracene	14.96	278	232532	132.24468	ppb		99
25) Benzo (g,h,i) perylene	15.30	276	167858	90.26530	ppb	#	95

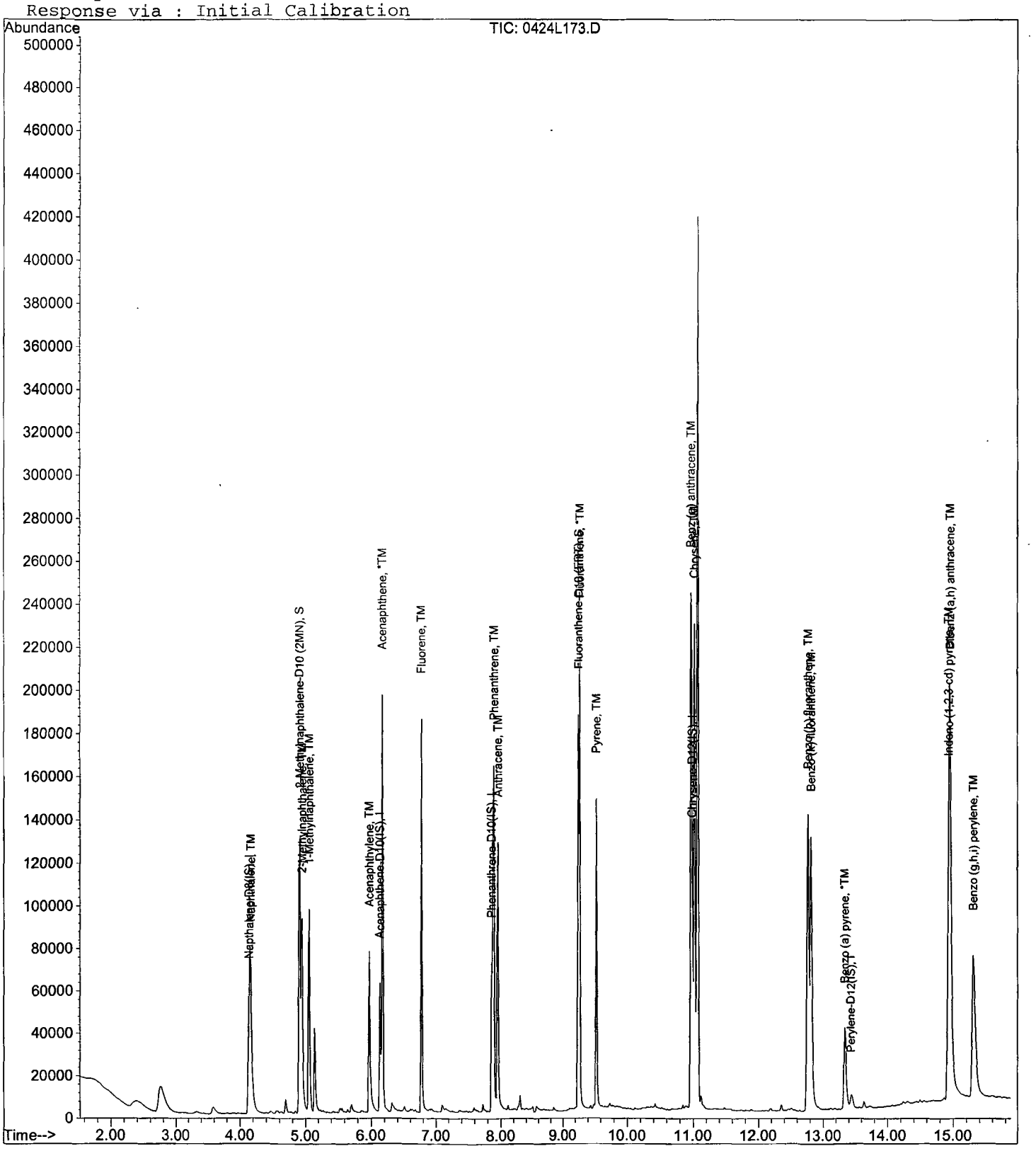
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L173.D Vial: 73
Acq On : 6 May 20 10:45 Operator: MA
Sample : 200504A LCS-2 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:39 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L174.D Vial: 74
Acq On : 6 May 20 11:07 Operator: MA
Sample : 200504A LCSD-2 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:40 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.14	136	84996	2.50000	ppb		-0.01
6) Acenaphthene-D10(IS)	6.13	164	46150	2.50000	ppb		-0.02
10) Phenanthrene-D10(IS)	7.86	188	92781	2.50000	ppb		-0.02
15) Chrysene-D12(IS)	10.98	240	119811	2.50000	ppb		-0.02
20) Perylene-D12(IS)	13.42	264	87066	2.50000	ppb		0.01
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.91	152	148414	4.53488	ppb		0.00
Spiked Amount 6.250			Recovery =	72.560%			
13) Fluoranthene-D10 (FRT)	9.25	212	189933	4.49092	ppb		0.00
Spiked Amount 6.250			Recovery =	71.856%			
Target Compounds							Qvalue
2) Naphthalene	4.17	128	125714	4.35416	ppb		100
4) 2-Methylnaphthalene	4.95	142	84481	4.55376	ppb		97
5) 1-Methylnaphthalene	5.06	142	84578	4.36991	ppb		97
7) Acenaphthylene	5.98	152	200242	3.47899	ppb		99
8) Acenaphthene	6.17	154	76090	4.18934	ppb		100
9) Fluorene	6.77	166	103256	4.72389	ppb		96
11) Phenanthrene	7.89	178	150607	4.36201	ppb		100
12) Anthracene	7.95	178	91669	3.01691	ppb		100
14) Fluoranthene	9.27	202	208779	4.43157	ppb		100
16) Pyrene	9.53	202	201268	4.12755	ppb		98
17) Benz (a) anthracene	10.97	228	197717	4.58594	ppb		99
18) Chrysene	11.02	228	216521	4.31339	ppb	#	98
19) Indeno (1,2,3-cd) pyrene	14.92	276	287293	5.09244	ppb		100
21) Benzo (b) fluoranthene	12.76	252	253812	9.23813	ppb	#	98
22) Benzo (k) fluoranthene	12.82	252	222222	6.30589	ppb		99
23) Benzo (a) pyrene	13.34	252	163977	5.97840	ppb	#	97
24) Dibenz (a,h) anthracene	14.95	278	254855	8.44344	ppb		98
25) Benzo (g,h,i) perylene	15.29	276	237700	7.44627	ppb	#	94

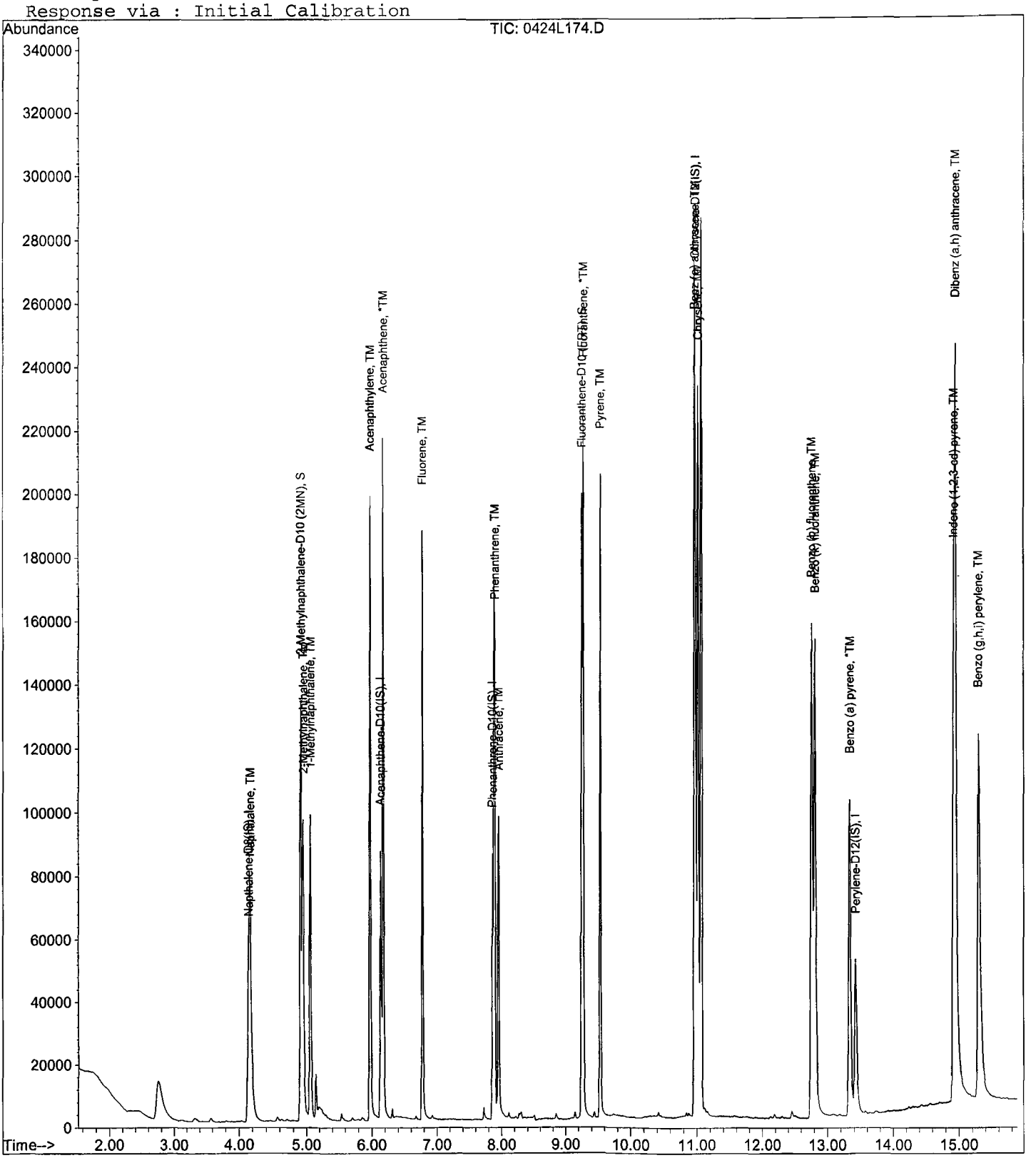
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L174.D Vial: 74
Acq On : 6 May 20 11:07 Operator: MA
Sample : 200504A LCSD-2 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:40 2020 Quant Results File: L0204.RES

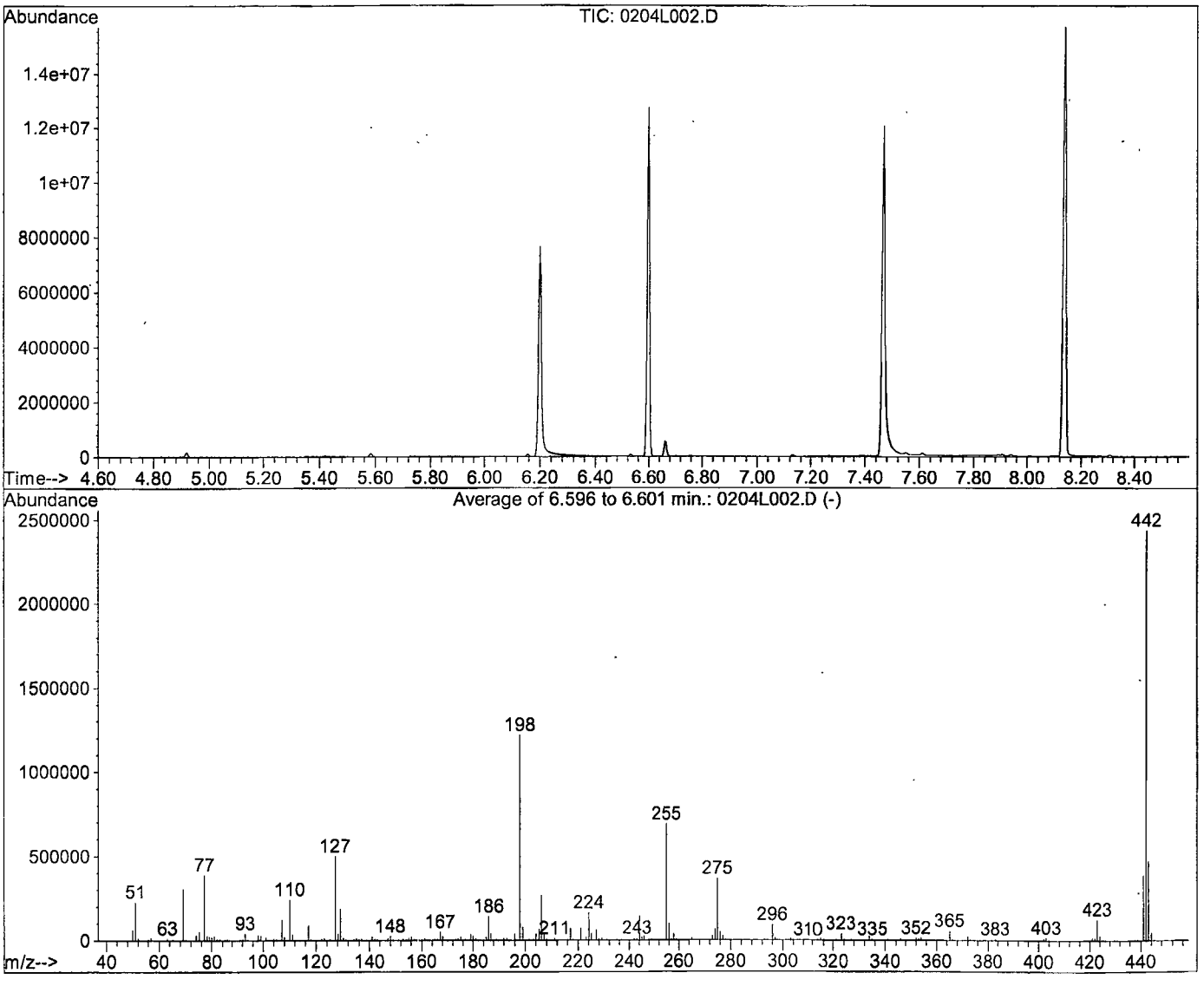
Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



DFTPP

Data File : M:\LINUS\DATA\L200204\0204L002.D Vial: 2
Acq On : 4 Feb 20 9:32 Operator: MA
Sample : SV Tune 10/01/19 Inst : Linus
Misc : Multiplr: 1.00

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270



AutoFind: Scans 1611, 1612, 1613; Background Corrected with Scan 1602

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	18.6	226705	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.4	1215	PASS
127	198	10	80	40.9	497237	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	1216619	PASS
199	198	5	9	6.3	77030	PASS
275	198	10	60	30.0	364907	PASS
365	198	1	100	4.7	56864	PASS
441	442	0.01	24	15.8	386027	PASS
442	198	50	500	200.3	2437461	PASS
443	442	15	24	19.3	470891	PASS

Data File Name:	**0204L002.D**
Data File Path:	**M:\LINUS\DATA\L200204**
Operator:	**MA**
Date Acquired:	**4 Feb 20 9:32**
Method File:	**DFTPP2.M**
Sample Name:	**SV Tune 10/01/19**
Vial Number:	**2**
Instrument Name:	**Linus**

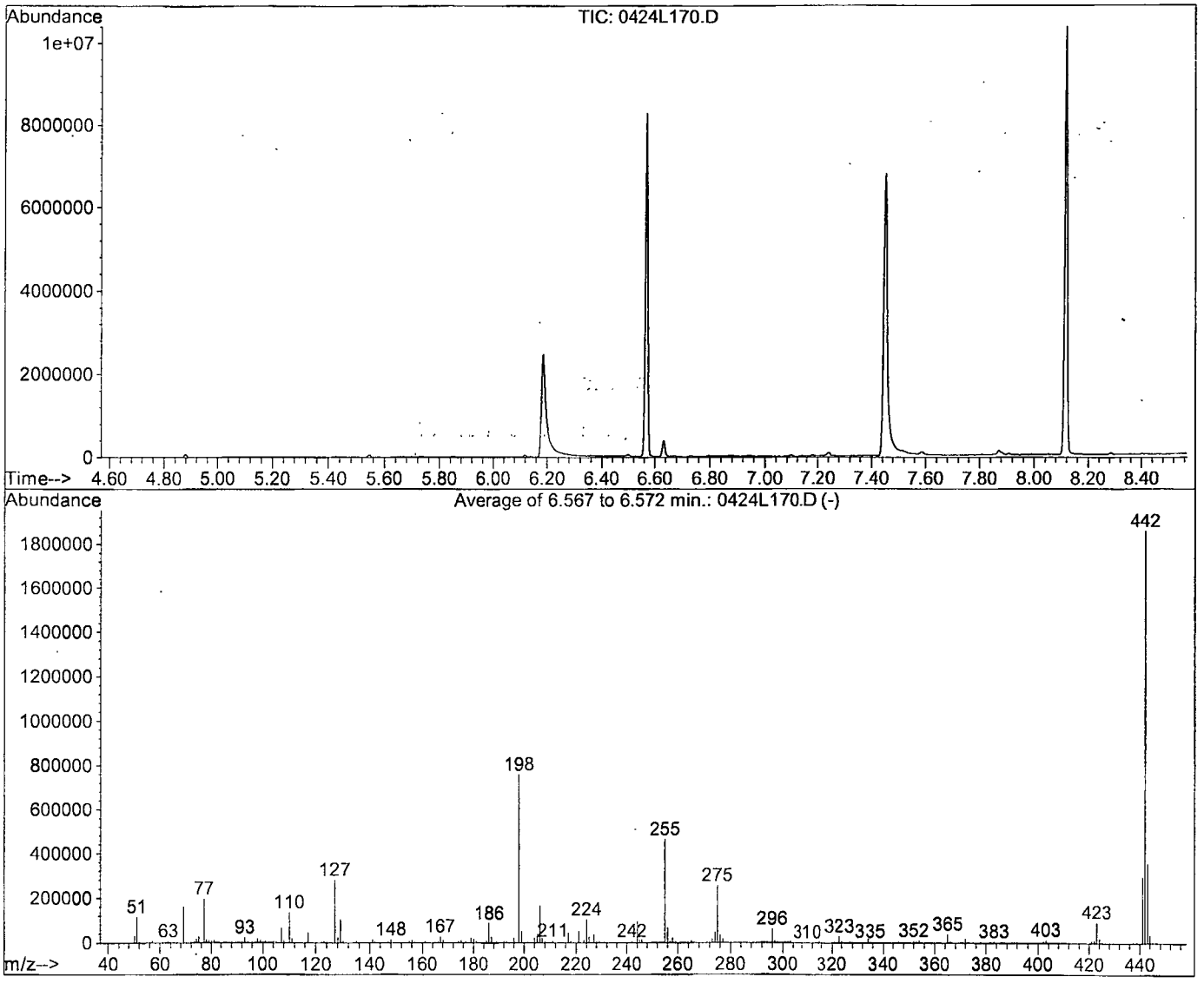
#	Name	Ret Time	Target Response
1)	DDT	8.16	112940000
2)	DDD	7.91	651825
3)	DDE	7.63	587422

Breakdown **1.09**

DFTPP

Data File : M:\LINUS\DATA\L200424\0424L170.D Vial: 70
Acq On : 6 May 20 8:38 Operator: MA
Sample : SV TUNE 10/1/19 Inst : Linus
Misc : Multiplr: 1.00

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270



AutoFind: Scans 1599, 1600, 1601; Background Corrected with Scan 1590

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	15.2	114862	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.5	859	PASS
127	198	10	80	37.0	280354	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	757696	PASS
199	198	5	9	6.6	50349	PASS
275	198	10	60	33.6	254421	PASS
365	198	1	100	4.8	36515	PASS
441	442	0.01	24	15.9	295829	PASS
442	198	50	500	245.4	1859413	PASS
443	442	15	24	19.1	354517	PASS

Data File Name:	**0424L170.D**
Data File Path:	**M:\LINUS\DATA\L200424**
Operator:	**MA**
Date Acquired:	**6 May 20 8:38**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/1/19**
Vial Number:	**70**
Instrument Name:	**Linus**

#	Name	Ret Time	Target Response
1)	DDT	8.12	72191800
2)	DDD	7.87	1176610
3)	DDE	7.59	543426

Breakdown **2.33**

Name of Final Standard: SIM Curve
Prep Date: 02/03/20
Exp Date: 08/10/20
Prep'd By (Initials): MA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
1.0 ug/mL SIM	APPL	1.0 ug/mL SIM	1.0 ug/mL	02/03/20	08/10/20	10 uL	100uL	MC 59130 90uL	0.1 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
1.0 ug/mL SIM	APPL	1.0 ug/mL SIM	1.0 ug/mL	02/03/20	08/10/20	20 uL	100uL	MC 59130 80uL	0.2 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
5.0 ug/mL SIM	APPL	5.0 ug/mL SIM	5.0 ug/mL	02/03/20	08/10/20	10 uL	100uL	MC 59130 90uL	0.5 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
5.0 ug/mL SIM	APPL	5.0 ug/mL SIM	5.0 ug/mL	02/03/20	08/10/20	20 uL	100uL	MC 59130 80 uL	1.0 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
SIM STOCK	APPL	PAH SIM STOCK	200 ug/mL	08/10/19	08/10/20	5 uL	200uL	MC 59130 190 uL	5.0 ug/mL
SIM SURROGATE	APPL	SIM SURR	100 ug/mL	12/17/19	12/17/20	5 uL	"	"	2.5ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	4 uL	"	"	2.5ug/mL
SIM STOCK	APPL	PAH SIM STOCK	200 ug/mL	08/10/19	08/10/20	5 uL	100 uL	MC 59130 80 uL	10 ug/mL
SIM SURROGATE	APPL	SIM SURR	100 ug/mL	12/17/19	12/17/20	5 uL	"	"	5 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
SIM STOCK	APPL	PAH SIM STOCK	200	08/10/19	08/10/20	25 uL	100uL	MC 59130 50 uL	50 ug/mL
SIM SURROGATE	APPL	SIM SURR	100 ug/mL	12/17/19	12/17/20	25 uL	"	"	25 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
SIM STOCK	APPL	PAH SIM STOCK	200 ug/mL	08/10/19	08/10/20	50 uL	100uL	na	100 ug/mL
SIM SURROGATE	APPL	SIM SURR	100 ug/mL	12/17/19	12/17/20	50 uL	"	"	50 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL

Name of Final Standard: 8270 PAH SIM Second Source
Prep Date: 02/03/20
Exp Date: 10/28/20
Prep'd By (Initials): MA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
PAH SIM SS Stock	Phenova	AL0-130490	200 ug/mL	CL13117-40623. Open 7/24/19	12/31/22	5 uL	200uL	MC 59130 195uL	5 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	4 uL	"	"	2.5ug/mL

Name of Final Standard	**PAH SIM Stock (Ampule)**
Prep Date	**08/10/19**
Exp Date	**08/10/20**

Prep'd By (I **MA**

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Custom PAH SIM Mix	Phenova	ALO-130490	200 ug/mL	**CL13121-41102**	**08/10/20**	1000 uL	1mL	**NA**	200ug/mL

Name of Final Standard	**SIM Surrogate**	**Prep'd By (Initials)**	**MA**
Prep Date	**12/17/19**		
Exp Date	**12/17/20**		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Sim Surrogate Deuterated	Restek	33913	2000 ug/mL	**A0149554-41363,41364, 41365,41366**	**04/30/25**	2500 uL	50 mL	**Acetone #0231086**	100 ug/mL

Name of Final Standard	**8270 SIM PAH Internal Standard**	**Prep'd By (Initials)**	**MA**
Prep Date	**10/28/19**		
Exp Date	**10/28/20**		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
SV Internal Standard	Restek	31206	2000 ug/mL	**A0151843-49414**	**07/35/25**	625uL	10mL	**MC 59130**	125 ug/mL

Name of Final Standard	**SIM Surrogate**
Prep Date	**04/01/20**
Exp Date	**04/01/21**

Prep'd By (Initials) **MA**

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Sim Surrogate Deuterated	Restek	33913	2000 ug/mL	**A0149554-41366,49991-995**	**04/30/25**	5mL	100 mL	**Acetone #0234320**	100 ug/mL

Name of Final Standard	**SIM Spike**
Prep Date	**12/19/19**
Exp Date	**11/31/20**

Prep'd By (Initials) **MA**

Initial Standard Information						Final Standard Information			
Standard (from contianer Label)	Supplier	P/N# (or APPL Mix	Conc.(range)	(or reference to APPL prep date)	Exp Date	from Stock	Final Volume	Solvent + Lot# (or	Standard Conc (range)
Custom PAH Sim Mix	Phenova	AL0-13049(	200 ug/mL	**CL13121-41379-382**	**12/31/22**	5 mL	25 mL	**Acetone 0231086**	40 ug/mL

Organic Extraction Worksheet

Method	Continuous Liquid/Liquid SVOC 3520C	Extraction Set	200504A	Extraction Method	LIQ003	Units	mL

Spiked ID 1	8270T Spike 4-1-20 4-1-21		Surrogate ID 1	8270 Surrogate 4-15-20 3-2-21	
Spiked ID 2	Sim Spike 4-1-20 4-1-21		Surrogate ID 2	SIM Surrogate 4-1-20 4-1-21	
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	05/04/20 12:20	
Spiked ID 8			Ext. End Time:	05/05/20 7:00	
			GC Requires Extract By:		

pH1	2	05/04/20 11:15	Water Bath Temp 1 °C	75/74.9 E-WB6 °
pH2	14	05/05/20 10:15	Water Bath Temp 2 °C	
pH3			Water Bath Temp 3 °C	

Spiked By: KY **Date** 05/04/20 **Witnessed By:** CFM **Date** 05/04/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200504A Blk				1,0.050	1,2	800	1	2/1	05/04/20 11:00	
						equip	E-HP51 E-WB6				
2	200504A LCS-1		1	1	1	1	800	1	2/1	05/04/20 11:00	
						equip	E-HP50 E-WB6				
3	200504A LCS-2		0.125	2	0.050	2	800	1	2/1	05/04/20 11:00	
						equip	E-HP49 E-WB6				
4	200504A LCSD-1		1	1	1	1	800	1	2/1	05/04/20 11:00	
						equip	E-HP48 E-WB6				
5	200504A LCSD-2		0.125	2	0.050	2	800	1	2/1	05/04/20 11:00	
						equip	E-HP47 E-WB6				
6	BA10439	BA10439W19			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92025
						equip	E-HP25 E-WB6				
7	BA10504	BA10504W18			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92039
						equip	E-HP26 E-WB6				
8	BA10505	BA10505W11			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92039
						equip	E-HP27 E-WB6				

Solvent and Lot#	
PH Strips	HC998032
Dichloromethane (DCM)	59239
1+1 H2SO4	4-2-20
10N NaOH	4-2-20
Filter Paper	400171
Na2SO4	2019070279

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	
Time	
Refrigerator	GC-C

	Technician's Initials
Scanned By	DL
Sample Preparation	KY,DL
Extraction	KY,DL
Concentration	DL

Modified	05/07/20 8:44:51 AM

Reviewed By: KY **Date** 05/07/20

Injection Log

Directory: M:\LINUS\DATA\L200204\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
2	0204L002.D	1	SV Tune 10/01/19		4 Feb 20 9:32
3	0204L003.D	1	0.1 SIM 02/03/20		4 Feb 20 9:48
4	0204L004.D	1	0.2 SIM 02/03/20		4 Feb 20 10:09
5	0204L005.D	1	0.5 SIM 02/03/20		4 Feb 20 10:31
6	0204L006.D	1	1 SIM 02/03/20		4 Feb 20 10:53
7	0204L007.D	1	5 SIM 02/03/20		4 Feb 20 11:15
8	0204L008.D	1	10 SIM 02/03/20		4 Feb 20 11:37
9	0204L009.D	1	50 SIM 02/03/20		4 Feb 20 11:59
10	0204L010.D	1	100 SIM 02/03/20		4 Feb 20 12:21
11	0204L011.D	1	SS SIM 02/03/20		4 Feb 20 13:21
70	0424L170.D	1	SV TUNE 10/1/19		6 May 20 8:38
71	0424L171.D	1	5 SIM 2/4/20 (3)		6 May 20 8:54
72	0424L172.D	1.25	200504A BLK 1/800		6 May 20 10:23
73	0424L173.D	1.25	200504A LCS-2 1/800		6 May 20 10:45
74	0424L174.D	1.25	200504A LCSD-2 1/800		6 May 20 11:07
75	0424L175.D	1.25	BA10439W19 1/800		6 May 20 11:29
78	0424L178.D	1	5 SIM 2/4/20 (4)		6 May 20 12:52

ORGANICS
Calibration Data

2MEE
EPA 8270

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 05/01/20
Matrix: Instrument: Yoda
Initials: MA

			0501Y003.D	0501Y004.D	0501Y006.D	0501Y007.D	0501Y008.D	0501Y009.D	0501Y010.D	0501Y011.D								
		Compound	1	2	3	4	5	6	7	8			Avg	%RSD	Type	r^2	Q	MRF
1	I	1,4-dichlorobenzene-D4(IS)																
2	TM	2-(2-Methoxyethoxy)ethanol	0.1264	0.1827	0.1475	0.1625	0.1354	0.1644	0.1592	0.1806			0.16	13	TM			
3																		
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Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y003.D Vial: 39
Acq On : 1 May 20 9:39 Operator: MA,SS
Sample : 50ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:24 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	428206	40.00000 ppb	-0.01
System Monitoring Compounds					
Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.28	45	67679	26.91018 ppb	95

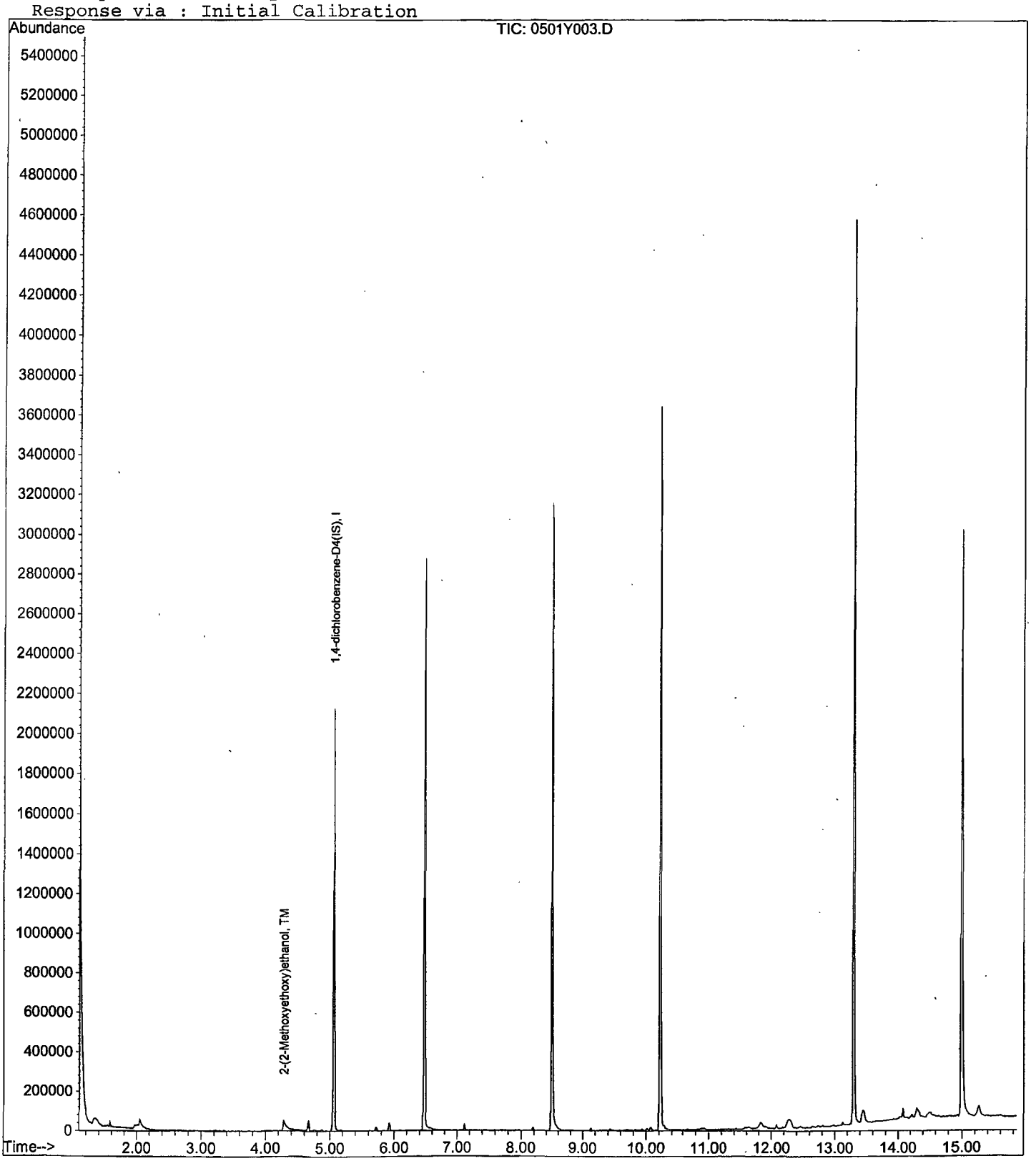
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y003.D Vial: 39
Acq On : 1 May 20 9:39 Operator: MA,SS
Sample : 50ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y004.D Vial: 40
Acq On : 1 May 20 10:03 Operator: MA,SS
Sample : 100ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:44 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	358512	40.00000 ppb	-0.01
System Monitoring Compounds					
Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	163785	77.78322 ppb	99

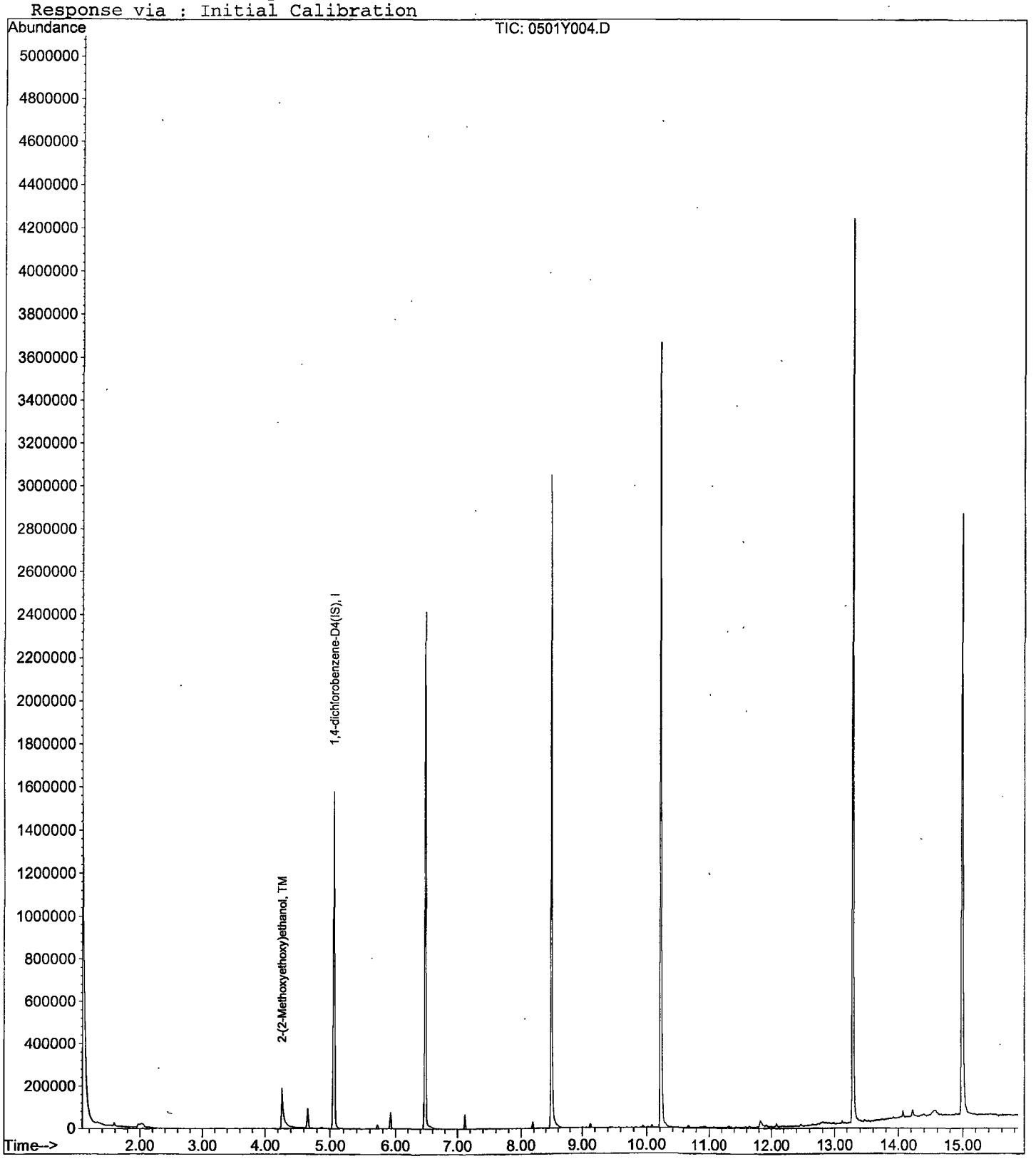
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y004.D Vial: 40
Acq On : 1 May 20 10:03 Operator: MA,SS
Sample : 100ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y006.D Vial: 42
Acq On : 1 May 20 10:51 Operator: MA,SS
Sample : 200ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:44 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	431824	40.00000 ppb	-0.01

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	318364	125.52571 ppb	98

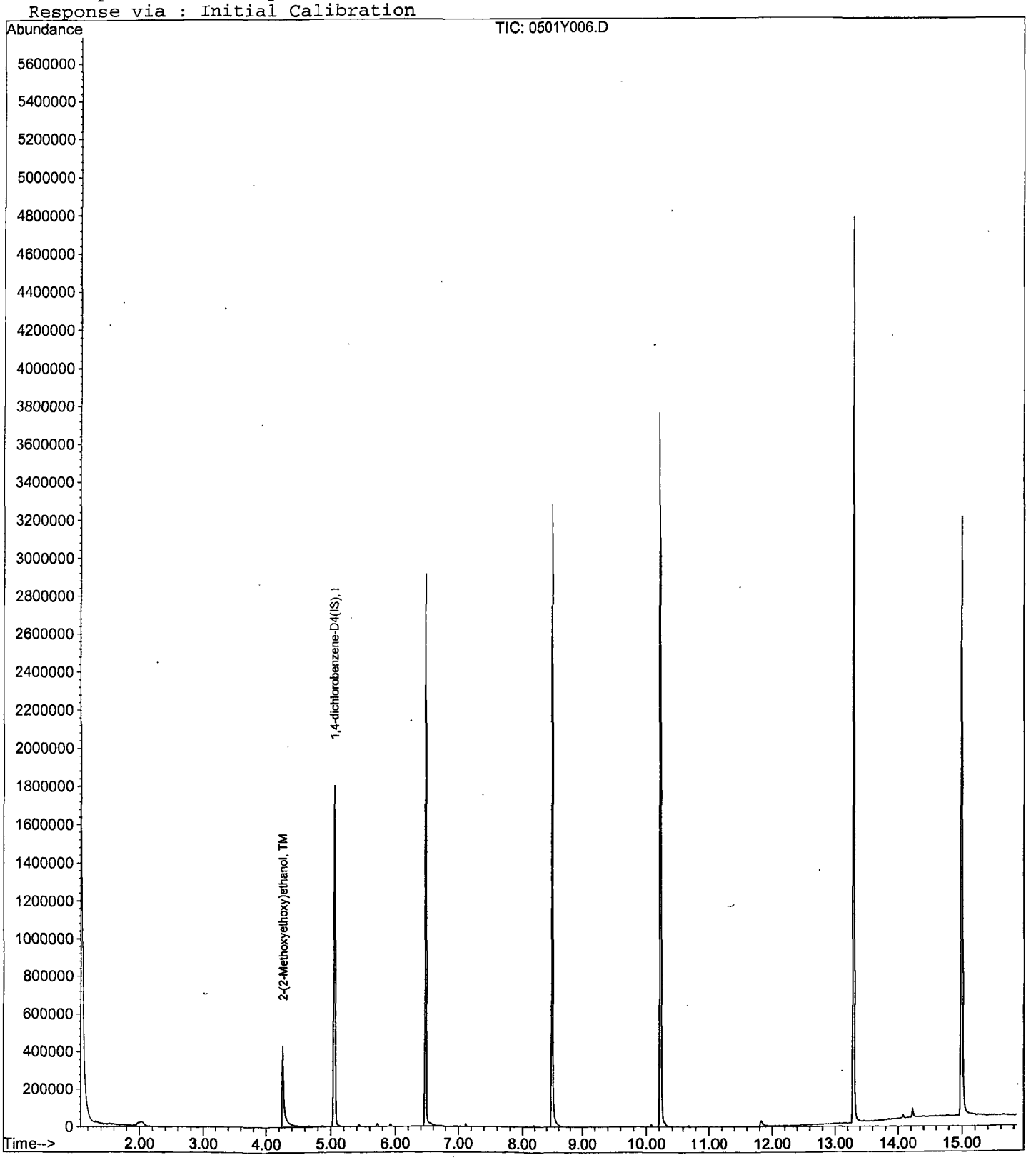
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y006.D Vial: 42
Acq On : 1 May 20 10:51 Operator: MA,SS
Sample : 200ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y007.D Vial: 7
Acq On : 1 May 20 11:24 Operator: MA,SS
Sample : 400ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:44 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	425852	40.00000	ppb	-0.01
System Monitoring Compounds						
Target Compounds						Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	692148	276.72970	ppb	99

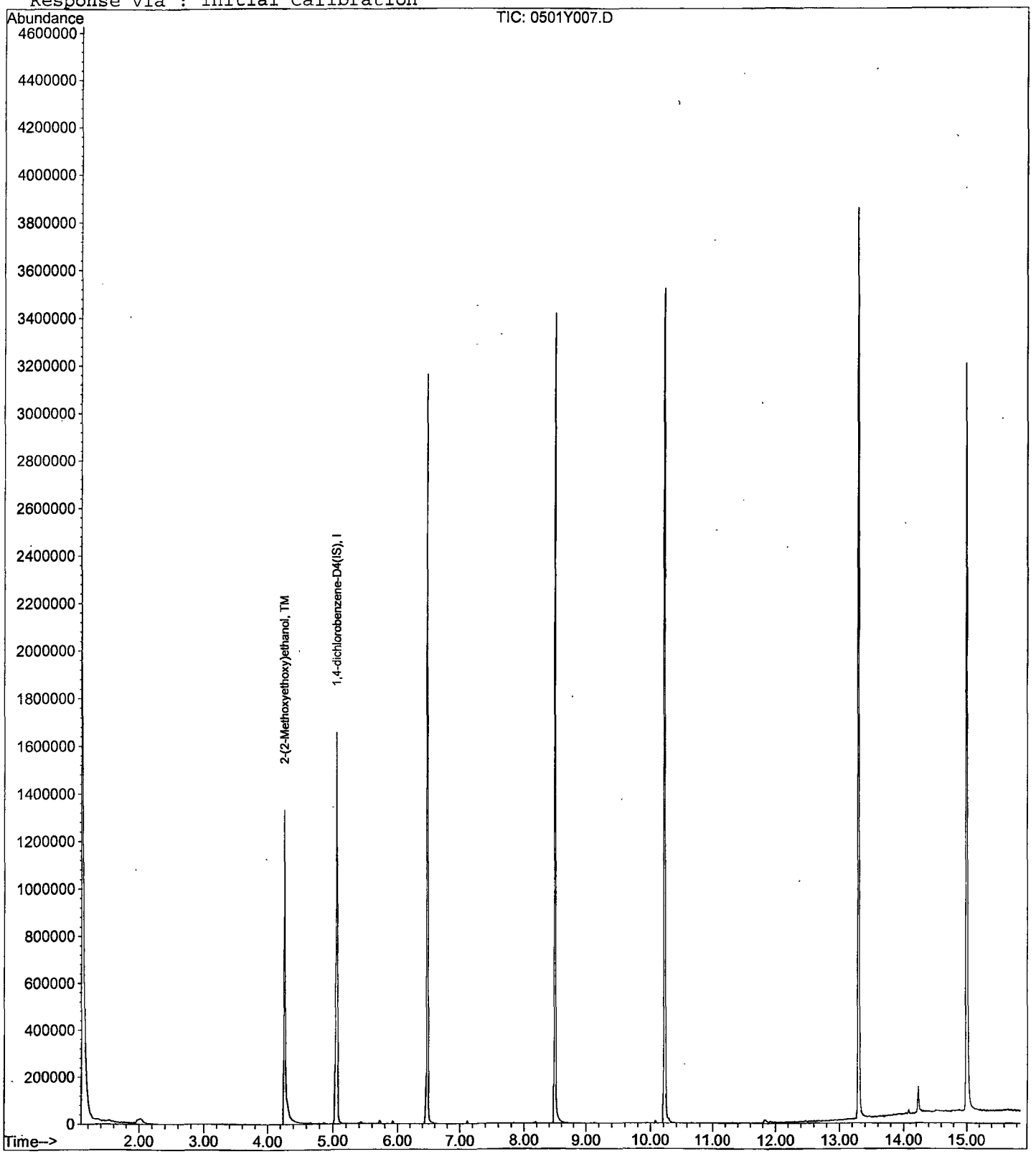
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y007.D Vial: 7
Acq On : 1 May 20 11:24 Operator: MA,SS
Sample : 400ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y008.D Vial: 8
Acq On : 1 May 20 11:48 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:16 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 12:15:50 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.07	152	483204	40.00000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.28	45	818058	442.11333	ppb	100

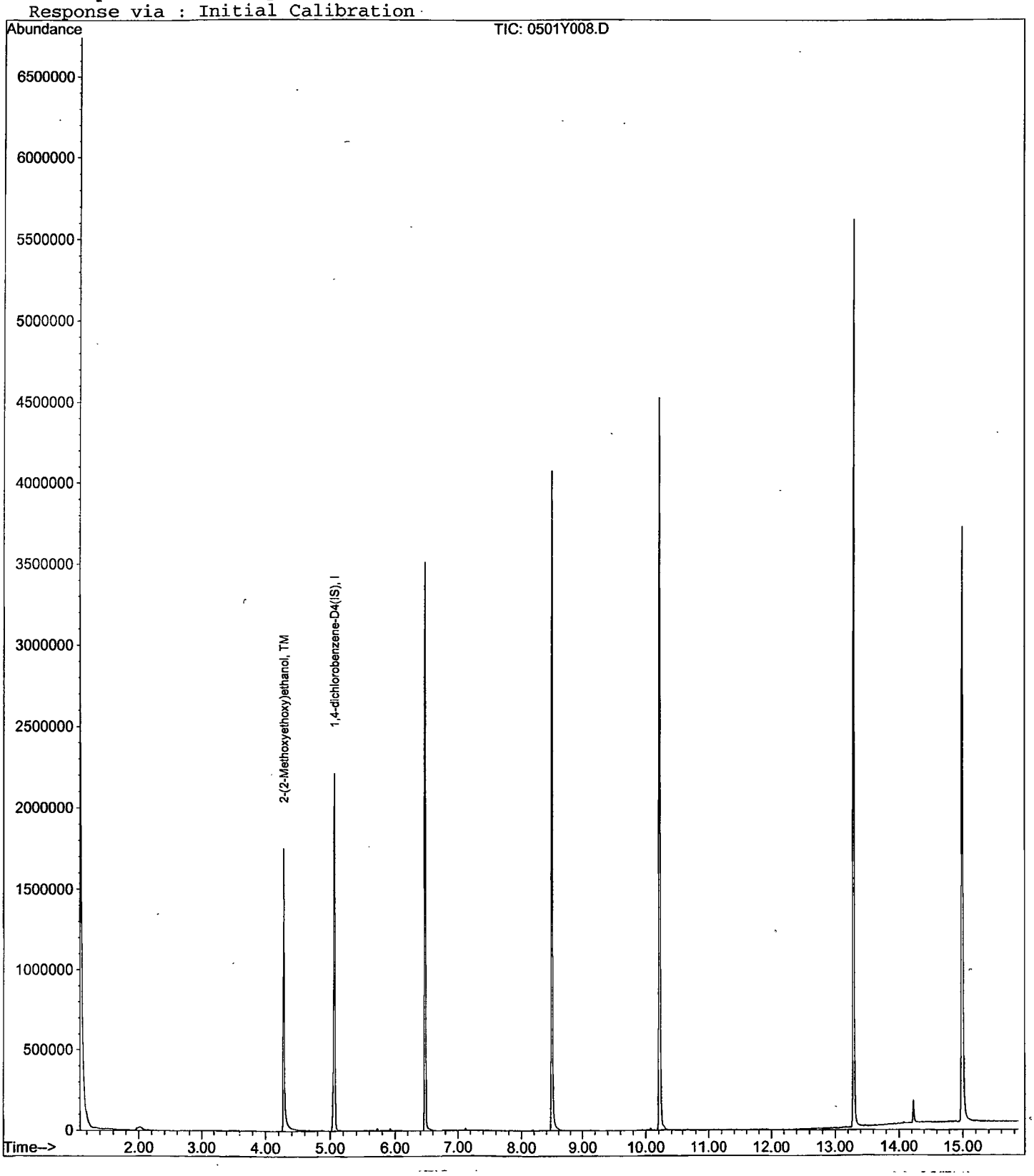
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y008.D Vial: 8
Acq On : 1 May 20 11:48 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:16 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y009.D Vial: 9
Acq On : 1 May 20 12:13 Operator: MA,SS
Sample : 600ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:14 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:44 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	445147	40.00000 ppb	-0.01

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.27	45	1097935	518.98742 ppb	99

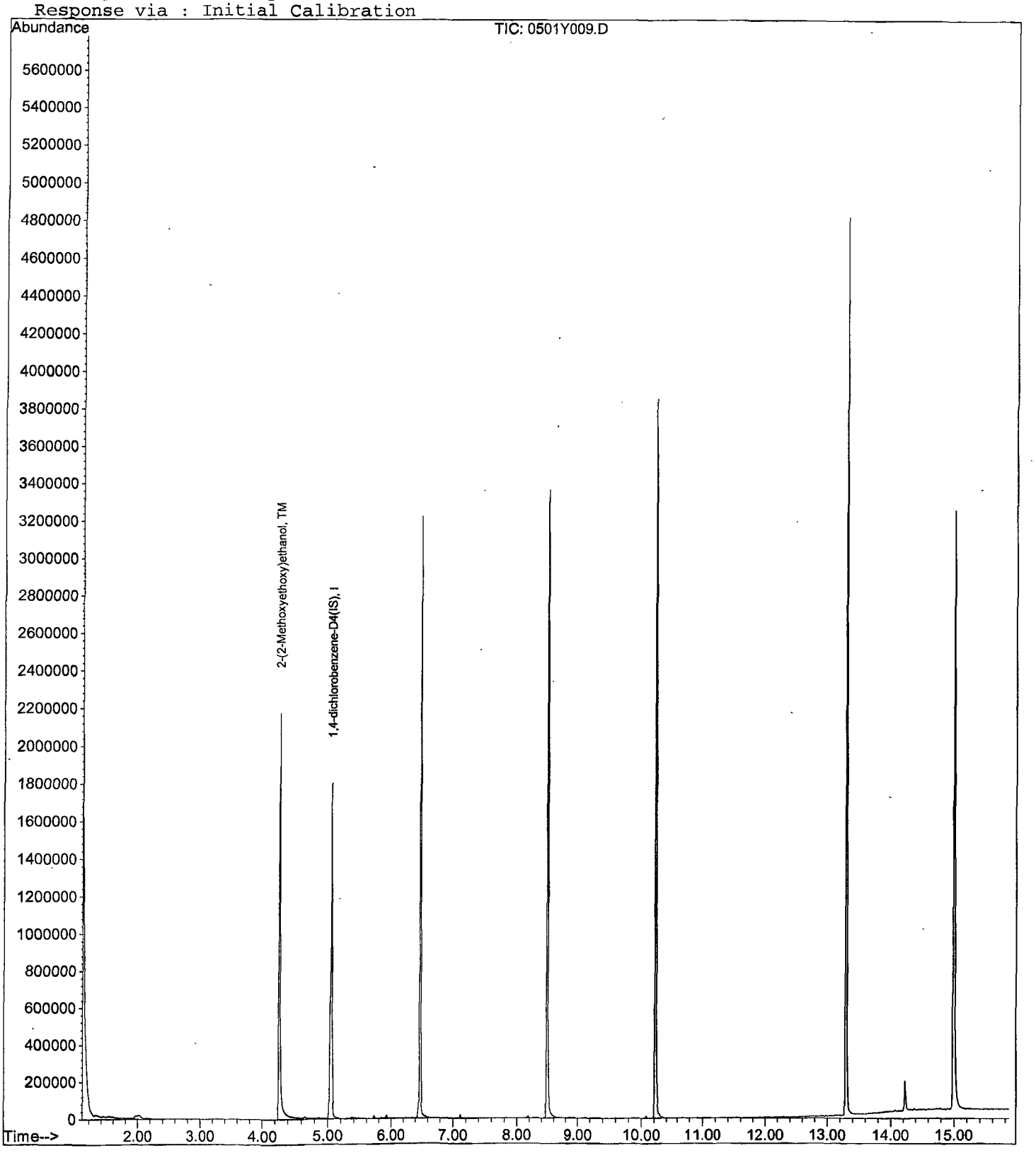
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y009.D Vial: 9
Acq On : 1 May 20 12:13 Operator: MA,SS
Sample : 600ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:14 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y010.D Vial: 10
Acq On : 1 May 20 12:37 Operator: MA,SS
Sample : 800ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:36 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 12:15:50 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.07	152	461483	40.00000 ppb	0.00

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.30	45	1469246	831.41690 ppb	99

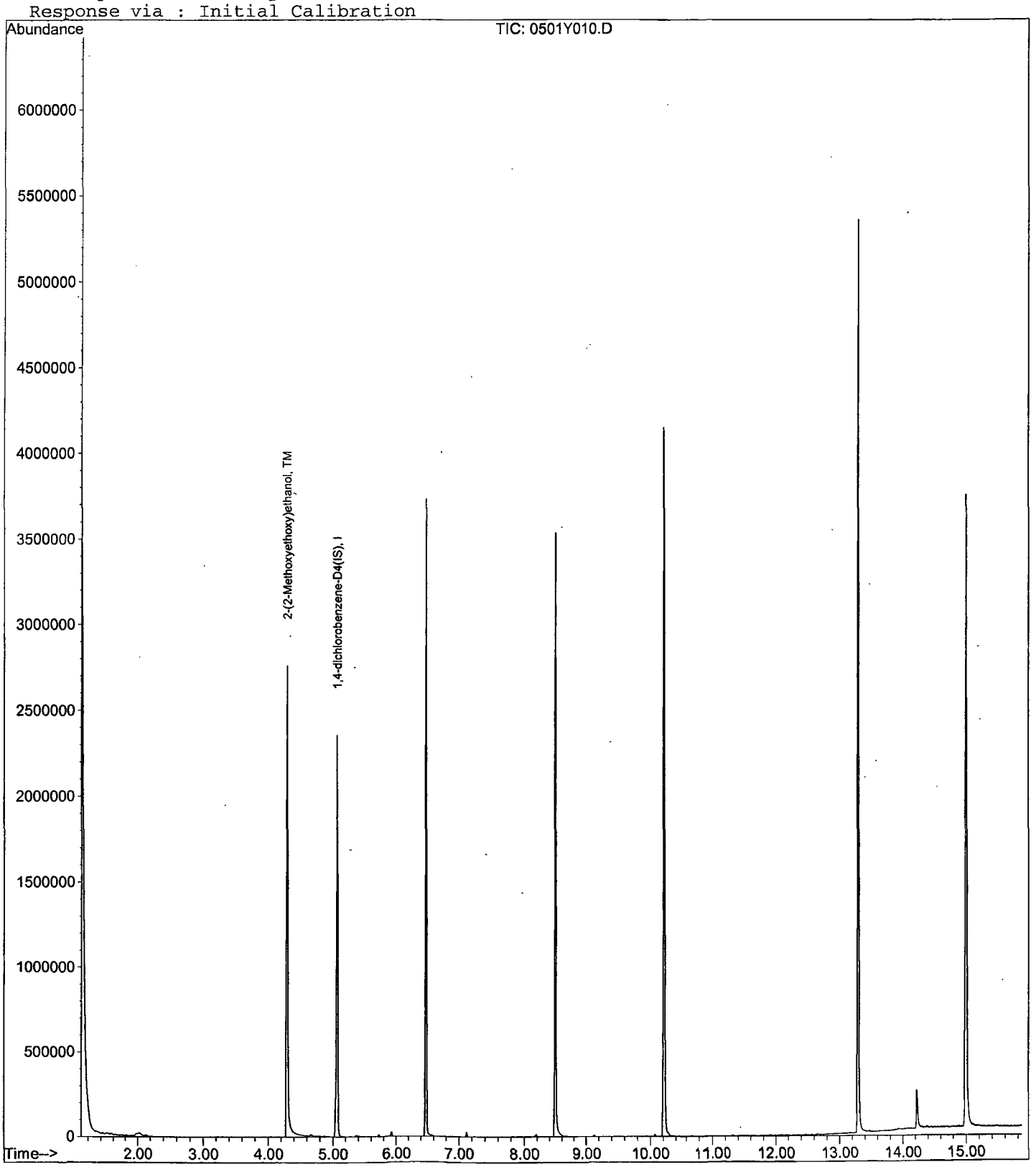
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y010.D Vial: 10
Acq On : 1 May 20 12:37 Operator: MA,SS
Sample : 800ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:36 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y011.D Vial: 11
Acq On : 1 May 20 13:01 Operator: MA,SS
Sample : 1000ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 13:03 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 12:15:50 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	445958	40.00000 ppb	-0.01

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.29	45	2014018	1172.78870 ppb	100

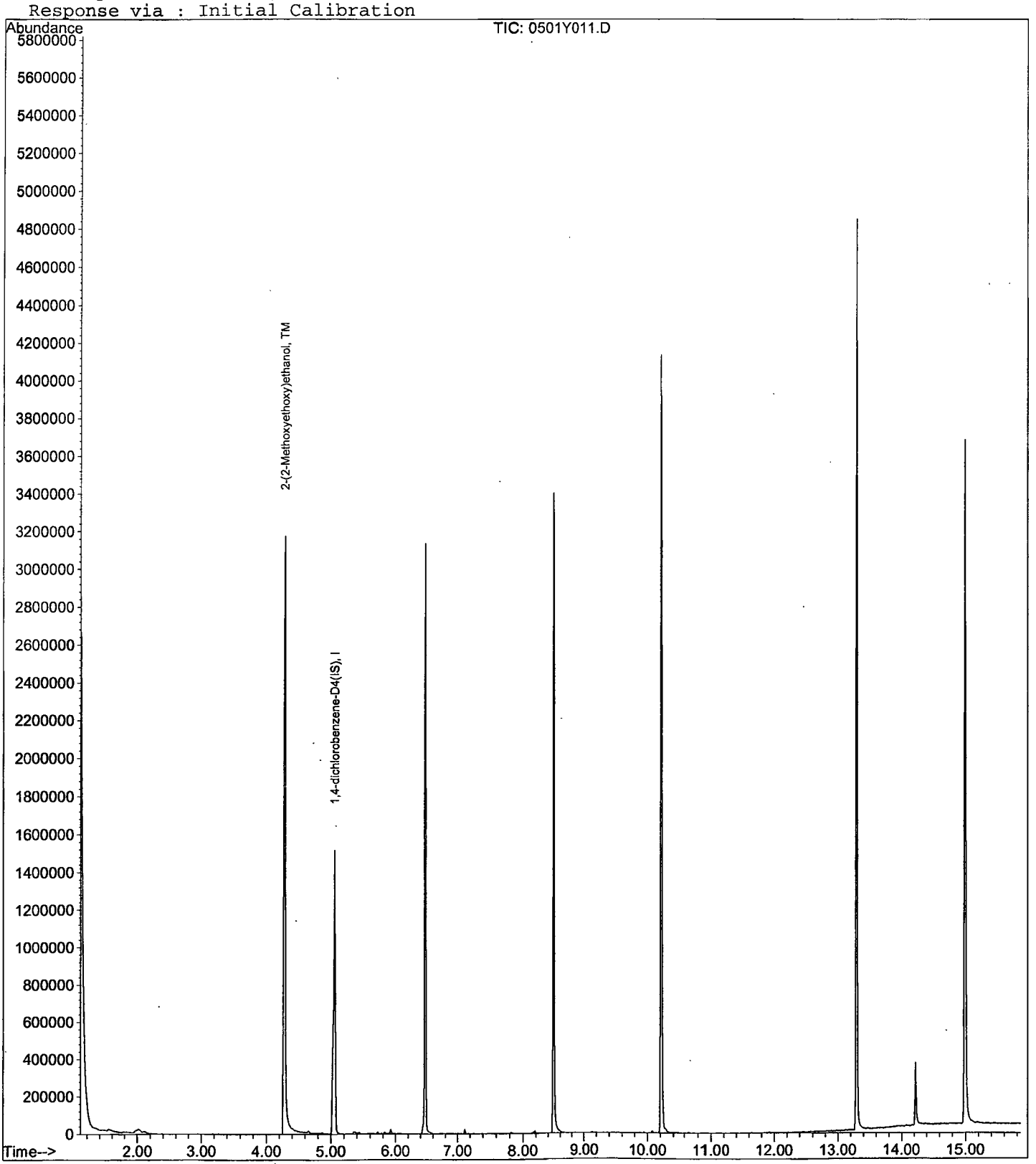
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y011.D Vial: 11
Acq On : 1 May 20 13:01 Operator: MA,SS
Sample : 1000ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 13:03 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



2MEE
EPA 8270

Form 7

Second Source

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 1 May 20 13:50
Instrument: Yoda
Initial Cal. Date: 05/01/20
Data File: 0501Y013.D

		Compound	MEAN	CCRF	%D	%Drift	
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2	TM	2-(2-Methoxyethoxy)ethanol	0.1574	0.1794	14	TM	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			14.0		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y013.D Vial: 13
Acq On : 1 May 20 13:50 Operator: MA,SS
Sample : SSug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 14:30 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	461050	40.00000 ppb	-0.01

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	1033684	569.91471 ppb	100

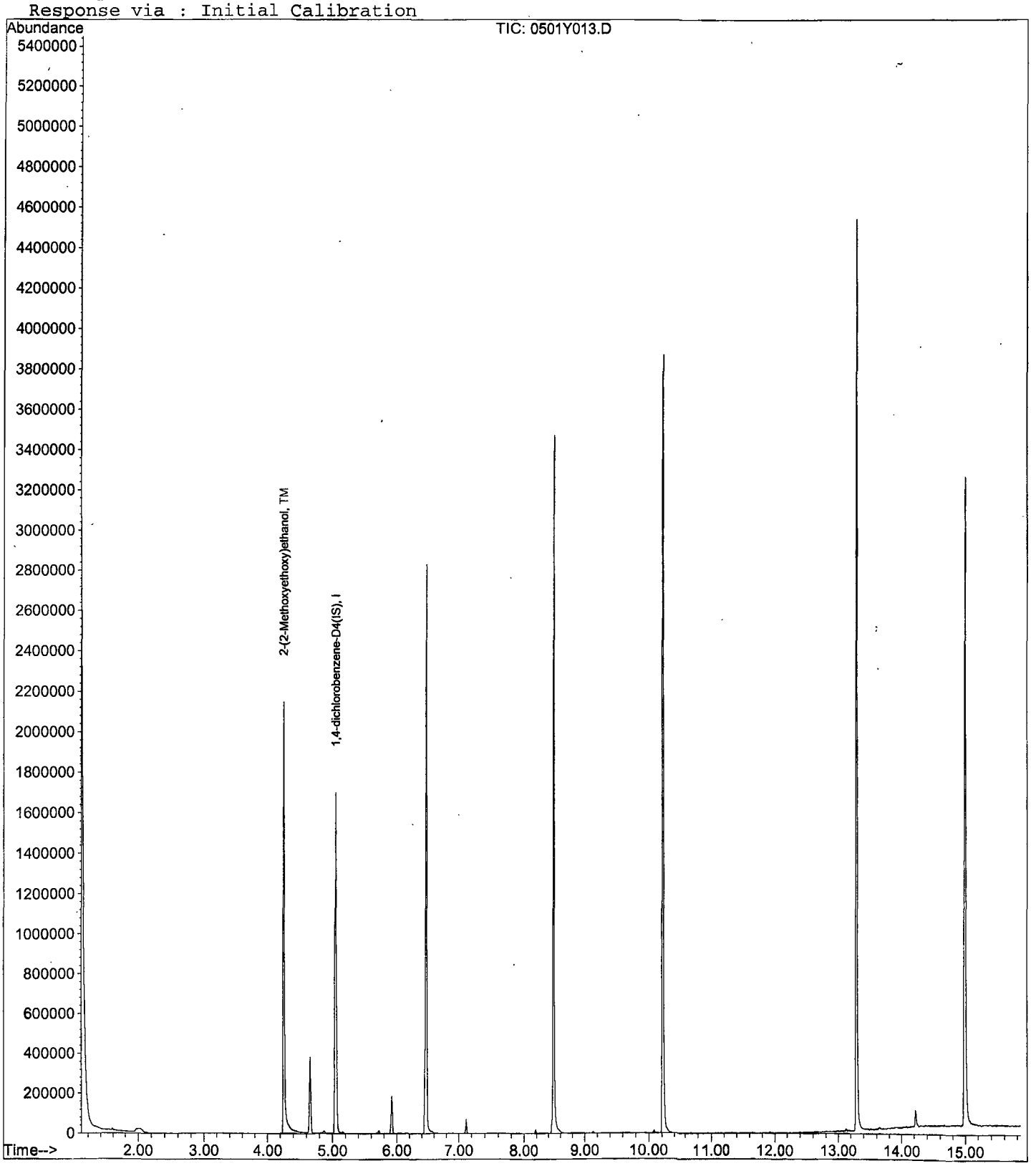
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y013.D Vial: 13
Acq On : 1 May 20 13:50 Operator: MA,SS
Sample : SSug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 14:30 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



2MEE
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 4 May 20 15:07
Instrument: Yoda
Initial Cal. Date: 05/01/20
Data File: 0501Y031.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2	TM	2-(2-Methoxyethoxy)ethanol	0.1574	0.1846	17	TM	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			17.0		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y031.D Vial: 45
Acq On : 4 May 20 15:07 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 4 15:27 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	450181	40.00000	ppb	-0.01
System Monitoring Compounds						
Target Compounds						Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	1038881	586.60903	ppb	98

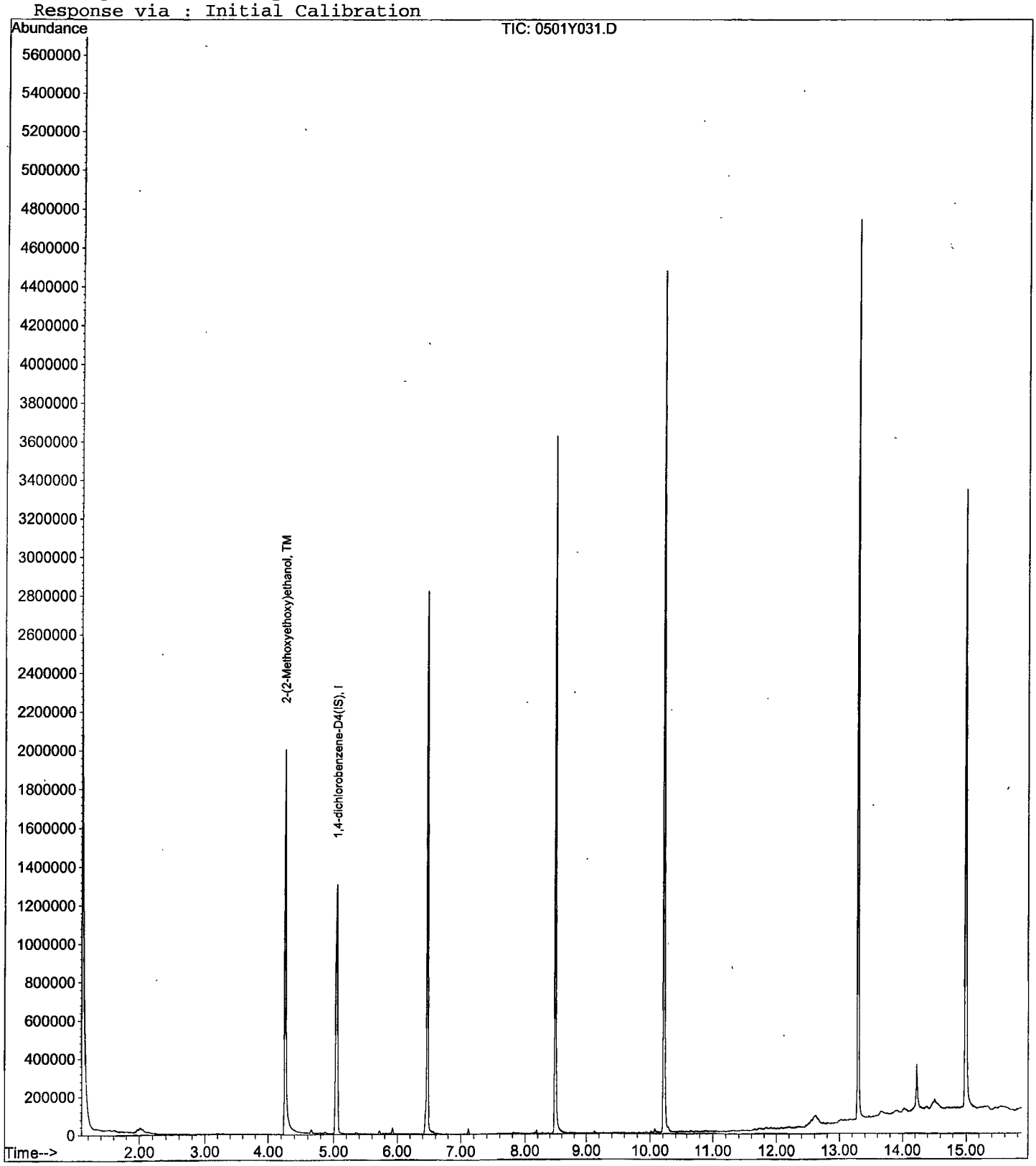
(#) = qualifier out of range (m) = manual integration
0501Y031.D YMEE0501.M Tue May 05 09:47:36 2020 Page 1

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y031.D Vial: 45
Acq On : 4 May 20 15:07 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 4 15:27 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration



2MEE
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 4 May 20 18:21
Instrument: Yoda
Initial Cal. Date: 05/01/20
Data File: 0501Y038.D

		Compound	MEAN	CCRF	%D	%Drift	
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2	TM	2-(2-Methoxyethoxy)ethanol	0.1574	0.1804	15	TM	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			15.0		

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y038.D Vial: 38
Acq On : 4 May 20 18:21 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 7:48 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	391416	40.00000 ppb	-0.01

System Monitoring Compounds

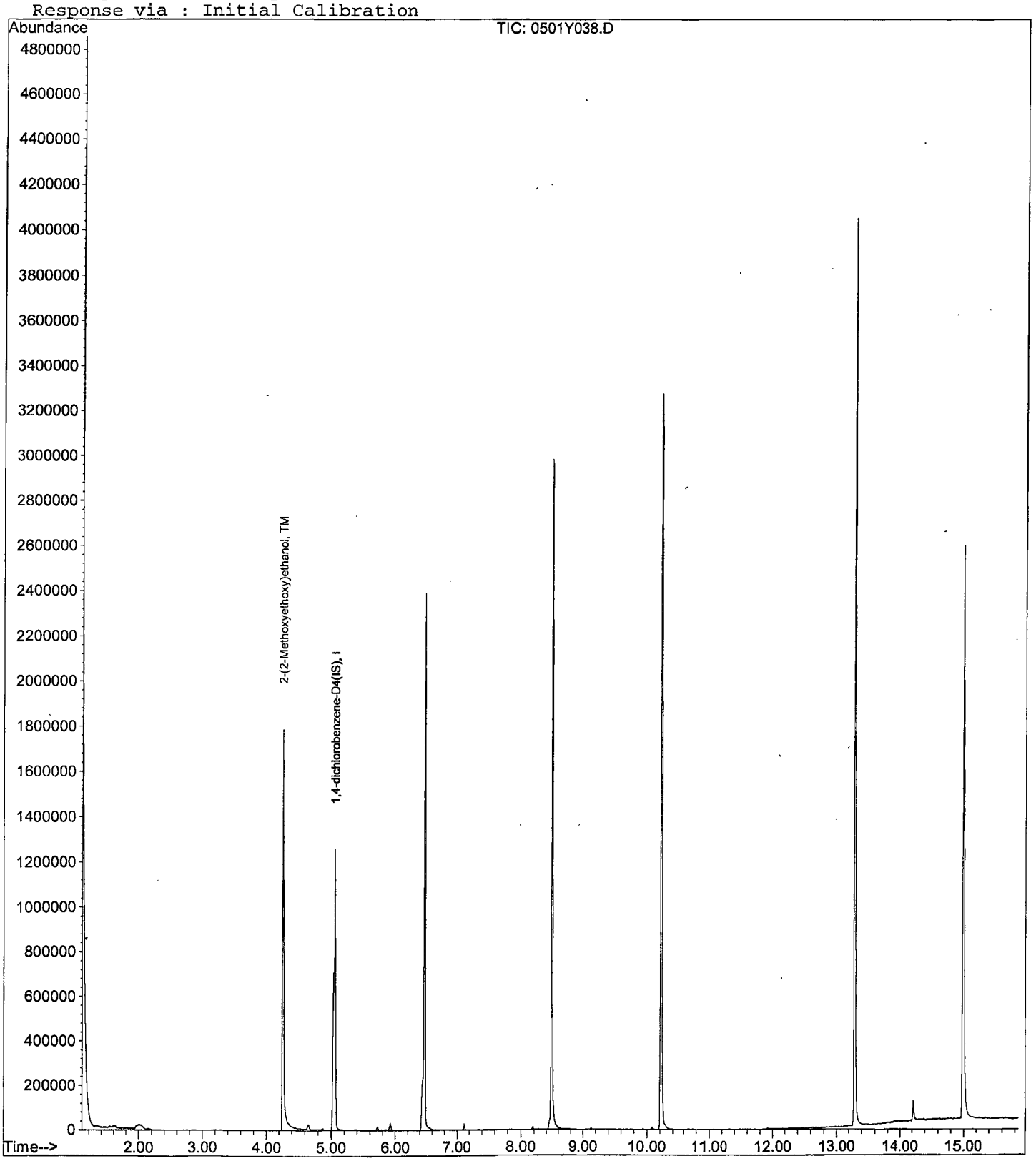
Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	882788	573.30793 ppb	100

(#) = qualifier out of range (m) = manual integration
0501Y038.D YMEE0501.M Tue May 05 09:47:53 2020 Page 1

Data File : M:\YODA\DATA\Y200501M\0501Y038.D Vial: 38
Acq On : 4 May 20 18:21 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 7:48 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y035.D Vial: 35
Acq On : 4 May 20 17:08 Operator: MA,SS
Sample : BA10439W14 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.04	152	352777	40.0000 ppb	-0.03

System Monitoring Compounds

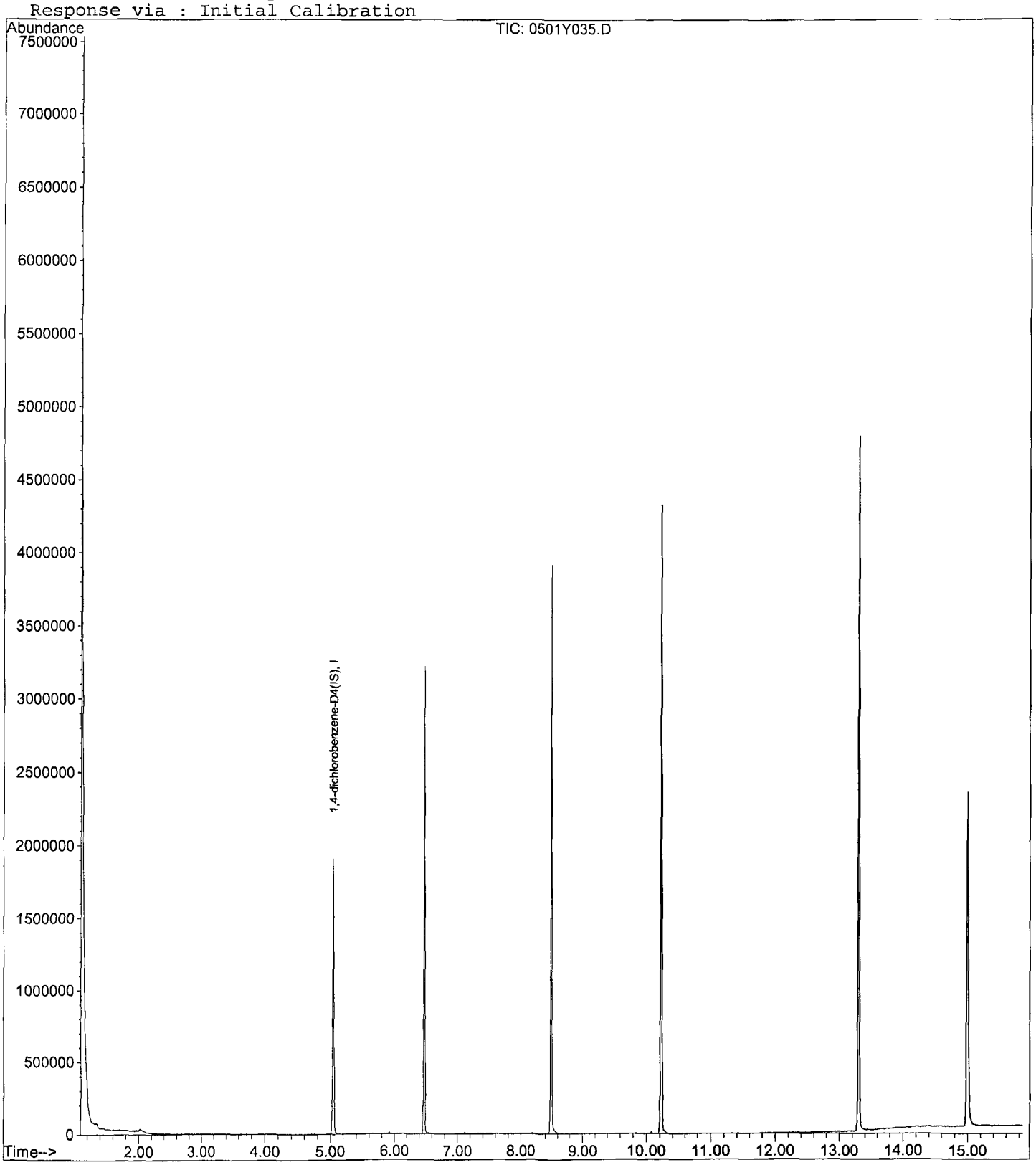
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration
0501Y035.D YMEE0501.M Wed May 06 13:24:40 2020 Page 1

Data File : M:\YODA\DATA\Y200501M\0501Y035.D Vial: 35
Acq On : 4 May 20 17:08 Operator: MA,SS
Sample : BA10439W14 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y032.D Vial: 32
Acq On : 4 May 20 15:56 Operator: MA,SS
Sample : 200504A BLK 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.04	152	476418	40.0000 ppb	-0.03

System Monitoring Compounds

Target Compounds Qvalue

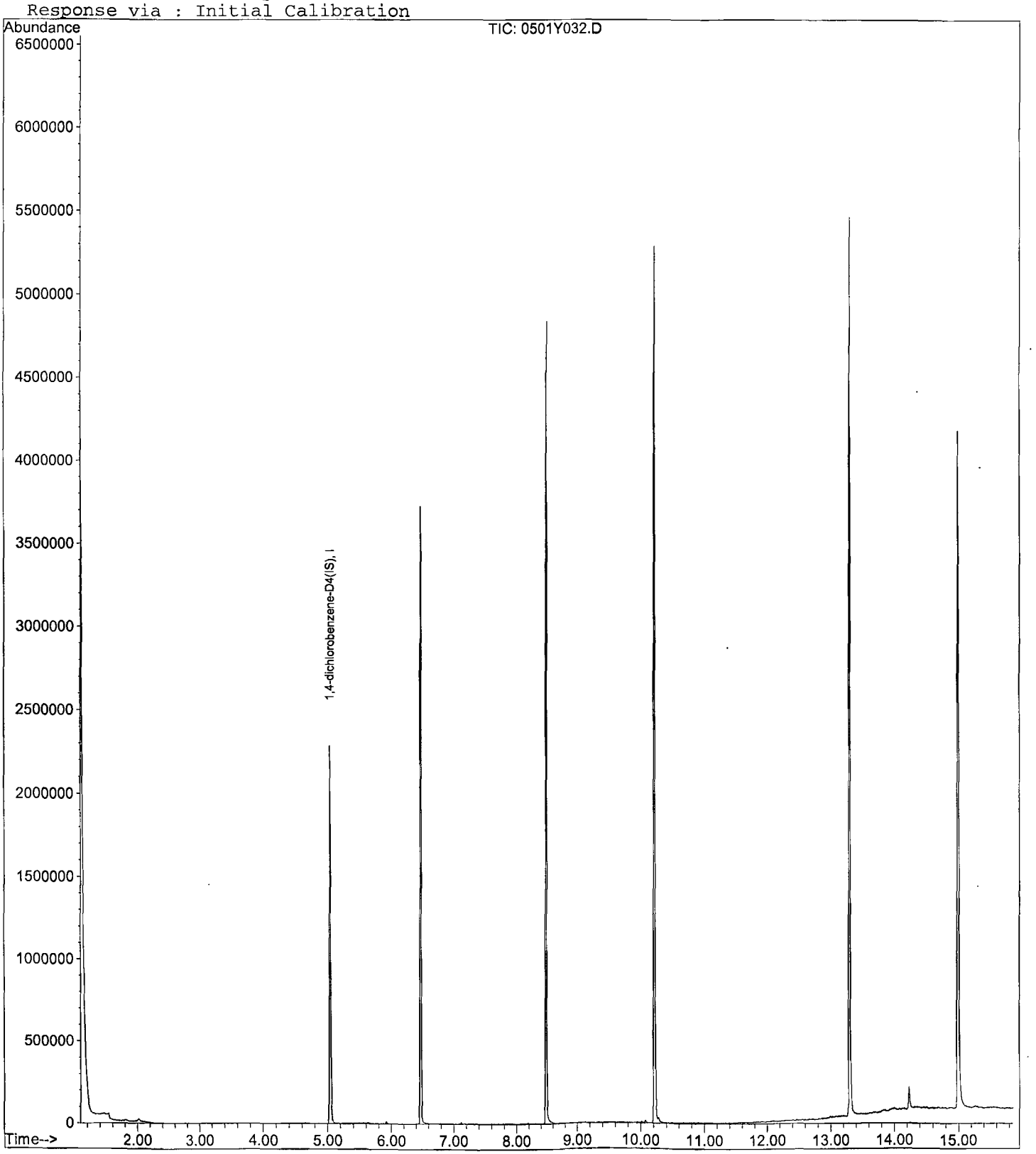
(#) = qualifier out of range (m) = manual integration
0501Y032.D YMEE0501.M Wed May 06 13:24:35 2020 Page 1

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y032.D Vial: 32
Acq On : 4 May 20 15:56 Operator: MA,SS
Sample : 200504A BLK 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y033.D Vial: 33
Acq On : 4 May 20 16:20 Operator: MA,SS
Sample : 200504A LCS-1 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:54 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.05	152	460181	40.0000 ppb	-0.02

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.47	45	100339	55.4257 ppb	100

(#) = qualifier out of range (m) = manual integration
0501Y033.D YMEE0501.M Wed May 06 13:24:37 2020 Page 1

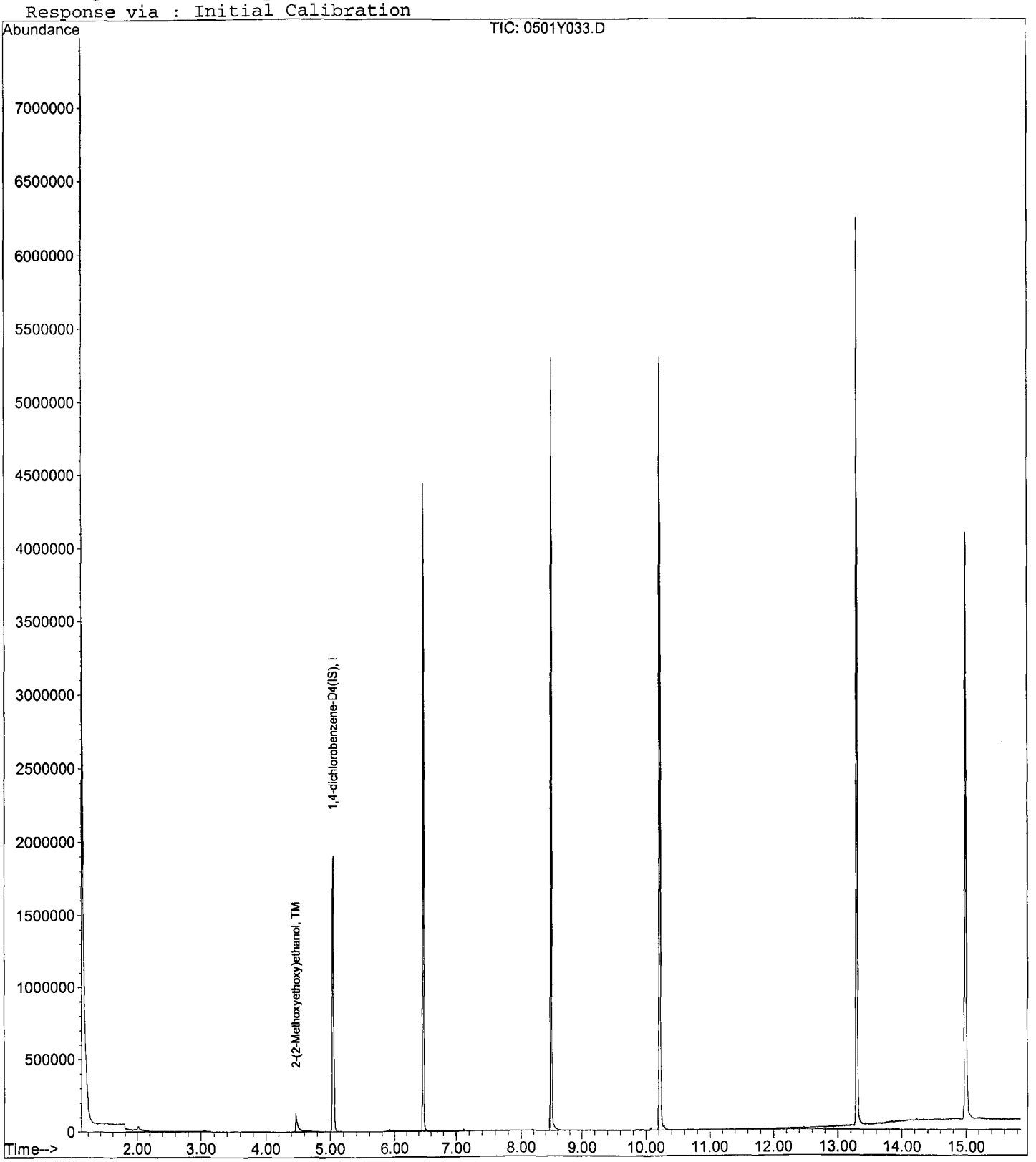
Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y033.D
Acq On : 4 May 20 16:20
Sample : 200504A LCS-1 2/500
Misc :

Vial: 33
Operator: MA,SS
Inst : Yoda
Multiplr: 1.00

Quant Time: May 5 9:54 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y034.D Vial: 34
Acq On : 4 May 20 16:44 Operator: MA,SS
Sample : 200504A LCSD-1 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:54 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.04	152	495995	40.0000 ppb	-0.03

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.48	45	82352	42.2053 ppb	98

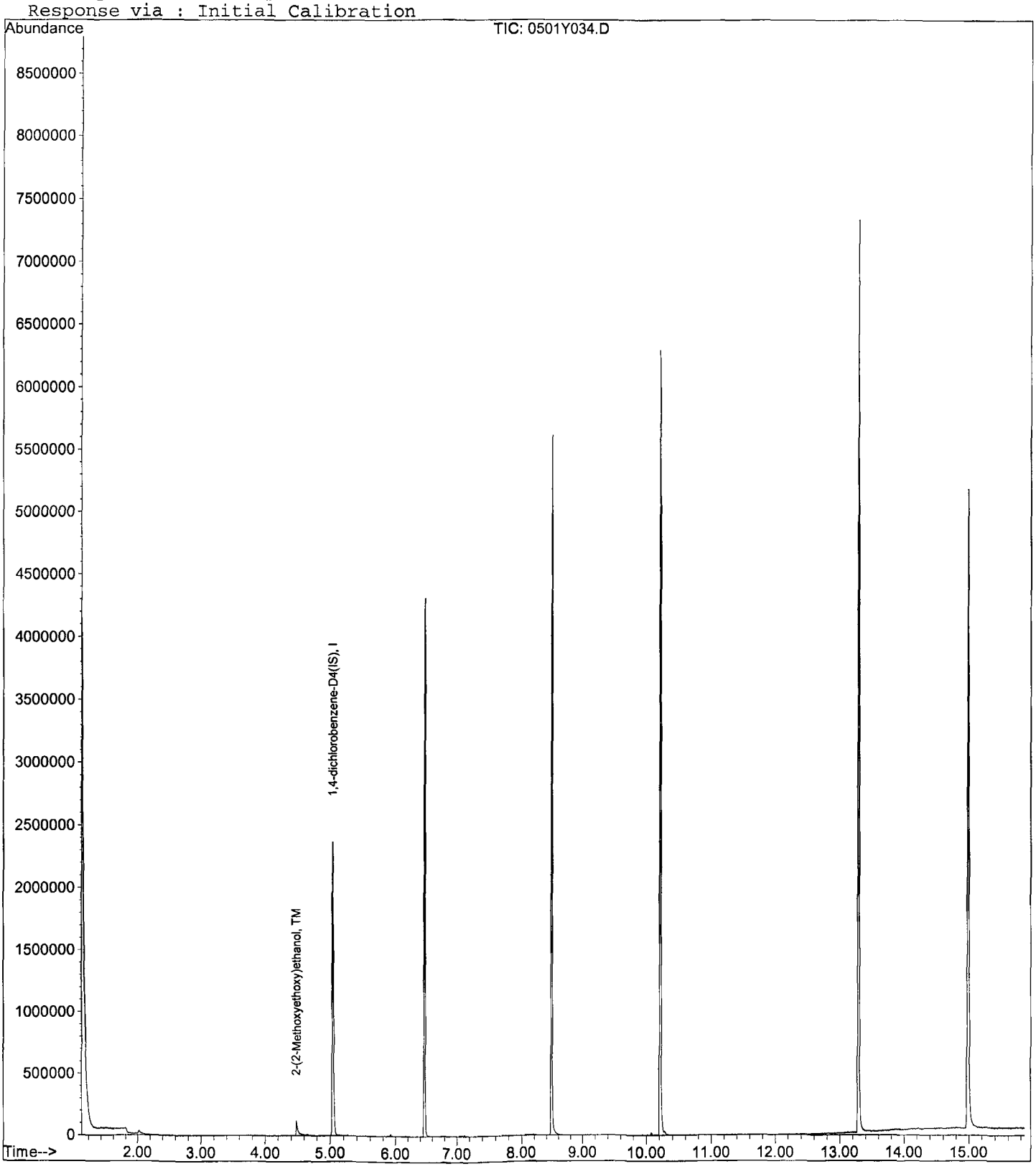
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y034.D Vial: 34
Acq On : 4 May 20 16:44 Operator: MA,SS
Sample : 200504A LCSD-1 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:54 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration

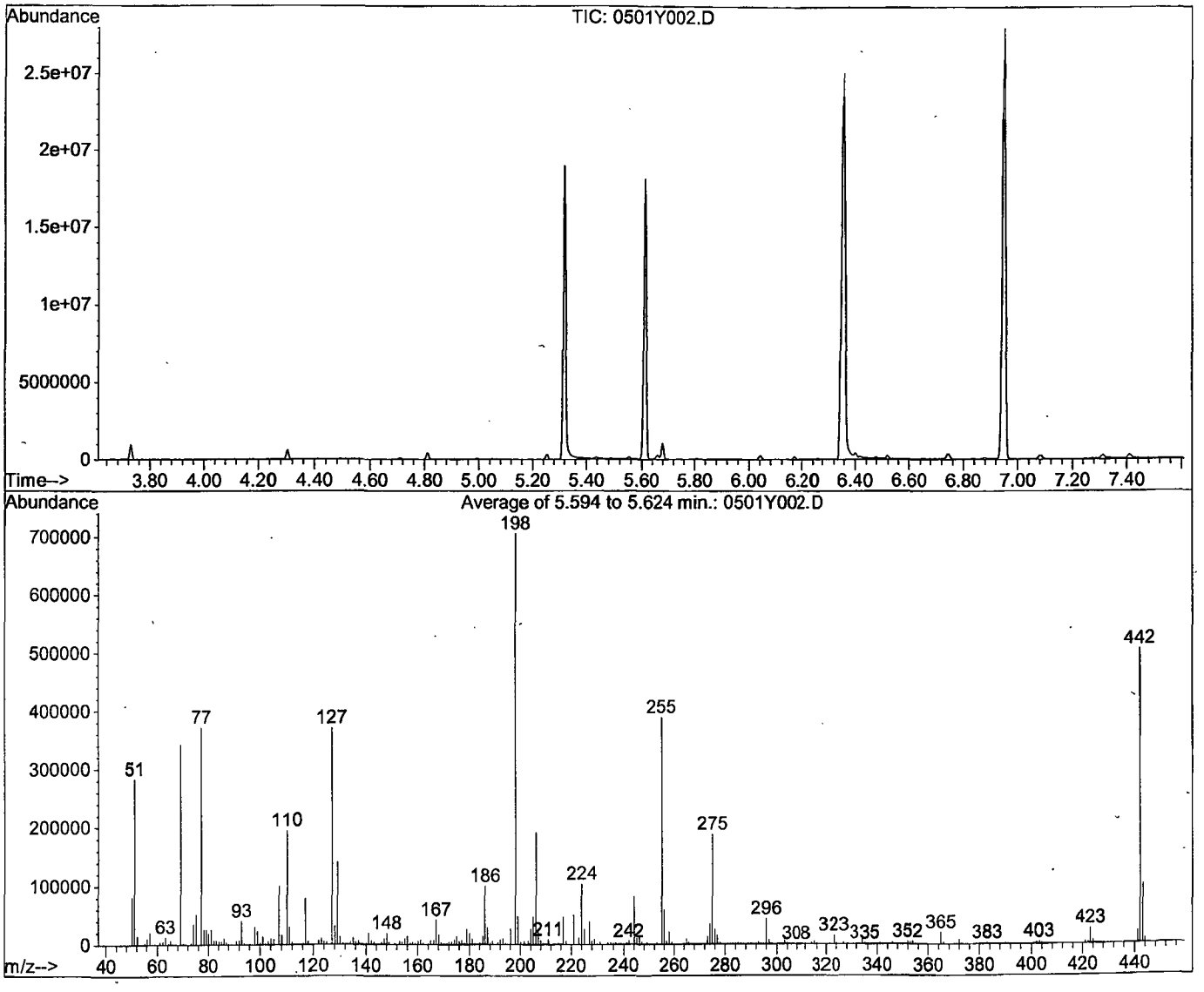


DFTPP

Data File : M:\YODA\DATA\Y200501M\0501Y002.D
Acq On : 1 May 20 9:23
Sample : SV TUNE 10/01/19
Misc : soil

Vial: 38
Operator: MA,SS
Inst : Yoda
Multiplr: 1.00

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C



Spectrum Information: Average of 5.594 to 5.624 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	40.1	283365	PASS
68	69	0.00	2	0.0	30	PASS
70	69	0.00	2	0.5	1711	PASS
127	198	10	80	52.5	370953	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	706767	PASS
199	198	5	9	6.8	48387	PASS
275	198	10	60	26.7	188525	PASS
365	198	1	100	2.8	20013	PASS
441	442	0.01	24	3.9	19955	PASS
442	198	50	500	71.6	506304	PASS
443	442	15	24	19.8	100283	PASS

Data File Name:	**0122Y138.D**
Data File Path:	**M:\YODA\DATA\Y200122M**
Operator:	**MA,SS**
Date Acquired:	**1 May 20 9:23**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/01/19**
Vial Number:	**38**
Instrument Name:	**Yoda**

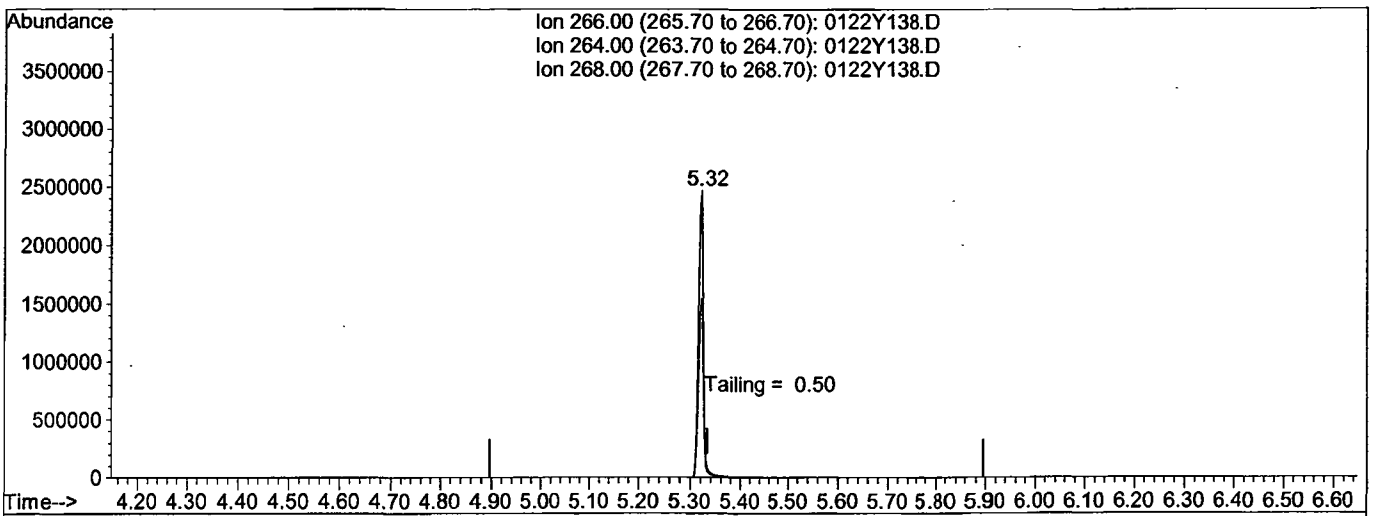
#	Name	Ret Time	Target Response
1)	DDT	6.95	212314000
2)	DDD	6.72	691986
3)	DDE	6.47	554319

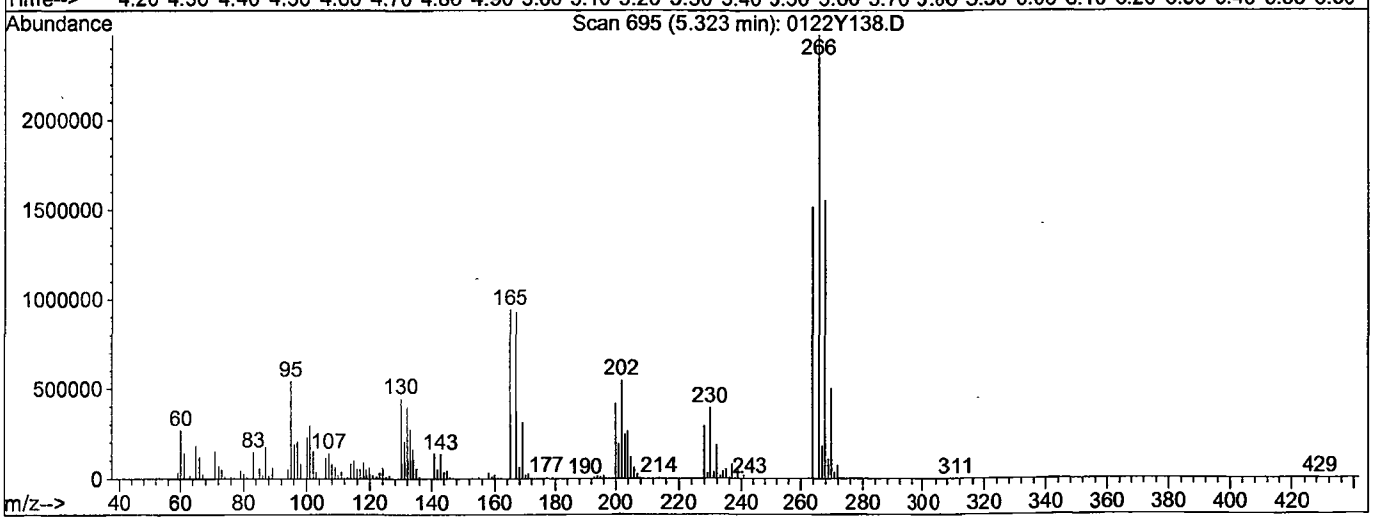
Breakdown **0.58**

Quantitation Report

Data File : M:\YODA\DATA\Y200122M\0122Y138.D Vial: 38
Acq On : 1 May 20 9:23 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00
Quant Time: May 1 10:02 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200122M\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 27 10:10:52 2020
Response via : Single Level Calibration





TIC: 0122Y138.D

(5) Pentachlorophenol

5.32min 0.0000

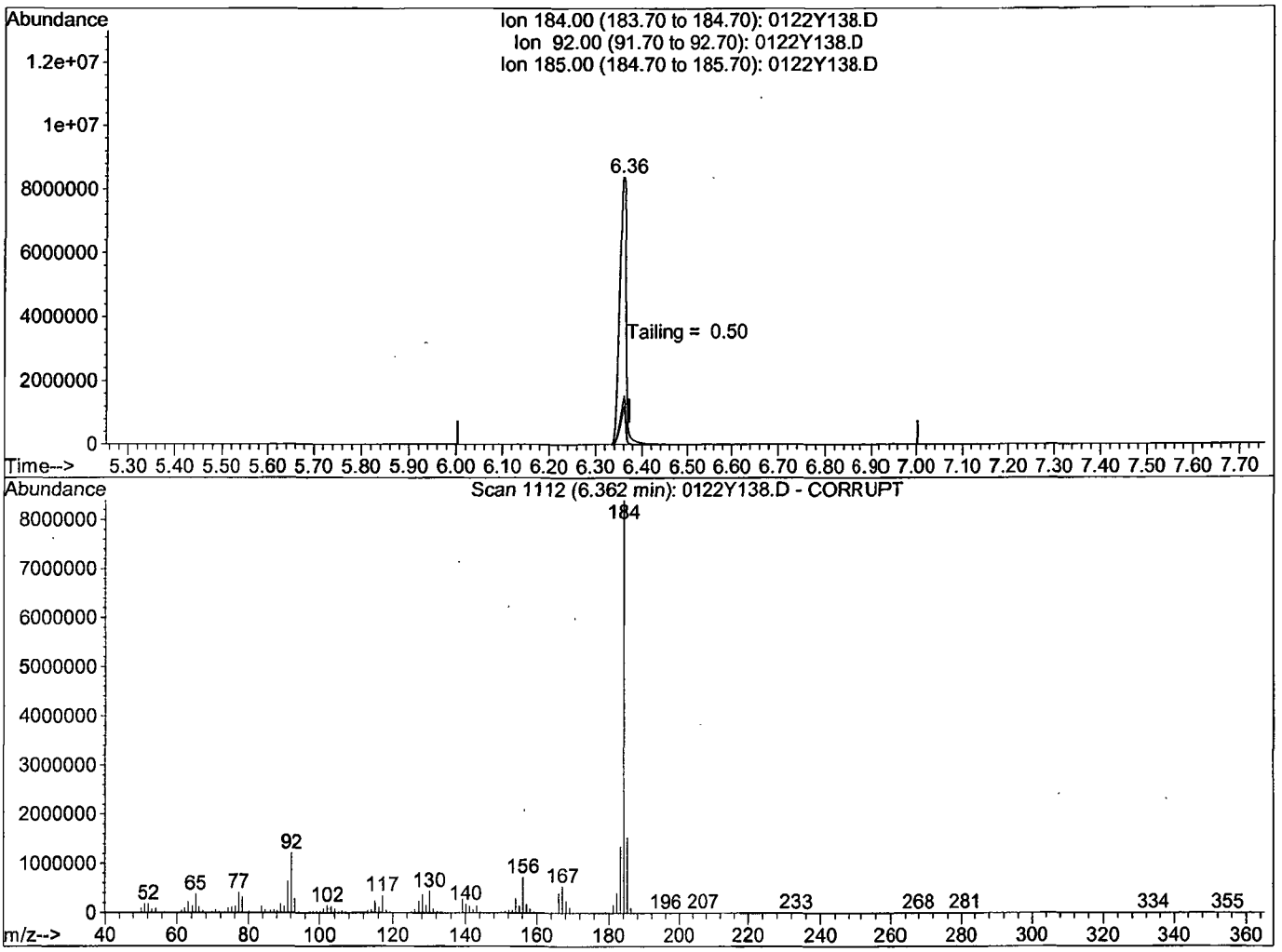
response 16198760

Ion	Exp%	Act%
266.00	100	100
264.00	63.80	61.57
268.00	63.80	63.41
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200122M\0122Y138.D Vial: 38
Acq On : 1 May 20 9:23 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00
Quant Time: May 1 10:02 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200122M\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 27 10:10:52 2020
Response via : Single Level Calibration



TIC: 0122Y138.D

(6) Benzidine

6.36min 0.0000

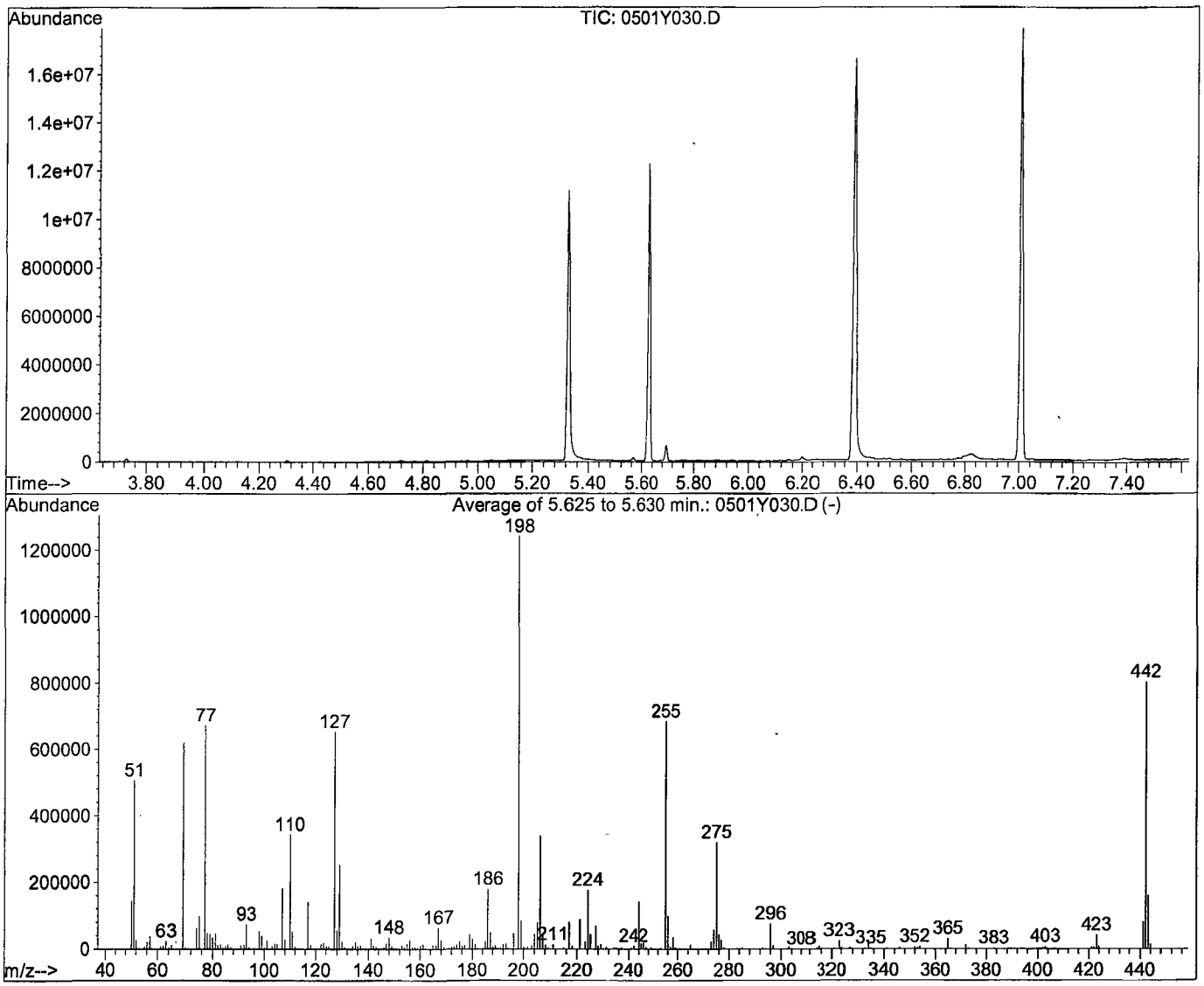
response 85362782

Ion	Exp%	Act%
184.00	100	100
92.00	11.60	11.47
185.00	14.90	15.08
0.00	0.00	0.00

DFTPP

Data File : M:\YODA\DATA\Y200501M\0501Y030.D Vial: 44
Acq On : 4 May 20 14:52 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C



AutoFind: Scans 816, 817, 818; Background Corrected with Scan 807

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	40.6	505640	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.7	4202	PASS
127	198	10	80	52.5	653269	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	1243904	PASS
199	198	5	9	6.9	85293	PASS
275	198	10	60	25.7	319189	PASS
365	198	1	100	2.6	31835	PASS
441	442	0.01	24	10.1	81517	PASS
442	198	50	500	64.6	803691	PASS
443	442	15	24	19.9	159880	PASS

Data File Name:	**0501Y030.D**
Data File Path:	**M:\YODA\DATA\Y200501M**
Operator:	**MA,SS**
Date Acquired:	**4 May 20 14:52**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/01/19**
Vial Number:	**44**
Instrument Name:	**Yoda**

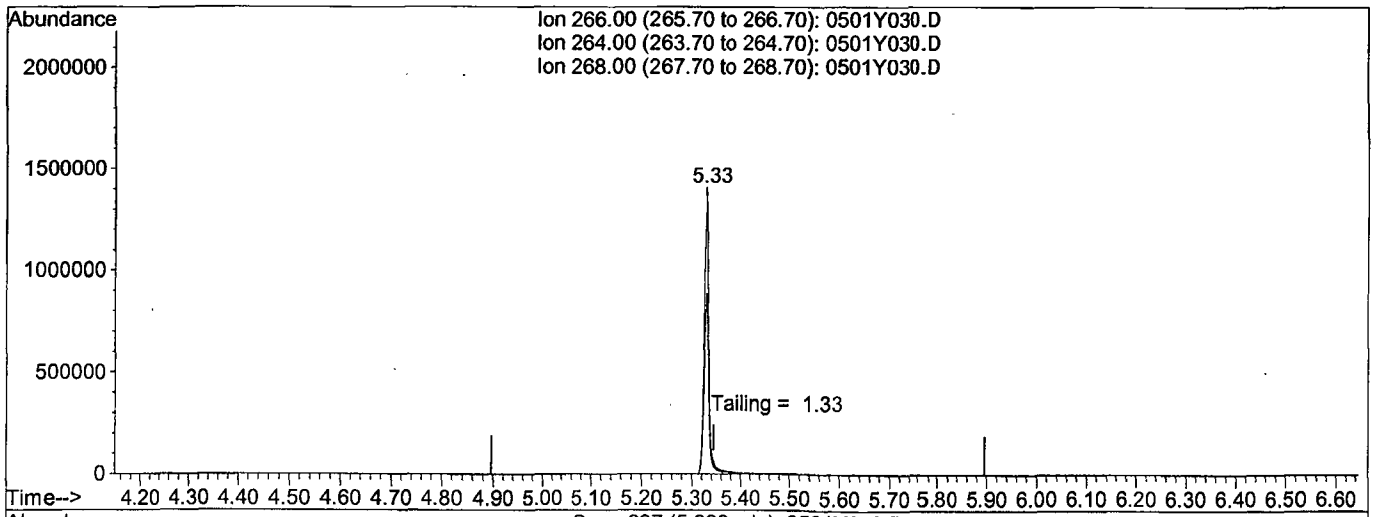
#	Name	Ret Time	Target Response
1)	DDT	6.95	128822000
2)	DDD	6.72	329585
3)	DDE	6.47	140503

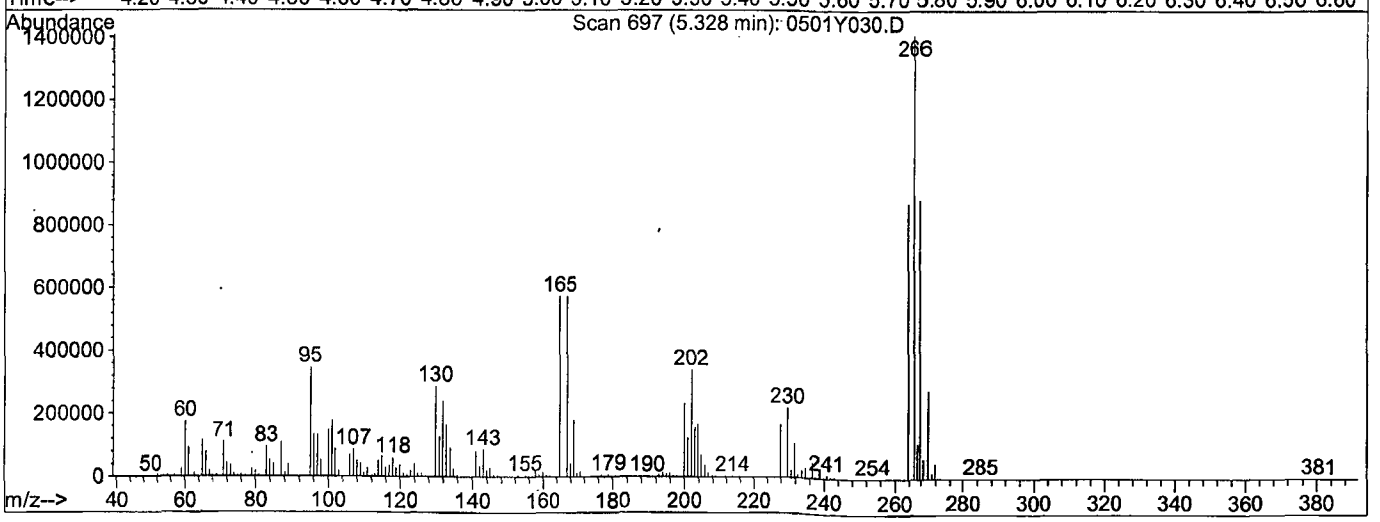
Breakdown **0.36**

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y030.D Vial: 44
Acq On : 4 May 20 14:52 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00
Quant Time: May 5 9:46 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200501M\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 27 10:10:52 2020
Response via : Single Level Calibration





TIC: 0501Y030.D

(5) Pentachlorophenol

5.33min 0.0000 m

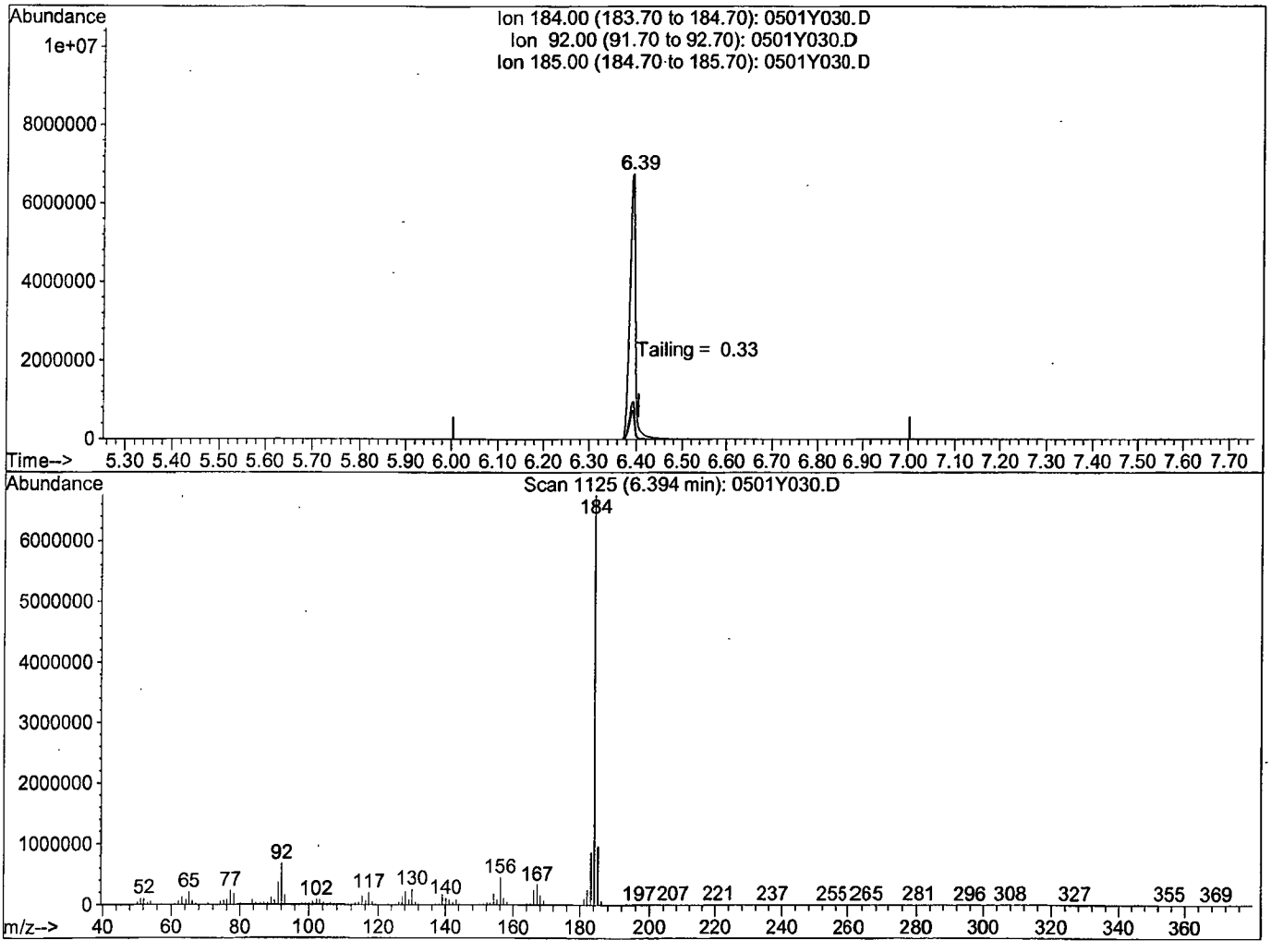
response 9419436

Ion	Exp%	Act%
266.00	100	100
264.00	63.80	59.32
268.00	63.80	62.00
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y030.D Vial: 44
Acq On : 4 May 20 14:52 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00
Quant Time: May 5 9:46 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200501M\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 27 10:10:52 2020
Response via : Single Level Calibration



TIC: 0501Y030.D

(6) Benzidine

6.39min 0.0000

response 55926364

Ion	Exp%	Act%
184.00	100	100
92.00	11.60	10.06
185.00	14.90	14.16
0.00	0.00	0.00

Name of Final Standard: MEE Curve
Prep Date: 05/01/20
Exp Date: 11/06/20
Prep'd By (Initials): CD

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	5 uL	200uL	Methanol 195uL Lot# 235140	50 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	5 uL	100uL	Methanol 95uL Lot# 235140	100 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	10 uL	100uL	Methanol 90uL Lot# 235140	200 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	20 uL	100uL	Methanol 80 uL Lot# 235140	400 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	50 uL	200 uL	Methanol 150 uL Lot# 235140	500 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	30 uL	100uL	Methanol 70 uL Lot# 235140	600 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	40 uL	100uL	Methanol 60 uL Lot# 235140	800 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	50 uL	100uL	Methanol 50uL Lot# 235140	1000 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"

Name of Final Standard: MEE Second Source
Prep Date: 05/01/20
Exp Date: 11/06/20
Prep'd By (Initials): MA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
MEE SS	APPL		2000 ug/mL	11/06/19	11/06/20	50 uL	200uL	Methanol 150uL Lot# 235140	500 ug/mL
SV Internal Standard	APPL	8277 Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"

Name of Final Standard	Diethylene Glycol
Prep Date	11/05/19
Exp Date	11/05/20

Prep'd By (Initials) MA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Diethylene glycol methyl ether	AccuStandard	S-72273	2000 ug/mL	**218101558-39890**	**12/01/20**	1.0 mL	2 mL	Methanol #208858	1000 ug/mL

Given to Extraction to do **MEE M STD Stock** (used for ICAL) Final concentration 2000ug/L

Name of Final Standard 2MEE Second Source Stock **Prep'd By (Initials)** JP

Prep Date 10/28/19
Exp Date 10/28/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Methoxyethanol-Neat	Chem Service	N-12404-1G	Neat 99.5%	**7079100 - 39417**	**07/31/22**	0.1022g	10 mL	**MC #56258**	10220 ug/mL

Given to Extraction to do **MEE SS** (used for ICAL SS)
0.097ml were spiked in 500ml of water and extracted on 04/29/19 . Final concentration is 2000ug/L

Name of Final Standard	8270 Internal Standard Ampules (2)	Prep'd By (Initials)	MA
Prep Date	11/20/19		
Exp Date	11/20/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Semivolatile Internal Standard	Restek	31206	2000 ug/mL	**AO157142-49871,872,873**	**07/31/25**	3 mL	3 mL	**NA**	2000ug/mL

_MWE2MEE

Organic Extraction Worksheet

Method	Solid Phase Extraction of 2MEE in Water	Extraction Set	200504A	Extraction Method	MWE2MEE	Units	mL

Spiked ID 1	Diethylene Glycol 4-29-20 12-1-20		Surrogate ID 1		
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	05/04/20 8:25	
Spiked ID 8			Ext. End Time:	05/04/20 13:40	
			GC Requires Extract By:		

pH1			Water Bath Temp 1 °C	
pH2			Water Bath Temp 2 °C	
pH3			Water Bath Temp 3 °C	

Spiked By: DL **Date** 05/04/20 **Witnessed By:** CFM **Date** 05/04/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200504A Blk				NA	NA equip	500	2	7	05/04/20 8:25	
2	200504A LCS-1		0.040	1	NA	NA equip	500	2	7	05/04/20 8:25	
3	200504A LCSD-1		0.040	1	NA	NA equip	500	2	7	05/04/20 8:25	
4	BA10439	BA10439W14			NA	NA equip	500	2	7	05/04/20 8:25	92025
5	BA10504	BA10504W15			NA	NA equip	500	2	7	05/04/20 8:25	92039
6	BA10505	BA10505W08			NA	NA equip	500	2	7	05/04/20 8:25	92039

Solvent and Lot#	
ENVIRO-CLEAN CARTRIDGES	47266-EY
PH Strip	HC998032
Di Water	5-4-20
Dichloromethane	59239
Methanol	60072

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	5/4/20
Time	2:15
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	05/04/20 2:29:34 PM

Reviewed By: KY **Date** 05/04/20

Injection Log

Directory: M:\YODA\DATA\Y200501M\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
38	0501Y002.D	1	SV TUNE 10/01/19	soil	1 May 20 9:23
39	0501Y003.D	1	50ug/ml MEE 05/01/20	soil	1 May 20 9:39
40	0501Y004.D	1	100ug/ml MEE 05/01/20	soil	1 May 20 10:03
42	0501Y006.D	1	200ug/ml MEE 05/01/20	soil	1 May 20 10:51
7	0501Y007.D	1	400ug/ml MEE 05/01/20	soil	1 May 20 11:24
8	0501Y008.D	1	500ug/ml MEE 05/01/20	soil	1 May 20 11:48
9	0501Y009.D	1	600ug/ml MEE 05/01/20	soil	1 May 20 12:13
10	0501Y010.D	1	800ug/ml MEE 05/01/20	soil	1 May 20 12:37
11	0501Y011.D	1	1000ug/ml MEE 05/01/20	soil	1 May 20 13:01
13	0501Y013.D	1	SSug/ml MEE 05/01/20	soil	1 May 20 13:50
44	0501Y030.D	1	SV TUNE 10/01/19	soil	4 May 20 14:52
45	0501Y031.D	1	500ug/ml MEE 05/01/20	soil	4 May 20 15:07
32	0501Y032.D	1	200504A BLK 2/500		4 May 20 15:56
33	0501Y033.D	1	200504A LCS-1 2/500		4 May 20 16:20
34	0501Y034.D	1	200504A LCSD-1 2/500		4 May 20 16:44
35	0501Y035.D	1	BA10439W14 2/500		4 May 20 17:08
38	0501Y038.D	1	500ug/ml MEE 05/01/20		4 May 20 18:21

ORGANICS
Calibration Data

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/24/20
Matrix: Instrument: Thor Initials: DP

			0424T27 D	0424T28 D	0424T29.D	0424T30.D	0424T31 D	0424T32.D	0424T33 D	0424T34 D	0424T35 D							
		Compound	1	2	3	4	5	6	7	8	9		Avg	%RSD	Type	r^2	Q	MRF
1	I	Fluorobenzene (IS)																
2	TM	Chlorotrifluoroethene													TM			
3	TML	Dichlorodifluoromethane		0.1470	0.1423	0.1408	0.0943	0.0931	0.0944	0.0949			0.12	23	TML	0.999		
4	TML	Freon 114		0.0946	0.0941	0.0920	0.0610	0.0615	0.0634	0.0649			0.08	22	TML	0.999		
5	TM**L	Chloromethane		0.1540	0.1188	0.1244	0.0851	0.0830	0.0750	0.0732			0.10	30	TM**L	0.999		
6	TM*L	Vinyl chloride		0.1215	0.1155	0.1166	0.0822	0.0857	0.0792	0.0808	0.0796		0.10	20	TM*L	1.000		
7		Butane																
8	TM	2-Chloro-1,1,1-trifluoroethane													TM			
9	TML	Bromomethane		0.1580	0.1139	0.0992	0.0817	0.0754					0.11	31	TML	1.000		
10	TML	Chloroethane		0.0211	0.0221	0.0165	0.0154	0.0123	0.0127	0.0134			0.02	25	TML	0.998		
11	TM	Dichlorofluoromethane		0.1592	0.1760	0.2024	0.1746	0.1653	0.1658	0.1608	0.1639		0.17	8.2	TM			
12	TM	Trichlorofluoromethane		0.1704	0.1866	0.1791	0.1583	0.1609	0.1555	0.1613	0.1542		0.17	7.1	TM			
13	TM	Pentane													TM			
14	TM	Diethyl ether													TM			
15	TM	1,2 Dichlorotrifluoroethane													TM			
16	TMQ	Acrolein		0.0081	0.0070	0.0075	0.0074	0.0071	0.0075				0.01	5.3	TMQ	0.997		
17	TML	Acetone				0.0291	0.0206	0.0139	0.0155	0.0144	0.0140		0.02	34	TML	0.999		
18	TM	Freon-113		0.0874	0.0916	0.0951	0.0720	0.0726	0.0788	0.0772	0.0783		0.08	11	TM			
19	TM*	1,1-DCE		0.1553	0.1464	0.1228	0.1206	0.1170	0.1153	0.1153	0.1157		0.13	12	TM*			
20	TM	2-Propanol													TM			
21	TM	Acetonitrile		0.0027	0.0025	0.0026	0.0025	0.0023	0.0025	0.0028	0.0022		0.00	8.6	TM			
22	TM	t-Butanol	0.0066	0.0079	0.0081	0.0079	0.0083	0.0077	0.0081	0.0090	0.0070		0.01	8.8	TM			
23	TML	Methyl Acetate		0.0823	0.0791	0.0772	0.0628	0.0573	0.0576	0.0550	0.0554		0.07	18	TML	1.000		
24	TMQ	Iodomethane			0.0628	0.0654	0.0518	0.0503	0.0725	0.1033	0.1314		0.08	39	TMQ	0.999		
25	TM	Acrylonitrile		0.0321	0.0318	0.0270	0.0231	0.0232	0.0240	0.0242	0.0236		0.03	15	TM			
26	TML	Methylene chloride		0.1470	0.1299	0.1292	0.1056	0.1023	0.0961	0.0979			0.12	17	TML	1.000		
27	TML	Carbon disulfide		0.2354	0.2586	0.2371	0.1832	0.1761	0.1791	0.1871	0.1884		0.21	16	TML	1.000		
28	TM	Methyl t-butyl ether (MtBE)		0.2854	0.2960	0.2773	0.2612	0.2709	0.2622	0.2663	0.2643		0.27	4.6	TM			
29	TM	Trans-1,2-DCE		0.1288	0.1234	0.1229	0.1053	0.1150	0.1099	0.1091	0.1093		0.12	7.4	TM			
30	TM	Hexane													TM			
31	TM	Diisopropyl Ether		0.2450	0.2511	0.2427	0.2255	0.2311	0.2207	0.2268	0.2276		0.23	4.7	TM			
32	TM**	2,2-Dichloro-1,1,1-trifluoroethane													TM**			
33	TM**	1,1-DCA		0.1460	0.1543	0.1775	0.1478	0.1477	0.1495	0.1474	0.1482		0.15	6.9	TM**			
34	TM	Vinyl Acetate		0.1456	0.1300	0.1156	0.1076	0.1077	0.1096	0.1058	0.1191		0.12	12	TM			
35	TM	Ethyl tert Butyl Ether		0.3059	0.2781	0.2745	0.2598	0.2615	0.2675	0.2633	0.2651		0.27	5.5	TM			

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/24/20
Matrix: Instrument: Thor Initials: DP

		Compound	1	2	3	4	5	6	7	8	9		Avg	%RSD	Type		Q	MRF
36	TM	MEK (2-Butanone)		0.0308	0.0438	0.0348	0.0362	0.0341	0.0299	0.0323	0.0320		0.03	13	TM			
37	TM	Cis-1,2-DCE		0.1851	0.1546	0.1627	0.1452	0.1443	0.1429	0.1434	0.1415		0.15	9.9	TM			
38	TM	2,2-Dichloropropane		0.1484	0.1843	0.1616	0.1446	0.1444	0.1438	0.1443	0.1465		0.15	9.3	TM			
39	TM	2-Methylpentane													TM			
40	TM	3-Methylpentane													TM			
41	TM*	Chloroform		0.2277	0.2157	0.2199	0.1875	0.1980	0.1946	0.1949	0.1939		0.20	7.3	TM*			
42	TM	Bromochloromethane		0.0759	0.0812	0.0729	0.0736	0.0697	0.0674	0.0678	0.0676		0.07	6.8	TM			
43	S	Dibromofluoromethane(S)	0.3078	0.2602	0.2715	0.2736	0.2648	0.2834	0.2757	0.2768	0.2753		0.28	4.9	S			
44	TM	1,1,1-TCA		0.1917	0.1825	0.2036	0.1839	0.1740	0.1721	0.1778	0.1794		0.18	5.6	TM			
45	TM	Cyclohexane		0.1333	0.1100	0.1321	0.1004	0.0964	0.0958	0.1032	0.1053		0.11	14	TM			
46	TM	1,1-Dichloropropene		0.1690	0.1514	0.1318	0.1192	0.1150	0.1200	0.1185	0.1205		0.13	15	TM			
47	TM	2,2,4-Trimethylpentane		0.2565	0.2400	0.2299	0.1738	0.1776	0.1876	0.1927	0.1959		0.21	15	TM			
48	S	1,2-DCA-D4(S)	0.3499	0.2675	0.2975	0.2941	0.2834	0.3042	0.3007	0.3003	0.2961		0.30	7.4	S			
49	TM	Carbon Tetrachloride		0.1767	0.1634	0.1602	0.1587	0.1534	0.1585	0.1633	0.1673		0.16	4.3	TM			
50	TM	Tert Amyl Methyl Ether		0.3257	0.2961	0.2988	0.2689	0.2732	0.2769	0.2812	0.2809		0.29	6.4	TM			
51	TM	Methylcyclopentane													TM			
52	TM	1,2-DCA		0.2016	0.1918	0.1963	0.1755	0.1517	0.1617	0.1564	0.1562		0.17	12	TM			
53	TM	Benzene		0.4619	0.4411	0.4237	0.3802	0.3801	0.3736	0.3721	0.3746		0.40	8.9	TM			
54	TM	TCE		0.1851	0.1570	0.1604	0.1423	0.1424	0.1448	0.1481	0.1480		0.15	9.4	TM			
55	TM	2-Pentanone		0.0573	0.0564	0.0594	0.0572	0.0597	0.0606	0.0689	0.0550		0.06	7.3	TM			
56	TM*	1,2-Dichloropropane		0.1135	0.1110	0.1044	0.0921	0.0949	0.0909	0.0916	0.0925		0.10	9.5	TM*			
57	TM	Bromodichloromethane		0.1903	0.1603	0.1592	0.1526	0.1529	0.1539	0.1559	0.1610		0.16	7.7	TM			
58	TM	Methyl Cyclohexane		0.1629	0.1369	0.1526	0.1142	0.1172	0.1221	0.1275	0.1306		0.13	13	TM			
59	TM	Dibromomethane		0.1325	0.1161	0.1238	0.1174	0.1145	0.1178	0.1155	0.1149		0.12	5.2	TM			
60	TM	MIBK (methyl isobutyl ketone)		0.0984	0.0884	0.0889	0.0874	0.0778	0.0787	0.0756	0.0784		0.08	9.3	TM			
61	TM	1-Bromo-2-chloroethane		0.0751	0.0714	0.0793	0.0653	0.0688	0.0702	0.0663	0.0674		0.07	6.7	TM			
62	TM	2-Chloroethyl vinyl ether													TM			
63	TM	Cis-1,3-Dichloropropene		0.1815	0.1745	0.1717	0.1619	0.1647	0.1655	0.1649	0.1709		0.17	3.8	TM			
64	TM*	Toluene		0.5610	0.5105	0.4976	0.4798	0.4569	0.4510	0.4623	0.4641		0.49	7.6	TM*			
65	TM	Trans-1,3-Dichloropropene		0.1758	0.1623	0.1575	0.1453	0.1548	0.1592	0.1543	0.1592		0.16	5.5	TM			
66	TM	1,1,2-TCA		0.1026	0.1344	0.1234	0.1091	0.1113	0.1083	0.1102	0.1074		0.11	9.1	TM			
67	TM	2-Hexanone		0.0530	0.0517	0.0495	0.0452	0.0503	0.0537	0.0535	0.0537		0.05	5.7	TM			
68	I	Chlorobenzene-D5 (IS)																
69	S	Toluene-D8(S)	1.306	1.025	1.107	1.114	1.052	1.132	1.124	1.121	1.119		1.1	7.0	S			
70	TM	1,2-EDB		0.1267	0.1349	0.1361	0.1253	0.1287	0.1359	0.1343	0.1334		0.13	3.3	TM			

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/24/20
Matrix: Instrument: Thor Initials: DP

		Compound	1	2	3	4	5	6	7	8	9		Avg	%RSD	Type		Q	MRF
71	TM	Tetrachloroethene		0.2474	0.2277	0.2116	0.1838	0.1906	0.1868	0.1822	0.1812		0.20	12	TM			
72	TM	1-Chlorohexane		0.1780	0.1537	0.1711	0.1296	0.1321	0.1345	0.1405	0.1471		0.15	12	TM			
73	TM	1,1,1,2-Tetrachloroethane		0.1536	0.1738	0.1634	0.1514	0.1653	0.1631	0.1647	0.1666		0.16	4.4	TM			
74	TM	m&p-Xylene		0.5271	0.4913	0.5078	0.4421	0.4584	0.4709	0.4700	0.4867		0.48	5.7	TM			
75	TM	o-Xylene		0.5596	0.5340	0.5613	0.4833	0.4918	0.5100	0.5088	0.5164		0.52	5.6	TM			
76	TM	Styrene		0.3924	0.3817	0.4329	0.3813	0.4039	0.4037	0.4200	0.4356		0.41	5.3	TM			
77	S	4-Bromofluorobenzene(S)	0.5406	0.4031	0.4411	0.4434	0.4370	0.4720	0.4563	0.4551	0.4691		0.46	8.1	S			
78	TM	1,3-Dichloropropane		0.2029	0.2028	0.2214	0.1959	0.1893	0.1922	0.1923	0.1904		0.20	5.4	TM			
79	TM	Dibromochloromethane		0.1656	0.1688	0.1738	0.1557	0.1590	0.1648	0.1691	0.1728		0.17	3.8	TM			
80	TM**	Chlorobenzene		0.4989	0.4046	0.4347	0.3834	0.4018	0.3830	0.3890	0.3921		0.41	9.6	TM**			
81	TM*	Ethylbenzene		0.7073	0.6969	0.6437	0.5900	0.5936	0.5970	0.5998	0.6172		0.63	7.5	TM*			
82	TM**	Bromoform		0.1532	0.1451	0.1243	0.1263	0.1340	0.1372	0.1413	0.1474		0.14	7.3	TM**			
83	I	1,4-Dichlorobenzene-D (IS)																
84	TM	Isopropylbenzene		1.179	1.092	1.052	0.9479	0.9694	0.9466	0.9712	0.9607		1.0	8.4	TM			
85	TM**	1,1,2,2-Tetrachloroethane		0.2648	0.2345	0.2159	0.2159	0.2105	0.2070	0.1930	0.1973		0.22	11	TM**			
86	TM	1,2,3-Trichloropropane		0.1229	0.1076	0.1067	0.0980	0.0913	0.0931	0.0907	0.0879		0.10	12	TM			
87	TM	t-1,4-Dichloro-2-Butene		0.0317	0.0475	0.0362	0.0408	0.0460	0.0406	0.0420	0.0446		0.04	13	TM			
88	TM	Bromobenzene		0.5809	0.5275	0.5218	0.4807	0.4598	0.4564	0.4524	0.4396		0.49	10.0	TM			
89	TM	n-Propylbenzene		1.281	1.212	1.161	1.031	1.053	1.056	1.061	1.061		1.1	8.3	TM			
90	TM	4-Ethyltoluene		1.017	1.039	1.006	0.9224	0.9327	0.9323	0.9627	0.9560		0.97	4.5	TM			
91	TM	2-Chlorotoluene		0.9258	0.9162	0.8765	0.7511	0.7828	0.7748	0.7672	0.7567		0.82	9.1	TM			
92	TM	1,3,5-Trimethylbenzene		0.8963	0.9401	0.9366	0.8516	0.8638	0.8744	0.8694	0.8695		0.89	3.8	TM			
93	TM	4-Chlorotoluene		0.9258	0.9162	0.8909	0.7727	0.8029	0.8149	0.8092	0.7894		0.84	7.2	TM			
94	TM	Tert-Butylbenzene		0.9986	0.9167	0.8494	0.8886	0.8698	0.8699	0.8821	0.8697		0.89	5.2	TM			
95	TM	1,2,4-Trimethylbenzene		1.102	0.9644	0.9112	0.8327	0.8576	0.8786	0.9053	0.9046		0.92	9.1	TM			
96	TM	Sec-Butylbenzene		1.161	1.078	1.068	0.9997	0.9870	1.004	1.031	1.030		1.0	5.4	TM			
97	TM	p-Isopropyltoluene		1.088	0.9632	0.9765	0.8921	0.9268	0.9430	0.9572	0.9698		0.96	5.9	TM			
98	TM	Benzyl Chloride		0.2761	0.3229	0.2810	0.2471	0.2587	0.2679	0.2862	0.3133		0.28	9.2	TM			
99	TM	1,3-DCB		0.7721	0.6671	0.6855	0.5995	0.5938	0.6060	0.5848	0.5833		0.64	11	TM			
100	TML	1,4-DCB		0.8981	0.7680	0.7198	0.6002	0.6117	0.6140	0.6084	0.5983		0.68	16	TML	1.00		
101	TM	n-Butylbenzene		0.8576	0.8964	0.7834	0.6702	0.6879	0.6818	0.7213	0.7446		0.76	11	TM			
102	TM	1,2-DCB		0.7903	0.7477	0.6403	0.5744	0.6033	0.6000	0.5899	0.5933		0.64	13	TM			
103	TM	Hexachloroethane		0.1741	0.1747	0.1826	0.1846	0.1773	0.1840	0.1866	0.1919		0.18	3.4	TM			
104	TM	1,2-Dibromo-3-chloropropane		0.0578	0.0534	0.0758	0.0695	0.0651	0.0725	0.0743	0.0781		0.07	13	TM			
105	TML	1,2,4-Trichlorobenzene		0.8059	0.5777	0.5473	0.4540	0.4579	0.4673	0.4709	0.4904		0.53	22	TML	1.000		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Initial Cal. Date: 04/24/20
Instrument: Thor

Initials: DP

		Compound	1	2	3	4	5	6	7	8	9		Avg	%RSD	Type		Q	MRF
106	TM	Hexachlorobutadiene		0.2959	0.2886	0.2359	0.2199	0.2256	0.2381	0.2339	0.2394		0.25	12	TM			
107	TML	Naphthalene		0.1893	0.1436	0.1300	0.1097	0.1097	0.1147	0.1155	0.1221		0.13	21	TML	0.999		
108	TML	1,2,3-Trichlorobenzene		0.6903	0.5050	0.4911	0.4480	0.4585	0.4668	0.4677	0.4748		0.50	16	TML	1.000		
109																		
110																		
111																		
112																		
113																		
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Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T27.D Vial: 2
Acq On : 24 Apr 20 14:31 Operator:
Sample : 0.3ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	633330	25.00 ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	552044	25.00 ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	332191	25.00 ppb		0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	38983	5.56 ppb		0.00
Spiked Amount 25.000			Recovery =	22.256%		
48) 1,2-DCA-D4(S)	5.93	65	44315	5.84 ppb		0.00
Spiked Amount 25.000			Recovery =	23.380%		
69) Toluene-D8(S)	8.25	98	144215	5.82 ppb		0.00
Spiked Amount 25.000			Recovery =	23.280%		
77) 4-Bromofluorobenzene(S)	11.13	95	59687	5.91 ppb		0.00
Spiked Amount 25.000			Recovery =	23.632%		
Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.11	85	1379	0.22 ppb	#	86
4) Freon 114	1.21	85	752	0.29 ppb		82
5) Chloromethane	1.25	50	1112	-0.40 ppb	#	79
6) Vinyl chloride	1.34	62	753	-0.11 ppb	#	57
10) Chloroethane	1.69	66	204	0.32 ppb	#	13
11) Dichlorofluoromethane	1.89	67	1405	0.32 ppb	#	83
12) Trichlorofluoromethane	1.94	101	1563	0.37 ppb		88
16) Acrolein	2.33	56	1629	4.15 ppb		99
17) Acetone	2.51	43	726	0.19 ppb		91
18) Freon-113	2.47	101	735	0.36 ppb	#	85
19) 1,1-DCE	2.44	61	1280	0.40 ppb	#	75
21) Acetonitrile	2.79	40	784	12.33 ppb		97
22) t-Butanol	3.22	59	1672	8.44 ppb		98
23) Methyl Acetate	2.89	43	579	-0.11 ppb	#	49
24) Iodomethane	2.58	142	708	2.17 ppb	#	86
25) Acrylonitrile	3.32	52	71	0.11 ppb	#	3
26) Methylene chloride	2.99	49	1970	0.40 ppb	#	73
27) Carbon disulfide	2.65	76	2261	0.57 ppb	#	61
28) Methyl t-butyl ether (MtBE	3.40	73	2780	0.40 ppb	#	86
29) Trans-1,2-DCE	3.36	61	1182	0.40 ppb	#	71
31) Diisopropyl Ether	4.20	45	2026	0.34 ppb	#	84
33) 1,1-DCA	3.96	63	1270	0.33 ppb	#	50
34) Vinyl Acetate	4.12	43	1069	0.36 ppb	#	67
35) Ethyl tert Butyl Ether	4.74	59	2490	0.36 ppb	#	71
36) MEK (2-Butanone)	4.93	43	158	0.18 ppb	#	47
37) Cis-1,2-DCE	4.84	61	1527	0.40 ppb	#	87
38) 2,2-Dichloropropane	4.84	77	1536	0.40 ppb	#	84
41) Chloroform	5.31	83	2444	0.47 ppb	#	77
42) Bromochloromethane	5.16	49	568	0.31 ppb	#	56
44) 1,1,1-TCA	5.53	97	1512	0.33 ppb	#	89
45) Cyclohexane	5.60	56	957	0.34 ppb	#	77
46) 1,1-Dichloropropene	5.75	75	1187	0.36 ppb	#	88
47) 2,2,4-Trimethylpentane	6.20	57	2347	0.45 ppb		90
49) Carbon Tetrachloride	5.76	117	1406	0.34 ppb	#	79
50) Tert Amyl Methyl Ether	6.23	73	2138	0.29 ppb	#	50
52) 1,2-DCA	6.04	62	1438	0.33 ppb	#	70
53) Benzene	6.01	78	3530	0.35 ppb		97
54) TCE	6.84	130	1315	0.34 ppb	#	75
55) 2-Pentanone	7.07	43	13830	9.20 ppb		97

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T27.D Vial: 2
Acq On : 24 Apr 20 14:31 Operator:
Sample : 0.3ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
56)	1,2-Dichloropropane	7.08	63	882	0.35	ppb	#	80
57)	Bromodichloromethane	7.41	83	1354	0.33	ppb	#	66
58)	Methyl Cyclohexane	7.07	83	1470	0.44	ppb		91
59)	Dibromomethane	7.20	174	1161	0.38	ppb	#	71
60)	MIBK (methyl isobutyl ket	8.14	43	750	0.35	ppb	#	48
61)	1-Bromo-2-chloroethane	7.75	63	676	0.38	ppb	#	79
63)	Cis-1,3-Dichloropropene	7.94	75	1331	0.31	ppb	#	78
64)	Toluene	8.32	91	4278	0.35	ppb		92
65)	Trans-1,3-Dichloropropene	8.57	75	1371	0.34	ppb	#	90
66)	1,1,2-TCA	8.76	97	1093	0.38	ppb	#	70
67)	2-Hexanone	9.08	43	352	0.27	ppb	#	82
70)	1,2-EDB	9.31	107	985	0.34	ppb	#	73
71)	Tetrachloroethene	8.93	166	1713	0.39	ppb	#	82
72)	1-Chlorohexane	9.84	91	1971	0.60	ppb	#	1
73)	1,1,1,2-Tetrachloroethane	9.97	131	1328	0.37	ppb		89
74)	m&p-Xylene	10.14	91	7910	0.74	ppb		100
75)	o-Xylene	10.57	91	4185	0.36	ppb	#	85
76)	Styrene	10.59	104	3125	0.35	ppb		95
78)	1,3-Dichloropropane	8.94	76	1475	0.34	ppb	#	81
79)	Dibromochloromethane	9.20	129	1202	0.33	ppb		96
80)	Chlorobenzene	9.87	112	3218	0.35	ppb		94
81)	Ethylbenzene	10.01	91	5148	0.37	ppb		93
82)	Bromoform	10.76	173	973	0.32	ppb	#	80
84)	Isopropylbenzene	10.98	105	4965	0.37	ppb		100
85)	1,1,2,2-Tetrachloroethane	11.29	83	970	0.34	ppb	#	69
86)	1,2,3-Trichloropropane	11.33	110	293	0.22	ppb	#	73
88)	Bromobenzene	11.29	77	2592	0.40	ppb		94
89)	n-Propylbenzene	11.43	91	6035	0.41	ppb		92
90)	4-Ethyltoluene	11.56	105	5400	0.42	ppb		94
91)	2-Chlorotoluene	11.51	91	4108	0.38	ppb		91
92)	1,3,5-Trimethylbenzene	11.63	105	4473	0.38	ppb		96
93)	4-Chlorotoluene	11.63	91	4945	0.44	ppb		92
94)	Tert-Butylbenzene	11.98	119	4736	0.40	ppb		87
95)	1,2,4-Trimethylbenzene	12.04	105	4815	0.39	ppb		89
96)	Sec-Butylbenzene	12.22	105	5592	0.40	ppb		94
97)	p-Isopropyltoluene	12.39	119	5438	0.42	ppb		96
98)	Benzyl Chloride	12.57	91	1316	0.35	ppb	#	89
99)	1,3-DCB	12.32	146	3793	0.45	ppb	#	93
100)	1,4-DCB	12.42	146	4613	0.25	ppb	#	85
101)	n-Butylbenzene	12.83	91	5007	0.50	ppb		98
102)	1,2-DCB	12.82	146	3693	0.43	ppb	#	84
103)	Hexachloroethane	13.11	201	796	0.33	ppb	#	39
104)	1,2-Dibromo-3-chloropropan	13.66	157	187	0.21	ppb	#	48
105)	1,2,4-Trichlorobenzene	14.59	180	5165	1.08	ppb		85
106)	Hexachlorobutadiene	14.79	225	1486	0.45	ppb		86
107)	Naphthalene	14.86	127	1469	1.38	ppb		68
108)	1,2,3-Trichlorobenzene	15.12	180	4153	0.79	ppb		87

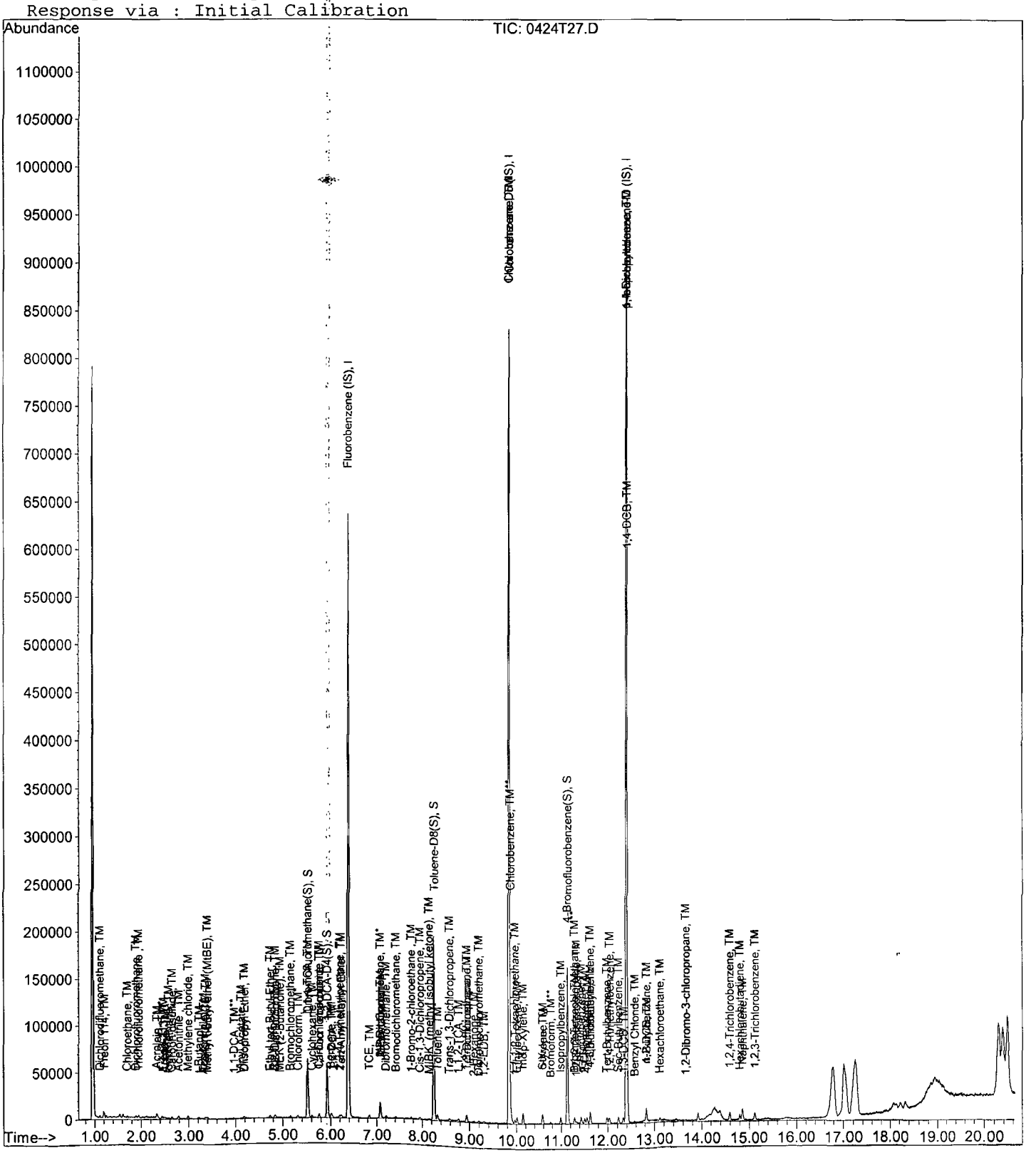
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T27.D Vial: 2
Acq On : 24 Apr 20 14:31 Operator:
Sample : 0.3ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T28.D Vial: 3
Acq On : 24 Apr 20 14:59 Operator:
Sample : 0.5ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	628870	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	555532	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	335709	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	65447	9.41	ppb		0.00
Spiked Amount 25.000			Recovery	=	37.632%		
48) 1,2-DCA-D4(S)	5.93	65	67289	8.94	ppb		0.00
Spiked Amount 25.000			Recovery	=	35.752%		
69) Toluene-D8(S)	8.25	98	227746	9.13	ppb		0.00
Spiked Amount 25.000			Recovery	=	36.532%		
77) 4-Bromofluorobenzene(S)	11.13	95	89582	8.81	ppb		0.00
Spiked Amount 25.000			Recovery	=	35.244%		
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	1849	0.42	ppb		99
4) Freon 114	1.22	85	1190	0.56	ppb		90
6) Vinyl chloride	1.34	62	1528	0.28	ppb	#	84
9) Bromomethane	1.61	94	1999	0.44	ppb	#	77
10) Chloroethane	1.71	66	266	0.52	ppb	#	26
11) Dichlorofluoromethane	1.89	67	2002	0.47	ppb	#	66
12) Trichlorofluoromethane	1.94	101	2143	0.51	ppb	#	64
16) Acrolein	2.33	56	5095	25.57	ppb		90
17) Acetone	2.49	43	779	0.36	ppb	#	84
18) Freon-113	2.46	101	1099	0.54	ppb		96
19) 1,1-DCE	2.44	61	1953	0.62	ppb	#	83
21) Acetonitrile	2.78	40	1718	27.20	ppb		90
22) t-Butanol	3.21	59	4941	25.11	ppb	#	80
23) Methyl Acetate	2.89	43	1035	0.22	ppb	#	49
24) Iodomethane	2.58	142	1209	2.42	ppb	#	90
25) Acrylonitrile	3.31	52	404	0.61	ppb		94
26) Methylene chloride	2.99	49	1849	0.35	ppb	#	84
27) Carbon disulfide	2.65	76	2961	0.72	ppb		99
28) Methyl t-butyl ether (MtBE	3.39	73	3589	0.52	ppb	#	76
29) Trans-1,2-DCE	3.36	61	1620	0.56	ppb	#	88
31) Diisopropyl Ether	4.20	45	3081	0.52	ppb		88
33) 1,1-DCA	3.96	63	1836	0.48	ppb	#	86
34) Vinyl Acetate	4.12	43	1831	0.62	ppb	#	67
35) Ethyl tert Butyl Ether	4.74	59	3847	0.56	ppb		86
36) MEK (2-Butanone)	4.93	43	387	0.45	ppb	#	47
37) Cis-1,2-DCE	4.84	61	2328	0.61	ppb	#	81
38) 2,2-Dichloropropane	4.85	77	1866	0.49	ppb	#	50
41) Chloroform	5.32	83	2864	0.56	ppb		93
42) Bromochloromethane	5.17	49	954	0.53	ppb	#	89
44) 1,1,1-TCA	5.53	97	2411	0.52	ppb	#	88
45) Cyclohexane	5.60	56	1676	0.61	ppb		89
46) 1,1-Dichloropropene	5.76	75	2126	0.65	ppb	#	89
47) 2,2,4-Trimethylpentane	6.19	57	3226	0.62	ppb		93
49) Carbon Tetrachloride	5.75	117	2223	0.54	ppb		99
50) Tert Amyl Methyl Ether	6.23	73	4097	0.57	ppb	#	86
52) 1,2-DCA	6.03	62	2536	0.58	ppb	#	70
53) Benzene	6.02	78	5809	0.58	ppb	#	86
54) TCE	6.84	130	2328	0.60	ppb		93
55) 2-Pentanone	7.08	43	36038	24.15	ppb		100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T28.D Vial: 3
Acq On : 24 Apr 20 14:59 Operator:
Sample : 0.5ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

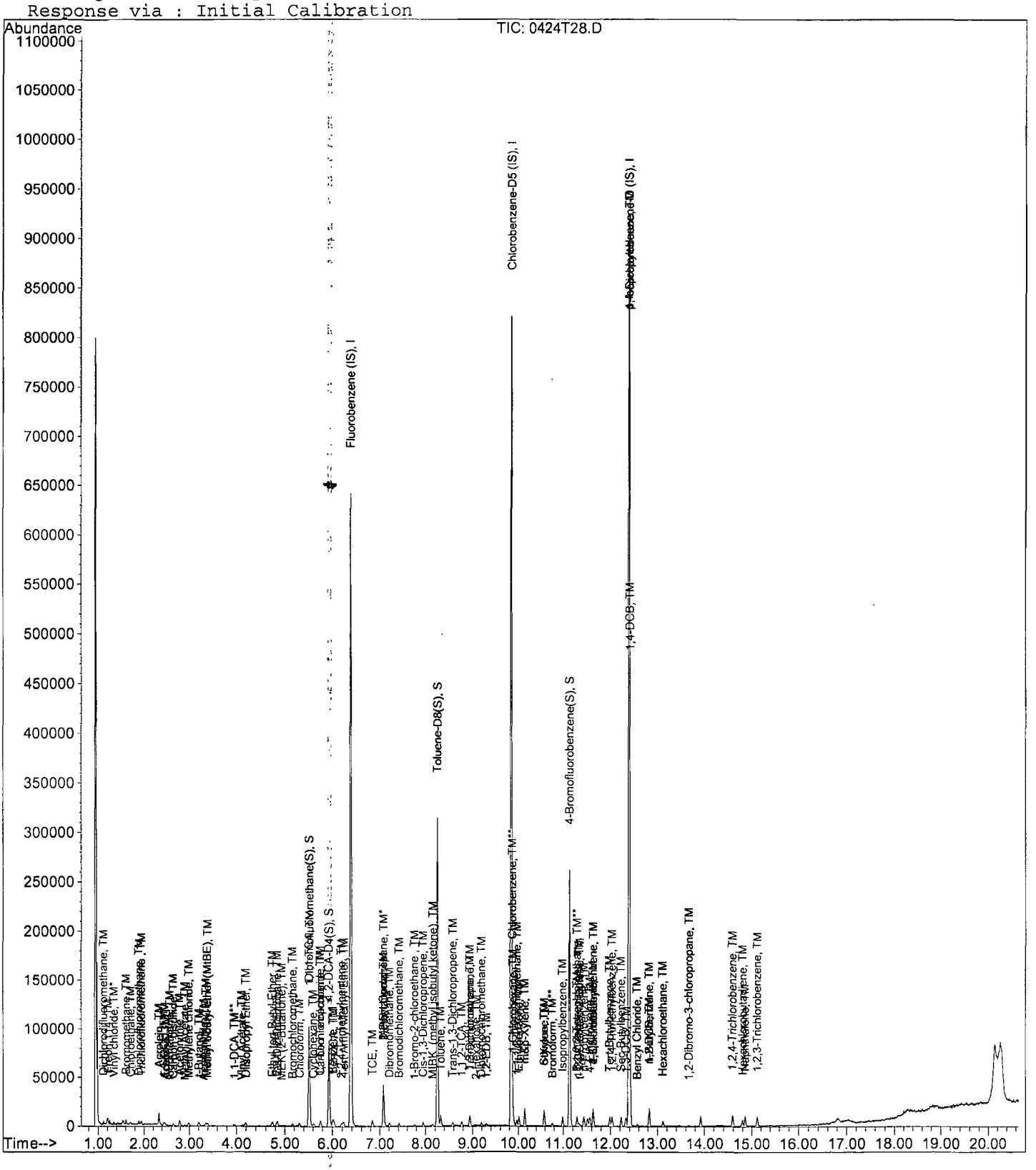
	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
56)	1,2-Dichloropropane	7.07	63	1428	0.57 ppb	#	80
57)	Bromodichloromethane	7.41	83	2394	0.59 ppb		84
58)	Methyl Cyclohexane	7.07	83	2049	0.61 ppb	#	81
59)	Dibromomethane	7.21	174	1667	0.56 ppb	#	87
60)	MIBK (methyl isobutyl ket	8.15	43	1237	0.58 ppb		97
61)	1-Bromo-2-chloroethane	7.75	63	945	0.53 ppb	#	82
63)	Cis-1,3-Dichloropropene	7.95	75	2283	0.54 ppb	#	93
64)	Toluene	8.32	91	7056	0.58 ppb		87
65)	Trans-1,3-Dichloropropene	8.58	75	2211	0.55 ppb		97
66)	1,1,2-TCA	8.77	97	1291	0.45 ppb	#	78
67)	2-Hexanone	9.08	43	666	0.52 ppb	#	68
70)	1,2-EDB	9.30	107	1408	0.48 ppb	#	82
71)	Tetrachloroethene	8.94	166	2749	0.61 ppb	#	70
72)	1-Chlorohexane	9.88	91	1978	0.60 ppb	#	91
73)	1,1,1,2-Tetrachloroethane	9.96	131	1707	0.47 ppb		94
74)	m&p-Xylene	10.14	91	11712	1.09 ppb		86
75)	o-Xylene	10.57	91	6217	0.54 ppb		97
76)	Styrene	10.58	104	4360	0.48 ppb	#	80
78)	1,3-Dichloropropane	8.95	76	2254	0.51 ppb	#	75
79)	Dibromochloromethane	9.19	129	1840	0.50 ppb		89
80)	Chlorobenzene	9.87	112	5543	0.61 ppb	#	81
81)	Ethylbenzene	10.01	91	7858	0.56 ppb		90
82)	Bromoform	10.76	173	1702	0.55 ppb	#	86
84)	Isopropylbenzene	10.98	105	7916	0.58 ppb		94
85)	1,1,2,2-Tetrachloroethane	11.29	83	1778	0.61 ppb	#	83
86)	1,2,3-Trichloropropane	11.32	110	825	0.62 ppb	#	49
87)	t-1,4-Dichloro-2-Butene	11.36	53	213	0.39 ppb	#	16
88)	Bromobenzene	11.30	77	3900	0.59 ppb		91
89)	n-Propylbenzene	11.44	91	8604	0.57 ppb	#	89
90)	4-Ethyltoluene	11.57	105	6826	0.52 ppb		95
91)	2-Chlorotoluene	11.64	91	6216	0.57 ppb		89
92)	1,3,5-Trimethylbenzene	11.63	105	6018	0.50 ppb		87
93)	4-Chlorotoluene	11.64	91	6216	0.55 ppb		97
94)	Tert-Butylbenzene	11.98	119	6705	0.56 ppb		94
95)	1,2,4-Trimethylbenzene	12.04	105	7401	0.60 ppb		98
96)	Sec-Butylbenzene	12.22	105	7798	0.56 ppb		95
97)	p-Isopropyltoluene	12.39	119	7306	0.56 ppb		98
98)	Benzyl Chloride	12.56	91	1854	0.49 ppb	#	95
99)	1,3-DCB	12.33	146	5184	0.61 ppb		91
100)	1,4-DCB	12.42	146	6030	0.42 ppb		90
101)	n-Butylbenzene	12.83	91	5758	0.57 ppb		96
102)	1,2-DCB	12.82	146	5306	0.62 ppb		97
103)	Hexachloroethane	13.12	201	1169	0.48 ppb	#	89
104)	1,2-Dibromo-3-chloropropan	13.66	157	388	0.42 ppb	#	64
105)	1,2,4-Trichlorobenzene	14.59	180	5411	1.11 ppb		89
106)	Hexachlorobutadiene	14.80	225	1987	0.60 ppb	#	82
107)	Naphthalene	14.85	127	1271	1.25 ppb		82
108)	1,2,3-Trichlorobenzene	15.12	180	4635	0.86 ppb		93

(#) = qualifier out of range (m) = manual integration

Data File : M:\THOR\DATA\T200424\0424T28.D Vial: 3
Acq On : 24 Apr 20 14:59 Operator:
Sample : 0.5ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T29.D Vial: 4
Acq On : 24 Apr 20 15:27 Operator:
Sample : 1.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	617973	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	541739	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	325141	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	167798	24.55	ppb		0.00
Spiked Amount 25.000			Recovery = 98.184%				
48) 1,2-DCA-D4(S)	5.93	65	183855	24.85	ppb		0.00
Spiked Amount 25.000			Recovery = 99.404%				
69) Toluene-D8(S)	8.25	98	599887	24.67	ppb		0.00
Spiked Amount 25.000			Recovery = 98.676%				
77) 4-Bromofluorobenzene(S)	11.13	95	238964	24.10	ppb		0.00
Spiked Amount 25.000			Recovery = 96.412%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	3518	1.16	ppb	#	79
4) Freon 114	1.22	85	2326	1.29	ppb		96
5) Chloromethane	1.25	50	2936	0.65	ppb		90
6) Vinyl chloride	1.34	62	2855	0.97	ppb		99
9) Bromomethane	1.60	94	2815	0.92	ppb		97
10) Chloroethane	1.70	66	546	1.39	ppb	#	17
11) Dichlorofluoromethane	1.89	67	4350	1.03	ppb	#	84
12) Trichlorofluoromethane	1.94	101	4613	1.13	ppb		96
16) Acrolein	2.33	56	8636	47.41	ppb		93
17) Acetone	2.50	43	862	0.65	ppb		99
18) Freon-113	2.47	101	2264	1.12	ppb	#	74
19) 1,1-DCE	2.43	61	3620	1.16	ppb	#	83
21) Acetonitrile	2.78	40	3080	49.63	ppb	#	72
22) t-Butanol	3.21	59	9952	51.46	ppb	#	83
23) Methyl Acetate	2.91	43	1956	0.92	ppb	#	49
24) Iodomethane	2.58	142	1552	2.59	ppb		93
25) Acrylonitrile	3.29	52	786	1.22	ppb	#	44
26) Methylene chloride	2.99	49	3212	0.94	ppb		99
27) Carbon disulfide	2.64	76	6392	1.47	ppb		99
28) Methyl t-butyl ether (MtBE	3.40	73	7316	1.08	ppb	#	91
29) Trans-1,2-DCE	3.35	61	3050	1.07	ppb		96
31) Diisopropyl Ether	4.19	45	6207	1.07	ppb		93
33) 1,1-DCA	3.95	63	3814	1.01	ppb	#	89
34) Vinyl Acetate	4.12	43	3213	1.10	ppb		95
35) Ethyl tert Butyl Ether	4.74	59	6875	1.02	ppb	#	66
36) MEK (2-Butanone)	4.93	43	1082	1.28	ppb	#	88
37) Cis-1,2-DCE	4.85	61	3821	1.01	ppb	#	85
38) 2,2-Dichloropropane	4.84	77	4555	1.21	ppb	#	88
41) Chloroform	5.31	83	5333	1.06	ppb		87
42) Bromochloromethane	5.16	49	2008	1.13	ppb		91
44) 1,1,1-TCA	5.53	97	4510	1.00	ppb		90
45) Cyclohexane	5.61	56	2719	1.00	ppb		83
46) 1,1-Dichloropropene	5.76	75	3743	1.16	ppb		95
47) 2,2,4-Trimethylpentane	6.19	57	5933	1.16	ppb		93
49) Carbon Tetrachloride	5.76	117	4040	1.00	ppb		97
50) Tert Amyl Methyl Ether	6.23	73	7319	1.03	ppb		96
52) 1,2-DCA	6.03	62	4741	1.10	ppb	#	86
53) Benzene	6.01	78	10904	1.10	ppb		99
54) TCE	6.83	130	3880	1.02	ppb		94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T29.D Vial: 4
Acq On : 24 Apr 20 15:27 Operator:
Sample : 1.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	69744	47.56	ppb		95
56)	1,2-Dichloropropane	7.08	63	2743	1.12	ppb	#	80
57)	Bromodichloromethane	7.42	83	3963	1.00	ppb		90
58)	Methyl Cyclohexane	7.07	83	3384	1.03	ppb		90
59)	Dibromomethane	7.21	174	2869	0.97	ppb		93
60)	MIBK (methyl isobutyl ket	8.14	43	2185	1.05	ppb	#	82
61)	1-Bromo-2-chloroethane	7.76	63	1765	1.01	ppb		95
63)	Cis-1,3-Dichloropropene	7.95	75	4314	1.03	ppb	#	89
64)	Toluene	8.32	91	12618	1.05	ppb		93
65)	Trans-1,3-Dichloropropene	8.58	75	4013	1.02	ppb		94
66)	1,1,2-TCA	8.77	97	3322	1.19	ppb		93
67)	2-Hexanone	9.08	43	1277	1.01	ppb	#	76
70)	1,2-EDB	9.31	107	2924	1.02	ppb	#	84
71)	Tetrachloroethene	8.94	166	4934	1.13	ppb		92
72)	1-Chlorohexane	9.88	91	3330	1.04	ppb		92
73)	1,1,1,2-Tetrachloroethane	9.96	131	3766	1.07	ppb		98
74)	m&p-Xylene	10.14	91	21292	2.04	ppb		88
75)	o-Xylene	10.57	91	11572	1.03	ppb		93
76)	Styrene	10.58	104	8272	0.94	ppb		97
78)	1,3-Dichloropropane	8.95	76	4394	1.02	ppb		98
79)	Dibromochloromethane	9.19	129	3657	1.02	ppb		94
80)	Chlorobenzene	9.87	112	8767	0.98	ppb		95
81)	Ethylbenzene	10.01	91	15101	1.10	ppb		99
82)	Bromoform	10.76	173	3145	1.05	ppb		89
84)	Isopropylbenzene	10.99	105	14204	1.08	ppb		99
85)	1,1,2,2-Tetrachloroethane	11.28	83	3050	1.08	ppb	#	89
86)	1,2,3-Trichloropropane	11.33	110	1400	1.08	ppb	#	58
87)	t-1,4-Dichloro-2-Butene	11.35	53	618	1.15	ppb		93
88)	Bromobenzene	11.29	77	6861	1.08	ppb		89
89)	n-Propylbenzene	11.44	91	15767	1.09	ppb		94
90)	4-Ethyltoluene	11.57	105	13519	1.07	ppb		97
91)	2-Chlorotoluene	11.63	91	11916	1.12	ppb		94
92)	1,3,5-Trimethylbenzene	11.63	105	12227	1.06	ppb		99
93)	4-Chlorotoluene	11.63	91	11916	1.09	ppb		98
94)	Tert-Butylbenzene	11.98	119	11922	1.03	ppb		91
95)	1,2,4-Trimethylbenzene	12.04	105	12542	1.05	ppb		93
96)	Sec-Butylbenzene	12.22	105	14016	1.03	ppb	#	89
97)	p-Isopropyltoluene	12.39	119	12527	1.00	ppb		99
98)	Benzyl Chloride	12.57	91	4200	1.15	ppb		97
99)	1,3-DCB	12.32	146	8676	1.05	ppb		93
100)	1,4-DCB	12.42	146	9988	0.95	ppb		98
101)	n-Butylbenzene	12.83	91	11658	1.19	ppb		99
102)	1,2-DCB	12.82	146	9724	1.16	ppb		98
103)	Hexachloroethane	13.12	201	2272	0.96	ppb		96
104)	1,2-Dibromo-3-chloropropan	13.67	157	694	0.78	ppb	#	32
105)	1,2,4-Trichlorobenzene	14.58	180	7514	1.46	ppb		96
106)	Hexachlorobutadiene	14.79	225	3754	1.17	ppb	#	81
107)	Naphthalene	14.86	127	1867	1.65	ppb	#	49
108)	1,2,3-Trichlorobenzene	15.12	180	6568	1.19	ppb	#	79

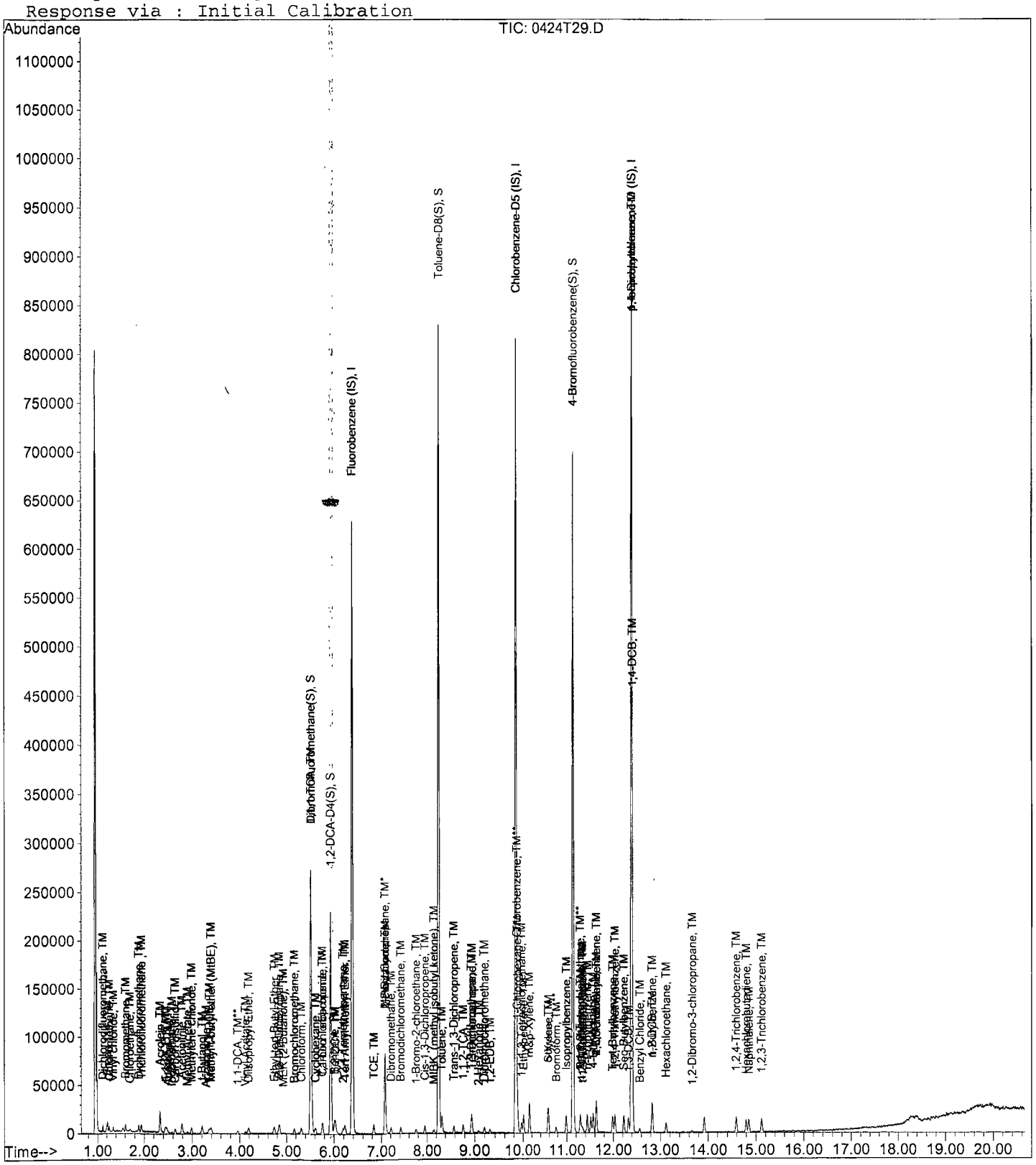
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T29.D Vial: 4
Acq On : 24 Apr 20 15:27 Operator:
Sample : 1.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T30.D Vial: 5
Acq On : 24 Apr 20 15:55 Operator:
Sample : 2.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	606274	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	528656	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	327988	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	331695	49.46	ppb		0.00
Spiked Amount 25.000			Recovery =	197.828%			
48) 1,2-DCA-D4(S)	5.93	65	356597	49.13	ppb		0.00
Spiked Amount 25.000			Recovery =	196.524%			
69) Toluene-D8(S)	8.25	98	1177925	49.64	ppb		0.00
Spiked Amount 25.000			Recovery =	198.552%			
77) 4-Bromofluorobenzene(S)	11.13	95	468783	48.45	ppb		0.00
Spiked Amount 25.000			Recovery =	193.816%			
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	6828	2.64	ppb		98
4) Freon 114	1.22	85	4460	2.69	ppb		85
5) Chloromethane	1.25	50	6033	2.46	ppb		93
6) Vinyl chloride	1.34	62	5654	2.46	ppb	#	85
9) Bromomethane	1.60	94	4813	2.12	ppb		98
10) Chloroethane	1.70	66	799	2.22	ppb		91
11) Dichlorofluoromethane	1.89	67	9818	2.37	ppb		88
12) Trichlorofluoromethane	1.94	101	8689	2.16	ppb		90
16) Acrolein	2.33	56	13619	77.52	ppb		96
17) Acetone	2.50	43	1412	2.35	ppb	#	81
18) Freon-113	2.46	101	4613	2.33	ppb		94
19) 1,1-DCE	2.43	61	5956	1.95	ppb	#	92
21) Acetonitrile	2.78	40	4803	78.89	ppb		83
22) t-Butanol	3.21	59	14317	75.46	ppb		98
23) Methyl Acetate	2.90	43	3743	2.28	ppb	#	78
24) Iodomethane	2.57	142	3171	3.40	ppb	#	92
25) Acrylonitrile	3.29	52	1309	2.07	ppb	#	76
26) Methylene chloride	2.98	49	6266	2.27	ppb	#	79
27) Carbon disulfide	2.65	76	11498	2.62	ppb		99
28) Methyl t-butyl ether (MTBE	3.40	73	13449	2.03	ppb		99
29) Trans-1,2-DCE	3.35	61	5962	2.13	ppb	#	91
31) Diisopropyl Ether	4.19	45	11771	2.08	ppb		91
33) 1,1-DCA	3.95	63	8611	2.33	ppb		98
34) Vinyl Acetate	4.12	43	5609	1.97	ppb	#	87
35) Ethyl tert Butyl Ether	4.74	59	13312	2.02	ppb		94
36) MEK (2-Butanone)	4.91	43	1689	2.03	ppb		90
37) Cis-1,2-DCE	4.85	61	7891	2.13	ppb		90
38) 2,2-Dichloropropane	4.83	77	7840	2.12	ppb		94
41) Chloroform	5.32	83	10666	2.16	ppb		97
42) Bromochloromethane	5.16	49	3535	2.02	ppb		90
44) 1,1,1-TCA	5.53	97	9873	2.22	ppb		91
45) Cyclohexane	5.61	56	6408	2.41	ppb		96
46) 1,1-Dichloropropene	5.76	75	6391	2.02	ppb	#	91
47) 2,2,4-Trimethylpentane	6.19	57	11149	2.22	ppb		99
49) Carbon Tetrachloride	5.76	117	7772	1.97	ppb		91
50) Tert Amyl Methyl Ether	6.23	73	14490	2.08	ppb		99
52) 1,2-DCA	6.03	62	9523	2.26	ppb	#	90
53) Benzene	6.02	78	20551	2.11	ppb		96
54) TCE	6.84	130	7780	2.09	ppb		95

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T30.D Vial: 5
Acq On : 24 Apr 20 15:55 Operator:
Sample : 2.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	108031	75.10	ppb		97
56)	1,2-Dichloropropane	7.08	63	5063	2.11	ppb	#	80
57)	Bromodichloromethane	7.42	83	7721	1.98	ppb		91
58)	Methyl Cyclohexane	7.06	83	7403	2.30	ppb		96
59)	Dibromomethane	7.21	174	6006	2.08	ppb		94
60)	MIBK (methyl isobutyl ket	8.14	43	4311	2.11	ppb	#	89
61)	1-Bromo-2-chloroethane	7.75	63	3844	2.25	ppb		90
63)	Cis-1,3-Dichloropropene	7.94	75	8328	2.03	ppb	#	94
64)	Toluene	8.32	91	24133	2.05	ppb		94
65)	Trans-1,3-Dichloropropene	8.58	75	7641	1.99	ppb		93
66)	1,1,2-TCA	8.77	97	5986	2.18	ppb		95
67)	2-Hexanone	9.08	43	2401	1.93	ppb	#	80
70)	1,2-EDB	9.30	107	5756	2.06	ppb		89
71)	Tetrachloroethene	8.94	166	8950	2.10	ppb		93
72)	1-Chlorohexane	9.88	91	7236	2.31	ppb		91
73)	1,1,1,2-Tetrachloroethane	9.96	131	6911	2.01	ppb		97
74)	m&p-Xylene	10.14	91	42953	4.22	ppb		99
75)	o-Xylene	10.57	91	23740	2.16	ppb		97
76)	Styrene	10.58	104	18309	2.13	ppb		96
78)	1,3-Dichloropropane	8.95	76	9362	2.23	ppb		92
79)	Dibromochloromethane	9.19	129	7349	2.09	ppb		94
80)	Chlorobenzene	9.87	112	18385	2.12	ppb		99
81)	Ethylbenzene	10.01	91	27222	2.04	ppb		98
82)	Bromoform	10.76	173	5255	1.79	ppb	#	85
84)	Isopropylbenzene	10.99	105	27599	2.07	ppb		91
85)	1,1,2,2-Tetrachloroethane	11.28	83	5666	1.99	ppb		91
86)	1,2,3-Trichloropropane	11.32	110	2800	2.14	ppb	#	80
87)	t-1,4-Dichloro-2-Butene	11.36	53	951	1.76	ppb		94
88)	Bromobenzene	11.29	77	13691	2.13	ppb		87
89)	n-Propylbenzene	11.43	91	30466	2.08	ppb		99
90)	4-Ethyltoluene	11.56	105	26394	2.07	ppb		98
91)	2-Chlorotoluene	11.51	91	22998	2.14	ppb		98
92)	1,3,5-Trimethylbenzene	11.63	105	24575	2.11	ppb		98
93)	4-Chlorotoluene	11.63	91	23376	2.12	ppb		99
94)	Tert-Butylbenzene	11.99	119	22287	1.90	ppb		100
95)	1,2,4-Trimethylbenzene	12.03	105	23910	1.98	ppb		96
96)	Sec-Butylbenzene	12.22	105	28019	2.04	ppb		100
97)	p-Isopropyltoluene	12.39	119	25622	2.02	ppb		98
98)	Benzyl Chloride	12.57	91	7372	2.00	ppb		93
99)	1,3-DCB	12.32	146	17988	2.15	ppb		98
100)	1,4-DCB	12.42	146	18886	2.08	ppb		93
101)	n-Butylbenzene	12.83	91	20556	2.07	ppb		88
102)	1,2-DCB	12.83	146	16802	1.99	ppb		90
103)	Hexachloroethane	13.12	201	4792	2.01	ppb	#	91
104)	1,2-Dibromo-3-chloropropan	13.66	157	1989	2.22	ppb		91
105)	1,2,4-Trichlorobenzene	14.59	180	14361	2.52	ppb		91
106)	Hexachlorobutadiene	14.80	225	6190	1.91	ppb		91
107)	Naphthalene	14.86	127	3411	2.60	ppb	#	58
108)	1,2,3-Trichlorobenzene	15.12	180	12885	2.20	ppb		98

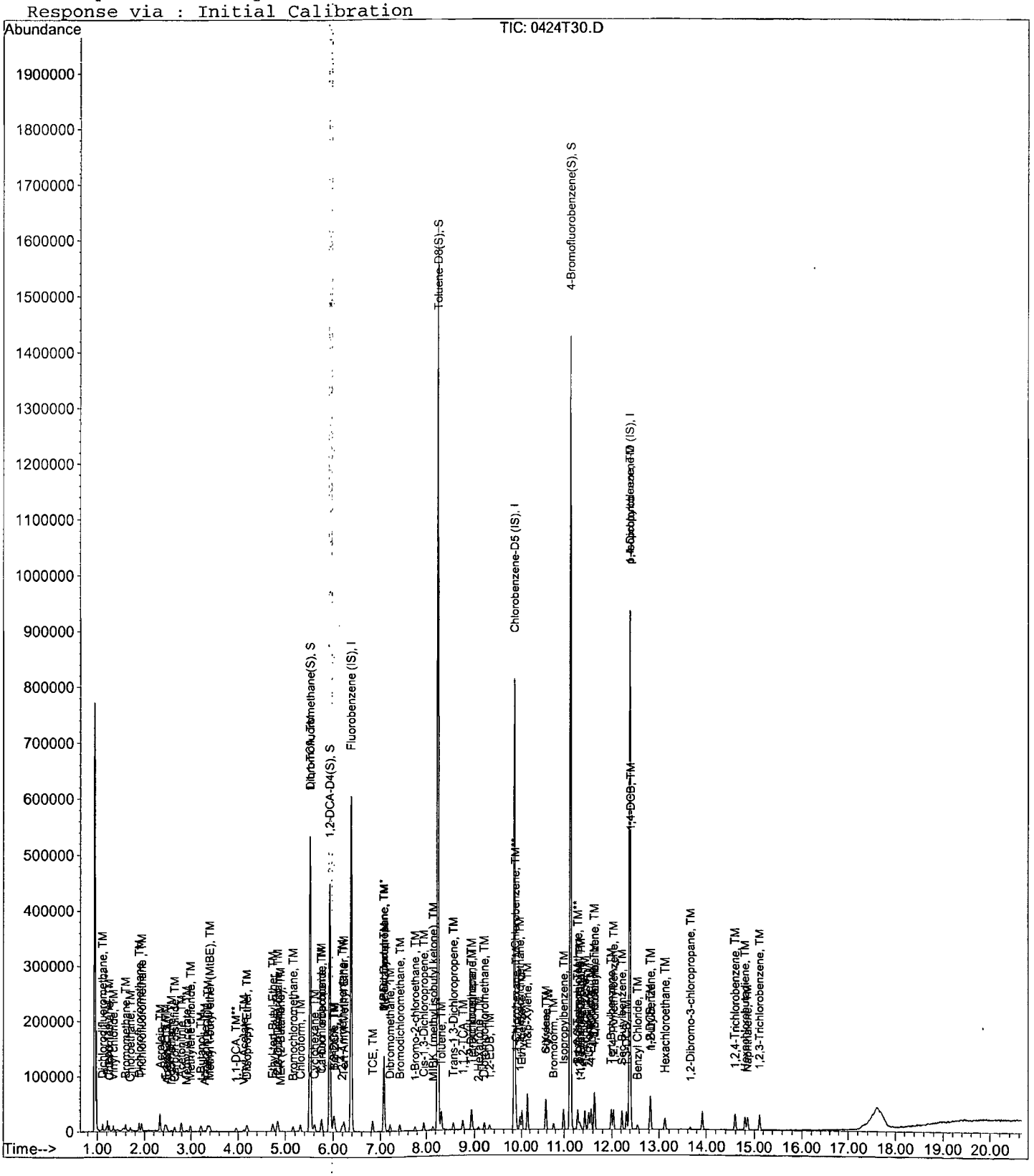
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T30.D Vial: 5
Acq On : 24 Apr 20 15:55 Operator:
Sample : 2.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T31.D Vial: 6
Acq On : 24 Apr 20 16:23 Operator:
Sample : 5.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	602684	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	540454	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	335907	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	638292	95.74	ppb		0.00
Spiked Amount 25.000			Recovery = 382.956%				
48) 1,2-DCA-D4(S)	5.93	65	683254	94.70	ppb		0.00
Spiked Amount 25.000			Recovery = 378.788%				
69) Toluene-D8(S)	8.25	98	2273371	93.71	ppb		0.00
Spiked Amount 25.000			Recovery = 374.836%				
77) 4-Bromofluorobenzene(S)	11.13	95	944760	95.52	ppb		0.00
Spiked Amount 25.000			Recovery = 382.076%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	11367	4.68	ppb		98
4) Freon 114	1.22	85	7347	4.58	ppb		97
5) Chloromethane	1.25	50	10252	4.93	ppb		97
6) Vinyl chloride	1.34	62	9912	4.70	ppb		98
9) Bromomethane	1.60	94	9843	5.07	ppb		92
10) Chloroethane	1.70	66	1859	5.59	ppb		70
11) Dichlorofluoromethane	1.89	67	21044	5.10	ppb		96
12) Trichlorofluoromethane	1.94	101	19086	4.78	ppb		93
16) Acrolein	2.33	56	17880	101.90	ppb		99
17) Acetone	2.50	43	2488	5.62	ppb		89
18) Freon-113	2.46	101	8679	4.41	ppb	#	75
19) 1,1-DCE	2.43	61	14537	4.78	ppb		87
21) Acetonitrile	2.79	40	5906	97.58	ppb		95
22) t-Butanol	3.21	59	19973	105.90	ppb	#	89
23) Methyl Acetate	2.90	43	7571	5.19	ppb		92
24) Iodomethane	2.58	142	6242	4.91	ppb		90
25) Acrylonitrile	3.30	52	2782	4.42	ppb	#	86
26) Methylene chloride	2.99	49	12734	5.07	ppb		91
27) Carbon disulfide	2.64	76	22080	4.96	ppb		99
28) Methyl t-butyl ether (MtBE	3.39	73	31480	4.78	ppb		95
29) Trans-1,2-DCE	3.35	61	12697	4.56	ppb		93
31) Diisopropyl Ether	4.19	45	27186	4.82	ppb		97
33) 1,1-DCA	3.96	63	17814	4.85	ppb		97
34) Vinyl Acetate	4.12	43	12974	4.57	ppb		94
35) Ethyl tert Butyl Ether	4.74	59	31321	4.78	ppb		96
36) MEK (2-Butanone)	4.91	43	4368	5.29	ppb	#	84
37) Cis-1,2-DCE	4.85	61	17503	4.76	ppb		94
38) 2,2-Dichloropropane	4.84	77	17431	4.75	ppb		93
41) Chloroform	5.32	83	22602	4.60	ppb		89
42) Bromochloromethane	5.16	49	8876	5.11	ppb		94
44) 1,1,1-TCA	5.53	97	22161	5.02	ppb		96
45) Cyclohexane	5.61	56	12097	4.58	ppb	#	83
46) 1,1-Dichloropropene	5.76	75	14370	4.56	ppb	#	86
47) 2,2,4-Trimethylpentane	6.20	57	20948	4.20	ppb		100
49) Carbon Tetrachloride	5.75	117	19133	4.88	ppb		95
50) Tert Amyl Methyl Ether	6.23	73	32415	4.67	ppb		94
52) 1,2-DCA	6.03	62	21160	5.05	ppb		94
53) Benzene	6.01	78	45827	4.74	ppb		97
54) TCE	6.83	130	17153	4.64	ppb		96

(#) = qualifier out of range (m) = manual integration
0424T31.D T0424W.M Wed May 06 13:21:34 2020

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T31.D Vial: 6
Acq On : 24 Apr 20 16:23 Operator:
Sample : 5.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	137927	96.45	ppb		99
56)	1,2-Dichloropropane	7.08	63	11105	4.66	ppb	#	90
57)	Bromodichloromethane	7.42	83	18393	4.75	ppb		99
58)	Methyl Cyclohexane	7.07	83	13760	4.29	ppb		99
59)	Dibromomethane	7.20	174	14154	4.93	ppb		93
60)	MIBK (methyl isobutyl ket	8.14	43	8431	4.15	ppb	#	76
61)	1-Bromo-2-chloroethane	7.75	63	7871	4.63	ppb		97
63)	Cis-1,3-Dichloropropene	7.95	75	19519	4.78	ppb		95
64)	Toluene	8.32	91	57839	4.94	ppb		99
65)	Trans-1,3-Dichloropropene	8.58	75	17508	4.58	ppb		96
66)	1,1,2-TCA	8.77	97	13155	4.81	ppb		96
67)	2-Hexanone	9.08	43	5452	4.41	ppb		97
70)	1,2-EDB	9.31	107	13548	4.75	ppb		97
71)	Tetrachloroethene	8.94	166	19871	4.56	ppb		97
72)	1-Chlorohexane	9.88	91	14007	4.37	ppb		97
73)	1,1,1,2-Tetrachloroethane	9.96	131	16364	4.65	ppb		95
74)	m&p-Xylene	10.14	91	95579	9.18	ppb		98
75)	o-Xylene	10.57	91	52242	4.64	ppb		100
76)	Styrene	10.58	104	41216	4.69	ppb		97
78)	1,3-Dichloropropane	8.95	76	21172	4.94	ppb		100
79)	Dibromochloromethane	9.19	129	16831	4.68	ppb		92
80)	Chlorobenzene	9.87	112	41441	4.66	ppb		96
81)	Ethylbenzene	10.01	91	63775	4.68	ppb		100
82)	Bromoform	10.76	173	13656	4.56	ppb		88
84)	Isopropylbenzene	10.99	105	63684	4.67	ppb		99
85)	1,1,2,2-Tetrachloroethane	11.29	83	14506	4.97	ppb		96
86)	1,2,3-Trichloropropane	11.33	110	6584	4.91	ppb	#	86
87)	t-1,4-Dichloro-2-Butene	11.35	53	2740	4.95	ppb		98
88)	Bromobenzene	11.29	77	32292	4.91	ppb		99
89)	n-Propylbenzene	11.43	91	69288	4.63	ppb		97
90)	4-Ethyltoluene	11.56	105	61971	4.75	ppb		95
91)	2-Chlorotoluene	11.51	91	50459	4.59	ppb		96
92)	1,3,5-Trimethylbenzene	11.63	105	57213	4.80	ppb		94
93)	4-Chlorotoluene	11.63	91	51909	4.60	ppb		98
94)	Tert-Butylbenzene	11.98	119	59700	4.98	ppb		99
95)	1,2,4-Trimethylbenzene	12.03	105	55941	4.53	ppb		100
96)	Sec-Butylbenzene	12.22	105	67160	4.78	ppb		97
97)	p-Isopropyltoluene	12.39	119	59934	4.62	ppb		98
98)	Benzyl Chloride	12.57	91	16603	4.39	ppb	#	92
99)	1,3-DCB	12.32	146	40274	4.71	ppb		96
100)	1,4-DCB	12.42	146	40323	4.69	ppb		92
101)	n-Butylbenzene	12.83	91	45022	4.44	ppb		100
102)	1,2-DCB	12.83	146	38589	4.47	ppb		96
103)	Hexachloroethane	13.12	201	12401	5.07	ppb		87
104)	1,2-Dibromo-3-chloropropan	13.66	157	4666	5.08	ppb		85
105)	1,2,4-Trichlorobenzene	14.59	180	30500	4.93	ppb		97
106)	Hexachlorobutadiene	14.80	225	14775	4.45	ppb		98
107)	Naphthalene	14.85	127	7367	4.97	ppb		93
108)	1,2,3-Trichlorobenzene	15.12	180	30096	4.85	ppb		89

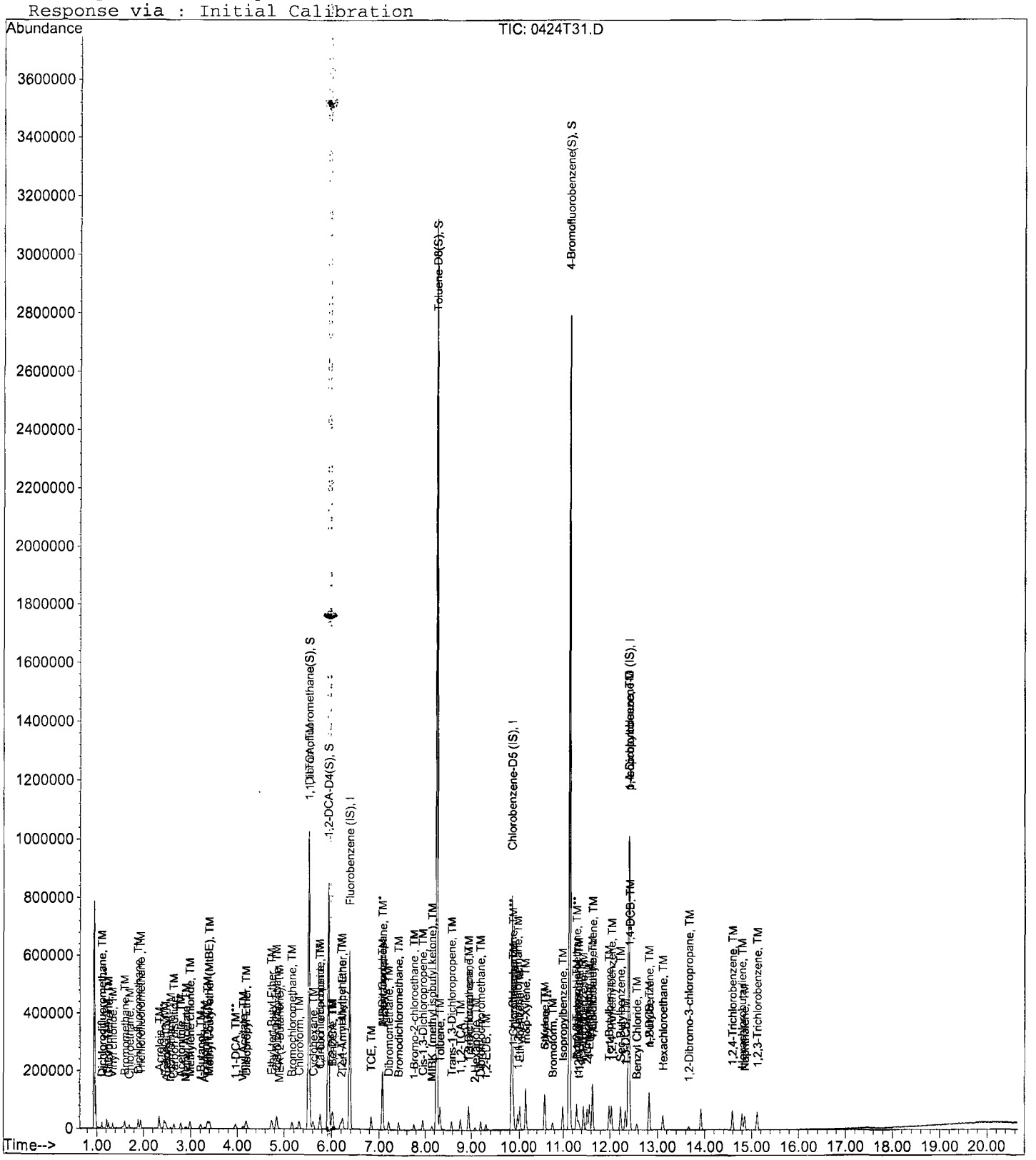
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T31.D Vial: 6
Acq On : 24 Apr 20 16:23 Operator:
Sample : 5.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T32.D Vial: 7
Acq On : 24 Apr 20 16:50 Operator:
Sample : 10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	605202	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	531673	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	337525	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	171517	25.62	ppb	0.00
Spiked Amount 25.000			Recovery = 102.476%			
48) 1,2-DCA-D4(S)	5.93	65	184080	25.41	ppb	0.00
Spiked Amount 25.000			Recovery = 101.628%			
69) Toluene-D8(S)	8.25	98	601842	25.22	ppb	0.00
Spiked Amount 25.000			Recovery = 100.872%			
77) 4-Bromofluorobenzene(S)	11.13	95	250949	25.79	ppb	0.00
Spiked Amount 25.000			Recovery = 103.164%			
Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.11	85	22544	9.59	ppb	100
4) Freon 114	1.22	85	14885	9.42	ppb	100
5) Chloromethane	1.25	50	20104	10.59	ppb	100
6) Vinyl chloride	1.34	62	20736	10.32	ppb	100
9) Bromomethane	1.60	94	18256	9.95	ppb	100
10) Chloroethane	1.70	66	2977	9.09	ppb	100
11) Dichlorofluoromethane	1.89	67	40017	9.67	ppb	100
12) Trichlorofluoromethane	1.94	101	38962	9.71	ppb	100
16) Acrolein	2.33	56	21504	121.04	ppb	100
17) Acetone	2.50	43	3362	8.22	ppb	100
18) Freon-113	2.47	101	17563	8.89	ppb	100
19) 1,1-DCE	2.44	61	28325	9.28	ppb	100
21) Acetonitrile	2.78	40	6921	113.88	ppb	100
22) t-Butanol	3.20	59	23400	123.55	ppb	100
23) Methyl Acetate	2.90	43	13866	9.89	ppb	100
24) Iodomethane	2.58	142	12167	7.70	ppb	100
25) Acrylonitrile	3.29	52	5606	8.86	ppb	100
26) Methylene chloride	2.99	49	24761	10.19	ppb	100
27) Carbon disulfide	2.65	76	42635	9.46	ppb	100
28) Methyl t-butyl ether (MtBE	3.40	73	65571	9.92	ppb	100
29) Trans-1,2-DCE	3.35	61	27835	9.96	ppb	100
31) Diisopropyl Ether	4.19	45	55945	9.88	ppb	100
33) 1,1-DCA	3.96	63	35758	9.70	ppb	100
34) Vinyl Acetate	4.12	43	26076	9.16	ppb	100
35) Ethyl tert Butyl Ether	4.73	59	63306	9.62	ppb	100
36) MEK (2-Butanone)	4.90	43	8255	9.96	ppb	100
37) Cis-1,2-DCE	4.84	61	34933	9.46	ppb	100
38) 2,2-Dichloropropane	4.84	77	34957	9.49	ppb	100
41) Chloroform	5.31	83	47924	9.70	ppb	100
42) Bromochloromethane	5.16	49	16878	9.68	ppb	100
44) 1,1,1-TCA	5.53	97	42130	9.50	ppb	100
45) Cyclohexane	5.61	56	23342	8.80	ppb	100
46) 1,1-Dichloropropene	5.76	75	27830	8.80	ppb	100
47) 2,2,4-Trimethylpentane	6.19	57	43005	8.59	ppb	100
49) Carbon Tetrachloride	5.76	117	37145	9.43	ppb	100
50) Tert Amyl Methyl Ether	6.23	73	66141	9.50	ppb	100
52) 1,2-DCA	6.03	62	36735	8.73	ppb	100
53) Benzene	6.01	78	92011	9.48	ppb	100
54) TCE	6.84	130	34461	9.27	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T32.D Vial: 7
Acq On : 24 Apr 20 16:50 Operator:
Sample : 10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
55)	2-Pentanone	7.08	43	180696	125.83	ppb	100
56)	1,2-Dichloropropane	7.08	63	22965	9.60	ppb	100
57)	Bromodichloromethane	7.42	83	37016	9.51	ppb	100
58)	Methyl Cyclohexane	7.07	83	28378	8.81	ppb	100
59)	Dibromomethane	7.21	174	27729	9.62	ppb	100
60)	MIBK (methyl isobutyl ket	8.14	43	18843	9.25	ppb	100
61)	1-Bromo-2-chloroethane	7.75	63	16664	9.77	ppb	100
63)	Cis-1,3-Dichloropropene	7.95	75	39879	9.72	ppb	100
64)	Toluene	8.32	91	110605	9.41	ppb	100
65)	Trans-1,3-Dichloropropene	8.58	75	37464	9.76	ppb	100
66)	1,1,2-TCA	8.77	97	26955	9.82	ppb	100
67)	2-Hexanone	9.07	43	12173	9.80	ppb	100
70)	1,2-EDB	9.31	107	27366	9.75	ppb	100
71)	Tetrachloroethene	8.94	166	40535	9.46	ppb	100
72)	1-Chlorohexane	9.88	91	28101	8.91	ppb	100
73)	1,1,1,2-Tetrachloroethane	9.97	131	35154	10.16	ppb	100
74)	m&p-Xylene	10.14	91	194967	19.03	ppb	100
75)	o-Xylene	10.57	91	104584	9.45	ppb	100
76)	Styrene	10.58	104	85902	9.94	ppb	100
78)	1,3-Dichloropropane	8.95	76	40250	9.54	ppb	100
79)	Dibromochloromethane	9.19	129	33813	9.57	ppb	100
80)	Chlorobenzene	9.87	112	85459	9.78	ppb	100
81)	Ethylbenzene	10.01	91	126234	9.41	ppb	100
82)	Bromoform	10.76	173	28494	9.67	ppb	100
84)	Isopropylbenzene	10.99	105	130879	9.55	ppb	100
85)	1,1,2,2-Tetrachloroethane	11.29	83	28423	9.68	ppb	100
86)	1,2,3-Trichloropropane	11.32	110	12322	9.15	ppb	100
87)	t-1,4-Dichloro-2-Butene	11.36	53	6205	11.16	ppb	100
88)	Bromobenzene	11.29	77	62074	9.39	ppb	100
89)	n-Propylbenzene	11.44	91	142182	9.45	ppb	100
90)	4-Ethyltoluene	11.56	105	125920	9.61	ppb	100
91)	2-Chlorotoluene	11.51	91	105686	9.56	ppb	100
92)	1,3,5-Trimethylbenzene	11.63	105	116619	9.73	ppb	100
93)	4-Chlorotoluene	11.63	91	108400	9.56	ppb	100
94)	Tert-Butylbenzene	11.98	119	117432	9.74	ppb	100
95)	1,2,4-Trimethylbenzene	12.03	105	115778	9.33	ppb	100
96)	Sec-Butylbenzene	12.22	105	133257	9.45	ppb	100
97)	p-Isopropyltoluene	12.39	119	125126	9.61	ppb	100
98)	Benzyl Chloride	12.57	91	34925	9.18	ppb	100
99)	1,3-DCB	12.32	146	80173	9.33	ppb	100
100)	1,4-DCB	12.42	146	82587	9.91	ppb	100
101)	n-Butylbenzene	12.83	91	92873	9.11	ppb	100
102)	1,2-DCB	12.82	146	81453	9.39	ppb	100
103)	Hexachloroethane	13.12	201	23931	9.74	ppb	100
104)	1,2-Dibromo-3-chloropropan	13.66	157	8787	9.53	ppb	100
105)	1,2,4-Trichlorobenzene	14.59	180	61822	9.65	ppb	100
106)	Hexachlorobutadiene	14.80	225	30455	9.13	ppb	100
107)	Naphthalene	14.85	127	14808	9.48	ppb	100
108)	1,2,3-Trichlorobenzene	15.12	180	61900	9.79	ppb	100

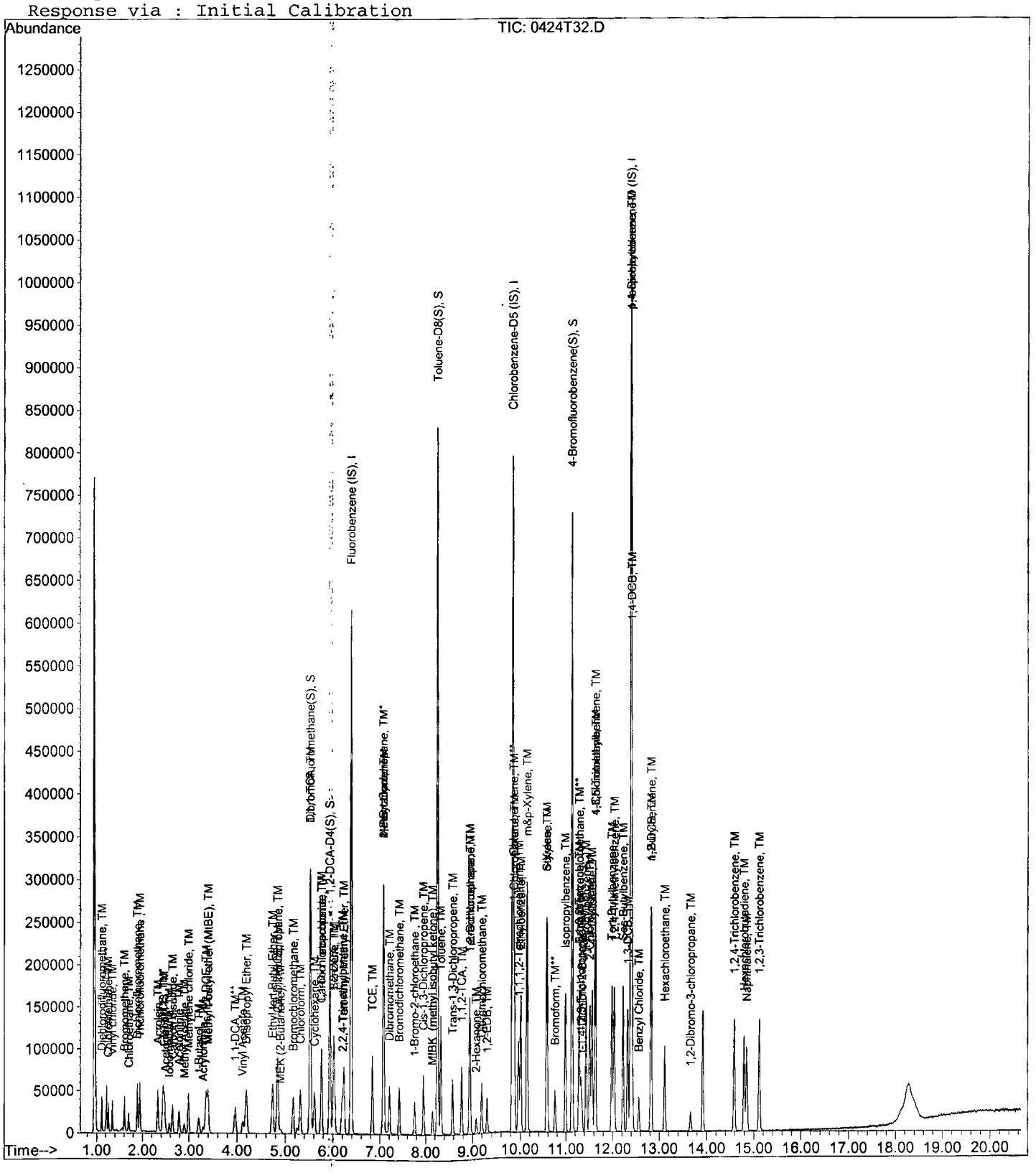
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T32.D Vial: 7
Acq On : 24 Apr 20 16:50 Operator:
Sample : 10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T33.D Vial: 8
Acq On : 24 Apr 20 17:18 Operator:
Sample : 20ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	606353	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	530559	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	343364	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	167194	24.93	ppb		0.00
Spiked Amount 25.000			Recovery = 99.704%				
48) 1,2-DCA-D4(S)	5.93	65	182313	25.12	ppb		0.00
Spiked Amount 25.000			Recovery = 100.460%				
69) Toluene-D8(S)	8.25	98	596370	25.04	ppb		0.00
Spiked Amount 25.000			Recovery = 100.164%				
77) 4-Bromofluorobenzene(S)	11.13	95	242082	24.93	ppb		0.00
Spiked Amount 25.000			Recovery = 99.728%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	45768	19.81	ppb		97
4) Freon 114	1.22	85	30739	19.60	ppb		98
5) Chloromethane	1.25	50	36360	19.93	ppb		97
6) Vinyl chloride	1.34	62	38440	19.51	ppb		99
9) Bromomethane	1.60	94	34446	19.34	ppb		100
10) Chloroethane	1.70	66	6175	19.12	ppb		88
11) Dichlorofluoromethane	1.89	67	80430	19.39	ppb		94
12) Trichlorofluoromethane	1.94	101	75420	18.76	ppb		100
16) Acrolein	2.33	56	27440	151.53	ppb		93
17) Acetone	2.50	43	7542	20.74	ppb	#	81
18) Freon-113	2.47	101	38227	19.31	ppb		96
19) 1,1-DCE	2.44	61	55953	18.30	ppb		95
21) Acetonitrile	2.78	40	8949	146.97	ppb		94
22) t-Butanol	3.21	59	29333	154.59	ppb	#	81
23) Methyl Acetate	2.90	43	27935	20.42	ppb		94
24) Iodomethane	2.58	142	35166	17.76	ppb	#	93
25) Acrylonitrile	3.30	52	11659	18.40	ppb		87
26) Methylene chloride	2.99	49	46596	19.50	ppb	#	86
27) Carbon disulfide	2.64	76	86876	19.14	ppb		100
28) Methyl t-butyl ether (MtBE	3.39	73	127212	19.22	ppb		98
29) Trans-1,2-DCE	3.35	61	53314	19.04	ppb		95
31) Diisopropyl Ether	4.19	45	107043	18.88	ppb		99
33) 1,1-DCA	3.96	63	72497	19.63	ppb		97
34) Vinyl Acetate	4.12	43	53173	18.64	ppb		97
35) Ethyl tert Butyl Ether	4.74	59	129779	19.67	ppb		96
36) MEK (2-Butanone)	4.90	43	14527	17.49	ppb	#	79
37) Cis-1,2-DCE	4.84	61	69309	18.74	ppb		97
38) 2,2-Dichloropropane	4.84	77	69743	18.89	ppb		99
41) Chloroform	5.31	83	94418	19.08	ppb		98
42) Bromochloromethane	5.16	49	32710	18.72	ppb		97
44) 1,1,1-TCA	5.53	97	83485	18.80	ppb		98
45) Cyclohexane	5.61	56	46459	17.49	ppb	#	97
46) 1,1-Dichloropropene	5.76	75	58188	18.36	ppb		93
47) 2,2,4-Trimethylpentane	6.19	57	91017	18.15	ppb		98
49) Carbon Tetrachloride	5.76	117	76863	19.48	ppb		88
50) Tert Amyl Methyl Ether	6.23	73	134340	19.25	ppb		97
52) 1,2-DCA	6.03	62	78414	18.59	ppb	#	94
53) Benzene	6.01	78	181208	18.64	ppb		96
54) TCE	6.84	130	70244	18.87	ppb		93

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T33.D Vial: 8
Acq On : 24 Apr 20 17:18 Operator:
Sample : 20ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	220360	153.16	ppb		98
56)	1,2-Dichloropropane	7.08	63	44076	18.38	ppb		97
57)	Bromodichloromethane	7.42	83	74633	19.14	ppb		98
58)	Methyl Cyclohexane	7.07	83	59229	18.36	ppb		94
59)	Dibromomethane	7.21	174	57124	19.78	ppb		92
60)	MIBK (methyl isobutyl ket	8.14	43	38183	18.70	ppb	#	90
61)	1-Bromo-2-chloroethane	7.75	63	34032	19.91	ppb		98
63)	Cis-1,3-Dichloropropene	7.95	75	80286	19.53	ppb		96
64)	Toluene	8.32	91	218765	18.58	ppb		98
65)	Trans-1,3-Dichloropropene	8.58	75	77213	20.08	ppb		98
66)	1,1,2-TCA	8.77	97	52541	19.11	ppb		91
67)	2-Hexanone	9.08	43	26036	20.92	ppb		95
70)	1,2-EDB	9.30	107	57693	20.61	ppb		98
71)	Tetrachloroethene	8.94	166	79276	18.55	ppb		97
72)	1-Chlorohexane	9.88	91	57099	18.14	ppb		90
73)	1,1,1,2-Tetrachloroethane	9.97	131	69237	20.05	ppb		98
74)	m&p-Xylene	10.14	91	399702	39.09	ppb		98
75)	o-Xylene	10.57	91	216458	19.59	ppb		95
76)	Styrene	10.58	104	171333	19.86	ppb		96
78)	1,3-Dichloropropane	8.95	76	81598	19.38	ppb		98
79)	Dibromochloromethane	9.19	129	69941	19.83	ppb		96
80)	Chlorobenzene	9.87	112	162573	18.64	ppb		97
81)	Ethylbenzene	10.01	91	253384	18.93	ppb		96
82)	Bromoform	10.76	173	58223	19.79	ppb		92
84)	Isopropylbenzene	10.99	105	260021	18.65	ppb		99
85)	1,1,2,2-Tetrachloroethane	11.29	83	56857	19.04	ppb		94
86)	1,2,3-Trichloropropane	11.33	110	25563	18.66	ppb	#	81
87)	t-1,4-Dichloro-2-Butene	11.35	53	11157	19.73	ppb	#	78
88)	Bromobenzene	11.29	77	125380	18.63	ppb		98
89)	n-Propylbenzene	11.43	91	290148	18.95	ppb		99
90)	4-Ethyltoluene	11.56	105	256082	19.20	ppb		98
91)	2-Chlorotoluene	11.51	91	212827	18.92	ppb		99
92)	1,3,5-Trimethylbenzene	11.63	105	240194	19.70	ppb		98
93)	4-Chlorotoluene	11.63	91	223842	19.40	ppb		99
94)	Tert-Butylbenzene	11.98	119	238952	19.48	ppb		95
95)	1,2,4-Trimethylbenzene	12.04	105	241344	19.11	ppb		99
96)	Sec-Butylbenzene	12.22	105	275837	19.22	ppb		100
97)	p-Isopropyltoluene	12.39	119	259030	19.55	ppb		99
98)	Benzyl Chloride	12.57	91	73580	19.02	ppb		96
99)	1,3-DCB	12.32	146	166458	19.04	ppb		99
100)	1,4-DCB	12.42	146	168669	20.22	ppb		97
101)	n-Butylbenzene	12.83	91	187295	18.05	ppb		97
102)	1,2-DCB	12.82	146	164813	18.68	ppb		98
103)	Hexachloroethane	13.12	201	50541	20.22	ppb		96
104)	1,2-Dibromo-3-chloropropan	13.66	157	19904	21.22	ppb		97
105)	1,2,4-Trichlorobenzene	14.59	180	128376	19.40	ppb		98
106)	Hexachlorobutadiene	14.79	225	65392	19.26	ppb		94
107)	Naphthalene	14.85	127	31495	19.32	ppb		99
108)	1,2,3-Trichlorobenzene	15.12	180	128238	19.81	ppb		100

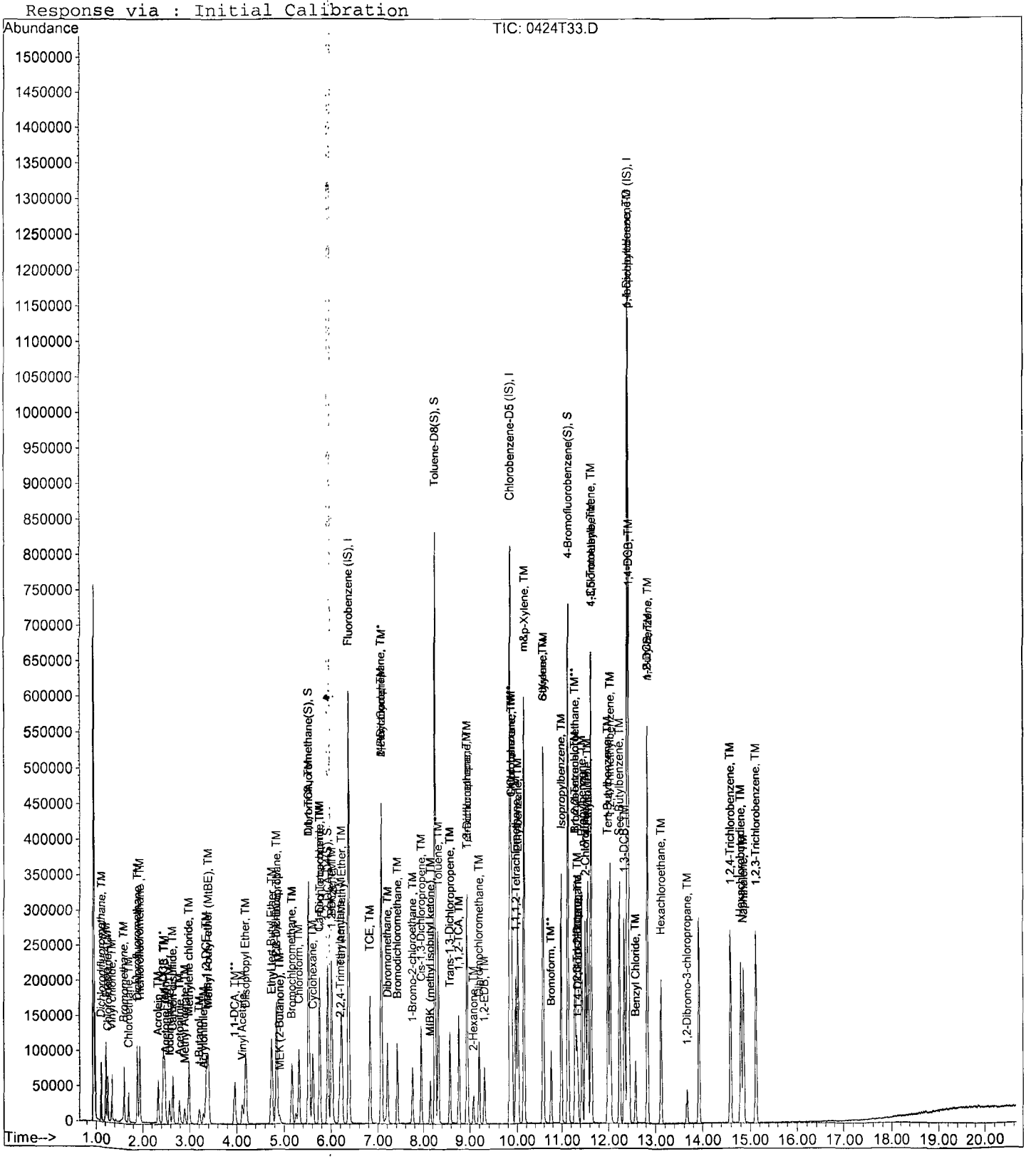
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T33.D Vial: 8
Acq On : 24 Apr 20 17:18 Operator:
Sample : 20ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T34.D Vial: 9
Acq On : 24 Apr 20 17:46 Operator:
Sample : 40ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	607670	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	542766	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	351135	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	168193	25.02	ppb		0.00
Spiked Amount 25.000			Recovery = 100.084%				
48) 1,2-DCA-D4(S)	5.93	65	182478	25.08	ppb		0.00
Spiked Amount 25.000			Recovery = 100.332%				
69) Toluene-D8(S)	8.25	98	608300	24.97	ppb		0.00
Spiked Amount 25.000			Recovery = 99.868%				
77) 4-Bromofluorobenzene(S)	11.13	95	246989	24.87	ppb		0.00
Spiked Amount 25.000			Recovery = 99.460%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	92240	40.20	ppb		98
4) Freon 114	1.22	85	63141	40.36	ppb		98
5) Chloromethane	1.25	50	71184	39.89	ppb		100
6) Vinyl chloride	1.34	62	78560	40.29	ppb		100
9) Bromomethane	1.60	94	61332	34.90	ppb		100
10) Chloroethane	1.70	66	13026	40.57	ppb		79
11) Dichlorofluoromethane	1.89	67	156345	37.61	ppb		98
12) Trichlorofluoromethane	1.94	101	156782	38.90	ppb		98
16) Acrolein	2.33	56	36544	195.63	ppb		95
17) Acetone	2.50	43	14040	40.14	ppb	#	81
18) Freon-113	2.47	101	75050	37.83	ppb		96
19) 1,1-DCE	2.44	61	112148	36.60	ppb		97
21) Acetonitrile	2.78	40	12039	197.29	ppb		92
22) t-Butanol	3.21	59	38095	200.33	ppb	#	86
23) Methyl Acetate	2.89	43	53446	39.45	ppb		96
24) Iodomethane	2.58	142	100438	41.73	ppb		97
25) Acrylonitrile	3.30	52	23532	37.06	ppb		96
26) Methylene chloride	2.98	49	95187	40.18	ppb		93
27) Carbon disulfide	2.64	76	181892	39.88	ppb		99
28) Methyl t-butyl ether (MtBE	3.40	73	258901	39.03	ppb		97
29) Trans-1,2-DCE	3.35	61	106046	37.79	ppb		98
31) Diisopropyl Ether	4.19	45	220552	38.81	ppb		97
33) 1,1-DCA	3.96	63	143334	38.72	ppb		97
34) Vinyl Acetate	4.12	43	102904	35.99	ppb		99
35) Ethyl tert Butyl Ether	4.74	59	255984	38.72	ppb		98
36) MEK (2-Butanone)	4.90	43	31390	37.71	ppb	#	89
37) Cis-1,2-DCE	4.84	61	139467	37.63	ppb		93
38) 2,2-Dichloropropane	4.84	77	140335	37.92	ppb		98
41) Chloroform	5.31	83	189447	38.20	ppb		98
42) Bromochloromethane	5.16	49	65953	37.67	ppb		96
44) 1,1,1-TCA	5.53	97	172846	38.83	ppb		98
45) Cyclohexane	5.61	56	100302	37.67	ppb		98
46) 1,1-Dichloropropene	5.76	75	115180	36.26	ppb		97
47) 2,2,4-Trimethylpentane	6.19	57	187389	37.29	ppb		98
49) Carbon Tetrachloride	5.76	117	158744	40.14	ppb		96
50) Tert Amyl Methyl Ether	6.23	73	273435	39.10	ppb		96
52) 1,2-DCA	6.03	62	152026	35.96	ppb		96
53) Benzene	6.01	78	361749	37.12	ppb		99
54) TCE	6.83	130	143988	38.59	ppb		96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T34.D Vial: 9
Acq On : 24 Apr 20 17:46 Operator:
Sample : 40ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	293211	203.36	ppb		99
56)	1,2-Dichloropropane	7.08	63	89020	37.05	ppb		97
57)	Bromodichloromethane	7.42	83	151604	38.80	ppb		97
58)	Methyl Cyclohexane	7.07	83	123933	38.34	ppb		96
59)	Dibromomethane	7.21	174	112256	38.79	ppb		94
60)	MIBK (methyl isobutyl ket	8.14	43	73456	35.89	ppb	#	85
61)	1-Bromo-2-chloroethane	7.75	63	64440	37.62	ppb		99
63)	Cis-1,3-Dichloropropene	7.95	75	160333	38.92	ppb		96
64)	Toluene	8.32	91	449462	38.10	ppb		100
65)	Trans-1,3-Dichloropropene	8.58	75	149978	38.92	ppb		99
66)	1,1,2-TCA	8.77	97	107159	38.89	ppb		96
67)	2-Hexanone	9.07	43	51982	41.68	ppb		92
70)	1,2-EDB	9.31	107	116611	40.71	ppb		99
71)	Tetrachloroethene	8.94	166	158206	36.18	ppb		98
72)	1-Chlorohexane	9.88	91	121975	37.88	ppb		94
73)	1,1,1,2-Tetrachloroethane	9.96	131	142997	40.47	ppb		100
74)	m&p-Xylene	10.14	91	816328	78.05	ppb		100
75)	o-Xylene	10.57	91	441853	39.09	ppb		96
76)	Styrene	10.58	104	364762	41.34	ppb		100
78)	1,3-Dichloropropane	8.95	76	166969	38.77	ppb		91
79)	Dibromochloromethane	9.19	129	146862	40.70	ppb		98
80)	Chlorobenzene	9.87	112	337817	37.86	ppb		98
81)	Ethylbenzene	10.01	91	520880	38.04	ppb		97
82)	Bromoform	10.76	173	122732	40.79	ppb		91
84)	Isopropylbenzene	10.99	105	545644	38.28	ppb		99
85)	1,1,2,2-Tetrachloroethane	11.29	83	108456	35.52	ppb		91
86)	1,2,3-Trichloropropane	11.33	110	50942	36.35	ppb	#	83
87)	t-1,4-Dichloro-2-Butene	11.35	53	23571	40.76	ppb		90
88)	Bromobenzene	11.29	77	254160	36.94	ppb		99
89)	n-Propylbenzene	11.43	91	596088	38.07	ppb		100
90)	4-Ethyltoluene	11.56	105	540877	39.66	ppb		98
91)	2-Chlorotoluene	11.51	91	431033	37.48	ppb		99
92)	1,3,5-Trimethylbenzene	11.63	105	488439	39.17	ppb		98
93)	4-Chlorotoluene	11.63	91	454645	38.52	ppb		100
94)	Tert-Butylbenzene	11.98	119	495564	39.51	ppb		99
95)	1,2,4-Trimethylbenzene	12.03	105	508621	39.38	ppb		98
96)	Sec-Butylbenzene	12.22	105	579228	39.47	ppb		98
97)	p-Isopropyltoluene	12.39	119	537788	39.69	ppb		100
98)	Benzyl Chloride	12.57	91	160809	40.65	ppb		96
99)	1,3-DCB	12.32	146	328535	36.75	ppb		97
100)	1,4-DCB	12.42	146	341835	40.41	ppb		99
101)	n-Butylbenzene	12.83	91	405228	38.19	ppb		98
102)	1,2-DCB	12.82	146	331436	36.73	ppb		96
103)	Hexachloroethane	13.12	201	104808	41.01	ppb		94
104)	1,2-Dibromo-3-chloropropan	13.66	157	41758	43.53	ppb		97
105)	1,2,4-Trichlorobenzene	14.59	180	264581	38.82	ppb		100
106)	Hexachlorobutadiene	14.80	225	131420	37.86	ppb		98
107)	Naphthalene	14.85	127	64890	38.44	ppb		80
108)	1,2,3-Trichlorobenzene	15.12	180	262774	39.57	ppb		100

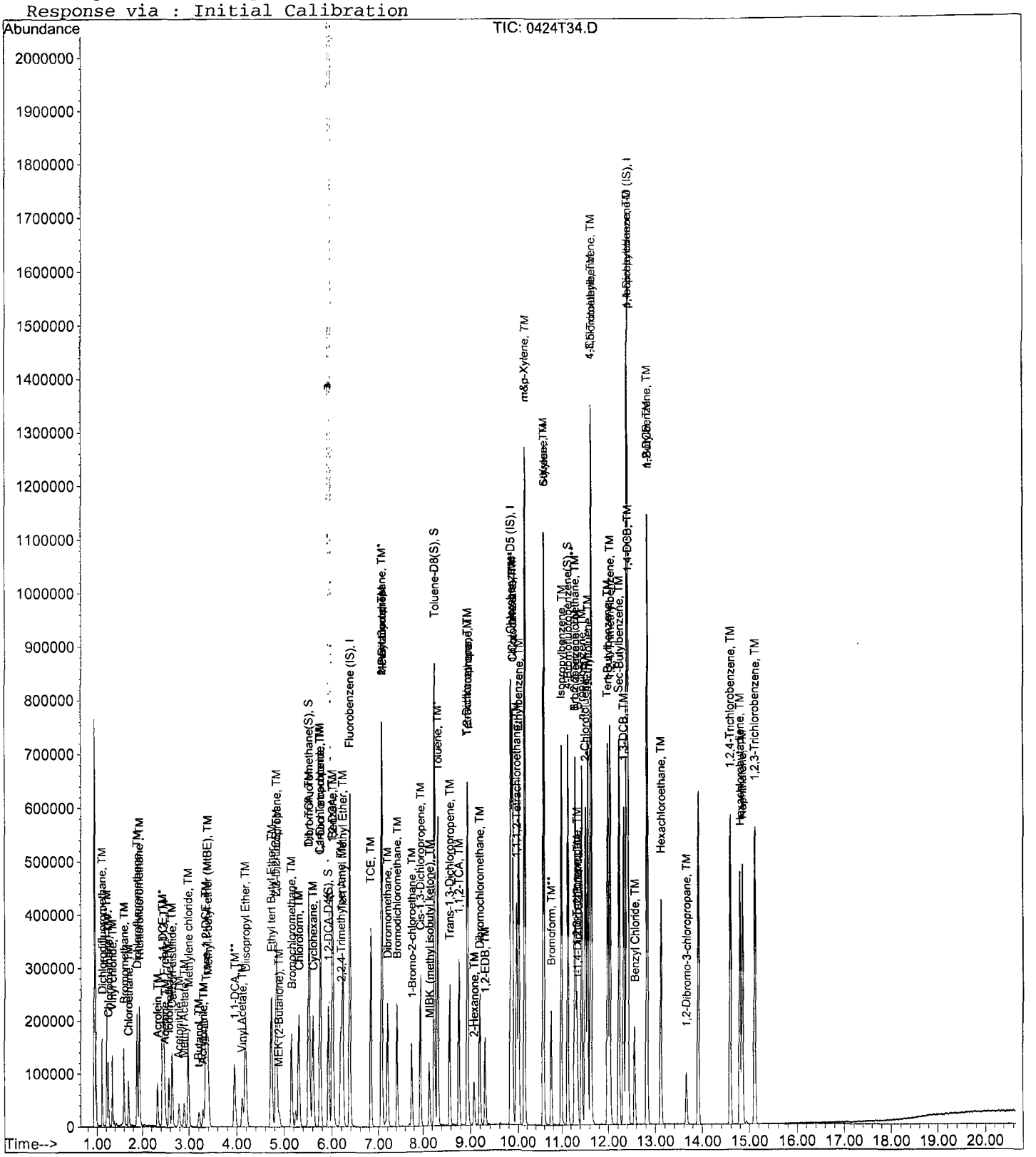
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T34.D Vial: 9
Acq On : 24 Apr 20 17:46 Operator:
Sample : 40ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration


Abundance
TIC: 0424T34.D
Time-->
Fluorobenzene (IS), I
Toluene-D8(S), S
Chlorobenzene-D5 (IS), I
4-Bromofluorobenzene(S), S
1,4-DCB-D4 (IS), I
Toluene, TM
Ethylbenzene, TM
m&p-Xylene, TM
o-Xylene, TM
Isopropylbenzene, TM
Bromobenzene, TM
n-Propylbenzene, TM
2-Chlorotoluene, TM
4-Chlorotoluene, TM
1,3,5-Trimethylbenzene, TM
Tert-Butylbenzene, TM
1,2,4-Trimethylbenzene, TM
Sec-Butylbenzene, TM
1,3-DCB, TM
1,4-DCB, TM
p-Isopropyltoluene, TM
1,2-DCB, TM
n-Butylbenzene, TM
1,2-Dichlorobenzene-D4(S), S
1,2-DCB-D4, TM
1,2-Dibromo-3-chloropropane, TM
Hexachloroethane, TM
1,2,4-Trichlorobenzene, TM
1,2,3-Trichlorobenzene, TM
Benzyl Chloride, TM
1,2-DCA-D4(S), S
Dibromofluoromethane(S), S
Dibromofluoromethane, TM
Bromochloromethane, TM
Chloroform, TM
Cyclohexane, TM
2,2,4-Trimethylpentane, TM
Methyl Acetate, TM
Methylene chloride, TM
Methyl tert Butyl Ether (MtBE), TM
Trans-1,2-DCE, TM
1,1-DCA, TM**
Vinyl Acetate, TM
Diisopropyl Ether, TM
Ethyl tert Butyl Ether, TM
MEK (2-Butanone), TM
Bromochloromethane, TM
Chloroform, TM
Cyclohexane, TM
1,2-DCA-D4(S), S

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T35.D Vial: 10
Acq On : 24 Apr 20 18:14 Operator:
Sample : 100ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	610400	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	542481	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	368942	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	168030	24.88	ppb		0.00
Spiked Amount 25.000			Recovery = 99.540%				
48) 1,2-DCA-D4(S)	5.93	65	180754	24.74	ppb		0.00
Spiked Amount 25.000			Recovery = 98.940%				
69) Toluene-D8(S)	8.25	98	607029	24.93	ppb		0.00
Spiked Amount 25.000			Recovery = 99.712%				
77) 4-Bromofluorobenzene(S)	11.13	95	254493	25.63	ppb		0.00
Spiked Amount 25.000			Recovery = 102.536%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	224128	97.77	ppb		96
4) Freon 114	1.22	85	157763	100.64	ppb		97
5) Chloromethane	1.25	50	164028	92.82	ppb		98
6) Vinyl chloride	1.34	62	194368	99.95	ppb		98
9) Bromomethane	1.60	94	131543	75.29	ppb		99
10) Chloroethane	1.69	66	30864	96.10	ppb		76
11) Dichlorofluoromethane	1.88	67	400237	95.86	ppb		96
12) Trichlorofluoromethane	1.93	101	376549	93.02	ppb		99
16) Acrolein	2.33	56	34504	185.19	ppb		95
17) Acetone	2.50	43	34163	99.93	ppb	#	87
18) Freon-113	2.47	101	191262	95.97	ppb		94
19) 1,1-DCE	2.43	61	282550	91.79	ppb		96
21) Acetonitrile	2.79	40	12045	196.50	ppb		88
22) t-Butanol	3.22	59	38426	201.16	ppb	#	86
23) Methyl Acetate	2.89	43	135184	100.13	ppb		93
24) Iodomethane	2.58	142	320745	99.87	ppb		99
25) Acrylonitrile	3.30	52	57685	90.43	ppb		95
26) Methylene chloride	2.98	49	230824	97.58	ppb		92
27) Carbon disulfide	2.64	76	460046	100.26	ppb		99
28) Methyl t-butyl ether (MtBE	3.39	73	645199	96.82	ppb		96
29) Trans-1,2-DCE	3.35	61	266814	94.65	ppb		95
31) Diisopropyl Ether	4.19	45	555806	97.36	ppb		99
33) 1,1-DCA	3.96	63	361756	97.29	ppb		97
34) Vinyl Acetate	4.12	43	290717	101.22	ppb		98
35) Ethyl tert Butyl Ether	4.74	59	647278	97.48	ppb		99
36) MEK (2-Butanone)	4.90	43	78157	93.48	ppb		92
37) Cis-1,2-DCE	4.84	61	345579	92.83	ppb		91
38) 2,2-Dichloropropane	4.84	77	357699	96.23	ppb		97
41) Chloroform	5.31	83	473413	95.03	ppb		99
42) Bromochloromethane	5.16	49	165163	93.91	ppb		95
44) 1,1,1-TCA	5.53	97	438109	97.99	ppb		96
45) Cyclohexane	5.61	56	257145	96.14	ppb		97
46) 1,1-Dichloropropene	5.76	75	294263	92.23	ppb		95
47) 2,2,4-Trimethylpentane	6.19	57	478375	94.76	ppb		98
49) Carbon Tetrachloride	5.76	117	408400	102.81	ppb		93
50) Tert Amyl Methyl Ether	6.23	73	685740	97.61	ppb		99
52) 1,2-DCA	6.03	62	381453	89.83	ppb		95
53) Benzene	6.01	78	914679	93.44	ppb		99
54) TCE	6.84	130	361398	96.42	ppb		96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T35.D Vial: 10
Acq On : 24 Apr 20 18:14 Operator:
Sample : 100ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	302111	208.59	ppb		96
56)	1,2-Dichloropropane	7.08	63	225778	93.55	ppb		97
57)	Bromodichloromethane	7.42	83	393129	100.15	ppb		96
58)	Methyl Cyclohexane	7.07	83	318766	98.17	ppb		93
59)	Dibromomethane	7.21	174	280440	96.47	ppb		95
60)	MIBK (methyl isobutyl ket	8.14	43	191376	93.10	ppb	#	86
61)	1-Bromo-2-chloroethane	7.75	63	164480	95.60	ppb		98
63)	Cis-1,3-Dichloropropene	7.95	75	417372	100.87	ppb		97
64)	Toluene	8.32	91	1133092	95.61	ppb		99
65)	Trans-1,3-Dichloropropene	8.58	75	388611	100.40	ppb		99
66)	1,1,2-TCA	8.77	97	262346	94.78	ppb		97
67)	2-Hexanone	9.08	43	131079	104.64	ppb		95
70)	1,2-EDB	9.31	107	289520	101.14	ppb		99
71)	Tetrachloroethene	8.94	166	393258	89.98	ppb		99
72)	1-Chlorohexane	9.88	91	319175	99.17	ppb		93
73)	1,1,1,2-Tetrachloroethane	9.97	131	361438	102.35	ppb		98
74)	m&p-Xylene	10.14	91	2111997	202.03	ppb		99
75)	o-Xylene	10.57	91	1120536	99.18	ppb		96
76)	Styrene	10.58	104	945232	107.17	ppb		97
78)	1,3-Dichloropropane	8.95	76	413256	96.00	ppb		98
79)	Dibromochloromethane	9.19	129	374884	103.96	ppb		96
80)	Chlorobenzene	9.87	112	850840	95.42	ppb		98
81)	Ethylbenzene	10.01	91	1339219	97.86	ppb		98
82)	Bromoform	10.76	173	319803	106.34	ppb		93
84)	Isopropylbenzene	10.99	105	1417818	94.67	ppb		99
85)	1,1,2,2-Tetrachloroethane	11.29	83	291235	90.78	ppb		91
86)	1,2,3-Trichloropropane	11.33	110	129756	88.13	ppb		89
87)	t-1,4-Dichloro-2-Butene	11.35	53	65748	108.22	ppb		86
88)	Bromobenzene	11.29	77	648753	89.74	ppb		99
89)	n-Propylbenzene	11.44	91	1566498	95.22	ppb		98
90)	4-Ethyltoluene	11.56	105	1410894	98.46	ppb		98
91)	2-Chlorotoluene	11.51	91	1116780	92.41	ppb		98
92)	1,3,5-Trimethylbenzene	11.63	105	1283195	97.95	ppb		100
93)	4-Chlorotoluene	11.63	91	1164970	93.95	ppb		98
94)	Tert-Butylbenzene	11.98	119	1283452	97.38	ppb		98
95)	1,2,4-Trimethylbenzene	12.04	105	1334964	98.37	ppb		99
96)	Sec-Butylbenzene	12.22	105	1520223	98.59	ppb		98
97)	p-Isopropyltoluene	12.39	119	1431269	100.54	ppb		97
98)	Benzyl Chloride	12.57	91	462393	111.24	ppb		97
99)	1,3-DCB	12.32	146	860826	91.64	ppb		98
100)	1,4-DCB	12.42	146	882946	99.82	ppb		99
101)	n-Butylbenzene	12.83	91	1098826	98.57	ppb		98
102)	1,2-DCB	12.82	146	875502	92.35	ppb		98
103)	Hexachloroethane	13.12	201	283253	105.48	ppb		91
104)	1,2-Dibromo-3-chloropropan	13.66	157	115212	114.31	ppb		97
105)	1,2,4-Trichlorobenzene	14.59	180	723741	100.61	ppb		99
106)	Hexachlorobutadiene	14.79	225	353227	96.84	ppb		99
107)	Naphthalene	14.85	127	180127	100.79	ppb		79
108)	1,2,3-Trichlorobenzene	15.12	180	700755	100.23	ppb		99

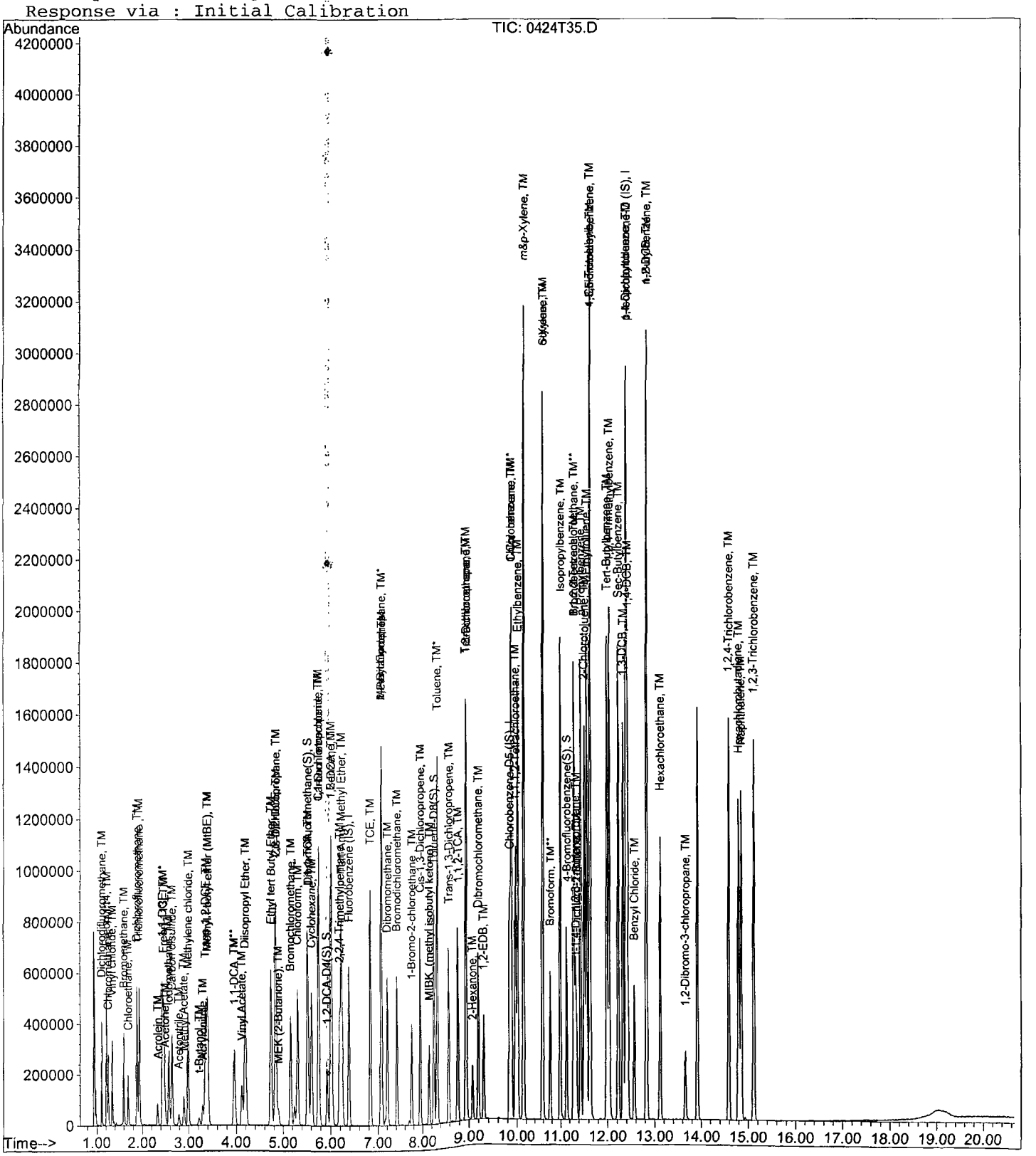
(#) = qualifier out of range (m) = manual integration

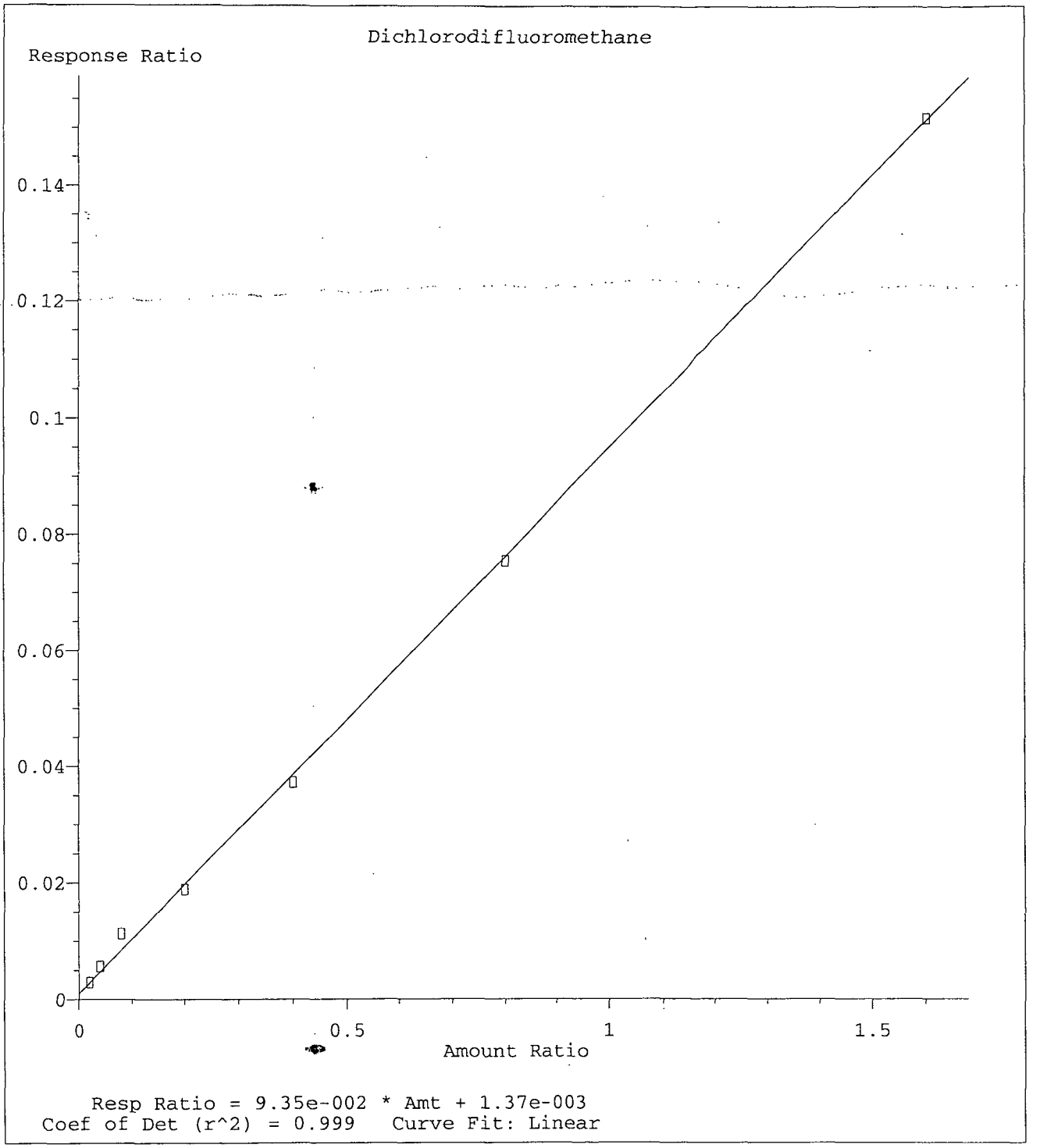
Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T35.D Vial: 10
Acq On : 24 Apr 20 18:14 Operator:
Sample : 100ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

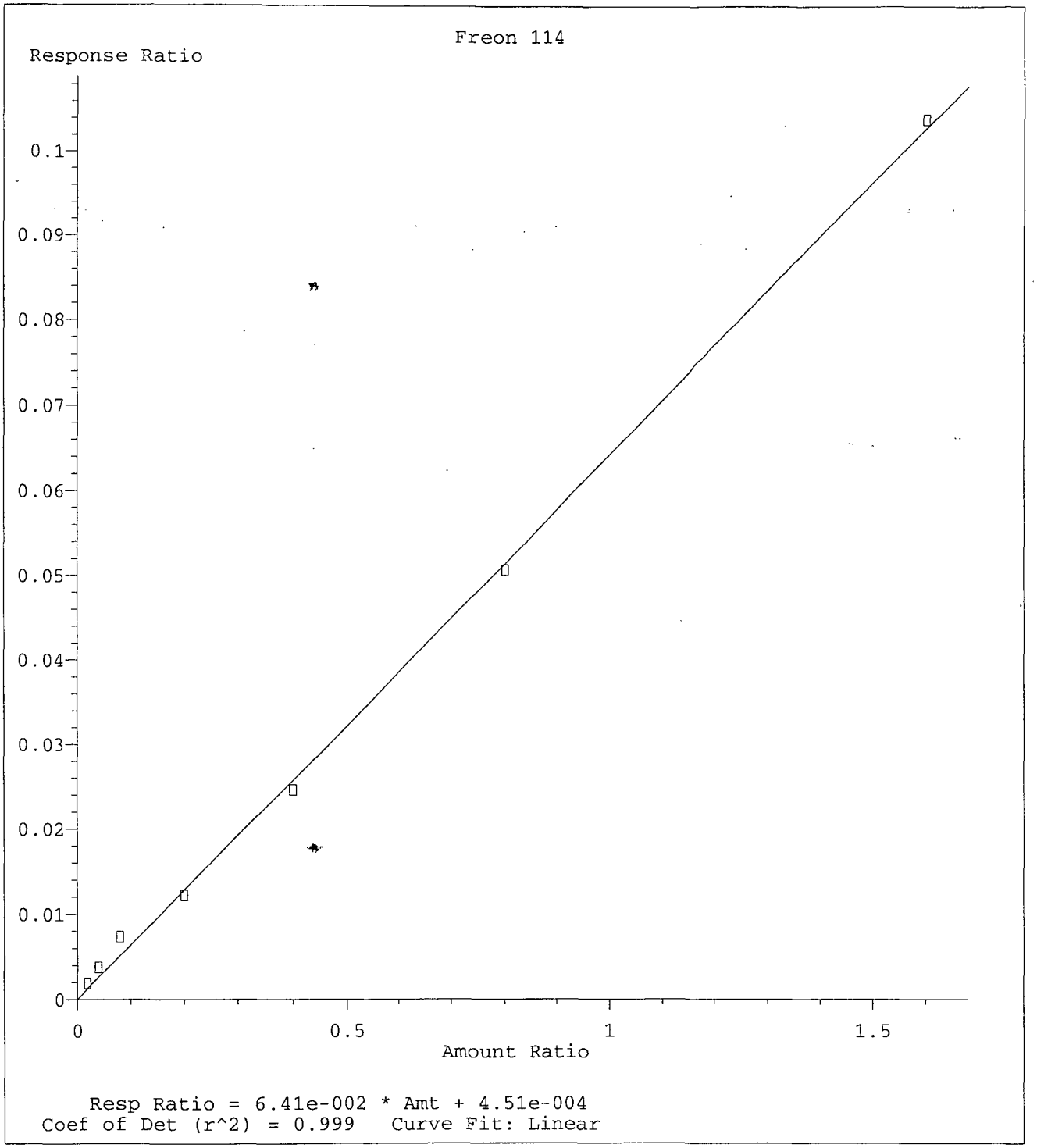
Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration

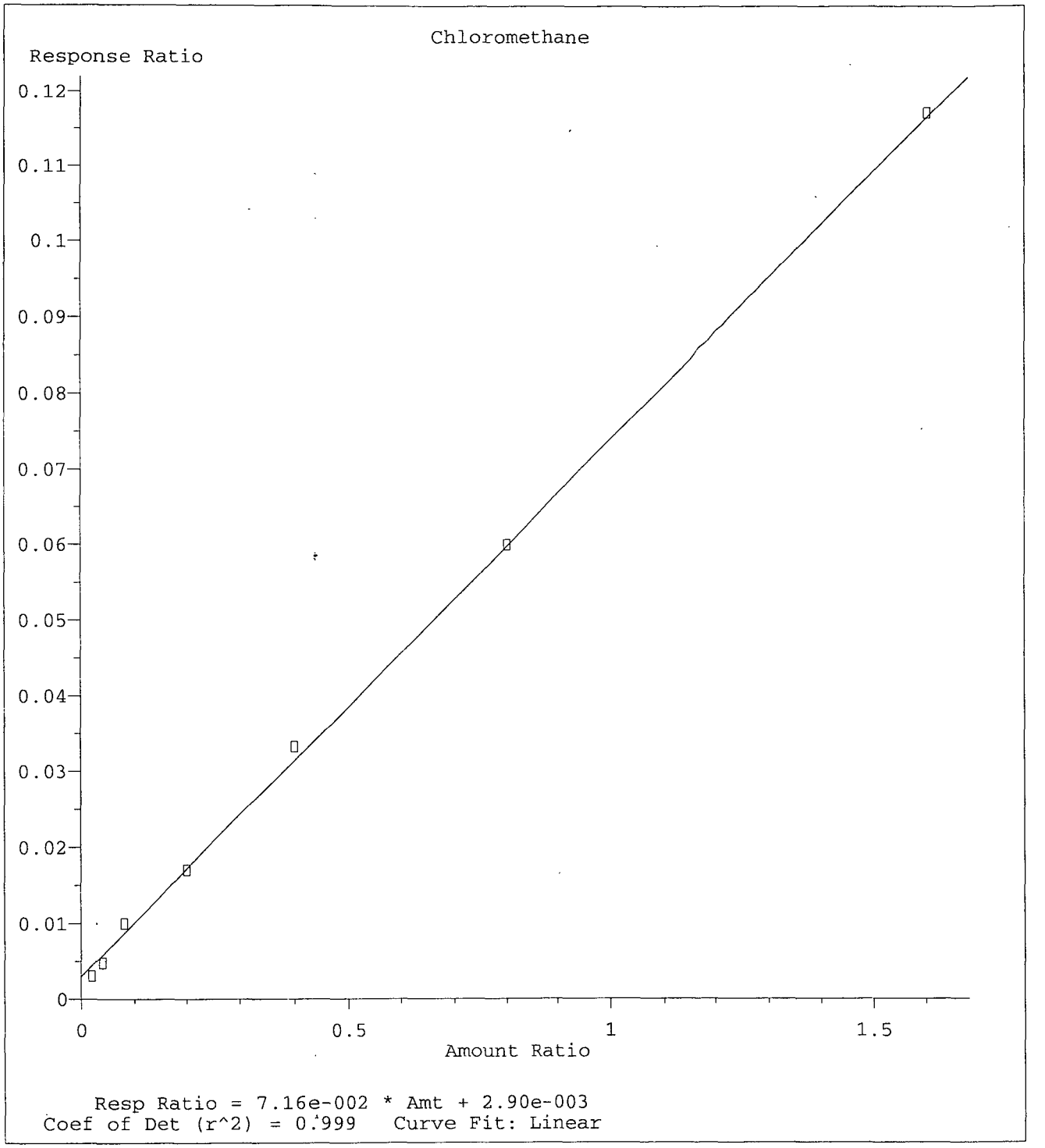




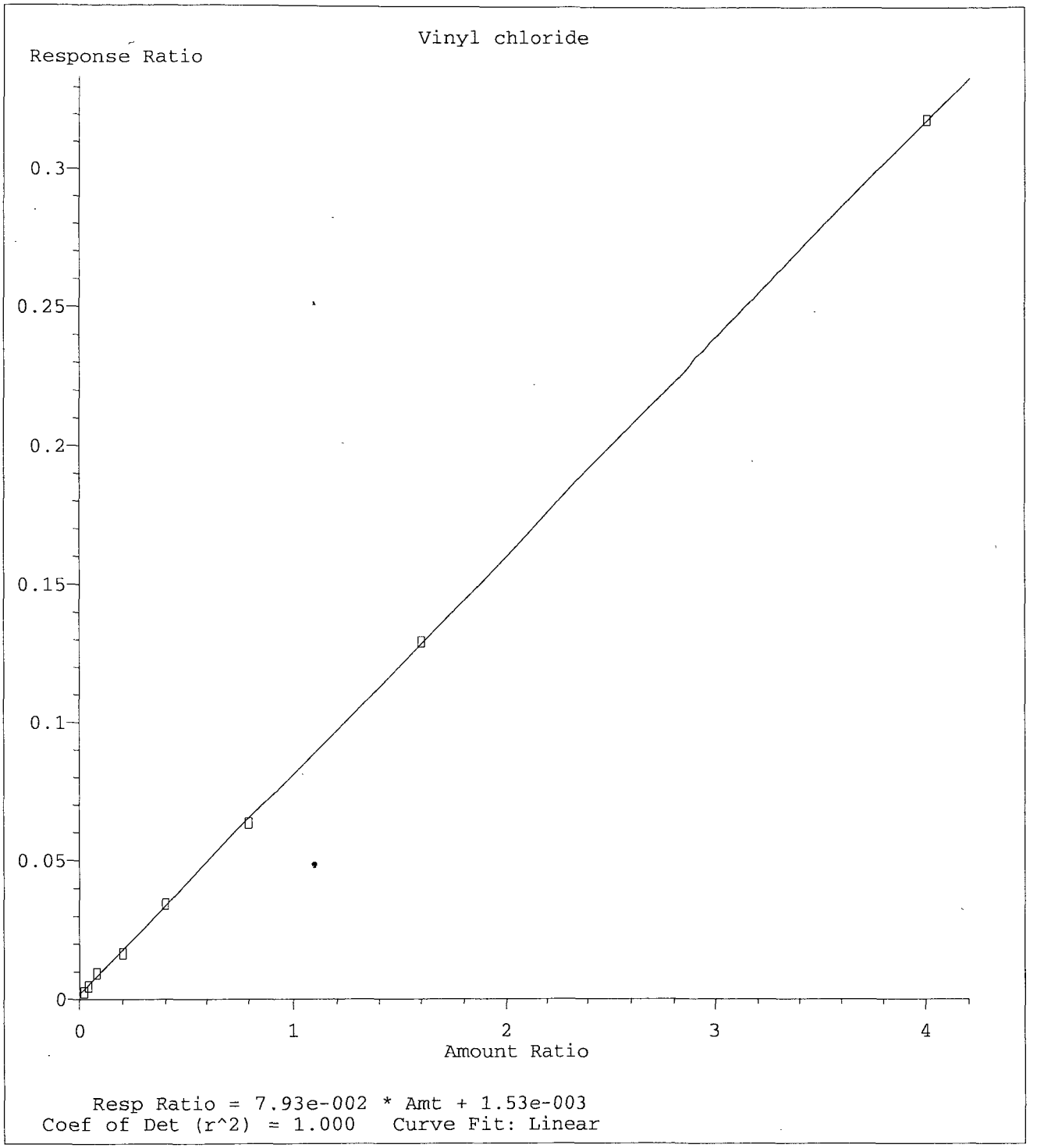
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



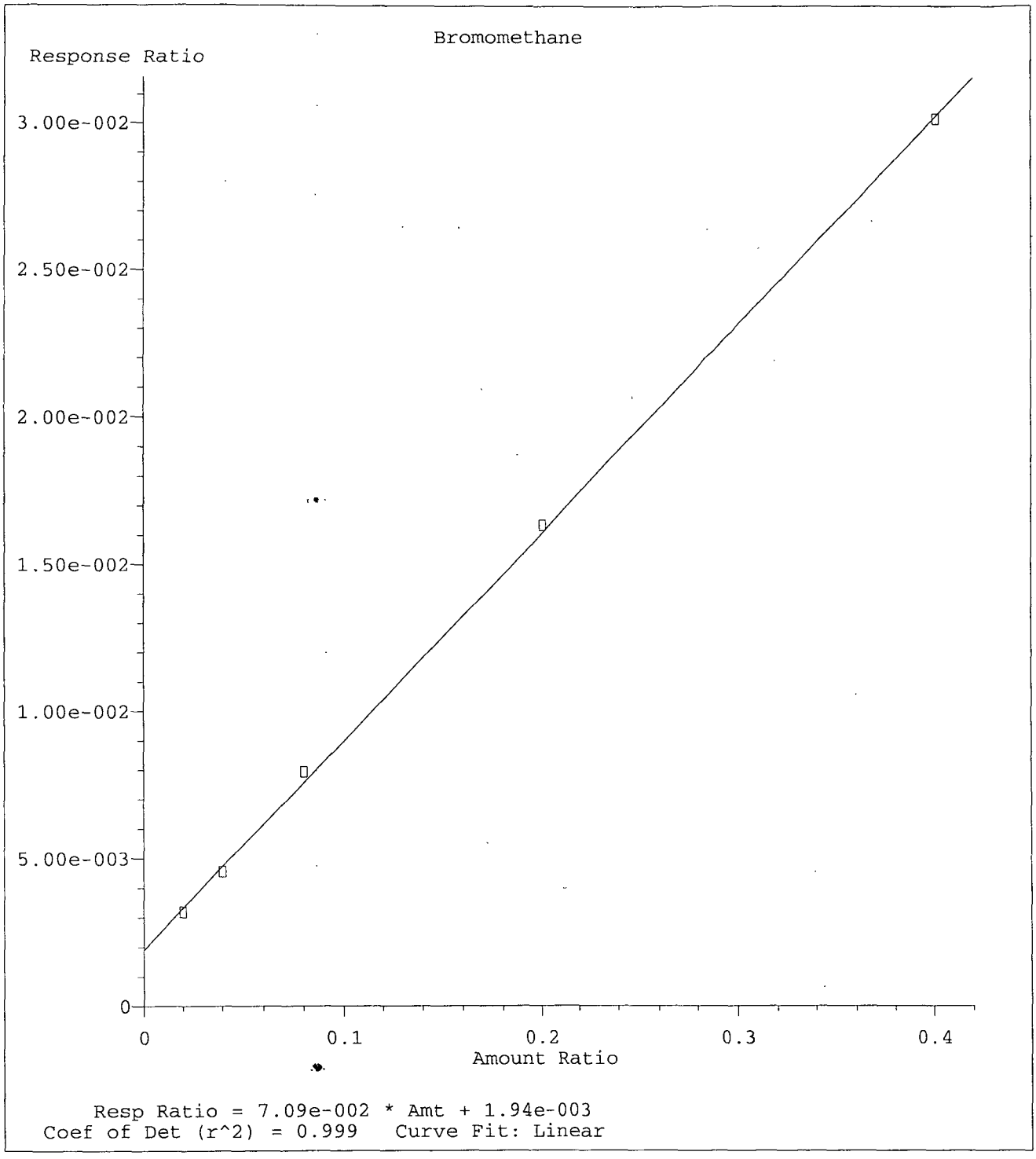
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



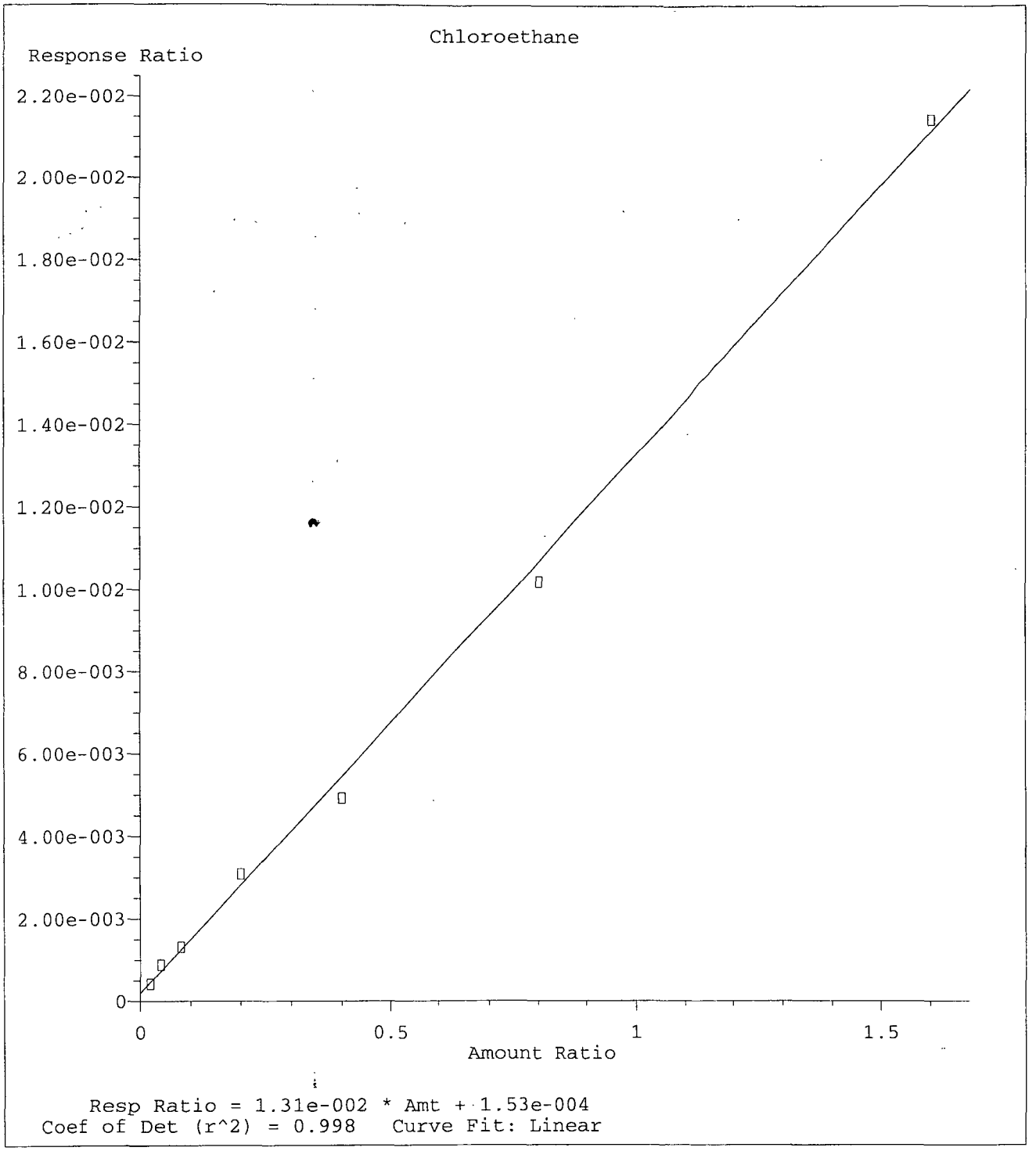
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



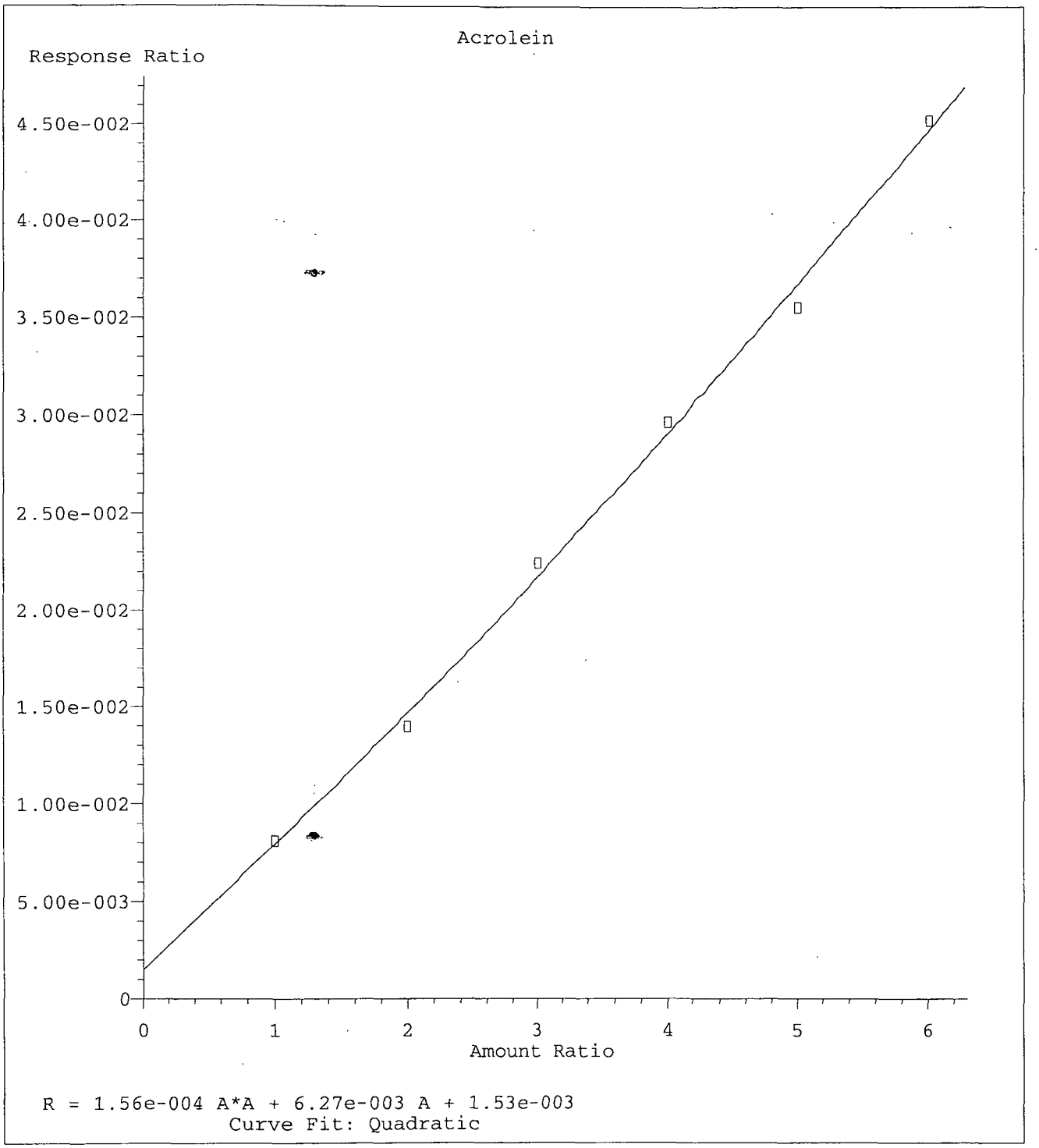
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



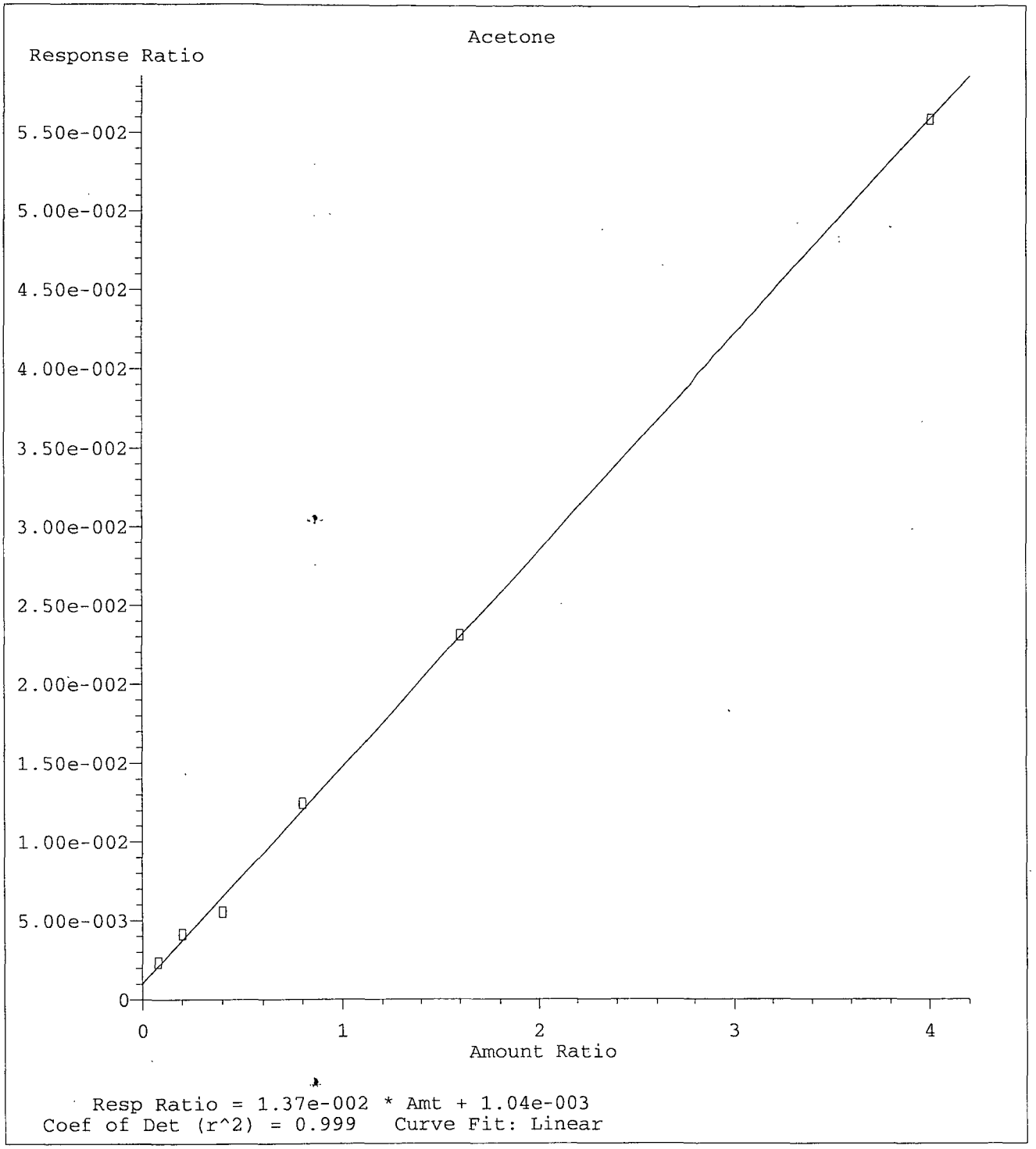
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



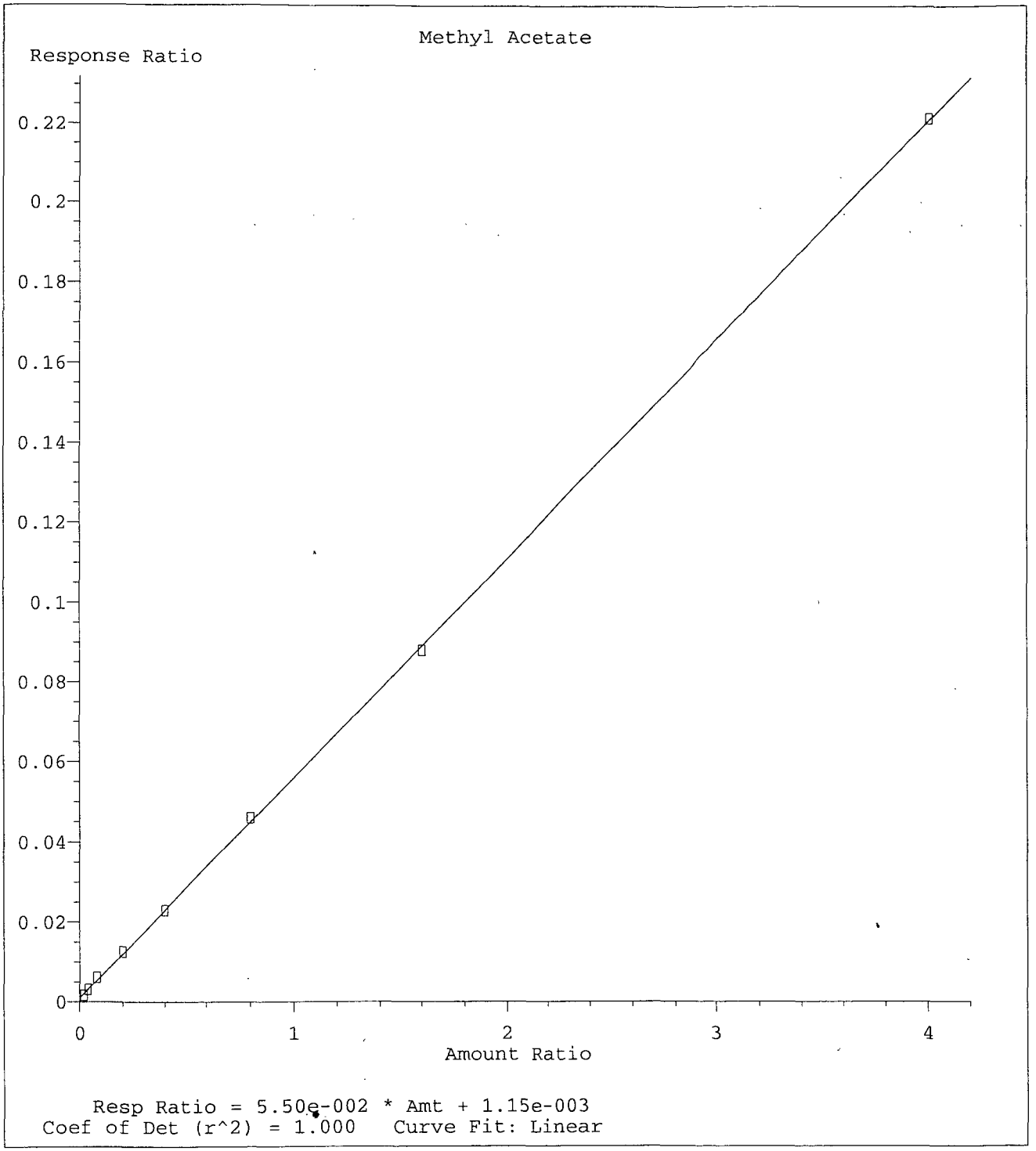
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



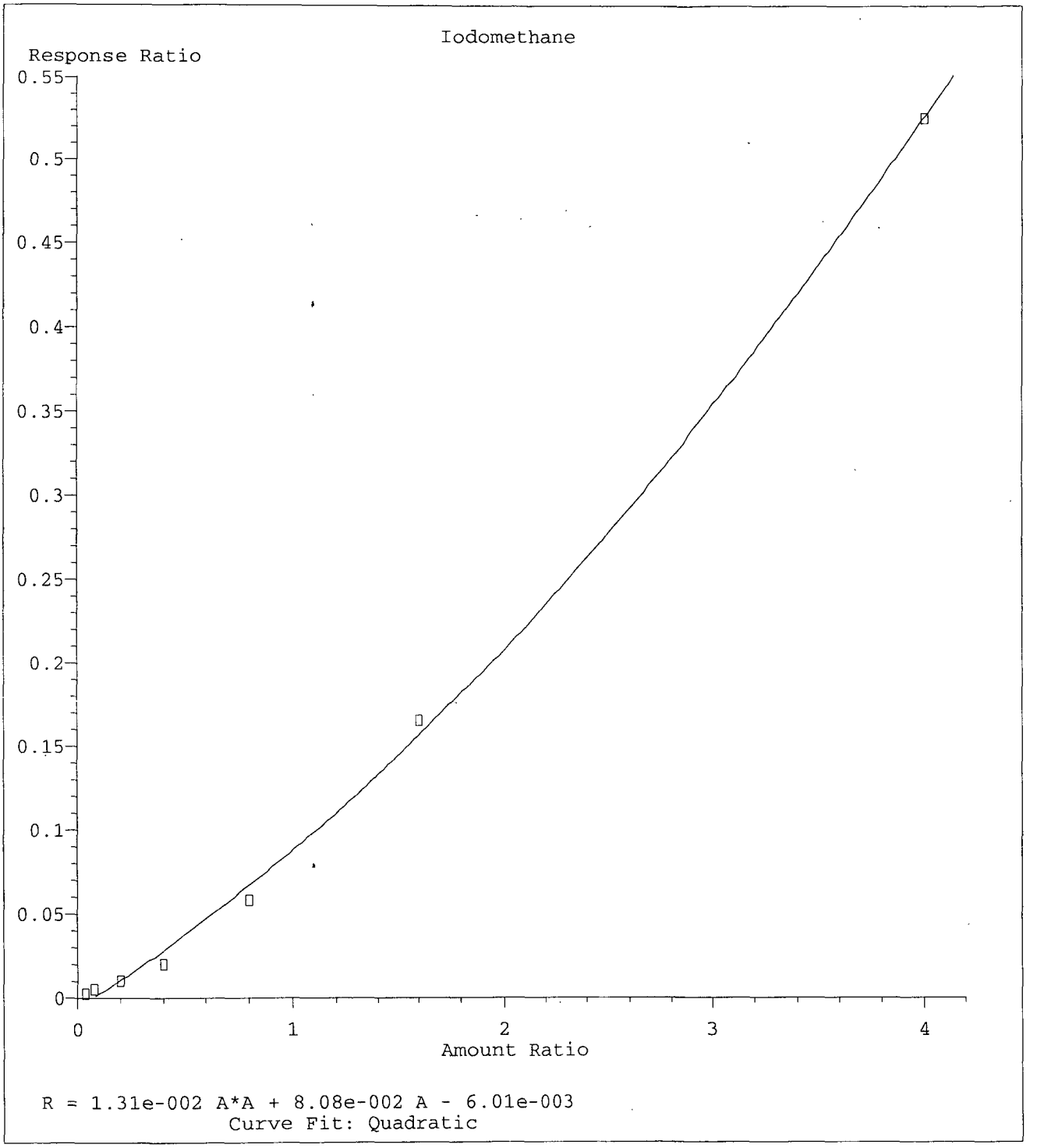
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



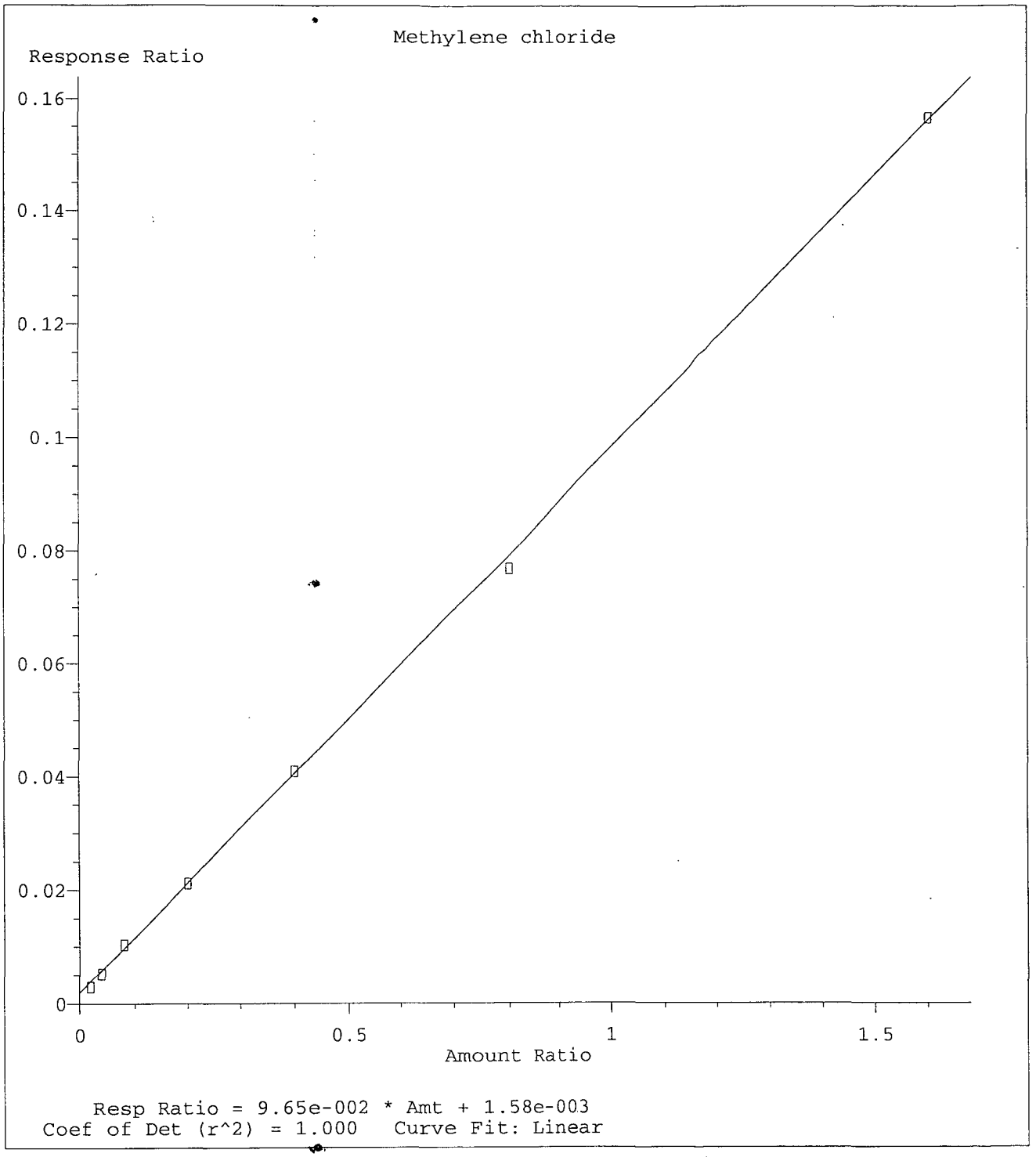
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



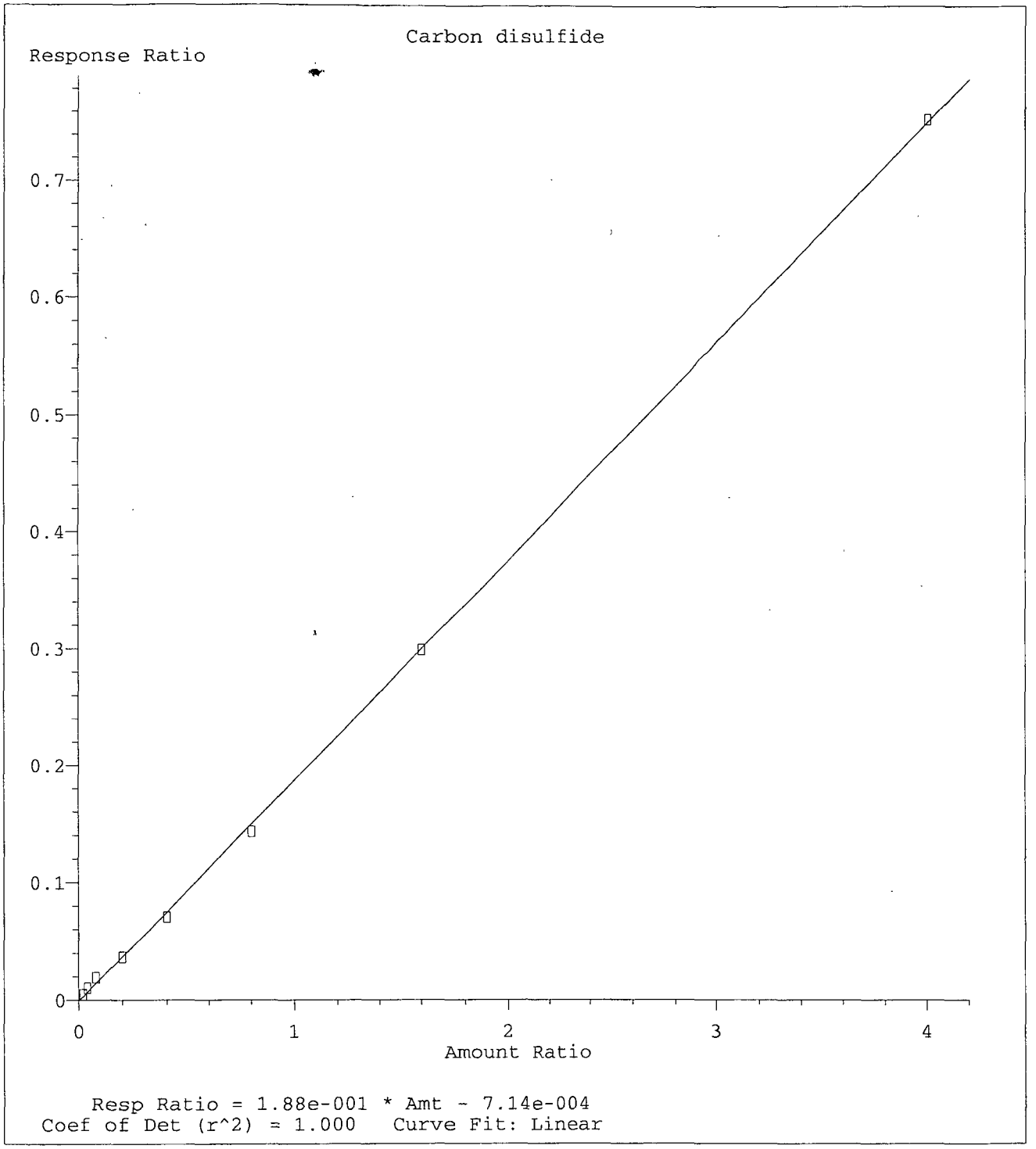
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



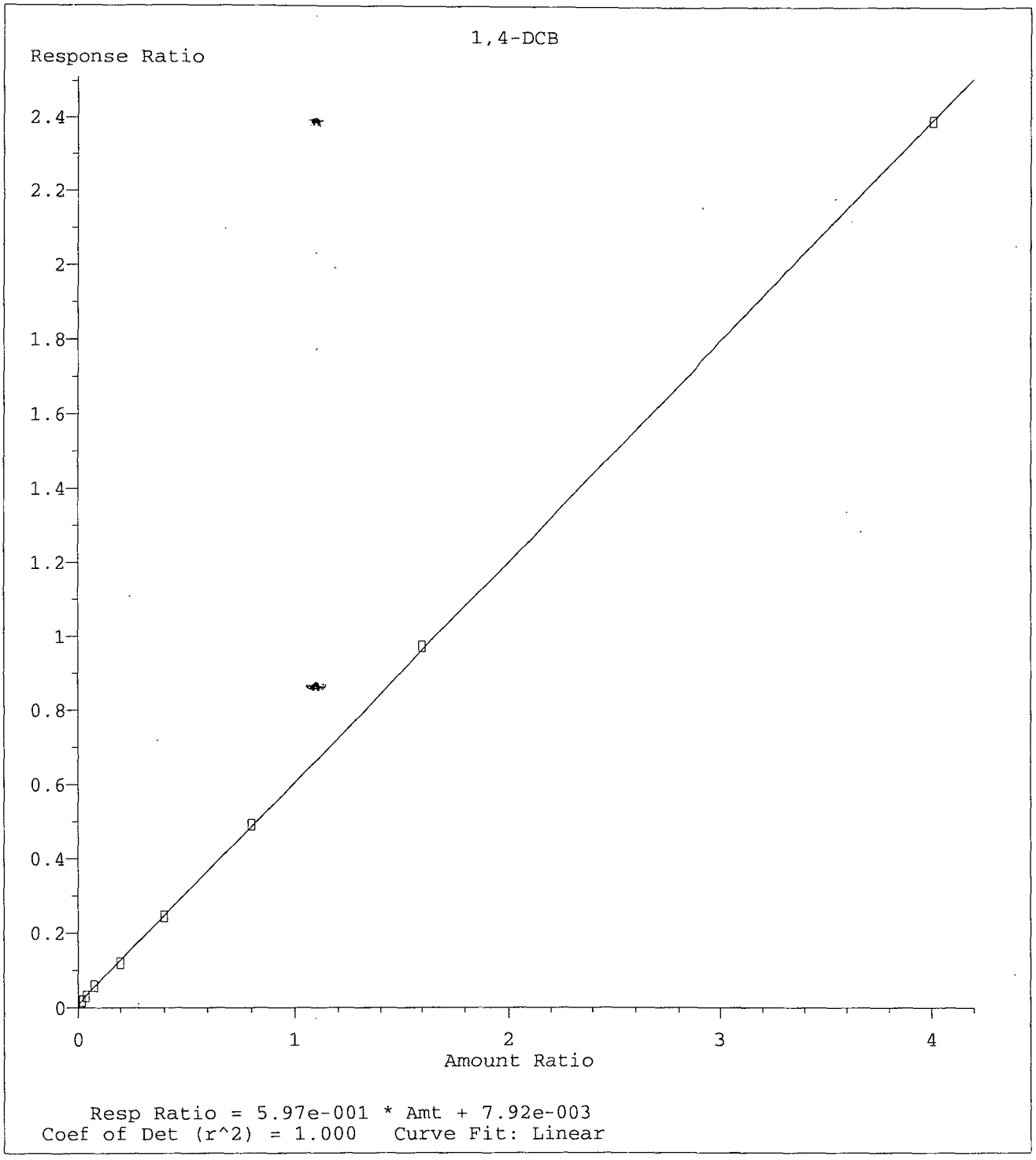
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



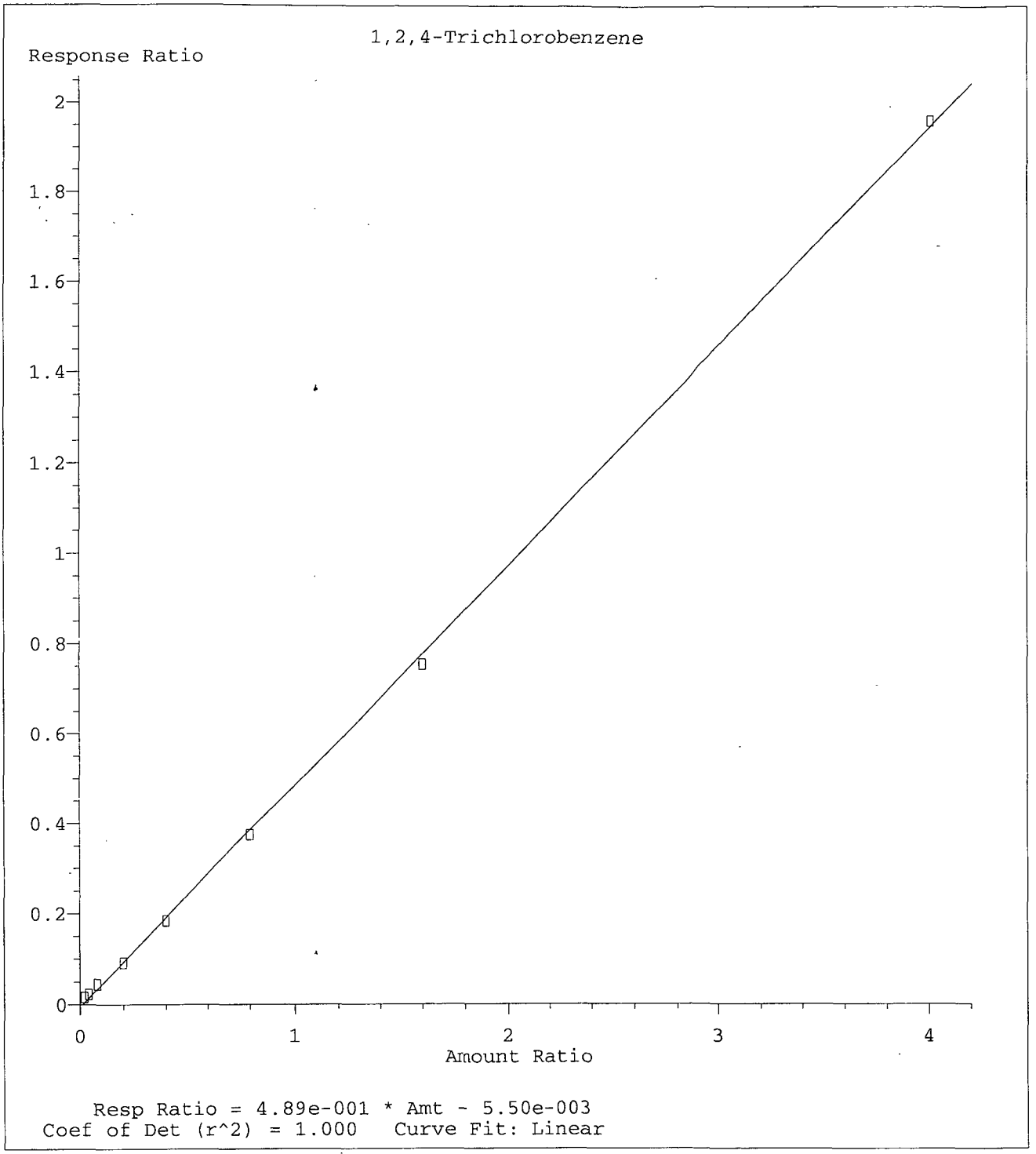
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



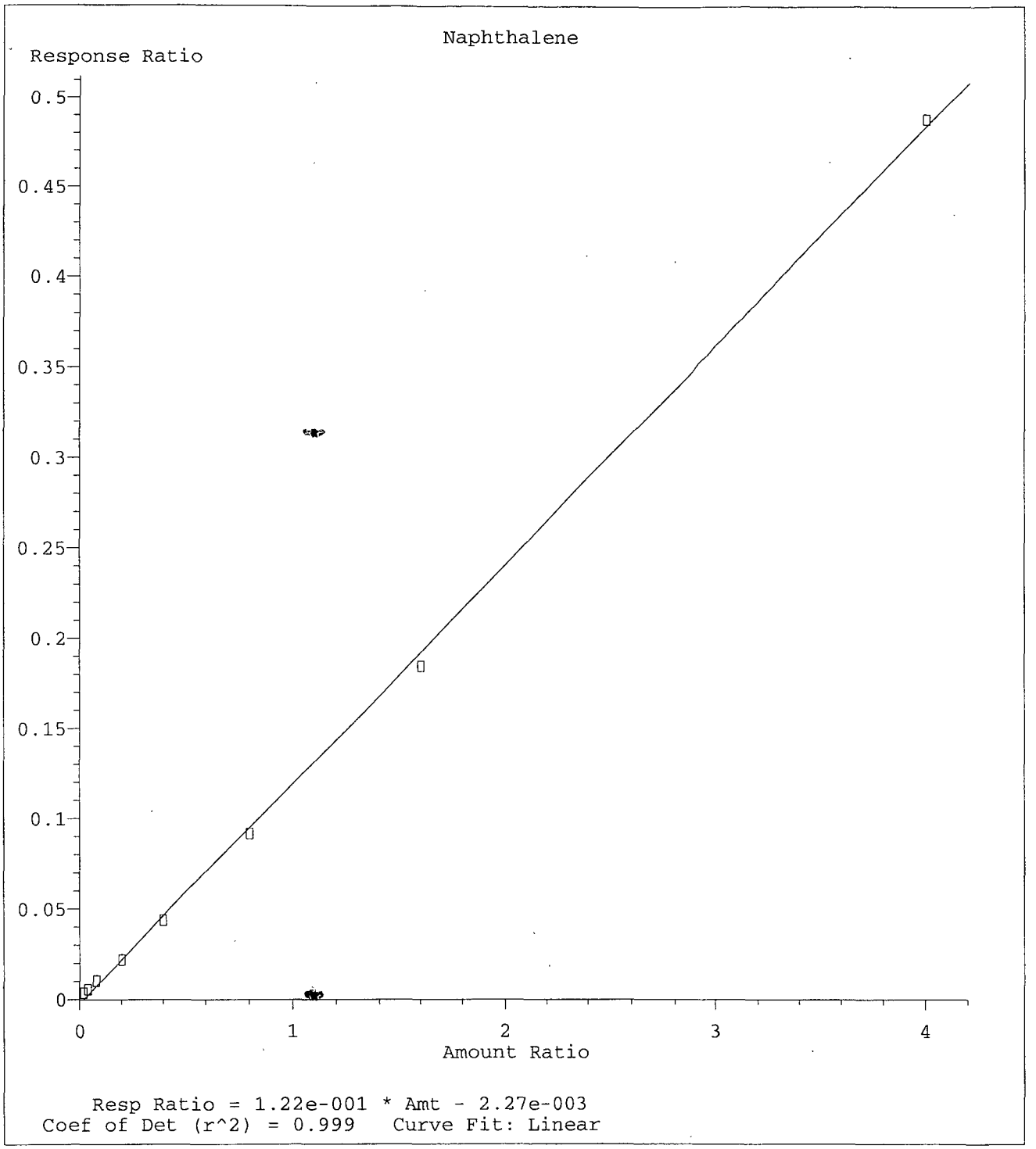
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



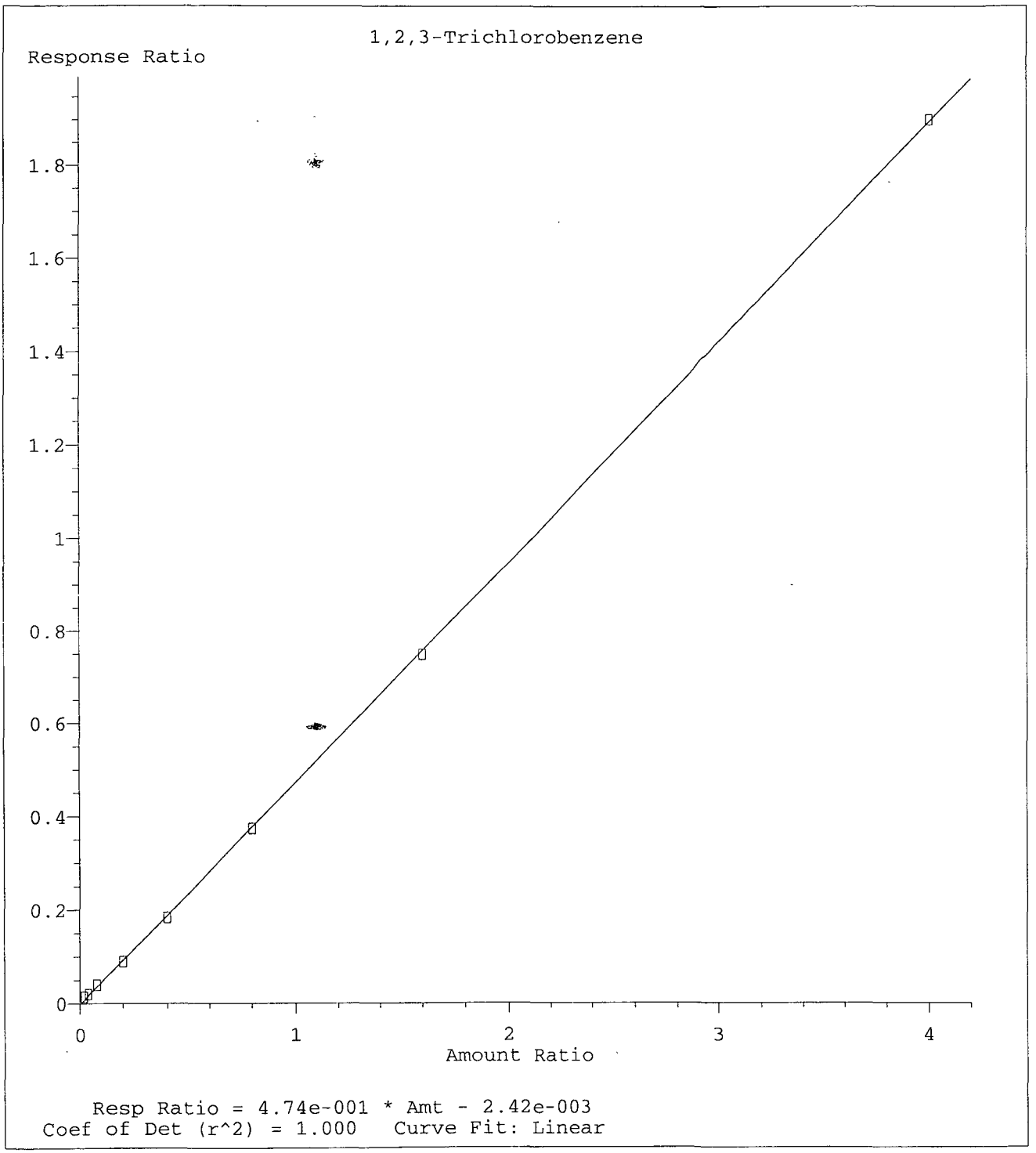
Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020



Method Name: M:\THOR\DATA\T200424\T0424W.M
Calibration Table Last Updated: Mon Apr 27 10:11:20 2020

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Second Source Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 04/24/20
Matrix: Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0424T37.D

		Compound	MEAN	CCRF	%D		%Drift	
1	TML	Dichlorodifluoromethane	0.1153	0.1035	10	TML	7.0	
2	TML	Freon 114	0.0759	0.0704	7.3	TML	8.0	
3	TM**L	Chloromethane	0.1019	0.0931	8.7	TM**L	20	
4	TM*L	Vinyl chloride	0.0951	0.0985	3.6	TM*L	19	
5		Butane	0.0000	0.0007	0.00			
6	TM	2-Chloro-1,1,1-trifluoroethane	0.0000	0.0000	0.00	TM		
7	TML	Bromomethane	0.1058	0.0896	15	TML	20	
8	TML	Chloroethane	0.0162	0.0141	13	TML	4.3	
9	TM	Dichlorofluoromethane	0.1710	0.1601	6.4	TM		
10	TM	Trichlorofluoromethane	0.1658	0.1720	3.7	TM		
11	TM	Pentane	0.0000	0.0005	0.00	TM		
12	TM	Diethyl ether	0.0000	0.0002	0.00	TM		
13	TM	1,2 Dichlorotrifluoroethane	0.0000	0.0001	0.00	TM		
14	TMQ	Acrolein	0.0074	0.0052	31	TMQ	29	* NT
15	TML	Acetone	0.0179	0.0191	6.4	TML	20	
16	TM	Freon-113	0.0816	0.0736	9.9	TM		
17	TM*	1,1-DCE	0.1261	0.1112	12	TM*		
18	TM	2-Propanol	0.0000	0.0000	0.00	TM		
19	TM	Acetonitrile	0.0025	0.0025	2.3	TM		
20	TM	t-Butanol	0.0078	0.0080	2.3	TM		
21	TML	Methyl Acetate	0.0658	0.0551	16	TML	5.1	
22	TMQ	Iodomethane	0.0768	0.0693	9.8	TMQ	1.9	
23	TM	Acrylonitrile	0.0261	0.0214	18	TM		
24	TML	Methylene chloride	0.1154	0.0938	19	TML	6.9	
25	TML	Carbon disulfide	0.2056	0.2096	1.9	TML	12	
26	TM	Methyl t-butyl ether (MtBE)	0.2729	0.2524	7.5	TM		
27	TM	Trans-1,2-DCE	0.1155	0.1038	10	TM		
28	TM	Diisopropyl Ether	0.2338	0.2114	9.6	TM		
29	TM**	1,1-DCA	0.1523	0.1414	7.1	TM**		
30	TM	Vinyl Acetate	0.1176	0.0777	34	TM		* NT
31	TM	Ethyl tert Butyl Ether	0.2720	0.2510	7.7	TM		
32	TM	MEK (2-Butanone)	0.0342	0.0376	9.9	TM		
33	TM	Cis-1,2-DCE	0.1525	0.1275	16	TM		
34	TM	2,2-Dichloropropane	0.1522	0.1278	16	TM		
35	TM*	Chloroform	0.2040	0.1748	14	TM*		
36	TM	Bromochloromethane	0.0720	0.0605	16	TM		
37	TM	1,1,1-TCA	0.1831	0.1519	17	TM		
38	TM	Cyclohexane	0.1096	0.0996	9.1	TM		
39	TM	1,1-Dichloropropene	0.1307	0.1086	17	TM		
40	TM	2,2,4-Trimethylpentane	0.2068	0.1729	16	TM		
		Average			10.1			

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Second Source Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 04/24/20
Matrix: 0 Instrument: Thor
Cal. Date: 04/24/20
Data File: 0424T37.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	Carbon Tetrachloride	0.1627	0.1332	18	TM	
42	TM	Tert Amyl Methyl Ether	0.2877	0.2590	10.0	TM	
43	TM	1,2-DCA	0.1739	0.1439	17	TM	
44	TM	Benzene	0.4009	0.3370	16	TM	
45	TM	TCE	0.1535	0.1312	15	TM	
46	TM	2-Pentanone	0.0593	0.0606	2.2	TM	
47	TM*	1,2-Dichloropropane	0.0988	0.0823	17	TM*	
48	TM	Bromodichloromethane	0.1608	0.1327	17	TM	
49	TM	Methyl Cyclohexane	0.1330	0.1216	8.5	TM	
50	TM	Dibromomethane	0.1191	0.1048	12	TM	
51	TM	MIBK (methyl isobutyl ketone)	0.0842	0.0808	4.1	TM	
52	TM	1-Bromo-2-chloroethane	0.0705	0.0638	9.5	TM	
53	TM	Cis-1,3-Dichloropropene	0.1695	0.1443	15	TM	
54	TM*	Toluene	0.4854	0.4020	17	TM*	
55	TM	Trans-1,3-Dichloropropene	0.1585	0.1346	15	TM	
56	TM	1,1,2-TCA	0.1134	0.0955	16	TM	
57	TM	2-Hexanone	0.0513	0.0528	2.8	TM	
58	TM	1,2-EDB	0.1319	0.1129	14	TM	
59	TM	Tetrachloroethene	0.2014	0.1675	17	TM	
60	TM	1-Chlorohexane	0.1483	0.1274	14	TM	
61	TM	1,1,1,2-Tetrachloroethane	0.1627	0.1445	11	TM	
62	TM	m&p-Xylene	0.4818	0.4047	16	TM	
63	TM	o-Xylene	0.5206	0.4384	16	TM	
64	TM	Styrene	0.4064	0.3506	14	TM	
65	TM	1,3-Dichloropropane	0.1984	0.1697	14	TM	
66	TM	Dibromochloromethane	0.1662	0.1412	15	TM	
67	TM**	Chlorobenzene	0.4109	0.3404	17	TM**	
68	TM*	Ethylbenzene	0.6307	0.5099	19	TM*	
69	TM**	Bromoform	0.1386	0.1164	16	TM**	
70	TM	Isopropylbenzene	1.015	0.8488	16	TM	
71	TM**	1,1,2,2-Tetrachloroethane	0.2174	0.1815	17	TM**	
72	TM	1,2,3-Trichloropropane	0.0998	0.0812	19	TM	
73	TM	t-1,4-Dichloro-2-Butene	0.0412	0.0370	10	TM	
74	TM	Bromobenzene	0.4899	0.4166	15	TM	
75	TM	n-Propylbenzene	1.115	0.9550	14	TM	
76	TM	4-Ethyltoluene	0.9710	0.9076	6.5	TM	
77	TM	2-Chlorotoluene	0.8189	0.6854	16	TM	
78	TM	1,3,5-Trimethylbenzene	0.8877	0.7567	15	TM	
79	TM	4-Chlorotoluene	0.8403	0.7223	14	TM	
80	TM	Tert-Butylbenzene	0.8931	0.7675	14	TM	
		Average			13.8		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Second Source Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 04/24/20
Matrix: 0 Instrument: Thor
Cal. Date: 04/24/20
Data File: 0424T37.D

		Compound	MEAN	CCRF	%D		%Drift	
81	TM	1,2,4-Trimethylbenzene	0.9196	0.7758	16	TM		
82	TM	Sec-Butylbenzene	1.045	0.9090	13	TM		
83	TM	p-Isopropyltoluene	0.9646	0.8001	17	TM		
84	TM	Benzyl Chloride	0.2817	0.2219	21	TM		* NT
85	TM	1,3-DCB	0.6365	0.5400	15	TM		
86	TML	1,4-DCB	0.6773	0.5350	21	TML	14	
87	TM	n-Butylbenzene	0.7554	0.6221	18	TM		
88	TM	1,2-DCB	0.6424	0.5351	17	TM		
89	TM	Hexachloroethane	0.1820	0.1745	4.1	TM		
90	TM	1,2-Dibromo-3-chloropropane	0.0683	0.0633	7.4	TM		
91	TML	1,2,4-Trichlorobenzene	0.5339	0.4567	14	TML	3.8	
92	TM	Hexachlorobutadiene	0.2472	0.2064	16	TM		
93	TML	Naphthalene	0.1293	0.1232	4.7	TML	6.0	
94	TML	1,2,3-Trichlorobenzene	0.5003	0.4375	13	TML	6.5	
95								
96								
97								
98								
99								
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
		Average			14.1			

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T37.D Vial: 12
Acq On : 24 Apr 20 19:10 Operator:
Sample : (SS)10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	606771	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	538699	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	338172	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	169154	25.20	ppb		0.00
Spiked Amount 25.000			Recovery =	100.804%			
48) 1,2-DCA-D4(S)	5.93	65	179955	24.77	ppb		0.00
Spiked Amount 25.000			Recovery =	99.092%			
69) Toluene-D8(S)	8.25	98	604016	24.98	ppb		0.00
Spiked Amount 25.000			Recovery =	99.916%			
77) 4-Bromofluorobenzene(S)	11.13	95	244393	24.79	ppb		0.00
Spiked Amount 25.000			Recovery =	99.160%			
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	25120	10.70	ppb		93
4) Freon 114	1.22	85	17078	10.80	ppb		96
5) Chloromethane	1.25	50	22592	11.99	ppb		90
6) Vinyl chloride	1.34	62	23912	11.95	ppb		92
9) Bromomethane	1.60	94	21757	11.96	ppb		93
10) Chloroethane	1.70	66	3413	10.43	ppb		85
11) Dichlorofluoromethane	1.89	67	38851	9.36	ppb		96
12) Trichlorofluoromethane	1.94	101	41749	10.37	ppb		97
16) Acrolein	2.33	56	15680	89.08	ppb		95
17) Acetone	2.50	43	4633	12.00	ppb	#	87
18) Freon-113	2.47	101	17853	9.01	ppb		96
19) 1,1-DCE	2.44	61	26986	8.82	ppb		95
21) Acetonitrile	2.78	40	7443	122.15	ppb		98
22) t-Butanol	3.20	59	24279	127.86	ppb	#	86
23) Methyl Acetate	2.89	43	13367	9.49	ppb		96
24) Iodomethane	2.58	142	16809	9.81	ppb	#	96
25) Acrylonitrile	3.30	52	5200	8.20	ppb		96
26) Methylene chloride	2.98	49	22756	9.31	ppb		89
27) Carbon disulfide	2.64	76	50866	11.24	ppb		98
28) Methyl t-butyl ether (MtBE	3.39	73	61270	9.25	ppb		98
29) Trans-1,2-DCE	3.35	61	25185	8.99	ppb		96
31) Diisopropyl Ether	4.19	45	51307	9.04	ppb		98
33) 1,1-DCA	3.96	63	34329	9.29	ppb		97
34) Vinyl Acetate	4.12	43	18858	6.61	ppb		99
35) Ethyl tert Butyl Ether	4.73	59	60926	9.23	ppb		100
36) MEK (2-Butanone)	4.90	43	9133	10.99	ppb		98
37) Cis-1,2-DCE	4.84	61	30940	8.36	ppb		93
38) 2,2-Dichloropropane	4.83	77	31018	8.39	ppb		93
41) Chloroform	5.32	83	42417	8.57	ppb		96
42) Bromochloromethane	5.16	49	14678	8.40	ppb		90
44) 1,1,1-TCA	5.53	97	36861	8.29	ppb		100
45) Cyclohexane	5.60	56	24171	9.09	ppb		96
46) 1,1-Dichloropropene	5.76	75	26357	8.31	ppb	#	88
47) 2,2,4-Trimethylpentane	6.19	57	41958	8.36	ppb		96
49) Carbon Tetrachloride	5.76	117	32335	8.19	ppb		96
50) Tert Amyl Methyl Ether	6.23	73	62853	9.00	ppb		99
52) 1,2-DCA	6.03	62	34915	8.27	ppb		95
53) Benzene	6.01	78	81802	8.41	ppb		97
54) TCE	6.83	130	31832	8.54	ppb		93

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T37.D Vial: 12
Acq On : 24 Apr 20 19:10 Operator:
Sample : (SS)10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:11:20 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.07	43	183910	127.74	ppb		98
56)	1,2-Dichloropropane	7.08	63	19965	8.32	ppb		99
57)	Bromodichloromethane	7.42	83	32211	8.26	ppb		95
58)	Methyl Cyclohexane	7.07	83	29520	9.15	ppb		95
59)	Dibromomethane	7.21	174	25430	8.80	ppb		89
60)	MIBK (methyl isobutyl ket	8.14	43	19605	9.59	ppb	#	81
61)	1-Bromo-2-chloroethane	7.75	63	15481	9.05	ppb		96
63)	Cis-1,3-Dichloropropene	7.95	75	35020	8.51	ppb		99
64)	Toluene	8.32	91	97565	8.28	ppb		99
65)	Trans-1,3-Dichloropropene	8.58	75	32664	8.49	ppb		94
66)	1,1,2-TCA	8.77	97	23168	8.42	ppb		96
67)	2-Hexanone	9.08	43	12805	10.28	ppb		97
70)	1,2-EDB	9.31	107	24332	8.56	ppb		98
71)	Tetrachloroethene	8.94	166	36087	8.31	ppb		94
72)	1-Chlorohexane	9.88	91	27457	8.59	ppb		94
73)	1,1,1,2-Tetrachloroethane	9.97	131	31141	8.88	ppb		90
74)	m&p-Xylene	10.14	91	174396	16.80	ppb		97
75)	o-Xylene	10.57	91	94458	8.42	ppb		98
76)	Styrene	10.59	104	75546	8.63	ppb		99
78)	1,3-Dichloropropane	8.95	76	36577	8.56	ppb		92
79)	Dibromochloromethane	9.19	129	30419	8.49	ppb		95
80)	Chlorobenzene	9.87	112	73354	8.28	ppb		98
81)	Ethylbenzene	10.01	91	109868	8.08	ppb		97
82)	Bromoform	10.76	173	25075	8.40	ppb		97
84)	Isopropylbenzene	10.99	105	114812	8.36	ppb		98
85)	1,1,2,2-Tetrachloroethane	11.29	83	24551	8.35	ppb	#	91
86)	1,2,3-Trichloropropane	11.32	110	10984	8.14	ppb	#	87
87)	t-1,4-Dichloro-2-Butene	11.35	53	5010	9.00	ppb		93
88)	Bromobenzene	11.29	77	56347	8.50	ppb		99
89)	n-Propylbenzene	11.43	91	129182	8.57	ppb		98
90)	4-Ethyltoluene	11.56	105	122765	9.35	ppb		98
91)	2-Chlorotoluene	11.51	91	92714	8.37	ppb		97
92)	1,3,5-Trimethylbenzene	11.63	105	102356	8.52	ppb		97
93)	4-Chlorotoluene	11.63	91	97702	8.60	ppb		100
94)	Tert-Butylbenzene	11.98	119	103823	8.59	ppb		95
95)	1,2,4-Trimethylbenzene	12.03	105	104936	8.44	ppb		92
96)	Sec-Butylbenzene	12.22	105	122957	8.70	ppb		100
97)	p-Isopropyltoluene	12.38	119	108235	8.30	ppb		97
98)	Benzyl Chloride	12.56	91	30014	7.88	ppb		99
99)	1,3-DCB	12.32	146	73040	8.48	ppb		98
100)	1,4-DCB	12.42	146	72371	8.62	ppb		98
101)	n-Butylbenzene	12.83	91	84146	8.24	ppb		96
102)	1,2-DCB	12.82	146	72379	8.33	ppb		98
103)	Hexachloroethane	13.12	201	23608	9.59	ppb		95
104)	1,2-Dibromo-3-chloropropan	13.66	157	8556	9.26	ppb		93
105)	1,2,4-Trichlorobenzene	14.59	180	61777	9.62	ppb		95
106)	Hexachlorobutadiene	14.80	225	27921	8.35	ppb		89
107)	Naphthalene	14.85	127	16670	10.60	ppb		91
108)	1,2,3-Trichlorobenzene	15.12	180	59177	9.35	ppb		99

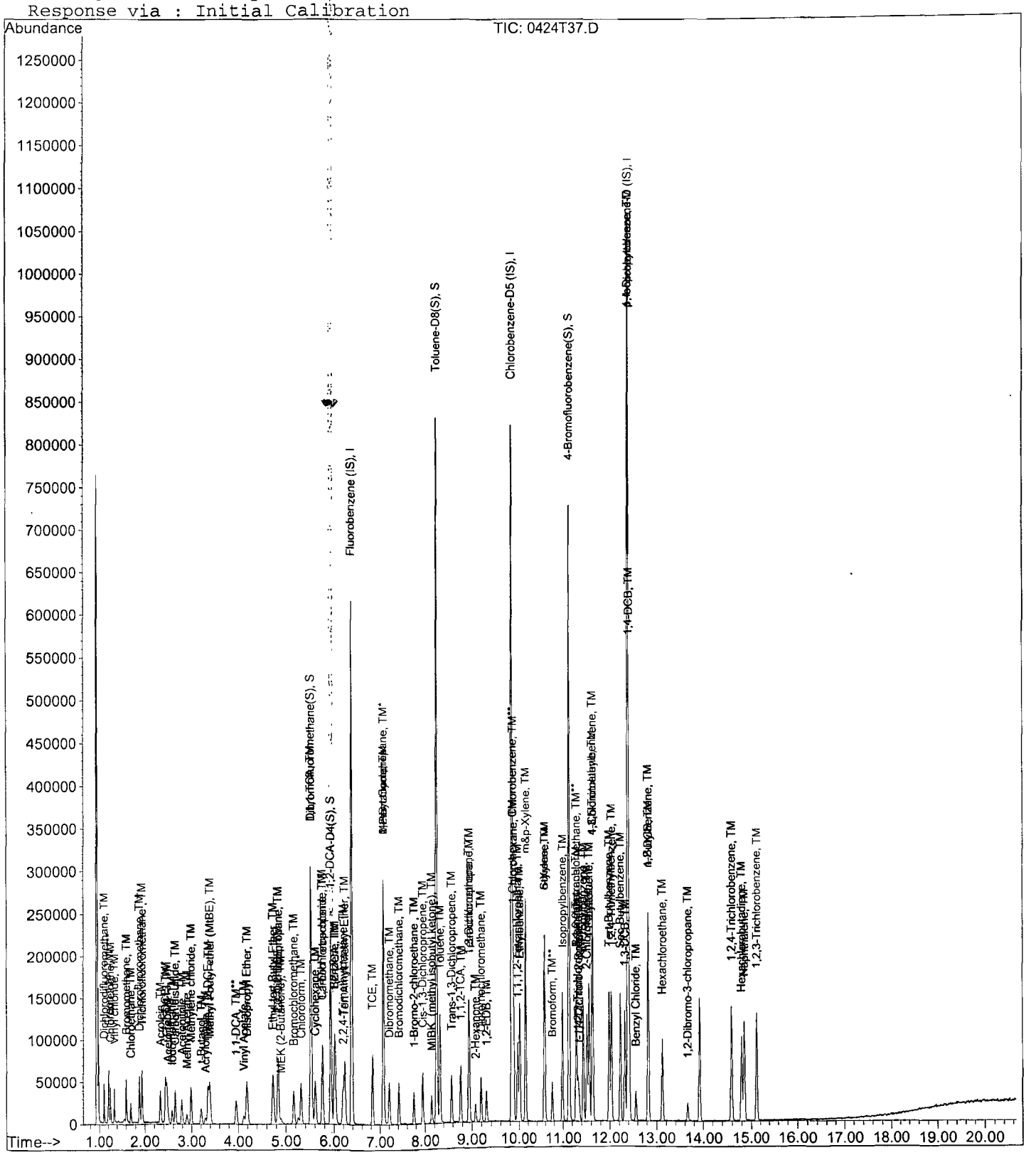
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T37.D Vial: 12
Acq On : 24 Apr 20 19:10 Operator:
Sample : (SS)10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 10:11 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 04/30/20
Matrix: Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0430t09.D

		Compound	MEAN	CCRF	%D		%Drift	
1	I	Fluorobenzene (IS)	ISTD			I		
2	TML	Dichlorodifluoromethane	0.1153	0.0806	30	TML	18	
3	TML	Freon 114	0.0759	0.0603	21	TML	7.7	
4	TM**L	Chloromethane	0.1019	0.0764	25	TM**L	3.5	
5	TM*L	Vinyl chloride	0.0951	0.0855	10	TM*L	3.0	
6		Butane	0.0000	0.0002	0.00			
7	TML	Bromomethane	0.1058	0.0779	26	TML	2.9	
8	TML	Chloroethane	0.0162	0.0137	15	TML	1.9	
9	TM	Dichlorofluoromethane	0.1710	0.1879	9.9	TM		
10	TM	Trichlorofluoromethane	0.1658	0.1919	16	TM		
11	TM	Pentane	0.0000	0.0003	0.00	TM		
12	TMQ	Acrolein	0.0074	0.0062	16	TMQ	15	
13	TML	Acetone	0.0179	0.0207	15	TML	32	* NT
14	TM	Freon-113	0.0816	0.0812	0.48	TM		
15	TM*	1,1-DCE	0.1261	0.1197	5.1	TM*		
16	TM	2-Propanol	0.0000	0.0001	0.00	TM		
17	TM	Acetonitrile	0.0025	0.0028	10	TM		
18	TM	t-Butanol	0.0078	0.0091	17	TM		
19	TML	Methyl Acetate	0.0658	0.0537	18	TML	7.5	
20	TMQ	Iodomethane	0.0768	0.0586	24	TMQ	14	
21	TM	Acrylonitrile	0.0261	0.0250	4.4	TM		
22	TML	Methylene chloride	0.1154	0.1103	4.5	TML	10	
23	TML	Carbon disulfide	0.2056	0.1715	17	TML	7.9	
24	TM	Methyl t-butyl ether (MtBE)	0.2729	0.2861	4.8	TM		
25	TM	Trans-1,2-DCE	0.1155	0.1174	1.6	TM		
26	TM	Diisopropyl Ether	0.2338	0.2257	3.5	TM		
27	TM**	2,2-Dichloro-1,1,1-trifluoroethane	0.0000	0.0001	0.00	TM**		
28	TM**	1,1-DCA	0.1523	0.1593	4.6	TM**		
29	TM	Vinyl Acetate	0.1176	0.1409	20	TM		
30	TM	Ethyl tert Butyl Ether	0.2720	0.2723	0.13	TM		
31	TM	MEK (2-Butanone)	0.0342	0.0340	0.81	TM		
32	TM	Cis-1,2-DCE	0.1525	0.1590	4.3	TM		
33	TM	2,2-Dichloropropane	0.1522	0.1787	17	TM		
34	TM*	Chloroform	0.2040	0.2220	8.8	TM*		
35	TM	Bromochloromethane	0.0720	0.0699	2.9	TM		
36	S	Dibromofluoromethane(S)	0.2766	0.2964	7.2	S		
37	TM	1,1,1-TCA	0.1831	0.2035	11	TM		
38	TM	Cyclohexane	0.1096	0.1008	8.0	TM		
39	TM	1,1-Dichloropropene	0.1307	0.1194	8.7	TM		
40	TM	2,2,4-Trimethylpentane	0.2068	0.1943	6.0	TM		
		Average			10.1			

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 04/30/20
Instrument: Thor
Cal. Date: 04/24/20
Data File: 0430t09.D

		Compound	MEAN	CCRF	%D		%Drift
41	S	1,2-DCA-D4(S)	0.2993	0.3301	10	S	
42	TM	Carbon Tetrachloride	0.1627	0.1921	18	TM	
43	TM	Tert Amyl Methyl Ether	0.2877	0.2891	0.48	TM	
44	TM	Methylcyclopentane	0.0000	0.0004	0.00	TM	
45	TM	1,2-DCA	0.1739	0.1852	6.5	TM	
46	TM	Benzene	0.4009	0.3930	2.0	TM	
47	TM	TCE	0.1535	0.1598	4.1	TM	
48	TM	2-Pentanone	0.0593	0.0611	2.9	TM	
49	TM*	1,2-Dichloropropane	0.0988	0.1006	1.7	TM*	
50	TM	Bromodichloromethane	0.1608	0.1698	5.6	TM	
51	TM	Methyl Cyclohexane	0.1330	0.1257	5.5	TM	
52	TM	Dibromomethane	0.1191	0.1265	6.3	TM	
53	TM	MIBK (methyl isobutyl ketone)	0.0842	0.0774	8.0	TM	
54	TM	1-Bromo-2-chloroethane	0.0705	0.0669	5.1	TM	
55	TM	Cis-1,3-Dichloropropene	0.1695	0.1727	1.9	TM	
56	TM*	Toluene	0.4854	0.4926	1.5	TM*	
57	TM	Trans-1,3-Dichloropropene	0.1585	0.1702	7.3	TM	
58	TM	1,1,2-TCA	0.1134	0.1135	0.08	TM	
59	TM	2-Hexanone	0.0513	0.0515	0.46	TM	
60	I	Chlorobenzene-D5 (IS)	ISTD			I	
61	S	Toluene-D8(S)	1.122	1.122	0.04	S	
62	TM	1,2-EDB	0.1319	0.1420	7.6	TM	
63	TM	Tetrachloroethene	0.2014	0.2186	8.5	TM	
64	TM	1-Chlorohexane	0.1483	0.1426	3.9	TM	
65	TM	1,1,1,2-Tetrachloroethane	0.1627	0.1860	14	TM	
66	TM	m&p-Xylene	0.4818	0.4953	2.8	TM	
67	TM	o-Xylene	0.5206	0.5328	2.3	TM	
68	TM	Styrene	0.4064	0.4057	0.18	TM	
69	S	4-Bromofluorobenzene(S)	0.4575	0.4512	1.4	S	
70	TM	1,3-Dichloropropane	0.1984	0.2013	1.5	TM	
71	TM	Dibromochloromethane	0.1662	0.1872	13	TM	
72	TM**	Chlorobenzene	0.4109	0.4159	1.2	TM**	
73	TM*	Ethylbenzene	0.6307	0.6272	0.55	TM*	
74	TM**	Bromoform	0.1386	0.1555	12	TM**	
75	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
76	TM	Isopropylbenzene	1.015	0.9592	5.5	TM	
77	TM**	1,1,2,2-Tetrachloroethane	0.2174	0.2160	0.65	TM**	
78	TM	1,2,3-Trichloropropane	0.0998	0.1053	5.6	TM	
79	TM	t-1,4-Dichloro-2-Butene	0.0412	0.0413	0.28	TM	
80	TM	Bromobenzene	0.4899	0.4572	6.7	TM	
		Average			4.6		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 04/30/20
Matrix: 0 Instrument: Thor
Cal. Date: 04/24/20
Data File: 0430t09.D

		Compound	MEAN	CCRF	%D		%Drift
81	TM	n-Propylbenzene	1.115	1.042	6.5	TM	
82	TM	4-Ethyltoluene	0.9710	0.9421	3.0	TM	
83	TM	2-Chlorotoluene	0.8189	0.7760	5.2	TM	
84	TM	1,3,5-Trimethylbenzene	0.8877	0.8704	2.0	TM	
85	TM	4-Chlorotoluene	0.8403	0.8089	3.7	TM	
86	TM	Tert-Butylbenzene	0.8931	0.8945	0.16	TM	
87	TM	1,2,4-Trimethylbenzene	0.9196	0.8907	3.1	TM	
88	TM	Sec-Butylbenzene	1.045	1.017	2.7	TM	
89	TM	p-Isopropyltoluene	0.9646	0.9633	0.13	TM	
90	TM	Benzyl Chloride	0.2817	0.3075	9.2	TM	
91	TM	1,3-DCB	0.6365	0.6313	0.82	TM	
92	TML	1,4-DCB	0.6773	0.6399	5.5	TML	3.8
93	TM	n-Butylbenzene	0.7554	0.7104	6.0	TM	
94	TM	1,2-DCB	0.6424	0.6227	3.1	TM	
95	TM	Hexachloroethane	0.1820	0.2182	20	TM	
96	TM	1,2-Dibromo-3-chloropropane	0.0683	0.0781	14	TM	
97	TML	1,2,4-Trichlorobenzene	0.5339	0.4869	8.8	TML	2.4
98	TM	Hexachlorobutadiene	0.2472	0.2748	11	TM	
99	TML	Naphthalene	0.1293	0.1149	11	TML	0.90
100	TML	1,2,3-Trichlorobenzene	0.5003	0.5002	0.01	TML	6.7
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
		Average			5.8		

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430t09.D Vial: 2
Acq On : 30 Apr 20 12:13 Operator:
Sample : 200430B CCV/LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	433246	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	391228	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	263406	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	128411	26.79	ppb		0.00
Spiked Amount 25.000			Recovery = 107.172%				
48) 1,2-DCA-D4(S)	5.93	65	143031	27.58	ppb		0.00
Spiked Amount 25.000			Recovery = 110.308%				
69) Toluene-D8(S)	8.25	98	438861	24.99	ppb		0.00
Spiked Amount 25.000			Recovery = 99.960%				
77) 4-Bromofluorobenzene(S)	11.13	95	176510	24.65	ppb		0.00
Spiked Amount 25.000			Recovery = 98.612%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	13961	8.25	ppb		96
4) Freon 114	1.22	85	10448	9.23	ppb		91
5) Chloromethane	1.25	50	13236	9.65	ppb		97
6) Vinyl chloride	1.34	62	14812	10.30	ppb	#	87
9) Bromomethane	1.60	94	13492	10.29	ppb		93
10) Chloroethane	1.70	66	2382	10.19	ppb		80
11) Dichlorofluoromethane	1.89	67	32567	10.99	ppb		94
12) Trichlorofluoromethane	1.94	101	33248	11.57	ppb		95
16) Acrolein	2.33	56	13506	106.87	ppb	#	100
17) Acetone	2.50	43	3582	13.15	ppb	#	78
18) Freon-113	2.47	101	14077	9.95	ppb		94
19) 1,1-DCE	2.44	61	20741	9.49	ppb		94
21) Acetonitrile	2.78	40	6002	137.95	ppb		86
22) t-Butanol	3.21	59	19817	146.16	ppb	#	83
23) Methyl Acetate	2.89	43	9313	9.25	ppb		95
24) Iodomethane	2.58	142	10163	8.64	ppb		97
25) Acrylonitrile	3.29	52	4327	9.56	ppb		89
26) Methylene chloride	2.98	49	19114	11.02	ppb		93
27) Carbon disulfide	2.65	76	29724	9.21	ppb		95
28) Methyl t-butyl ether (MtBE	3.40	73	49587	10.48	ppb		93
29) Trans-1,2-DCE	3.35	61	20339	10.16	ppb		94
31) Diisopropyl Ether	4.19	45	39120	9.65	ppb		99
33) 1,1-DCA	3.96	63	27612	10.46	ppb		98
34) Vinyl Acetate	4.12	43	24414	11.98	ppb		98
35) Ethyl tert Butyl Ether	4.74	59	47193	10.01	ppb		93
36) MEK (2-Butanone)	4.90	43	5886	9.92	ppb		93
37) Cis-1,2-DCE	4.84	61	27562	10.43	ppb		94
38) 2,2-Dichloropropane	4.84	77	30964	11.74	ppb		94
41) Chloroform	5.31	83	38475	10.88	ppb		95
42) Bromochloromethane	5.16	49	12117	9.71	ppb		95
44) 1,1,1-TCA	5.53	97	35270	11.11	ppb		96
45) Cyclohexane	5.61	56	17468	9.20	ppb		89
46) 1,1-Dichloropropene	5.76	75	20684	9.13	ppb		90
47) 2,2,4-Trimethylpentane	6.19	57	33674	9.40	ppb		97
49) Carbon Tetrachloride	5.76	117	33299	11.81	ppb		85
50) Tert Amyl Methyl Ether	6.23	73	50103	10.05	ppb		98
52) 1,2-DCA	6.03	62	32089	10.65	ppb		95
53) Benzene	6.01	78	68103	9.80	ppb		100
54) TCE	6.83	130	27699	10.41	ppb		96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430t09.D Vial: 2
Acq On : 30 Apr 20 12:13 Operator:
Sample : 200430B CCV/LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	132270	128.67	ppb		100
56)	1,2-Dichloropropane	7.08	63	17429	10.17	ppb		97
57)	Bromodichloromethane	7.42	83	29418	10.56	ppb		95
58)	Methyl Cyclohexane	7.07	83	21775	9.45	ppb		96
59)	Dibromomethane	7.21	174	21923	10.63	ppb		88
60)	MIBK (methyl isobutyl ket	8.14	43	13421	9.20	ppb	#	86
61)	1-Bromo-2-chloroethane	7.75	63	11586	9.49	ppb		98
63)	Cis-1,3-Dichloropropene	7.94	75	29935	10.19	ppb		97
64)	Toluene	8.32	91	85370	10.15	ppb		94
65)	Trans-1,3-Dichloropropene	8.58	75	29492	10.73	ppb		96
66)	1,1,2-TCA	8.77	97	19662	10.01	ppb		95
67)	2-Hexanone	9.08	43	8932	10.05	ppb	#	93
70)	1,2-EDB	9.31	107	22222	10.76	ppb	#	94
71)	Tetrachloroethene	8.94	166	34215	10.85	ppb		95
72)	1-Chlorohexane	9.88	91	22312	9.61	ppb		94
73)	1,1,1,2-Tetrachloroethane	9.96	131	29111	11.43	ppb		93
74)	m&p-Xylene	10.14	91	155027	20.56	ppb		100
75)	o-Xylene	10.57	91	83376	10.23	ppb		92
76)	Styrene	10.59	104	63489	9.98	ppb		97
78)	1,3-Dichloropropane	8.95	76	31502	10.15	ppb		98
79)	Dibromochloromethane	9.19	129	29292	11.26	ppb		98
80)	Chlorobenzene	9.87	112	65077	10.12	ppb		97
81)	Ethylbenzene	10.01	91	98150	9.94	ppb		97
82)	Bromoform	10.75	173	24331	11.22	ppb		99
84)	Isopropylbenzene	10.98	105	101067	9.45	ppb		100
85)	1,1,2,2-Tetrachloroethane	11.29	83	22755	9.93	ppb		91
86)	1,2,3-Trichloropropane	11.33	110	11099	10.56	ppb	#	80
87)	t-1,4-Dichloro-2-Butene	11.35	53	4350	10.03	ppb		84
88)	Bromobenzene	11.29	77	48170	9.33	ppb		98
89)	n-Propylbenzene	11.43	91	109828	9.35	ppb		96
90)	4-Ethyltoluene	11.56	105	99267	9.70	ppb		94
91)	2-Chlorotoluene	11.51	91	81760	9.48	ppb		94
92)	1,3,5-Trimethylbenzene	11.63	105	91706	9.80	ppb		99
93)	4-Chlorotoluene	11.63	91	85230	9.63	ppb		97
94)	Tert-Butylbenzene	11.98	119	94249	10.02	ppb		93
95)	1,2,4-Trimethylbenzene	12.03	105	93846	9.69	ppb		96
96)	Sec-Butylbenzene	12.22	105	107149	9.73	ppb		99
97)	p-Isopropyltoluene	12.39	119	101500	9.99	ppb		92
98)	Benzyl Chloride	12.56	91	32395	10.92	ppb		96
99)	1,3-DCB	12.32	146	66516	9.92	ppb		98
100)	1,4-DCB	12.42	146	67426	10.38	ppb		97
101)	n-Butylbenzene	12.83	91	74848	9.40	ppb		95
102)	1,2-DCB	12.82	146	65609	9.69	ppb		97
103)	Hexachloroethane	13.12	201	22986	11.99	ppb		96
104)	1,2-Dibromo-3-chloropropan	13.66	157	8231	11.44	ppb		94
105)	1,2,4-Trichlorobenzene	14.59	180	51306	10.24	ppb		97
106)	Hexachlorobutadiene	14.79	225	28956	11.12	ppb		94
107)	Naphthalene	14.85	127	12104	9.91	ppb		89
108)	1,2,3-Trichlorobenzene	15.12	180	52704	10.67	ppb		99

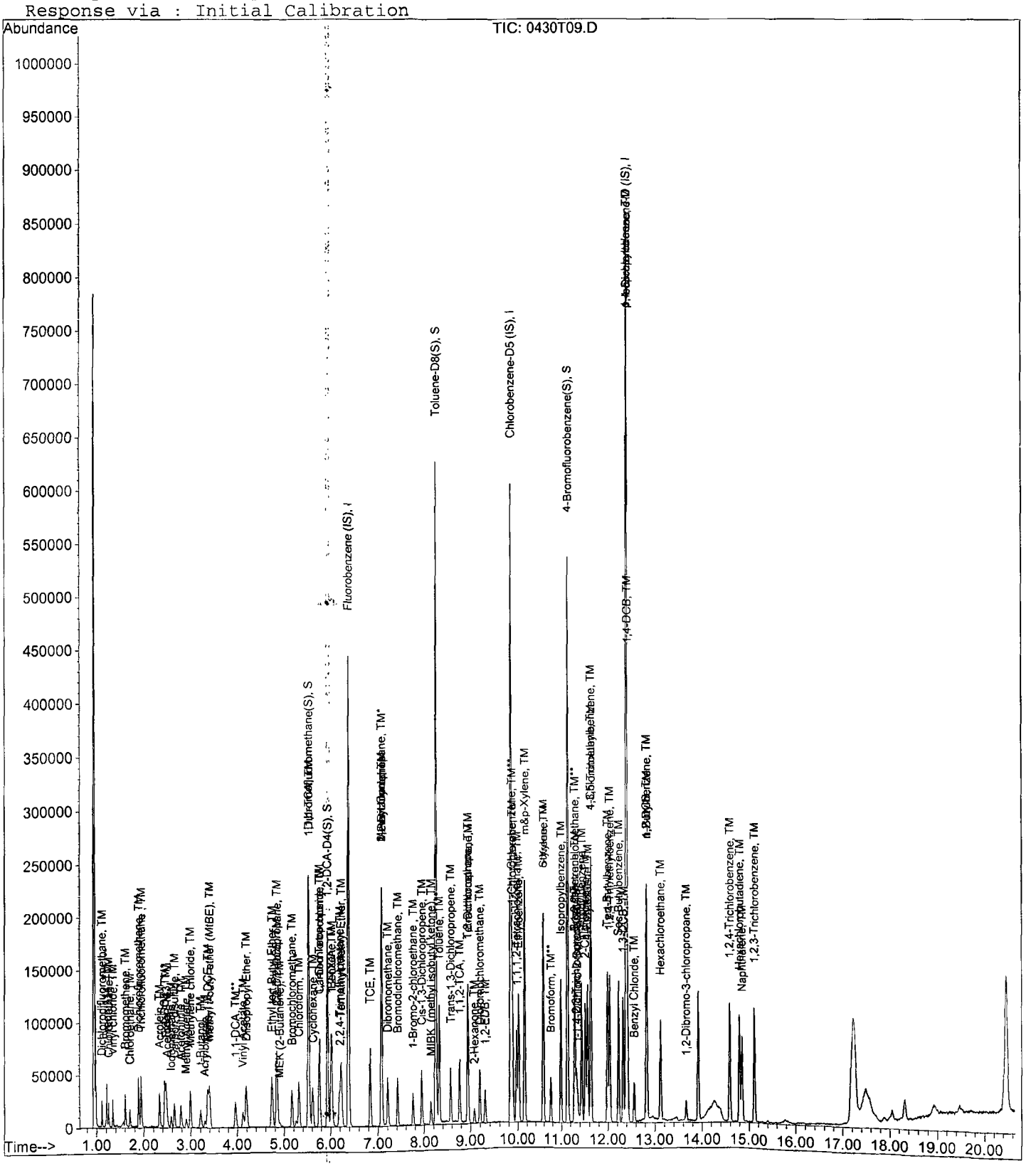
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430t09.D Vial: 2
Acq On : 30 Apr 20 12:13 Operator:
Sample : 200430B CCV/LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 1 May 20 1:16
Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0430T38.D

		Compound	MEAN	CCRF	%D	%Drift	
1	I	Fluorobenzene (IS)	ISTD			I	
2	TML	Dichlorodifluoromethane	0.1153	0.0740	36	TML	25
3	TML	Freon 114	0.0759	0.0530	30	TML	19
4	TM**L	Chloromethane	0.1019	0.0560	45	TM**L	32
5	TM*L	Vinyl chloride	0.0951	0.0638	33	TM*L	24
6		Butane	0.0000	0.0002	0.00		
7	TML	Bromomethane	0.1058	0.0697	34	TML	8.6
8	TML	Chloroethane	0.0162	0.0108	33	TML	20
9	TM	Dichlorofluoromethane	0.1710	0.1667	2.5	TM	
10	TM	Trichlorofluoromethane	0.1658	0.1641	0.99	TM	
11	TM	Pentane	0.0000	0.0005	0.00	TM	
12	TM	1,2 Dichlorotrifluoroethane	0.0000	0.0001	0.00	TM	
13	TMQ	Acrolein	0.0074	0.0044	41	TMQ	40
14	TML	Acetone	0.0179	0.0194	8.4	TML	23
15	TM	Freon-113	0.0816	0.0821	0.64	TM	
16	TM*	1,1-DCE	0.1261	0.1083	14	TM*	
17	TM	2-Propanol	0.0000	0.0001	0.00	TM	
18	TM	Acetonitrile	0.0025	0.0023	8.2	TM	
19	TM	t-Butanol	0.0078	0.0097	24	TM	
20	TML	Methyl Acetate	0.0658	0.0548	17	TML	5.7
21	TMQ	Iodomethane	0.0768	0.0374	51	TMQ	38
22	TM	Acrylonitrile	0.0261	0.0236	9.8	TM	
23	TML	Methylene chloride	0.1154	0.0914	21	TML	9.4
24	TML	Carbon disulfide	0.2056	0.1535	25	TML	17
25	TM	Methyl t-butyl ether (MtBE)	0.2729	0.2756	0.96	TM	
26	TM	Trans-1,2-DCE	0.1155	0.1019	12	TM	
27	TM	Diisopropyl Ether	0.2338	0.1971	16	TM	
28	TM**	1,1-DCA	0.1523	0.1435	5.8	TM**	
29	TM	Vinyl Acetate	0.1176	0.1150	2.2	TM	
30	TM	Ethyl tert Butyl Ether	0.2720	0.2407	11	TM	
31	TM	MEK (2-Butanone)	0.0342	0.0323	5.6	TM	
32	TM	Cis-1,2-DCE	0.1525	0.1289	15	TM	
33	TM	2,2-Dichloropropane	0.1522	0.1284	16	TM	
34	TM	2-Methylpentane	0.0000	0.0005	0.00	TM	
35	TM*	Chloroform	0.2040	0.2007	1.6	TM*	
36	TM	Bromochloromethane	0.0720	0.0637	12	TM	
37	S	Dibromofluoromethane(S)	0.2766	0.2908	5.2	S	
38	TM	1,1,1-TCA	0.1831	0.1903	3.9	TM	
39	TM	Cyclohexane	0.1096	0.0838	24	TM	
40	TM	1,1-Dichloropropene	0.1307	0.1095	16	TM	
		Average			14.9		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 1 May 20 1:16
Matrix: 0 Instrument: Thor
Cal. Date: 04/24/20
Data File: 0430T38.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	2,2,4-Trimethylpentane	0.2068	0.1473	29	TM	
42	S	1,2-DCA-D4(S)	0.2993	0.3286	9.8	S	
43	TM	Carbon Tetrachloride	0.1627	0.1734	6.6	TM	
44	TM	Tert Amyl Methyl Ether	0.2877	0.2680	6.9	TM	
45	TM	1,2-DCA	0.1739	0.1782	2.5	TM	
46	TM	Benzene	0.4009	0.3529	12	TM	
47	TM	TCE	0.1535	0.1392	9.3	TM	
48	TM	2-Pentanone	0.0593	0.0588	0.95	TM	
49	TM*	1,2-Dichloropropane	0.0988	0.0845	15	TM*	
50	TM	Bromodichloromethane	0.1608	0.1607	0.02	TM	
51	TM	Methyl Cyclohexane	0.1330	0.1105	17	TM	
52	TM	Dibromomethane	0.1191	0.1205	1.2	TM	
53	TM	MIBK (methyl isobutyl ketone)	0.0842	0.0794	5.7	TM	
54	TM	1-Bromo-2-chloroethane	0.0705	0.0585	17	TM	
55	TM	Cis-1,3-Dichloropropene	0.1695	0.1560	7.9	TM	
56	TM*	Toluene	0.4854	0.4426	8.8	TM*	
57	TM	Trans-1,3-Dichloropropene	0.1585	0.1490	6.0	TM	
58	TM	1,1,2-TCA	0.1134	0.1089	3.9	TM	
59	TM	2-Hexanone	0.0513	0.0510	0.53	TM	
60	I	Chlorobenzene-D5 (IS)	ISTD			I	
61	S	Toluene-D8(S)	1.122	1.101	1.9	S	
62	TM	1,2-EDB	0.1319	0.1352	2.5	TM	
63	TM	Tetrachloroethene	0.2014	0.1991	1.1	TM	
64	TM	1-Chlorohexane	0.1483	0.1308	12	TM	
65	TM	1,1,1,2-Tetrachloroethane	0.1627	0.1719	5.6	TM	
66	TM	m&p-Xylene	0.4818	0.4418	8.3	TM	
67	TM	o-Xylene	0.5206	0.4634	11	TM	
68	TM	Styrene	0.4064	0.3721	8.5	TM	
69	S	4-Bromofluorobenzene(S)	0.4575	0.4486	1.9	S	
70	TM	1,3-Dichloropropane	0.1984	0.1845	7.0	TM	
71	TM	Dibromochloromethane	0.1662	0.1750	5.3	TM	
72	TM**	Chlorobenzene	0.4109	0.3850	6.3	TM**	
73	TM*	Ethylbenzene	0.6307	0.5684	9.9	TM*	
74	TM**	Bromoform	0.1386	0.1483	7.0	TM**	
75	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
76	TM	Isopropylbenzene	1.015	0.8944	12	TM	
77	TM**	1,1,2,2-Tetrachloroethane	0.2174	0.2088	3.9	TM**	
78	TM	1,2,3-Trichloropropane	0.0998	0.0973	2.4	TM	
79	TM	t-1,4-Dichloro-2-Butene	0.0412	0.0436	5.8	TM	
80	TM	Bromobenzene	0.4899	0.4222	14	TM	
		Average			7.5		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 1 May 20 1:16
Instrument: Thor
Cal. Date: 04/24/20
Data File: 0430T38.D

		Compound	MEAN	CCRF	%D		%Drift
81	TM	n-Propylbenzene	1.115	0.9742	13	TM	
82	TM	4-Ethyltoluene	0.9710	0.8424	13	TM	
83	TM	2-Chlorotoluene	0.8189	0.7014	14	TM	
84	TM	1,3,5-Trimethylbenzene	0.8877	0.7933	11	TM	
85	TM	4-Chlorotoluene	0.8403	0.7442	11	TM	
86	TM	Tert-Butylbenzene	0.8931	0.8099	9.3	TM	
87	TM	1,2,4-Trimethylbenzene	0.9196	0.8064	12	TM	
88	TM	Sec-Butylbenzene	1.045	0.9090	13	TM	
89	TM	p-Isopropyltoluene	0.9646	0.8492	12	TM	
90	TM	Benzyl Chloride	0.2817	0.2179	23	TM	
91	TM	1,3-DCB	0.6365	0.5781	9.2	TM	
92	TML	1,4-DCB	0.6773	0.5902	13	TML	4.5
93	TM	n-Butylbenzene	0.7554	0.6058	20	TM	
94	TM	1,2-DCB	0.6424	0.5756	10	TM	
95	TM	Hexachloroethane	0.1820	0.1995	9.6	TM	
96	TM	1,2-Dibromo-3-chloropropane	0.0683	0.0801	17	TM	
97	TML	1,2,4-Trichlorobenzene	0.5339	0.4378	18	TML	7.6
98	TM	Hexachlorobutadiene	0.2472	0.2525	2.2	TM	
99	TML	Naphthalene	0.1293	0.1044	19	TML	9.6
100	TML	1,2,3-Trichlorobenzene	0.5003	0.4557	8.9	TML	2.7
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
		Average			12.9		

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T38.D Vial: 28
Acq On : 1 May 20 1:16 Operator:
Sample : Ending CCV 10ug/l 04/29/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 8:14 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	421247	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	374594	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	248036	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	122498	26.29	ppb		0.00
Spiked Amount 25.000			Recovery = 105.152%				
48) 1,2-DCA-D4(S)	5.93	65	138431	27.45	ppb		0.00
Spiked Amount 25.000			Recovery = 109.800%				
69) Toluene-D8(S)	8.25	98	412372	24.52	ppb		0.00
Spiked Amount 25.000			Recovery = 98.096%				
77) 4-Bromofluorobenzene(S)	11.13	95	168055	24.51	ppb		0.00
Spiked Amount 25.000			Recovery = 98.056%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	12471	7.55	ppb		99
4) Freon 114	1.22	85	8934	8.10	ppb		89
5) Chloromethane	1.25	50	9438	6.81	ppb		99
6) Vinyl chloride	1.34	62	10746	7.56	ppb		95
9) Bromomethane	1.60	94	11740	9.14	ppb		85
10) Chloroethane	1.70	66	1827	7.98	ppb		83
11) Dichlorofluoromethane	1.88	67	28084	9.75	ppb		93
12) Trichlorofluoromethane	1.94	101	27659	9.90	ppb		98
16) Acrolein	2.33	56	9182	75.22	ppb	#	100
17) Acetone	2.50	43	3277	12.26	ppb	#	78
18) Freon-113	2.46	101	13841	10.06	ppb	#	84
19) 1,1-DCE	2.43	61	18244	8.59	ppb		94
21) Acetonitrile	2.79	40	4856	114.79	ppb	#	95
22) t-Butanol	3.21	59	20397	154.73	ppb	#	80
23) Methyl Acetate	2.90	43	9228	9.43	ppb	#	83
24) Iodomethane	2.58	142	6309	6.24	ppb	#	87
25) Acrylonitrile	3.30	52	3970	9.02	ppb	#	93
26) Methylene chloride	2.98	49	15396	9.06	ppb		87
27) Carbon disulfide	2.64	76	25858	8.25	ppb		96
28) Methyl t-butyl ether (MtBE	3.39	73	46431	10.10	ppb		99
29) Trans-1,2-DCE	3.35	61	17173	8.83	ppb		90
31) Diisopropyl Ether	4.19	45	33217	8.43	ppb		91
33) 1,1-DCA	3.96	63	24181	9.42	ppb	#	90
34) Vinyl Acetate	4.12	43	19379	9.78	ppb		99
35) Ethyl tert Butyl Ether	4.73	59	40559	8.85	ppb		95
36) MEK (2-Butanone)	4.90	43	5447	9.44	ppb		98
37) Cis-1,2-DCE	4.84	61	21720	8.45	ppb		88
38) 2,2-Dichloropropane	4.83	77	21634	8.43	ppb		95
41) Chloroform	5.31	83	33825	9.84	ppb		95
42) Bromochloromethane	5.16	49	10725	8.84	ppb		99
44) 1,1,1-TCA	5.53	97	32064	10.39	ppb		97
45) Cyclohexane	5.61	56	14114	7.65	ppb		92
46) 1,1-Dichloropropene	5.76	75	18458	8.38	ppb		93
47) 2,2,4-Trimethylpentane	6.19	57	24816	7.12	ppb		96
49) Carbon Tetrachloride	5.75	117	29225	10.66	ppb		89
50) Tert Amyl Methyl Ether	6.23	73	45157	9.31	ppb	#	89
52) 1,2-DCA	6.03	62	30026	10.25	ppb		98
53) Benzene	6.01	78	59464	8.80	ppb		99
54) TCE	6.83	130	23462	9.07	ppb		93

(#) = qualifier out of range (m) = manual integration
0430T38.D T0424W.M Wed May 06 13:26:28 2020

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T38.D Vial: 28
Acq On : 1 May 20 1:16 Operator:
Sample : Ending CCV 10ug/l 04/29/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 8:14 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.07	43	123758	123.82	ppb		95
56)	1,2-Dichloropropane	7.08	63	14240	8.55	ppb	#	89
57)	Bromodichloromethane	7.42	83	27085	10.00	ppb		96
58)	Methyl Cyclohexane	7.07	83	18617	8.31	ppb		97
59)	Dibromomethane	7.21	174	20310	10.12	ppb		95
60)	MIBK (methyl isobutyl ket	8.14	43	13381	9.43	ppb	#	88
61)	1-Bromo-2-chloroethane	7.75	63	9853	8.30	ppb		96
63)	Cis-1,3-Dichloropropene	7.94	75	26288	9.21	ppb		92
64)	Toluene	8.32	91	74585	9.12	ppb		96
65)	Trans-1,3-Dichloropropene	8.58	75	25102	9.40	ppb		96
66)	1,1,2-TCA	8.77	97	18350	9.61	ppb		93
67)	2-Hexanone	9.07	43	8599	9.95	ppb		90
70)	1,2-EDB	9.31	107	20263	10.25	ppb		94
71)	Tetrachloroethene	8.94	166	29839	9.89	ppb		97
72)	1-Chlorohexane	9.88	91	19606	8.82	ppb		94
73)	1,1,1,2-Tetrachloroethane	9.96	131	25759	10.56	ppb		98
74)	m&p-Xylene	10.14	91	132393	18.34	ppb		100
75)	o-Xylene	10.57	91	69430	8.90	ppb		95
76)	Styrene	10.58	104	55752	9.15	ppb		93
78)	1,3-Dichloropropane	8.95	76	27642	9.30	ppb		100
79)	Dibromochloromethane	9.19	129	26227	10.53	ppb		99
80)	Chlorobenzene	9.87	112	57689	9.37	ppb		97
81)	Ethylbenzene	10.01	91	85163	9.01	ppb		98
82)	Bromoform	10.76	173	22223	10.70	ppb		92
84)	Isopropylbenzene	10.98	105	88738	8.81	ppb		100
85)	1,1,2,2-Tetrachloroethane	11.29	83	20716	9.61	ppb		88
86)	1,2,3-Trichloropropane	11.32	110	9658	9.76	ppb	#	86
87)	t-1,4-Dichloro-2-Butene	11.35	53	4322	10.58	ppb		96
88)	Bromobenzene	11.29	77	41891	8.62	ppb		98
89)	n-Propylbenzene	11.43	91	96656	8.74	ppb		96
90)	4-Ethyltoluene	11.56	105	83577	8.68	ppb		99
91)	2-Chlorotoluene	11.51	91	69589	8.57	ppb		93
92)	1,3,5-Trimethylbenzene	11.63	105	78703	8.94	ppb		98
93)	4-Chlorotoluene	11.63	91	73837	8.86	ppb		99
94)	Tert-Butylbenzene	11.98	119	80355	9.07	ppb		94
95)	1,2,4-Trimethylbenzene	12.03	105	80002	8.77	ppb		97
96)	Sec-Butylbenzene	12.22	105	90186	8.70	ppb		98
97)	p-Isopropyltoluene	12.39	119	84252	8.80	ppb		99
98)	Benzyl Chloride	12.57	91	21623	7.74	ppb		96
99)	1,3-DCB	12.32	146	57358	9.08	ppb		95
100)	1,4-DCB	12.42	146	58554	9.55	ppb		97
101)	n-Butylbenzene	12.83	91	60105	8.02	ppb		98
102)	1,2-DCB	12.82	146	57110	8.96	ppb		96
103)	Hexachloroethane	13.12	201	19790	10.96	ppb		93
104)	1,2-Dibromo-3-chloropropan	13.66	157	7948	11.73	ppb	#	86
105)	1,2,4-Trichlorobenzene	14.59	180	43436	9.24	ppb		92
106)	Hexachlorobutadiene	14.79	225	25052	10.22	ppb		94
107)	Naphthalene	14.85	127	10354	9.04	ppb		87
108)	1,2,3-Trichlorobenzene	15.12	180	45210	9.73	ppb		95

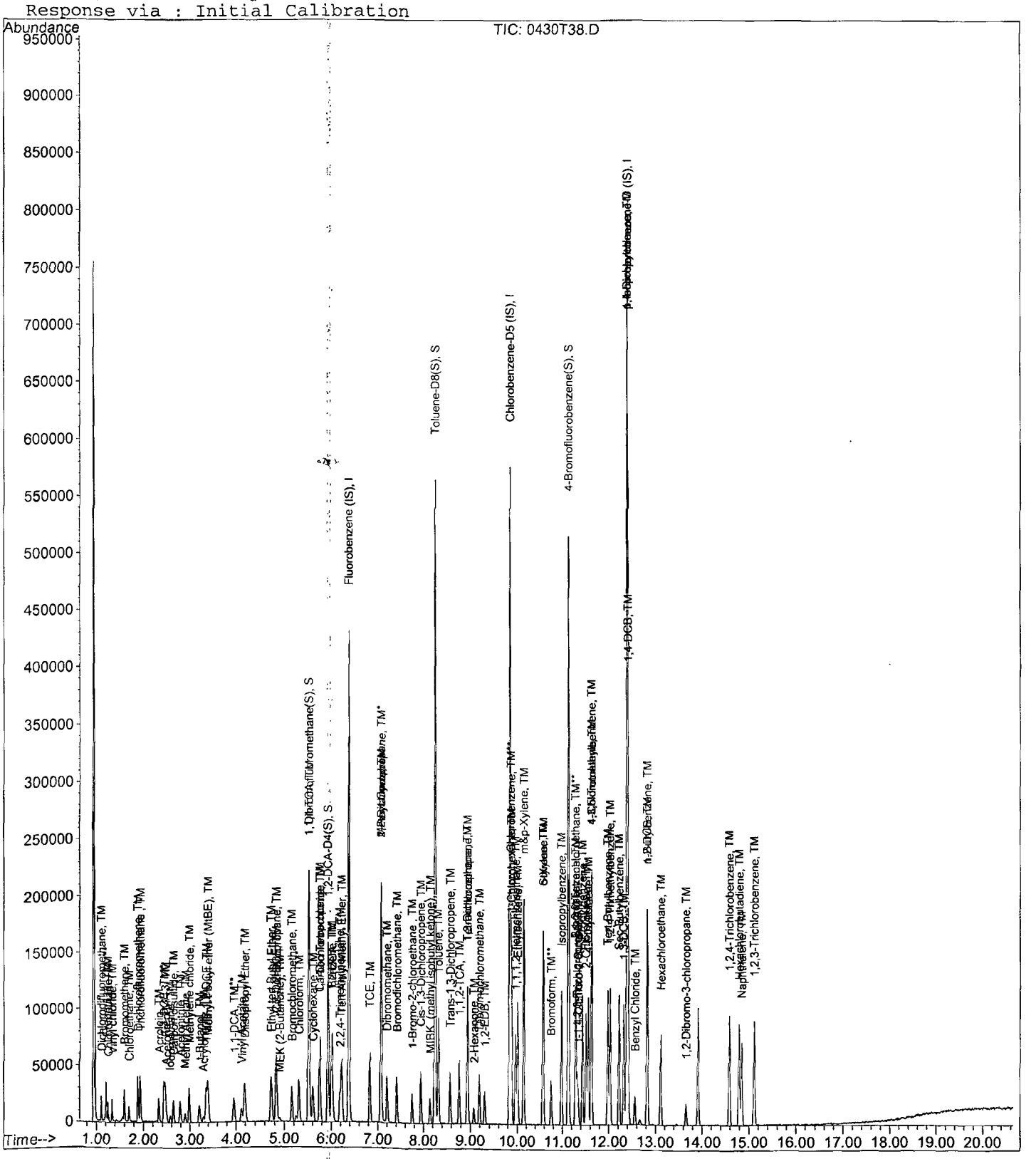
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T38.D Vial: 28
Acq On : 1 May 20 1:16 Operator:
Sample : Ending CCV 10ug/l 04/29/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 8:14 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430T22.D Vial: 12
Acq On : 30 Apr 20 17:50 Operator:
Sample : BA10438W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:16 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	422392	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	378201	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.39	152	233865	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.51	111	122012	26.11	ppb	0.00
Spiked Amount 25.000			Recovery = 104.448%			
48) 1,2-DCA-D4(S)	5.93	65	139034	27.49	ppb	0.00
Spiked Amount 25.000			Recovery = 109.980%			
69) Toluene-D8(S)	8.25	98	409277	24.11	ppb	0.00
Spiked Amount 25.000			Recovery = 96.432%			
77) 4-Bromofluorobenzene(S)	11.13	95	157198	22.71	ppb	0.00
Spiked Amount 25.000			Recovery = 90.848%			

Target Compounds Qvalue

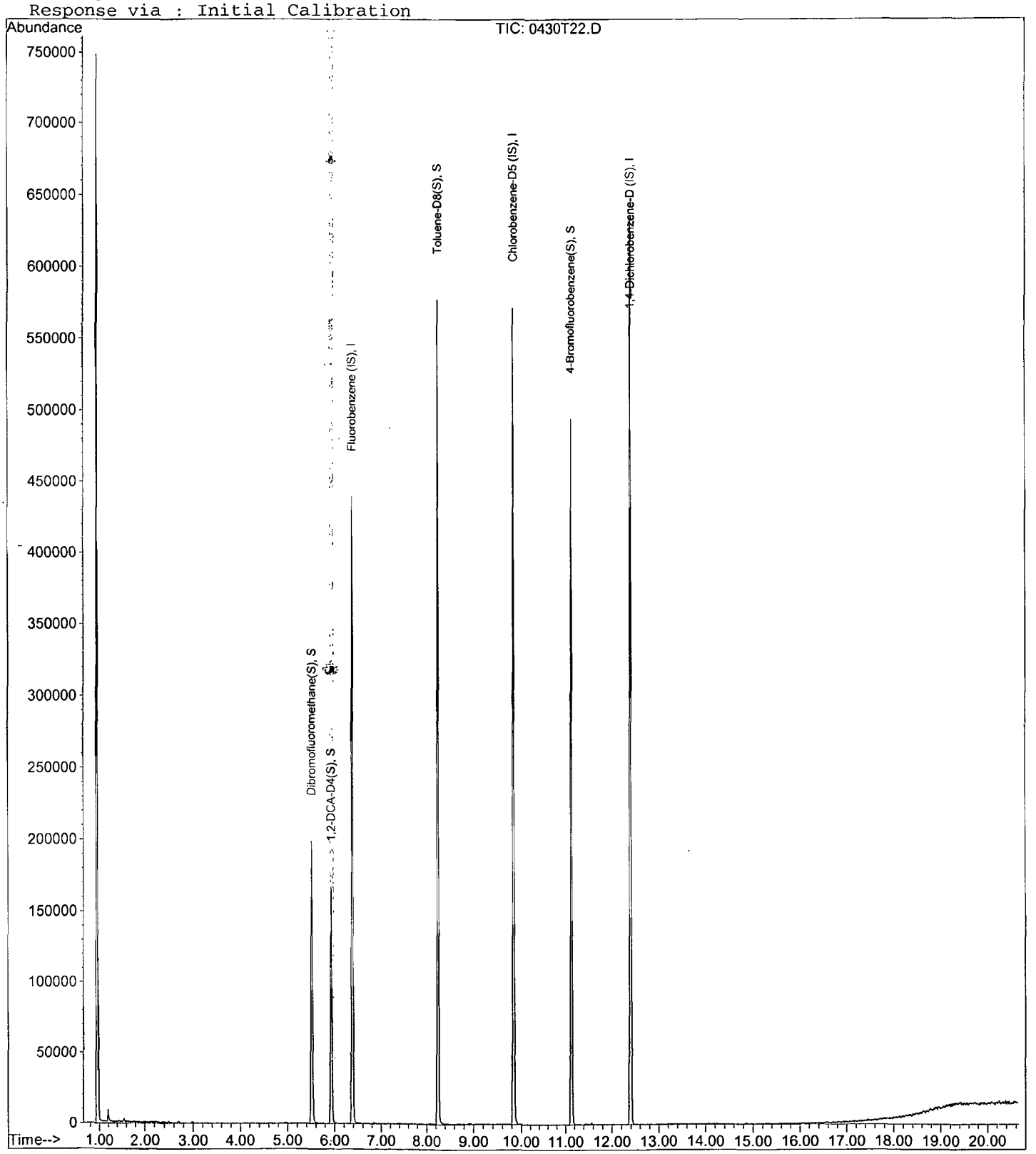
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T22.D Vial: 12
Acq On : 30 Apr 20 17:50 Operator:
Sample : BA10438W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:16 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430T23.D Vial: 13
Acq On : 30 Apr 20 18:18 Operator:
Sample : BA10439W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:16 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	417012	25.00	ppb	0.00
68) Chlorobenzene-D5 (IS)	9.84	117	374902	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	230338	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.52	111	124166	26.92	ppb	0.00
Spiked Amount 25.000			Recovery = 107.664%			
48) 1,2-DCA-D4(S)	5.93	65	142302	28.50	ppb	0.00
Spiked Amount 25.000			Recovery = 114.016%			
69) Toluene-D8(S)	8.25	98	405974	24.12	ppb	0.00
Spiked Amount 25.000			Recovery = 96.496%			
77) 4-Bromofluorobenzene(S)	11.13	95	157105	22.90	ppb	0.00
Spiked Amount 25.000			Recovery = 91.592%			

Target Compounds Qvalue

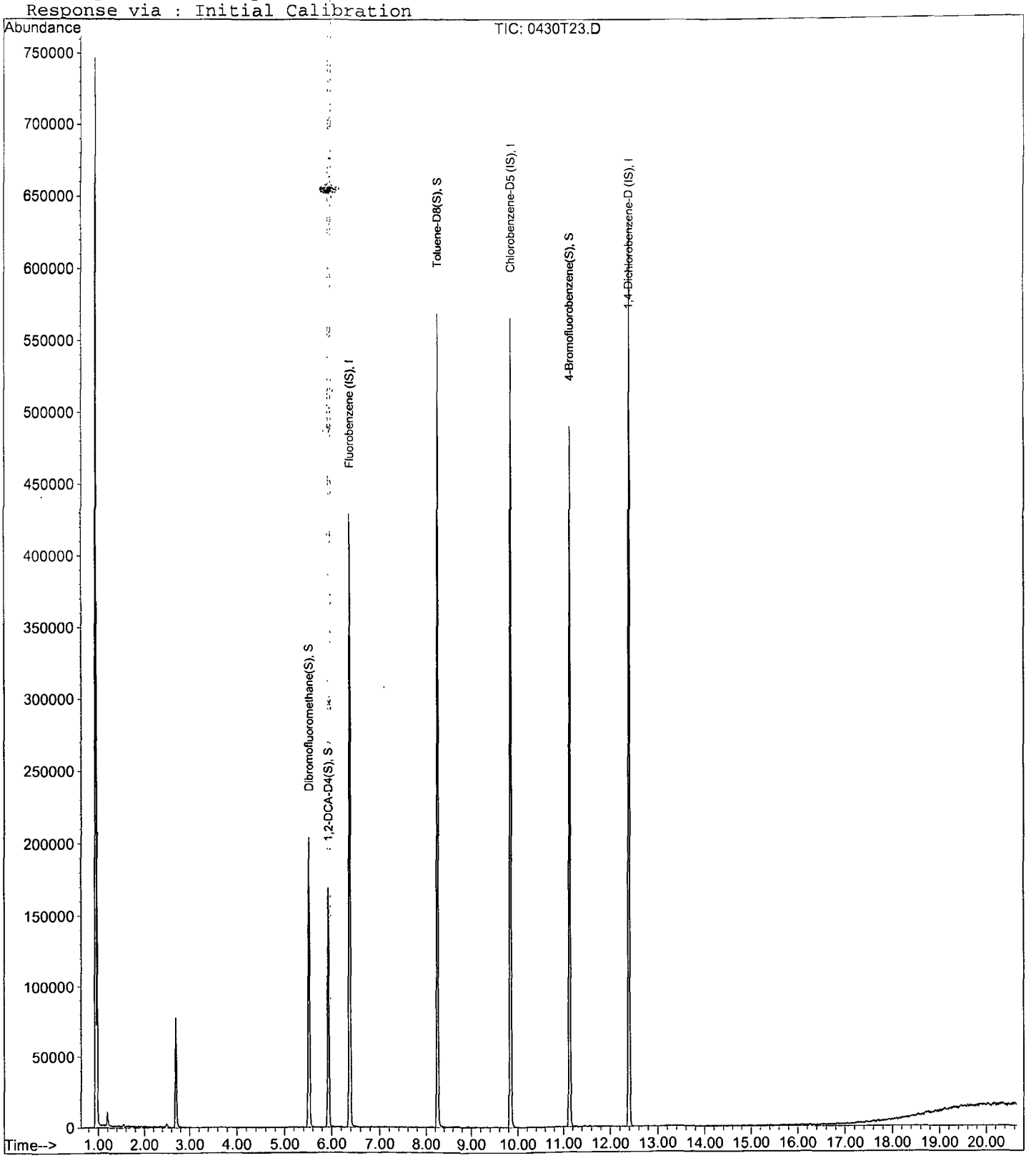
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T23.D Vial: 13
Acq On : 30 Apr 20 18:18 Operator:
Sample : BA10439W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:16 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430T21.D Vial: 11
Acq On : 30 Apr 20 17:22 Operator:
Sample : 200430B BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:16 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.37	96	422185	25.00	ppb	-0.01
68) Chlorobenzene-D5 (IS)	9.84	117	385190	25.00	ppb	0.00
83) 1,4-Dichlorobenzene-D (IS)	12.39	152	234397	25.00	ppb	0.00
System Monitoring Compounds						
43) Dibromofluoromethane(S)	5.50	111	124781	26.72	ppb	-0.02
Spiked Amount 25.000			Recovery = 106.872%			
48) 1,2-DCA-D4(S)	5.92	65	139535	27.61	ppb	-0.01
Spiked Amount 25.000			Recovery = 110.428%			
69) Toluene-D8(S)	8.24	98	411024	23.77	ppb	0.00
Spiked Amount 25.000			Recovery = 95.088%			
77) 4-Bromofluorobenzene(S)	11.13	95	160627	22.79	ppb	0.00
Spiked Amount 25.000			Recovery = 91.144%			

Target Compounds Qvalue

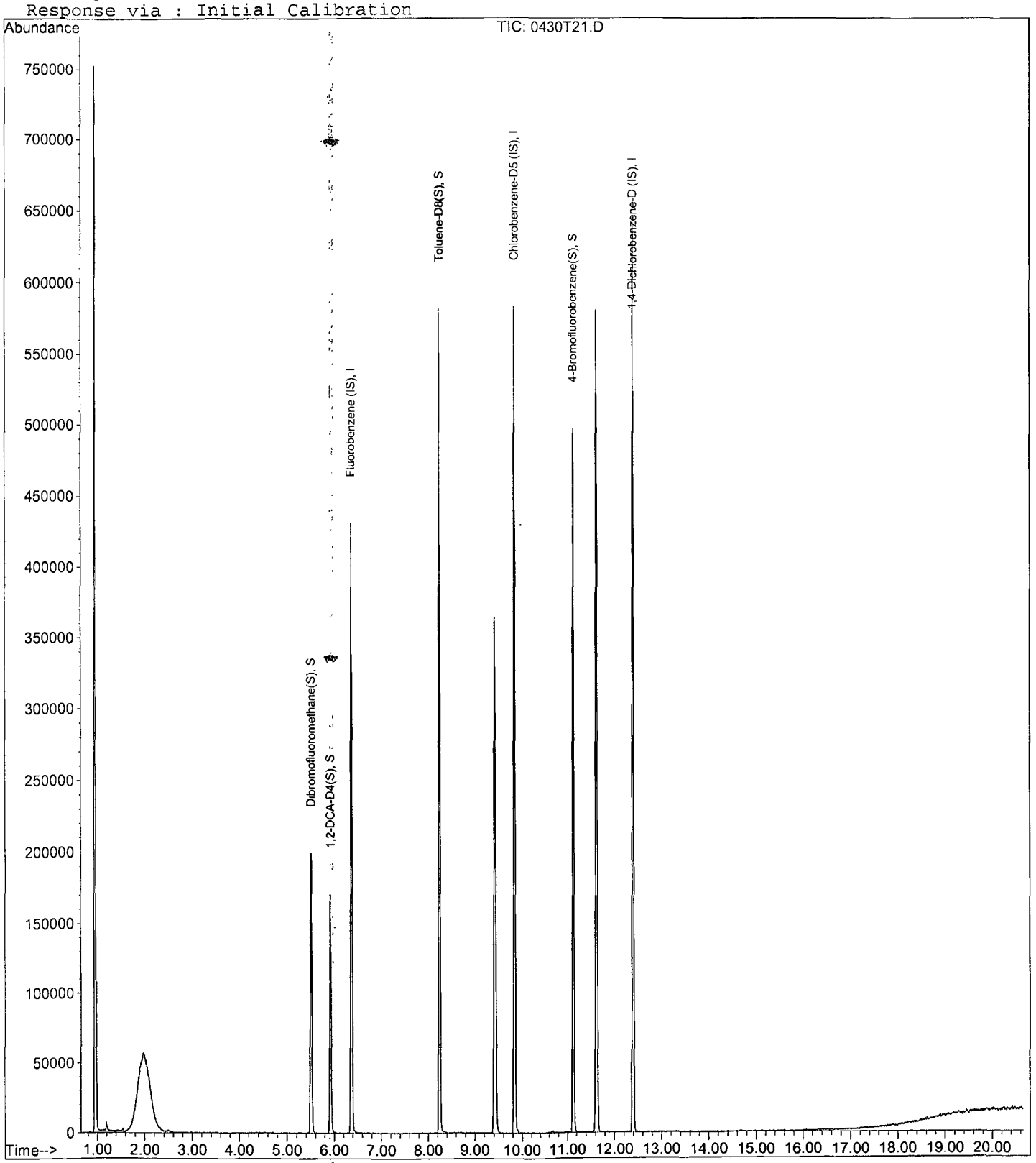
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T21.D Vial: 11
Acq On : 30 Apr 20 17:22 Operator:
Sample : 200430B BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:16 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T09.D Vial: 2
Acq On : 30 Apr 20 12:13 Operator:
Sample : 200430B CCV/LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	433246	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	391228	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	263406	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	128411	26.79	ppb		0.00
Spiked Amount 25.000			Recovery = 107.172%				
48) 1,2-DCA-D4(S)	5.93	65	143031	27.58	ppb		0.00
Spiked Amount 25.000			Recovery = 110.308%				
69) Toluene-D8(S)	8.25	98	438861	24.99	ppb		0.00
Spiked Amount 25.000			Recovery = 99.960%				
77) 4-Bromofluorobenzene(S)	11.13	95	176510	24.65	ppb		0.00
Spiked Amount 25.000			Recovery = 98.612%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	13961	8.25	ppb		96
4) Freon 114	1.22	85	10448	9.23	ppb		91
5) Chloromethane	1.25	50	13236	9.65	ppb		97
6) Vinyl chloride	1.34	62	14812	10.30	ppb	#	87
9) Bromomethane	1.60	94	13492	10.29	ppb		93
10) Chloroethane	1.70	66	2382	10.19	ppb		80
11) Dichlorofluoromethane	1.89	67	32567	10.99	ppb		94
12) Trichlorofluoromethane	1.94	101	33248	11.57	ppb		95
16) Acrolein	2.33	56	13506	106.87	ppb	#	100
17) Acetone	2.50	43	3582	13.15	ppb	#	78
18) Freon-113	2.47	101	14077	9.95	ppb		94
19) 1,1-DCE	2.44	61	20741	9.49	ppb		94
21) Acetonitrile	2.78	40	6002	137.95	ppb		86
22) t-Butanol	3.21	59	19817	146.16	ppb	#	83
23) Methyl Acetate	2.89	43	9313	9.25	ppb		95
24) Iodomethane	2.58	142	10163	8.64	ppb		97
25) Acrylonitrile	3.29	52	4327	9.56	ppb		89
26) Methylene chloride	2.98	49	19114	11.02	ppb		93
27) Carbon disulfide	2.65	76	29724	9.21	ppb		95
28) Methyl t-butyl ether (MTBE	3.40	73	49587	10.48	ppb		93
29) Trans-1,2-DCE	3.35	61	20339	10.16	ppb		94
31) Diisopropyl Ether	4.19	45	39120	9.65	ppb		99
33) 1,1-DCA	3.96	63	27612	10.46	ppb		98
34) Vinyl Acetate	4.12	43	24414	11.98	ppb		98
35) Ethyl tert Butyl Ether	4.74	59	47193	10.01	ppb		93
36) MEK (2-Butanone)	4.90	43	5886	9.92	ppb		93
37) Cis-1,2-DCE	4.84	61	27562	10.43	ppb		94
38) 2,2-Dichloropropane	4.84	77	30964	11.74	ppb		94
41) Chloroform	5.31	83	38475	10.88	ppb		95
42) Bromochloromethane	5.16	49	12117	9.71	ppb		95
44) 1,1,1-TCA	5.53	97	35270	11.11	ppb		96
45) Cyclohexane	5.61	56	17468	9.20	ppb		89
46) 1,1-Dichloropropene	5.76	75	20684	9.13	ppb		90
47) 2,2,4-Trimethylpentane	6.19	57	33674	9.40	ppb		97
49) Carbon Tetrachloride	5.76	117	33299	11.81	ppb		85
50) Tert Amyl Methyl Ether	6.23	73	50103	10.05	ppb		98
52) 1,2-DCA	6.03	62	32089	10.65	ppb		95
53) Benzene	6.01	78	68103	9.80	ppb		100
54) TCE	6.83	130	27699	10.41	ppb		96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T09.D Vial: 2
Acq On : 30 Apr 20 12:13 Operator:
Sample : 200430B CCV/LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.08	43	132270	128.67	ppb		100
56)	1,2-Dichloropropane	7.08	63	17429	10.17	ppb		97
57)	Bromodichloromethane	7.42	83	29418	10.56	ppb		95
58)	Methyl Cyclohexane	7.07	83	21775	9.45	ppb		96
59)	Dibromomethane	7.21	174	21923	10.63	ppb		88
60)	MIBK (methyl isobutyl ket	8.14	43	13421	9.20	ppb	#	86
61)	1-Bromo-2-chloroethane	7.75	63	11586	9.49	ppb		98
63)	Cis-1,3-Dichloropropene	7.94	75	29935	10.19	ppb		97
64)	Toluene	8.32	91	85370	10.15	ppb		94
65)	Trans-1,3-Dichloropropene	8.58	75	29492	10.73	ppb		96
66)	1,1,2-TCA	8.77	97	19662	10.01	ppb		95
67)	2-Hexanone	9.08	43	8932	10.05	ppb	#	93
70)	1,2-EDB	9.31	107	22222	10.76	ppb	#	94
71)	Tetrachloroethene	8.94	166	34215	10.85	ppb		95
72)	1-Chlorohexane	9.88	91	22312	9.61	ppb		94
73)	1,1,1,2-Tetrachloroethane	9.96	131	29111	11.43	ppb		93
74)	m&p-Xylene	10.14	91	155027	20.56	ppb		100
75)	o-Xylene	10.57	91	83376	10.23	ppb		92
76)	Styrene	10.59	104	63489	9.98	ppb		97
78)	1,3-Dichloropropane	8.95	76	31502	10.15	ppb		98
79)	Dibromochloromethane	9.19	129	29292	11.26	ppb		98
80)	Chlorobenzene	9.87	112	65077	10.12	ppb		97
81)	Ethylbenzene	10.01	91	98150	9.94	ppb		97
82)	Bromoform	10.75	173	24331	11.22	ppb		99
84)	Isopropylbenzene	10.98	105	101067	9.45	ppb		100
85)	1,1,2,2-Tetrachloroethane	11.29	83	22755	9.93	ppb		91
86)	1,2,3-Trichloropropane	11.33	110	11099	10.56	ppb	#	80
87)	t-1,4-Dichloro-2-Butene	11.35	53	4350	10.03	ppb		84
88)	Bromobenzene	11.29	77	48170	9.33	ppb		98
89)	n-Propylbenzene	11.43	91	109828	9.35	ppb		96
90)	4-Ethyltoluene	11.56	105	99267	9.70	ppb		94
91)	2-Chlorotoluene	11.51	91	81760	9.48	ppb		94
92)	1,3,5-Trimethylbenzene	11.63	105	91706	9.80	ppb		99
93)	4-Chlorotoluene	11.63	91	85230	9.63	ppb		97
94)	Tert-Butylbenzene	11.98	119	94249	10.02	ppb		93
95)	1,2,4-Trimethylbenzene	12.03	105	93846	9.69	ppb		96
96)	Sec-Butylbenzene	12.22	105	107149	9.73	ppb		99
97)	p-Isopropyltoluene	12.39	119	101500	9.99	ppb		92
98)	Benzyl Chloride	12.56	91	32395	10.92	ppb		96
99)	1,3-DCB	12.32	146	66516	9.92	ppb		98
100)	1,4-DCB	12.42	146	67426	10.38	ppb		97
101)	n-Butylbenzene	12.83	91	74848	9.40	ppb		95
102)	1,2-DCB	12.82	146	65609	9.69	ppb		97
103)	Hexachloroethane	13.12	201	22986	11.99	ppb		96
104)	1,2-Dibromo-3-chloropropan	13.66	157	8231	11.44	ppb		94
105)	1,2,4-Trichlorobenzene	14.59	180	51306	10.24	ppb		97
106)	Hexachlorobutadiene	14.79	225	28956	11.12	ppb		94
107)	Naphthalene	14.85	127	12104	9.91	ppb		89
108)	1,2,3-Trichlorobenzene	15.12	180	52704	10.67	ppb		99

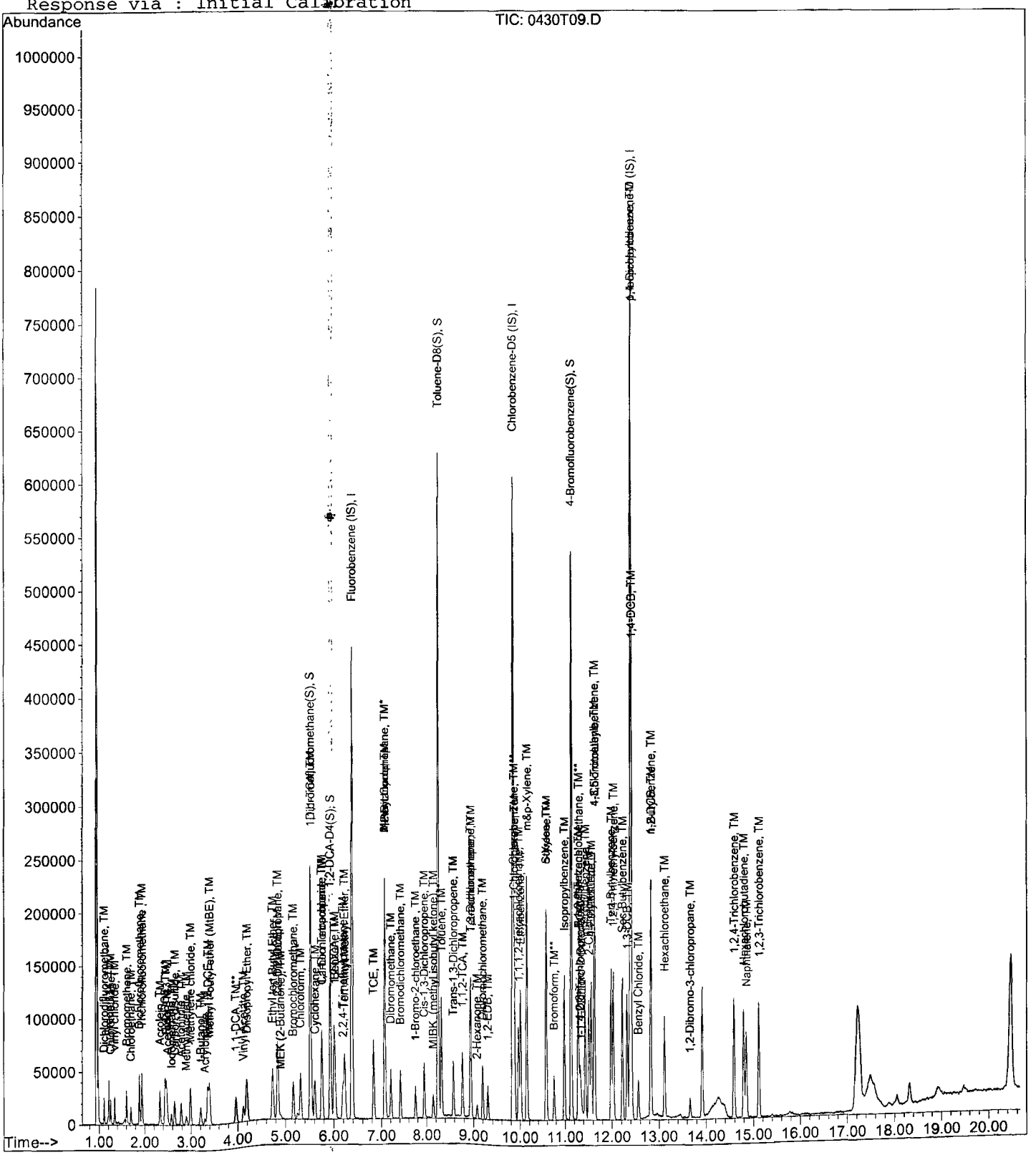
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T09.D Vial: 2
Acq On : 30 Apr 20 12:13 Operator:
Sample : 200430B CCV/LCS 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T10.D Vial: 3
Acq On : 30 Apr 20 12:41 Operator:
Sample : 200430B LCSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.38	96	460801	25.00	ppb		0.00
68) Chlorobenzene-D5 (IS)	9.84	117	410890	25.00	ppb		0.00
83) 1,4-Dichlorobenzene-D (IS)	12.40	152	265295	25.00	ppb		0.00
System Monitoring Compounds							
43) Dibromofluoromethane(S)	5.52	111	132450	25.98	ppb		0.00
Spiked Amount 25.000			Recovery = 103.932%				
48) 1,2-DCA-D4(S)	5.93	65	149022	27.01	ppb		0.00
Spiked Amount 25.000			Recovery = 108.056%				
69) Toluene-D8(S)	8.25	98	451921	24.50	ppb		0.00
Spiked Amount 25.000			Recovery = 98.008%				
77) 4-Bromofluorobenzene(S)	11.13	95	180936	24.06	ppb		0.00
Spiked Amount 25.000			Recovery = 96.248%				
Target Compounds							Qvalue
3) Dichlorodifluoromethane	1.11	85	12682	6.99	ppb		98
4) Freon 114	1.22	85	9806	8.13	ppb		95
5) Chloromethane	1.25	50	12053	8.12	ppb		91
6) Vinyl chloride	1.34	62	13520	8.77	ppb		91
9) Bromomethane	1.60	94	12880	9.17	ppb		99
10) Chloroethane	1.70	66	2246	9.00	ppb		93
11) Dichlorofluoromethane	1.89	67	29500	9.36	ppb		99
12) Trichlorofluoromethane	1.94	101	31378	10.27	ppb		98
16) Acrolein	2.33	56	12318	92.08	ppb	#	100
17) Acetone	2.50	43	4073	14.19	ppb	#	64
18) Freon-113	2.47	101	13863	9.21	ppb		96
19) 1,1-DCE	2.44	61	19952	8.59	ppb		91
21) Acetonitrile	2.78	40	6339	136.99	ppb	#	71
22) t-Butanol	3.21	59	22433	155.56	ppb	#	87
23) Methyl Acetate	2.89	43	10275	9.61	ppb		97
24) Iodomethane	2.58	142	10429	8.41	ppb		98
25) Acrylonitrile	3.29	52	4990	10.36	ppb		84
26) Methylene chloride	2.99	49	18606	10.05	ppb		94
27) Carbon disulfide	2.64	76	30086	8.77	ppb		99
28) Methyl t-butyl ether (MtBE	3.40	73	48922	9.72	ppb		98
29) Trans-1,2-DCE	3.35	61	19568	9.19	ppb		93
31) Diisopropyl Ether	4.19	45	38637	8.97	ppb		97
33) 1,1-DCA	3.96	63	27480	9.79	ppb		94
34) Vinyl Acetate	4.12	43	23435	10.81	ppb		99
35) Ethyl tert Butyl Ether	4.73	59	45744	9.13	ppb		96
36) MEK (2-Butanone)	4.90	43	5887	9.33	ppb		100
37) Cis-1,2-DCE	4.84	61	25764	9.17	ppb	#	92
38) 2,2-Dichloropropane	4.84	77	28795	10.26	ppb		100
41) Chloroform	5.31	83	36505	9.71	ppb		100
42) Bromochloromethane	5.16	49	12622	9.51	ppb		94
44) 1,1,1-TCA	5.53	97	35022	10.38	ppb		95
45) Cyclohexane	5.61	56	16049	7.95	ppb	#	93
46) 1,1-Dichloropropene	5.76	75	20888	8.67	ppb		89
47) 2,2,4-Trimethylpentane	6.19	57	31201	8.19	ppb		99
49) Carbon Tetrachloride	5.75	117	30499	10.17	ppb		88
50) Tert Amyl Methyl Ether	6.23	73	49053	9.25	ppb		96
52) 1,2-DCA	6.03	62	31035	9.68	ppb	#	92
53) Benzene	6.01	78	64975	8.79	ppb		93
54) TCE	6.84	130	26670	9.43	ppb		96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T10.D Vial: 3
Acq On : 30 Apr 20 12:41 Operator:
Sample : 200430B LCSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Quant Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	2-Pentanone	7.07	43	134862	123.34	ppb		98
56)	1,2-Dichloropropane	7.08	63	16988	9.32	ppb		99
57)	Bromodichloromethane	7.42	83	30337	10.24	ppb		94
58)	Methyl Cyclohexane	7.07	83	21149	8.63	ppb		97
59)	Dibromomethane	7.21	174	21808	9.94	ppb		93
60)	MIBK (methyl isobutyl ket	8.14	43	13994	9.02	ppb	#	87
61)	1-Bromo-2-chloroethane	7.75	63	10971	8.45	ppb		91
63)	Cis-1,3-Dichloropropene	7.95	75	28476	9.12	ppb		94
64)	Toluene	8.32	91	82887	9.26	ppb		99
65)	Trans-1,3-Dichloropropene	8.58	75	30198	10.33	ppb		97
66)	1,1,2-TCA	8.77	97	20446	9.78	ppb		97
67)	2-Hexanone	9.07	43	9036	9.55	ppb	#	85
70)	1,2-EDB	9.31	107	21008	9.69	ppb		99
71)	Tetrachloroethene	8.94	166	30748	9.29	ppb		95
72)	1-Chlorohexane	9.88	91	21192	8.69	ppb		95
73)	1,1,1,2-Tetrachloroethane	9.96	131	27881	10.42	ppb		95
74)	m&p-Xylene	10.14	91	146851	18.55	ppb		99
75)	o-Xylene	10.57	91	78746	9.20	ppb		94
76)	Styrene	10.58	104	62855	9.41	ppb		93
78)	1,3-Dichloropropane	8.95	76	30565	9.37	ppb		96
79)	Dibromochloromethane	9.19	129	29053	10.64	ppb		98
80)	Chlorobenzene	9.87	112	63476	9.40	ppb		97
81)	Ethylbenzene	10.01	91	93810	9.05	ppb		94
82)	Bromoform	10.76	173	25440	11.17	ppb		95
84)	Isopropylbenzene	10.99	105	96803	8.99	ppb		98
85)	1,1,2,2-Tetrachloroethane	11.29	83	21809	9.45	ppb		89
86)	1,2,3-Trichloropropane	11.32	110	10323	9.75	ppb	#	80
87)	t-1,4-Dichloro-2-Butene	11.35	53	4693	10.74	ppb		100
88)	Bromobenzene	11.29	77	46852	9.01	ppb		87
89)	n-Propylbenzene	11.43	91	104609	8.84	ppb		96
90)	4-Ethyltoluene	11.56	105	95630	9.28	ppb		99
91)	2-Chlorotoluene	11.51	91	77008	8.86	ppb		97
92)	1,3,5-Trimethylbenzene	11.63	105	86574	9.19	ppb		96
93)	4-Chlorotoluene	11.63	91	83533	9.37	ppb		96
94)	Tert-Butylbenzene	11.98	119	80964	8.54	ppb		96
95)	1,2,4-Trimethylbenzene	12.03	105	88158	9.03	ppb		99
96)	Sec-Butylbenzene	12.22	105	102680	9.26	ppb		97
97)	p-Isopropyltoluene	12.39	119	93345	9.12	ppb		98
98)	Benzyl Chloride	12.57	91	31240	10.45	ppb	#	93
99)	1,3-DCB	12.32	146	64185	9.50	ppb		98
100)	1,4-DCB	12.42	146	66568	10.17	ppb		97
101)	n-Butylbenzene	12.83	91	69607	8.68	ppb		97
102)	1,2-DCB	12.82	146	63261	9.28	ppb		94
103)	Hexachloroethane	13.12	201	21379	11.07	ppb		92
104)	1,2-Dibromo-3-chloropropan	13.66	157	7229	9.97	ppb		91
105)	1,2,4-Trichlorobenzene	14.59	180	51857	10.28	ppb		100
106)	Hexachlorobutadiene	14.79	225	26909	10.26	ppb		97
107)	Naphthalene	14.85	127	12431	10.10	ppb		81
108)	1,2,3-Trichlorobenzene	15.12	180	52599	10.58	ppb		93

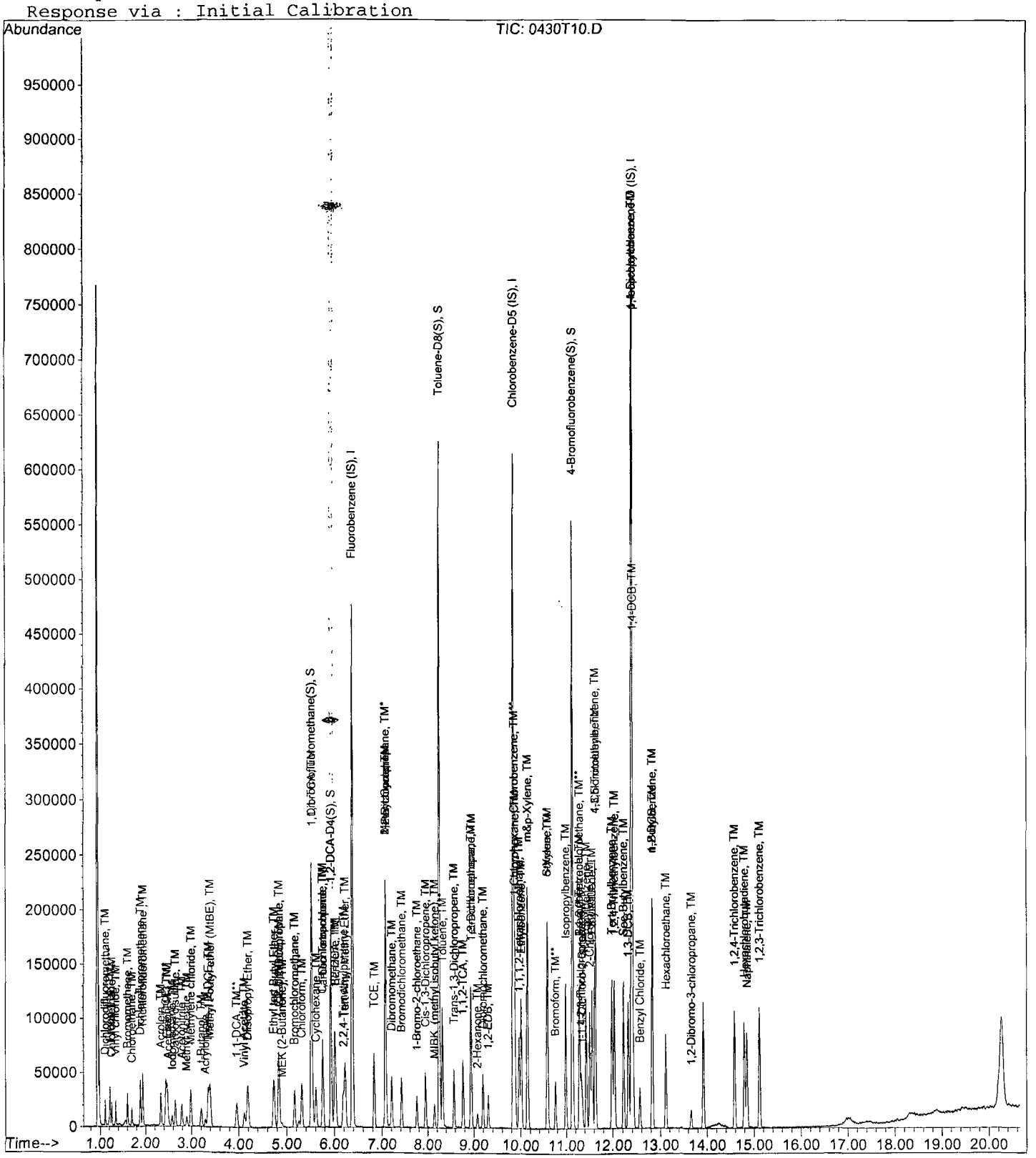
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T10.D Vial: 3
Acq On : 30 Apr 20 12:41 Operator:
Sample : 200430B LCSD 10ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

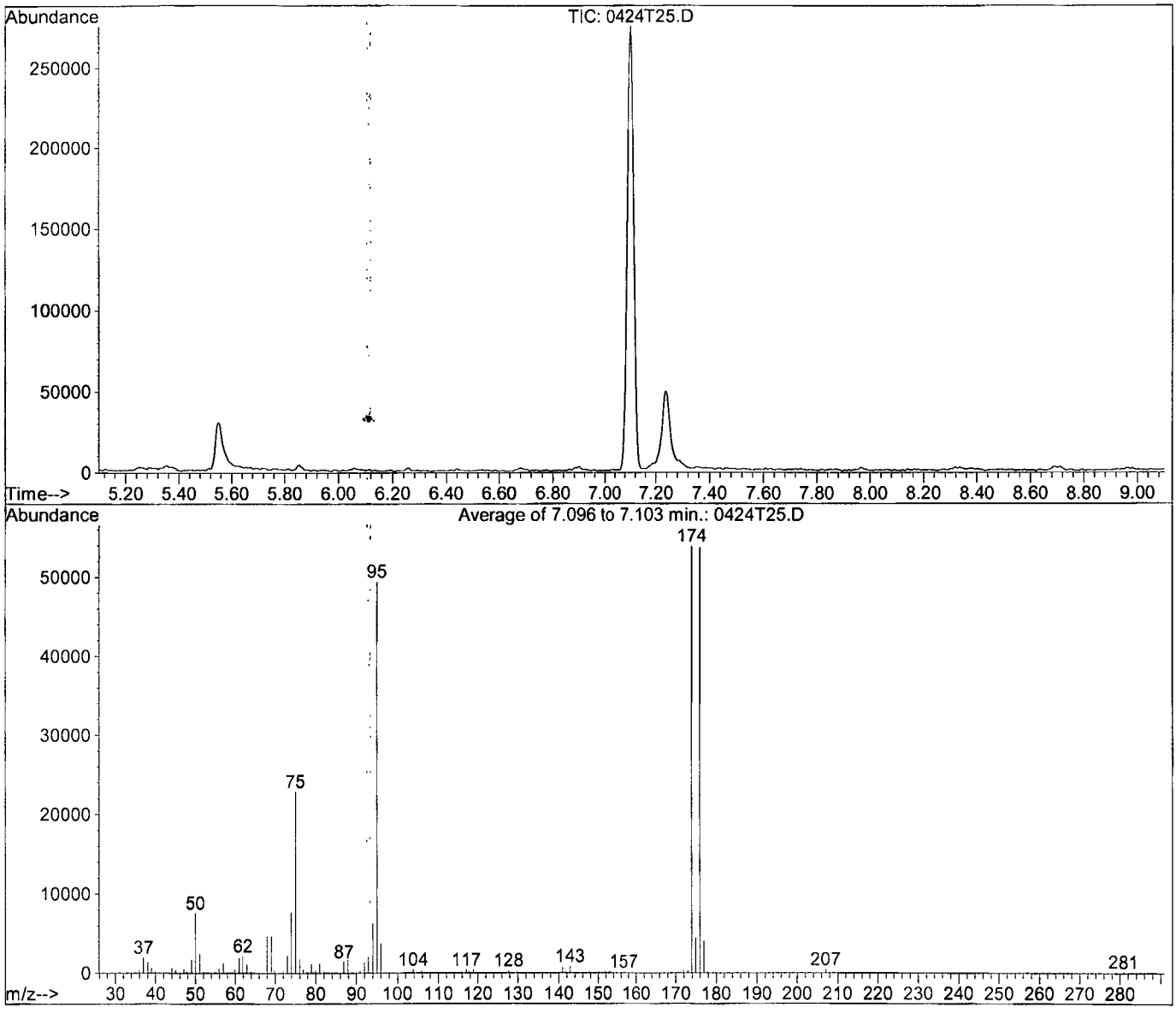
Quant Time: May 1 11:34 2020 Quant Results File: T0424W.RES

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Data File : M:\THOR\DATA\T200424\0424t25.D Vial: 1
Acq On : 24 Apr 20 13:38 Operator:
Sample : 25ug/mL BFB STD 3/25/20 Inst : Thor
Misc : 2uL Multiplr: 1.00

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B



Spectrum Information: Average of 7.096 to 7.103 min.

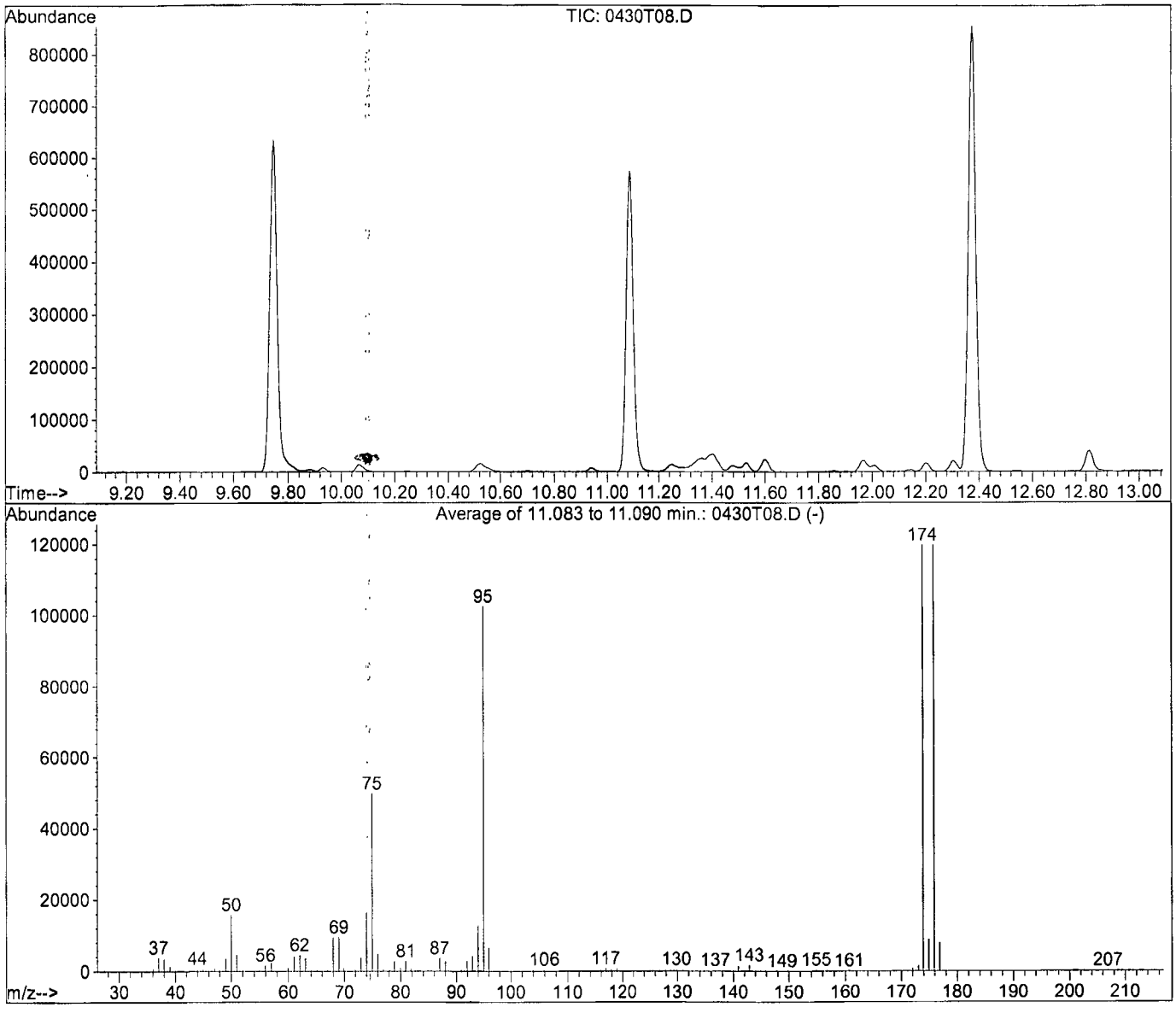
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	15.2	7516	PASS
75	95	30	60	46.2	22856	PASS
95	95	100	100	100.0	49459	PASS
96	95	5	9	7.5	3727	PASS
173	174	0.00	2	0.5	281	PASS
174	95	50	200	109.0	53909	PASS
175	174	5	9	8.1	4383	PASS
176	174	95	101	99.6	53704	PASS
177	176	5	9	7.6	4055	PASS

BFB

Data File : M:\THOR\DATA\T200424\0430t08.D
Acq On : 30 Apr 20 11:46
Sample : 25ug/mL BFB STD 3/25/20
Misc : IS&S 3/17/20, 4/7/20

Vial: 1
Operator:
Inst : Thor
Multiplr: 1.00

Method : M:\THOR\DATA\T200424\T0424W.M (RTE Integrator)
Title : METHOD 8260B



Spectrum Information: Average of 11.083 to 11.090 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	15.3	15698	PASS
75	95	30	60	48.7	49824	PASS
95	95	100	100	100.0	102333	PASS
96	95	5	9	6.2	6313	PASS
173	174	0.00	2	1.3	1514	PASS
174	95	50	200	117.0	119736	PASS
175	174	5	9	7.4	8877	PASS
176	174	95	101	100.0	119725	PASS
177	176	5	9	6.7	8012	PASS

0430t08.D T0424W.M Fri May 01 12:01:05 2020

Thor 8260 Standard Prep

Thor 8260 Water Calibration Curve

0.3ug/L

Prepared By (Initials): CH

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	0.3ug/L	5	Prepared 04/14/20	06/13/20	N/A	3uL	50mL	P&T Water	0.3
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	3uL			5
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	3uL			0.3
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	2uL			10

0.5ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	0.5ug/L	5	Prepared 04/14/20	06/13/20	N/A	5uL	50mL	P&T Water	0.5
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			10
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	5uL			0.5
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	5uL			25

1.0ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	1.0ug/L	5	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	1
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			20
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	10uL			1
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	10uL			50

2.0ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	2.0ug/L	5	Prepared 04/14/20	06/13/20	N/A	20uL	50mL	P&T Water	2
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			30
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	20uL			2
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	15uL			75

5ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	5ug/L	50	Prepared 04/14/20	06/13/20	N/A	5uL	50mL	P&T Water	5
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	5uL			5
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			40
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			5
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	20uL			100

10ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	10ug/L	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			50
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	25uL			125

20ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	20ug/L	50	Prepared 04/14/20	06/13/20	N/A	20uL	50mL	P&T Water	20
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	20uL			20
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			60
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			20
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	30uL			150

40ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	40ug/L	50	Prepared 04/14/20	06/13/20	N/A	40uL	50mL	P&T Water	40
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	40uL			40
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	40uL			80
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	40uL			40
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	35uL			175

100ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	100ug/L	50	Prepared 04/14/20	06/13/20	N/A	100uL	50mL	P&T Water	100
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	100uL			100
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	100uL			100
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	100uL			100
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	40uL			200

Thor 8260 Water Second Source (SS)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. Gases	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 3	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. 2-CEVE	Absolute	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 6	Various	8260 Water SS	50	Prepared 04/14/20	04/22/20	N/A	10uL			10
VOA STD. 0	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
Voa STD. TBA	Various	8260 Water SS	250	Prepared 04/14/20	04/02/20	N/A	25uL			250

8260 Water Continuing Calibrations (CCV)/ Lab Control Spikes (LCS)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 04/25/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	CCV/ LCS	50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 2	O2SI	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. TBA	Various	CCV/ LCS	250	Prepared 04/14/20	05/06/20	N/A	25uL			125

LCS (X4 Ketones)

Prepared: 04/24/20

Prepared By (Initials): CH

Expires: 04/25/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	LCS X4 Ketones	50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 2	O2SI	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	40uL			40
VOA STD. TBA	Various	LCS X4 Ketones	250	Prepared 04/14/20	05/06/20	N/A	25uL			125

Primary and Secondary Working Standards

Primary Standards

VOA STD 7

Prepared: 04/14/20 A
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Gasses STD	Phenova	ALO-101206	2,000	CL14053-49896	04/14/21	10/31/24	100uL	4mL	Methanol	50
Hexachloroethane	Absolute	70199	1,000	091818-49911	04/14/21	09/18/23	200uL			50
Benzyl Chloride	Accusta	M-8010-01	1,000	011320-49979	04/14/21	01/13/21	200uL			50

VOA STD 8

Prepared: 04/14/20 B
Expires: 05/06/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Additions STD	Phenova	ALO-130175	2,000	CL14058-49891	04/14/21	08/31/21	100uL	4mL	Methanol	50
502.2 Cal. Std.	Phenova	ALO-101200	2,000	CL14379-49943	04/14/21	10/31/24	100uL			50
Vinyl Acetate	Phenova	ALO-101228	2,000	CL15169-50084	04/14/21	05/06/20	100uL			50

VOA STD TBA

Prepared: 04/14/20 C
Expires: 05/06/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOC Mix	Phenova	ALO-130176	2,000	CL12929-49956	04/14/21	11/30/20	500uL	4mL	Methanol	250
Acrolein	Phenova	ALO-130549	10,000	CL15174-50085	04/14/21	05/06/20	100uL			250

VOA STD 1

Prepared: 04/14/20 D
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE	Absolute	82408	2,000	011320-49914	04/14/21	01/13/23	50	2mL	Methanol	50

VOA STD 2

Prepared: 04/14/20 E
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Std.	Phenova	AL0-109211	2,000	CL12730-49961	04/14/21	08/31/28	100	4mL	Methanol	50

VOA STD 9

Prepared: 04/14/20 F
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 7		VOA STD. 9	50	Prepared 04/14/20	04/14/21	N/A	200uL	2mL	Methanol	5
VOA STD. 8			50	Prepared 04/14/20	04/14/21	N/A	200uL			5

VOA STD. 10

Prepared: 04/14/20 G
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 1		VOA STD. 10	50	Prepared 04/14/20	04/14/21	N/A	200uL	2mL	Methanol	5

VOA STD. 12

Prepared: 04/14/20 H
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 2		VOA STD. 12	50	Prepared 04/14/20	04/14/21	N/A	200uL	2mL	Methanol	5

Second Source (SS) Standards

VOA STD. 3

Prepared: 04/14/20 I
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Standard	Phenova	ALO-101211	2,000	CL13994-49966	04/14/21	08/31/29	50uL	2mL	Methanol	50

VOA STD. Gases

Prepared: 04/14/20 J
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
8260 Gases (SS)	Phenova	ALO-101206	2,000	CL14504-49899	04/14/21	10/31/24	50uL	2mL	Methanol	50

VOA STD. 6

Prepared: 04/14/20 K
Expires: 04/22/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
502.2 Calibration STD. (54-compounds)	Phenova	ALO-101200	2,000	CL14381-49947	04/14/21	10/31/24	50uL	2mL	Methanol	50
Vinyl Acetate	Phenova	ALO-101228	2,000	CL15134-50008	04/02/21	04/22/20	50uL			50
Hexachloroethane	Accustan	AS-E0011	1,000	219061767-49989	04/14/21	06/28/29	100uL			50
Benzyl Chloride	Accustan	M-8010-01	200	219041664-49933	04/14/21	12/25/21	500uL			50

VOA STD. TBA

Prepared: 04/14/20 L
Expires: 04/02/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOA Mix (4-3)	Phenova	ALO-130176	2,000	CL12734-49952	04/14/21	08/31/20	250uL	2mL	Methanol	250
Acrolein	Phenova	ALO-101224	10,000	CL15142-50009	04/02/20	04/22/20	50uL			250

VOA STD. 0

Prepared: 04/14/20 M
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Addition STD.	Phenova	ALO-130175	2,000	CL14058-49972	04/14/21	08/31/21	50uL	2mL	Methanol	50

VOA STD. 2-CEVE

Prepared: 04/14/20 N
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE (SS)	Absolute	82408	2,000	121119-49915	04/14/21	12/11/22	50uL	2mL	Methanol	50

Injection Log

Directory: M:\THOR\DATA\T200424\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	0424T25.D	1	25ug/mL BFB STD 3/25/20	2uL	24 Apr 20 13:38
2	0424T27.D	1	0.3ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 14:31
3	0424T28.D	1	0.5ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 14:59
4	0424T29.D	1	1.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 15:27
5	0424T30.D	1	2.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 15:55
6	0424T31.D	1	5.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 16:23
7	0424T32.D	1	10ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 16:50
8	0424T33.D	1	20ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 17:18
9	0424T34.D	1	40ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 17:46
10	0424T35.D	1	100ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 18:14
12	0424T37.D	1	(SS)10ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 19:10
1	0430T08.D	1	25ug/mL BFB STD 3/25/20	IS&S 3/17/20, 4/7/20	30 Apr 20 11:46
2	0430T09.D	1	200430B CCV/LCS 10ug/L	IS&S 3/17/20, 4/7/20	30 Apr 20 12:13
3	0430T10.D	1	200430B LCSD 10ug/L	IS&S 3/17/20, 4/7/20	30 Apr 20 12:41
11	0430T21.D	1	200430B BLK	IS&S 3/17/20, 4/7/20	30 Apr 20 17:22
12	0430T22.D	1	BA10438W01	IS&S 3/17/20, 4/7/20	30 Apr 20 17:50
13	0430T23.D	1	BA10439W01	IS&S 3/17/20, 4/7/20	30 Apr 20 18:18
28	0430T38.D	1	Ending CCV 10ug/l 04/29/20	IS&S 3/17/20, 4/7/20	1 May 20 1:16

ORGANICS
Calibration Data

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/27/20
Matrix: Instrument: Thor Initials: DP

			0424T27 D	0424T28.D	0424T29 D	0424T30 D	0424T31 D	0424T32 D	0424T33 D	0424T34 D	0424T35 D							
		Compound	1	2	3	4	5	6	7	8	9		Avg	%RSD	Type	r^2	Q	MRF
1	I	Fluorobenzene (IS)																
2	S	Dibromofluoromethane(S)	0.3078	0.2602	0.2715	0.2736	0.2648	0.2834	0.2757	0.2768	0.2753		0.28	4.9	S			
3	S	1,2-DCA-D4(S)	0.3499	0.2675	0.2975	0.2941	0.2834	0.3042	0.3007	0.3003	0.2961		0.30	7.4	S			
4	I	Chlorobenzene-D5 (IS)																
5	S	Toluene-D8(S)	1.306	1.025	1.107	1.114	1.052	1.132	1.124	1.121	1.119		1.1	7.0	S			
6	S	4-Bromofluorobenzene(S)	0.5406	0.4031	0.4411	0.4434	0.4370	0.4720	0.4563	0.4551	0.4691		0.46	8.1	S			
7	I	1,4-Dichlorobenzene-D (IS)																
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Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T27.D Vial: 2
Acq On : 24 Apr 20 14:31 Operator:
Sample : 0.3ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	633330	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	552044	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	332191	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	38983	5.56	ppb	0.00
Spiked Amount 25.000			Recovery =	22.256%		
3) 1,2-DCA-D4(S)	5.93	65	44315	5.84	ppb	0.00
Spiked Amount 25.000			Recovery =	23.380%		
5) Toluene-D8(S)	8.25	98	144215	5.82	ppb	0.00
Spiked Amount 25.000			Recovery =	23.280%		
6) 4-Bromofluorobenzene(S)	11.13	95	59687	5.91	ppb	0.00
Spiked Amount 25.000			Recovery =	23.632%		

Target Compounds Qvalue

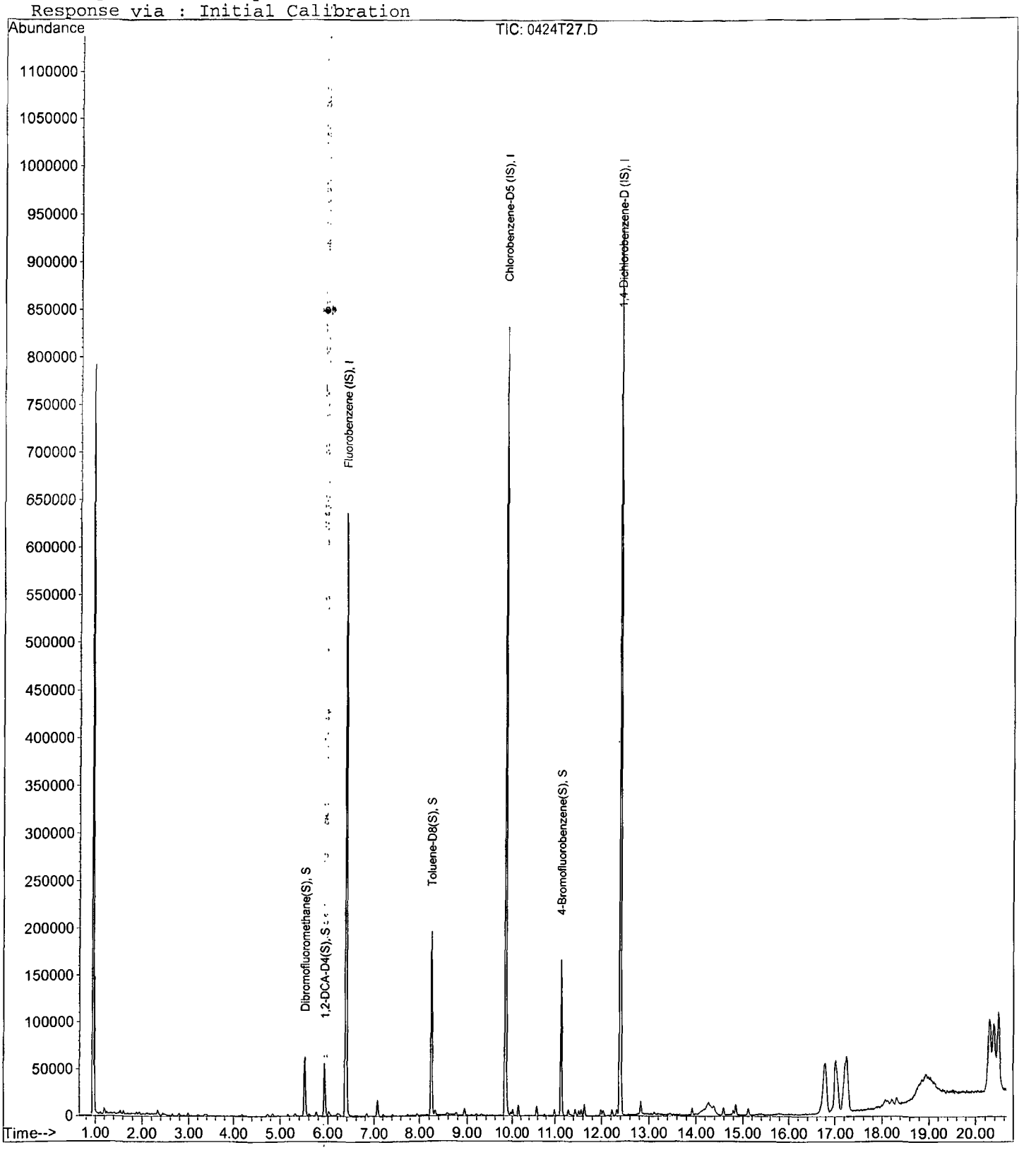
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T27.D Vial: 2
Acq On : 24 Apr 20 14:31 Operator:
Sample : 0.3ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T28.D Vial: 3
Acq On : 24 Apr 20 14:59 Operator:
Sample : 0.5ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	628870	25.00 ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	555532	25.00 ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	335709	25.00 ppb	0.00
System Monitoring Compounds					
2) Dibromofluoromethane(S)	5.52	111	65447	9.41 ppb	0.00
Spiked Amount 25.000			Recovery	= 37.632%	
3) 1,2-DCA-D4(S)	5.93	65	67289	8.94 ppb	0.00
Spiked Amount 25.000			Recovery	= 35.752%	
5) Toluene-D8(S)	8.25	98	227746	9.13 ppb	0.00
Spiked Amount 25.000			Recovery	= 36.532%	
6) 4-Bromofluorobenzene(S)	11.13	95	89582	8.81 ppb	0.00
Spiked Amount 25.000			Recovery	= 35.244%	

Target Compounds Qvalue

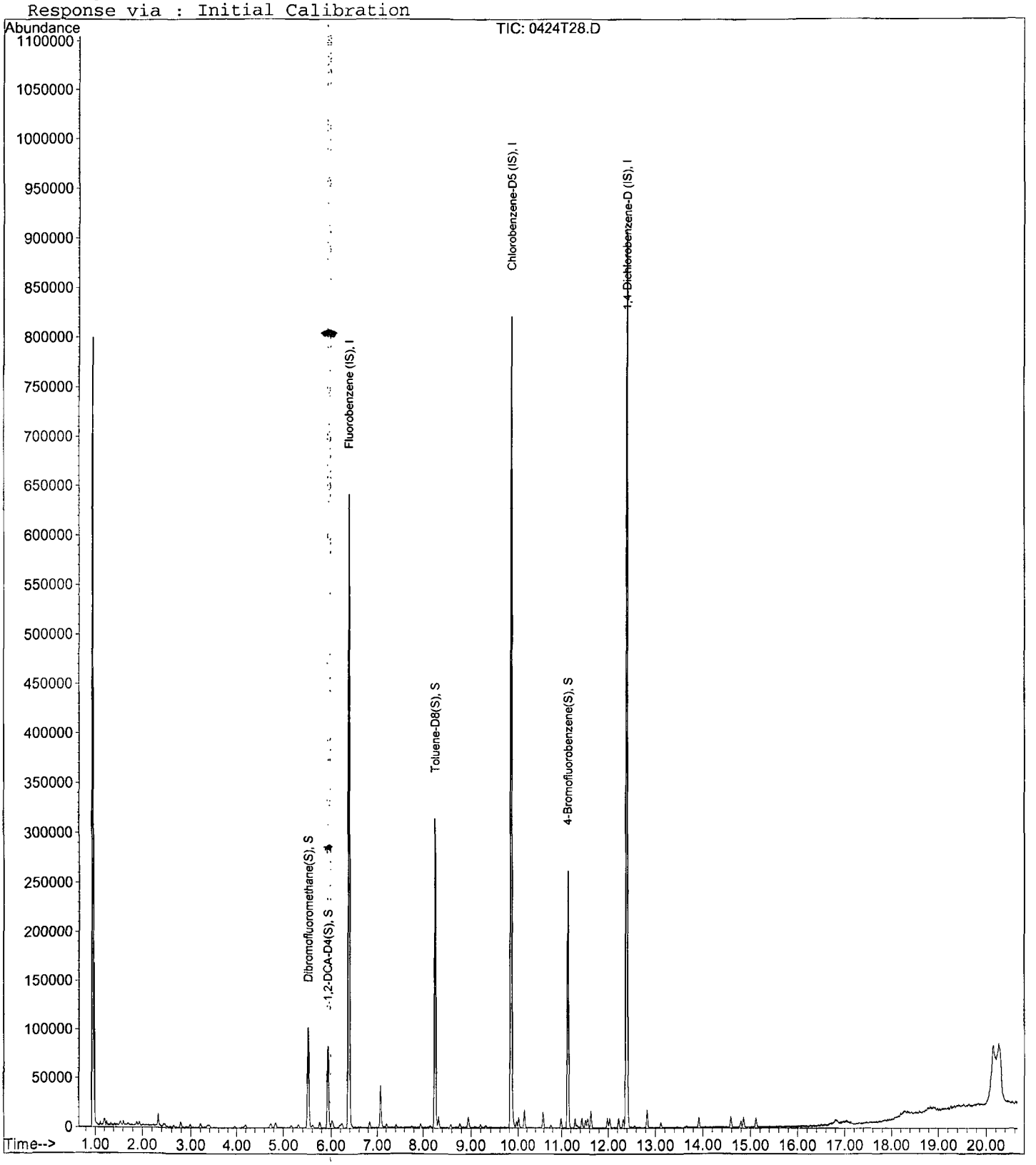
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T28.D Vial: 3
Acq On : 24 Apr 20 14:59 Operator:
Sample : 0.5ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T29.D Vial: 4
Acq On : 24 Apr 20 15:27 Operator:
Sample : 1.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	617973	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	541739	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	325141	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	167798	24.55	ppb	0.00
Spiked Amount 25.000			Recovery =	98.184%		
3) 1,2-DCA-D4(S)	5.93	65	183855	24.85	ppb	0.00
Spiked Amount 25.000			Recovery =	99.404%		
5) Toluene-D8(S)	8.25	98	599887	24.67	ppb	0.00
Spiked Amount 25.000			Recovery =	98.676%		
6) 4-Bromofluorobenzene(S)	11.13	95	238964	24.10	ppb	0.00
Spiked Amount 25.000			Recovery =	96.412%		

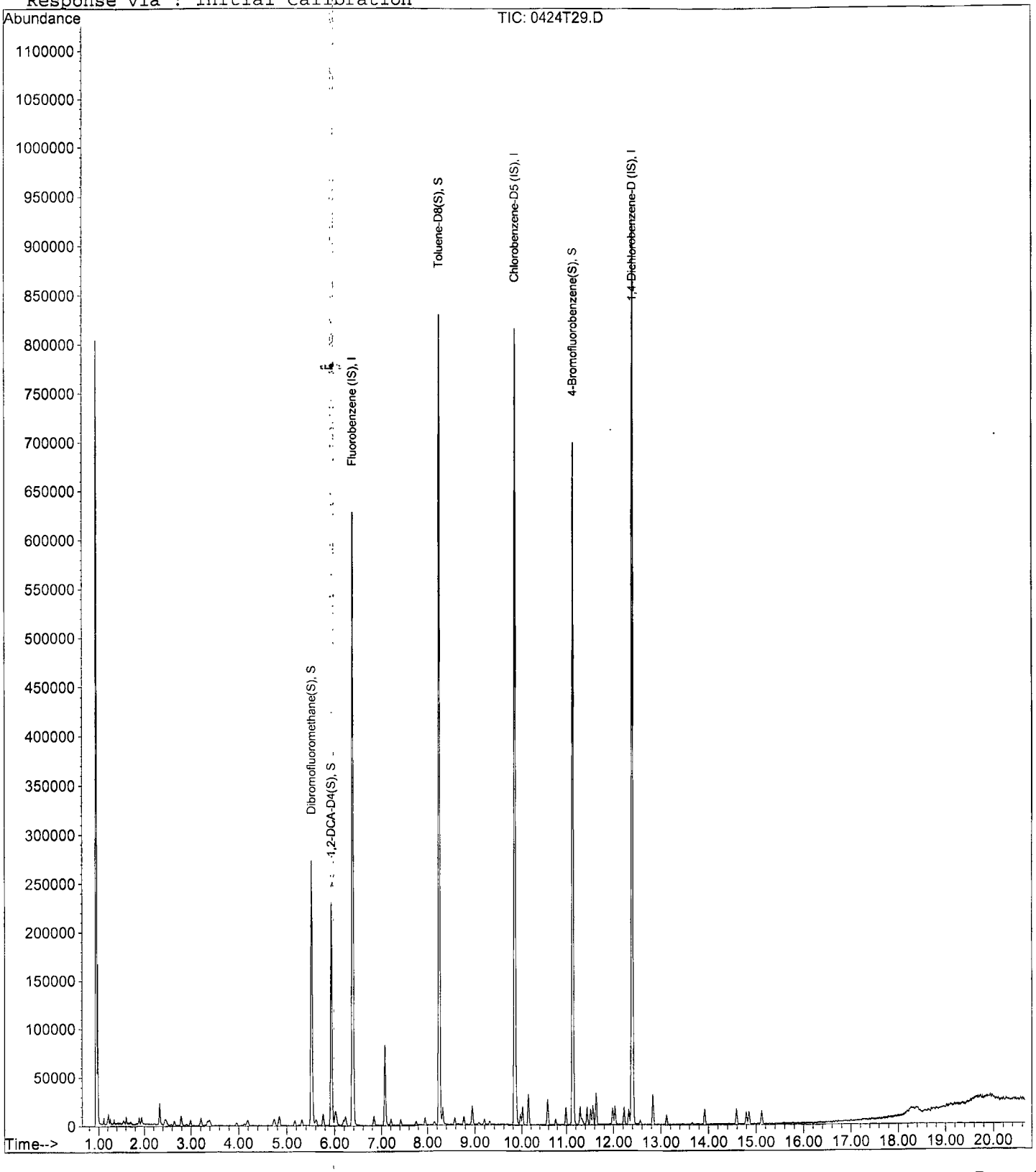
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Data File : M:\THOR\DATA\T200424\0424T29.D Vial: 4
Acq On : 24 Apr 20 15:27 Operator:
Sample : 1.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T30.D Vial: 5
Acq On : 24 Apr 20 15:55 Operator:
Sample : 2.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	606274	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	528656	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	327988	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	331695	49.46	ppb	0.00
Spiked Amount 25.000			Recovery =	197.828%		
3) 1,2-DCA-D4(S)	5.93	65	356597	49.13	ppb	0.00
Spiked Amount 25.000			Recovery =	196.524%		
5) Toluene-D8(S)	8.25	98	1177925	49.64	ppb	0.00
Spiked Amount 25.000			Recovery =	198.552%		
6) 4-Bromofluorobenzene(S)	11.13	95	468783	48.45	ppb	0.00
Spiked Amount 25.000			Recovery =	193.816%		

Target Compounds Qvalue

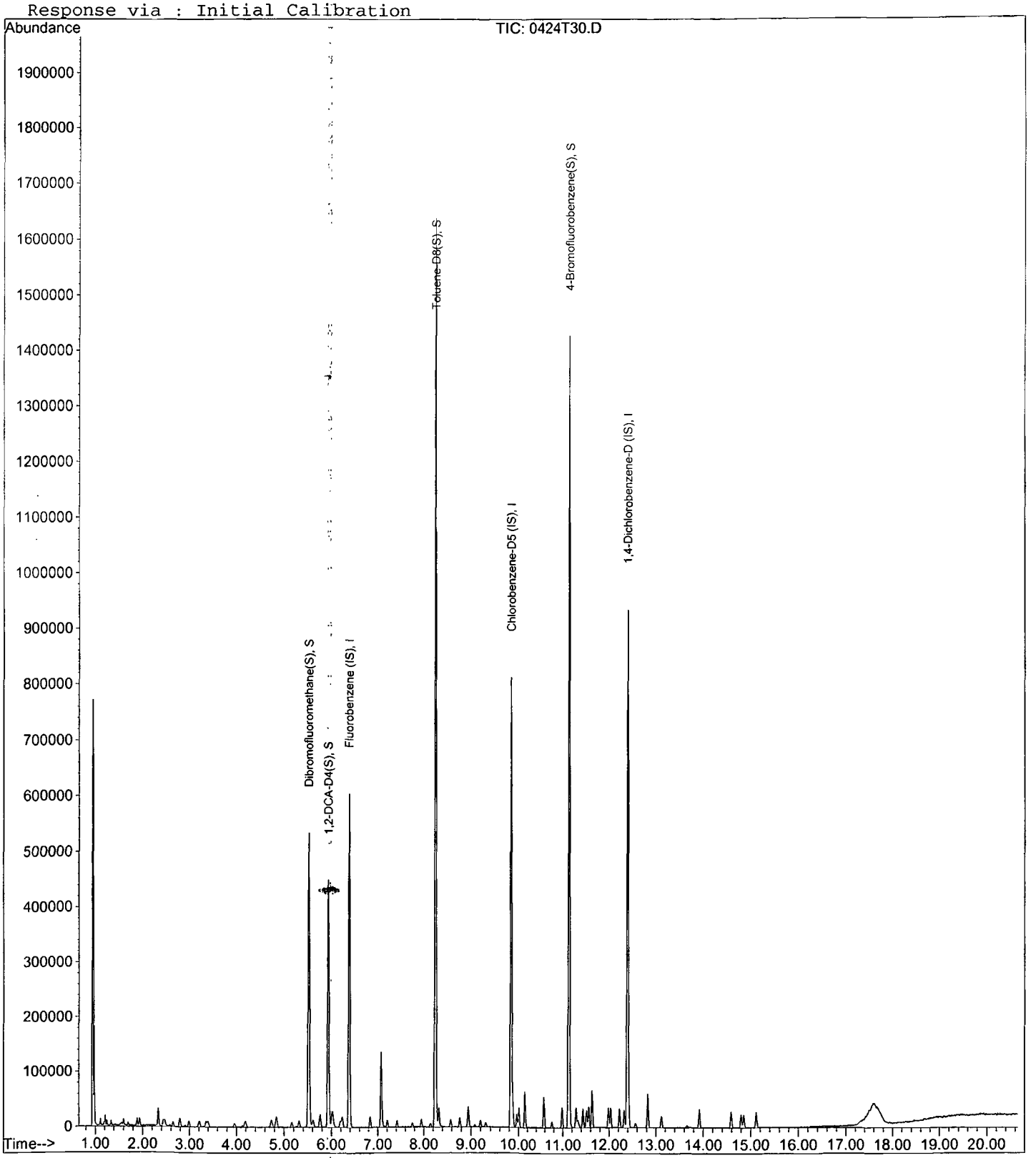
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T30.D Vial: 5
Acq On : 24 Apr 20 15:55 Operator:
Sample : 2.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T31.D Vial: 6
Acq On : 24 Apr 20 16:23 Operator:
Sample : 5.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	602684	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	540454	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	335907	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	638292	95.74	ppb	0.00
Spiked Amount 25.000			Recovery = 382.956%			
3) 1,2-DCA-D4(S)	5.93	65	683254	94.70	ppb	0.00
Spiked Amount 25.000			Recovery = 378.788%			
5) Toluene-D8(S)	8.25	98	2273371	93.71	ppb	0.00
Spiked Amount 25.000			Recovery = 374.836%			
6) 4-Bromofluorobenzene(S)	11.13	95	944760	95.52	ppb	0.00
Spiked Amount 25.000			Recovery = 382.076%			

Target Compounds Qvalue

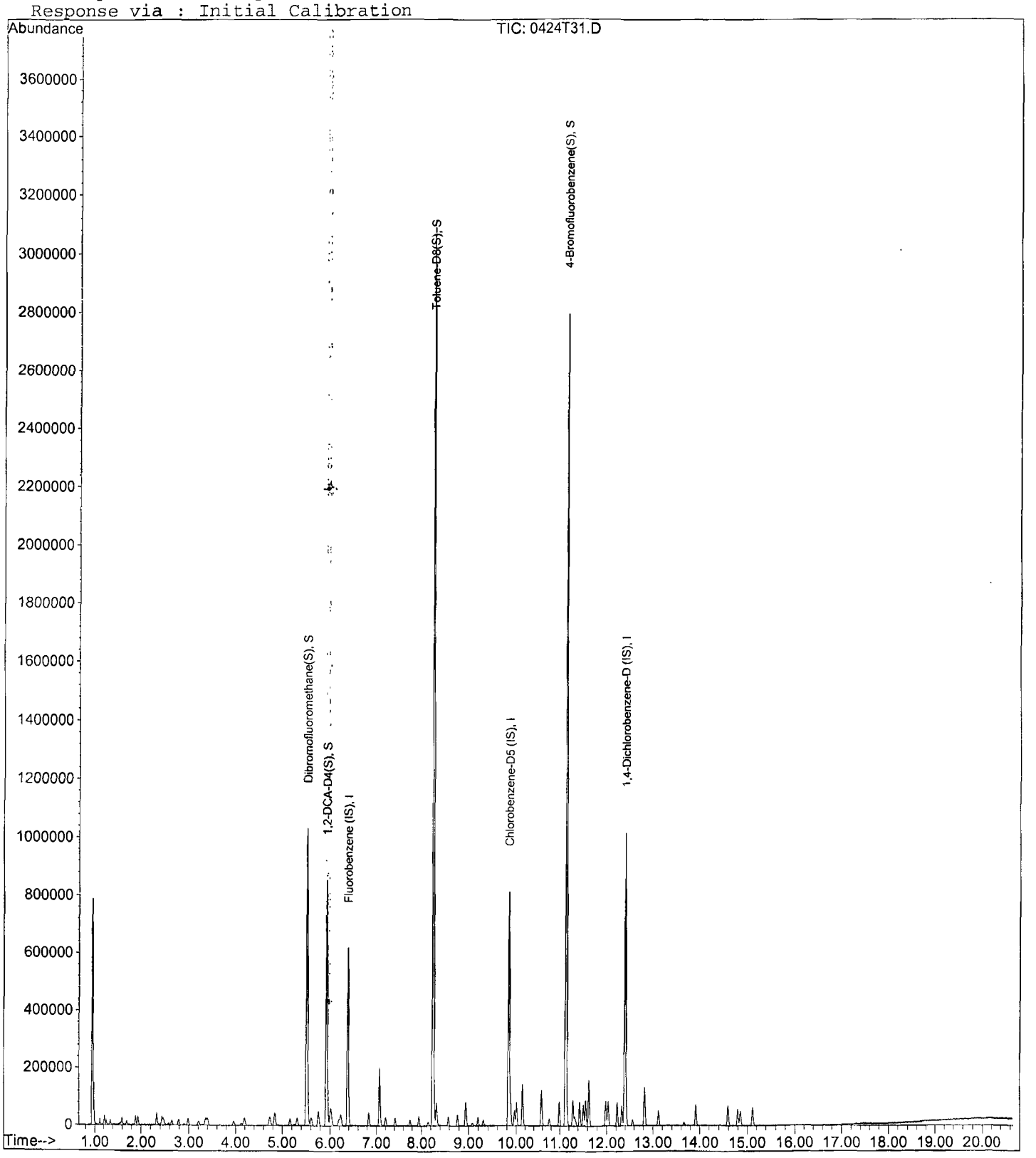
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T31.D Vial: 6
Acq On : 24 Apr 20 16:23 Operator:
Sample : 5.0ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T32.D Vial: 7
Acq On : 24 Apr 20 16:50 Operator:
Sample : 10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	605202	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	531673	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	337525	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	171517	25.62	ppb	0.00
Spiked Amount 25.000			Recovery = 102.476%			
3) 1,2-DCA-D4(S)	5.93	65	184080	25.41	ppb	0.00
Spiked Amount 25.000			Recovery = 101.628%			
5) Toluene-D8(S)	8.25	98	601842	25.22	ppb	0.00
Spiked Amount 25.000			Recovery = 100.872%			
6) 4-Bromofluorobenzene(S)	11.13	95	250949	25.79	ppb	0.00
Spiked Amount 25.000			Recovery = 103.164%			

Target Compounds Qvalue

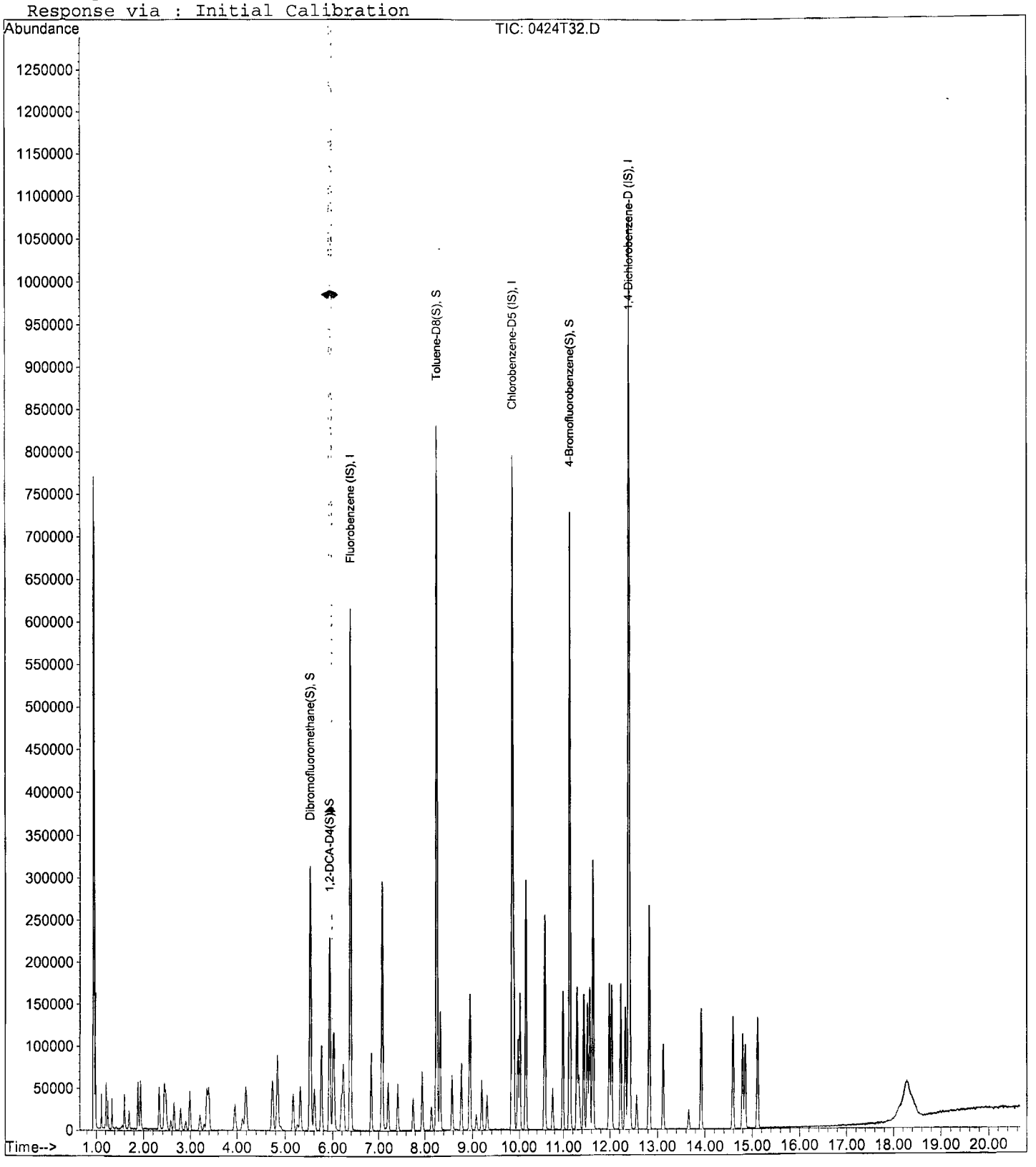
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T32.D Vial: 7
Acq On : 24 Apr 20 16:50 Operator:
Sample : 10ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T33.D Vial: 8
Acq On : 24 Apr 20 17:18 Operator:
Sample : 20ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	606353	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	530559	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	343364	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	167194	24.93	ppb	0.00
Spiked Amount 25.000			Recovery = 99.704%			
3) 1,2-DCA-D4(S)	5.93	65	182313	25.12	ppb	0.00
Spiked Amount 25.000			Recovery = 100.460%			
5) Toluene-D8(S)	8.25	98	596370	25.04	ppb	0.00
Spiked Amount 25.000			Recovery = 100.164%			
6) 4-Bromofluorobenzene(S)	11.13	95	242082	24.93	ppb	0.00
Spiked Amount 25.000			Recovery = 99.728%			

Target Compounds Qvalue

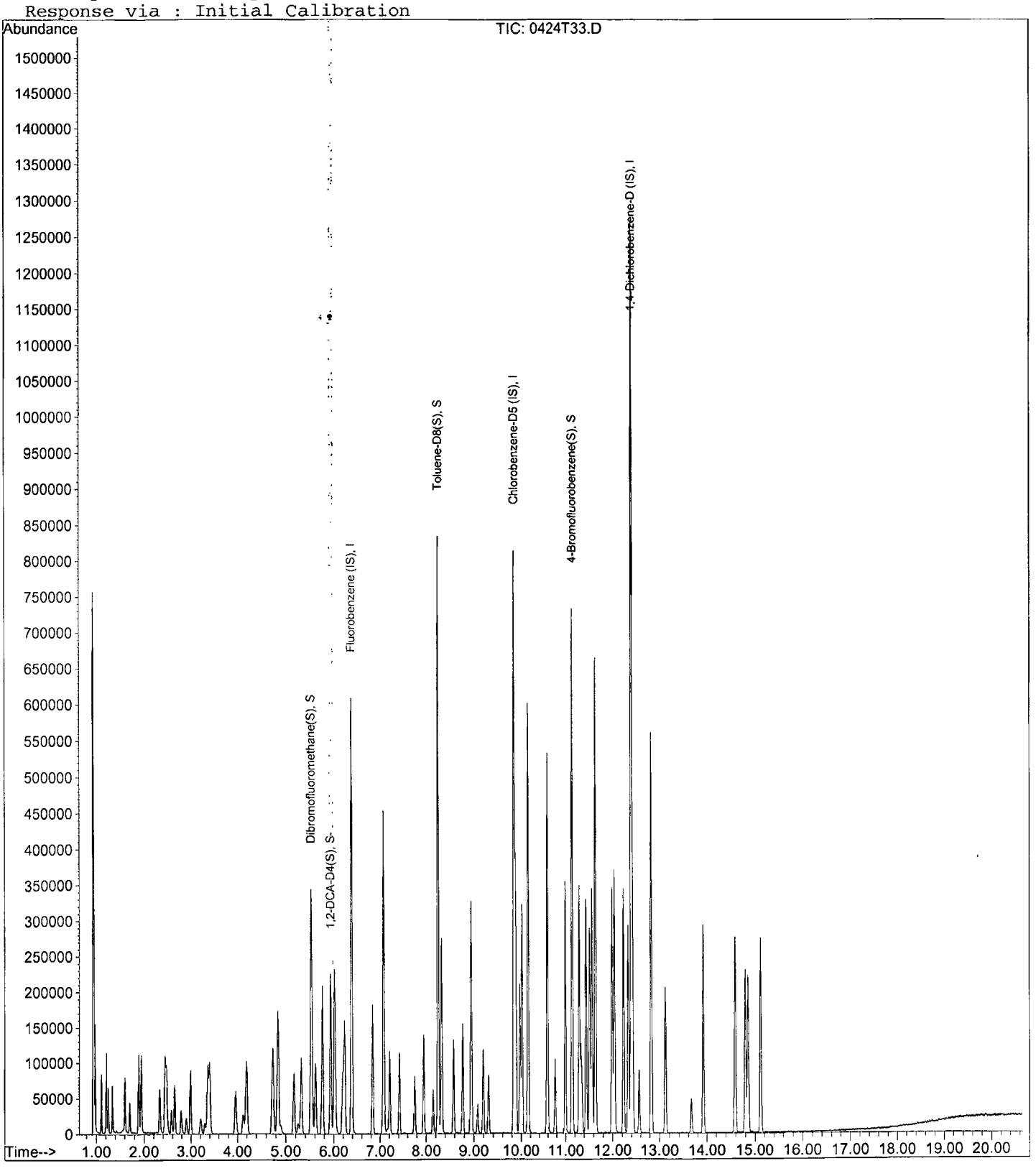
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T33.D Vial: 8
Acq On : 24 Apr 20 17:18 Operator:
Sample : 20ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T34.D Vial: 9
Acq On : 24 Apr 20 17:46 Operator:
Sample : 40ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	607670	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	542766	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	351135	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	168193	25.02	ppb	0.00
Spiked Amount 25.000			Recovery = 100.084%			
3) 1,2-DCA-D4(S)	5.93	65	182478	25.08	ppb	0.00
Spiked Amount 25.000			Recovery = 100.332%			
5) Toluene-D8(S)	8.25	98	608300	24.97	ppb	0.00
Spiked Amount 25.000			Recovery = 99.868%			
6) 4-Bromofluorobenzene(S)	11.13	95	246989	24.87	ppb	0.00
Spiked Amount 25.000			Recovery = 99.460%			

Target Compounds Qvalue

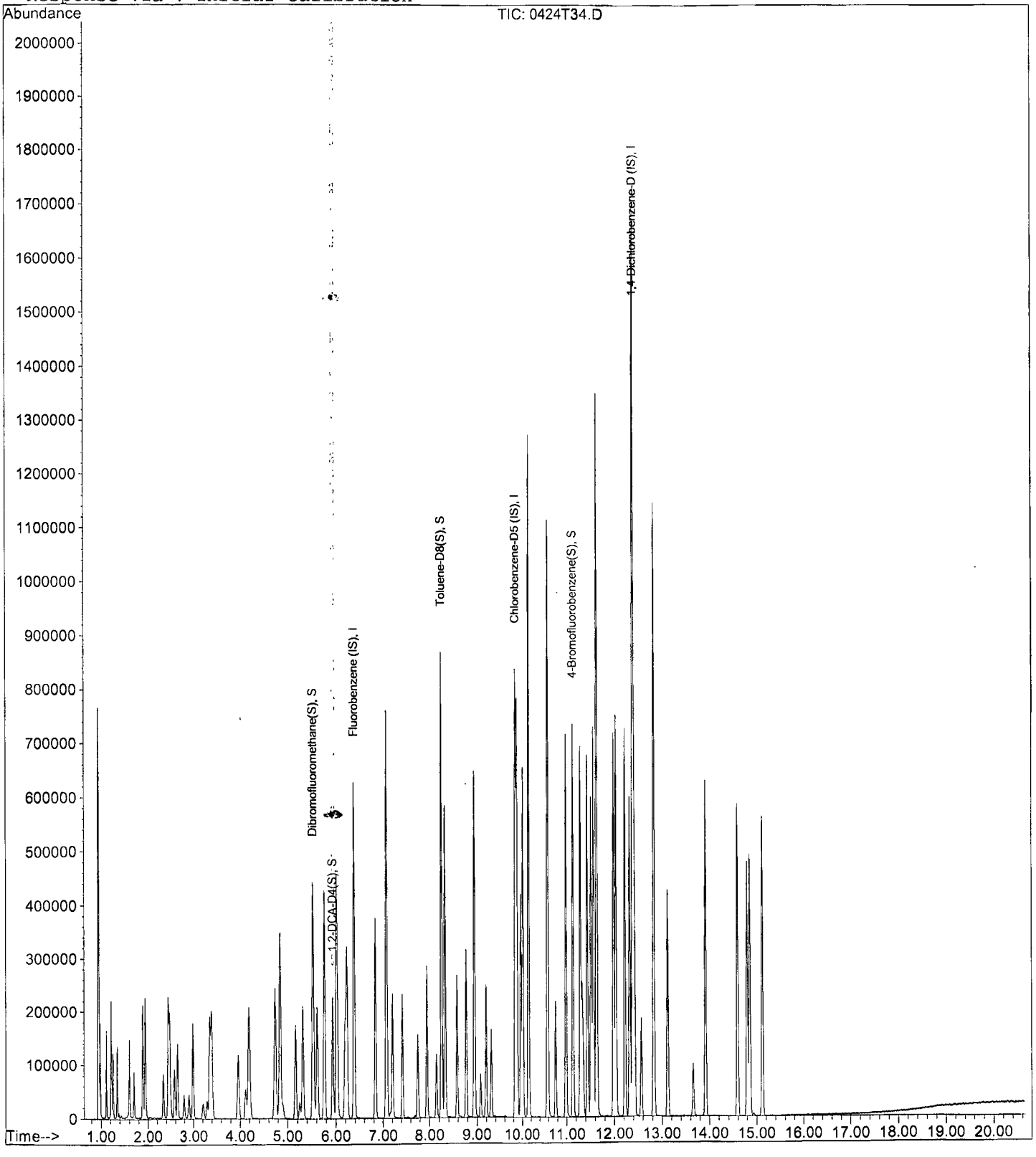
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T34.D Vial: 9
Acq On : 24 Apr 20 17:46 Operator:
Sample : 40ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0424T35.D Vial: 10
Acq On : 24 Apr 20 18:14 Operator:
Sample : 100ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	610400	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	542481	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	368942	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	168030	24.88	ppb	0.00
Spiked Amount 25.000			Recovery = 99.540%			
3) 1,2-DCA-D4(S)	5.93	65	180754	24.74	ppb	0.00
Spiked Amount 25.000			Recovery = 98.940%			
5) Toluene-D8(S)	8.25	98	607029	24.93	ppb	0.00
Spiked Amount 25.000			Recovery = 99.712%			
6) 4-Bromofluorobenzene(S)	11.13	95	254493	25.63	ppb	0.00
Spiked Amount 25.000			Recovery = 102.536%			

Target Compounds Qvalue

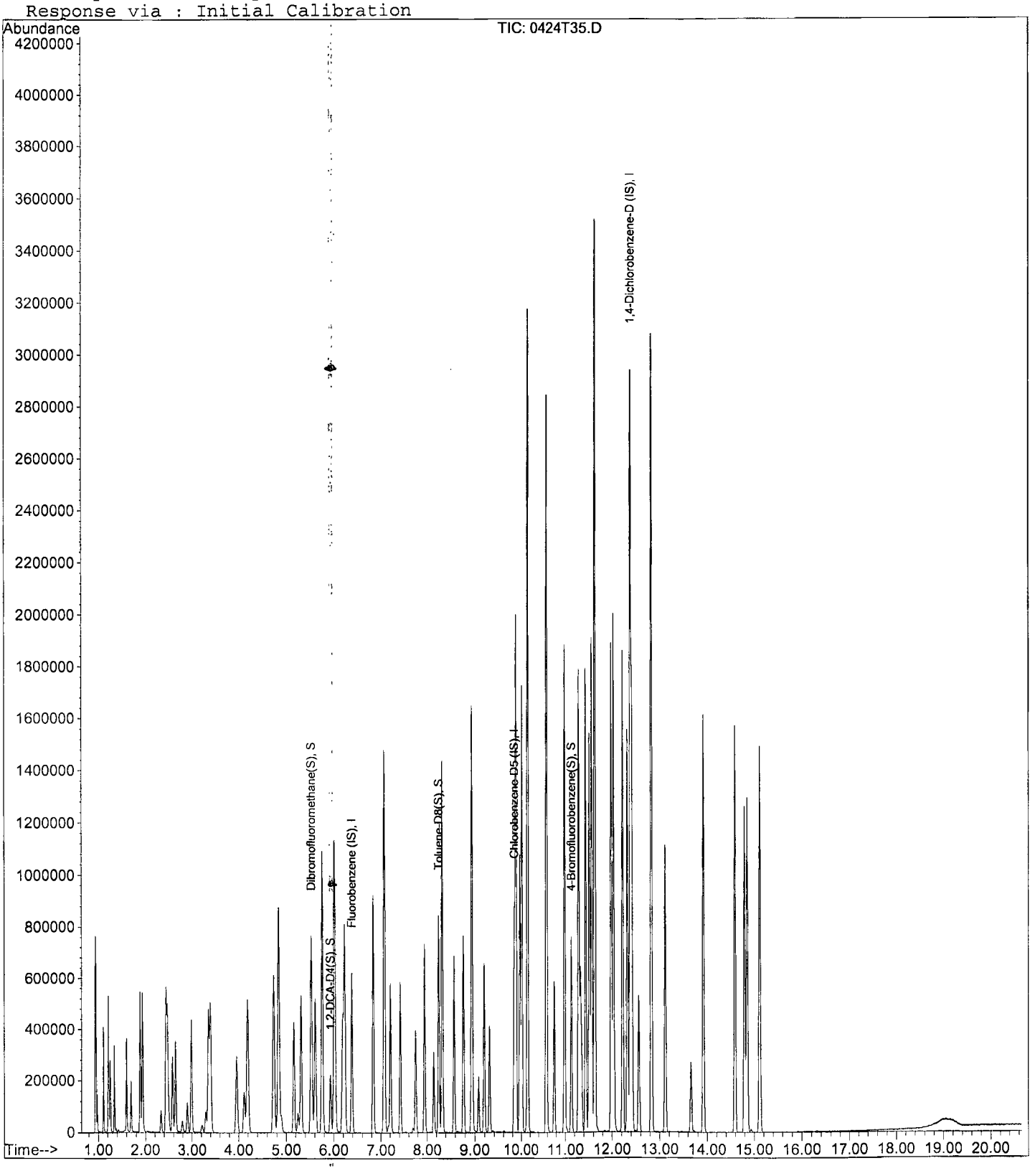
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0424T35.D Vial: 10
Acq On : 24 Apr 20 18:14 Operator:
Sample : 100ug/L VOC STD 4/24/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 11:23 2020 Quant Results File: TSUR0424.RES

Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/24/20
Matrix: Instrument: Thor
Initials: DP

0427T03 D 0427T04 D 0427T05 D 0427T06 D 0427T07 D 0427T08 D 0427T09.D

		Compound	1	2	3	4	5	6	7				Avg	%RSD	Type	r^2	Q	MRF
1	I	Fluorobenzene (IS)																
2	TMHBL	Gasoline C6-C10	14.3	5.914	3.054	1.175	0.8139	0.6933	0.6159				3.8	132	TMHBL	0.994		
3	I	Chlorobenzene-D5 (IS)																
4	I	1,4-Dichlorobenzene-D (IS)																
5																		
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Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T03.D Vial: 2
Acq On : 27 Apr 20 10:27 Operator:
Sample : 20ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:45 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	598775	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	770841	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	856942	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6830780m	20.95	ppb	100

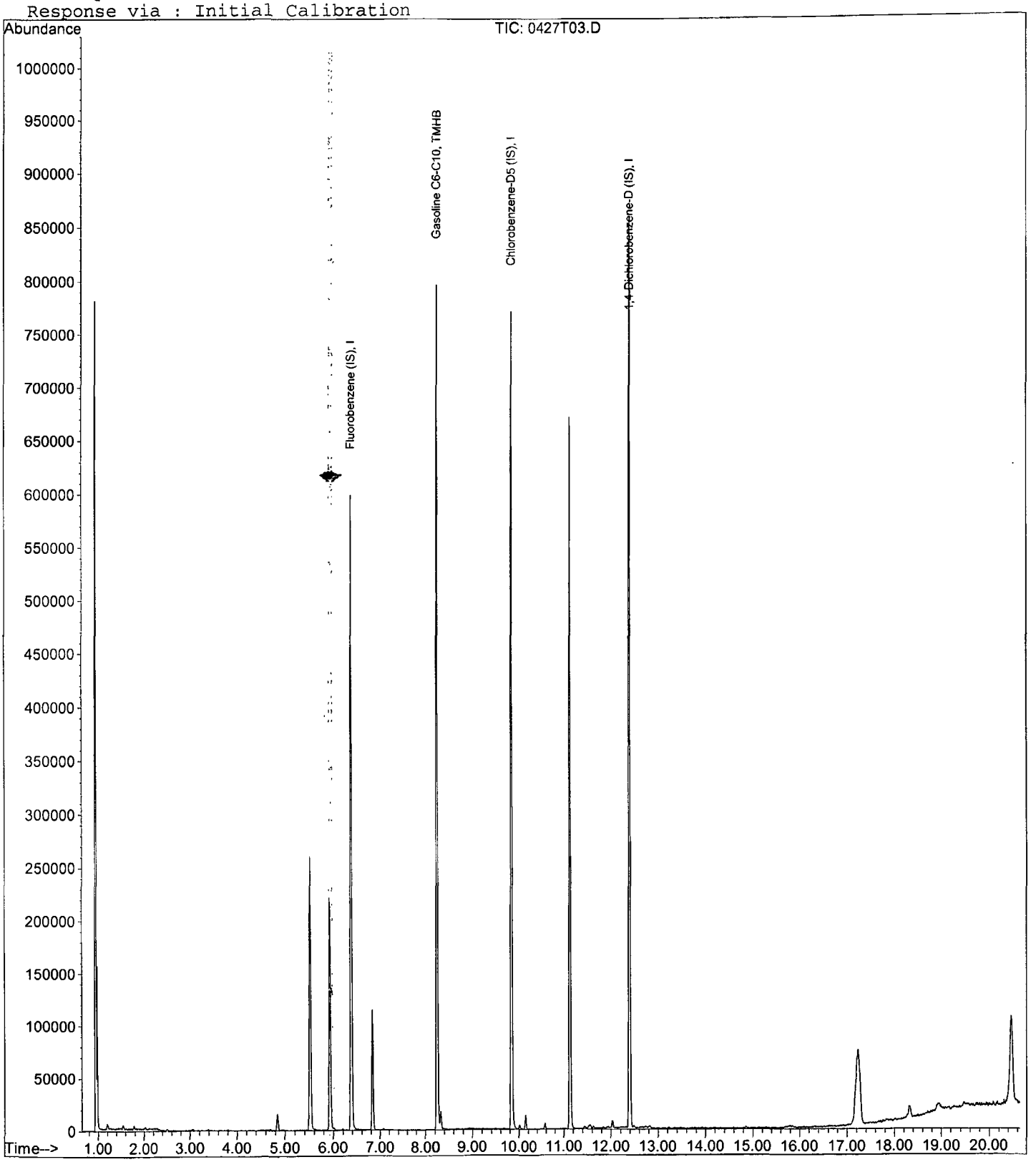
(#) = qualifier out of range (m) = manual integration
0427T03.D TGAS0427.M Wed May 06 13:06:41 2020 Page 1

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T03.D Vial: 2
Acq On : 27 Apr 20 10:27 Operator:
Sample : 20ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:45 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T04.D Vial: 3
Acq On : 27 Apr 20 10:55 Operator:
Sample : 50ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:45 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	571536	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	752701	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	861970	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6759670m	47.33	ppb	100

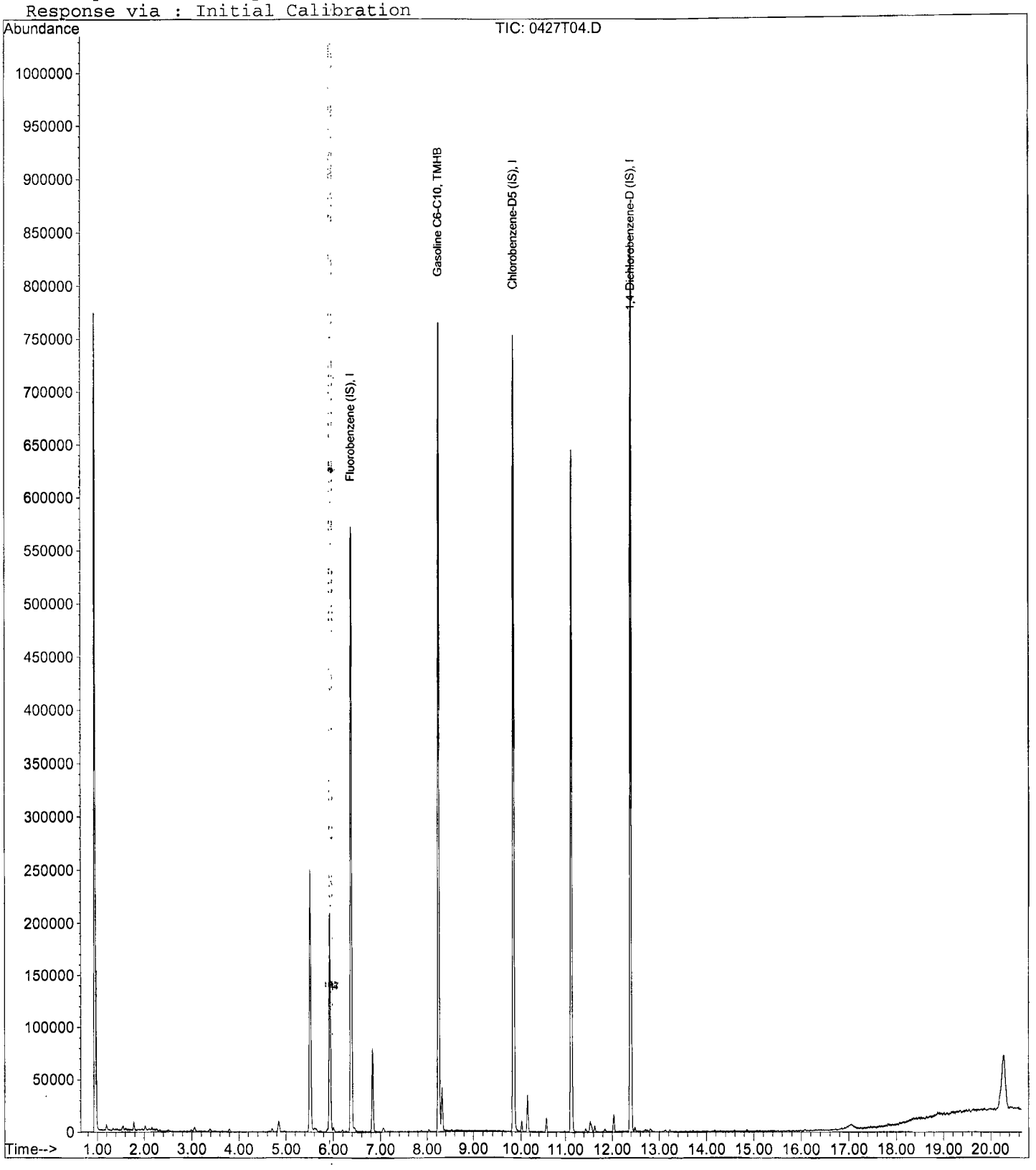
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T04.D Vial: 3
Acq On : 27 Apr 20 10:55 Operator:
Sample : 50ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:45 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T05.D Vial: 4
Acq On : 27 Apr 20 11:23 Operator:
Sample : 100ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	577561	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	746938	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	853116	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	7055454m	70.36	ppb	100

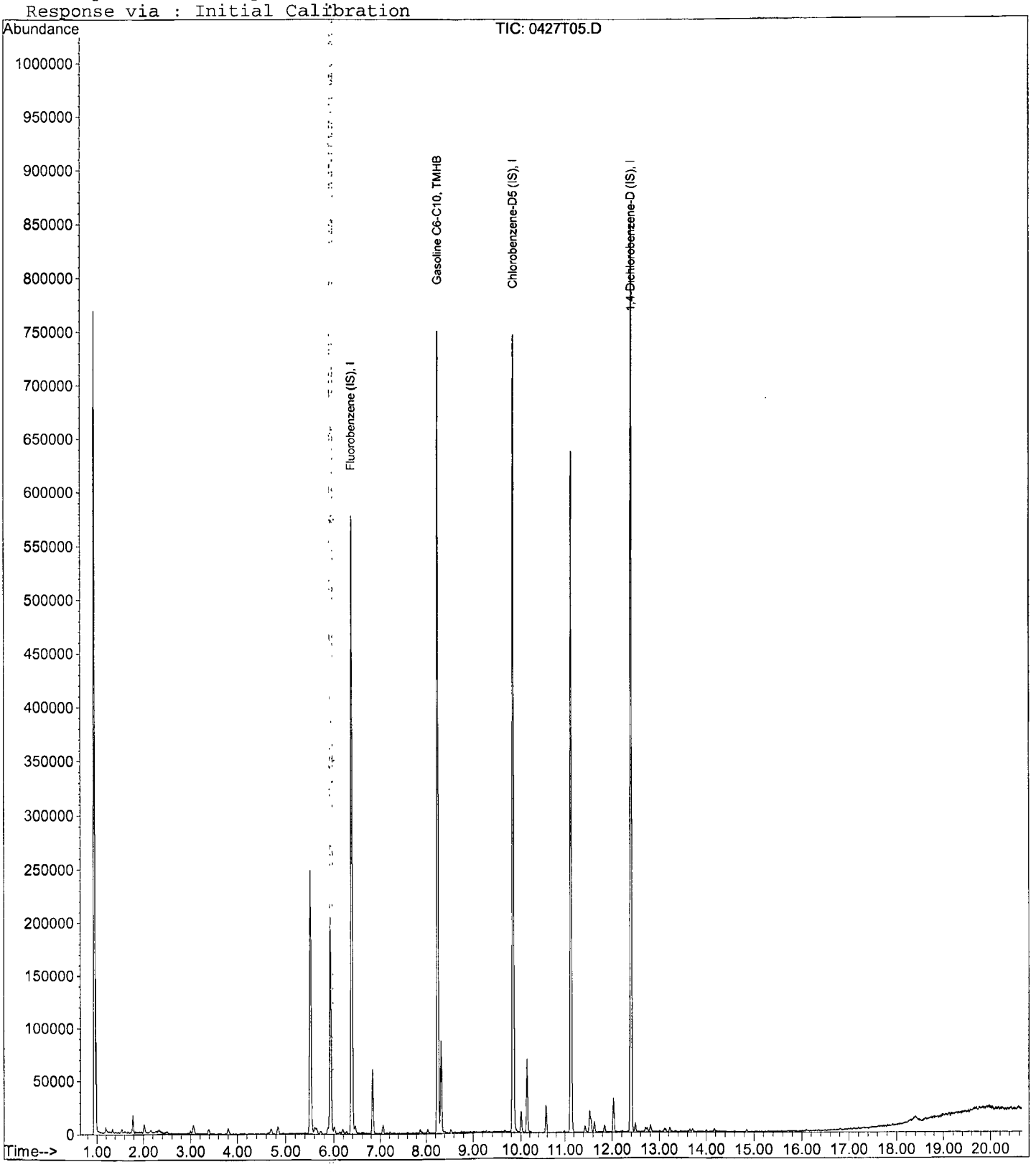
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T05.D Vial: 4
Acq On : 27 Apr 20 11:23 Operator:
Sample : 100ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T06.D Vial: 5
Acq On : 27 Apr 20 11:51 Operator:
Sample : 300ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	579412	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	745628	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	853726	25.00 ppb	0.00
System Monitoring Compounds					
Target Compounds					Qvalue
2) Gasoline C6-C10	8.25	TIC	8172672m	186.68 ppb	100

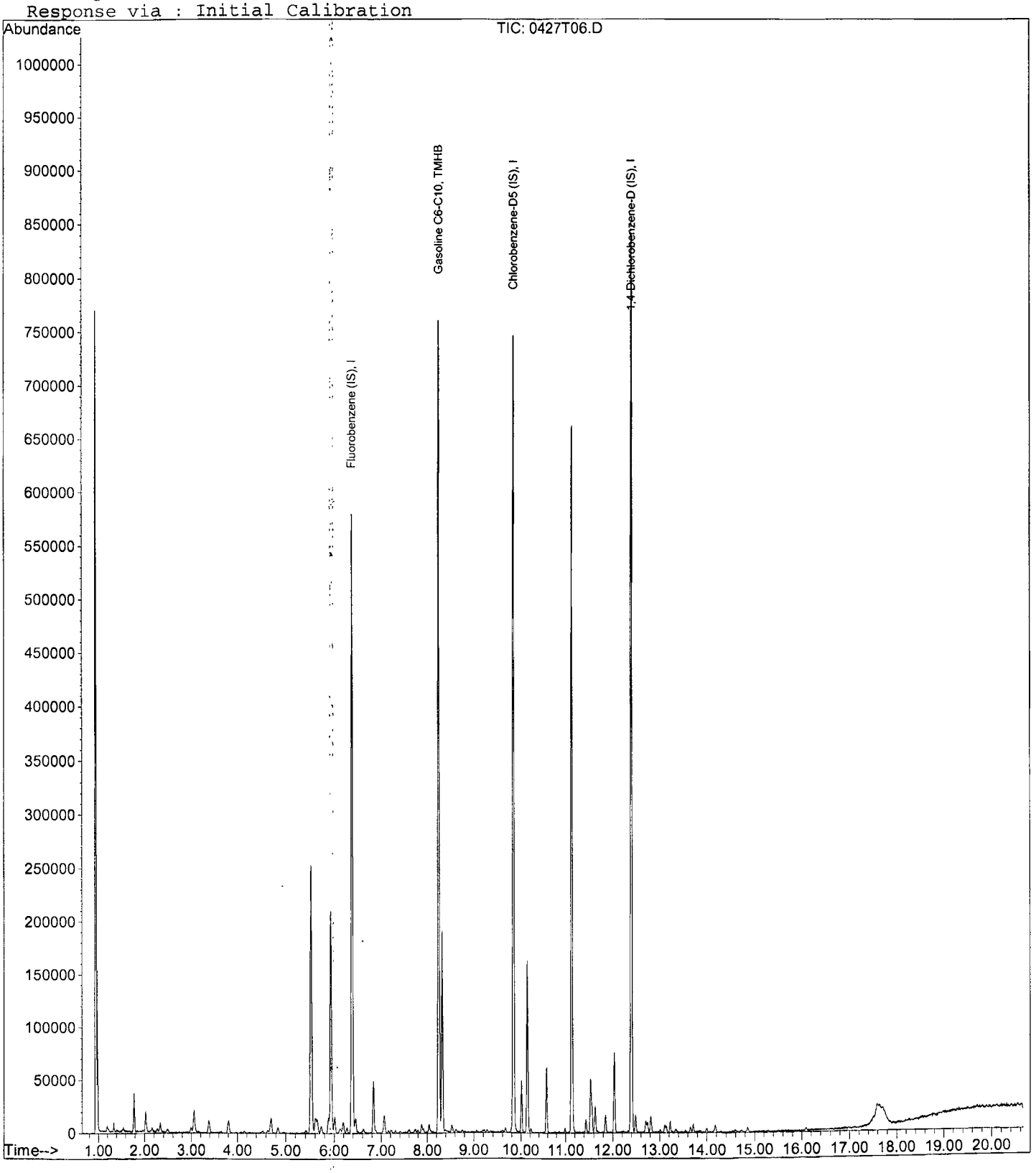
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T06.D Vial: 5
Acq On : 27 Apr 20 11:51 Operator:
Sample : 300ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T07.D Vial: 6
Acq On : 27 Apr 20 12:19 Operator:
Sample : 600ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	562866	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	756491	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	841114	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	10994130m	515.55	ppb	100

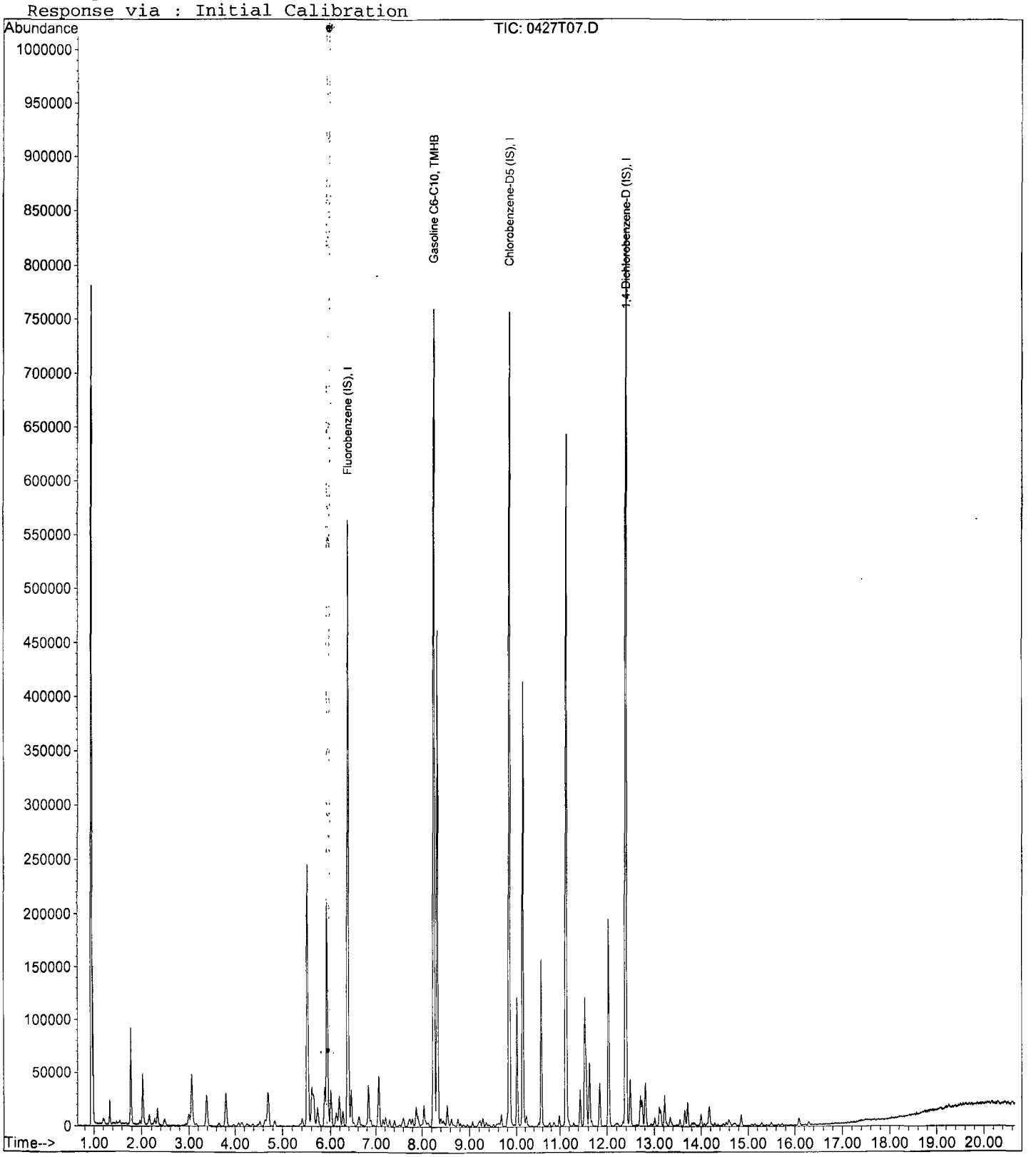
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T07.D Vial: 6
Acq On : 27 Apr 20 12:19 Operator:
Sample : 600ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T08.D Vial: 7
Acq On : 27 Apr 20 12:46 Operator:
Sample : 800ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	567984	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	757006	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	865612	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	12601692m	686.50	ppb	100

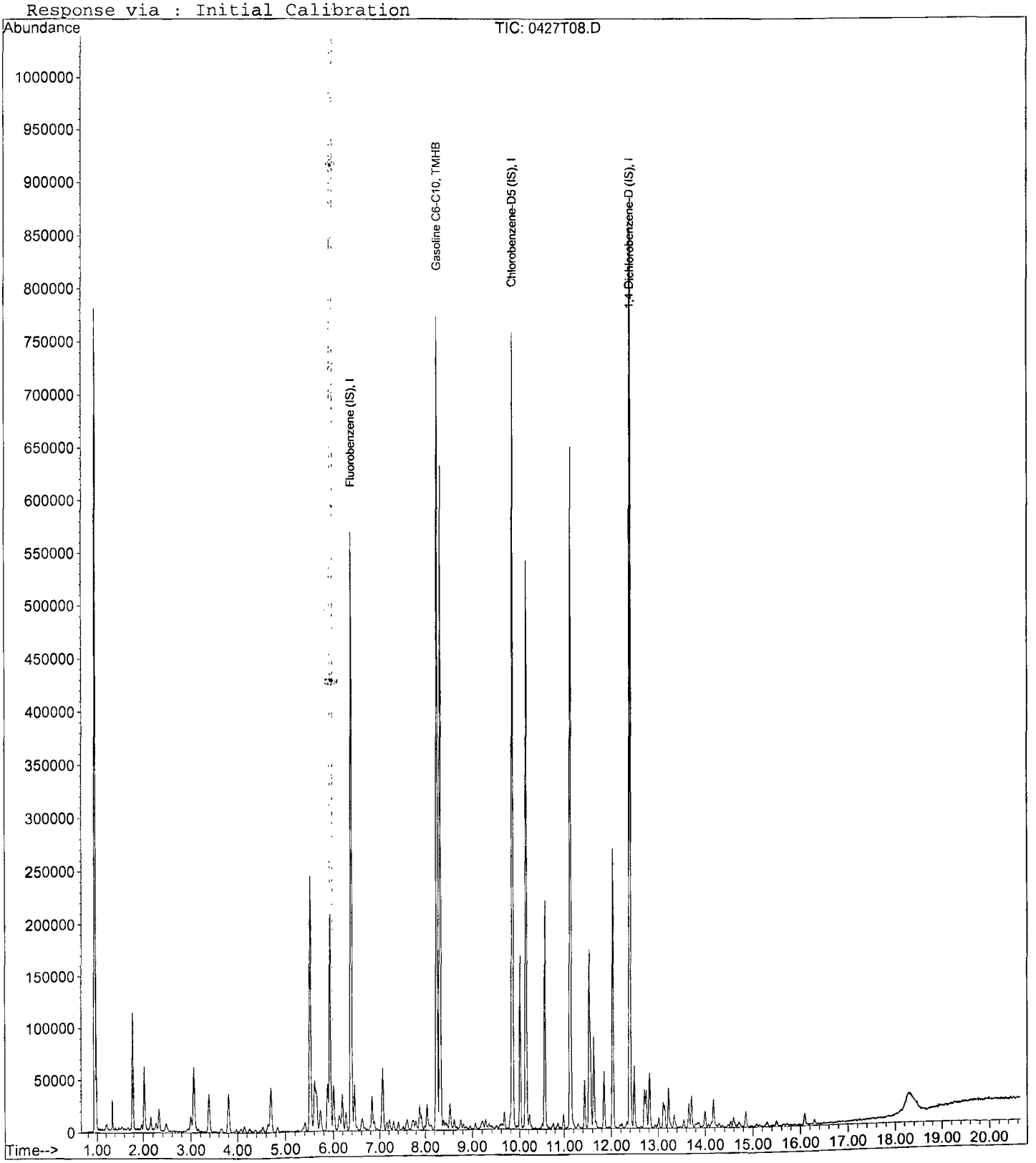
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T08.D Vial: 7
Acq On : 27 Apr 20 12:46 Operator:
Sample : 800ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:46 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T09.D Vial: 8
Acq On : 27 Apr 20 13:14 Operator:
Sample : 1000ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:47 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	578094	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	755934	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	871536	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.32	TIC	14242946m	871.03	ppb	100

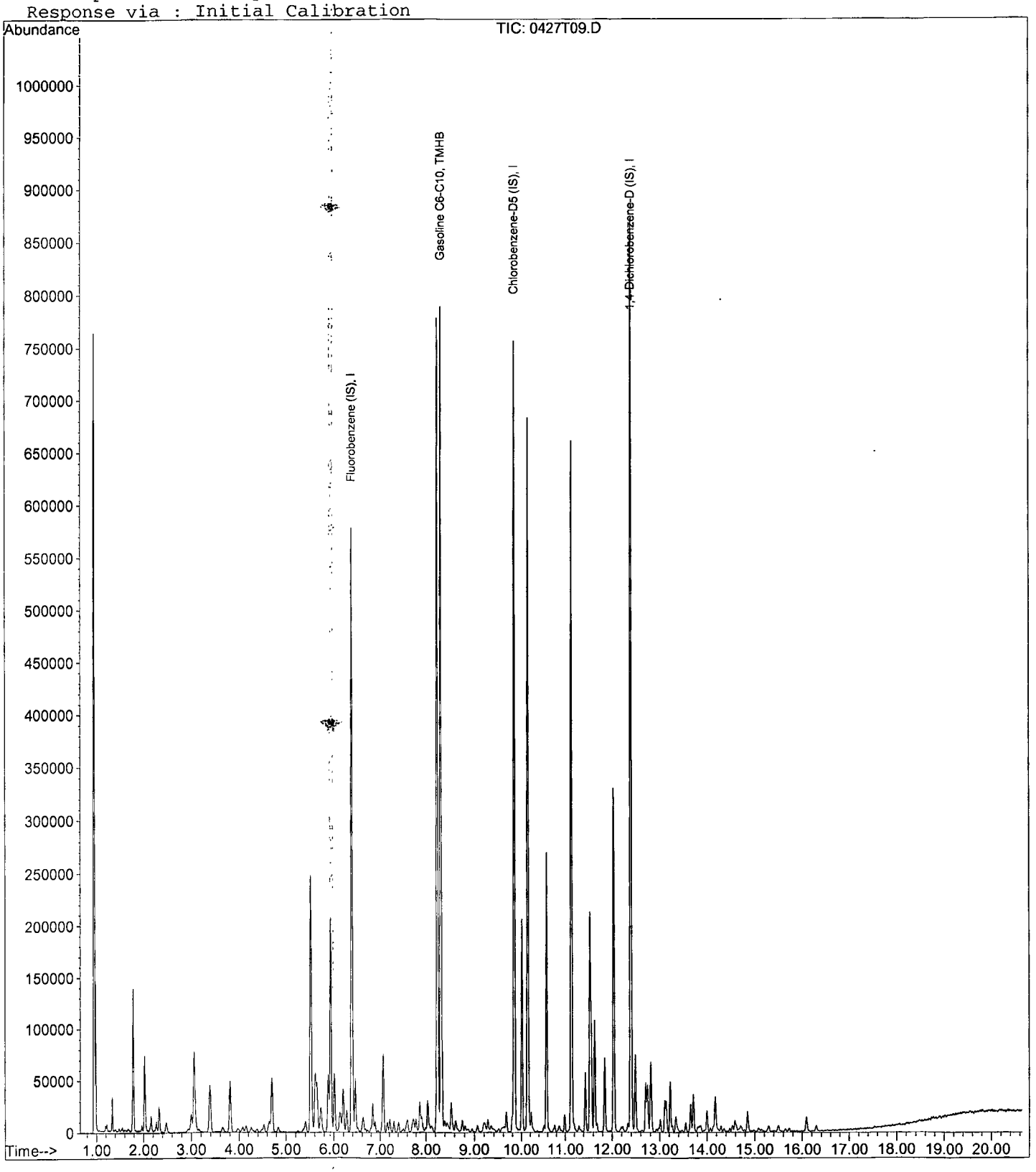
(#) = qualifier out of range (m) = manual integration

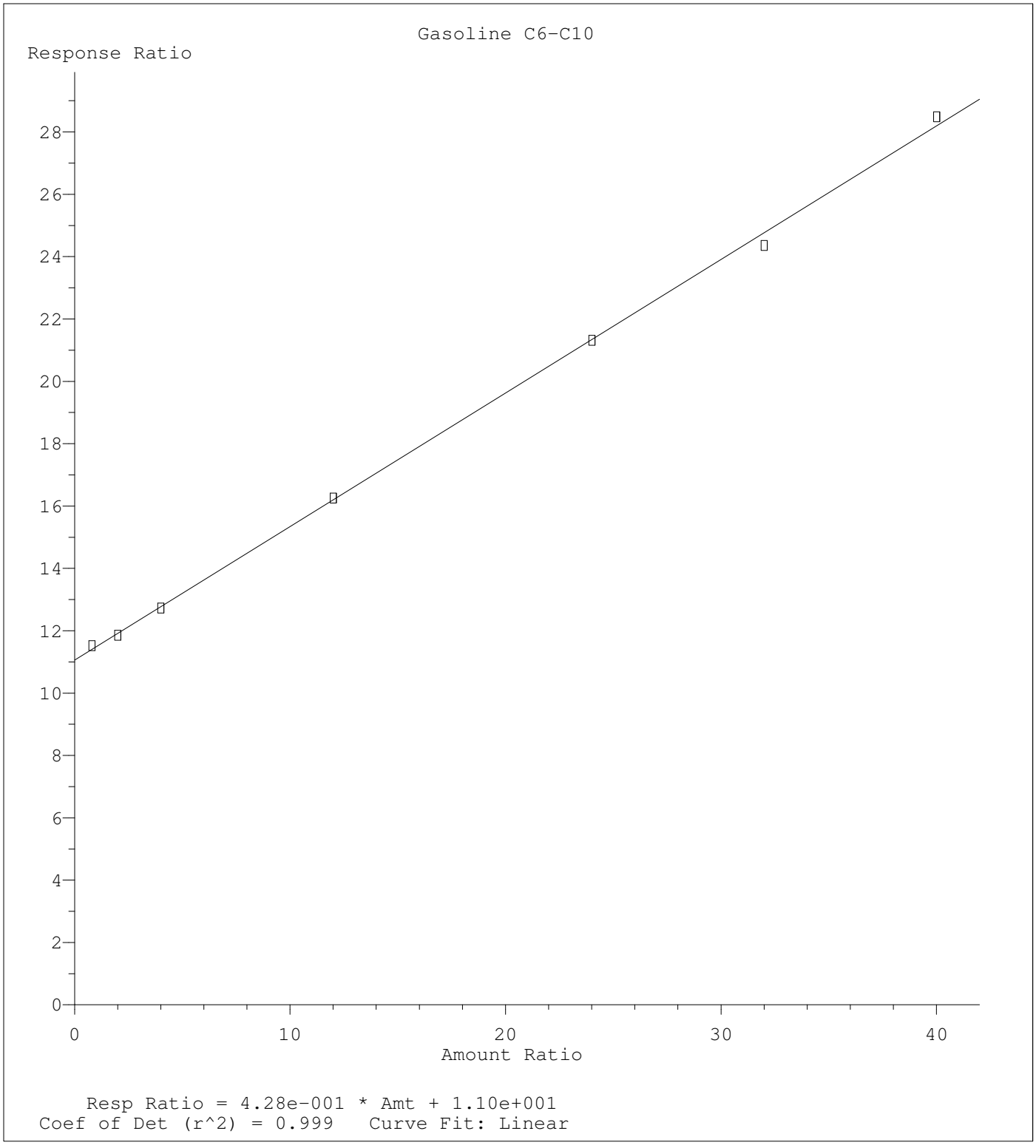
Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T09.D Vial: 8
Acq On : 27 Apr 20 13:14 Operator:
Sample : 1000ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:47 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration





Method Name: M:\THOR\DATA\T200414\TGAS0414.M
Calibration Table Last Updated: Wed Apr 15 09:44:32 2020

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/27/20
Instrument: Thor
Initial Cal. Date: 04/27/20
Data File: 0427T10.D

		Compound	MEAN	CCRF	%D	%Drift	
1	TMHB	Gasoline C6-C10	3.789	1.274	66	TMHBL	6.1
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
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31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			66.0		

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0427T10.D Vial: 9
Acq On : 27 Apr 20 13:42 Operator:
Sample : (SS)300ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:47 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	561723	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	741761	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	854949	25.00 ppb	0.00
System Monitoring Compounds					
Target Compounds					Qvalue
2) Gasoline C6-C10	8.25	TIC	8585753m	318.18 ppb	100

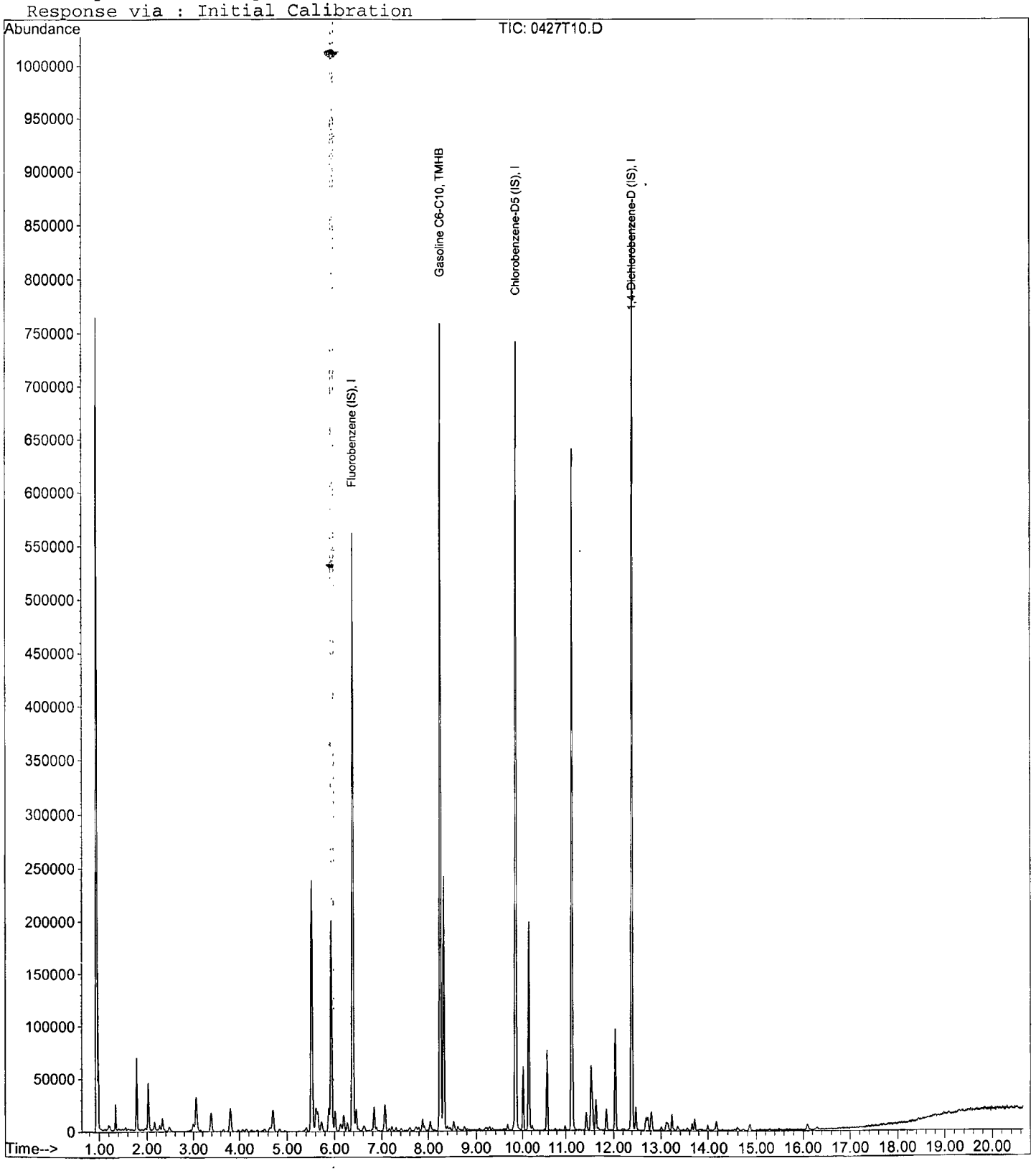
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0427T10.D Vial: 9
Acq On : 27 Apr 20 13:42 Operator:
Sample : (SS)300ug/L GAS STD 4/27/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 27 15:47 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/30/20
Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0430t13.D

		Compound	MEAN	CCRF	%D	%Drift	
1	I	Fluorobenzene (IS)	ISTD			I	
2	TMHB	Gasoline C6-C10	3.789	1.226	68	TMHBL	7.7
3	I	Chlorobenzene-D5 (IS)	ISTD			I	
4	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
5							
6							
7							
8							
9							
10							
11							
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33							
34							
35							
36							
37							
38							
39							
40							
		Average			68.0		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/30/20
Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0430t13.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	S	Dibromofluoromethane(S)	0.2766	0.2969	7.3	S	
3	S	1,2-DCA-D4(S)	0.2993	0.3298	10	S	
4	I	Chlorobenzene-D5 (IS)	ISTD			I	
5	S	Toluene-D8(S)	1.122	1.098	2.2	S	
6	S	4-Bromofluorobenzene(S)	0.4575	0.4374	4.4	S	
7	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
8							
9							
10							
11							
12							
13							
14							
15							
16							
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32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			6.0		

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430t13.D Vial: 6
Acq On : 30 Apr 20 14:04 Operator:
Sample : 200430B CCV/LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 30 14:39 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	454589	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	590524	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	697385	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6687786m	276.90	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430t13.D Vial: 6
Acq On : 30 Apr 20 14:04 Operator:
Sample : 200430B CCV/LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 5 12:47 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	436737	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	394117	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	251413	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	129653	26.84	ppb	0.00
Spiked Amount 25.000			Recovery = 107.344%			
3) 1,2-DCA-D4(S)	5.93	65	144037	27.55	ppb	0.00
Spiked Amount 25.000			Recovery = 110.196%			
5) Toluene-D8(S)	8.25	98	432573	24.45	ppb	0.00
Spiked Amount 25.000			Recovery = 97.804%			
6) 4-Bromofluorobenzene(S)	11.13	95	172386	23.90	ppb	0.00
Spiked Amount 25.000			Recovery = 95.600%			

Target Compounds Qvalue

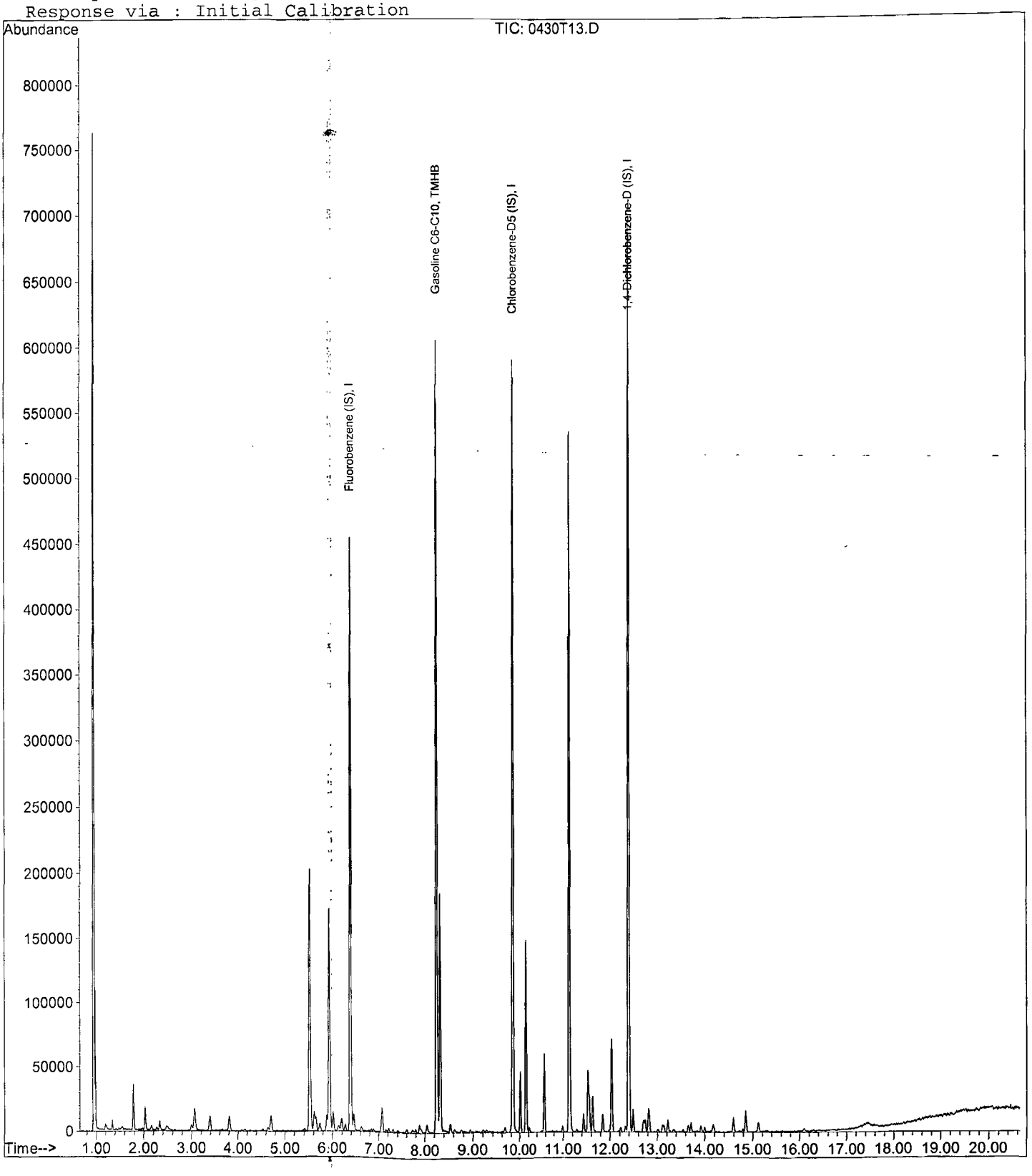
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430t13.D Vial: 6
Acq On : 30 Apr 20 14:04 Operator:
Sample : 200430B CCV/LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 30 14:39 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 1 May 20 1:44
Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0430t39.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	TMHB	Gasoline C6-C10	3.789	1.243	67	TMHBL	2.7
3	I	Chlorobenzene-D5 (IS)	ISTD			I	
4	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
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26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			67.0		

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 1 May 20 1:44
Instrument: Thor
Initial Cal. Date: 04/24/20
Data File: 0430t39.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	S	Dibromofluoromethane(S)	0.2766	0.2997	8.4	S	
3	S	1,2-DCA-D4(S)	0.2993	0.3436	15	S	
4	I	Chlorobenzene-D5 (IS)	ISTD			I	
5	S	Toluene-D8(S)	1.122	1.100	2.0	S	
6	S	4-Bromofluorobenzene(S)	0.4575	0.4370	4.5	S	
7	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
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27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			7.5		

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430t39.D Vial: 29
Acq On : 1 May 20 1:44 Operator:
Sample : Ending CCV 300ug/l 04/29/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 14:08 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	411272	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	546192	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	635452	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6136830m	292.02	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430t39.D Vial: 29
Acq On : 1 May 20 1:44 Operator:
Sample : Ending CCV 300ug/l 04/29/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 5 12:47 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	400575	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	362036	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	232032	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	120060	27.09	ppb	0.00
Spiked Amount 25.000			Recovery = 108.376%			
3) 1,2-DCA-D4(S)	5.93	65	137634	28.70	ppb	0.00
Spiked Amount 25.000			Recovery = 114.800%			
5) Toluene-D8(S)	8.25	98	398100	24.50	ppb	0.00
Spiked Amount 25.000			Recovery = 97.988%			
6) 4-Bromofluorobenzene(S)	11.13	95	158205	23.88	ppb	0.00
Spiked Amount 25.000			Recovery = 95.512%			

Target Compounds Qvalue

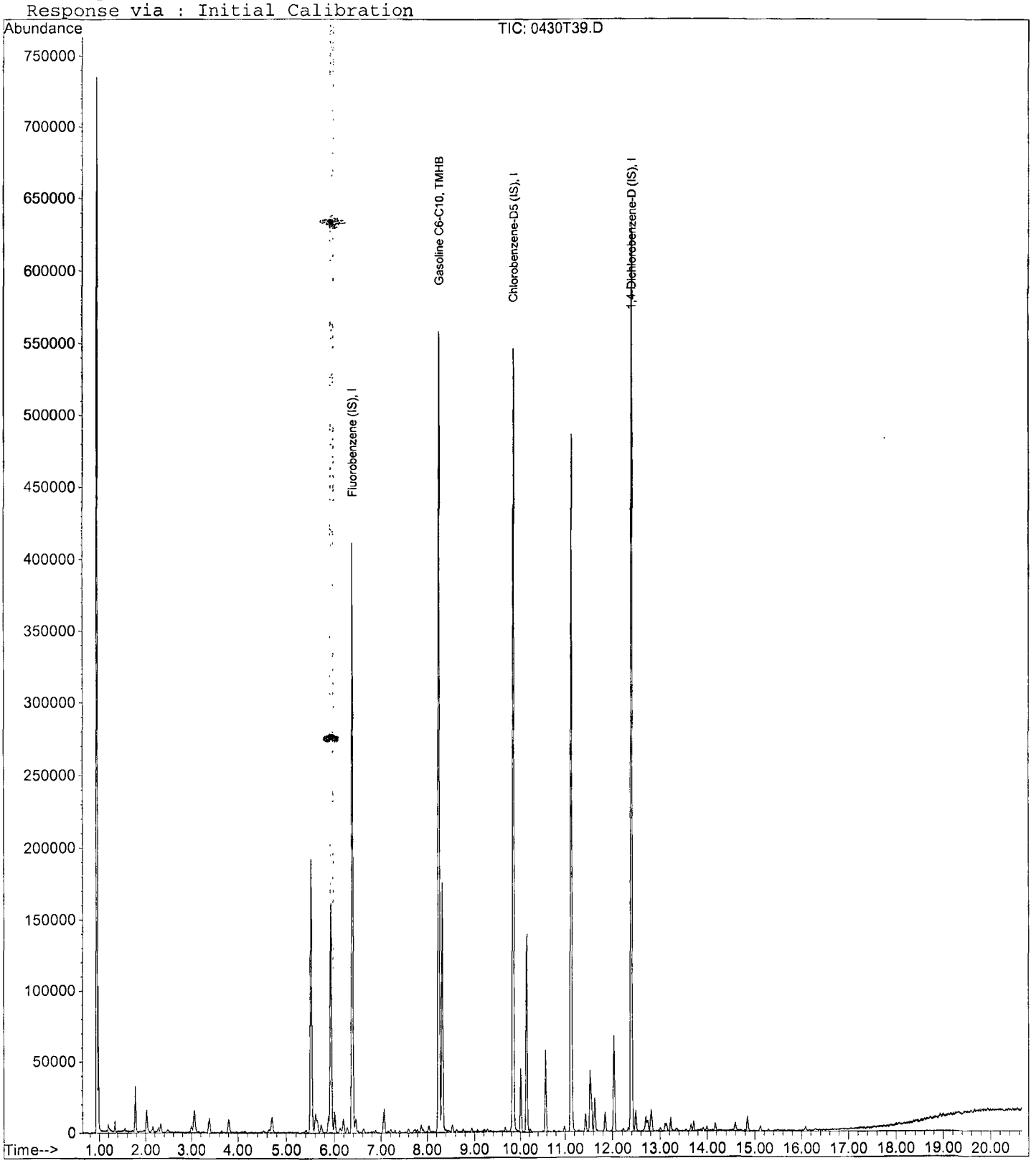
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430t39.D Vial: 29
Acq On : 1 May 20 1:44 Operator:
Sample : Ending CCV 300ug/l 04/29/20 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 14:08 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430T22.D Vial: 12
Acq On : 30 Apr 20 17:50 Operator:
Sample : BA10438W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:18 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	439459	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	572034	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.39	TIC	634502	25.00	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T22.D Vial: 12
Acq On : 30 Apr 20 17:50 Operator:
Sample : BA10438W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:26 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	422392	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	378201	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.39	152	233865	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.51	111	122012	26.11	ppb	0.00
Spiked Amount 25.000			Recovery = 104.448%			
3) 1,2-DCA-D4(S)	5.93	65	139034	27.49	ppb	0.00
Spiked Amount 25.000			Recovery = 109.980%			
5) Toluene-D8(S)	8.25	98	409277	24.11	ppb	0.00
Spiked Amount 25.000			Recovery = 96.432%			
6) 4-Bromofluorobenzene(S)	11.13	95	157198	22.71	ppb	0.00
Spiked Amount 25.000			Recovery = 90.848%			

Target Compounds Qvalue

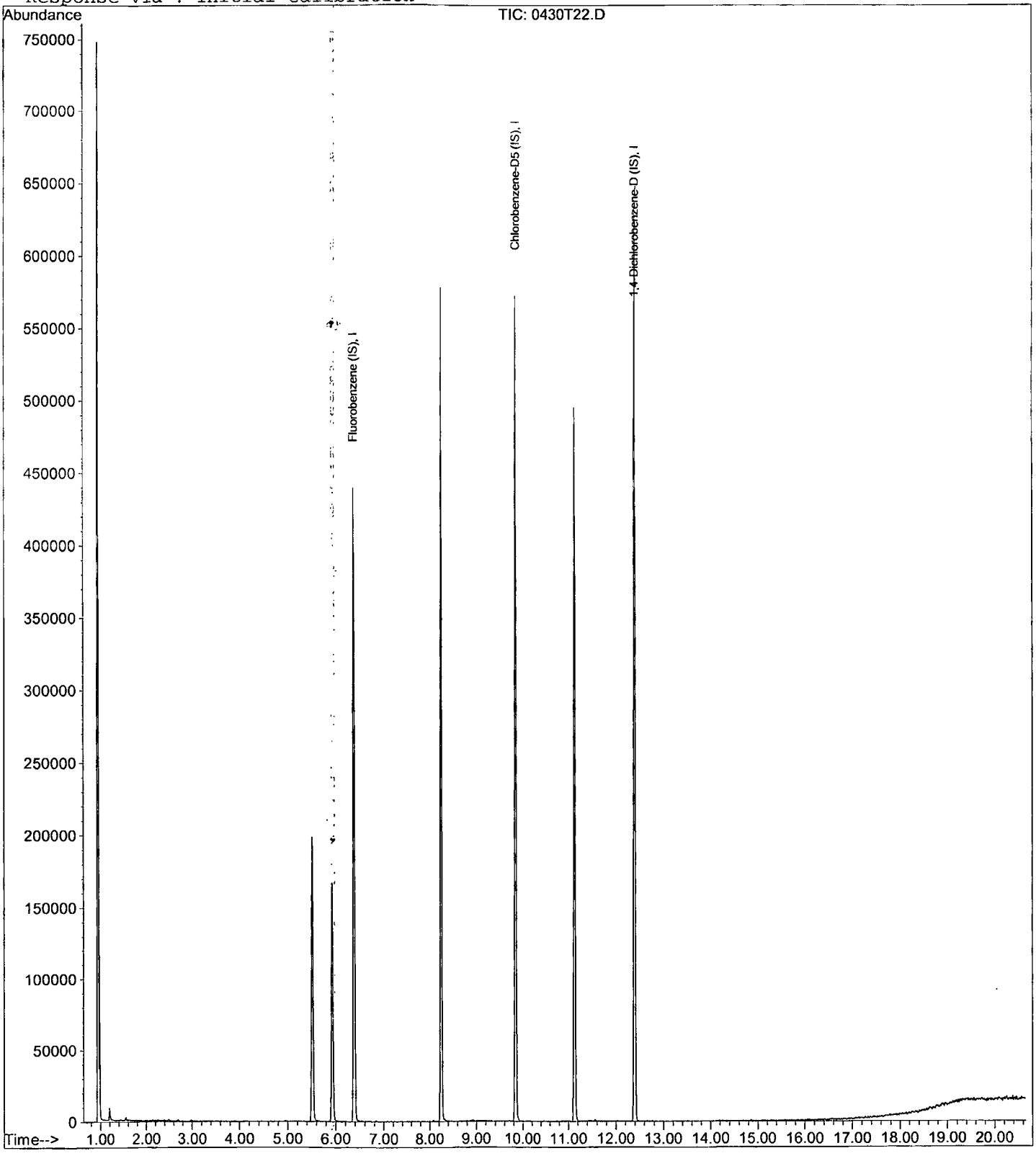
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T22.D Vial: 12
Acq On : 30 Apr 20 17:50 Operator:
Sample : BA10438W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:18 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430T23.D Vial: 13
Acq On : 30 Apr 20 18:18 Operator:
Sample : BA10439W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:18 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	429239	25.00 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	565435	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	634712	25.00 ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T23.D Vial: 13
Acq On : 30 Apr 20 18:18 Operator:
Sample : BA10439W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:26 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	417012	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	374902	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	230338	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	124166	26.92	ppb	0.00
Spiked Amount 25.000			Recovery =	107.664%		
3) 1,2-DCA-D4(S)	5.93	65	142302	28.50	ppb	0.00
Spiked Amount 25.000			Recovery =	114.016%		
5) Toluene-D8(S)	8.25	98	405974	24.12	ppb	0.00
Spiked Amount 25.000			Recovery =	96.496%		
6) 4-Bromofluorobenzene(S)	11.13	95	157105	22.90	ppb	0.00
Spiked Amount 25.000			Recovery =	91.592%		

Target Compounds Qvalue

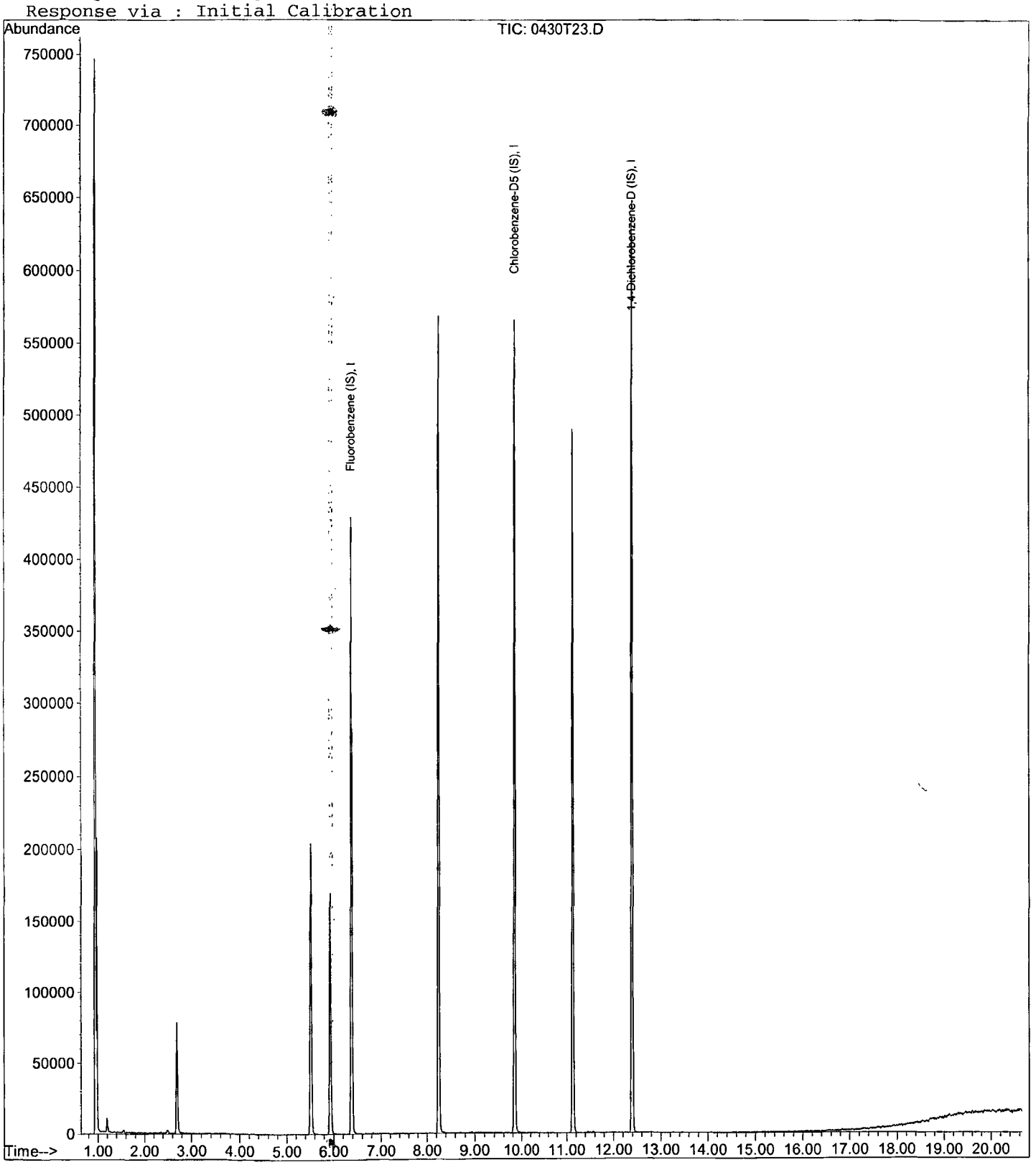
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T23.D Vial: 13
Acq On : 30 Apr 20 18:18 Operator:
Sample : BA10439W01 Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:18 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430T21.D Vial: 11
Acq On : 30 Apr 20 17:22 Operator:
Sample : 200430B BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:19 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.37	TIC	430979	25.00 ppb	-0.01
3) Chlorobenzene-D5 (IS)	9.84	TIC	582636	25.00 ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.39	TIC	644761	25.00 ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T21.D Vial: 11
Acq On : 30 Apr 20 17:22 Operator:
Sample : 200430B BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 5 12:47 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.37	96	422185	25.00	ppb	-0.01
4) Chlorobenzene-D5 (IS)	9.84	117	385190	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.39	152	234397	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.50	111	124781	26.72	ppb	-0.02
Spiked Amount 25.000			Recovery =	106.872%		
3) 1,2-DCA-D4(S)	5.92	65	139535	27.61	ppb	-0.01
Spiked Amount 25.000			Recovery =	110.428%		
5) Toluene-D8(S)	8.24	98	411024	23.77	ppb	0.00
Spiked Amount 25.000			Recovery =	95.088%		
6) 4-Bromofluorobenzene(S)	11.13	95	160627	22.79	ppb	0.00
Spiked Amount 25.000			Recovery =	91.144%		

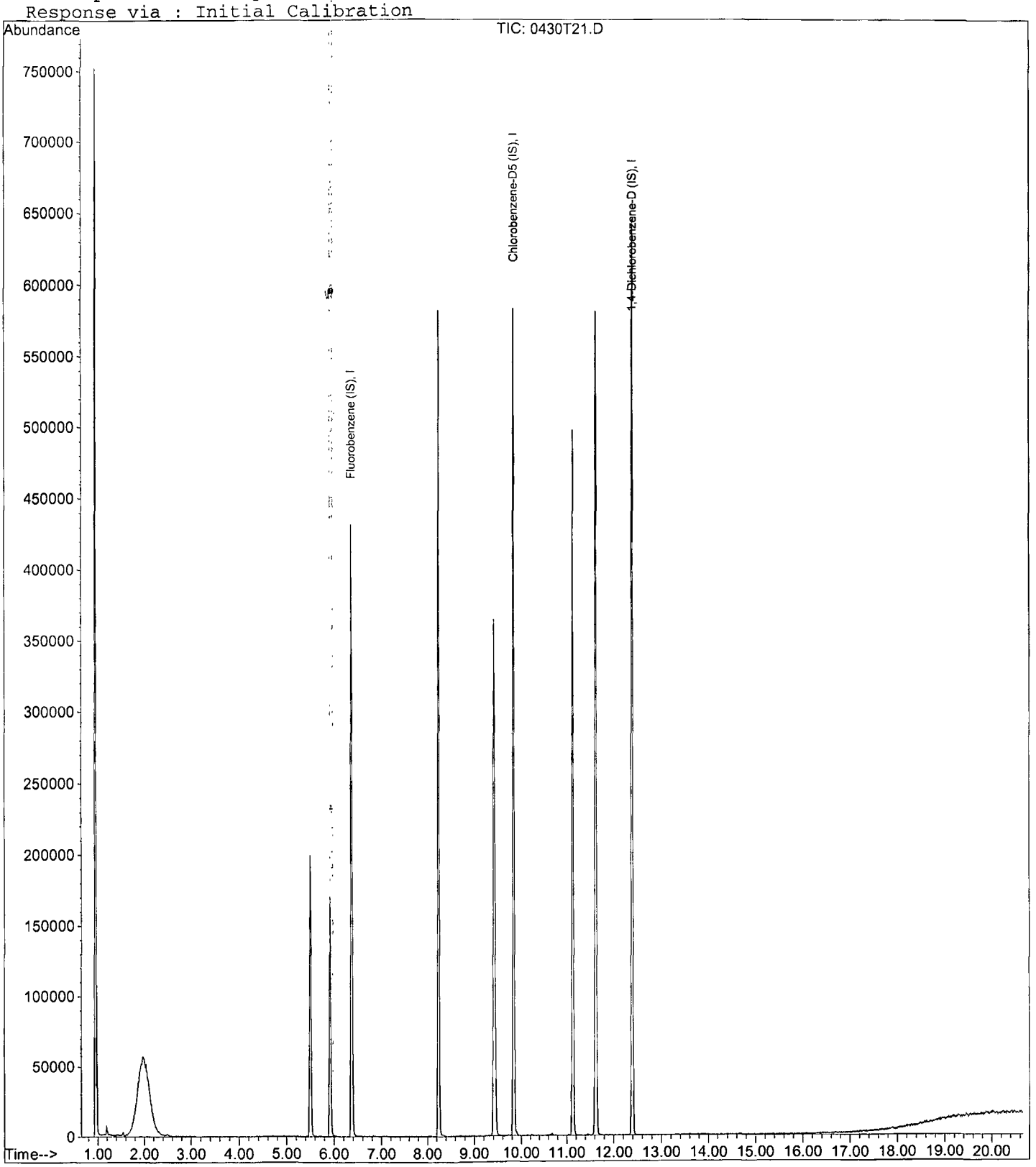
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Data File : M:\THOR\DATA\T200424\0430T21.D Vial: 11
Acq On : 30 Apr 20 17:22 Operator:
Sample : 200430B BLK Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 1 11:19 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430T13.D Vial: 6
Acq On : 30 Apr 20 14:04 Operator:
Sample : 200430B CCV/LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 30 14:39 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	454589	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	590524	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	697385	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6687786m	276.90	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T13.D Vial: 6
Acq On : 30 Apr 20 14:04 Operator:
Sample : 200430B CCV/LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 5 12:47 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	436737	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	394117	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	251413	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	129653	26.84	ppb	0.00
Spiked Amount 25.000			Recovery =	107.344%		
3) 1,2-DCA-D4(S)	5.93	65	144037	27.55	ppb	0.00
Spiked Amount 25.000			Recovery =	110.196%		
5) Toluene-D8(S)	8.25	98	432573	24.45	ppb	0.00
Spiked Amount 25.000			Recovery =	97.804%		
6) 4-Bromofluorobenzene(S)	11.13	95	172386	23.90	ppb	0.00
Spiked Amount 25.000			Recovery =	95.600%		

Target Compounds Qvalue

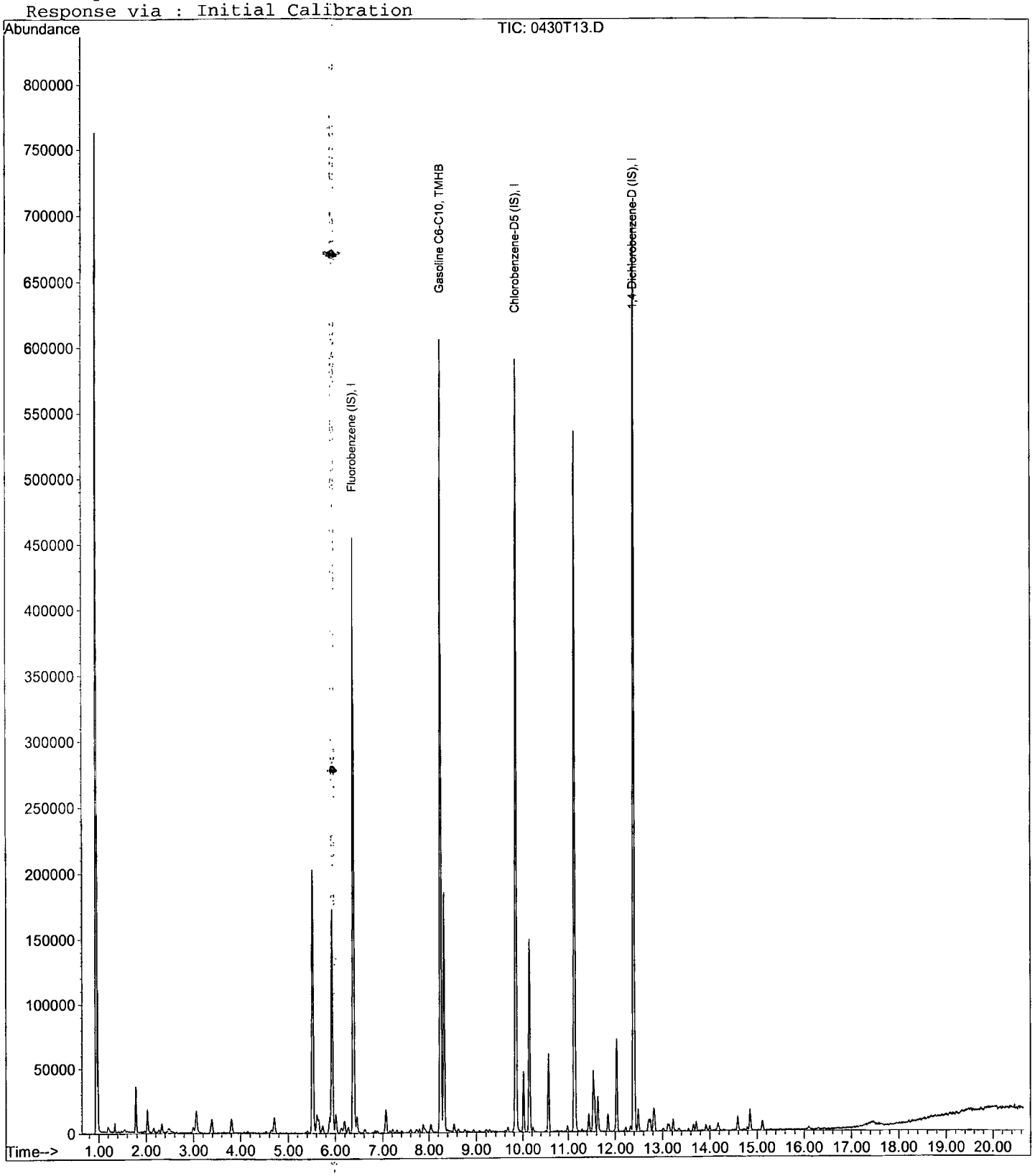
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T13.D Vial: 6
Acq On : 30 Apr 20 14:04 Operator:
Sample : 200430B CCV/LCS 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 30 14:39 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\THOR\DATA\T200424\0430T14.D Vial: 7
Acq On : 30 Apr 20 14:32 Operator:
Sample : 200430B LCSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 30 16:20 2020 Quant Results File: TGAS0427.RES

Quant Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	TIC	439931	25.00	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.84	TIC	590130	25.00	ppb	0.00
4) 1,4-Dichlorobenzene-D (IS)	12.40	TIC	671535	25.00	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.25	TIC	6540785m	288.14	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\THOR\DATA\T200424\0430T14.D Vial: 7
Acq On : 30 Apr 20 14:32 Operator:
Sample : 200430B LCSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: May 5 12:47 2020 Quant Results File: TSUR0424.RES

Quant Method : M:\THOR\DATA\T200424\TSUR0424.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Mon Apr 27 10:10:22 2020
Response via : Initial Calibration
DataAcq Meth : T8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.38	96	430216	25.00	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.84	117	387620	25.00	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	12.40	152	238877	25.00	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.52	111	126602	26.60	ppb	0.00
Spiked Amount 25.000			Recovery =	106.408%		
3) 1,2-DCA-D4(S)	5.93	65	138741	26.94	ppb	0.00
Spiked Amount 25.000			Recovery =	107.752%		
5) Toluene-D8(S)	8.25	98	420944	24.19	ppb	0.00
Spiked Amount 25.000			Recovery =	96.772%		
6) 4-Bromofluorobenzene(S)	11.13	95	166154	23.42	ppb	0.00
Spiked Amount 25.000			Recovery =	93.688%		

Target Compounds Qvalue

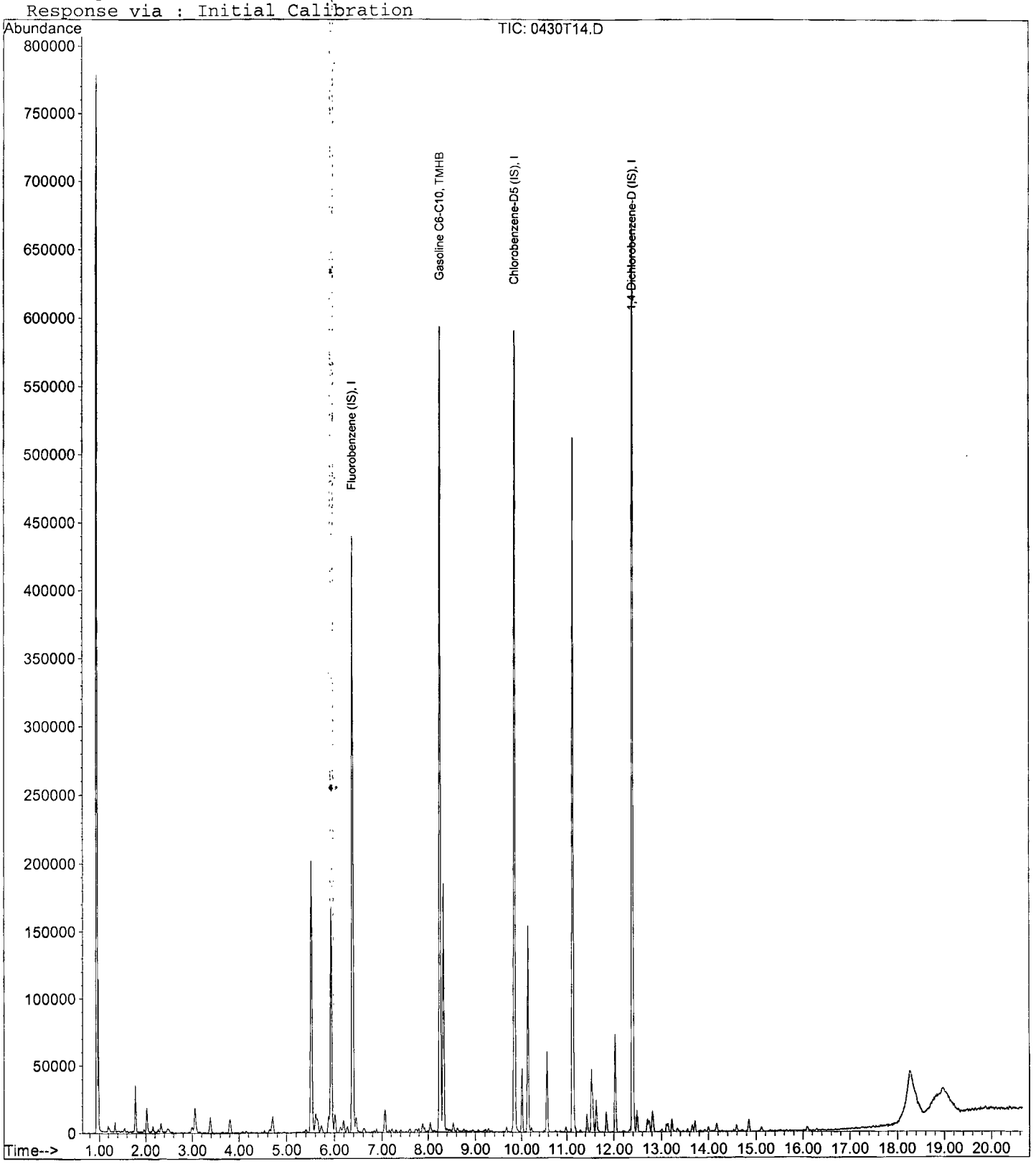
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\THOR\DATA\T200424\0430T14.D Vial: 7
Acq On : 30 Apr 20 14:32 Operator:
Sample : 200430B LCSD 300ug/L Inst : Thor
Misc : IS&S 3/17/20, 4/7/20 Multiplr: 1.00

Quant Time: Apr 30 16:20 2020 Quant Results File: TGAS0427.RES

Method : M:\THOR\DATA\T200424\TGAS0427.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Wed Apr 15 09:44:32 2020
Response via : Initial Calibration



Thor Gas Standard Prep

Gas Primary Working Standard

Prepared: 03/13/20 — **Prepared By (Initials): CH**

Expires: 01/06/21

Methanol Lot No. 58019-00962

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
50,000ug/mL Gas STD	Restek	30205	50,000	A0132443-39859	01/06/21	12/31/24	80uL	2mL	Methanol	2,000

Gas Second Source (SS) Working Standard

Prepared: 03/13/20 — **Prepared By (Initials): CH**

Expires: 07/16/20

Methanol Lot No. 58019-00962

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Gasoline (5,000ppm)	O2SI	020246-06	5,000	CL11750-40999	07/16/20	02/28/27	800uL	2mL	Methanol	2,000

Thor Gas Calibration Curve

Prepared: 04/27/20 — **Prepared By (Initials): CH**

Expires: 06/26/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA Gasses Standards	Phenova	20ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	1uL	100mL	P&T Water	20
VOA Gasses Standards	Phenova	50ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	2.5uL	100mL	P&T Water	50
VOA Gasses Standards	Phenova	100ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	5uL	100mL	P&T Water	100
VOA Gasses Standards	Phenova	300ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	15uL	100mL	P&T Water	300
VOA Gasses Standards	Phenova	600ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	30uL	100mL	P&T Water	600
VOA Gasses Standards	Phenova	800ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	40uL	100mL	P&T Water	800
VOA Gasses Standards	Phenova	1,000ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	50uL	100mL	P&T Water	1,000

Thor Gas Second Source

Prepared: 04/27/20 — **Prepared By (Initials): CH**

Expires: 06/26/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
50,000ug/mL Gas STD	Phenova	SS 300ug/L	2,000	Prepared 03/13/20	07/16/20	N/A	15uL	100mL	P&T Water	300

Thor Gas Continuing Calibrations/Lab Control Spikes

Prepared: 04/27/20 — **Prepared By (Initials): CH**

Expires: 04/28/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Gasses Standards	Phenova	300ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	15uL	100mL	P&T Water	300

Thor 8260 Standard Prep

Thor 8260 Water Calibration Curve

0.3ug/L

Prepared: 04/24/20

Expires: 05/24/20

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	0.3ug/L	5	Prepared 04/14/20	06/13/20	N/A	3uL	50mL	P&T Water	0.3
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	3uL			5
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	3uL			0.3
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	2uL			10

0.5ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	0.5ug/L	5	Prepared 04/14/20	06/13/20	N/A	5uL	50mL	P&T Water	0.5
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			10
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	5uL			0.5
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	5uL			25

1.0ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	1.0ug/L	5	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	1
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			20
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	10uL			1
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	10uL			50

2.0ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	O2SI	2.0ug/L	5	Prepared 04/14/20	06/13/20	N/A	20uL	50mL	P&T Water	2
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			30
VOA STD. 12	O2SI		5	Prepared 04/14/20	06/13/20	N/A	20uL			2
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	15uL			75

5ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	5ug/L	50	Prepared 04/14/20	06/13/20	N/A	5uL	50mL	P&T Water	5
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	5uL			5
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			40
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	5uL			5
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	20uL			100

10ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	10ug/L	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			50
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	25uL			125

20ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	20ug/L	50	Prepared 04/14/20	06/13/20	N/A	20uL	50mL	P&T Water	20
VOA STD. 6	Phenova		50	Prepared 04/14/20	05/06/20	N/A	20uL			20
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			60
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	20uL			20
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	30uL			150

40ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	40ug/L	50	Prepared 04/14/20	06/13/20	N/A	40uL	50mL	P&T Water	40
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	40uL			40
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	40uL			80
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	40uL			40
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	35uL			175

100ug/L

Prepared: 04/24/20

Expires: 05/24/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	100ug/L	50	Prepared 04/14/20	06/13/20	N/A	100uL	50mL	P&T Water	100
VOA STD. 8	Phenova		50	Prepared 04/14/20	05/06/20	N/A	100uL			100
VOA STD. 1	O2SI		50	Prepared 04/14/20	06/13/20	N/A	100uL			100
VOA STD. 2	O2SI		50	Prepared 04/14/20	06/13/20	N/A	100uL			100
VOA STD. TBA	Various		250	Prepared 04/14/20	05/06/20	N/A	40uL			200

Thor 8260 Water Second Source (SS)

Prepared: 04/24/20

Expires: 05/24/20

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. Gases	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 3	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. 2-CEVE	Absolute	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 6	Various	8260 Water SS	50	Prepared 04/14/20	04/22/20	N/A	10uL			10
VOA STD. 0	Phenova	8260 Water SS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
Voa STD. TBA	Various	8260 Water SS	250	Prepared 04/14/20	04/02/20	N/A	25uL			250

8260 Water Continuing Calibrations (CCV)/ Lab Control Spikes (LCS)

Prepared: 04/24/20

Expires: 04/25/20

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	CCV/ LCS	50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 2	O2SI	CCV/ LCS	50	Prepared 04/14/20	06/13/20	N/A	10uL			10
VOA STD. TBA	Various	CCV/ LCS	250	Prepared 04/14/20	05/06/20	N/A	25uL			125

LCS (X4 Ketones)

Prepared: 04/24/20

Expires: 04/25/20

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	LCS X4 Ketones	50	Prepared 04/14/20	05/06/20	N/A	10uL			10
VOA STD. 1	O2SI	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	50uL			50
VOA STD. 2	O2SI	LCS X4 Ketones	50	Prepared 04/14/20	06/13/20	N/A	40uL			40
VOA STD. TBA	Various	LCS X4 Ketones	250	Prepared 04/14/20	05/06/20	N/A	25uL			125

Primary and Secondary Working Standards

Primary Standards

VOA STD 7

Prepared: 04/14/20 A
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Gasses STD	Phenova	ALO-101206	2,000	CL14053-49896	04/14/21	10/31/24	100uL	4mL	Methanol	50
Hexachloroethane	Absolute	70199	1,000	091818-49911	04/14/21	09/18/23	200uL			50
Benzyl Chloride	Accusta	M-8010-01	1,000	011320-49979	04/14/21	01/13/21	200uL			50

VOA STD 8

Prepared: 04/14/20 B
Expires: 05/06/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Additions STD	Phenova	ALO-130175	2,000	CL14058-49891	04/14/21	08/31/21	100uL	4mL	Methanol	50
502.2 Cal. Std.	Phenova	ALO-101200	2,000	CL14379-49943	04/14/21	10/31/24	100uL			50
Vinyl Acetate	Phenova	ALO-101228	2,000	CL15169-50084	04/14/21	05/06/20	100uL			50

VOA STD TBA

Prepared: 04/14/20 C
Expires: 05/06/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOC Mix	Phenova	ALO-130176	2,000	CL12929-49956	04/14/21	11/30/20	500uL	4mL	Methanol	250
Acrolein	Phenova	ALO-130549	10,000	CL15174-50085	04/14/21	05/06/20	100uL			250

VOA STD 1

Prepared: 04/14/20 D
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE	Absolute	82408	2,000	011320-49914	04/14/21	01/13/23	50	2mL	Methanol	50

VOA STD 2

Prepared: 04/14/20 E
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Std.	Phenova	ALO-109211	2,000	CL12730-49961	04/14/21	08/31/28	100	4mL	Methanol	50

VOA STD 9

Prepared: 04/14/20 F
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 7		VOA STD. 9	50	Prepared 04/14/20	04/14/21	N/A	200uL	2mL	Methanol	5
VOA STD. 8			50	Prepared 04/14/20	04/14/21	N/A	200uL			5

VOA STD. 10

Prepared: 04/14/20 G
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 1		VOA STD. 10	50	Prepared 04/14/20	04/14/21	N/A	200uL	2mL	Methanol	5

VOA STD. 12

Prepared: 04/14/20 H
Expires: 06/13/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 2		VOA STD. 12	50	Prepared 04/14/20	04/14/21	N/A	200uL	2mL	Methanol	5

Second Source (SS) Standards

VOA STD. 3

Prepared: 04/14/20 I
Expires: 06/13/20
Methanol Lot No. DW117-US-0095
Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Standard	Phenova	ALO-101211	2,000	CL13994-49966	04/14/21	08/31/29	50uL	2mL	Methanol	50

VOA STD. Gases

Prepared: 04/14/20 J
Expires: 06/13/20
Methanol Lot No. DW117-US-0095
Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
8260 Gases (SS)	Phenova	ALO-101206	2,000	CL14504-49899	04/14/21	10/31/24	50uL	2mL	Methanol	50

VOA STD. 6

Prepared: 04/14/20 K
Expires: 04/22/20
Methanol Lot No. DW117-US-0095
Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
502.2 Calibration STD. (54-compounds)	Phenova	ALO-101200	2,000	CL14381-49947	04/14/21	10/31/24	50uL	2mL	Methanol	50
Vinyl Acetate	Phenova	ALO-101228	2,000	CL15134-50008	04/02/21	04/22/20	50uL			50
Hexachloroethane	Accustan	AS-E0011	1,000	219061767-49989	04/14/21	06/28/29	100uL			50
Benzyl Chloride	Accustan	M-8010-01	200	219041664-49933	04/14/21	12/25/21	500uL			50

VOA STD. TBA

Prepared: 04/14/20 L
Expires: 04/02/20
Methanol Lot No. DW117-US-0095
Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOA Mix (4-3)	Phenova	ALO-130176	2,000	CL12734-49952	04/14/21	08/31/20	250uL	2mL	Methanol	250
Acroleln	Phenova	ALO-101224	10,000	CL15142-50009	04/02/20	04/22/20	50uL			250

VOA STD. 0

Prepared: 04/14/20 M
Expires: 06/13/20
Methanol Lot No. DW117-US-0095
Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Addition STD.	Phenova	ALO-130175	2,000	CL14058-49972	04/14/21	08/31/21	50uL	2mL	Methanol	50

VOA STD. 2-CEVE

Prepared: 04/14/20 N
Expires: 06/13/20
Methanol Lot No. DW117-US-0095
Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE (SS)	Absolute	82408	2,000	121119-49915	04/14/21	12/11/22	50uL	2mL	Methanol	50

Injection Log

Directory: M:\THOR\DATA\T200424\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
2	0424T27.D	1	0.3ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 14:31
3	0424T28.D	1	0.5ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 14:59
4	0424T29.D	1	1.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 15:27
5	0424T30.D	1	2.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 15:55
6	0424T31.D	1	5.0ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 16:23
7	0424T32.D	1	10ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 16:50
8	0424T33.D	1	20ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 17:18
9	0424T34.D	1	40ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 17:46
10	0424T35.D	1	100ug/L VOC STD 4/24/20	IS&S 3/17/20, 4/7/20	24 Apr 20 18:14
2	0427T03.D	1	20ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 10:27
3	0427T04.D	1	50ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 10:55
4	0427T05.D	1	100ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 11:23
5	0427T06.D	1	300ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 11:51
6	0427T07.D	1	600ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 12:19
7	0427T08.D	1	800ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 12:46
8	0427T09.D	1	1000ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 13:14
9	0427T10.D	1	(SS)300ug/L GAS STD 4/27/20	IS&S 3/17/20, 4/7/20	27 Apr 20 13:42
6	0430T13.D	1	200430B CCV/LCS 300ug/L	IS&S 3/17/20, 4/7/20	30 Apr 20 14:04
7	0430T14.D	1	200430B LCSD 300ug/L	IS&S 3/17/20, 4/7/20	30 Apr 20 14:32
11	0430T21.D	1	200430B BLK	IS&S 3/17/20, 4/7/20	30 Apr 20 17:22
12	0430T22.D	1	BA10438W01	IS&S 3/17/20, 4/7/20	30 Apr 20 17:50
13	0430T23.D	1	BA10439W01	IS&S 3/17/20, 4/7/20	30 Apr 20 18:18
29	0430T39.D	1	Ending CCV 300ug/l 04/29/20	IS&S 3/17/20, 4/7/20	1 May 20 1:44

ORGANICS
Calibration Data

RSK 175

Form 6
Initial Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:
SDG No:
Initial Cal. Date: 03/11/20
Instrument: 7890
Initials:

			0311R03.D	0311R04.D	0311R07.D	0311R08.D	0311R09.D	0311R11.D	0311R13.D								
		Compound	1	2	3	4	5	6	7				Avg	%RSD	Type	r^2	Q
1	ATML	Methane	29734	15773	13580	17096	20094	18490	14651				18488	29	ATM	0.995	
2	ATML	Ethane	23899	13476	11688	13961	16062	14509	11867				15066	28	ATM	0.996	
3	ATML	Ethene	18360	10463	8970	10401	12628	10583	9230				11519	28	ATM	0.998	
4																	
5																	
6																	
7																	
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32																	
33																	
34																	
35																	

2.435739

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R03.D Vial: 3
Acq On : 11 Mar 20 13:00 Operator: GA
Sample : RSK Std 1 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

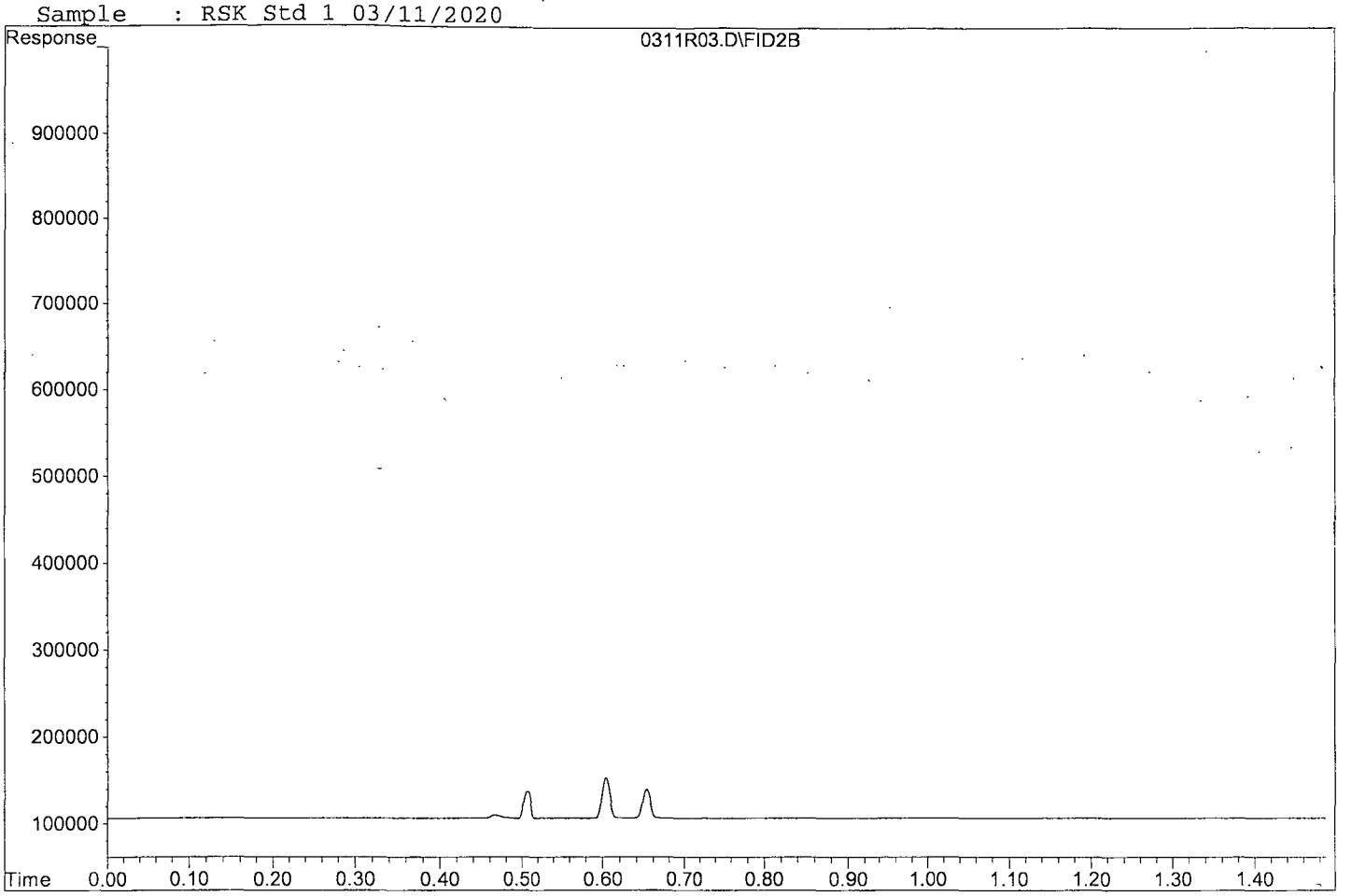
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.51	30923	N.D.	ppb
2) ATM Ethane	0.60	46722	N.D.	ppb
3) ATM Ethene	0.65	33507	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R03.D
Sample : RSK Std 1 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R04.D Vial: 4
Acq On : 11 Mar 20 13:03 Operator: GA
Sample : RSK Std 2 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

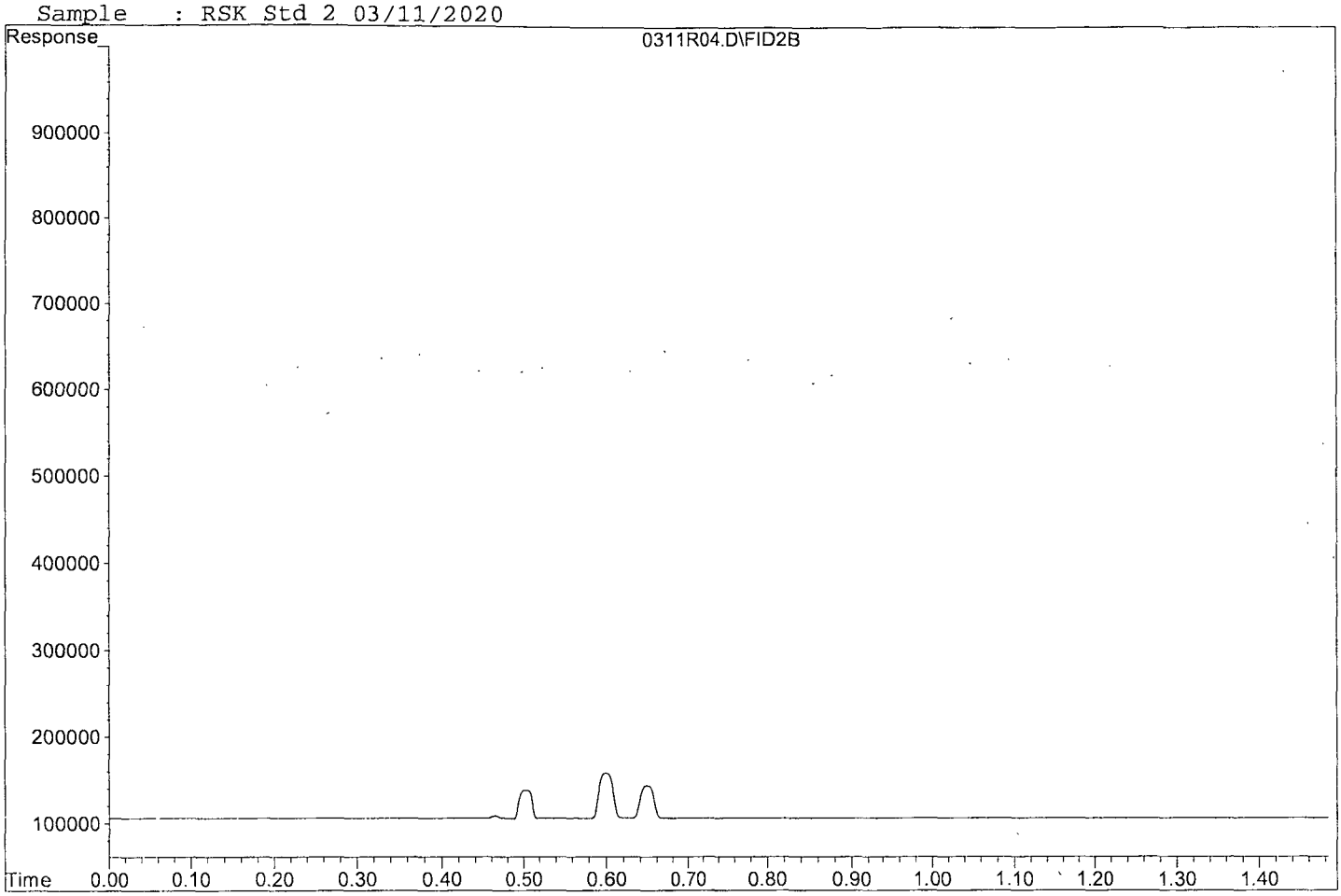
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.50	32807	N.D.	ppb
2) ATM Ethane	0.60	52625	N.D.	ppb
3) ATM Ethene	0.65	38189	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R04.D
Sample : RSK Std 2 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R07.D Vial: 7
Acq On : 11 Mar 20 13:12 Operator: GA
Sample : RSK Std 3 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

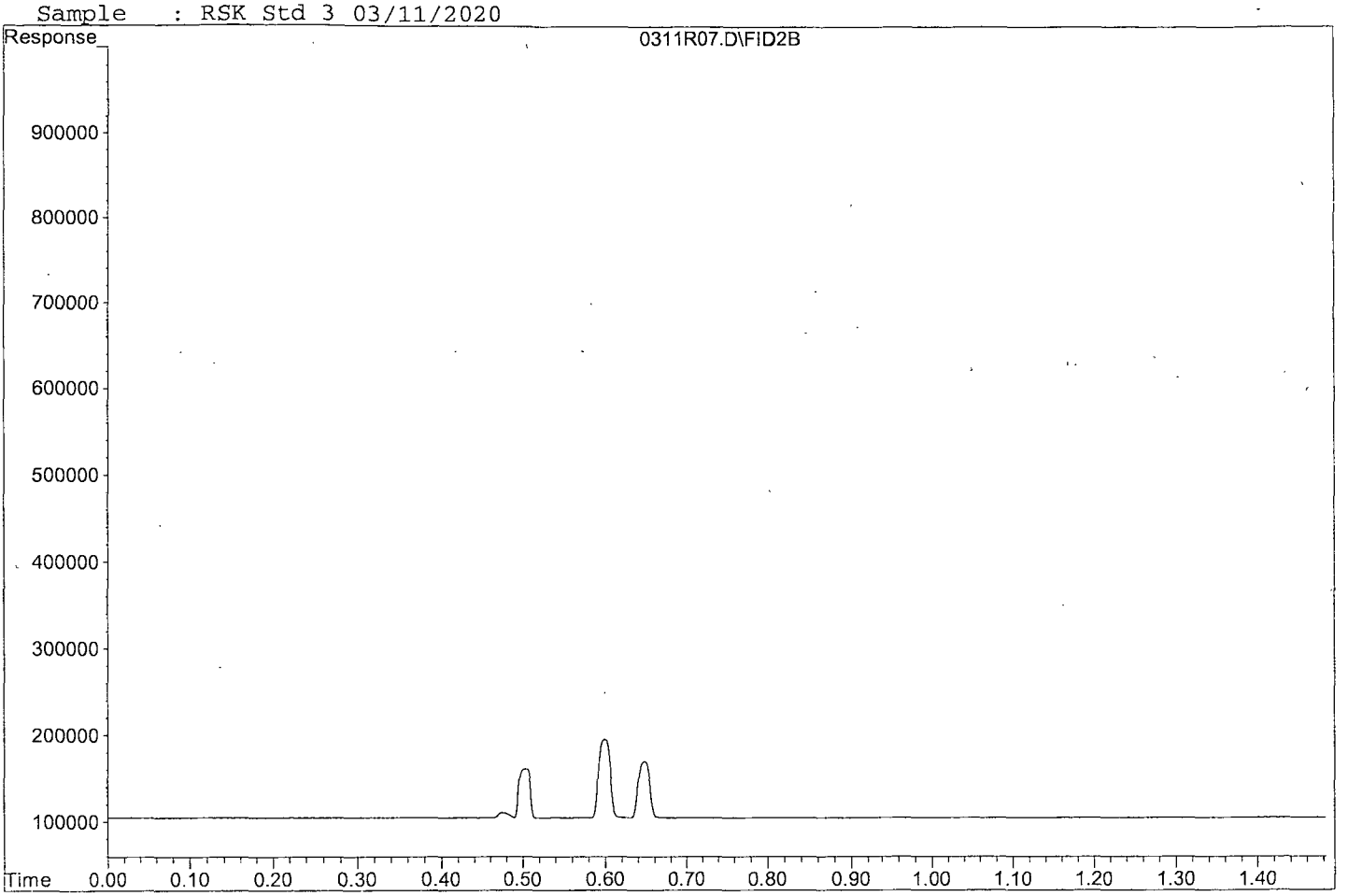
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.50	56629	N.D.	ppb
2) ATM Ethane	0.60	91168	N.D.	ppb
3) ATM Ethene	0.65	65481	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R07.D
Sample : RSK Std 3 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R08.D Vial: 8
Acq On : 11 Mar 20 13:15 Operator: GA
Sample : RSK Std 4 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 17 11:28 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Mar 17 11:20:36 2020
Response via : Multiple Level Calibration

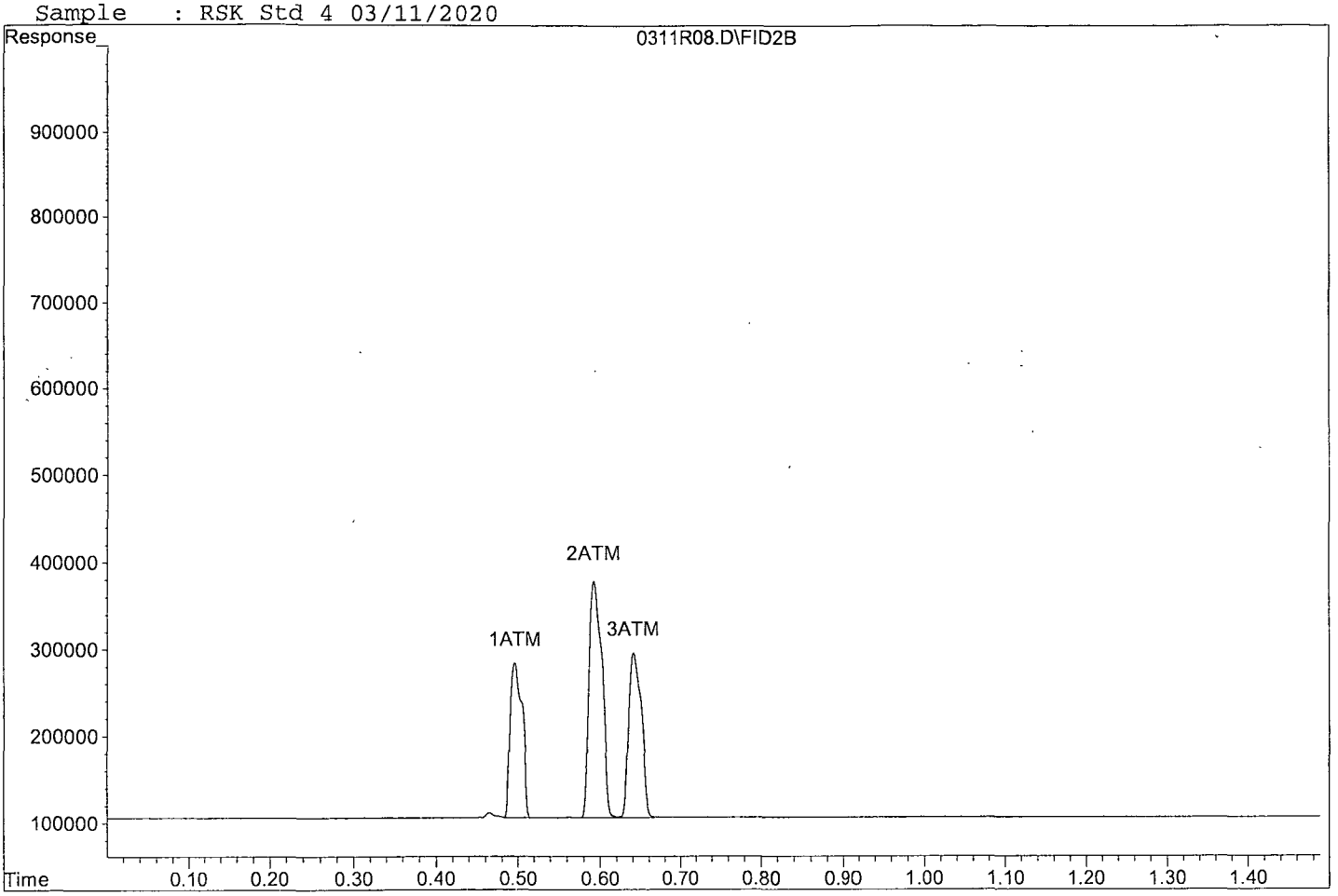
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	178225	11.047 ppb
2) ATM Ethane	0.59	272861	23.257 ppb
3) ATM Ethene	0.64	189615	23.557 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R08.D
Sample : RSK Std 4 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R09.D Vial: 9
Acq On : 11 Mar 20 13:17 Operator: GA
Sample : RSK Std 5 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

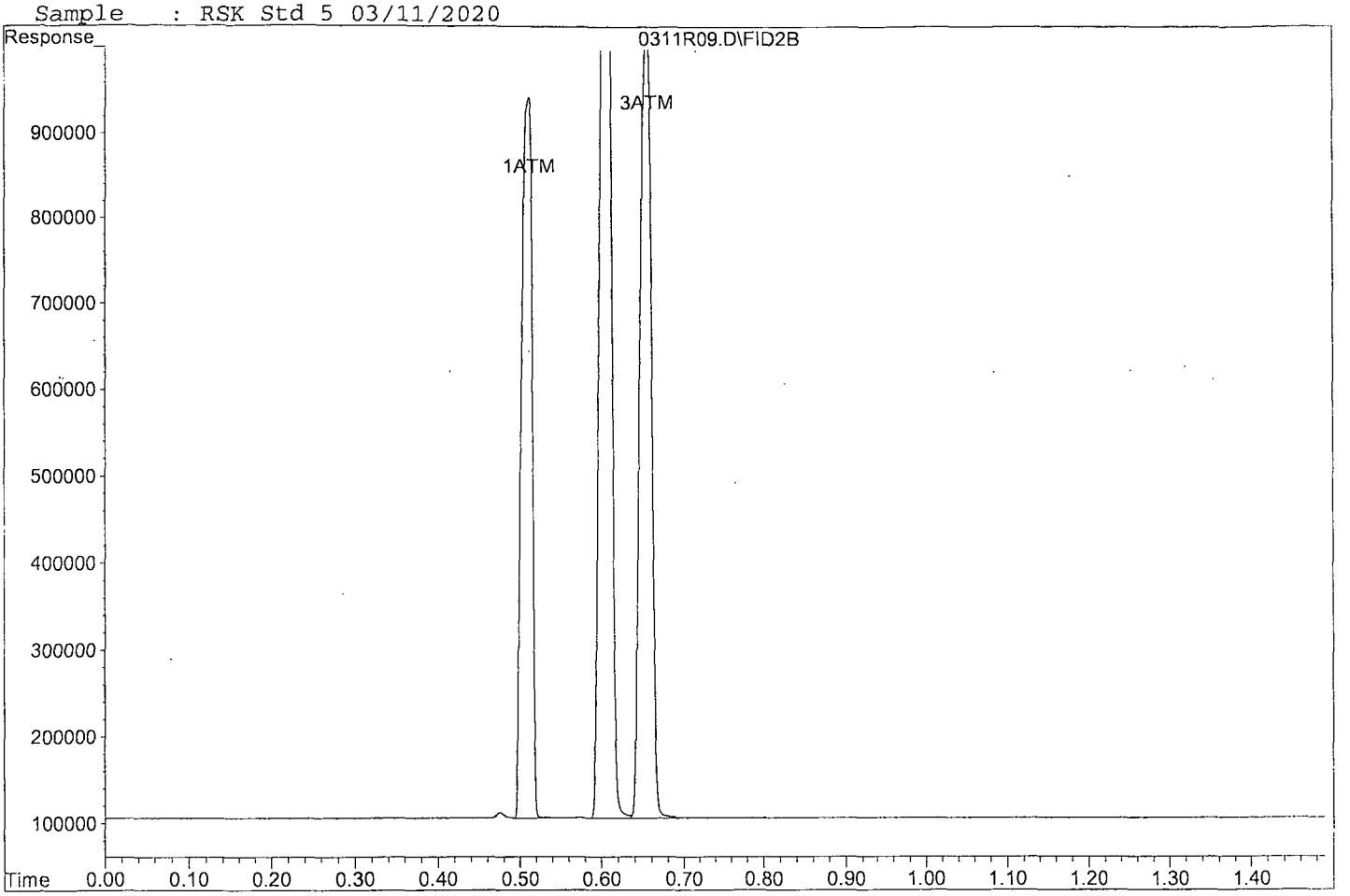
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.51	837925	101.270 ppb
2) ATM Ethane	0.61	1255676	189.317 ppb
3) ATM Ethene	0.66	920839	182.581 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R09.D
Sample : RSK Std 5 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R11.D Vial: 11
Acq On : 11 Mar 20 13:22 Operator: GA
Sample : RSK Std 6 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

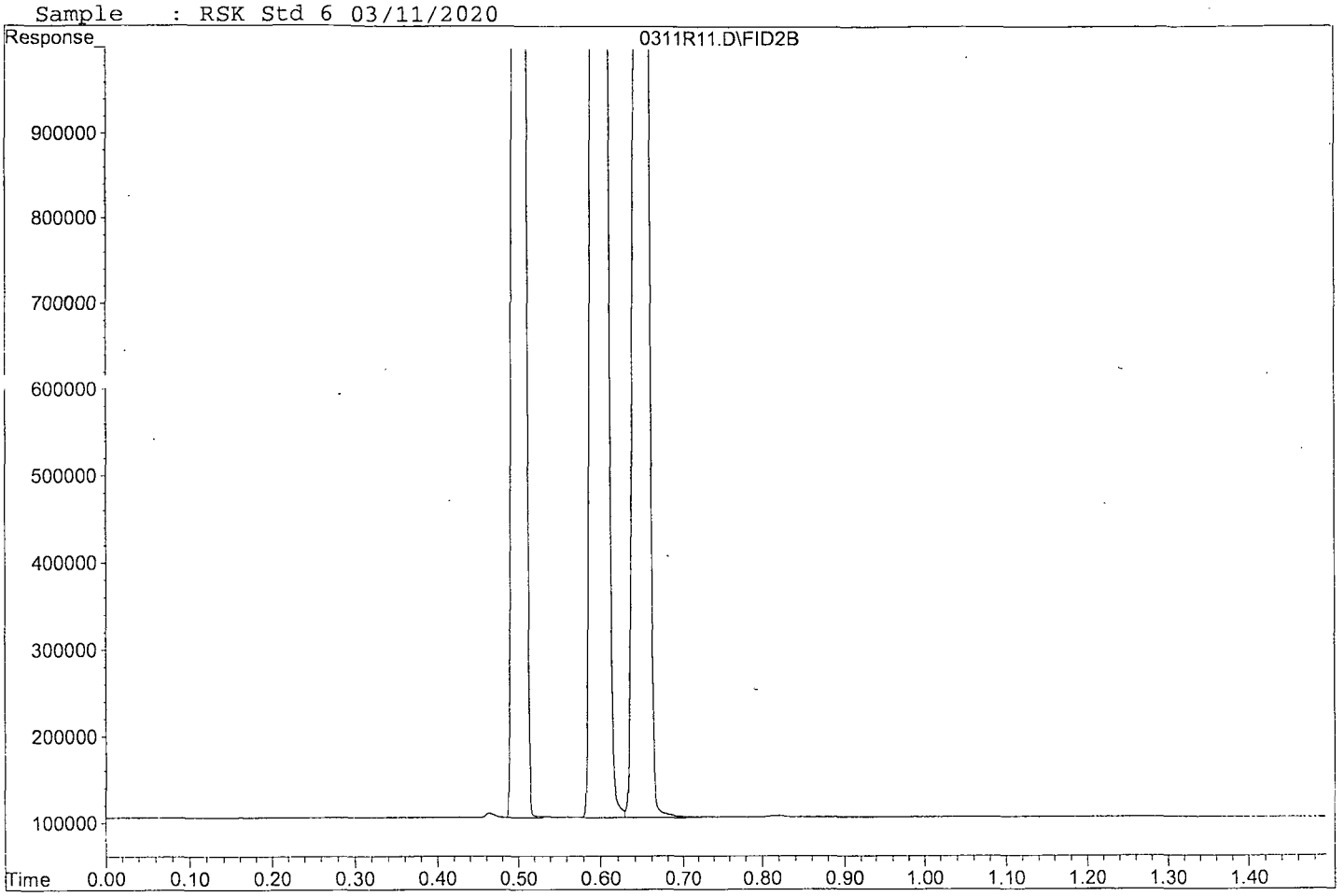
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	1927571	250.295 ppb
2) ATM Ethane	0.60	2835810	456.301 ppb
3) ATM Ethene	0.65	1929291	401.895 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R11.D
Sample : RSK Std 6 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R13.D Vial: 13
Acq On : 11 Mar 20 13:28 Operator: GA
Sample : RSK Std 7 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 17 11:30 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Mar 17 11:20:36 2020
Response via : Multiple Level Calibration

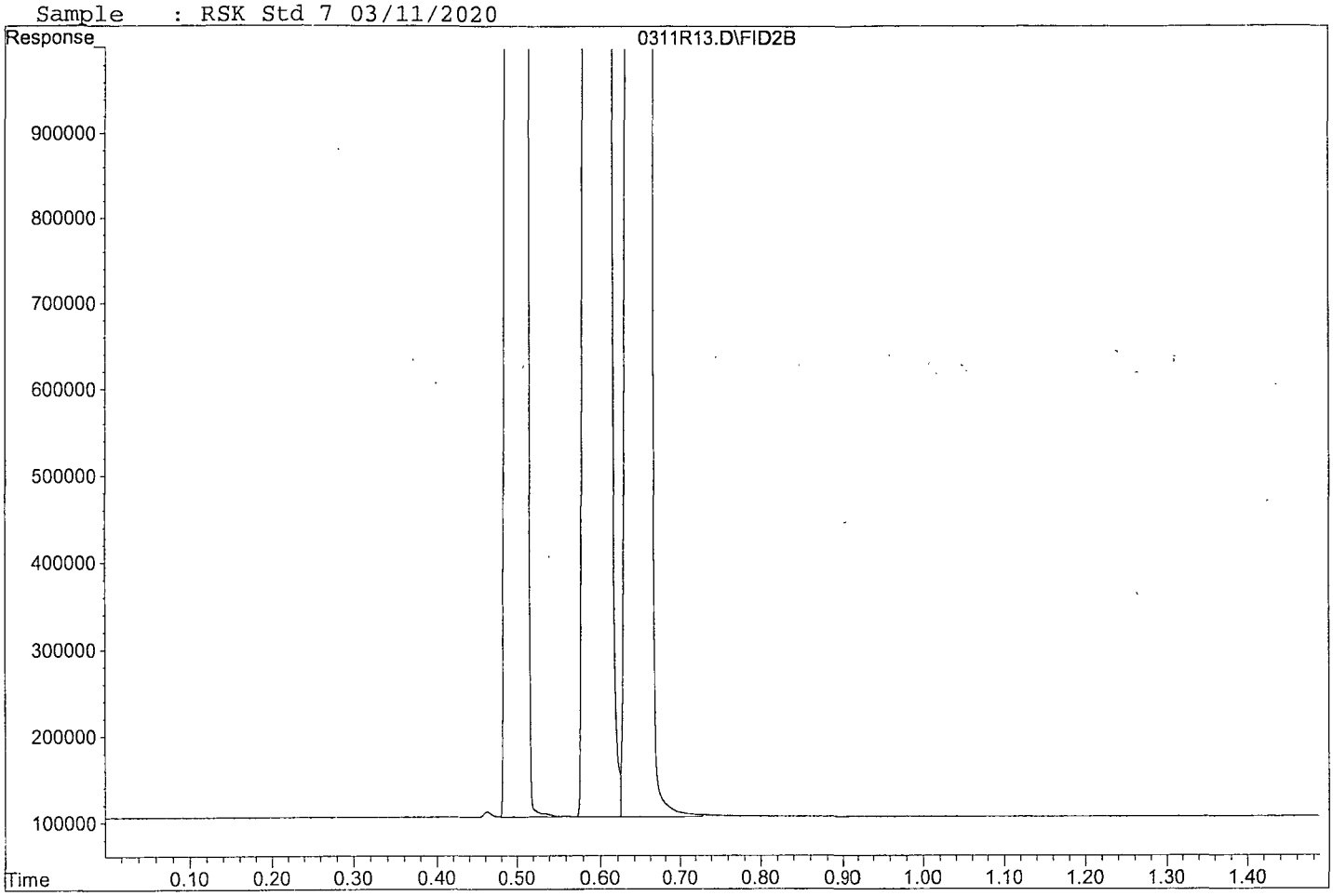
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

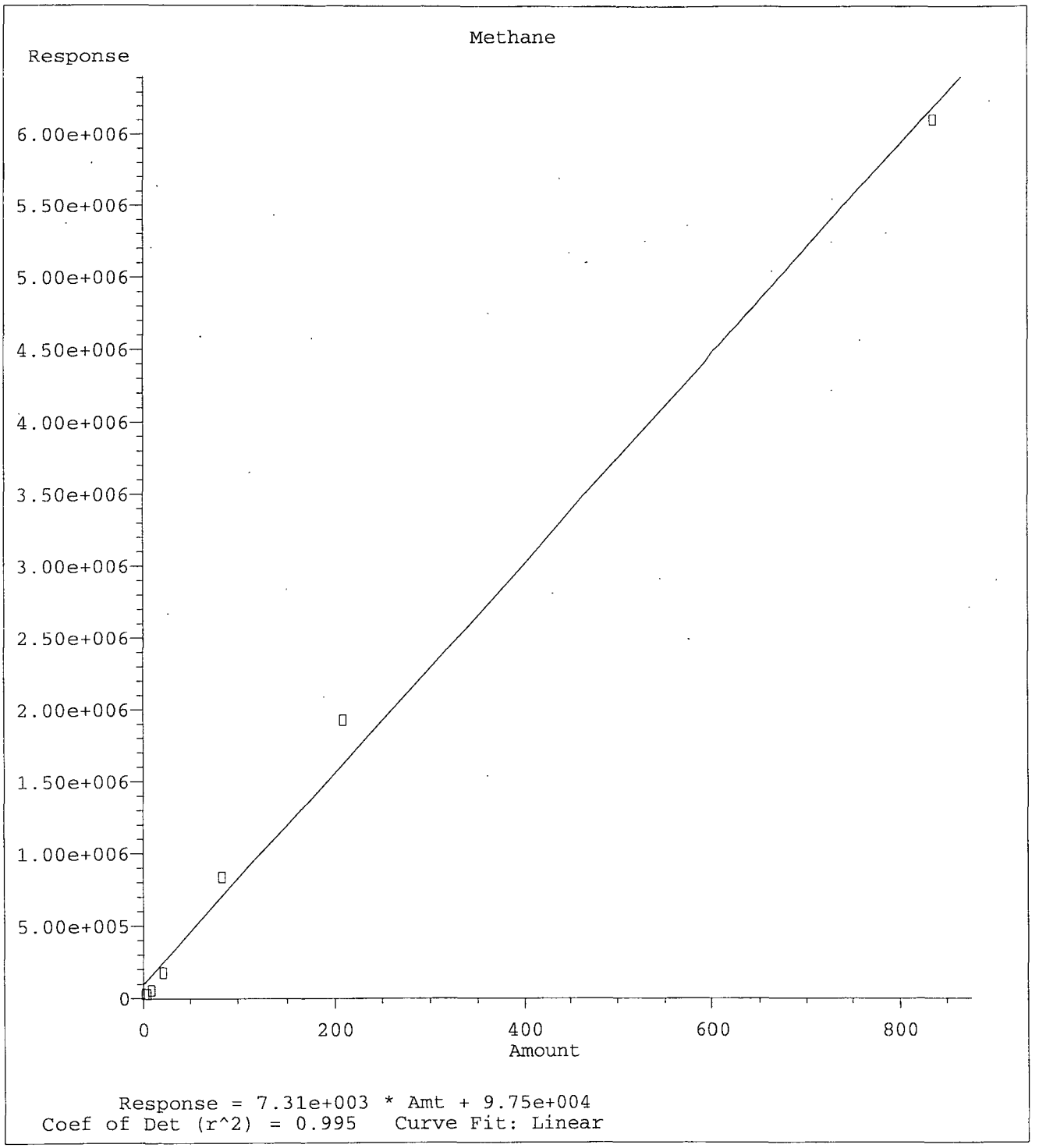
Compound	R.T.	Response	Conc	Units
Target Compounds				
1) ATM Methane	0.50	6109561	822.241	ppb
2) ATM Ethane	0.60	9277052	1544.634	ppb
3) ATM Ethene	0.64	6730405	1446.024	ppb

Target Compounds

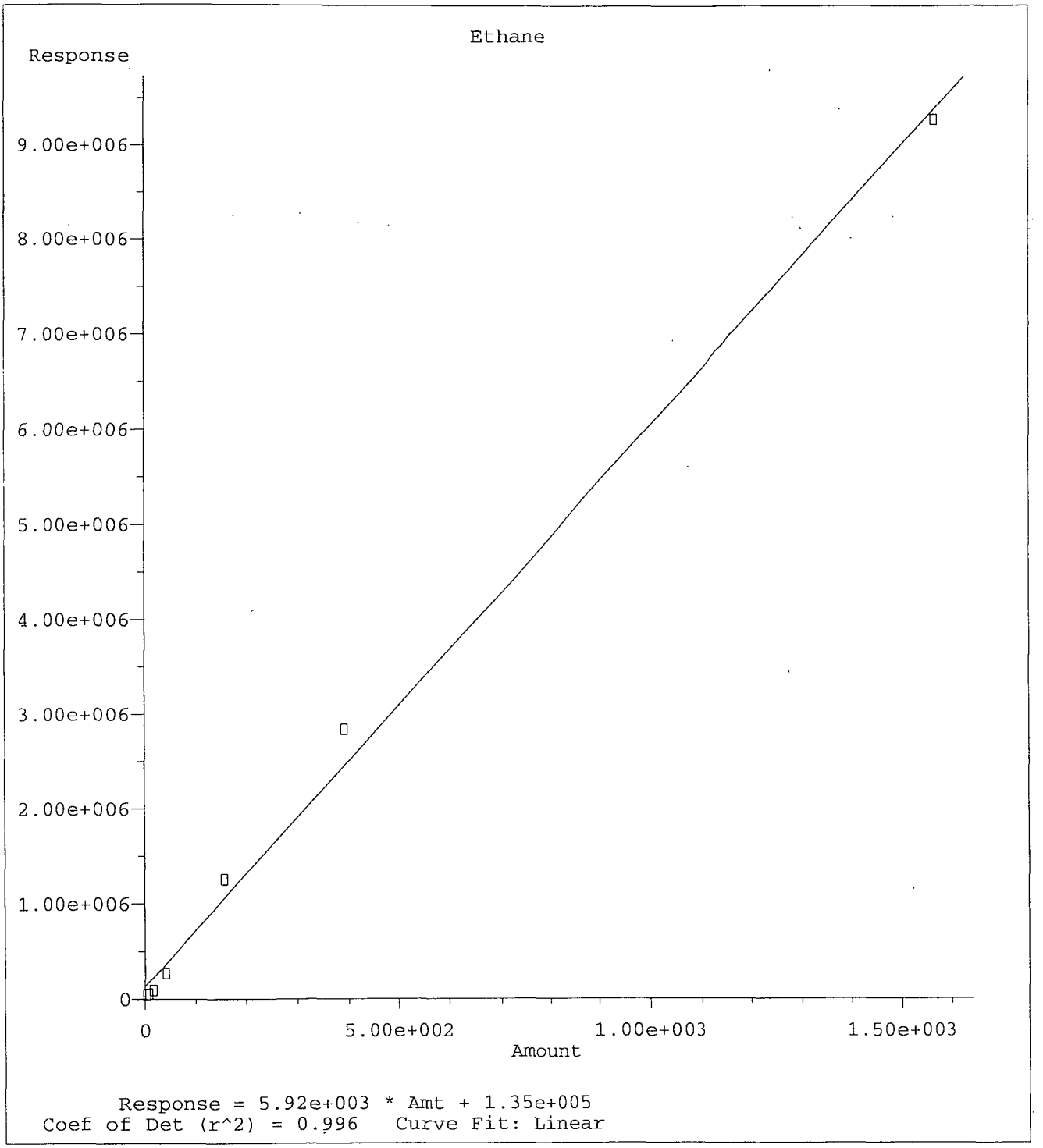
(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R13.D
Sample : RSK Std 7 03/11/2020

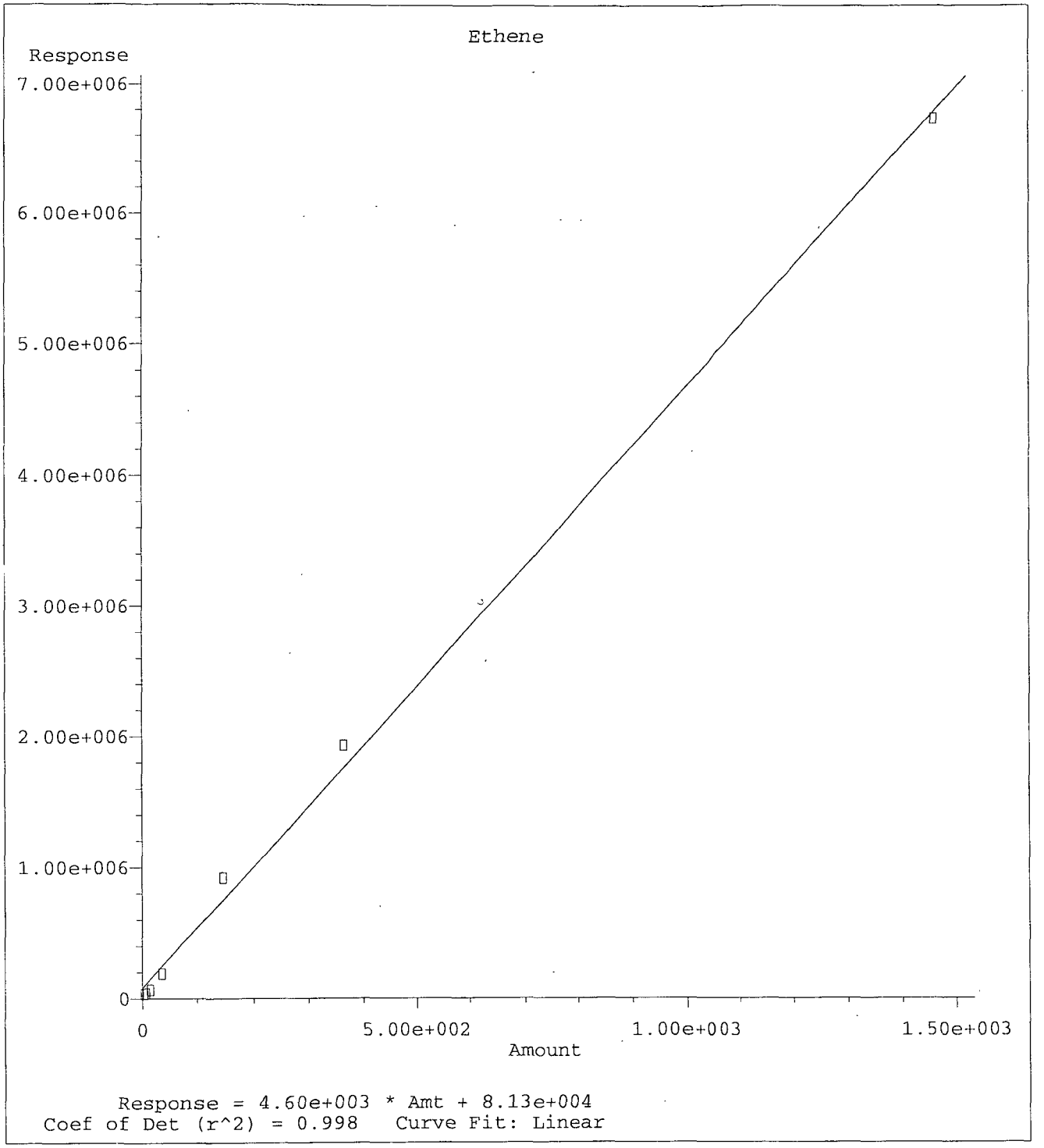




Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020



Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020



Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 03/11/20
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0311R15.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	16733	9.5	ATML	1.6
2	ATML	Ethane	15066	13396	11	ATML	1.4
3	ATML	Ethene	11519	10439	9.4	ATML	1.4
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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38							
39							
40							
		Average			10.0		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R15.D Vial: 15
Acq On : 11 Mar 20 13:38 Operator: GA
Sample : RSK SS Std 5 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:40 2020 Quant Results File: RSK0311.RES

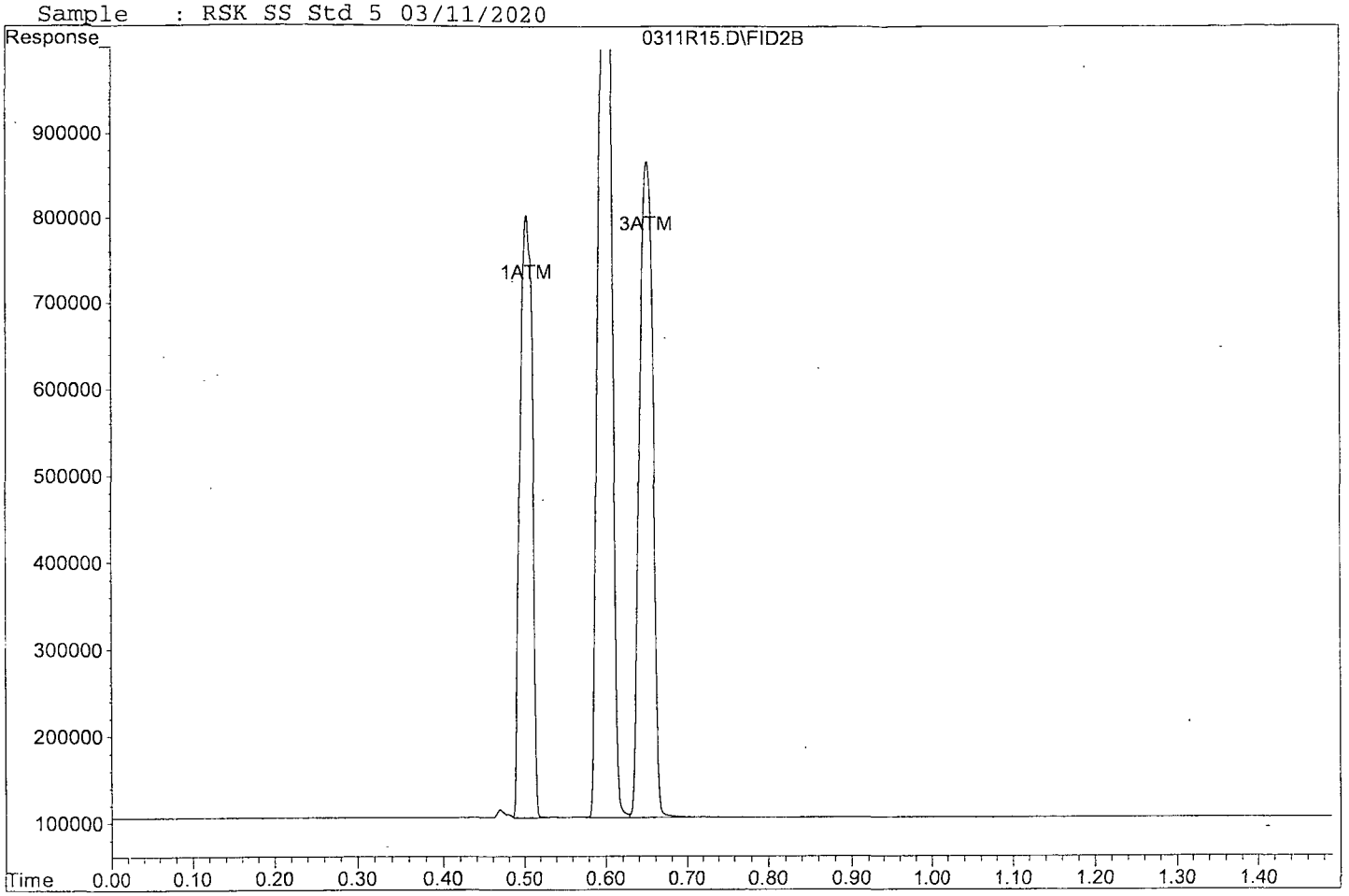
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	697755	82.100 ppb
2) ATM Ethane	0.60	1047226	154.096 ppb
3) ATM Ethene	0.65	761233	147.870 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R15.D
Sample : RSK SS Std 5 03/11/2020



Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 5 May 20 11:28
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0505R01.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	15290	17	ATML	11
2	ATML	Ethane	15066	13892	7.8	ATML	2.7
3	ATML	Ethene	11519	10360	10	ATML	0.53
4							
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37							
38							
39							
40							
		Average			11.6		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R01.D Vial: 1
Acq On : 5 May 20 11:28 Operator: GA; CMM
Sample : 200505A CCV/LCS RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 11:31 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

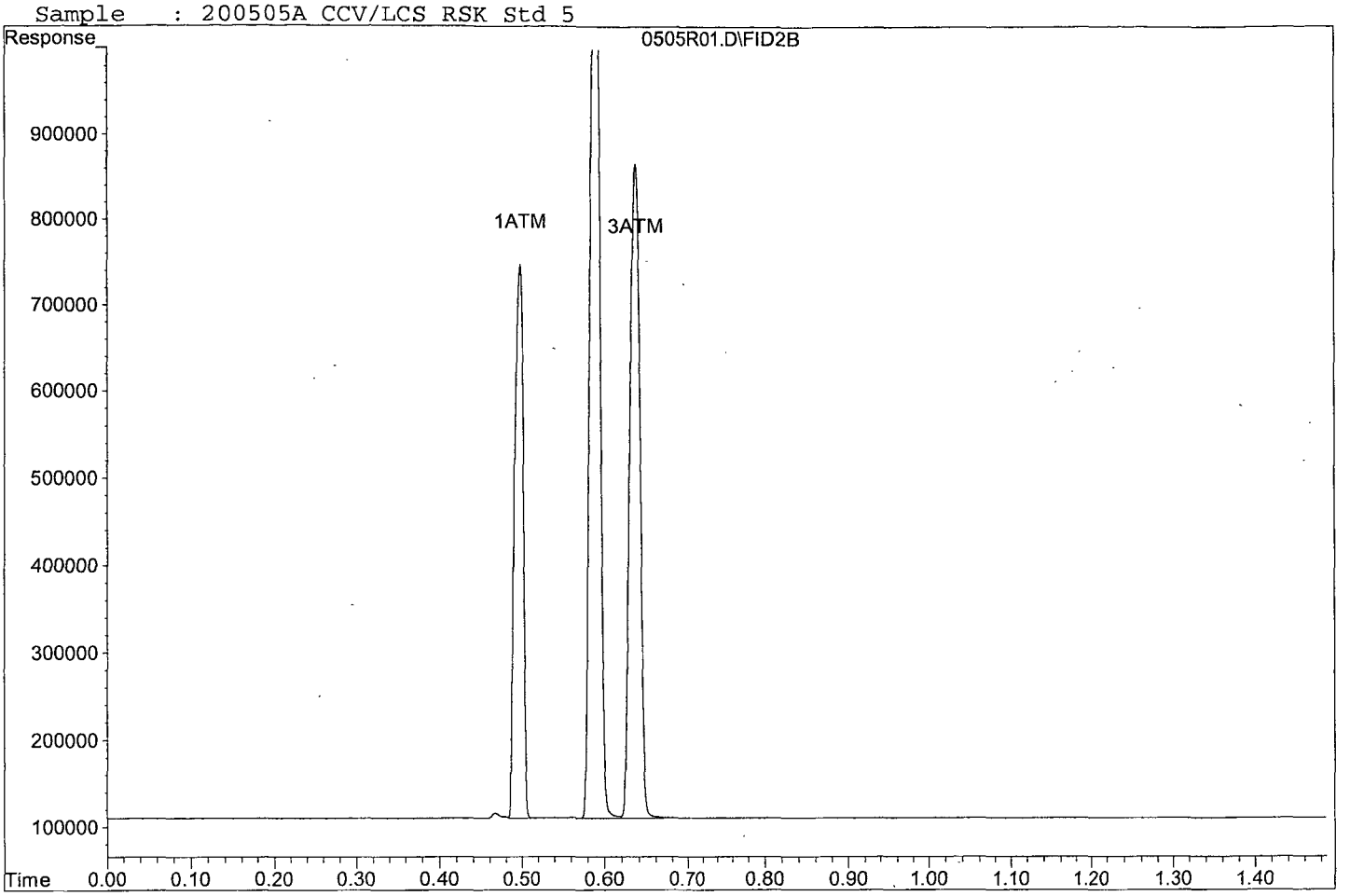
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	637603	73.873 ppb
2) ATM Ethane	0.59	1085970	160.643 ppb
3) ATM Ethene	0.64	755466	146.616 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0505R01.D
Sample : 200505A CCV/LCS RSK Std 5



Form 7

Ending Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 5 May 20 12:12
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0505R11.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	14757	20	ATML	15
2	ATML	Ethane	15066	13211	12	ATML	3.0
3	ATML	Ethene	11519	9700	16	ATML	6.6
4							
5							
6							
7							
8							
9							
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11							
12							
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35							
36							
37							
38							
39							
40							
		Average			16.0		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R11.D Vial: 11
Acq On : 5 May 20 12:12 Operator: GA; CMM
Sample : Ending CCV RSK Std 5 05/05/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 12:14 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

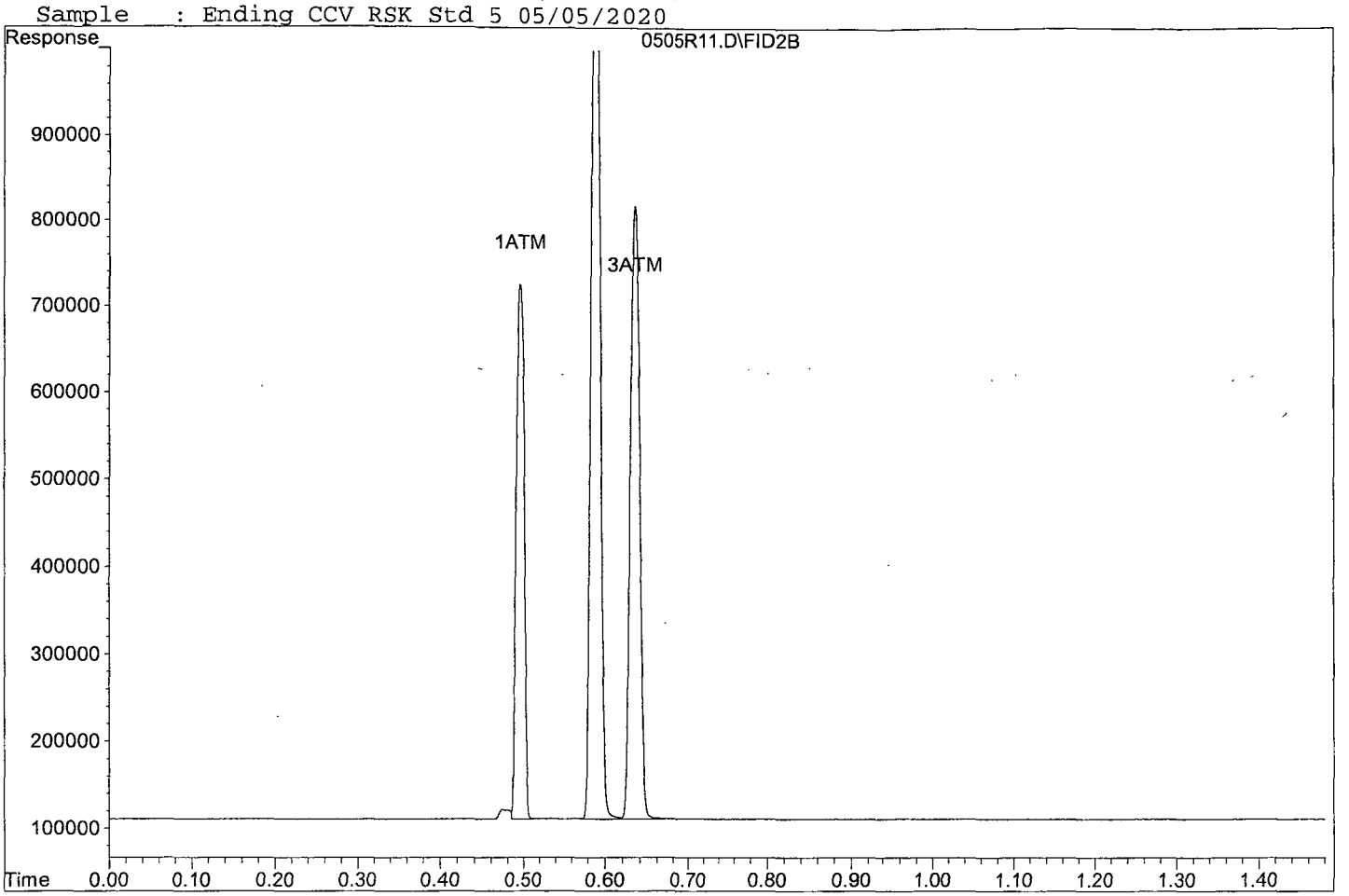
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	615378	70.834 ppb
2) ATM Ethane	0.59	1032758	151.652 ppb
3) ATM Ethene	0.64	707313	136.144 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0505R11.D
Sample : Ending CCV RSK Std 5 05/05/2020



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R06.D Vial: 6
Acq On : 5 May 20 11:59 Operator: GA; CMM
Sample : BA10438W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 12:03 2020 Quant Results File: RSK0311.RES

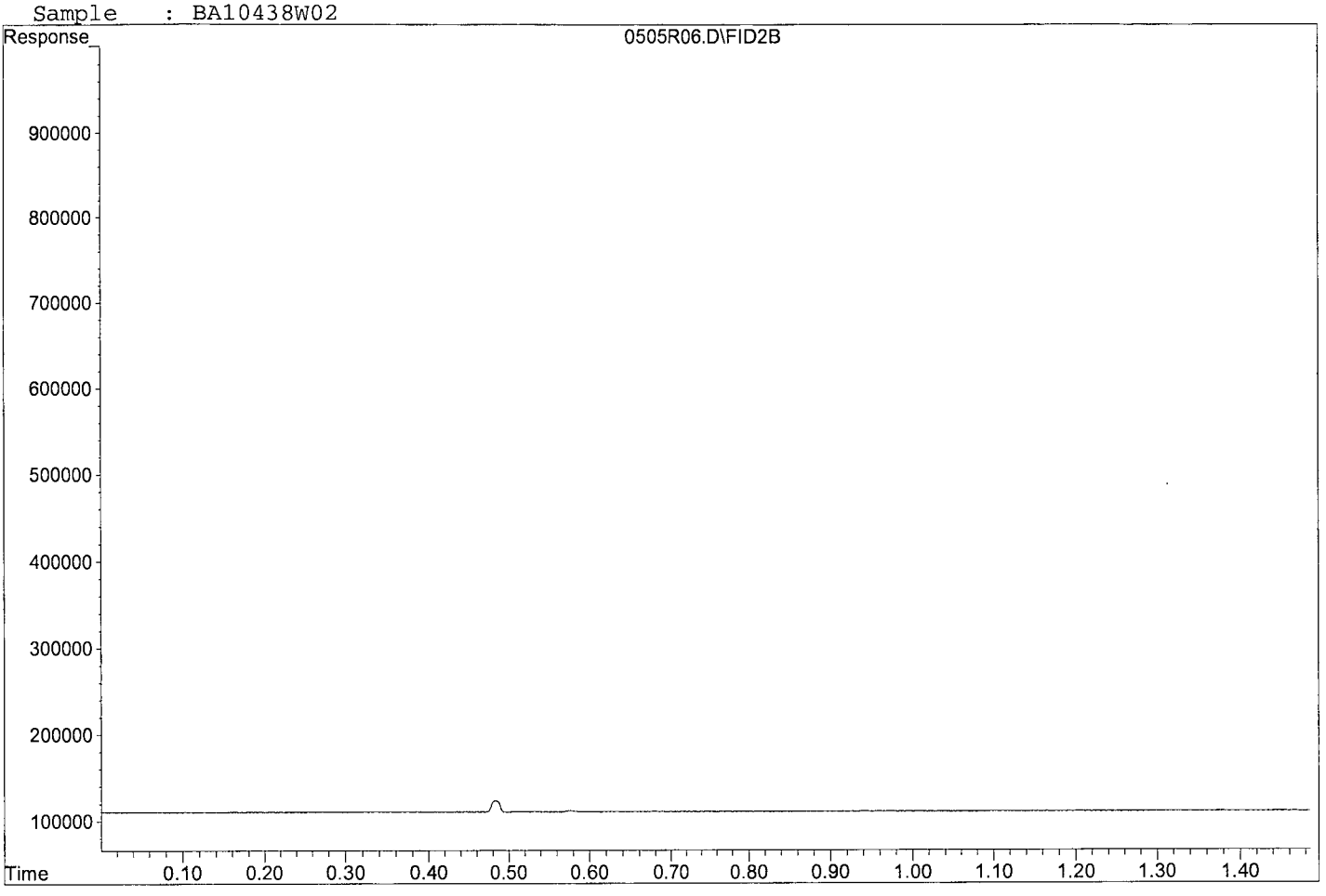
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0505R06.D
Sample : BA10438W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R07.D Vial: 7
Acq On : 5 May 20 12:01 Operator: GA; CMM
Sample : BA10439W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 12:04 2020 Quant Results File: RSK0311.RES

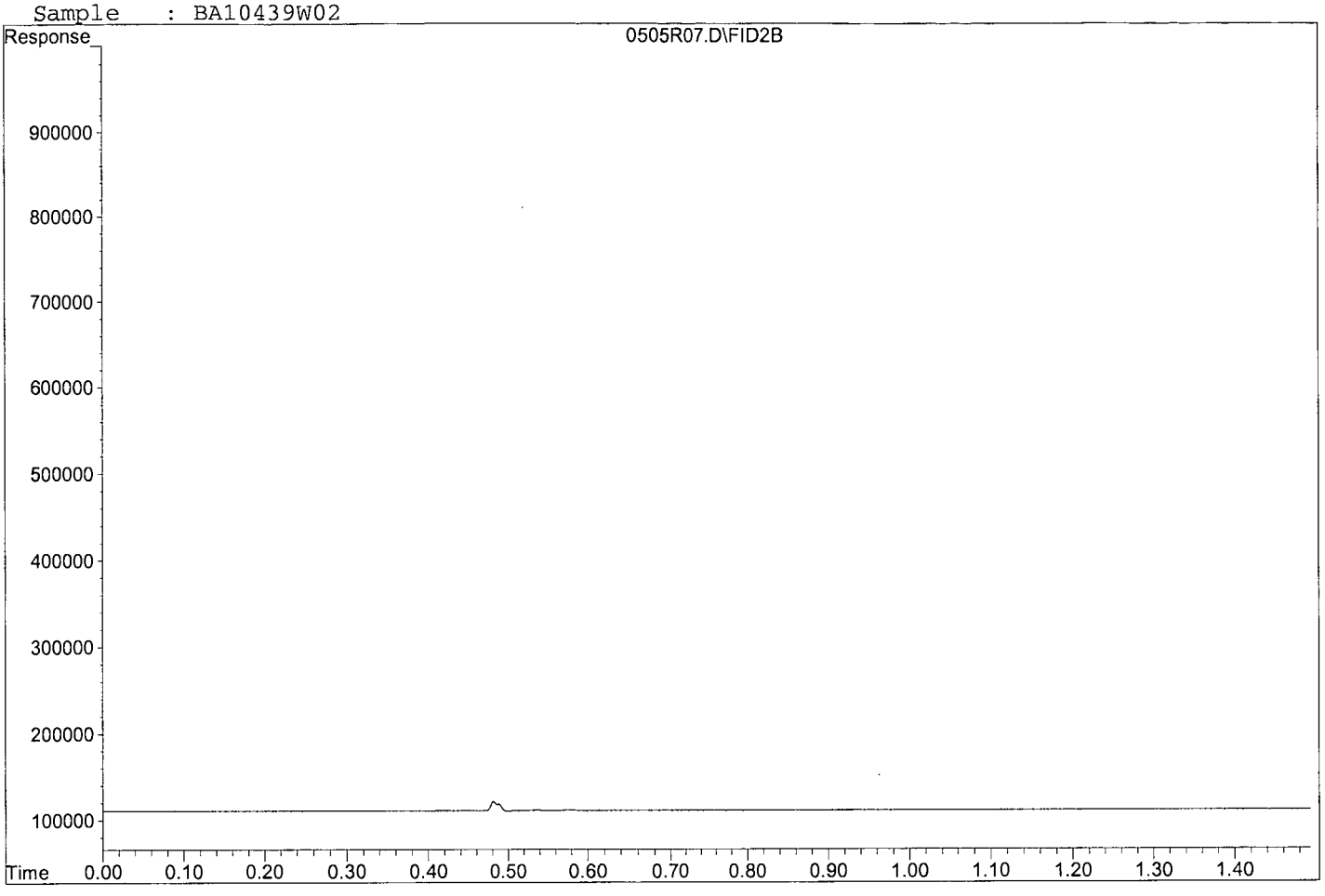
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0505R07.D
Sample : BA10439W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R05.D Vial: 5
Acq On : 5 May 20 11:52 Operator: GA; CMM
Sample : 200505A Blk Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 11:59 2020 Quant Results File: RSK0311.RES

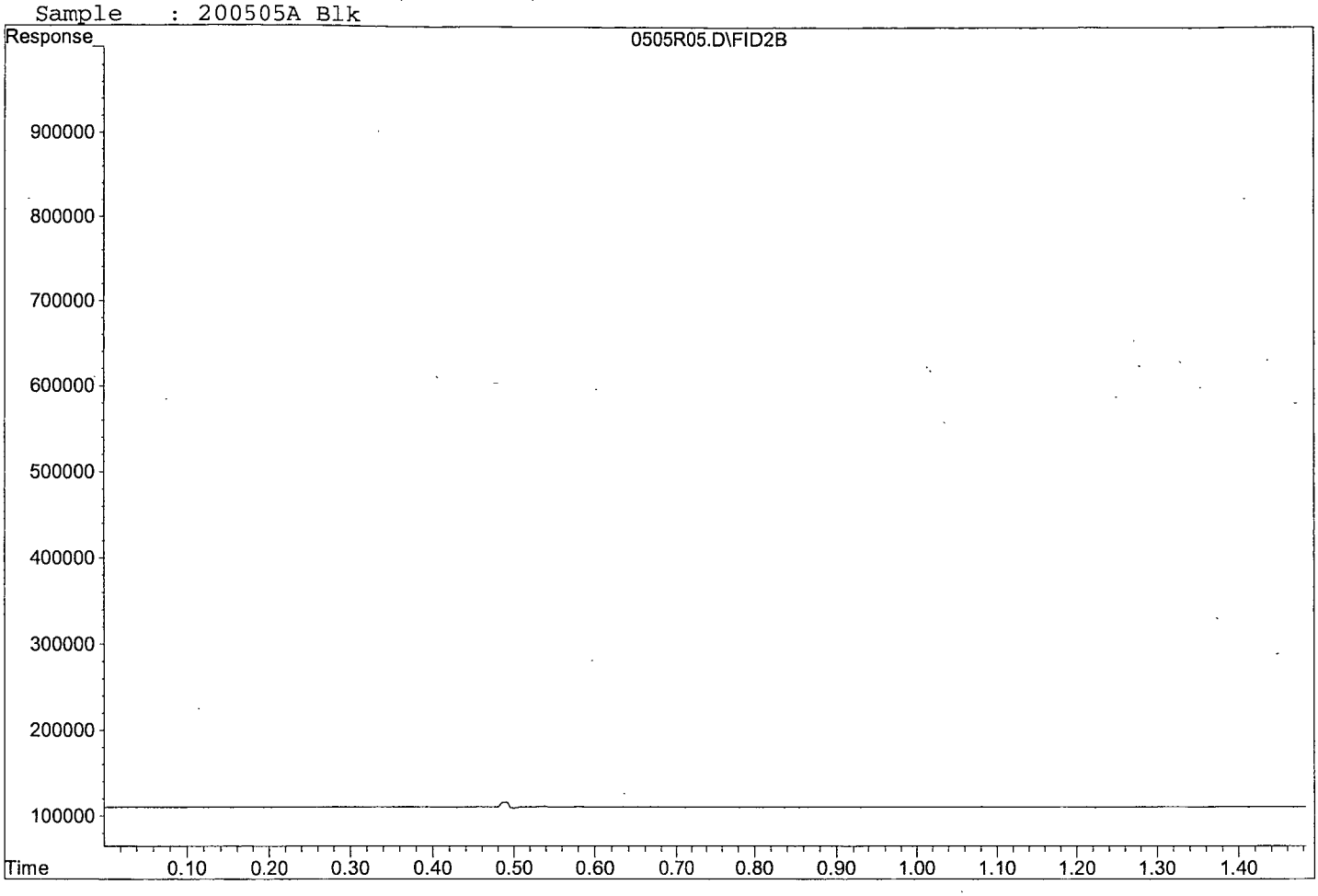
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0505R05.D
Sample : 200505A Blk



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R01.D Vial: 1
Acq On : 5 May 20 11:28 Operator: GA; CMM
Sample : 200505A CCV/LCS RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 11:31 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

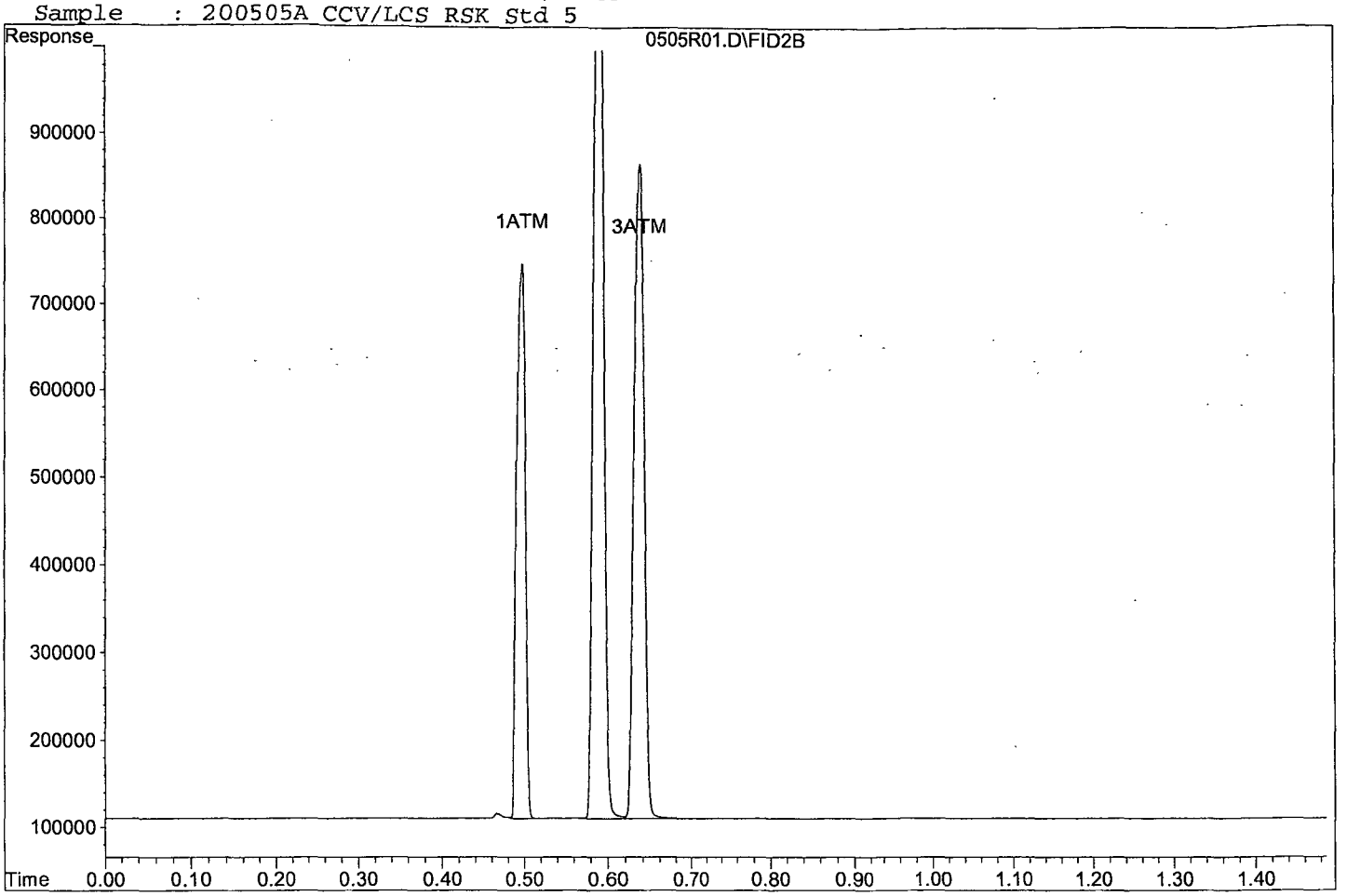
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	637603	73.873 ppb
2) ATM Ethane	0.59	1085970	160.643 ppb
3) ATM Ethene	0.64	755466	146.616 ppb

Target Compounds

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0505R01.D
Sample : 200505A CCV/LCS RSK Std 5



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R03.D Vial: 3
Acq On : 5 May 20 11:46 Operator: GA; CMM
Sample : 200505A LCSD RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 11:49 2020 Quant Results File: RSK0311.RES

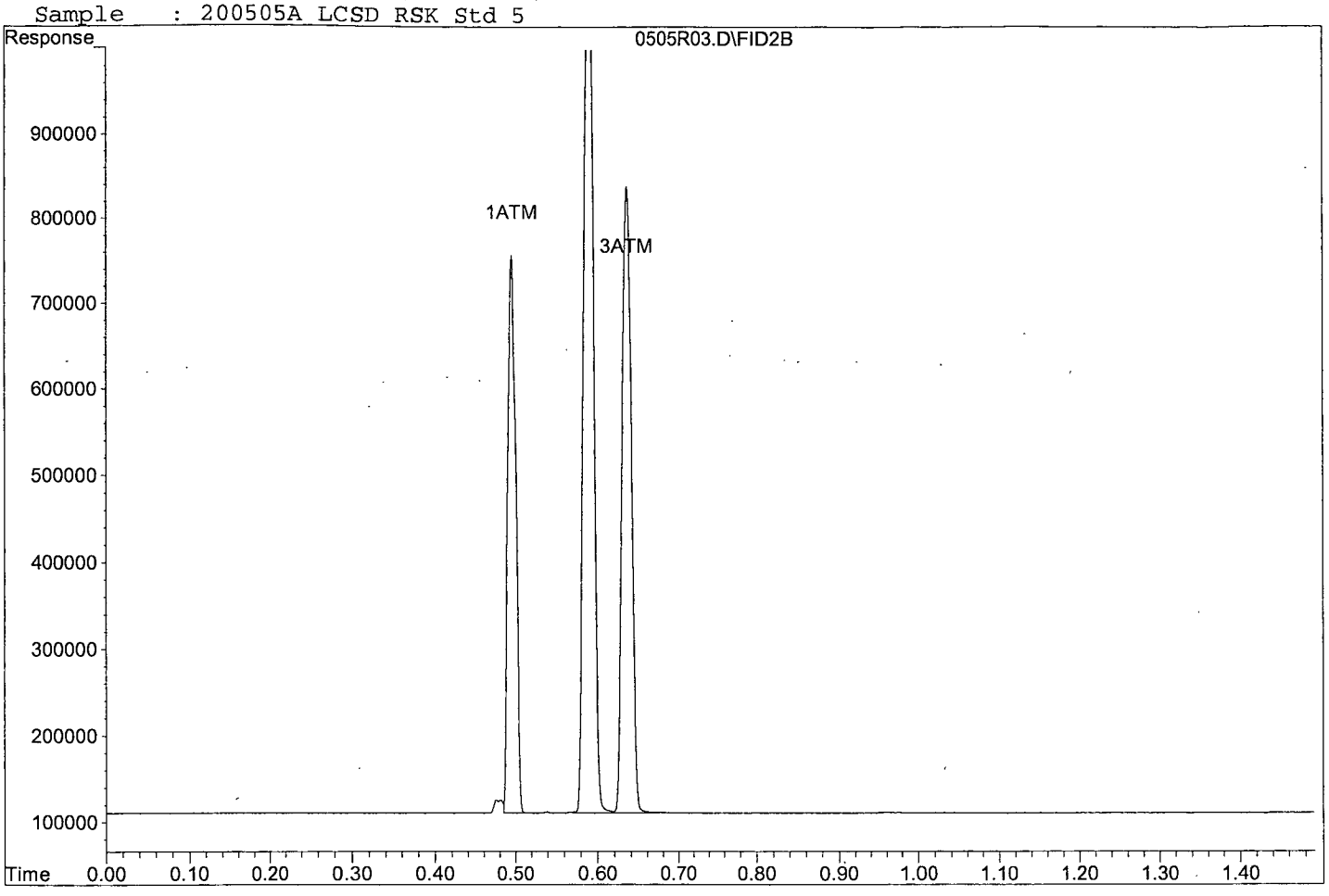
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	644612	74.832 ppb
2) ATM Ethane	0.59	1059347	156.144 ppb
3) ATM Ethene	0.64	727278	140.486 ppb

Target Compounds

Data File: G:\ROCKY\DATA\200311RS\0505R03.D
Sample : 200505A LCSD RSK Std 5



Primary Stock Source

10,000ppmV **Manufacture Expiration:** 09/21/21

RSK Gas Mix (Scott Specialty Gas) CAT#X04NI97CP140001 LOT#160-401558175-1

1% Gas Concentration Moles = 10,000ppmV Methane, Ethane, Ethene

RSK Calibration Curve (prepared in 1.0 L Tedlar Bags at room temp) **05/11/20** **03/11/20**

Analyte	Conc Std 1 (1/2 = LOD) (ug/L)	Conc Std 2 (LOQ Chk) (ug/L)	Conc Std 3 (ug/L)	Conc Std 4 (ug/L)	Conc Std 5 (ug/L)	Conc Std 6 (ug/L)	Conc Std 7 (ug/L)
Methane (MW 16.04)	2.08	4.16	8.34	20.85	83.40	208.5	834.0
Ethane (MW 30.07)	3.91	7.81	15.6	39.09	156.35	390.9	1563.5
Ethene (MW 28.05)	3.65	7.30	14.6	36.46	145.84	364.6	1458.4
Stock Source	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1
Stock Conc (ppmv)	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV
Stock Aliquot (mL)	0.010	0.020	0.040	0.100	0.400	1.00	4.00
Final Volume P&T Water	32 mL	32 mL	32 mL	32 mL	32 mL	32 mL	32 mL

Second Source Stock Standard 10,000ppmV **Manufacturer Exp date 9-21-2021**

RSK Gas Mix (Scott Specialty Gas) Cat.# 23452, Lot # 160-401303032-1-39774

1% Gas Concentration Moles = 10,000ppmV Methane, Ethane, Ethene

Second Source **Expires 03/12/2020** **CMM 03/11/2020**

Spike 0.400mL of 10,000ppmV into 32mL DI water, with 8mL Nitrogen headspace

final conc: 83.40ug/L Methane, 156.35ug/L Ethane, and 145.84ug/L Ethene

CCV/LCS/LCSD **CMM 05/05/20**

Spike 0.400mL of 10,000ppmV into 32mL DI water, with 8mL Nitrogen headspace

final conc: 83.40ug/L Methane, 156.35ug/L Ethane, and 145.84ug/L Ethene

Injection Log

Directory: G:\ROCKY\DATA\200311RS\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	3	0311R03.D	1	RSK Std 1 03/11/2020		11 Mar 20 13:00
2	4	0311R04.D	1	RSK Std 2 03/11/2020		11 Mar 20 13:03
3	7	0311R07.D	1	RSK Std 3 03/11/2020		11 Mar 20 13:12
4	8	0311R08.D	1	RSK Std 4 03/11/2020		11 Mar 20 13:15
5	9	0311R09.D	1	RSK Std 5 03/11/2020		11 Mar 20 13:17
6	11	0311R11.D	1	RSK Std 6 03/11/2020		11 Mar 20 13:22
7	13	0311R13.D	1	RSK Std 7 03/11/2020		11 Mar 20 13:28
8	15	0311R15.D	1	RSK SS Std 5 03/11/2020		11 Mar 20 13:38
9	1	0505R01.D	1	200505A CCV/LCS RSK Std 5		5 May 20 11:28
10	3	0505R03.D	1	200505A LCSD RSK Std 5		5 May 20 11:46
11	5	0505R05.D	1	200505A Blk		5 May 20 11:52
12	6	0505R06.D	1	BA10438W02		5 May 20 11:59
13	7	0505R07.D	1	BA10439W02		5 May 20 12:01
16	11	0505R11.D	1	Ending CCV RSK Std 5 05/05/2020		5 May 20 12:12

INORGANIC ANALYSIS
Calibration Data

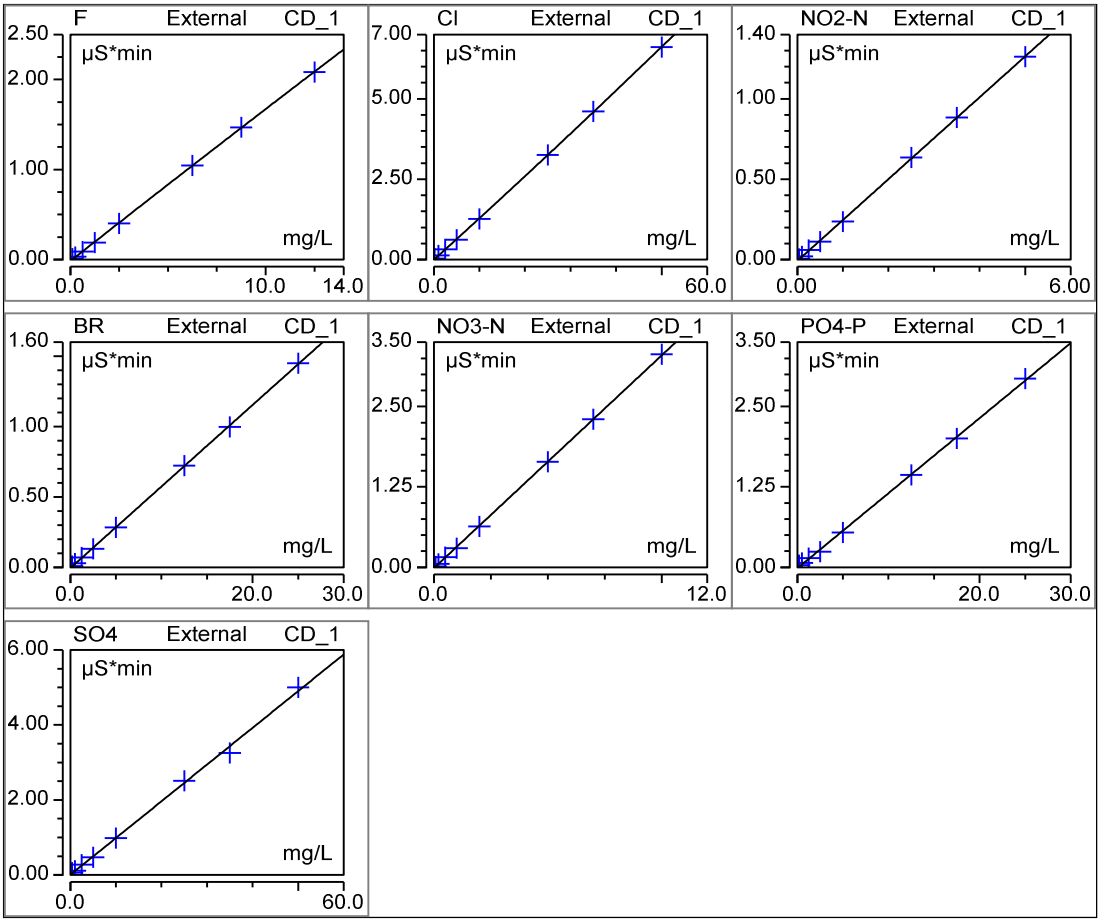
Calibration Batch Report

Sequence:	**200326**	*Injection Volume:*	**25.00**
Instrument Method:	**Anions IM**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:22**	*Run Time:*	**14**

Calibration Summary

Peak Name	Eval.Type	Cal.Type	Points	Offset (C0)	Slope (C1)	Curve (C2)	Coeff.Det. %
F	Area	Quad, WithOffset	8.000	-0.016	0.171	0.000	99.9922
Cl	Area	Quad, WithOffset	8.000	-0.007	0.128	0.000	99.9957
NO2-N	Area	Lin, WithOffset	8.000	-0.009	0.255	0.000	99.9838
BR	Area	Lin, WithOffset	8.000	-0.006	0.058	0.000	99.9872
NO3-N	Area	Lin, WithOffset, 1/A	8.000	-0.014	0.331	0.000	99.9739
PO4-P	Area	Lin, WithOffset	8.000	-0.016	0.117	0.000	99.9396
SO4	Area	Lin, WithOffset	8.000	0.006	0.098	0.000	99.7903

Injection Name	Amount mg/L CD_1 F	Amount mg/L CD_1 Cl	Amount mg/L CD_1 NO2-N	Amount mg/L CD_1 BR	Amount mg/L CD_1 NO3-N	Amount mg/L CD_1 PO4-P	Amount mg/L CD_1 SO4
Cal 1	0.157	0.3163	0.0511	0.2474	0.0796	0.4282	0.6148
Cal 2	0.273	1.0789	0.1153	0.5781	0.2054	0.7072	1.0626
Cal 3	0.611	2.5316	0.2592	1.2595	0.5238	1.1933	2.7192
Cal 4	1.187	4.8096	0.4672	2.4043	0.9297	2.1420	4.7385
Cal 5	2.371	9.8094	0.9573	4.9426	1.9148	4.5306	9.9082
Cal 6	6.245	25.0387	2.4641	12.3303	4.9622	12.0807	25.4677
Cal 7	8.827	34.9499	3.4985	17.2085	6.9204	17.1012	35.1265
Cal 8 2020.03.25	12.582	49.9317	4.9740	25.1090	9.9430	25.1800	50.7694

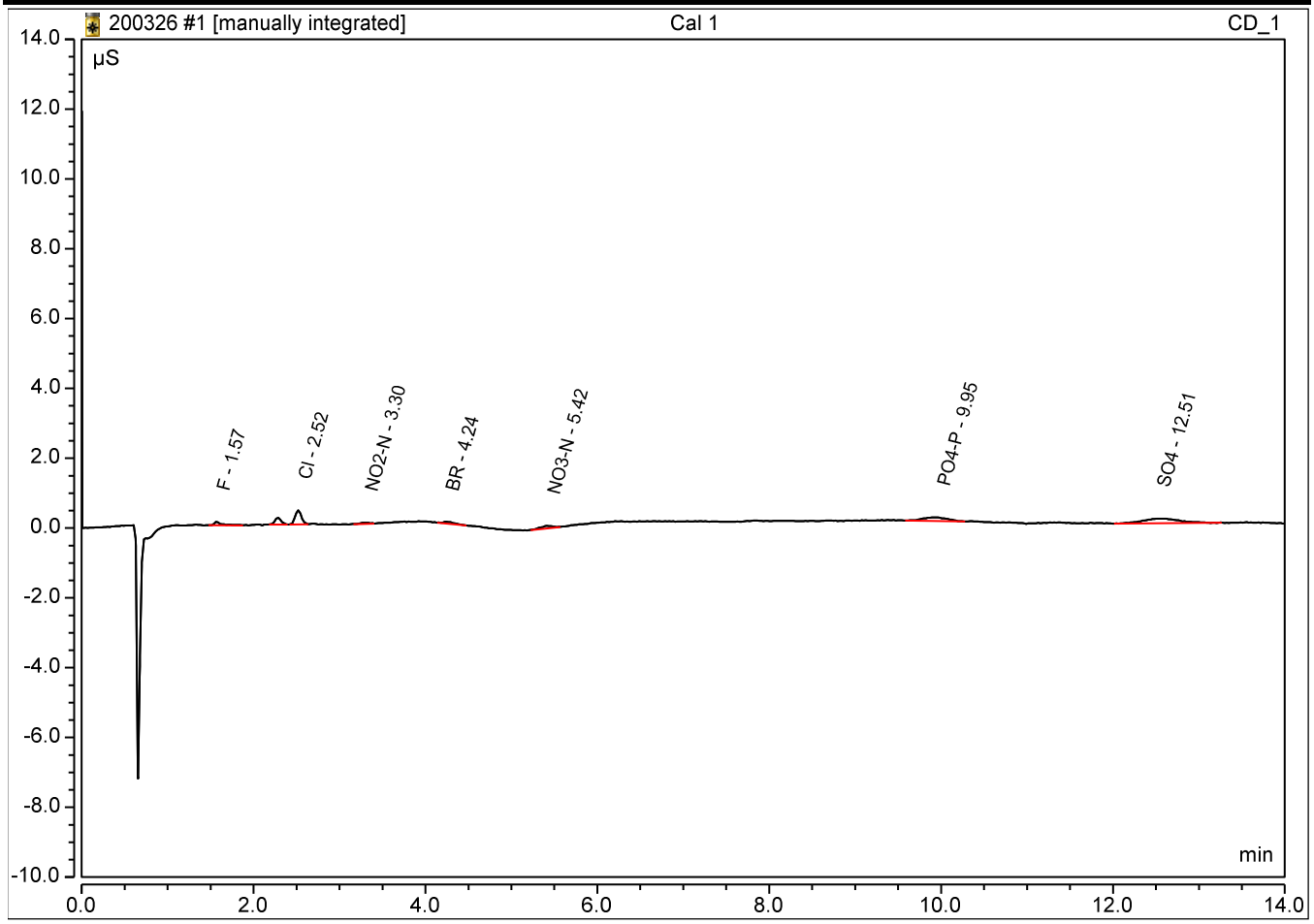


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:28**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.011	0.098	0.16	0.1	157.2%
3	2.52	**Cl**	BMB	0.034	0.405	0.32	0.2	158.1%
4	3.30	**NO2-N**	BMB	0.005	0.038	0.05	0.04	127.7%
5	4.24	**BR**	BMB	0.009	0.050	0.25	0.2	123.7%
6	5.42	**NO3-N**	BMB	0.012	0.074	0.08	0.08	99.5%
7	9.95	**PO4-P**	BMB*	0.034	0.107	0.43	0.2	214.1%
8	12.51	**SO4**	BMB*	0.067	0.137	0.61	0.4	153.7%

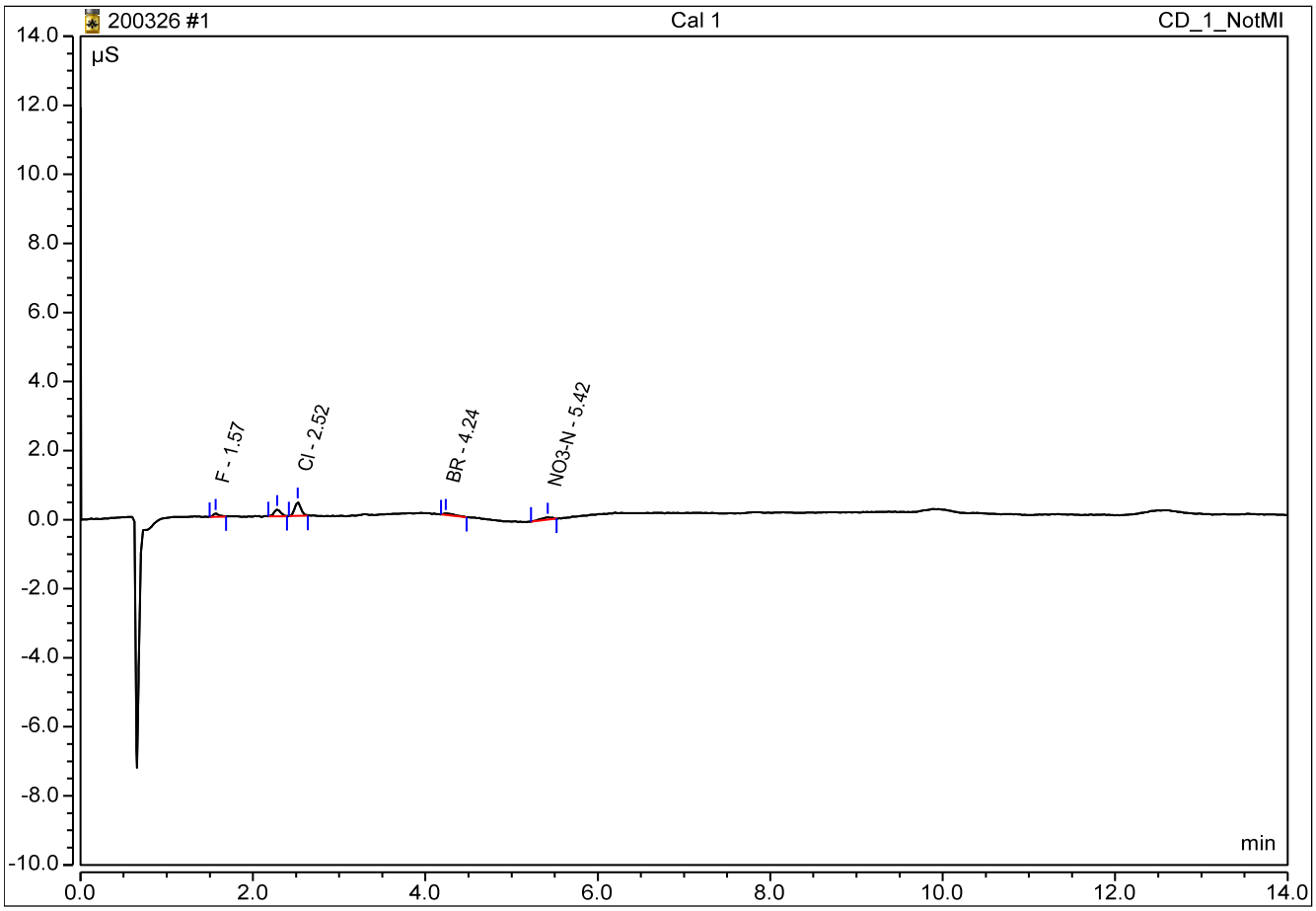


GA MI 1 2020.03.26

Not Manipulated Peak Integration Report

Sample Name:	**Cal 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:28**	*Run Time:*	**14.00**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	1.57	**F**	BMB	0.007	0.093	0.1305
3	2.52	**Cl**	BMB	0.034	0.405	0.3164
4	n.a.	**NO2-N**	BMB	n.a.	n.a.	n.a.
5	4.24	**BR**	BMB	0.006	0.041	0.2065
6	5.42	**NO3-N**	BMB	0.010	0.068	0.0644
7	n.a.	**PO4-P**	BMB*	n.a.	n.a.	n.a.
8	n.a.	**SO4**	BMB*	n.a.	n.a.	n.a.

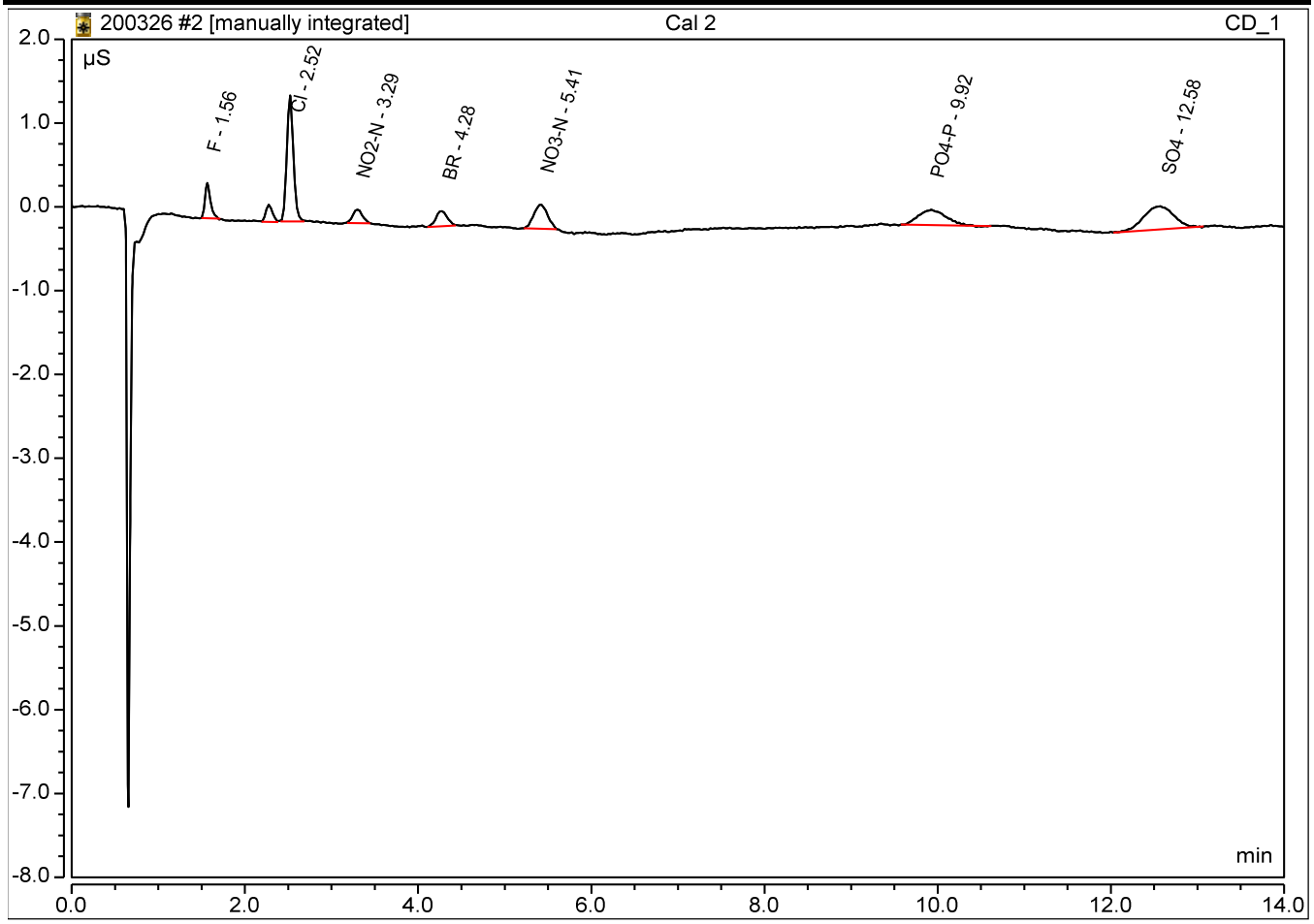


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:44**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.56	**F**	BMB*	0.030	0.420	0.27	0.25	109.1%
3	2.52	**Cl**	BMB	0.132	1.502	1.08	1	107.9%
4	3.29	**NO2-N**	BMB	0.021	0.165	0.12	0.1	115.3%
5	4.28	**BR**	BMB	0.028	0.182	0.58	0.5	115.6%
6	5.41	**NO3-N**	BMB	0.054	0.288	0.21	0.2	102.7%
7	9.92	**PO4-P**	BMB*	0.067	0.192	0.71	0.5	141.4%
8	12.58	**SO4**	BMB*	0.110	0.278	1.06	1	106.3%



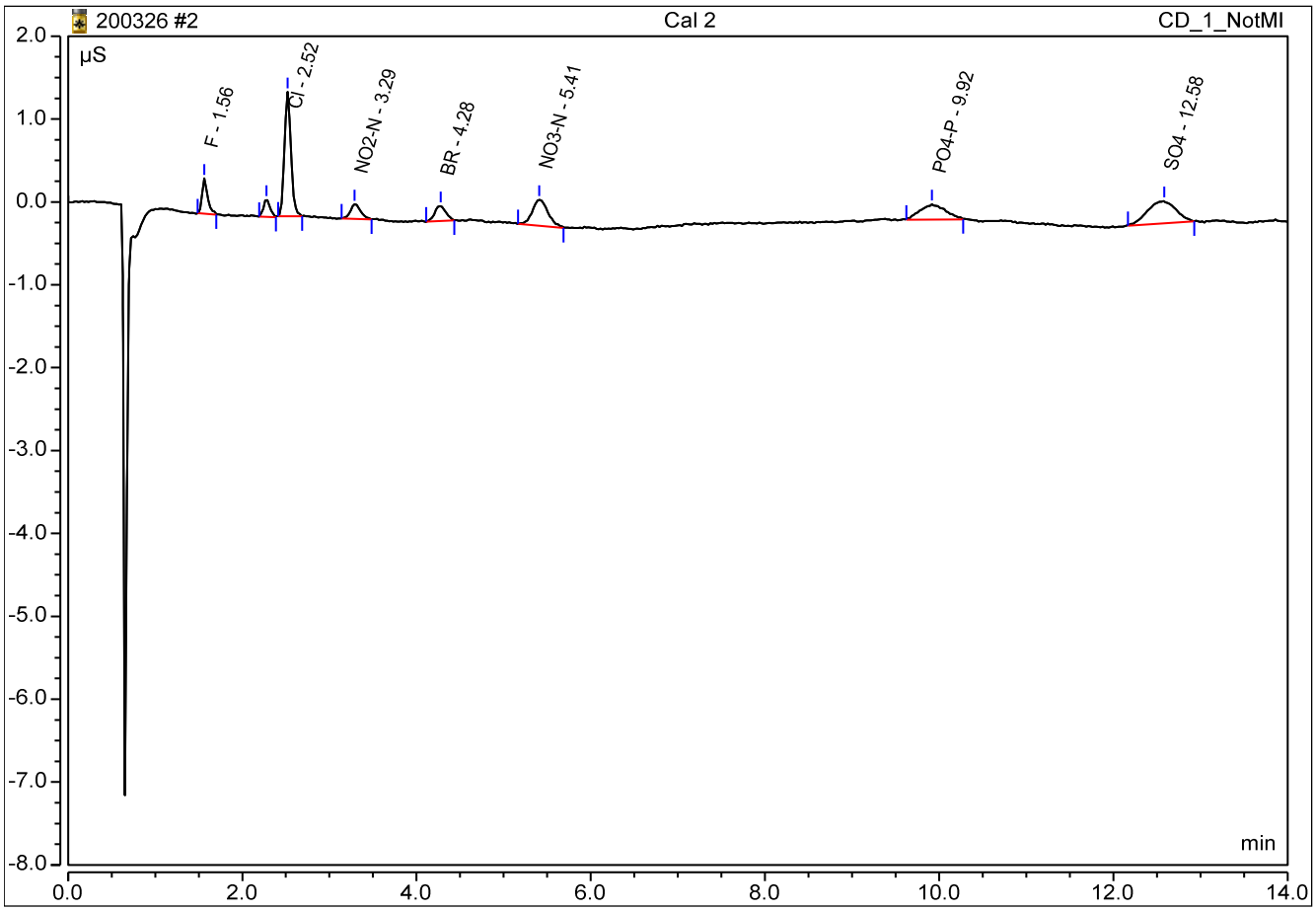
GA MI 1 2020.03.26

Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Not Manipulated Peak Integration Report

Sample Name:	**Cal 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:44**	*Run Time:*	**14.00**

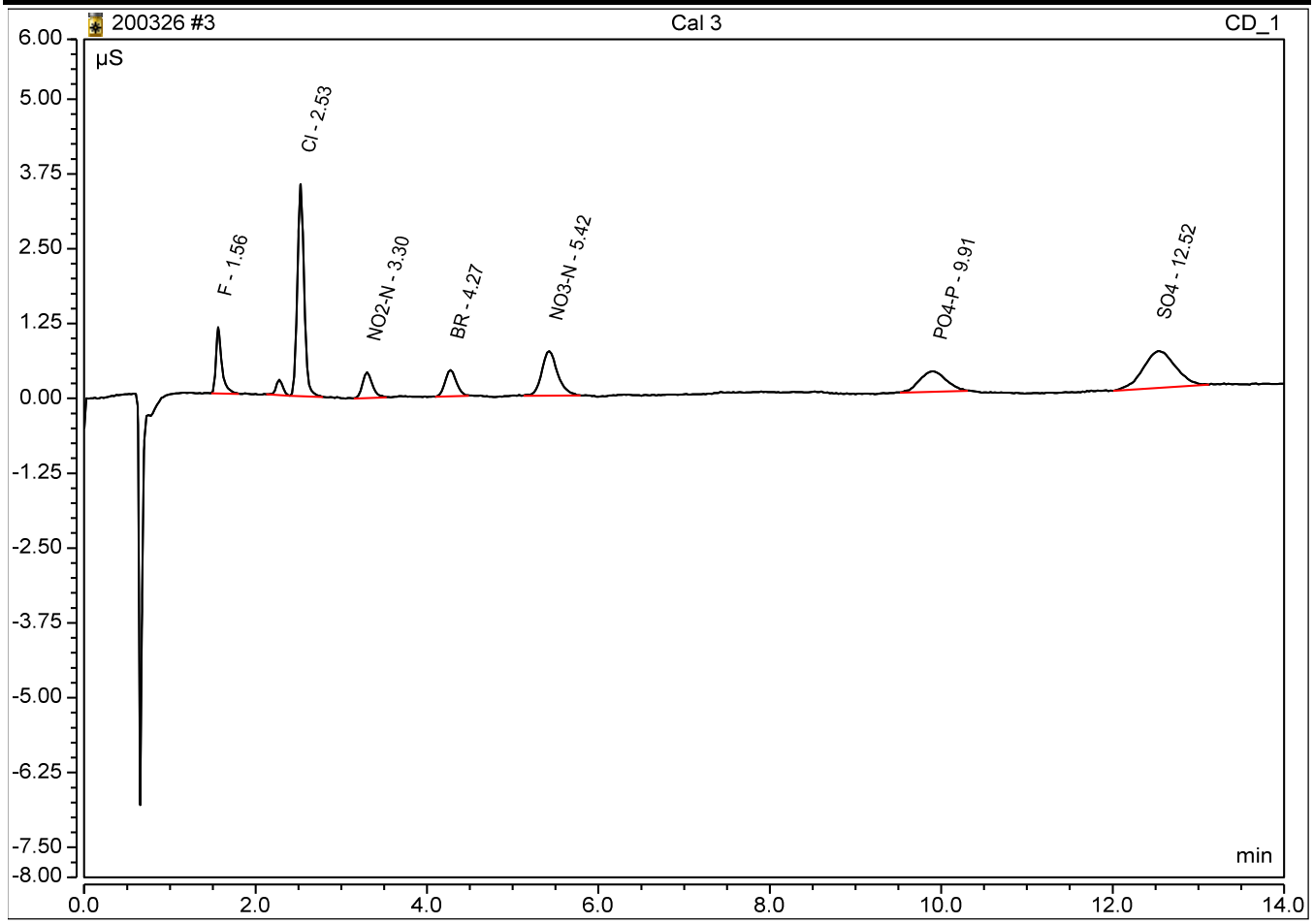
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	1.56	**F**	BMB*	0.032	0.425	0.2765
3	2.52	**Cl**	BMB	0.132	1.502	1.0796
4	3.29	**NO2-N**	BMB	0.025	0.176	0.1249
5	4.28	**BR**	BMB	0.027	0.180	0.5628
6	5.41	**NO3-N**	BMB	0.067	0.315	0.2352
7	9.92	**PO4-P**	BMB*	0.061	0.185	0.6914
8	12.58	**SO4**	BMB*	0.103	0.270	1.0287



Peak Integration Report

Sample Name:	**Cal 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:01**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.56	**F**	BMB	0.088	1.107	0.61	0.625	97.8%
3	2.53	**Cl**	BMB	0.319	3.543	2.53	2.5	101.3%
4	3.30	**NO2-N**	BMB	0.057	0.430	0.26	0.25	103.7%
5	4.27	**BR**	BMB	0.067	0.442	1.26	1.25	100.8%
6	5.42	**NO3-N**	BMB	0.159	0.742	0.52	0.5	104.8%
7	9.91	**PO4-P**	BMB	0.124	0.343	1.19	1.25	95.5%
8	12.52	**SO4**	BMB	0.273	0.621	2.72	2.5	108.8%

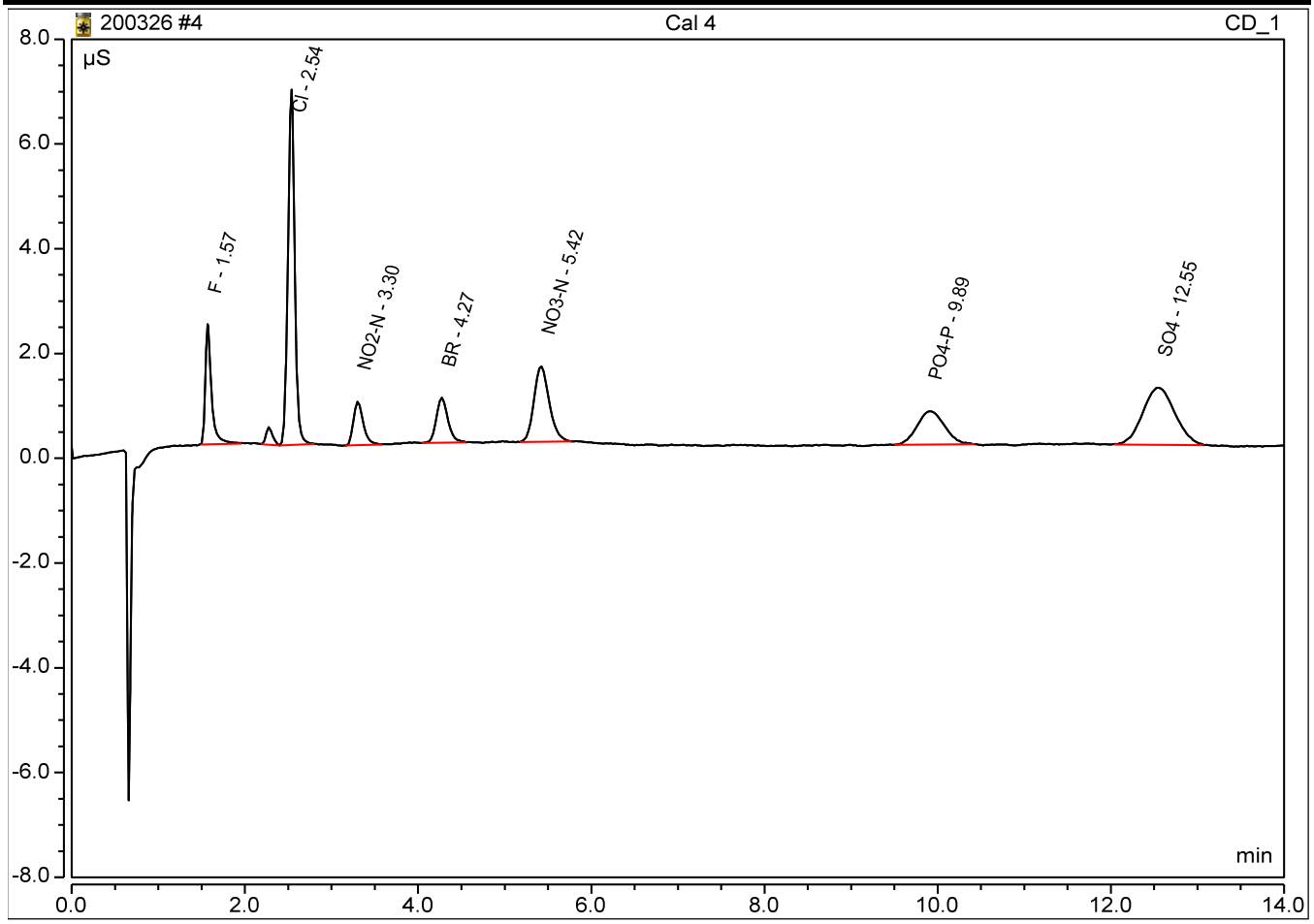


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 4**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:17**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.186	2.294	1.19	1.25	94.9%
3	2.54	**Cl**	BMB	0.612	6.787	4.81	5	96.2%
4	3.30	**NO2-N**	BMB	0.110	0.831	0.47	0.5	93.4%
5	4.27	**BR**	BMB	0.134	0.859	2.40	2.5	96.2%
6	5.42	**NO3-N**	BMB	0.293	1.442	0.93	1	93.0%
7	9.89	**PO4-P**	BMB	0.234	0.639	2.14	2.5	85.7%
8	12.55	**SO4**	BMB	0.470	1.092	4.74	5	94.8%

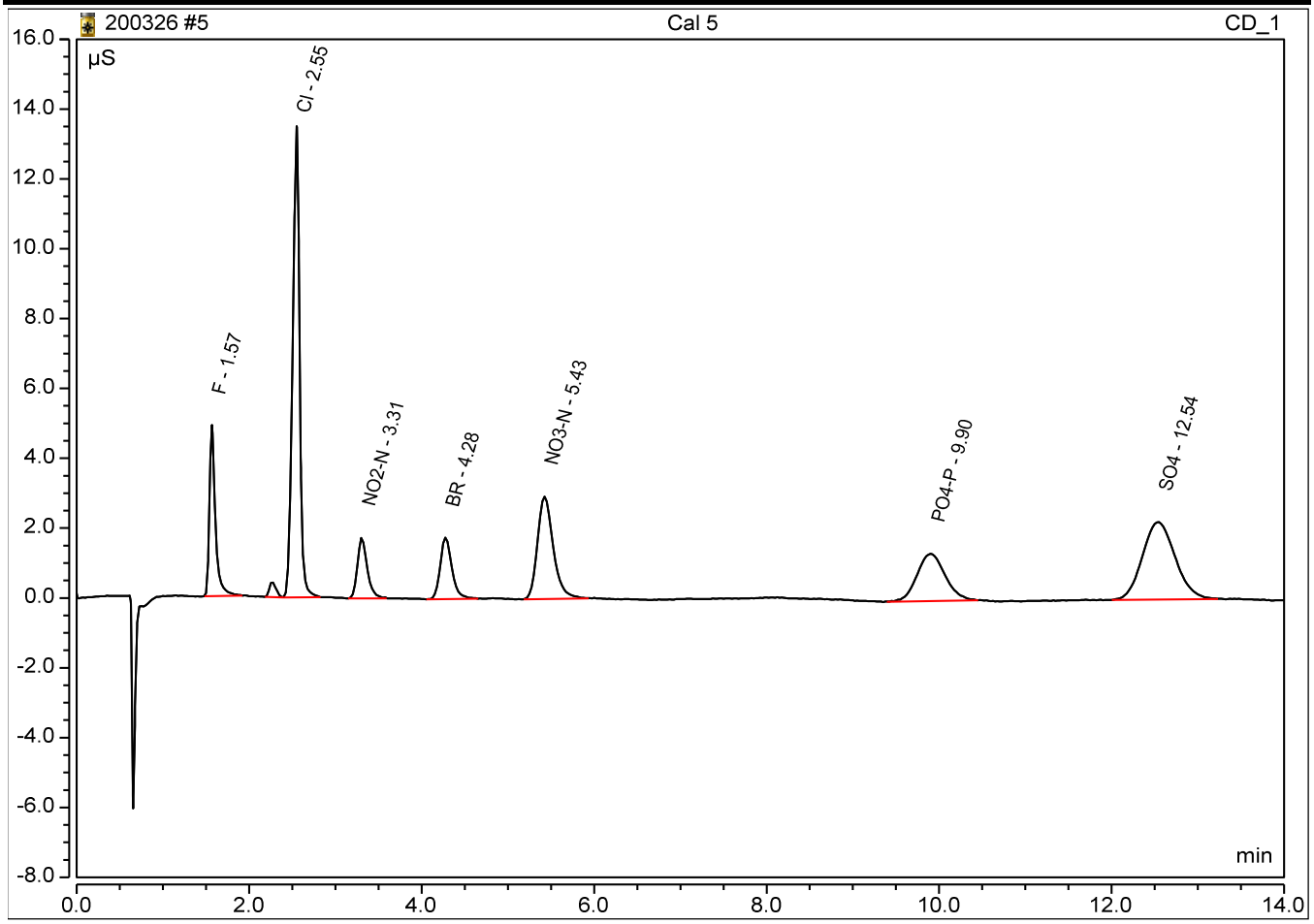


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:33**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.388	4.897	2.37	2.5	94.8%
3	2.55	**Cl**	BMB	1.260	13.489	9.81	10	98.1%
4	3.31	**NO2-N**	BMB	0.235	1.743	0.96	1	95.7%
5	4.28	**BR**	BMB	0.281	1.762	4.94	5	98.9%
6	5.43	**NO3-N**	BMB	0.619	2.936	1.91	2	95.7%
7	9.90	**PO4-P**	BMB	0.513	1.360	4.53	5	90.6%
8	12.54	**SO4**	BMB	0.977	2.218	9.91	10	99.1%



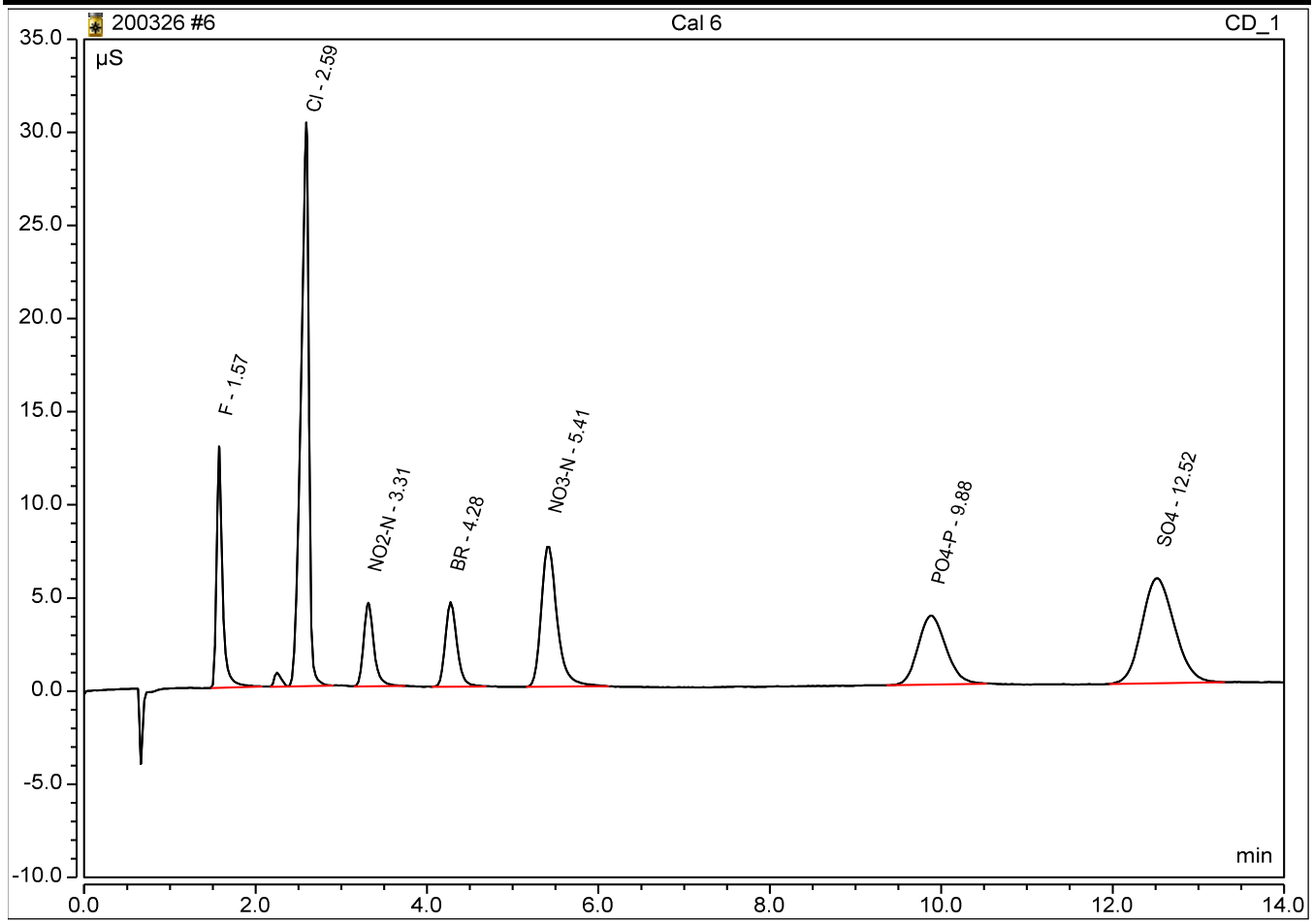
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 6**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:50**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	1.043	12.959	6.25	6.25	99.9%
3	2.59	**Cl**	BMB	3.257	30.258	25.04	25	100.2%
4	3.31	**NO2-N**	BMB	0.619	4.484	2.46	2.5	98.6%
5	4.28	**BR**	BMB	0.709	4.535	12.33	12.5	98.6%
6	5.41	**NO3-N**	BMB	1.628	7.608	4.96	5	99.2%
7	9.88	**PO4-P**	BMB	1.395	3.711	12.08	12.5	96.6%
8	12.52	**SO4**	BMB	2.500	5.638	25.47	25	101.9%

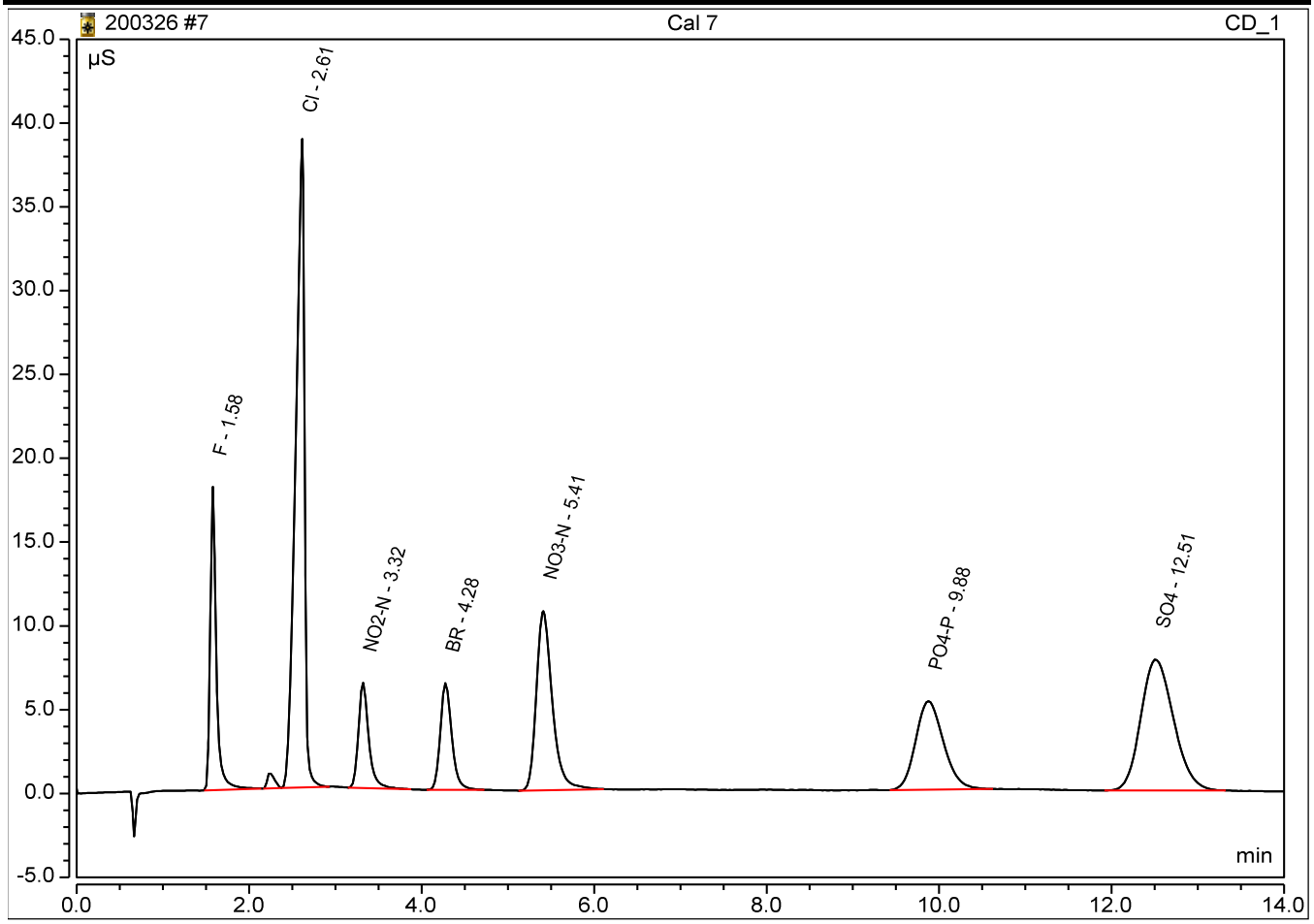


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 7**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:06**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.58	**F**	BMB	1.476	18.100	8.83	8.75	100.9%
3	2.61	**Cl**	BMB	4.578	38.681	34.95	35	99.9%
4	3.32	**NO2-N**	BMB	0.882	6.277	3.50	3.5	100.0%
5	4.28	**BR**	BMB	0.992	6.366	17.21	17.5	98.3%
6	5.41	**NO3-N**	BMB	2.276	10.681	6.92	7	98.9%
7	9.88	**PO4-P**	BMB	1.981	5.287	17.10	17.5	97.7%
8	12.51	**SO4**	BMB	3.446	7.825	35.13	35	100.4%

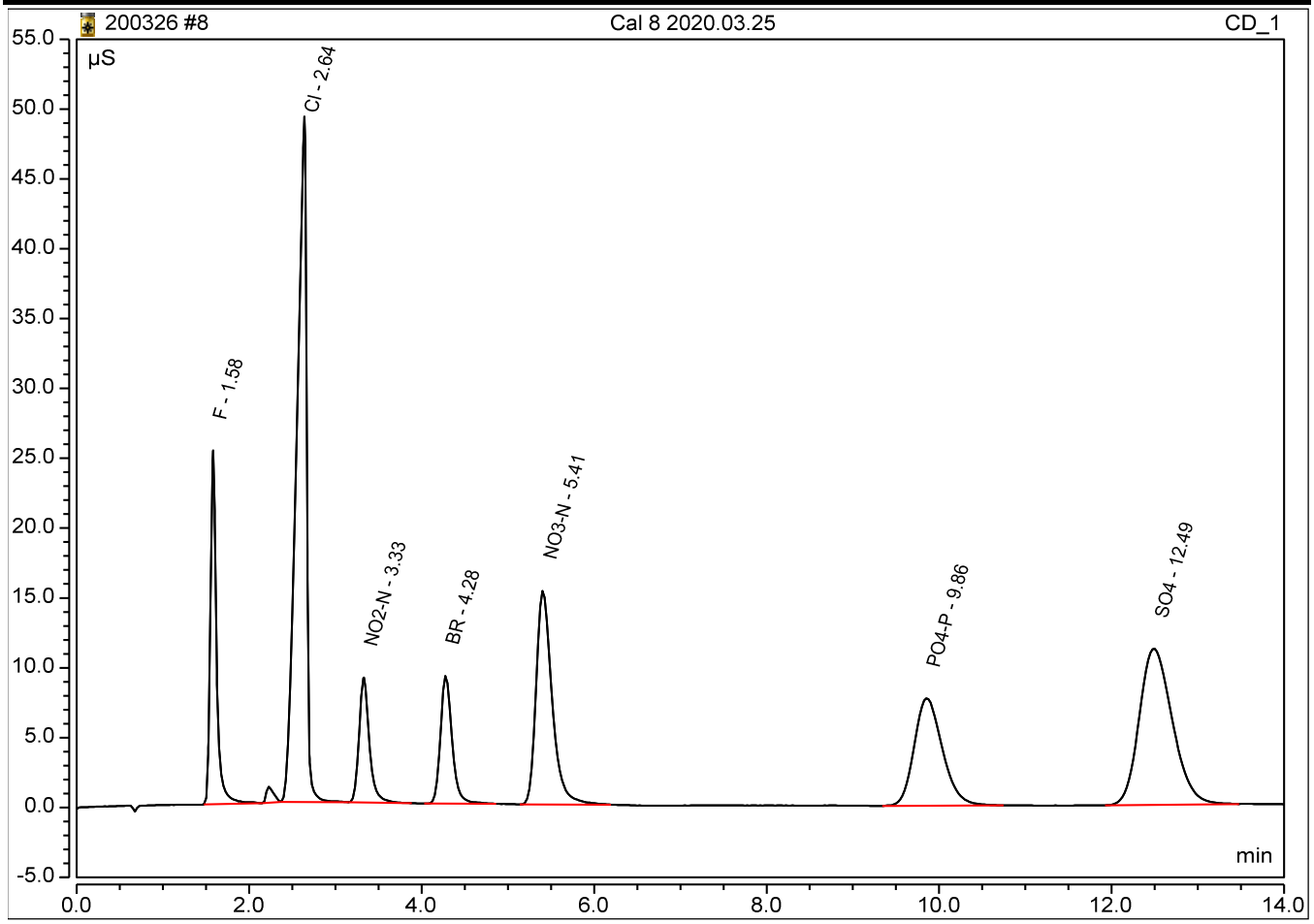


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 8 2020.03.25**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:22**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.58	**F**	BMB	2.100	25.328	12.58	12.5	100.7%
3	2.64	**Cl**	BMB	6.606	49.067	49.93	50	99.9%
4	3.33	**NO2-N**	BMB	1.257	8.938	4.97	5	99.5%
5	4.28	**BR**	BMB	1.450	9.175	25.11	25	100.4%
6	5.41	**NO3-N**	BMB	3.277	15.327	9.94	10	99.4%
7	9.86	**PO4-P**	BMB	2.924	7.700	25.18	25	100.7%
8	12.49	**SO4**	BMB	4.978	11.186	50.77	50	101.5%



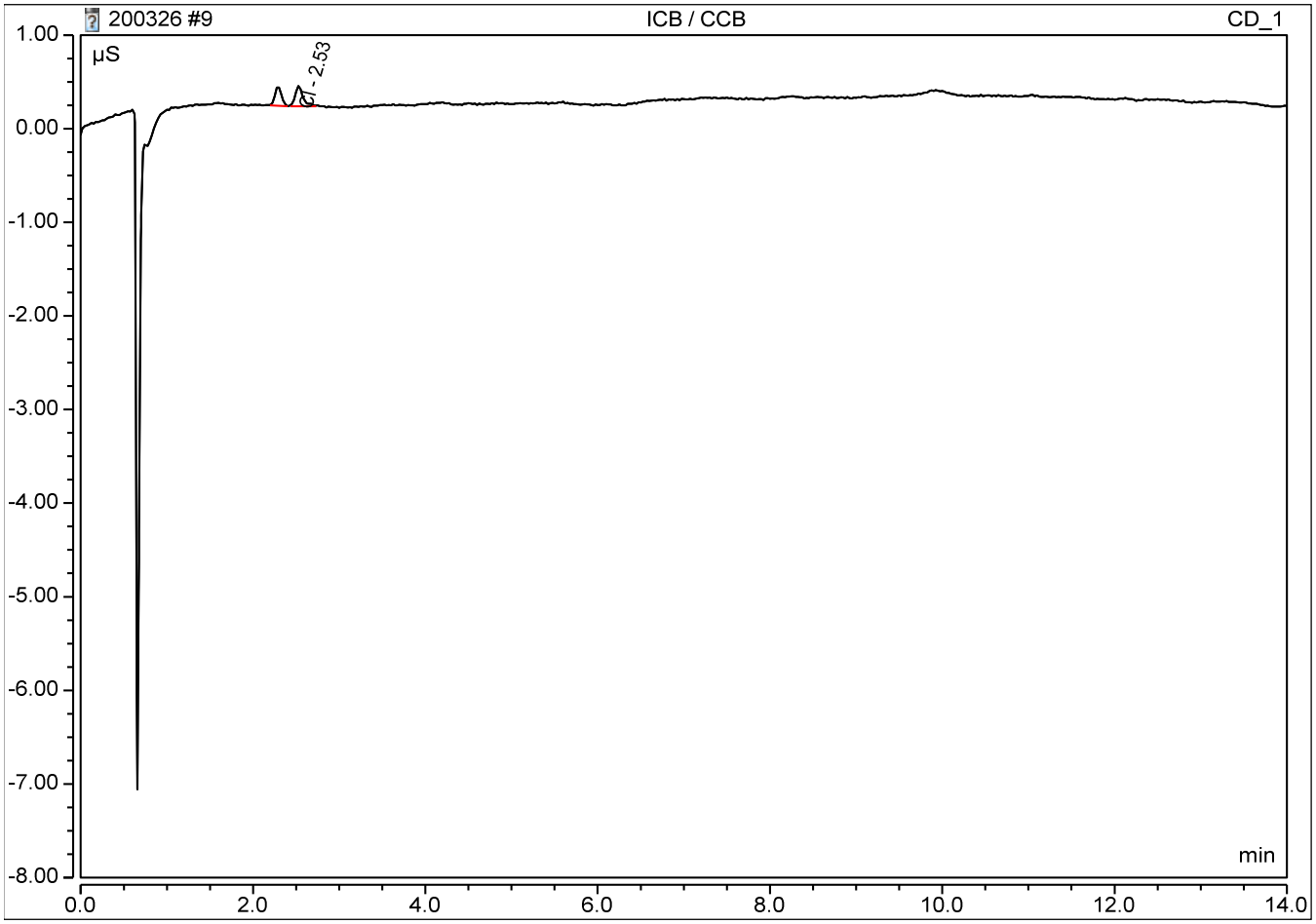
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**ICB / CCB**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:39**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.53	**Cl**	BMB	0.022	0.219	0.22		



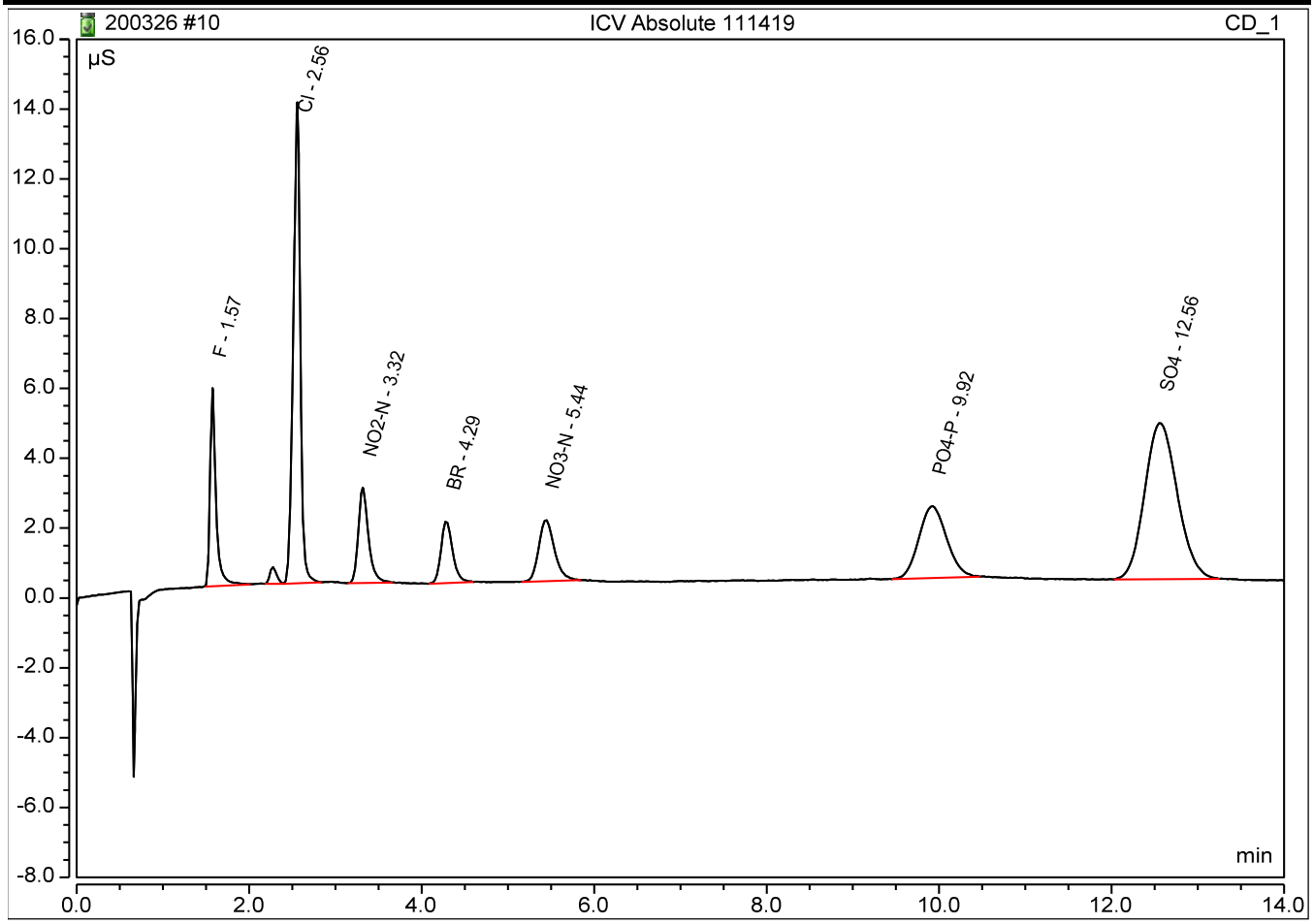
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**ICV Absolute 111419**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:55**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.452	5.670	2.75	2.5	110.0%
3	2.56	**Cl**	BMB	1.301	13.777	10.13	10	101.3%
4	3.32	**NO2-N**	BMB	0.377	2.729	1.51	1.522334	99.4%
5	4.29	**BR**	BMB	0.279	1.779	4.91	5	98.3%
6	5.44	**NO3-N**	BMB	0.370	1.758	1.16	1.129525	102.7%
7	9.92	**PO4-P**	BMB	0.771	2.060	6.74	6.522	103.3%
8	12.56	**SO4**	BMB	1.968	4.481	20.04	20	100.2%



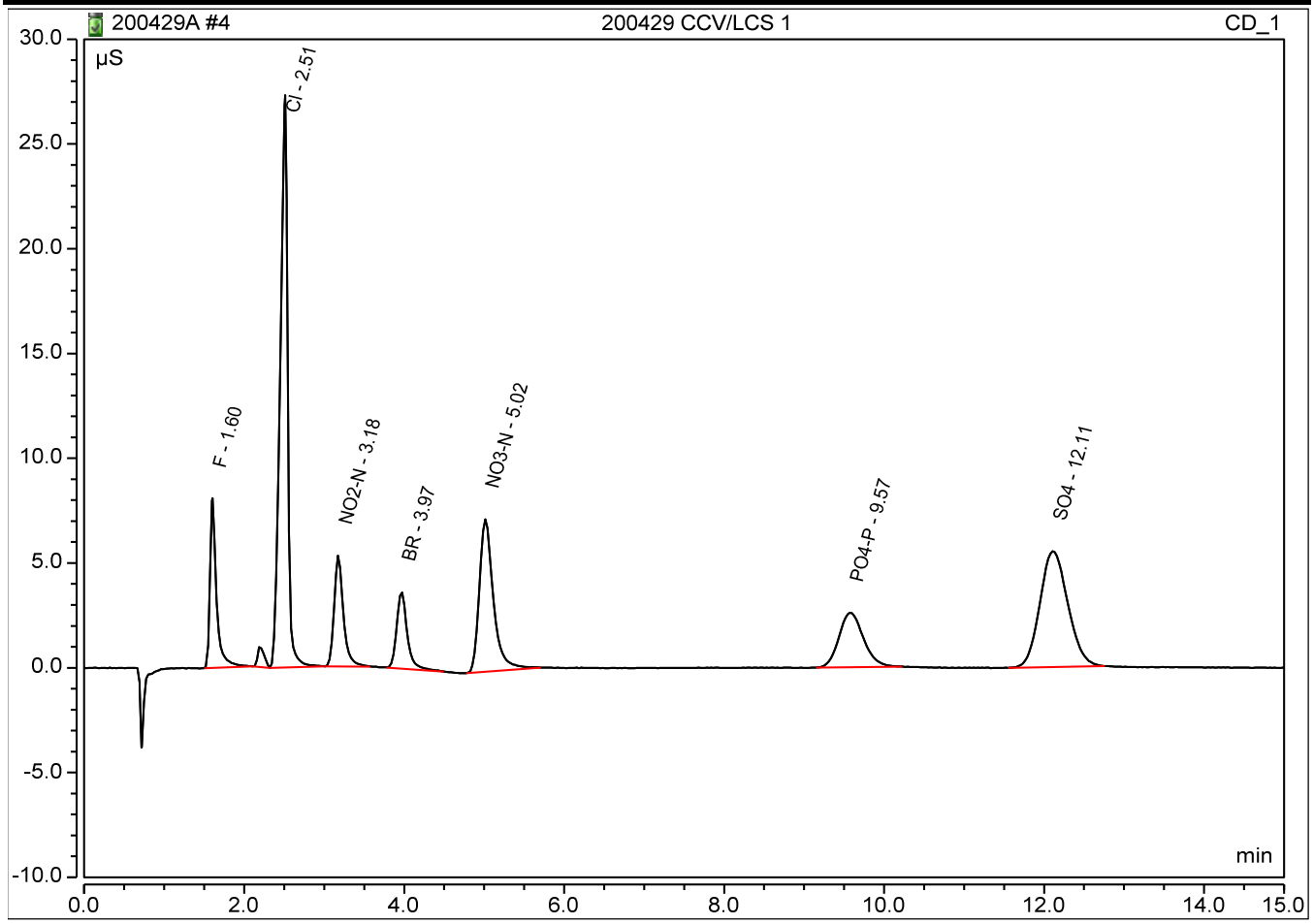
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200429A

Peak Integration Report

Sample Name:	**200429 CCV/LCS 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**29-Apr-2020 / 11:27**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	**F**	BMB	0.753	8.090	4.53	5	90.6%
3	2.51	**Cl**	BMB	2.990	27.317	23.02	25	92.1%
4	3.18	**NO2-N**	BMB	0.717	5.304	2.85	3.04	93.8%
5	3.97	**BR**	BMB	0.561	3.666	9.77	10	97.7%
6	5.02	**NO3-N**	BMB	1.489	7.277	4.54	5	90.8%
7	9.57	**PO4-P**	BMB	0.927	2.604	8.07	10	80.7%
8	12.11	**SO4**	BMB	2.246	5.531	22.87	25	91.5%



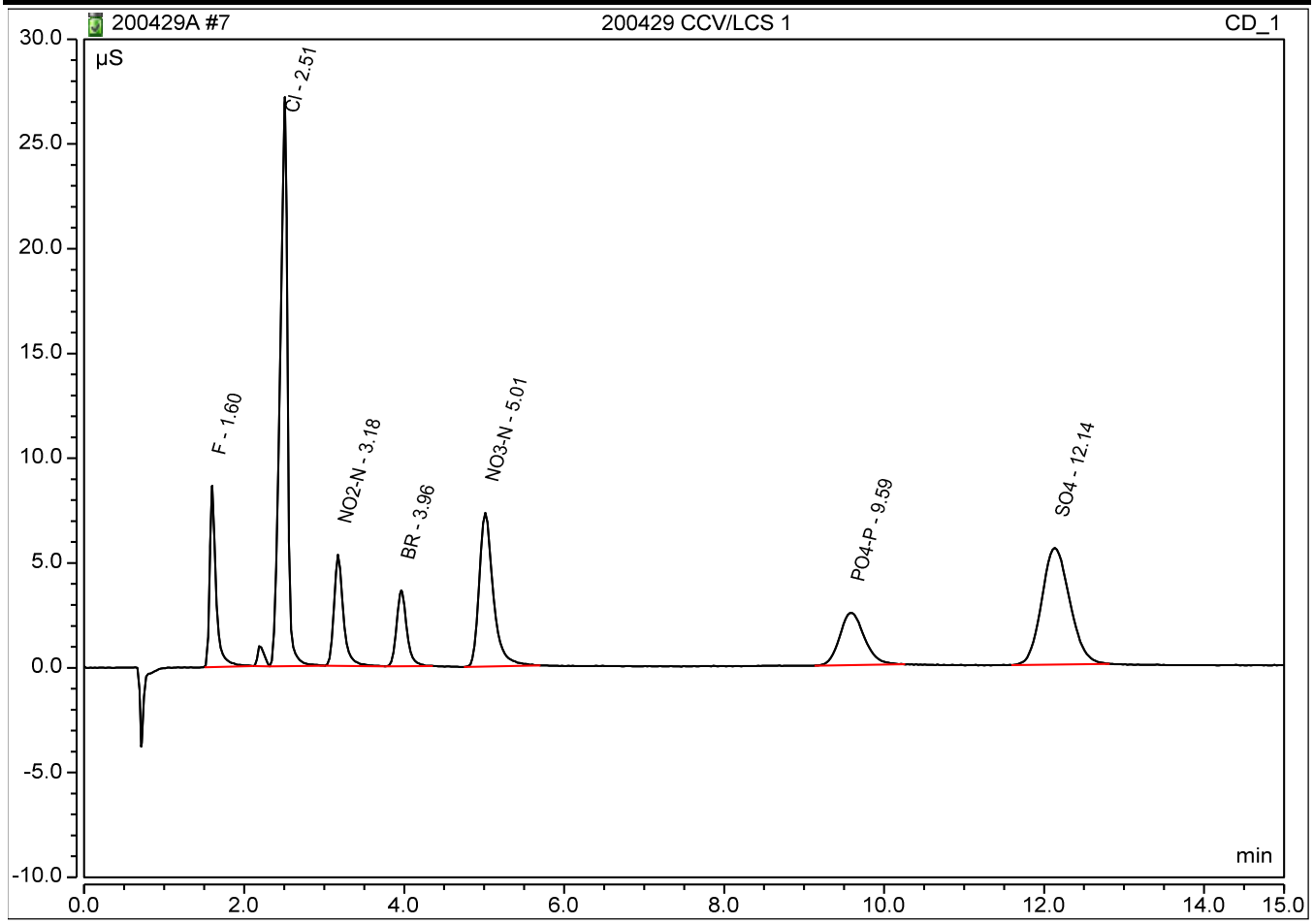
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200429A

Peak Integration Report

Sample Name:	**200429 CCV/LCS 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**29-Apr-2020 / 15:20**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	**F**	BMB	0.784	8.660	4.71	5	94.2%
3	2.51	**Cl**	BMB	2.990	27.170	23.02	25	92.1%
4	3.18	**NO2-N**	BMB	0.729	5.317	2.90	3.04	95.3%
5	3.96	**BR**	BMB	0.532	3.613	9.28	10	92.8%
6	5.01	**NO3-N**	BMB	1.503	7.335	4.58	5	91.7%
7	9.59	**PO4-P**	BMB	0.899	2.513	7.84	10	78.4%
8	12.14	**SO4**	BMB	2.272	5.572	23.13	25	92.5%



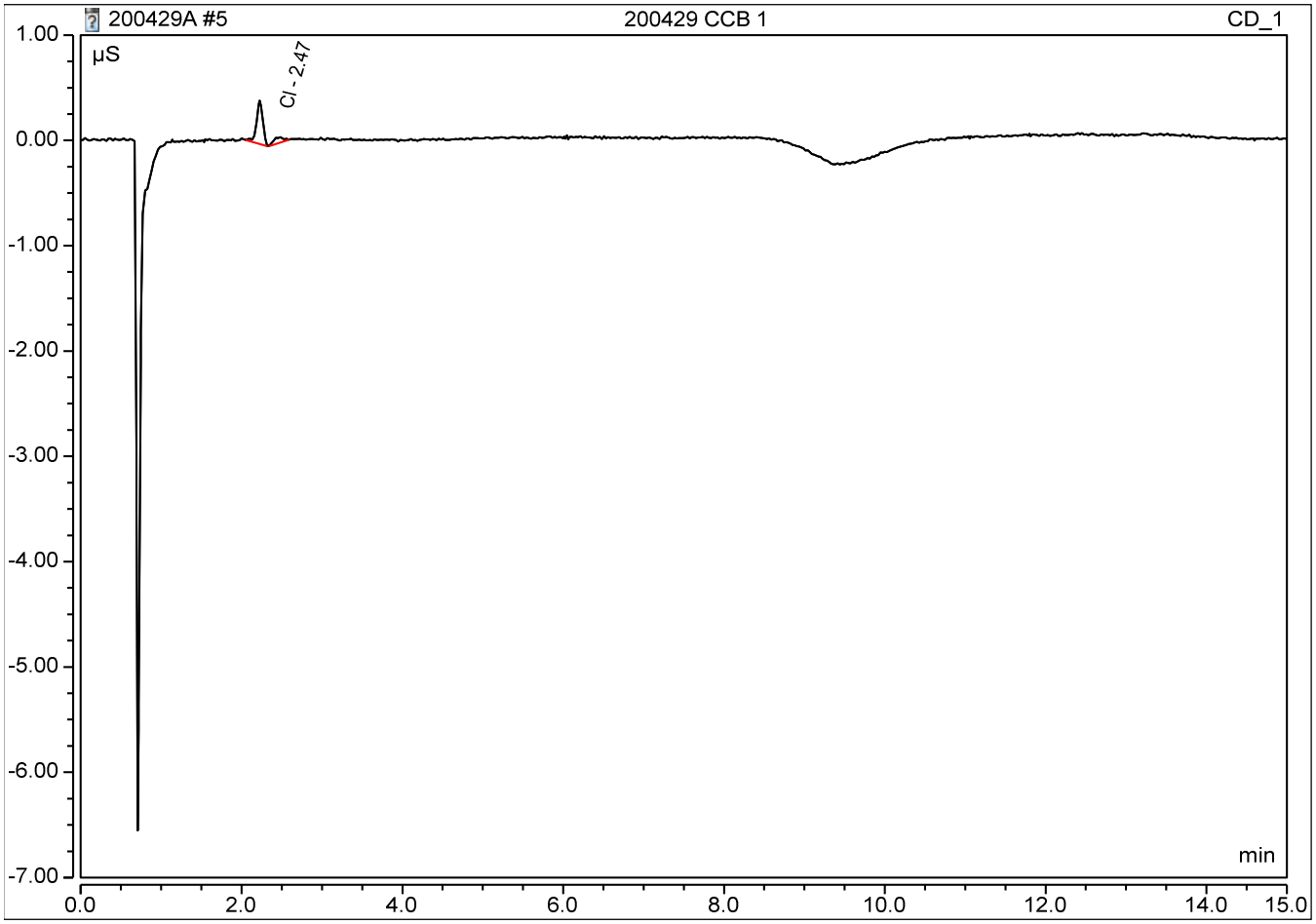
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200429A

Peak Integration Report

Sample Name:	**200429 CCB 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**29-Apr-2020 / 11:45**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.47	**Cl**	BMB	0.008	0.064	0.11		

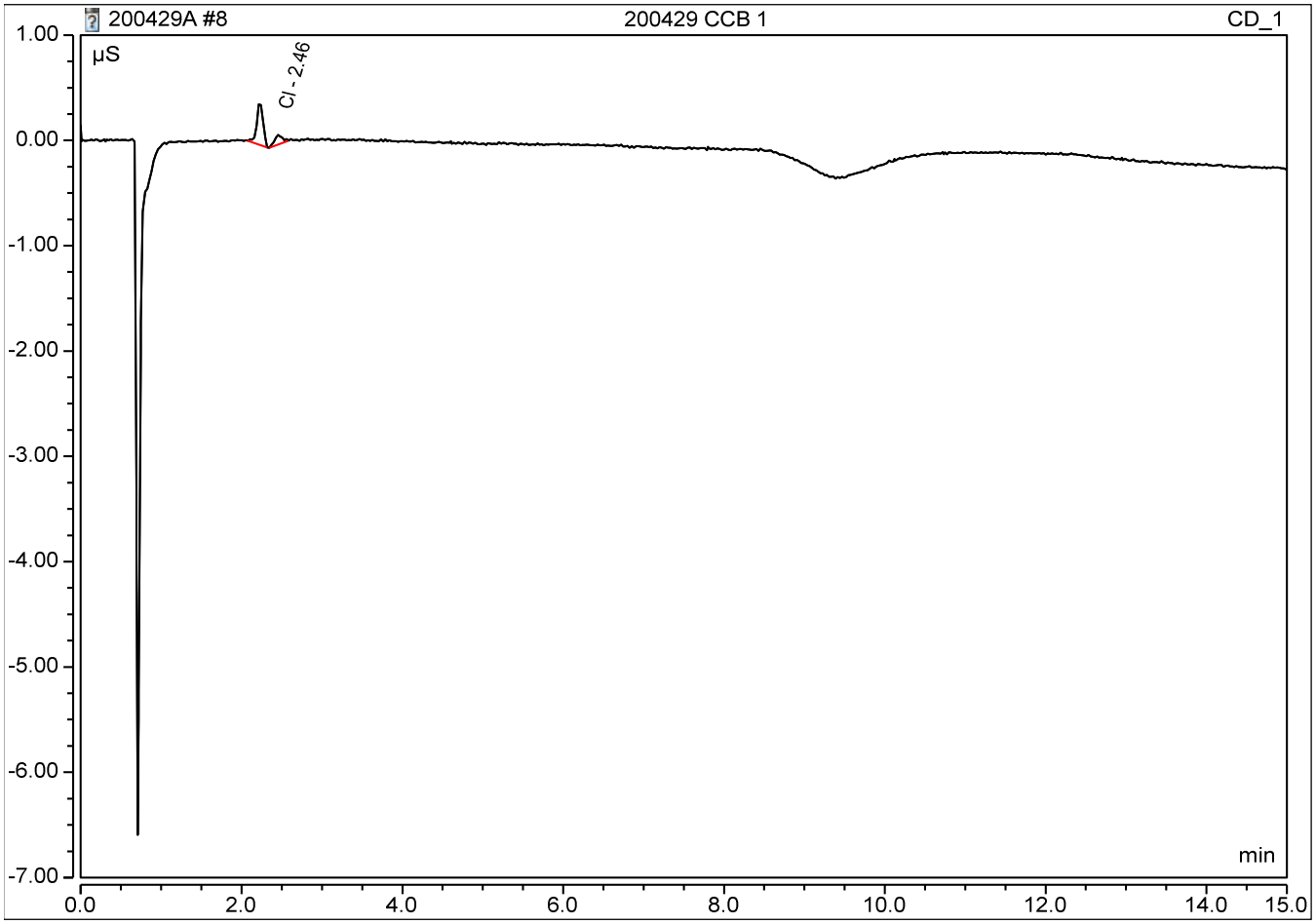


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200429A

Peak Integration Report

Sample Name:	**200429 CCB 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**29-Apr-2020 / 15:38**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.46	**Cl**	BMB	0.010	0.093	0.13		



Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

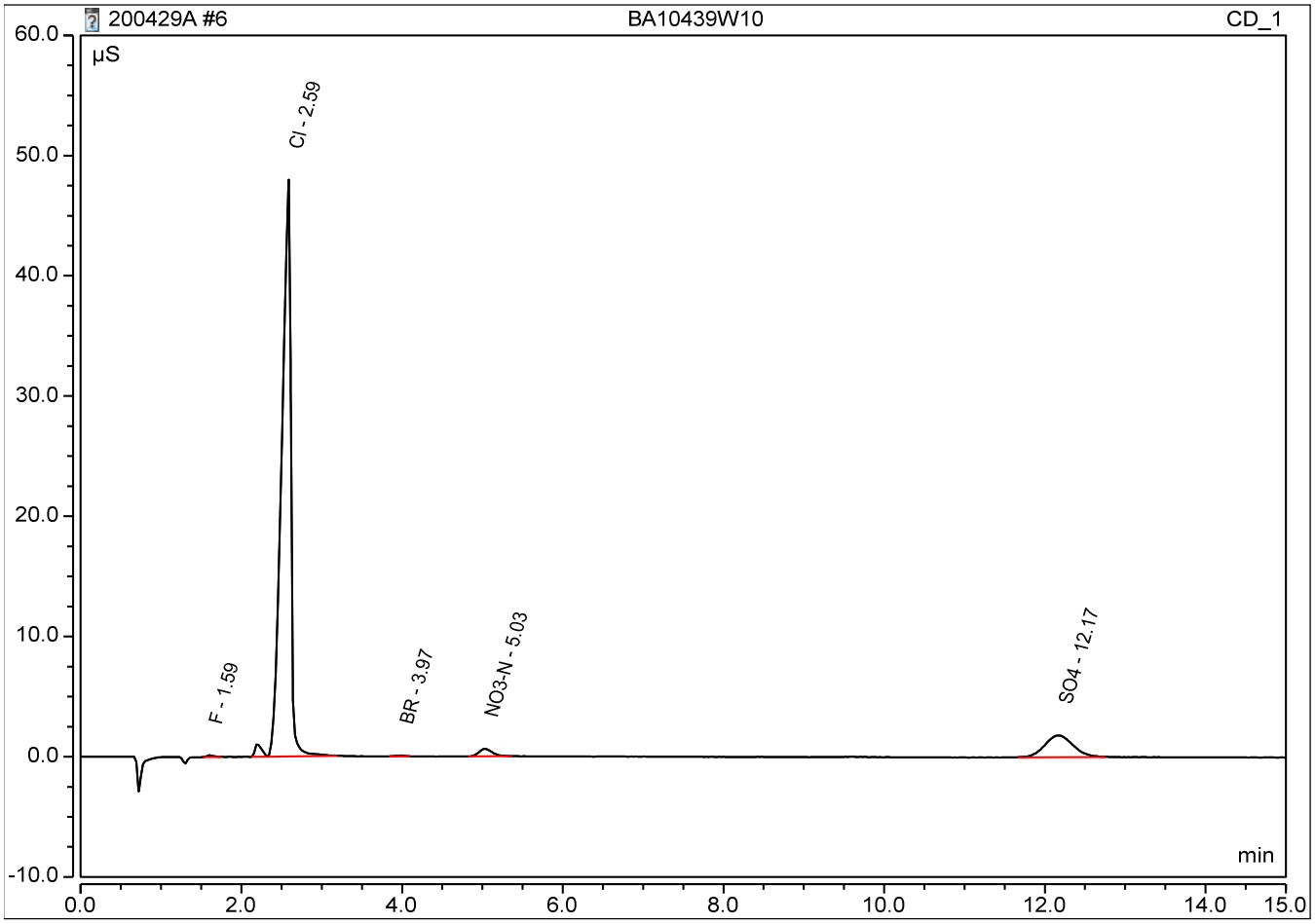
INORGANIC ANALYSIS
Raw Data

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200429A

Peak Integration Report

Sample Name:	**BA10439W10**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**29-Apr-2020 / 14:47**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.013	0.146	0.17		
3	2.59	**Cl**	BMB	6.330	47.966	47.91		
4	3.97	**BR**	BMB	0.010	0.074	0.26		
5	5.03	**NO3-N**	BMB	0.122	0.625	0.41		
6	12.17	**SO4**	BMB	0.737	1.817	7.46		



Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Anion Chromatography Working Standard

Prep Date: 03/25/20

Exp Date: 03/26/20

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Ion Chromatography Standard Fluoride 1000 µg/mL in H2O	o2si	O2SI-062002-01-01	1000	**687393-38-40744**	**10/30/20**	312.5 µL	25 mL	Millipore Water	12.5
Ion Chromatography Standard Nitrite 1000 µg/mL in H2O	Inorganic Ventures	ICCL1	1000	**P2-CL675597-41353**	**01/15/23**	411 µL	25 mL	Millipore Water	5 as NO2-N
Ion Chromatography Standard Chloride 5000 µg/mL in H2O	Inorganic Ventures	ICNO21	1000	**N2-NOX672889-49601**	**01/30/23**	1250 µL	25 mL	Millipore Water	50
Ortho-Phosphate as P Standard	Agilent	ICC-005A	1000	**G34-CP-3323-49590**	**05/31/25**	625 µL	25 mL	Millipore Water	25
Ion Chromatography Standard Nitrate as N 1000 µg/mL in H2O	Inorganic Ventures	P2-NOX675324	1000	**P2-NOX675324-49391**	**02/14/23**	250 µL	25 mL	Millipore Water	10
Bromide Standard	CPI international	4400-IC8M	1000	**1011817-12-49602**	**06/04/21**	625 µL	25 mL	Millipore Water	25
Sulfate Standard	Inorganic Ventures	ICS041	1000	**P2-SOX677315**	**04/03/23**	1250 µL	25 mL	Millipore Water	50

Anion Chromatography Calibration Curve

Prep Date: 03/25/20

Exp Date: 03/26/20

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. Range (ug/mL)	Reference To APPL Prep Date	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc. Range (µg/mL)
Anion Chromatography Working Standard	Varies	ICal1	5.0-50.0	Prepared 03/25/20	03/26/20	4 µL	1000 µL	Millipore Water	0.04-0.40
Anion Chromatography Working Standard	Varies	ICal2	5.0-50.0	Prepared 03/25/20	03/26/20	20 µL	1000 µL	Millipore Water	0.1-1.0
Anion Chromatography Working Standard	Varies	ICal3	5.0-50.0	Prepared 03/25/20	03/26/20	50 µL	1000 µL	Millipore Water	0.25-2.5
Anion Chromatography Working Standard	Varies	ICal4	5.0-50.0	Prepared 03/25/20	03/26/20	100 µL	1000 µL	Millipore Water	0.5-5.0
Anion Chromatography Working Standard	Varies	ICal5	5.0-50.0	Prepared 03/25/20	03/26/20	200 µL	1000 µL	Millipore Water	1.0-10.0
Anion Chromatography Working Standard	Varies	ICal6	5.0-50.0	Prepared 03/25/20	03/26/20	500 µL	1000 µL	Millipore Water	2.5-25.0
Anion Chromatography Working Standard	Varies	ICal7	5.0-50.0	Prepared 03/25/20	03/26/20	700 µL	1000 µL	Millipore Water	3.5-35.0
Anion Chromatography Working Standard	Varies	ICal8	5.0-50.0	Prepared 03/25/20	03/26/20	1000 µL	1000 µL	Millipore Water	5.0-50.0

Anion Chromatography ICV Absolute COA 49866

Prep Date: See injection Log

Exp Date: 24 hours after prep

Prep'd By (Initials): Absolute

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. Range (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Flouride	Absolute	50021	2.5	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	2.5
Nitrite	Absolute	50021	1.522334	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.522334
Chloride	Absolute	50021	1.522334	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.522334
O-Phosphate as P	Absolute	50021	6.522	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	6.522
Nitrate as N	Absolute	50021	1.129525	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.129525
Ion Chromatography Standard Bromide, 1000 µg/mL in H2O	Absolute	50021	5	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	5
Sulfate	Absolute	50021	20	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	20

Anion Chromatography CCV / LCS

Prep Date: See injection Log

Exp Date: 24 hours after prep

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Ion Chromatography Standard Fluoride 1000 µg/mL in H2O	o2si	O2SI-062002-01-01	1000	**687393-38-40744**	**10/30/20**	125 µL	25 mL	Millipore Water	5
Ion Chromatography Standard Nitrite 1000 µg/mL in H2O	Inorganic Ventures	ICCL1	1000	**P2-CL675597-41353**	**01/15/23**	250 µL	25 mL	Millipore Water	10
Ion Chromatography Standard Chloride 5000 µg/mL in H2O	Inorganic Ventures	ICNO21	1000	**N2-NOX672889-49601**	**01/30/23**	125 µL	25 mL	Millipore Water	25
Ortho-Phosphate as P Standard	Agilent	ICC-005A	1000	**G34-CP-3323-49590**	**05/31/25**	250 µL	25 mL	Millipore Water	10
Ion Chromatography Standard Nitrate as N 1000 µg/mL in H2O	Inorganic Ventures	P2-NOX675324	1000	**P2-NOX675324-49391**	**02/14/23**	125 µL	25 mL	Millipore Water	5
Bromide Standard	CPI international	4400-IC8M	1000	**1011817-12-49602**	**06/04/21**	250 µL	25 mL	Millipore Water	10
Sulfate Standard	Inorganic Ventures	ICS041	1000	**P2-SOX677315**	**04/03/23**	625 µL	25 mL	Millipore Water	25

Method 300 and 9056 Injection Log

No.	Position	Injection Description	Inject Time		Type	Comment
1	RA1	Cal 1	26/Mar/2020	13:28	Calibration Standard	
2	RA2	Cal 2	26/Mar/2020	13:44	Calibration Standard	
3	RA3	Cal 3	26/Mar/2020	14:01	Calibration Standard	MDL 1
4	RA4	Cal 4	26/Mar/2020	14:17	Calibration Standard	
5	RA5	Cal 5	26/Mar/2020	14:33	Calibration Standard	
6	RA6	Cal 6	26/Mar/2020	14:50	Calibration Standard	
7	RA7	Cal 7	26/Mar/2020	15:06	Calibration Standard	
8	RA8	Cal 8 2020.03.25	26/Mar/2020	15:22	Calibration Standard	
9	R1	ICB / CCB	26/Mar/2020	15:39	Unknown	
10	RB1	ICV Absolute 111419	26/Mar/2020	15:55	Check Standard	
11	RB2	BA09192W01	26/Mar/2020	16:18	Unknown	
12	RB3	BA09197W07	26/Mar/2020	16:35	Unknown	
13	RB4	BA09203W13	26/Mar/2020	16:51	Unknown	
14	RB5	BA09227W13	26/Mar/2020	17:08	Unknown	
15	RB6	BA08726W07	26/Mar/2020	17:24	Unknown	
16	RB7	BA08727W07	26/Mar/2020	17:40	Unknown	
17	RB8	BA08728W07	26/Mar/2020	17:57	Unknown	
18	RC1	BA08729W07	26/Mar/2020	18:13	Unknown	
19	RC2	BA08730W07	26/Mar/2020	18:30	Unknown	
20	RC3	BA08731W07	26/Mar/2020	18:46	Unknown	
21	R2	200326 CCV/LCS 1	26/Mar/2020	19:02	Check Standard	
22	R1	200326 CCB 1	26/Mar/2020	19:19	Unknown	
23	RC4	BA08735W07	26/Mar/2020	19:35	Unknown	
24	RC5	BA08540W07 DF5	26/Mar/2020	19:52	Unknown	
25	RC6	BA08540W07 DF10	26/Mar/2020	20:08	Unknown	
26	RC7	BA08548W14 DF5	26/Mar/2020	20:24	Unknown	
27	RC8	BA08548W14 DUP DF5	26/Mar/2020	20:41	Unknown	
28	RD1	BA08548W14 MS DF5	26/Mar/2020	20:57	Unknown	
29	RD2	BA08746W14	26/Mar/2020	21:13	Unknown	
30	RD3	BA08747W07	26/Mar/2020	21:30	Unknown	
31	RD4	BA08748W07	26/Mar/2020	21:46	Unknown	
32	RD5	BA08749W07	26/Mar/2020	22:03	Unknown	
33	RD6	BA08750W14	26/Mar/2020	22:19	Unknown	
34	RD7	BA08750W14 MS	26/Mar/2020	22:35	Unknown	
35	RD8	BA08750W14 MSD	26/Mar/2020	22:52	Unknown	
36	RE1	BA08751W07	26/Mar/2020	23:08	Unknown	
37	R2	200326 CCV/LCS 2	26/Mar/2020	23:24	Check Standard	
38	R1	200326 CCB 2	26/Mar/2020	23:41	Unknown	
39	RE2	BA08752W07	26/Mar/2020	23:57	Unknown	
40	RE3	BA08753W07	27/Mar/2020	00:14	Unknown	
41	RE4	BA08754W07	27/Mar/2020	00:30	Unknown	
42	RE5	BA08755W07	27/Mar/2020	00:46	Unknown	
43	RE6	BA08756W07	27/Mar/2020	01:03	Unknown	
44	RE7	BA08757W07	27/Mar/2020	01:19	Unknown	
45	RE8	BA08758W14	27/Mar/2020	01:35	Unknown	
46	BA1	BA08759W07	27/Mar/2020	01:52	Unknown	
47	BA2	BA08760W07	27/Mar/2020	02:08	Unknown	
48	BA3	BA08765W07	27/Mar/2020	02:25	Unknown	
49	R2	200326 CCV/LCS 3	27/Mar/2020	02:41	Check Standard	
50	R1	200326 CCB 3	27/Mar/2020	02:57	Unknown	
51	RA3	MDL 2	27/Mar/2020	03:14	Unknown	
52	RA3	MDL 3	27/Mar/2020	03:30	Unknown	
53	R1	MDL BLK 1	27/Mar/2020	03:47	Unknown	
54	R1	MDL BLK 2	27/Mar/2020	04:03	Unknown	
55	R1	MDL BLK 3	27/Mar/2020	04:19	Unknown	
56	BA4	BLK Nitro AR	27/Mar/2020	04:36	Unknown	
57	BA5	DOC 1 Nitro AR	27/Mar/2020	04:52	Unknown	
58	BA6	DOC 2 Nitro AR	27/Mar/2020	05:09	Unknown	
59	BA7	DOC 3 Nitro AR	n.a.		Unknown	
60	BA8	DOC 4 Nitro AR	n.a.		Unknown	
61	R2	200326 CCV/LCS 4	n.a.		Check Standard	
62	R1	200326 CCB 4	n.a.		Unknown	

Method 300 and 9056 Injection Log

No.	Position	Injection Description	Inject Time		Type	Comment
1	R2	200429 CCV/LCS 1xxx	29/Apr/2020	10:17	Check Standard	
2	R1	200429 CCB 1xxx	29/Apr/2020	10:34	Unknown	
3	R2	200429 CCV/LCS 1xxx	29/Apr/2020	11:05	Check Standard	
4	R2	200429 CCV/LCS 1	29/Apr/2020	11:27	Check Standard	
5	R1	200429 CCB 1	29/Apr/2020	11:45	Unknown	
6	RE8	BA10439W10	29/Apr/2020	14:47	Unknown	
7	R2	200429 CCV/LCS 1	29/Apr/2020	15:20	Check Standard	
8	R1	200429 CCB 1	29/Apr/2020	15:38	Unknown	

Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

INORGANIC ANALYSIS
Calibration and Raw Data

A.P.P.L. INC.
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: A.P.P.L. INC. Contract: AECOM
ARF No: 92025 SDG: 92025
Initial Calibration Source: CPI
Continuing Calibration Source: Environmental Express
Analysis Date: 05/01/20

Analyte	Calibration Verification									M
	True CCV1	Found 11:43	%R(1)	True CCV1	Found 11:49	%R(1)	True	Found	%R(1)	
TOXN	3	2.9484	98.3	3	2.965	98.8				

(1) Control Limits: 90-110

A.P.P.L. INC.
3
BLANKS

Lab Name: A.P.P.L. INC. Contract: AECOM

ARF No.: 92025 SDG: 92025

Preparation Blank Matrix (soil/water): water

Preparation Blank Concentration Units (ug/L or mg/kg): mg/L

Analyte	Calibration Blanks										M
	ICB 05/01/20 11:26	C	CCB 05/01/20 11:44	C	CCB 05/01/20 11:50	C		C		C	
TOXN	.100	U	.100	U	.100	U					

AQ2 Tray Report

Serial Number:	190170
Software Version:	2.1.0
Report Requested By:	Kyle S
Date & Time:	2020-05-01 12:33:07
Tray Number:	2
Tray Name:	200501A NO2 NO3 TOXN

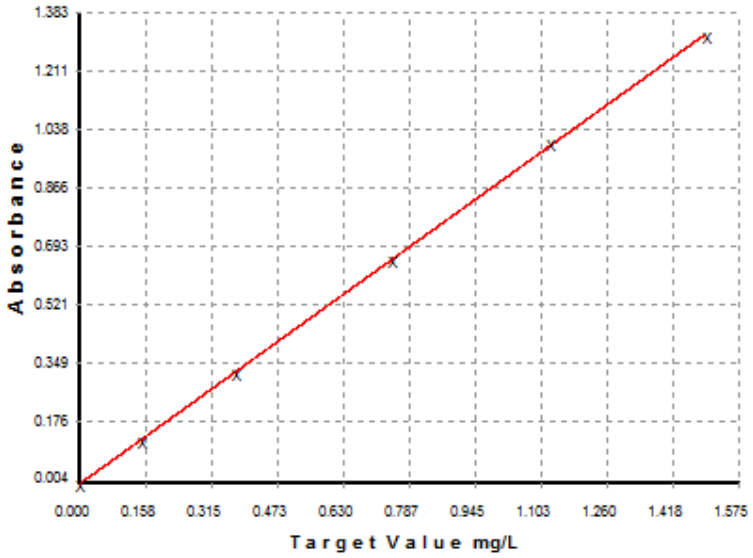
Nitrite-N

Calibration Chart

Type	Absorbance	Calc mg/L	Target mg/L	% Error
S1	0.0038	0.0034	0.0000	
S90	0.1304	0.1471	0.1500	-1.95
S91	0.3288	0.3724	0.3750	-0.71
S92	0.6590	0.7473	0.7500	-0.36
S93	1.0009	1.1354	1.1250	0.93
S94	1.3172	1.4945	1.5000	-0.37
S0	0.0123	0.0130	0.0000	

Polynomial Order:	1
Correlation Coefficient:	0.9999
Carryover(%):	0.6
Calibration equation:	y = bx + a
y =:	Concentration mg/L
x =:	Measured absorbance
a =:	-9.635769E-004
b =:	1.135361E+000
Date & Time:	2020-05-01 10:15:45

Calibration Graph



Test Results

Cup	Type	ID	Result	Units	QC Pro	Raw Data	Auto Dil.	Man Dil.	User	Time/Date
	S1	Standard 1	0.0038			0.003825			KS	2020-05-01 10:08:04
	S90	Standard 90	0.1304			0.130389			KS	2020-05-01 10:09:21
	S91	Standard 91	0.3288			0.328807			KS	2020-05-01 10:10:39
	S92	Standard 92	0.6590			0.659032			KS	2020-05-01 10:11:56
	S93	Standard 93	1.0009			1.000891			KS	2020-05-01 10:13:11
	S94	Standard 94	1.3172			1.317179			KS	2020-05-01 10:14:27
	S0	Standard 0	0.0123			0.012290			KS	2020-05-01 10:15:45
	CCV	CCV .75	0.7457	mg/L		0.657625			KS	2020-05-01 10:17:02
	CCB	CCB	0.0077	mg/L		0.007672			KS	2020-05-01 10:18:19
3	U1	ICV NO2	0.7172	mg/L		0.632561			KS	2020-05-01 10:19:36
4	U2	ICV NO3 TOXN	0.0088	mg/L		0.008579			KS	2020-05-01 10:20:54
5	U3	ICB NO2 NO3 TOXN	0.0023ELL	mg/L		0.002916			KS	2020-05-01 10:22:11
6	U4	200501A Blk NO2 NO3 TOXN	0.0019ELL	mg/L		0.002517			KS	2020-05-01 10:23:29
7	U5	200501A LCS NO2	0.7348	mg/L		0.648007			KS	2020-05-01 10:24:47
8	U6	200501A LCSD NO2	0.7373	mg/L		0.650212			KS	2020-05-01 10:26:05
9	U7	200501A LCS NO3 TOXN	0.0078	mg/L		0.007697			KS	2020-05-01 10:27:23
10	U8	200501A LCSD NO3 TOXN	0.0039	mg/L		0.004250			KS	2020-05-01 10:28:42
11	U9	1 ppm NO2	0.9992	mg/L		0.880937			KS	2020-05-01 10:30:00
12	U10	1 ppm NO3	0.0095	mg/L		0.009248			KS	2020-05-01 10:31:19
	CCV	CCV .75	0.7511	mg/L		0.662372			KS	2020-05-01 10:32:37
	CCB	CCB	0.0082	mg/L		0.008100			KS	2020-05-01 10:33:56
13	U11	BA10508W34 MS	0.7487	mg/L		0.660275			KS	2020-05-01 10:35:13
14	U12	BA10508W34 MSD	0.7559	mg/L		0.666655			KS	2020-05-01 10:36:32
15	U13	BA10506W12	0.0111	mg/L		0.010652			KS	2020-05-01 10:39:12

16	U14	BA10507W12	0.0253	mg/L	0.023122	KS	2020-05-01 10:41:32
17	U15	BA10508W34	0.0098	mg/L	0.009501	KS	2020-05-01 10:43:56
18	U16	BA10509W12	0.0106	mg/L	0.010222	KS	2020-05-01 10:46:20
19	U17	BA10439W11 Thing 1 pH 6.48	0.0028ELL	mg/L	0.003352	KS	2020-05-01 10:48:45
20	U18	BA10504W11 Thing 1 pH 6.26	0.0048	mg/L	0.005112	KS	2020-05-01 10:51:08
	CCV	CCV .75	0.7535	mg/L	0.664480	KS	2020-05-01 10:53:27
	CCB	CCB	0.0066	mg/L	0.006679	KS	2020-05-01 10:55:47

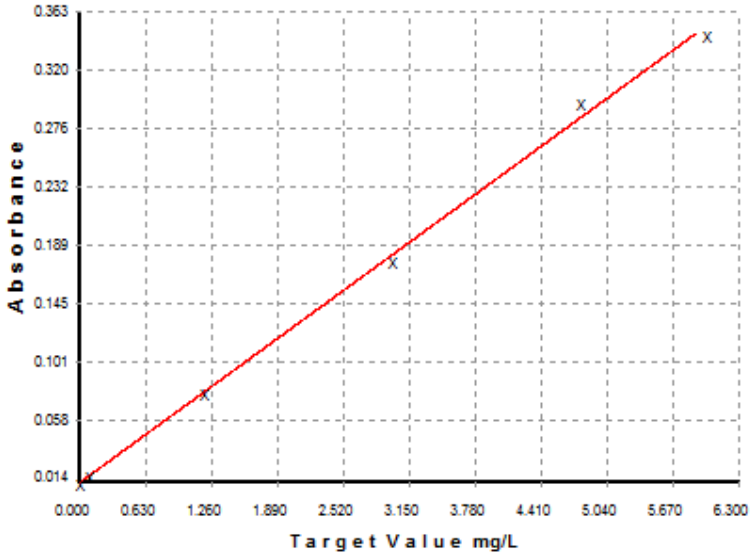
TOXN

Calibration Chart

Type	Absorbance	Calc mg/L	Target mg/L	% Error
S1	0.0139	0.0159	0.0000	
S90	0.0184	0.0955	0.1000	-4.49
S91	0.0800	1.1847	1.2000	-1.27
S92	0.1784	2.9250	3.0000	-2.50
S93	0.2953	4.9912	4.8000	3.98
S94	0.3460	5.8877	6.0000	-1.87
S0	0.0143	0.0227	0.0000	

Polynomial Order:	1
Correlation Coefficient:	0.9991
Carryover(%):	0.1
Calibration equation:	y = bx + a
y =:	Concentration mg/L
x =:	Measured absorbance
a =:	-2.293231E-001
b =:	1.767836E+001
Date & Time:	2020-05-01 11:14:44

Calibration Graph



Test Results

Cup	Type	ID	Result	Units	QC Pro	Raw Data	Auto Dil.	Man Dil.	User	Time/Date
	S1	Standard 1	0.0139			0.013870			KS	2020-05-01 11:00:58
	S90	Standard 90	0.0184			0.018375			KS	2020-05-01 11:03:16
	S91	Standard 91	0.0800			0.079988			KS	2020-05-01 11:05:33
	S92	Standard 92	0.1784			0.178428			KS	2020-05-01 11:07:51
	S93	Standard 93	0.2953			0.295306			KS	2020-05-01 11:10:09
	S94	Standard 94	0.3460			0.346016			KS	2020-05-01 11:12:27
	S0	Standard 0	0.0143			0.014254			KS	2020-05-01 11:14:44
	CCV	CCV	2.9365	mg/L		0.179082			KS	2020-05-01 11:19:09
	CCB	CCB	0.0193	mg/L		0.014062			KS	2020-05-01 11:21:27
4	U2	ICV NO3 TOXN	2.8911	mg/L		0.176512			KS	2020-05-01 11:23:45
5	U3	ICB NO2 NO3 TOXN	0.0245	mg/L		0.014356			KS	2020-05-01 11:26:03
6	U4	200501A Blk NO2 NO3 TOXN	0.0177	mg/L		0.013973			KS	2020-05-01 11:28:23
9	U7	200501A LCS NO3 TOXN	3.0493	mg/L		0.185459			KS	2020-05-01 11:30:41
10	U8	200501A LCSD NO3 TOXN	3.0590	mg/L		0.186009			KS	2020-05-01 11:32:59
12	U10	1 ppm NO3	1.0171	mg/L		0.070504			KS	2020-05-01 11:35:17
13	U11	BA10508W34 MS	15.2158	mg/L		0.099042	x10.0000		KS	2020-05-01 12:16:27
13	U11	BA10508W34 MS	15.5207	mg/L		0.890921			KS	2020-05-01 11:37:35
14	U12	BA10508W34 MSD	15.6067	mg/L		0.101253	x10.0000		KS	2020-05-01 12:17:23
14	U12	BA10508W34 MSD	15.3326	mg/L		0.880280			KS	2020-05-01 11:39:54
15	U13	BA10506W12	10.0423	mg/L		0.069777	x10.0000		KS	2020-05-01 12:18:19
15	U13	BA10506W12	10.5096	mg/L		0.607460			KS	2020-05-01 11:42:13
16	U14	BA10507W12	10.1142	mg/L		0.070184	x10.0000		KS	2020-05-01 12:19:15
16	U14	BA10507W12	10.6318	mg/L		0.614376			KS	2020-05-01 11:42:53
	CCV	CCV	2.9484	mg/L		0.179754			KS	2020-05-01 11:43:58
	CCB	CCB	0.0168	mg/L		0.013922			KS	2020-05-01 11:44:54
17	U15	BA10508W34	11.4385	mg/L		0.077675	x10.0000		KS	2020-05-01 12:20:11
17	U15	BA10508W34	11.7899	mg/L		0.679883			KS	2020-05-01 11:45:51
18	U16	BA10509W12	11.6243	mg/L		0.078726	x10.0000		KS	2020-05-01 12:21:07
18	U16	BA10509W12	12.0020	mg/L		0.691881			KS	2020-05-01 11:46:47
19	U17	BA10439W11 Thing 1 pH 6.48	0.4955	mg/L		0.041000			KS	2020-05-01 11:47:43
20	U18	BA10504W11 Thing 1 pH 6.26	0.4085	mg/L		0.036081			KS	2020-05-01 11:48:39
	CCV	CCV	2.9650	mg/L		0.180691			KS	2020-05-01 11:49:36
	CCB	CCB	0.0242	mg/L		0.014343			KS	2020-05-01 11:50:32
	CCV	CCV	2.9395	mg/L		0.179250				2020-05-01 12:14:43
	CCB	CCB	0.0179	mg/L		0.013985				2020-05-01 12:15:22
	CCV	CCV	2.9398	mg/L		0.179268				2020-05-01 12:22:03
	CCB	CCB	0.0152	mg/L		0.013832				2020-05-01 12:23:00

Nitrate-N

Test Results

Cup	Type	ID	Result	Units	QC Pro	Raw Data	Auto Dil.	Man Dil.	User	Time/Date
4	U2	ICV NO3 TOXN	2.8823	mg/L		0.000000			KS	2020-05-01 11:23:45
4	U2	ICV NO3 TOXN				0.000000			KS	2020-05-01 11:23:45
5	U3	ICB NO2 NO3 TOXN	0.0221	mg/L		0.000000			KS	2020-05-01 11:26:03
5	U3	ICB NO2 NO3 TOXN				0.000000			KS	2020-05-01 11:26:03
6	U4	200501A Blk NO2 NO3 TOXN	0.0158	mg/L		0.000000			KS	2020-05-01 11:28:23
6	U4	200501A Blk NO2 NO3 TOXN				0.000000			KS	2020-05-01 11:28:23
9	U7	200501A LCS NO3 TOXN	3.0415	mg/L		0.000000			KS	2020-05-01 11:30:41
9	U7	200501A LCS NO3 TOXN				0.000000			KS	2020-05-01 11:30:41
10	U8	200501A LCSD NO3 TOXN	3.0552	mg/L		0.000000			KS	2020-05-01 11:32:59
10	U8	200501A LCSD NO3 TOXN				0.000000			KS	2020-05-01 11:32:59
12	U10	1 ppm NO3	1.0075	mg/L		0.000000			KS	2020-05-01 11:35:17
12	U10	1 ppm NO3				0.000000			KS	2020-05-01 11:35:17
13	U11	BA10508W34 MS	14.4671	mg/L		0.000000			KS	2020-05-01 12:16:27
13	U11	BA10508W34 MS				0.000000			KS	2020-05-01 12:16:27
14	U12	BA10508W34 MSD	14.8508	mg/L		0.000000			KS	2020-05-01 12:17:23
14	U12	BA10508W34 MSD				0.000000			KS	2020-05-01 12:17:23
15	U13	BA10506W12	10.0311	mg/L		0.000000			KS	2020-05-01 12:18:19
15	U13	BA10506W12				0.000000			KS	2020-05-01 12:18:19
16	U14	BA10507W12	10.0889	mg/L		0.000000			KS	2020-05-01 12:19:15
16	U14	BA10507W12				0.000000			KS	2020-05-01 12:19:15
17	U15	BA10508W34	11.4287	mg/L		0.000000			KS	2020-05-01 12:20:11
17	U15	BA10508W34				0.000000			KS	2020-05-01 12:20:11
18	U16	BA10509W12	11.6137	mg/L		0.000000			KS	2020-05-01 12:21:07
18	U16	BA10509W12				0.000000			KS	2020-05-01 12:21:07
19	U17	BA10439W11 Thing 1 pH 6.48	0.4926	mg/L		0.000000			KS	2020-05-01 11:47:43
19	U17	BA10439W11 Thing 1 pH 6.48				0.000000			KS	2020-05-01 11:47:43
20	U18	BA10504W11 Thing 1 pH 6.26	0.4037	mg/L		0.000000			KS	2020-05-01 11:48:39
20	U18	BA10504W11 Thing 1 pH 6.26				0.000000			KS	2020-05-01 11:48:39

Nitrite

High Point @ 1.5 mg/L
0.2463 mL NO2 Inorganic Ventures lot N2-NOX672889-40759 exp: 05/01/20
50 mL DI Water

CCV @ 0.75 mg/L
0.1232 mL NO2 Inorganic Ventures lot N2-NOX672889-40759 exp: 05/01/20
50 mL DI Water

ICV/LCS @ 0.73 mg/L
0.120 mL NO2 Inorganic Ventures lot M2-NOX660562-40468 exp: 08/25/21
50 mL DI Water

1 mg/L NO2
400 uL of High point and 200 uL of DI made directly into a sample cup

Prep 05/01/20
Exp 05/08/20
KS

Nitrate/TOXN

High Point @ 6 mg/L
0.300 mL NO3 O2Si lot 880117-4-39577 exp: 2/21/20
50 mL DI Water

CCV @ 3.0 mg/L
0.150 mL NO3 O2Si lot 880117-4-39577 exp: 2/21/20
50 mL DI Water

ICV/LCS @ 3.0 mg/L
0.150 mL NO3 Inorganic Ventures lot P2-NOX675324-49391 exp: 02/14/23
50 mL DI Water

1 mg/L NO3
100 uL of High point and 500 uLof DI made directly into a sample cup

MS @ 0.73 mg/L NO2 and 2.5 mg/L NO3
0.120 mL NO2 Inorganic Ventures lot M2-NOX660562-40468 exp: 08/25/21and
0.125 mL NO3 Inorganic Ventures lot P2-NOX675324-49391 exp: 02/14/23
Final volume 50 mL of sample

Prep 05/01/20
Exp 05/08/20
KS

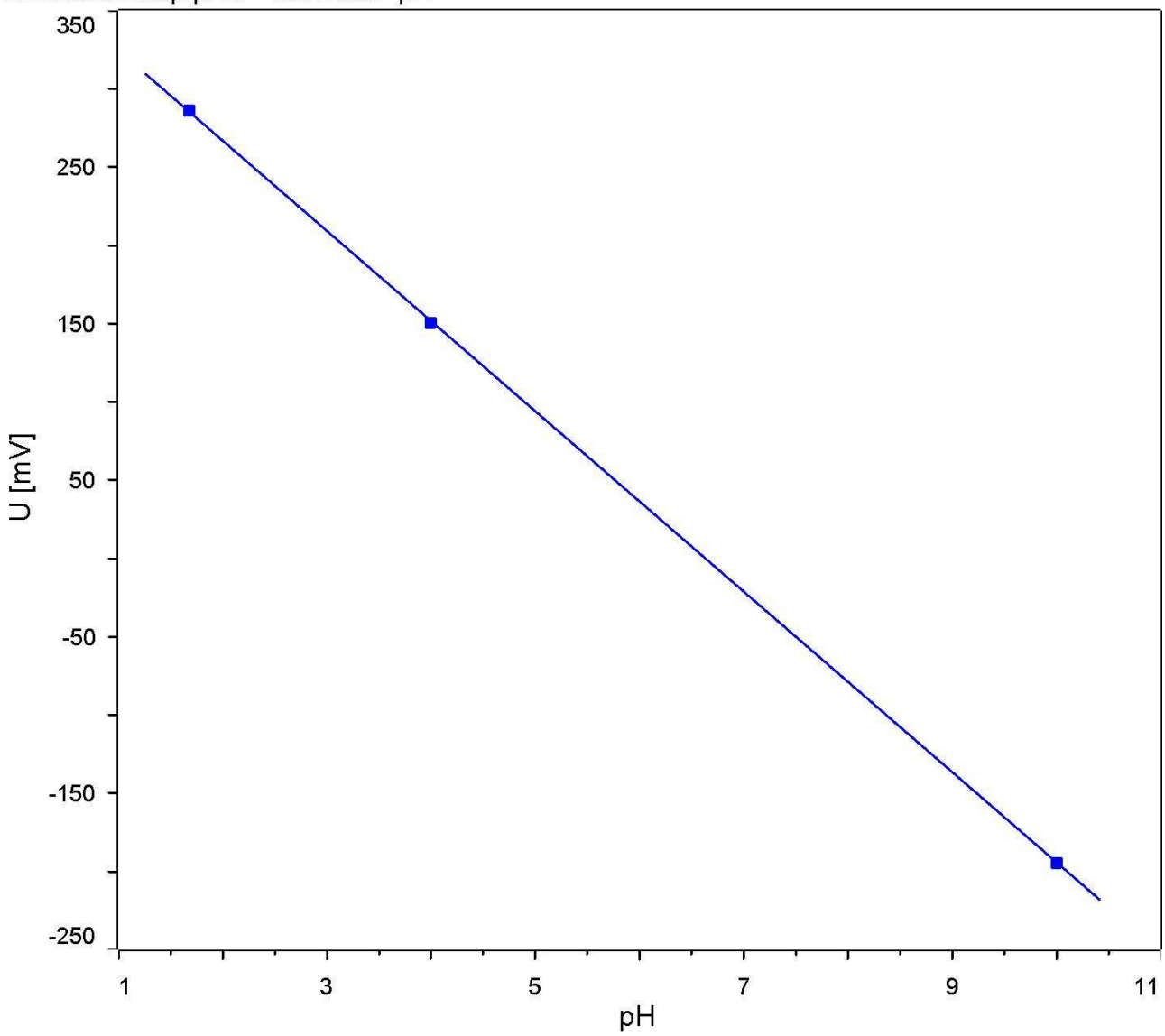
Timao Calibration Curve

2020-05-04 13:32:21

Calculations

Buffer 7	7.05	
Formula	'MEAS pH.EME'	
MEAS pH.EME	7.0487	
Slope	98.30	
Formula	'Calibration loop pH.SLO'	
Calibration loop pH.SLO	98.3	
pH(as)	6.63	
Formula	'Calibration loop pH.ENP'	
Calibration loop pH.ENP	6.626	
Res19	22.4	°C
Formula	'CAL MEAS pH.ETE'	
CAL MEAS pH.ETE	22.4408	

Calibration loop pH.1 - CAL LOOP pH



Metrohm 814/809 Titrando Data

Sample ID	Analysis Date/Time	Method	Titration Volume (to 8.3)	Titration Volume (total)	OH	CO3	HCO3	Total Alk	Unit	Sample Vol	N	Batch	Initials
200504A LCSD	2020-05-04 20:00:33 UTC-7	Alkalinity	0.240	6.838	0.00	18.91	250.51	269.42	mg/L	25 mL	0.0197	200504A	AR
200504A LCS	2020-05-04 19:49:59 UTC-7	Alkalinity	0.302	6.966	0.00	23.80	250.66	274.46	mg/L	25 mL	0.0197	200504A	AR
BA10439W10	2020-05-04 17:11:51 UTC-7	Alkalinity	0.000	1.820	0.00	0.00	71.71	71.71	mg/L	25 mL	0.0197	200504A	AR
200504A BLK	2020-05-04 16:51:28 UTC-7	Alkalinity	0.000	0.088	0.00	0.00	3.47	3.47	mg/L	25 mL	0.0197	200504A	AR

Tiamo Alkalinity Standard Prep

Prep Date:

Exp Date:

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Unit	Conc	Lot Number - QA Number	Prep/Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc
Sulfuric Acid (H2SO4)	J.T.Baker	NA	NA	167828	NA	NA	PURCHASED	NA	NA	NA
0.10N Sulfuric Acid (H2SO4)	J.T.Baker	Normality	0.1N	167828	05/24/19	05/24/20	3ml	1L	DI	0.10N
0.02N Sulfuric Acid (H2SO4)	J.T.Baker	Normality	0.02N	167828	05/24/19	05/24/20	200mL	1L	DI	0.02N
Inorganic Spike(NaHCO3)	BDH	NA	NA	1575C510	10/18/18	08/14/20	PURCHASED	NA	NA	NA
Inorganic Spike Solution	BDH	Milligrams/Liters	250mg/L	1575C510	01/30/20	07/30/20	3.5g	500mL	DI	250mg/L
Standarizing Solution(NaCO3)	J.T.Baker	Normality	1N	178494	07/25/17	07/25/19	PURCHASED	NA	NA	NA

Tiamo Electroconductivity Standard Prep

Prep Date:

Exp Date:

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Units	Conc	Lot Number	Prep/Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc. Range (µg/mL)
EC Spike(KCl)	Mallinckrodt AR	Na	NA	6858 KHMV	NA	NA	PURCHASED	NA	NA	NA
EC Spike Solution	Mallinckrodt AR	Moles/Conductivity	0.01M	6858 KHMV	11/26/18	11/26/19	0.7456g	1L	DI	1412umos
EC Daily LCS Solution	Mallinckrodt AR	Moles/Conductivity	0.0070824M	6858 KHMV	06/06/19	6/6/20	0.5280g	1L	DI	1000umos
Storage Solution EC Probe	APPL	NA	NA	NA	NA	NA	NA	NA	DI	NA

Tiamo pH Buffer Reference Standards

Prep Date: Daily

Exp Date: Daily

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Units	pH	Lot Number - QA Number	Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
pH 1.68 Buffer	ORION	pH Units	1.68	WX1-40709	04/22/19	01/01/21	NA	NA	NA	NA
pH 4.00 Buffer	RICCA	pH Units	4	1807191-39782	04/22/19	01/01/21	NA	NA	NA	NA
pH 10.01 Buffer	VWR	pH Units	10.01	0903980-40707	04/22/19	08/27/19	NA	NA	NA	NA
pH 7.00 Buffer	Ricca	pH Units	7	1805M17 - 39765	10/11/18	05/01/20	NA	NA	NA	NA

Ferrous Iron — Rev 2, 04-05-19

Method SM3500Fe | Units mg/L | Instrument: Genisis Spectrometer
Analyte Fe2+ | QCG: 200501 | Wavelength: 510 nm
Analyist fjr | Final Volume: 50mL | Units: mg/L

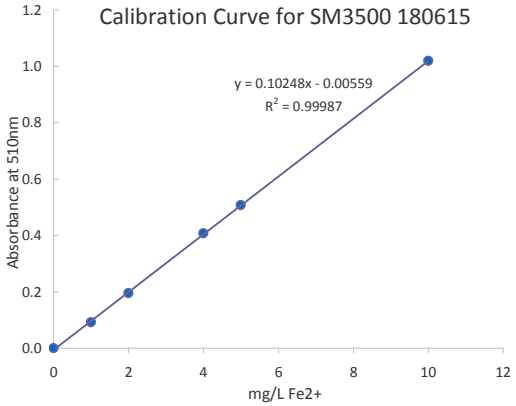
Date	Time	Appl ID	[Fe2+]	Absorbance	% Recovery
06/28/19	12:48	ICB	0.00	0.000	
06/28/19	12:49	Ical 1	1.00	0.092	95.2%
06/28/19	12:50	Ical 2	2.00	0.195	97.9%
06/28/19	12:51	Ical 3	4.00	0.408	100.9%
06/28/19	12:51	Ical 4	5.00	0.507	100.0%
06/28/19	12:52	Ical 5	10.00	1.019	100.0%
06/28/19	13:08	ICV	3.00	0.326	107.9%
06/28/19	12:53	ICB	0.00	0.002	

Slope	0.102479592
Intercept	-0.005591837
Coefficient of Determination	0.999872044

Algortithm Check:	Appl ID	Absorbance	Result
	LCS 200501	0.301	2.99

Result = (Absorbance-Raw Blk-Intercept)/ Slope

Test:	FJR	05/01/20	2.99



Date	Time	Appl ID	DF	Raw Result	SubSample Amount	Raw BLK	Calc Conc	Result	QC True	% Recovery
05/01/20	20:30	CCV 4.0 200501	1	0.405	25mL		4.01	4.01	4.00	100.2%
05/01/20	20:31	CCB 200501	1	0.000	25mL		0.05	0.05		
05/01/20	20:32	LCS 200501	1	0.301	25mL		2.99	2.99	3.00	99.7%
05/01/20	20:33	LCSD 200501	1	0.301	25mL		2.99	2.99	3.00	99.7%
05/01/20										
05/01/20	20:35	BA10439W12	1	0.005	25mL		0.10	0.10		
05/01/20	20:36	BA10504W12	1	0.010	25mL		0.15	0.15		
05/01/20	20:37	BA10504W12 MS	1	0.310	25mL		3.08	3.08		
05/01/20	20:38	BA10504W12 MSD	1	0.310	25mL		3.08	3.08		
05/01/20	20:39	CCV 4.0 200501	1	0.406	25mL		4.02	4.02	4.00	100.4%
05/01/20	20:40	CCB 200501	1	0.001	25mL		0.06	0.06		

Standard Prep

	Ferrous Iron Standards		Prep'd By (Initials)		FJR		
Prep Date	06/28/18						
Exp Date	06/28/19						
Stock Label	Supplier	Batch Number	Exp Date	Aliquot from Stock	Final Volume	Solvent	Ferrous Iron Concentration
Ferrous Ammonium Sulfate	J.T.Baker	0000184592	08/21/20	0.351	250mL	5ml H2SO4 (0000167828) Diluted with water	200ug/L
Ferrous Sulfate	Mallinckrodt	Lot 5056 KDRX	NA	0.250	250mL	5ml H2SO4 (0000167828) Diluted with water	200ug/L
Ferrous Iron CCV/LCS/MS/ICV			Prep'd By (Initials)		FJR		
Prep Date	See Injection Log						
Exp Date	24 Hours						
Initial Standard Information	Supplier	Batch Number	Exp Date	Final Standard Information			
Ferrous Iron CCV	J.T.Baker	0000184592	06/14/19	500uL	25mL	Deionized water	4mg/L
Ferrous Iron ICV/LCS	Mallinckrodt	Lot 5056 KDRX	06/14/19	375uL	25mL	Deionized water	3mg/L
	Ferrous Iron Calibration Curve		Prep'd By (Initials)		FJR		
Prep Date	06/28/18						
Exp Date	06/28/19						
Final Standard Information							
Point Label	Supplier	Batch Number	Exp Date	Aliquot from Stock (mL)	Final Volume	Solvent	Ferrous Iron Concentration
CCB	J.T.Baker	0000184592	06/14/19	0	25mL	Deionized water	0mg/L
Ical 1	J.T.Baker	0000184592	06/14/19	0.125	25mL	Deionized water	1mg/L
Ical 2	J.T.Baker	0000184592	06/14/19	0.25	25mL	Deionized water	2mg/L
Ical 3	J.T.Baker	0000184592	06/14/19	0.5	25mL	Deionized water	4mg/L
Ical 4	J.T.Baker	0000184592	06/14/19	0.625	25mL	Deionized water	5mg/L
Ical 5	J.T.Baker	0000184592	06/14/19	1.25	25mL	Deionized water	10mg/L
ICV	Mallinckrodt	Lot 5056 KDRX	06/14/19	0.375	25mL	Deionized water	3mg/L

Reagent Prep

Reagent	Chemical Lot #	Chemical	Chemical Expiration Date	Amount	Date Prep
Colorizer	0747C107	1,10-phenanthroline	na	1.008	03/12/20
		10% HCL conc	na	enough to dissolve	03/12/20
Buffer	Z28B018	Ammonia Acetate	na	248	01/03/20
	2018071399	Glacial Acetic Acid	06/27/20	700mL	

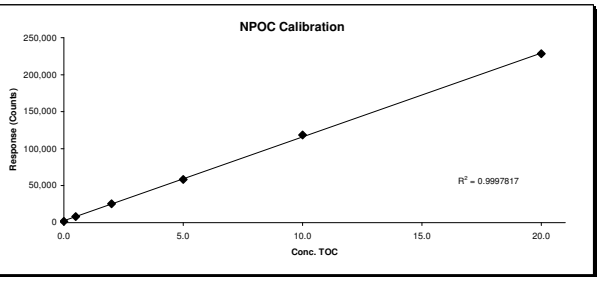
TOTAL ORGANIC CARBON

Method: WetChem | Units mg/L | Instrument: Tic Toc

Analyte: TOC | QCG: 200501A

Analyist: AAR | Final Volume: 40mL

Date	Time	Appl ID	[TOC]	Raw	% Recovery
01/15/20	13:42	QC blank	0.00	1639	
01/15/20	14:25	Ical 1	0.50	8021	
01/15/20	15:01	Ical 2	2.00	25461	
01/15/20	15:37	Ical 3	5.00	58252	
01/15/20	16:13	Ical 4	10.00	118315	
01/15/20	16:49	Ical 5	20.00	228427	
01/16/20	15:11	ICB	0.08	906	
01/16/20	14:33	ICV	5.20	59018	104.0%



Date	Time	Appl ID	DF	Raw Result	SubSample Amount	Filter Blank Subtract	Calc Conc	Result	Range (mg/L)	QC True	% Recovery
2020-05-01	05:28 PM	QCB	1	2011	40mL	0.000	0	0.00	0.00		
2020-05-01	06:07 PM	CCV / 200501A LCS	1	59453	40mL	0.000	5.061	5.06	0.23	5.00	101.2%
2020-05-01	06:46 PM	CCB	1	1356	40mL	0.000	0	0.00	0.00		
2020-05-01	07:25 PM	BA10439W08	1	111960	40mL	0.000	9.834	9.83	1.04		
2020-05-01	08:03 PM	BA10504W09	1	10152	40mL	0.000	0.865	0.87	0.08		
2020-05-01	08:41 PM	BA10506W10	1	8920	40mL	0.000	0.756	0.76	0.05		
2020-05-01	09:17 PM	BA10507W07	1	9500	40mL	0.000	0.807	0.81	0.06		
2020-05-01	09:54 PM	BA10508W16	1	9984	40mL	0.000	0.85	0.85	0.02		
2020-05-01	10:31 PM	BA10508W16 DUP	1	9517	40mL	0.000	0.809	0.81	0.34		
2020-05-01	11:08 PM	BA10508W27 MS	1	63256	40mL	0.000	5.543	5.54	0.01		
2020-05-01	11:46 PM	BA10508W27 MSD	1	60611	40mL	0.000	5.309	5.31	0.90		
2020-05-02	12:24 AM	BA10509W09	1	10160	40mL	0.000	0.865	0.87	0.05		
2020-05-02	01:01 AM	CCV / 200501A LCSD	1	59984	40mL	0.000	5.108	5.11	0.03	5.00	102.2%
2020-05-02	01:41 AM	CCB	1	1457	40mL	0.000	0	0.00	0.00		

Name of Final Standard TOC Calibration Curve — **Prep'd By (Initials)** AR

Prep Date 01/15/20

Exp Date 01/15/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	20 uL	40 mL	DI Water	0.5 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	100 uL	40 mL	DI Water	2 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	250 uL	40 mL	DI Water	5 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	500 uL	40 mL	DI Water	10 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	1000 uL	40 mL	DI Water	20 ppm

Name of Final Standard ICV (TOC) — **Prep'd By (Initials)** HH

Prep Date 01/15/20

Exp Date 01/15/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
1000 PPM ICV TOC Intermediate	APPL Inc.	Prep: 2/11/19	1000 mg/L	Prep: 2/11/19	01/15/21	500 uL	40mL	DI Water	10 ppm

Name of Final Standard CCV (TOC) — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	200 uL	40 mL	DI Water	5 ppm

Name of Final Standard TOC_LCS/LCSD — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	ULTRA Scientific	IQC-106-5	1000 mg/L	CR-0328-37639	02/28/19	200 uL	40 mL	DI Water	5 ppm

Name of Final Standard TOC_MS/MSD — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	ULTRA Scientific	IQC-106-5	1000 mg/L	CR-0328-37639	02/28/19	200 uL	40 mL	sample	5 ppm

908 North Temperance Ave. ∇ Clovis, CA 93611 ∇ Phone 559-275-2175 ∇ Fax 559-275-4422

Certification Number: CA1312
NELAP Certification number: CA00046
DoD-ELAP Certificate number: 4064.01

Data Validatable Report

May 26, 2020

AECOM
1001 Bishop Street, Suite 1600
Honolulu, Hawaii 96813

Attn: Margie Pascua

Title: Report of Data: Case 92039

Project: 60571032 CV18F0126 Red Hill Fuel Storage, HI

Contract #: Prime contract # for DoD: NAVY CLEAN N62742-17-F-1800, CV18F0126
Subcontract: 18S-22209-HI27

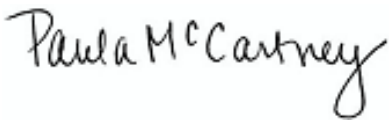
Dear Ms. Pascua:

Three water samples were received April 30, 2020. Written results for the requested analyses are being provided on this May 26, 2020.

Results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

If you have any questions or require further information, please contact your APPL Project Manager, Libby Cheeseborough, libby@applinc.com, at your convenience. Thank you for choosing APPL, Inc.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. These test results meet all requirements of NELAC and DoD QSM. Release of the hard copy has been authorized by the Laboratory Manager or her designee, as verified by the following signature.



Paula McCartney, Laboratory Director
APPL, Inc.

PM/lac
Enclosure
cc: File

Data Validation Package
for
60571032 CV18F0126 Red Hill Fuel Storage
APPL SDG 92039
TABLE OF CONTENTS

LABORATORY NAME: *APPL, Inc.*

Case Narrative	3
Sample Management Records	7
Sample Results	13
QC Forms	37
Method 8011 Calibration Data	116
Method 8011 Raw Data	143
Method 8015B Calibration Data	162
Method 8015B Raw Data	225
Method 8270D Calibration Data	265
Method 8270D Raw Data	319
Method 8270D SIM Calibration Data	348
Method 8270D SIM Raw Data	375
APPL SOP 2-MEE Calibration Data	397
APPL SOP 2-MEE Raw Data	424
Method 8260B Calibration Data	449
Method 8260B Raw Data	522
Method 8260B GRO Calibration Data	546
Method 8260B GRO Raw Data	595
Method RSK-175 Calibration Data	617
Method RSK-175 Raw Data	645
Method 300 Calibration Data	658
Method 300 Raw Data	682
Inorganic Analyses Calibration Raw Data	689

CASE NARRATIVE

Case Narrative

ARF: 92039

Project: 60571032 CV18F0126 Red Hill Fuel Storage. HI

Sample Receipt Information:

Three water samples were received April 30, 2020, at 4.4°C and 4.3°C. The sample group was assigned Analytical Request Form (ARF) number 92039.

Sample Preparation and Analysis Information:

For the EPA 8011 analysis, the samples were extracted according to APPL SOP method MWE012.

For the EPA 8015B analysis, the sample was extracted according to EPA method 3520C. The sample extracts were silica gel cleaned according to APPL's SOP CLN004 and placed on hold.

For the EPA 8270D Phenol analysis, the samples were extracted according to EPA method 3520C.

For the EPA 8270D SIM analysis, the samples were extracted according to EPA method 3520C.

For the APPL SOP ANA2MEE analysis, the samples were extracted according to EPA method 3535.

For the EPA 8260B analysis, the samples were purged according to EPA method 5030B.

For the RSK-175 analysis, the samples were allowed to equilibrate for 10 minutes at 40°C and a portion of the headspace was analyzed.

For the EPA 9060A, 300.0, 353.2, SM 2320B, and SM 3500FeB analyses, the sample was prepared according to the methods.

Only the portion of the injection log relative to these samples is included. A full sequence log is available upon request. Measurement uncertainty can be reported upon request.

Analytical Exceptions, Deviations and Abnormalities.

EPA 8270D: Three surrogates recovered above their control limits in the LCS/LCSD. They are not associated with the target analyte.

Between one and three internal standards are outside of the control limits in the Blank, LCS, LCSD and one sample. They are not associated with the target analyte.

EPA 300.0: Sample ERH1080 received at hold time and injected eight hours past hold time for nitrate.

SDG	Received	Client ID	APPL ID	Collected DateTime	Matrix	Method	Method Description
92039	04/30/20	ERH1079	BA10503	04/28/20 7:07:00 AM	WATER	8011	EPA 8011
92039	04/30/20	ERH1079	BA10503	04/28/20 7:07:00 AM	WATER	EPA 8260B	EPA 8260B BTEX & 1,2-DCA WATER
92039	04/30/20	ERH1079	BA10503	04/28/20 7:07:00 AM	WATER	EPA 8260B	EPA 8260B GRO WATER
92039	04/30/20	ERH1079	BA10503	04/28/20 7:07:00 AM	WATER	RSK 175	METHANE BY RSK 175
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	SM 2320B	Wetlab 2320B - Water
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 300.0	Wetlab 300.0 - Water
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 300.0	Wetlab 300.0 - Water
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	SM3500FeB	Ferrous Iron
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 353.2	EPA 353.2 - WATER
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	8011	EPA 8011
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 8260B	EPA 8260B BTEX & 1,2-DCA WATER
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 8270D	EPA 8270D WATER
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 8270D	EPA 8270D MODIFIED WATER
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 8015B-eHL	EPA 8015B TPH WATER L-L SGC
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 8015B-eHL	EPA 8015B TPH LIQ-LIQ
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	EPA 8260B	EPA 8260B GRO WATER
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	RSK 175	METHANE BY RSK 175
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	8270D-SIM	EPA 8270D SIM LIQ-LIQ
92039	04/30/20	ERH1080	BA10504	04/28/20 10:20:00 AM	WATER	SW846 9060A	9060A TOC
92039	04/30/20	ERH1081	BA10505	04/28/20 10:20:00 AM	WATER	8011	EPA 8011
92039	04/30/20	ERH1081	BA10505	04/28/20 10:20:00 AM	WATER	EPA 8260B	EPA 8260B BTEX & 1,2-DCA WATER
92039	04/30/20	ERH1081	BA10505	04/28/20 10:20:00 AM	WATER	EPA 8270D	EPA 8270D WATER
92039	04/30/20	ERH1081	BA10505	04/28/20 10:20:00 AM	WATER	EPA 8270D	EPA 8270D MODIFIED WATER
92039	04/30/20	ERH1081	BA10505	04/28/20 10:20:00 AM	WATER	EPA 8015B-eHL	EPA 8015B TPH WATER L-L SGC
92039	04/30/20	ERH1081	BA10505	04/28/20 10:20:00 AM	WATER	EPA 8015B-eHL	EPA 8015B TPH LIQ-LIQ
92039	04/30/20	ERH1081	BA10505	04/28/20 10:20:00 AM	WATER	EPA 8260B	EPA 8260B GRO WATER
92039	04/30/20	ERH1081	BA10505	04/28/20 10:20:00 AM	WATER	8270D-SIM	EPA 8270D SIM LIQ-LIQ

Abbreviations and Flags

FLAG	DESCRIPTION
#	Recovery or RPD outside control limits
*	Recovery or RPD outside control limits
B	Analyte detected in associated method blank
C1	Reason for correction: wrote incorrect response
C2	Reason for correction: calculated incorrectly
C3	Reason for correction: needs to be rechecked
C4	Reason for correction: data not usable
DO	Diluted out
E	Exceeds linear range
F	Estimated value
G1	Includes a wide range of hydrocarbons which does not match our gasoline standard
G10	Includes a match to hydrocarbon profiles within the range of mineral spirits
G11	Includes a match to hydrocarbon profiles within the range of JP-4
G12	Pattern does not match the gasoline standard; the carbon range for this sample is consistent with JP8
G13	Closely resembles the hydrocarbon profile of aviation gasoline
G14	Analyte concentration may be biased due to carry over
G2	Closely resembles the boiling point hydrocarbon profile consistent with weathered gasoline
G3	Includes higher boiling hydrocarbons
G4	Includes dominant peak(s) not indicative of petroleum hydrocarbons
G5	Is mainly dominant peak(s) not indicative of petroleum hydrocarbons
G6	Contains recognizable contaminant peak(s) which has been removed from quantitation
G7	Is mainly a match to hydrocarbons within the range of gasoline
G8	Closely resembles the boiling point hydrocarbon profile consistent with weathered gasoline
G9	Includes hydrocarbons within the range of kerosene
J	Estimated value
M	Matrix effect
MI1	Manual integration: integration does not follow baseline
MI2	Manual integration: non-target peak interference
MI3	Manual integration: to split a peak that was integrated as one peak by the computer
MI4	Manual integration: to integrate a split peak
MI5	Manual integration: the whole peak or part of the peak was not integrated
MI6	Manual integration: computer integrated wrong peak
MI7	Manual integration: other - explain
MDL	Method detection limit
ND	Not detected
NT	Non-target
Q	Acceptance criteria not met
T1 I	Includes wide range of hydrocarbons not indicative of diesel
T1 M	Is mainly wide range of hydrocarbons not necessarily indicative of diesel
T2 I	Includes lower boiling hydrocarbons, i.e. mineral spirits, kerosene, stoddard solvent, white gas
T2 M	Is mainly lower boiling hydrocarbons, i.e. mineral spirits, kerosene, stoddard solvent, white gas
T3 I	Includes higher boiling hydrocarbons, i.e. asphaltene, waster oil, motor oil, or weathered diesel fuel
T3 M	Is mainly higher boiling hydrocarbons, i.e. asphaltene, waster oil, motor oil, or weathered diesel fuel
T4 I	Includes dominant peak(s) not indicative of hydrocarbons
T4 M	Is mainly dominant peak(s) not indicative of hydrocarbons
T5	Contains recognizable contaminant peak(s) which has been removed from quantitation
T6	Is mainly a match to hydrocarbons within range of diesel fuel
T7	Closely resembles the boiling point hydrocarbon profile consistent with diesel fuel
T8	Includes a match to hydrocarbon profiles within range of diesel and kerosene fuel
T9 I	Includes non-diesel hydrocarbons within boiling point range of diesel fuel
T9 M	Is mainly non-diesel hydrocarbons within boiling point range of diesel fuel.
Y	Percent difference between primary and confirmation column > 40%

SAMPLE RECORDS MANAGEMENT

CHAIN OF CUSTODY,

ARF, CRF, AND

CLIENT COMMUNICATION

APPL - Analysis Request Form 92039

Client: **AECOM**
Address: **1001 Bishop Street, Suite 1600**
Honolulu, HI 96813
Attn: **Margie Pascua**
Phone: **808-356-5373** Fax: **808-523-8950**
Job: **60571032 CV18F0126 Red Hill Fuel Storage**
PO #: **18S-22209-HI27 PO# 102604**
Chain of Custody (Y/N): **Y** # **208,209**
RAD Screen (Y/N): **Y** pH (Y/N): **Y**
Turn Around Type: **1 WEEK**

Received by: **RBR**
Date Received: **04/30/20** Time: **10:05**
Delivered by: **FEDEX**
Shuttle Custody Seals (Y/N): **Y** Time Zone: **-10**
Chest Temp(s): **4.4,4.3°C**
Color: **VFRG/B-Red**
Samples Chilled until Placed in Refrig/Freezer: **Y**
Project Manager: **Libby Cheesebor**
QC Report Type: **DVP4DOD/EQUIS/HI**
Due Date: **05/07/20**

Comments:
PM: login and F1s to Margie.Pascua@aecom.com
AN: 7 day TAT for Form 1s; 21 day TAT for PKG STYLE 1; DOD v5.1; DOD Forms: LOD database
Wetlab: NO3, CL, & SO4 by EPA 300 and NO3-N & NO2-N by 353.2;
8260: BTEX & TPH-G only; 8270 SIM: 1-methylnaphthalene, 2-methylnaphthalene & naphthalene only.
TPH D & O both with and w/o SGC, reverse surrogate for the SGC; analyze SGC if detections
RSK: Methane only; 8011: EDB only; $87DC53W5: report phenol
FR: email ftp info to Margie, Stella, trommelfanger@lab-data.com & jcanlas@lab-data.com
EDD: AECOM EQuIS EDD 2.5.3 Red Hill 87DMEE->3535A to Margie.Pascua@aecom.com & jecklund@lab-data.com

Sample Distribution:
GC: 3-$8011, 2-$87DC53W5, 2-$87DMEEW5, 2-$DOC53W5LIQ, 2-$SIM53LIQ51
Extractions: 3-_MWE012, 2-_LIQ003, 2-_LIQ005, 2-_MWE2MEE
VOA: 3-$86BTOTXDCAW, 3-$GASBL, 3-$GRO86BW, 2-$RSKMETH
Wetlab: 1-$232W(HCO3,CO3,ALK), 1-$300W, 1-$35FE, 1-$35OF, 1-$TOCW53

Charges:

Invoice To:
ACCOUNTS PAYABLE
1001 Bishop Street, Ste 1600
USAPImaging@aecom.com
mary.basano@aecom.com

	Client ID		APPL ID	Sampled		Analyses Requested
1.	ERH1079	LCSD	BA10503W	04/28/20	07:07	$8011, $86BTOTXDCAW, $GASBL, $GRO86BW, $RSKMETH -- see comments
2.	ERH1080	LCSD	BA10504W	04/28/20	10:20	$232W(HCO3,CO3,ALK), $300W, $35FE, $35OF, $8011, $86BTOTXDCAW, $87DC53W5, $87DMEEW5, $DOC53W5LIQ, $GASBL, $GRO86BW, $RSKMETH, $SIM53LIQ51, $TOCW53 -- see comments
3.	ERH1081	LCSD	BA10505W	04/28/20	10:20	$8011, $86BTOTXDCAW, $87DC53W5, $87DMEEW5, $DOC53W5LIQ, $GASBL, $GRO86BW, $SIM53LIQ51 -- see comments

Note: All times, excluding sample collection times, are Pacific Time Zone unless noted otherwise. Collection times are in: -10 UTC

APPL Sample Receipt Form

ARF# **92039**

Sample	Container Type	Count	p
BA10503	[13] VOAs - HCL	7	NA
BA10504	[3] PL 250mL	1	NA
	[10] PL 250mL - H2SO4	1	1.7
	[13] VOAs - HCL	4	NA
	[15] VOAs - NP	3	NA
	[17] Amber Liter	4	NA
	[32] Clear VOA - H2SO4	2	NA
	[38] 250mL brn poly, HCl prsvd	1	1.7
	[40] 500mL Amber, unprsrvd	3	NA
BA10505	[13] VOAs - HCL	4	NA
	[15] VOAs - NP	3	NA
	[17] Amber Liter	4	NA
	[40] 500mL Amber, unprsrvd	3	NA

Sample	Container Type	Count	p

APPL, Inc.
908 N Temperance Ave
Clovis, CA 93611
www.applinc.com
Phone: (559) 275-2175
Fax: (559) 275-4422
coc@applinc.com

CHAIN OF CUSTODY RECORD

C.O.C. 208

Report to: PLEASE PRINT
Company Name: AECOM Phone: 808-356-5373
Address: 1001 Bishop St, Suite 1600 Fax: 808-523-8950
Honolulu, HI 96813
Attn: Margie Pascua
Email: margie.pascua@aecom.com

Invoice to: PLEASE PRINT
Company Name: AECOM Phone: 808-529-7249
Address: 1001 Bishop St, Suite 1600 Fax: 808-523-8950
Honolulu, HI 96813
Attn: Mary Basano
Email: mary.basano@aecom.com; usapimaging@aecom.com

Project Name/Number: CV18F0126 / 60571032
Purchase Order Number: 102604
Sampler (Print): BM, DH, TV
Sampler (Signature): Alex Llanas for BM, DH, TV

Date Shipped: 4/29/20
Carrier: FedEx
Waybill No.:
Comments:

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Matrix: Aq	Sed.	Soil	8260C BTEX,TPH-g	8260C DCA 8011 EDB	8015C TPH-d/o	3630/8015C TPH-d/o w/ SGT	8270DSIM PAHs short list	8270D Phenol, THG	8270D 2-(2-methoxy ethoxy)-ethanol	RSK175M Methane	SM3500-Fe Ferrous Iron	353.2 Nitrate-Nitrite N	SM2320B Alkalinity 300.0 Nitrate,Sulfate,Chloride	300.0 Bromide/Fluoride 8010 Total Ca,Mg,Mn,K,Na SM4500 Total & Dissolved Silica	9060A TOC	
ERH1079	Trip Blank	04/28	07:07	HST	7	X			X	X						X						
ERH1080	RHMW13-05	04/28	10:20	HST	19	X			X	X	X	X*	X	X	X	X	X	X	X		X	
ERH1081	RHMW13-05	04/28	10:20	HST	0	X			X	X	X	X*	X	X	X							-see other cocs

AM 04/29/20

*Analyze TPH w/SGT only if TPH-d/o detected.
TPH-d/o & PAHs need liquid-liquid extraction.

Page 10 of 703

Shuttle Temperature:

Turnaround Requested: Check one
☐ Standard 2-3 wk ☒ One week ☐ 3 days ☐ 24/48 Hrs. ☐ Other:

Sample Disposal:
☐ Return to client ☒ Disposal by Lab (30-day retention)

Relinquished by sampler: AECOM	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
Alex Llanas	4/29/20	1200					
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received at lab by:
					4/30/20	10:05	

See page 2 for Container Preservative and Sampling Information

92039

APPL, Inc.
908 N Temperance Ave
Clovis, CA 93611
www.applinc.com
Phone: (559) 275-2175
Fax: (559) 275-4422
coc@applinc.com

CHAIN OF CUSTODY RECORD

C.O.C. 209

Report to: PLEASE PRINT

Company Name: AECOM Phone: 808-356-5373

Address: 1001 Bishop St, Suite 1600
Honolulu, HI 96813 Fax: 808-523-8950

Attn: Margie Pascua

Email: margie.pascua@aecom.com

Invoice to: PLEASE PRINT

Company Name: AECOM Phone: 808-529-7249

Address: 1001 Bishop St, Suite 1600
Honolulu, HI 96813 Fax: 808-523-8950

Attn: Mary Basano

Email: mary.basano@aecom.com; usapimaging@aecom.com

Project Name/Number: CV18F0126 / 60571032

Purchase Order Number: 102604

Sampler (Print): BM, DH, TV

Sampler (Signature): Alex Hansen for BM, DH, TV

Date Shipped: 4/29/20

Carrier: FedEx

Waybill No.:

Comments:

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Matrix: Aq	Matrix: Sed.	Matrix: Soil	8260C BTEX,TPH-g	8260C DCA 8011 EDB	8015C TPH-d/o	3630/8015C TPH-d/o w/ SGT	8270DSIM PAHs short list	8270D Phenol, ~~1-MeO~~	8270D 2-(2-methoxy ethoxy)-ethanol	RSK175M Methane	SM3500-Fe Ferrous Iron	353.2 Nitrate-Nitrite N	SM2320B Alkalinity 300.0 Nitrate,Sulfate,Chloride	300.0 Bromide/Fluoride 6010 Total Ca,Mg,Mn,K,Na SM4500 Total & Dissolved Silica	9060A TOC	
ERH1081	RHMW13-05	04/28	10:20	HST	14	X			X	X	X	X*	X	X	X							-see other coolers for VOAs

Page 11 of 103

AM 4/29/20

*Analyze TPH w/SGT only if TPH-d/o detected.

TPH-d/o & PAHs need liquid-liquid extraction.

Shuttle Temperature: 0.3/ IR @ 3.0 4.4/4.4°C 0.3°C

Turnaround Requested: Check one
☐ Standard 2-3 wk ☒ One week ☐ 3 days ☐ 24/48 Hrs. ☐ Other: _____

Sample Disposal:
☐ Return to client ☒ Disposal by Lab (30-day retention)

Relinquished by sampler: AECOM	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
Alex Hansen	4/29/20	1200					
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received at lab by:
					4/30/20	10:05	

See page 2 for Container Preservative and Sampling Information

COOLER RECEIPT FORM **ARF: 92039**

1) Project: 60571032 CV18F0126 Red Hill Fuel Storage Date Received: 04/30/20

2) Coolers: Number of Coolers: 2

3) YES Were custody seals present and intact?
How many? 4 Name/Date on seal? See Below

4) YES Was there a shipping slip? Carrier name: FEDEX

5) Type of packing in cooler: X bubble wrap __ popcorn __ foam X plastic bags __ other
X wet ice __ dry ice __ no ice __ gel ice

6) YES Were cooler temperatures acceptable?

7) Serial number of certified NIST thermometer use IR @ 0.0°C

8) Cooler temp(s): In °C. Thermometer Temp / Corrected Temp
1: 4.4/4.4 2: 4.3/4.3 3: ____ 4: ____ 5: ____ 6: ____
7: ____ 8: ____ 9: ____ 10: ____ 11: ____ 12: ____

Chain of custody:

9) YES Was a chain of custody received?

10) YES Were the custody papers complete/signed in the appropriate places?

Sample Labels:

11) YES Were all sample labels complete (sample ID, date/time of sampling, etc.)?

12) YES Did all container labels agree with custody papers?

Sample Containers:

13) YES Were all containers sealed in separate bags?

14) YES Did all containers arrive in good condition:(unbroken, no leakage, no cracked/broken lids)?

15) YES Were correct containers and preservatives used for the tests indicated?

16) YES Was a sufficient amount of sample sent for tests indicated?

17) No Were bubbles present in volatile samples?
If yes, the following were received with air bubbles:
Larger than a pea: ____
Smaller than a pea: ____

Preservation Hold time:

18) Yes Was a sufficient amount of holding time remaining to analyze the samples?

19) Yes Was the pH taken of all non-VOA preserved samples and written on the sample container?

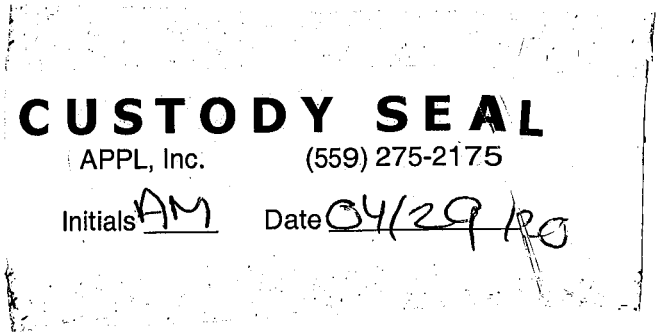
20) Yes Was the pH of acid preserved non-VOA samples < 2?

21) NA Was the pH of the "basic" preserved samples for Cyanide > 12, Sulfide >9, Hexchrom >9?

22) NO Were unpreserved VOA Vials received?

23) NA Are unpreserved VOA vials noted in the ADD TEST FIELD on the ARF?
pH strip lot number: HC982588
Lab notified if pH was not adequate: ____

Notes/Deficiencies:



Personnel receiving samples: RB Second reviewer: AA
Personnel labeling samples: RB
Project manager notified: RB Date/Time of notification 04/30/20 10:40:00 AM
Name of client notified: ____ Date/Time of notification ____

SAMPLE RESULTS

EPA 8011

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Attn: Margie Pascua

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1079

APPL ID: BA10503

Sample Collection Date: 04/28/20

QCG: #8011-200504A-252304

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
8011	EDB	0.019 U	0.02	0.019	0.010	ug/L	05/04/20	05/04/20
8011	SURROGATE: 1,3-DIBROMOPROPANE	105	70-132			%	05/04/20	05/04/20

Quant Method:	80110427.M
Run #:	0430024
Instrument:	Herbie
Sequence:	200430
Dilution Factor:	1
Initials:	SSE

Printed: 05/06/20 10:31:47 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8011

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #8011-200504A-252304

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
8011	EDB	0.019 U	0.02	0.019	0.010	ug/L	05/04/20	05/04/20
8011	SURROGATE: 1,3-DIBROMOPROPANE	102	70-132			%	05/04/20	05/04/20

Quant Method:	80110427.M
Run #:	0430025
Instrument:	Herbie
Sequence:	200430
Dilution Factor:	1
Initials:	SSE

Printed: 05/06/20 10:31:47 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8011

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1081

APPL ID: BA10505

Sample Collection Date: 04/28/20

QCG: #8011-200504A-252304

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
8011	EDB	0.019 U	0.02	0.019	0.010	ug/L	05/04/20	05/04/20
8011	SURROGATE: 1,3-DIBROMOPROPANE	101	70-132			%	05/04/20	05/04/20

Quant Method:	80110427.M
Run #:	0430026
Instrument:	Herbie
Sequence:	200430
Dilution Factor:	1
Initials:	SSE

Printed: 05/06/20 10:31:47 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8015B TPH LIQ-LIQ

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #DOC53-200430A1-252259

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8015B-e	DIESEL (C10-C24)	210 J	320	300.0	150.0	ug/L	04/30/20	05/04/20
EPA 8015B-e	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/04/20
EPA 8015B-e	SURROGATE: OCTACOSANE (S)	95.8	60-142			%	04/30/20	05/04/20
EPA 8015B-e	SURROGATE: ORTHO-TERPHENYL (S)	75.9	56-125			%	04/30/20	05/04/20

J = Estimated value.

Quant Method:	DOC0310.M
Run #:	424112
Instrument:	Apollo
Sequence:	200424
Dilution Factor:	1
Initials:	SSE

Printed: 05/06/20 9:44:52 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8015B TPH WATER L-L SGC

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #DOC53-200430A3-252582

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8015B-e	DIESEL (C10-C24)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/12/20
EPA 8015B-e	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: (R) DECANOIC ACID (S)	0.0	0-1			%	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: OCTACOSANE (S)	98.8	60-142			%	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: ORTHO-TERPHENYL (S)	75.3	56-125			%	04/30/20	05/12/20

Quant Method:	DOC0310.M
Run #:	424261
Instrument:	Apollo
Sequence:	200424
Dilution Factor:	1
Initials:	SSE

Printed: 05/13/20 11:52:20 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8015B TPH LIQ-LIQ

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1081

APPL ID: BA10505

Sample Collection Date: 04/28/20

QCG: #DOC53-200430A1-252259

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8015B-e	DIESEL (C10-C24)	180 J	320	300.0	150.0	ug/L	04/30/20	05/04/20
EPA 8015B-e	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/04/20
EPA 8015B-e	SURROGATE: OCTACOSANE (S)	96.2	60-142			%	04/30/20	05/04/20
EPA 8015B-e	SURROGATE: ORTHO-TERPHENYL (S)	76.0	56-125			%	04/30/20	05/04/20

J = Estimated value.

Quant Method:	DOC0310.M
Run #:	424113
Instrument:	Apollo
Sequence:	200424
Dilution Factor:	1
Initials:	SSE

Printed: 05/06/20 9:44:52 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8015B TPH WATER L-L SGC

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1081

APPL ID: BA10505

Sample Collection Date: 04/28/20

QCG: #DOC53-200430A3-252582

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8015B-e	DIESEL (C10-C24)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/12/20
EPA 8015B-e	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: (R) DECANOIC ACID (S)	0.0	0-1			%	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: OCTACOSANE (S)	99.1	60-142			%	04/30/20	05/12/20
EPA 8015B-e	SURROGATE: ORTHO-TERPHENYL (S)	76.0	56-125			%	04/30/20	05/12/20

Quant Method:	DOC0310.M
Run #:	424262
Instrument:	Apollo
Sequence:	200424
Dilution Factor:	1
Initials:	SSE

Printed: 05/13/20 11:52:20 AM

APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #87DC5-200504A-252339

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8270D	PHENOL	4.00 U	5.0	4.00	1.00	ug/L	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2,4,6-TRIBROMOPHENO	88.0	43-140			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2-FLUORBIPHENYL (S)	89.4	44-119			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2-FLUOROPHENOL (S)	66.9	19-119			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: NITROBENZENE-D5 (S)	82.6	44-120			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: PHENOL-D6 (S)	48.1	10-115			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: TERPHENYL-D14 (S)	87.2	50-134			%	05/04/20	05/06/20

Quant Method: Y0420.M
Run #: 0420Y196
Instrument: Yoda
Sequence: Y200420
Dilution Factor: 1
Initials: MA

Printed: 05/06/20 5:38:16 PM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1081

APPL ID: BA10505

Sample Collection Date: 04/28/20

QCG: #87DC5-200504A-252339

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8270D	PHENOL	4.00 U	5.0	4.00	1.00	ug/L	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2,4,6-TRIBROMOPHENO	73.6	43-140			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2-FLUORBIPHENYL (S)	75.7	44-119			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: 2-FLUOROPHENOL (S)	54.6	19-119			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: NITROBENZENE-D5 (S)	76.4	44-120			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: PHENOL-D6 (S)	52.9	10-115			%	05/04/20	05/06/20
EPA 8270D	SURROGATE: TERPHENYL-D14 (S)	80.3	50-134			%	05/04/20	05/06/20

Quant Method: Y0420.M
Run #: 0420Y197
Instrument: Yoda
Sequence: Y200420
Dilution Factor: 1
Initials: MA

Printed: 05/06/20 5:38:16 PM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D SIM LIQ-LIQ

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #SIM53-200504A-252338

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
8270D-SIM	1-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	2-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	NAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	SURROGATE: 2-METHYLNAPHTHALEN	78.2	39-114			%	05/04/20	05/06/20
8270D-SIM	SURROGATE: FLUORANTHENE-D10 (S	72.8	58-120			%	05/04/20	05/06/20

Quant Method: L0204.M
Run #: 0424L176
Instrument: Linus
Sequence: L200424
Dilution Factor: 1
Initials: MA

Printed: 05/06/20 4:52:42 PM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D SIM LIQ-LIQ

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1081

APPL ID: BA10505

Sample Collection Date: 04/28/20

QCG: #SIM53-200504A-252338

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
8270D-SIM	1-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	2-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	NAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
8270D-SIM	SURROGATE: 2-METHYLNAPHTHALEN	69.7	39-114			%	05/04/20	05/06/20
8270D-SIM	SURROGATE: FLUORANTHENE-D10 (S	72.2	58-120			%	05/04/20	05/06/20

Quant Method: L0204.M
Run #: 0424L177
Instrument: Linus
Sequence: L200424
Dilution Factor: 1
Initials: MA

Printed: 05/06/20 4:52:42 PM
APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D MODIFIED WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #87DME-200504A-252289

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8270D	2-(2-METHOXYETHOXY)-ETHANOL	80.0 U	100	80.0	40.0	ug/L	05/04/20	05/04/20

Quant Method:	YMEE0501.M
Run #:	0501Y036
Instrument:	Yoda
Sequence:	Y200501M
Dilution Factor:	1
Initials:	MA

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APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8270D MODIFIED WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1081

APPL ID: BA10505

Sample Collection Date: 04/28/20

QCG: #87DME-200504A-252289

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8270D	2-(2-METHOXYETHOXY)-ETHANOL	80.0 U	100	80.0	40.0	ug/L	05/04/20	05/04/20

Quant Method:	YMEE0501.M
Run #:	0501Y037
Instrument:	Yoda
Sequence:	Y200501M
Dilution Factor:	1
Initials:	MA

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APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B BTEX & 1,2-DCA WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1079

APPL ID: BA10503

Sample Collection Date: 04/28/20

QCG: #86BTO-200501AM-252241

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	1,2-DICHLOROETHANE	0.30 U	1.0	0.30	0.14	ug/L	05/01/20	05/01/20
EPA 8260B	BENZENE	0.30 U	1.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	ETHYLBENZENE	0.50 U	1.0	0.50	0.23	ug/L	05/01/20	05/01/20
EPA 8260B	TOLUENE	0.30 U	1.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	XYLENES (TOTAL)	0.30 U	2.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	SURROGATE: 1,2-DICHLOROETHANE-	105	81-118			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	91.8	85-114			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: DIBROMOFLUOROMETH	98.8	80-119			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: TOLUENE-D8 (S)	92.9	89-112			%	05/01/20	05/01/20

Quant Method:	M0430W.M
Run #:	0501M12
Instrument:	Max
Sequence:	M200430
Dilution Factor:	1
Initials:	DG

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APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B BTEX & 1,2-DCA WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #86BTO-200501AM-252241

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	1,2-DICHLOROETHANE	0.30 U	1.0	0.30	0.14	ug/L	05/01/20	05/01/20
EPA 8260B	BENZENE	0.30 U	1.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	ETHYLBENZENE	0.50 U	1.0	0.50	0.23	ug/L	05/01/20	05/01/20
EPA 8260B	TOLUENE	0.30 U	1.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	XYLENES (TOTAL)	0.30 U	2.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	SURROGATE: 1,2-DICHLOROETHANE-	109	81-118			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	92.1	85-114			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: DIBROMOFLUOROMETH	102	80-119			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: TOLUENE-D8 (S)	93.6	89-112			%	05/01/20	05/01/20

Quant Method:	M0430W.M
Run #:	0501M13
Instrument:	Max
Sequence:	M200430
Dilution Factor:	1
Initials:	DG

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APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B BTEX & 1,2-DCA WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1081

APPL ID: BA10505

Sample Collection Date: 04/28/20

QCG: #86BTO-200501AM-252241

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	1,2-DICHLOROETHANE	0.30 U	1.0	0.30	0.14	ug/L	05/01/20	05/01/20
EPA 8260B	BENZENE	0.30 U	1.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	ETHYLBENZENE	0.50 U	1.0	0.50	0.23	ug/L	05/01/20	05/01/20
EPA 8260B	TOLUENE	0.30 U	1.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	XYLENES (TOTAL)	0.30 U	2.0	0.30	0.15	ug/L	05/01/20	05/01/20
EPA 8260B	SURROGATE: 1,2-DICHLOROETHANE-	108	81-118			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	92.7	85-114			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: DIBROMOFLUOROMETH	100	80-119			%	05/01/20	05/01/20
EPA 8260B	SURROGATE: TOLUENE-D8 (S)	91.2	89-112			%	05/01/20	05/01/20

Quant Method: M0430W.M
Run #: 0501M14
Instrument: Max
Sequence: M200430
Dilution Factor: 1
Initials: DG

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APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B GRO WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1079

APPL ID: BA10503

Sample Collection Date: 04/28/20

QCG: #GRO86-200501AM-252242

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	GASOLINE RANGE ORGANICS	18.0 U	20	18.0	8.6	ug/L	05/01/20	05/01/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	91.8	85-114			%	05/01/20	05/01/20

Quant Method:	SUR430W.M
Run #:	0501M12
Instrument:	Max
Sequence:	M200430
Dilution Factor:	1
Initials:	DG

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APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B GRO WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #GRO86-200501AM-252242

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	GASOLINE RANGE ORGANICS	18.0 U	20	18.0	8.6	ug/L	05/01/20	05/01/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	92.1	85-114			%	05/01/20	05/01/20

Quant Method:	SUR430W.M
Run #:	0501M13
Instrument:	Max
Sequence:	M200430
Dilution Factor:	1
Initials:	DG

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APPL-F1-SC-NoMC-REG MDLs-DOD

EPA 8260B GRO WATER

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1081

APPL ID: BA10505

Sample Collection Date: 04/28/20

QCG: #GRO86-200501AM-252242

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8260B	GASOLINE RANGE ORGANICS	18.0 U	20	18.0	8.6	ug/L	05/01/20	05/01/20
EPA 8260B	SURROGATE: 4-BROMOFLUOROBENZ	92.7	85-114			%	05/01/20	05/01/20

Quant Method:	SUR430W.M
Run #:	0501M14
Instrument:	Max
Sequence:	M200430
Dilution Factor:	1
Initials:	DG

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APPL-F1-SC-NoMC-REG MDLs-DOD

METHANE

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1079

APPL ID: BA10503

Sample Collection Date: 04/28/20

QCG: #RSKME-200505A-252264

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
RSK 175	METHANE	1.00 U	5.0	1.00	0.25	ug/L	05/05/20	05/05/20

Quant Method:	RSK0311.M
Run #:	0505R08
Instrument:	Rocky
Sequence:	200311
Dilution Factor:	1
Initials:	CMO

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APPL-F1-SC-NoMC-REG MDLs-DOD

METHANE

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

ARF: 92039

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

QCG: #RSKME-200505A-252264

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
RSK 175	METHANE	19	5.0	1.00	0.25	ug/L	05/05/20	05/05/20

Quant Method:	RSK0311.M
Run #:	0505R09
Instrument:	Rocky
Sequence:	200311
Dilution Factor:	1
Initials:	CMO

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APPL-F1-SC-NoMC-REG MDLs-DOD

Wet Lab Analysis

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

ARF: 92039

Method	Analyte	Result	LOQ	LOD	DL	Units	DF	Prep Date	Analysis Date
EPA 300.0	CHLORIDE	70.5	5.0	1.00	0.40	mg/L	5	05/06/20	05/06/20
EPA 300.0	NITRATE	1.6	0.5	0.18	0.04	mg/L	1	04/30/20	04/30/20
EPA 300.0	SULFATE	12.0	1.0	0.20	0.09	mg/L	1	04/30/20	04/30/20

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APPL-F1-SC-NoMC-REG MDLs

Wet Lab Analysis

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Margie Pascua

Project: 60571032 CV18F0126 Red Hill Fuel Storage

Sample ID: ERH1080

APPL ID: BA10504

Sample Collection Date: 04/28/20

ARF: 92039

Method	Analyte	Result	LOQ	LOD	DL	Units	DF	Prep Date	Analysis Date
EPA 353.2	NITRATE-NITRITE-N	0.41	0.10	0.090	0.028	mg/L	1	05/01/20	05/01/20
SM 2320B	BICARBONATE AS CACO3	93.4	2.0	1.70	0.85	mg/L	1	05/04/20	05/04/20
SM 2320B	CARBONATE AS CACO3	1.70 U	2.0	1.70	0.85	mg/L	1	05/04/20	05/04/20
SM 2320B	TOTAL ALKALINITY AS CACO	93.4	2.0	1.70	0.85	mg/L	1	05/04/20	05/04/20
SM3500FeB	FERROUS IRON	0.32 U	1.0	0.32	0.16	mg/L	1	05/01/20	05/01/20
SW846 9060A	TOTAL ORGANIC CARBON	0.87 J	0.93	0.350	0.130	mg/L	1	05/01/20	05/01/20

J = Estimated value.

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APPL-F1-SC-NoMC-REG MDLs

QC FORMS

8011

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/04/20

Matrix: WATER Instrument: Herbie

APPL ID.	Client Sample No.	SURROGATE: 1,3-DIBROMOPROPANE (S)					
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	70-132	101				
200504A-LCS	Lab Control Spike	70-132	106				
200504A-LCSD	Lab Control SpikeD	70-132	98.4				
BA10503	ERH1079	70-132	105				
BA10504	ERH1080	70-132	102				
BA10505	ERH1081	70-132	101				

Comments: Batch: #8011-200504A

8011

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Herbie
Blank ID:	200504A-BLK	Time Analyzed:	1405

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0430019	05/04/20 1405
200504A-LCS	Lab Control Spike	0430020	05/04/20 1425
200504A-LCSD	Lab Control SpikeD	0430021	05/04/20 1445
BA10503	ERH1079	0430024	05/04/20 1546
BA10504	ERH1080	0430025	05/04/20 1607
BA10505	ERH1081	0430026	05/04/20 1627

Comments: Batch: #8011-200504A

Method Blank
EPA 8011

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200504W-10438 - 252304**
Batch ID: #8011-200504A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	EDB	0.019 U	0.02	0.019	0.010	ug/L	05/04/20	05/04/20
BLANK	SURROGATE: 1,3-DIBROMOPRO	101	70-132			%	05/04/20	05/04/20

Quant Method:80110427.M
Run #:0430019
Instrument:Herbie
Sequence:200430
Initials:SSE

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 10:31:47 AM

8011

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Herbie
LCS ID:	200504A-LCS	Time Analyzed:	1425

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0430019	05/04/20 1405
200504A-LCS	Lab Control Spike	0430020	05/04/20 1425
200504A-LCSD	Lab Control SpikeD	0430021	05/04/20 1445
BA10503	ERH1079	0430024	05/04/20 1546
BA10504	ERH1080	0430025	05/04/20 1607
BA10505	ERH1081	0430026	05/04/20 1627

Comments: Batch: #8011-200504A

Laboratory Control Spike Recoveries
EPA 8011

APPL ID: **200504W-10438 LCS - 252304**
Batch ID: #8011-200504A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
EDB	0.250	0.253	0.246	101	98.4	60-140	2.8	25
SURROGATE: 1,3-DIBROMOPROPANE (	0.250	0.265	0.246	106	98.4	70-132		

Comments:

Primary	SPK	DUP
Quant Method :	80110427.M	80110427.M
Extraction Date :	05/04/20	05/04/20
Analysis Date :	05/04/20	05/04/20
Instrument :	Herbie	Herbie
Run :	0430020	0430021
Initials :	SSE	

EPA 8015B-eHL

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/04/20

Matrix: WATER Instrument: Apollo

APPL ID.	Client Sample No.	SURROGATE: OCTACOSANE (S)			SURROGATE: ORTHO-TERPHENYL (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430A1-BLK	Blank	60-142	87.0		56-125	73.1	
200430A1-LCS	Lab Control Spike	60-142	94.5		56-125	84.5	
200430A1-LCSD	Lab Control SpikeD	60-142	91.1		56-125	83.2	
BA10504	ERH1080	60-142	95.8		56-125	75.9	
BA10505	ERH1081	60-142	96.2		56-125	76.0	

Comments: Batch: #DOC53-200430A1

EPA 8015B-eH

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Apollo
Blank ID:	200430A1-BLK	Time Analyzed:	1527

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A1-BLK	Blank	424096	05/04/20 1527
200430A1-LCS	Lab Control Spike	424097	05/04/20 1550
200430A1-LCSD	Lab Control SpikeD	424098	05/04/20 1613
BA10504	ERH1080	424112	05/04/20 2130
BA10505	ERH1081	424113	05/04/20 2153

Comments: Batch: #DOC53-200430A1

Method Blank
EPA 8015B TPH LIQ-LIQ

Blank Name/QCG: **200430W-10439 - 252259**
Batch ID: #DOC53-200430A1

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	DIESEL (C10-C24)	150 J	320	300.0	150.0	ug/L	04/30/20	05/04/20
BLANK	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/04/20
BLANK	SURROGATE: OCTACOSANE (S)	87.0	60-142			%	04/30/20	05/04/20
BLANK	SURROGATE: ORTHO-TERPHEN	73.1	56-125			%	04/30/20	05/04/20

J = Estimated value.

Quant Method: DOC0310.M
Run #: 424096
Instrument: Apollo
Sequence: 200424
Initials: SSE

GC SC-Blank-REG MDLs-DOD
Printed: 05/27/20 10:21:44 AM

AMENDED PAGE

EPA 8015B-eH

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Apollo
LCS ID:	200430A1-LCS	Time Analyzed:	1550

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A1-BLK	Blank	424096	05/04/20 1527
200430A1-LCS	Lab Control Spike	424097	05/04/20 1550
200430A1-LCSD	Lab Control SpikeD	424098	05/04/20 1613
BA10504	ERH1080	424112	05/04/20 2130
BA10505	ERH1081	424113	05/04/20 2153

Comments: Batch: #DOC53-200430A1

Laboratory Control Spike Recoveries
EPA 8015B TPH LIQ-LIQ

APPL ID: **200430W-10439 LCS - 252259**
Batch ID: #DOC53-200430A1

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
DIESEL (C10-C24)	1250	1200	1140	96.0	91.2	36-132	5.1	30
OIL (C24-C40)	1250	1150	1120	92.0	89.6	41-113	2.6	30
SURROGATE: OCTACOSANE (S)	75.0	70.9	68.3	94.5	91.1	60-142		
SURROGATE: ORTHO-TERPHENYL (S)	75.0	63.4	62.4	84.5	83.2	56-125		

Comments:

Primary	SPK	DUP
Quant Method :	DOC0310.M	DOC0310.M
Extraction Date :	04/30/20	04/30/20
Analysis Date :	05/04/20	05/04/20
Instrument :	Apollo	Apollo
Run :	424097	424098
Initials :	SSE	

EPA 8015B-eHL

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/07/20

Matrix: WATER Instrument: Apollo

APPL ID.	Client Sample No.	SURROGATE: (R) DECANOIC ACID (S)			SURROGATE: OCTACOSANE (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430A3-BLK	Blank	0-1	0.0		60-142	88.3	
200430A3-LCS	Lab Control Spike	0-1	0.0		60-142	96.9	
200430A3-LCSD	Lab Control SpikeD	0-1	0.0		60-142	82.0	
BA10504	ERH1080	0-1	0.0		60-142	98.8	
BA10505	ERH1081	0-1	0.0		60-142	99.1	

Comments: Batch: #DOC53-200430A3

EPA 8015B-eHL

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/07/20

Matrix: WATER Instrument: Apollo

APPL ID.	Client Sample No.	SURROGATE: ORTHO-TERPHENYL (S)					
		Limits	Result	Qualifier	Limits	Result	Qualifier
200430A3-BLK	Blank	56-125	73.8				
200430A3-LCS	Lab Control Spike	56-125	87.3				
200430A3-LCSD	Lab Control SpikeD	56-125	77.5				
BA10504	ERH1080	56-125	75.3				
BA10505	ERH1081	56-125	76.0				

Comments: Batch: #DOC53-200430A3

EPA 8015B-eH

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/07/20

Matrix: WATER Instrument: Apollo

Blank ID: 200430A3-BLK Time Analyzed: 1755

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A3-BLK	Blank	424187	05/07/20 1755
200430A3-LCS	Lab Control Spike	424188	05/07/20 1818
200430A3-LCSD	Lab Control SpikeD	424189	05/07/20 1841
BA10504	ERH1080	424261	05/12/20 2139
BA10505	ERH1081	424262	05/12/20 2201

Comments: Batch: #DOC53-200430A3

Method Blank
EPA 8015B TPH WATER L-L SGC

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200430W-10439 - 252582**
Batch ID: #DOC53-200430A3

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	DIESEL (C10-C24)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/07/20
BLANK	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/30/20	05/07/20
BLANK	SURROGATE: (R) DECANOIC AC	0.0	0-1			%	04/30/20	05/07/20
BLANK	SURROGATE: OCTACOSANE (S)	88.3	60-142			%	04/30/20	05/07/20
BLANK	SURROGATE: ORTHO-TERPHEN	73.8	56-125			%	04/30/20	05/07/20

Quant Method: DOC0310.M
Run #: 424187
Instrument: Apollo
Sequence: 200424
Initials: SSE

GC SC-Blank-REG MDLs-DOD
Printed: 05/13/20 11:52:20 AM

EPA 8015B-eH

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/07/20
Matrix:	WATER	Instrument:	Apollo
LCS ID:	200430A3-LCS	Time Analyzed:	1818

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A3-BLK	Blank	424187	05/07/20 1755
200430A3-LCS	Lab Control Spike	424188	05/07/20 1818
200430A3-LCSD	Lab Control SpikeD	424189	05/07/20 1841
BA10504	ERH1080	424261	05/12/20 2139
BA10505	ERH1081	424262	05/12/20 2201

Comments: Batch: #DOC53-200430A3

Laboratory Control Spike Recoveries
EPA 8015B TPH WATER L-L SGC

APPL ID: **200430W-10439 LCS - 252582**
Batch ID: #DOC53-200430A3

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
DIESEL (C10-C24)	1250	921	867	73.7	69.4	36-132	6.0	30
OIL (C24-C40)	1250	1170	1020	93.6	81.6	41-113	13.7	30
SURROGATE: (R) DECANOIC ACID (S)	10.00	0	0	0.0	0.0	0-1		
SURROGATE: OCTACOSANE (S)	75.0	72.7	61.5	96.9	82.0	60-142		
SURROGATE: ORTHO-TERPHENYL (S)	75.0	65.5	58.1	87.3	77.5	56-125		

Comments:

Primary	SPK	DUP
Quant Method :	DOC0310.M	DOC0310.M
Extraction Date :	04/30/20	04/30/20
Analysis Date :	05/07/20	05/07/20
Instrument :	Apollo	Apollo
Run :	424188	424189
Initials :	SSE	

EPA 8270D

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Yoda

APPL ID.	Client Sample No.	SURROGATE: 2,4,6-TRIBROMOPHENOL (S)			SURROGATE: 2-FLUORBIPHENYL (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	43-140	82.7		44-119	85.1	
200504A-LCS	Lab Control Spike	43-140	172	*	44-119	169	*
200504A-LCSD	Lab Control SpikeD	43-140	440	*	44-119	433	*
BA10504	ERH1080	43-140	88.0		44-119	89.4	
BA10505	ERH1081	43-140	73.6		44-119	75.7	

Comments: Batch: #87DC5-200504A

* = Recovery outside of Control Limits on QC Sample.

EPA 8270D

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Yoda

APPL ID.	Client Sample No.	SURROGATE: 2-FLUOROPHENOL (S)			SURROGATE: NITROBENZENE-D5 (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	19-119	65.0		44-120	81.2	
200504A-LCS	Lab Control Spike	19-119	74.8		44-120	85.6	
200504A-LCSD	Lab Control SpikeD	19-119	72.8		44-120	85.6	
BA10504	ERH1080	19-119	66.9		44-120	82.6	
BA10505	ERH1081	19-119	54.6		44-120	76.4	

Comments: Batch: #87DC5-200504A

EPA 8270D

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Yoda

APPL ID.	Client Sample No.	SURROGATE: PHENOL-D6 (S)			SURROGATE: TERPHENYL-D14 (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	10-115	57.3		50-134	89.4	
200504A-LCS	Lab Control Spike	10-115	52.0		50-134	96.0	
200504A-LCSD	Lab Control SpikeD	10-115	27.2		50-134	236	*
BA10504	ERH1080	10-115	48.1		50-134	87.2	
BA10505	ERH1081	10-115	52.9		50-134	80.3	

Comments: Batch: #87DC5-200504A

* = Recovery outside of Control Limits on QC Sample.

EPA 8270D

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Yoda

Blank ID: 200504A-BLK Time Analyzed: 1040

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0420Y192	05/06/20 1040
200504A-LCS	Lab Control Spike	0420Y193	05/06/20 1109
200504A-LCSD	Lab Control SpikeD	0420Y194	05/06/20 1137
BA10504	ERH1080	0420Y196	05/06/20 1234
BA10505	ERH1081	0420Y197	05/06/20 1302

Comments: Batch: #87DC5-200504A

Method Blank
EPA 8270D WATER

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200504W-10439 - 252339**
Batch ID: #87DC5-200504A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	PHENOL	4.00 U	5.0	4.00	1.00	ug/L	05/04/20	05/06/20
BLANK	SURROGATE: 2,4,6-TRIBROMOP	82.7	43-140			%	05/04/20	05/06/20
BLANK	SURROGATE: 2-FLUORBIPHENY	85.1	44-119			%	05/04/20	05/06/20
BLANK	SURROGATE: 2-FLUOROPHENO	65.0	19-119			%	05/04/20	05/06/20
BLANK	SURROGATE: NITROBENZENE-	81.2	44-120			%	05/04/20	05/06/20
BLANK	SURROGATE: PHENOL-D6 (S)	57.3	10-115			%	05/04/20	05/06/20
BLANK	SURROGATE: TERPHENYL-D14 (	89.4	50-134			%	05/04/20	05/06/20

Quant Method: Y0420.M
Run #: 0420Y192
Instrument: Yoda
Sequence: Y200420
Initials: MA

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 5:38:19 PM

EPA 8270D

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/06/20
Matrix:	WATER	Instrument:	Yoda
LCS ID:	200504A-LCS	Time Analyzed:	1109

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0420Y192	05/06/20 1040
200504A-LCS	Lab Control Spike	0420Y193	05/06/20 1109
200504A-LCSD	Lab Control SpikeD	0420Y194	05/06/20 1137
BA10504	ERH1080	0420Y196	05/06/20 1234
BA10505	ERH1081	0420Y197	05/06/20 1302

Comments: Batch: #87DC5-200504A

Laboratory Control Spike Recoveries
EPA 8270D WATER

APPL ID: **200504W-10439 LCS - 252339**
Batch ID: #87DC5-200504A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
PHENOL	62.5	37.4	33.3	59.8	53.3	10-115	11.6	20
SURROGATE: 2,4,6-TRIBROMOPHENOL	250	429	1100	172 #	440 #	43-140		
SURROGATE: 2-FLUORBIPHENYL (S)	125	211	541	169 #	433 #	44-119		
SURROGATE: 2-FLUOROPHENOL (S)	250	187	182	74.8	72.8	19-119		
SURROGATE: NITROBENZENE-D5 (S)	125	107	107	85.6	85.6	44-120		
SURROGATE: PHENOL-D6 (S)	250	130	68.1	52.0	27.2	10-115		
SURROGATE: TERPHENYL-D14 (S)	125	120	295	96.0	236 #	50-134		

= Recovery is outside QC limits.

Comments:

Primary	SPK	DUP
Quant Method :	Y0420.M	Y0420.M
Extraction Date :	05/04/20	05/04/20
Analysis Date :	05/06/20	05/06/20
Instrument :	Yoda	Yoda
Run :	0420Y193	0420Y194
Initials :	MA	

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No:
Matrix: Water
ID: 0420Y002.D

SDG No:
Date Analyzed: 04/20/20
Instrument: Yoda
Time Analyzed: 9:12

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		4ug/ml 8270 3/4/20	0420Y003.D	04/20/20 9:28
2		5ug/ml 8270 3/4/20	0420Y004.D	04/20/20 9:57
3		10ug/ml 8270 3/4/20	0420Y005.D	04/20/20 10:31
4		20ug/ml 8270 3/4/20	0420Y006.D	04/20/20 11:00
5		40ug/ml 8270 3/4/20	0420Y007.D	04/20/20 11:28
6		50ug/ml 8270 3/4/20	0420Y008.D	04/20/20 11:57
7		60ug/ml 8270 3/4/20	0420Y009.D	04/20/20 12:26
8		80ug/ml 8270 3/4/20	0420Y010.D	04/20/20 12:55
9		100ug/ml 8270 3/4/20	0420Y011.D	04/20/20 13:24
10		SS 8270 3/4/20	0420Y012.D	04/20/20 13:53
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	10 - 80% of mass 198	34.1
68	0 - 2% of mass 69	0.0
70	0 - 2% of mass 69	0.8
127	10 - 80% of mass 198	48.2
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.9
275	10 - 60% of mass 198	27.9
365	1 - 100% of mass 198	3.2
441	0.01 - 24% of mass 442	1.3
442	50 - 500% of mass 198	87.6
443	15 - 24% of mass 442	19.0

Form 5
Tune Summary

Lab Name: APPL Inc. SDG No: 92039
Case No: 92039 Date Analyzed: 05/06/20
Matrix: Water Instrument: Yoda
ID: 0420Y190.D Time Analyzed: 9:54

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		50ug/ml 8270 3/30/20	0420Y191.D	05/06/20 10:10
2	Blank	200504A BLK 1/800	0420Y192.D	05/06/20 10:40
3	Lab Control Spike	200504A LCS-1 1/800	0420Y193.D	05/06/20 11:09
4	Lab Control SpikeD	200504A LCSD-1 1/800	0420Y194.D	05/06/20 11:37
5	ERH1080	BA10504W18 1/800	0420Y196.D	05/06/20 12:34
6	ERH1081	BA10505W11 1/800	0420Y197.D	05/06/20 13:02
7		50ug/ml 8270 3/30/20	0420Y198.D	05/06/20 13:32
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	9.95 - 80.04% of mass 198	38.7
68	0 - 2% of mass 69	0.0
70	0 - 2% of mass 69	0.6
127	10 - 80% of mass 198	51.9
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198.05	100.0
199	5 - 9% of mass 198	6.9
275	10 - 60% of mass 198	26.2
365	1 - 100% of mass 198	2.8
441	0.01 - 24% of mass 442	12.8
442	50 - 500% of mass 198.05	68.8
443	15 - 24% of mass 442	19.5

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0420Y191.D Date Analyzed: 6 May 20 10:10

Instrument ID: Yoda Time Analyzed: 6 May 20 10:10

GC Column: ID: Heated Purge: (Y/N)

		1,4-dichlorobenzene-D4(IS)		Napthalene-D8(IS)		Acenaphthene-D10(IS)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	560488	5.28	2480990	6.71	1519110	8.74
	UPPER LIMIT	1120976	5.45	4961980	6.88	3038220	8.91
	LOWER LIMIT	280244	5.11	1240495	6.54	759555	8.57
	SAMPLE NO.						
01	200504A BLK 1/800	490692	5.27	2027580	6.71	1094660	8.73
02	200504A LCS-1 1/800	429277	5.28	1870440	6.71	552807 *	8.73
03	200504A LCSD-1 1/800	451589	5.28	1898690	6.71	216990 *	8.73
04	BA10504W18 1/800	463276	5.27	1961190	6.71	1054590	8.73
05	BA10505W11 1/800	439143	5.28	1821970	6.71	1058890	8.73
06	50ug/ml 8270 3/30/20 (5	400214	5.28	1651960	6.71	974422	8.74
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0420Y191.D Date Analyzed: 6 May 20 10:10

Instrument ID: Yoda Time Analyzed: 6 May 20 10:10

GC Column: ID: Heated Purge: (Y/N)

		Phenanthrene-D10(IS)		Chrysene-D12(IS)		Perylene-D12(IS)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	2861200	10.46	3331180	13.56	2679200	15.35
	UPPER LIMIT	5722400	10.63	6662360	13.73	5358400	15.52
	LOWER LIMIT	1430600	10.29	1665590	13.39	1339600	15.18
	SAMPLE NO.						
01	200504A BLK 1/800	2246300	10.46	2168050	13.55	445281 *	15.34
02	200504A LCS-1 1/800	1989460	10.46	1946170	13.55	21401 *	15.34
03	200504A LCSD-1 1/800	1695320	10.46	699718 *	13.55	4267 *	15.34
04	BA10504W18 1/800	2192920	10.46	2138100	13.55	403898 *	15.34
05	BA10505W11 1/800	2004560	10.47	2030200	13.55	1688940	15.34
06	50ug/ml 8270 3/30/20 (5	1820290	10.47	2031760	13.56	1660390	15.34
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8270D-SIM

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Linus

APPL ID.	Client Sample No.	SURROGATE: 2-METHYLNAPHTHALENE-D10 (S)			SURROGATE: FLUORANTHENE-D10 (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200504A-BLK	Blank	39-114	83.8		58-120	75.0	
200504A-LCS	Lab Control Spike	39-114	74.9		58-120	69.1	
200504A-LCSD	Lab Control SpikeD	39-114	72.5		58-120	71.8	
BA10504	ERH1080	39-114	78.2		58-120	72.8	
BA10505	ERH1081	39-114	69.7		58-120	72.2	

Comments: Batch: #SIM53-200504A

8270D-SIM

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/06/20

Matrix: WATER Instrument: Linus

Blank ID: 200504A-BLK Time Analyzed: 1023

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0424L172	05/06/20 1023
200504A-LCS	Lab Control Spike	0424L173	05/06/20 1045
200504A-LCSD	Lab Control SpikeD	0424L174	05/06/20 1107
BA10504	ERH1080	0424L176	05/06/20 1151
BA10505	ERH1081	0424L177	05/06/20 1213

Comments: Batch: #SIM53-200504A

Method Blank
EPA 8270D SIM LIQ-LIQ

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200504W-10439 - 252338**
Batch ID: #SIM53-200504A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	1-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
BLANK	2-METHYLNAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
BLANK	NAPHTHALENE	0.10 U	0.2	0.10	0.04	ug/L	05/04/20	05/06/20
BLANK	SURROGATE: 2-METHYLNAPHT	83.8	39-114			%	05/04/20	05/06/20
BLANK	SURROGATE: FLUORANTHENE-	75.0	58-120			%	05/04/20	05/06/20

Quant Method:L0204.M
Run #:0424L172
Instrument:Linus
Sequence:L200424
Initials:MA

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 4:54:29 PM

8270D-SIM

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/06/20
Matrix:	WATER	Instrument:	Linus
LCS ID:	200504A-LCS	Time Analyzed:	1045

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0424L172	05/06/20 1023
200504A-LCS	Lab Control Spike	0424L173	05/06/20 1045
200504A-LCSD	Lab Control SpikeD	0424L174	05/06/20 1107
BA10504	ERH1080	0424L176	05/06/20 1151
BA10505	ERH1081	0424L177	05/06/20 1213

Comments: Batch: #SIM53-200504A

Laboratory Control Spike Recoveries
EPA 8270D SIM LIQ-LIQ

APPL ID: **200504W-10439 LCS - 252338**
Batch ID: #SIM53-200504A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
1-METHYLNAPHTHALENE	6.25	4.47	4.37	71.5	69.9	41-115	2.3	20
2-METHYLNAPHTHALENE	6.25	4.63	4.55	74.1	72.8	39-114	1.7	20
NAPHTHALENE	6.25	4.47	4.35	71.5	69.6	43-114	2.7	20
SURROGATE: 2-METHYLNAPHTHALEN	6.25	4.68	4.53	74.9	72.5	39-114		
SURROGATE: FLUORANTHENE-D10 (S)	6.25	4.32	4.49	69.1	71.8	58-120		

Comments:

Primary	SPK	DUP
Quant Method :	L0204.M	L0204.M
Extraction Date :	05/04/20	05/04/20
Analysis Date :	05/06/20	05/06/20
Instrument :	Linus	Linus
Run :	0424L173	0424L174
Initials :	MA	

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No:
Matrix: Water
ID: 0204L002.D

SDG No:
Date Analyzed: 02/04/20
Instrument: Linus
Time Analyzed: 9:32

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		0.1 SIM 02/03/20	0204L003.D	02/04/20 9:48
2		0.2 SIM 02/03/20	0204L004.D	02/04/20 10:09
3		0.5 SIM 02/03/20	0204L005.D	02/04/20 10:31
4		1 SIM 02/03/20	0204L006.D	02/04/20 10:53
5		5 SIM 02/03/20	0204L007.D	02/04/20 11:15
6		10 SIM 02/03/20	0204L008.D	02/04/20 11:37
7		50 SIM 02/03/20	0204L009.D	02/04/20 11:59
8		100 SIM 02/03/20	0204L010.D	02/04/20 12:21
9		SS SIM 02/03/20	0204L011.D	02/04/20 13:21
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	9.95 - 80.1% of mass 198	18.6
68	0 - 2.05% of mass 69	0.0
70	0 - 2% of mass 69	0.4
127	10 - 80% of mass 198	40.9
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.3
275	10 - 60% of mass 198	30.0
365	1 - 100% of mass 198	4.7
441	0.01 - 24% of mass 442	15.8
442	50 - 500% of mass 198	200.3
443	15 - 24% of mass 442	19.3

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No: 92039
Matrix: Water
ID: 0424L170.D

SDG No: 92039
Date Analyzed: 05/06/20
Instrument: Linus
Time Analyzed: 8:38

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		5 SIM 2/4/20 (3)	0424L171.D	05/06/20 8:54
2	Blank	200504A BLK 1/800	0424L172.D	05/06/20 10:23
3	Lab Control Spike	200504A LCS-2 1/800	0424L173.D	05/06/20 10:45
4	Lab Control SpikeD	200504A LCSD-2 1/800	0424L174.D	05/06/20 11:07
5	ERH1080	BA10504W18 1/800	0424L176.D	05/06/20 11:51
6	ERH1081	BA10505W11 1/800	0424L177.D	05/06/20 12:13
7		5 SIM 2/4/20 (4)	0424L178.D	05/06/20 12:52
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	9.95 - 80.1% of mass 198	15.2
68	0 - 2.05% of mass 69	0.0
70	0 - 2% of mass 69	0.5
127	10 - 80% of mass 198	37.0
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.6
275	10 - 60% of mass 198	33.6
365	1 - 100% of mass 198	4.8
441	0.01 - 24% of mass 442	15.9
442	50 - 500% of mass 198	245.4
443	15 - 24% of mass 442	19.1

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0424L171.D Date Analyzed: 6 May 20 8:54

Instrument ID: Linus Time Analyzed: 6 May 20 8:54

GC Column: ID: Heated Purge: (Y/N)

		Napthalene-D8(IS)		Acenaphthene-D10(IS)		Phenanthrene-D10(IS)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	92595	4.14	51356	6.13	99414	7.87
	UPPER LIMIT	185190	4.31	102712	6.30	198828	8.04
	LOWER LIMIT	46298	3.97	25678	5.96	49707	7.70
	SAMPLE NO.						
01	200504A BLK 1/800	80484	4.14	42134	6.13	91708	7.87
02	200504A LCS-2 1/800	82766	4.14	30697	6.13	87731	7.86
03	200504A LCSD-2 1/800	84996	4.14	46150	6.13	92781	7.86
04	BA10504W18 1/800	84871	4.14	45755	6.13	94491	7.87
05	BA10505W11 1/800	88846	4.14	48973	6.13	94421	7.87
06	5 SIM 2/4/20 (4)	73064	4.14	40148	6.14	78468	7.87
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0424L171.D Date Analyzed: 6 May 20 8:54

Instrument ID: Linus Time Analyzed: 6 May 20 8:54

GC Column: ID: Heated Purge: (Y/N)

	Chrysene-D12(IS)						
	AREA #	RT #	AREA #	RT #	AREA #	RT #	
12 HOUR STD	128459	10.99					
UPPER LIMIT	256918	11.16					
LOWER LIMIT	64230	10.82					
SAMPLE NO.							
01 200504A BLK 1/800	114406	10.99					
02 200504A LCS-2 1/800	99404	10.99					
03 200504A LCSD-2 1/800	119811	10.98					
04 BA10504W18 1/800	124300	10.99					
05 BA10505W11 1/800	125503	10.99					
06 5 SIM 2/4/20 (4)	100616	10.99					
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

EPA 8270D

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/04/20

Matrix: WATER Instrument: Yoda

Blank ID: 200504A-BLK Time Analyzed: 1556

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0501Y032	05/04/20 1556
200504A-LCS	Lab Control Spike	0501Y033	05/04/20 1620
200504A-LCSD	Lab Control SpikeD	0501Y034	05/04/20 1644
BA10504	ERH1080	0501Y036	05/04/20 1733
BA10505	ERH1081	0501Y037	05/04/20 1756

Comments: Batch: #87DME-200504A

Method Blank
EPA 8270D MODIFIED WATER

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200504W-10439 - 252289**
Batch ID: #87DME-200504A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	2-(2-METHOXYETHOXY)-ETHAN	80.0 U	100	80.0	40.0	ug/L	05/04/20	05/04/20

Quant Method: YMEE0501.M
Run #: 0501Y032
Instrument: Yoda
Sequence: Y200501M
Initials: MA

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 2:42:59 PM

EPA 8270D

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Yoda
LCS ID:	200504A-LCS	Time Analyzed:	1620

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	0501Y032	05/04/20 1556
200504A-LCS	Lab Control Spike	0501Y033	05/04/20 1620
200504A-LCSD	Lab Control SpikeD	0501Y034	05/04/20 1644
BA10504	ERH1080	0501Y036	05/04/20 1733
BA10505	ERH1081	0501Y037	05/04/20 1756

Comments: Batch: #87DME-200504A

Laboratory Control Spike Recoveries
EPA 8270D MODIFIED WATER

APPL ID: **200504W-10439 LCS - 252289**
Batch ID: #87DME-200504A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
2-(2-METHOXYETHOXY)-ETHANOL	80.0	55.4	42.2	69.3	52.8	30-130	27.0 #	20

= Recovery is outside QC limits.

Comments:

Primary	SPK	DUP
Quant Method :	YMEE0501.M	YMEE0501.M
Extraction Date :	05/04/20	05/04/20
Analysis Date :	05/04/20	05/04/20
Instrument :	Yoda	Yoda
Run :	0501Y033	0501Y034
Initials :	MA	

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No:
Matrix: Soil
ID: 0501Y002.D

SDG No:
Date Analyzed: 05/01/20
Instrument: Yoda
Time Analyzed: 9:23

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		50ug/ml MEE 05/01/20	0501Y003.D	05/01/20 9:39
2		100ug/ml MEE 05/01/2	0501Y004.D	05/01/20 10:03
3		200ug/ml MEE 05/01/2	0501Y006.D	05/01/20 10:51
4		400ug/ml MEE 05/01/2	0501Y007.D	05/01/20 11:24
5		500ug/ml MEE 05/01/2	0501Y008.D	05/01/20 11:48
6		600ug/ml MEE 05/01/2	0501Y009.D	05/01/20 12:13
7		800ug/ml MEE 05/01/2	0501Y010.D	05/01/20 12:37
8		1000ug/ml MEE 05/01/	0501Y011.D	05/01/20 13:01
9		SSug/ml MEE 05/01/20	0501Y013.D	05/01/20 13:50
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	10 - 80% of mass 198	40.1
68	0 - 2% of mass 69	0.0
70	0 - 2% of mass 69	0.5
127	10 - 80% of mass 198	52.5
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.8
275	10 - 60% of mass 198	26.7
365	1 - 100% of mass 198	2.8
441	0.01 - 24% of mass 442	3.9
442	50 - 500% of mass 198	71.6
443	15 - 24% of mass 442	19.8

Form 5
Tune Summary

Lab Name: APPL Inc.
Case No: 92039
Matrix: Soil
ID: 0501Y030.D

SDG No: 92039
Date Analyzed: 05/04/20
Instrument: Yoda
Time Analyzed: 14:52

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		500ug/ml MEE 05/01/2	0501Y031.D	05/04/20 15:07
2	Blank	200504A BLK 2/500	0501Y032.D	05/04/20 15:56
3	Lab Control Spike	200504A LCS-1 2/500	0501Y033.D	05/04/20 16:20
4	Lab Control SpikeD	200504A LCSD-1 2/500	0501Y034.D	05/04/20 16:44
5	ERH1080	BA10504W15 2/500	0501Y036.D	05/04/20 17:33
6	ERH1081	BA10505W08 2/500	0501Y037.D	05/04/20 17:56
7		500ug/ml MEE 05/01/2	0501Y038.D	05/04/20 18:21
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
51	10 - 80% of mass 198	40.6
68	0 - 2% of mass 69	0.0
70	0 - 2% of mass 69	0.7
127	10 - 80% of mass 198	52.5
197	0 - 2% of mass 198	0.0
198	100 - 100% of mass 198	100.0
199	5 - 9% of mass 198	6.9
275	10 - 60% of mass 198	25.7
365	1 - 100% of mass 198	2.6
441	0.01 - 24% of mass 442	10.1
442	50 - 500% of mass 198	64.6
443	15 - 24% of mass 442	19.9

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0501Y031.D Date Analyzed: 4 May 20 15:07

Instrument ID: Yoda Time Analyzed: 4 May 20 15:07

GC Column: ID: Heated Purge: (Y/N)

	1,4-dichlorobenzene-D4(IS)							
		AREA #	RT #	AREA #	RT #	AREA #	RT #	
	12 HOUR STD	450181	5.06					
	UPPER LIMIT	900362	5.23					
	LOWER LIMIT	225091	4.89					
	SAMPLE NO.							
01	200504A BLK 2/500	476418	5.04					
02	200504A LCS-1 2/500	460181	5.05					
03	200504A LCSD-1 2/500	495995	5.04					
04	BA10504W15 2/500	309114	5.04					
05	BA10505W08 2/500	385597	5.05					
06	500ug/ml MEE 05/01/20	391416	5.06					
07								
08								
09								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

EPA 8260B

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/01/20

Matrix: WATER Instrument: Max

APPL ID.	Client Sample No.	SURROGATE: 1,2-DICHLOROETHANE-D4 (S)			SURROGATE: 4-BROMOFLUOROBENZENE (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200501AM-LCS	Lab Control Spike	81-118	112		85-114	95.6	
200501AM-LCSD	Lab Control SpikeD	81-118	113		85-114	97.6	
200501AM-BLK	Blank	81-118	117		85-114	98.7	
BA10503	ERH1079	81-118	105		85-114	91.8	
BA10504	ERH1080	81-118	109		85-114	92.1	
BA10505	ERH1081	81-118	108		85-114	92.7	

Comments: Batch: #86BTO-200501AM

EPA 8260B

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/01/20

Matrix: WATER Instrument: Max

APPL ID.	Client Sample No.	SURROGATE: DIBROMOFLUOROMETHANE (S)			SURROGATE: TOLUENE-D8 (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
200501AM-LCS	Lab Control Spike	80-119	104		89-112	95.2	
200501AM-LCSD	Lab Control SpikeD	80-119	105		89-112	98.4	
200501AM-BLK	Blank	80-119	110		89-112	99.1	
BA10503	ERH1079	80-119	98.8		89-112	92.9	
BA10504	ERH1080	80-119	102		89-112	93.6	
BA10505	ERH1081	80-119	100		89-112	91.2	

Comments: Batch: #86BTO-200501AM

EPA 8260B

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	Max
Blank ID:	200501AM-BLK	Time Analyzed:	1546

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501AM-LCS	Lab Control Spike	0501M06	05/01/20 1321
200501AM-LCSD	Lab Control SpikeD	0501M07	05/01/20 1350
200501AM-BLK	Blank	0501M11	05/01/20 1546
BA10503	ERH1079	0501M12	05/01/20 1615
BA10504	ERH1080	0501M13	05/01/20 1644
BA10505	ERH1081	0501M14	05/01/20 1713

Comments: Batch: #86BTO-200501AM

Method Blank
EPA 8260B BTEX & 1,2-DCA WATER

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200501W-10503 - 252241**
Batch ID: #86BTO-200501AM

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	1,2-DICHLOROETHANE	0.30 U	1.0	0.30	0.14	ug/L	05/01/20	05/01/20
BLANK	BENZENE	0.30 U	1.0	0.30	0.15	ug/L	05/01/20	05/01/20
BLANK	ETHYLBENZENE	0.50 U	1.0	0.50	0.23	ug/L	05/01/20	05/01/20
BLANK	TOLUENE	0.30 U	1.0	0.30	0.15	ug/L	05/01/20	05/01/20
BLANK	XYLENES (TOTAL)	0.30 U	2.0	0.30	0.15	ug/L	05/01/20	05/01/20
BLANK	SURROGATE: 1,2-DICHLOROET	117	81-118			%	05/01/20	05/01/20
BLANK	SURROGATE: 4-BROMOFLUORO	98.7	85-114			%	05/01/20	05/01/20
BLANK	SURROGATE: DIBROMOFLUOR	110	80-119			%	05/01/20	05/01/20
BLANK	SURROGATE: TOLUENE-D8 (S)	99.1	89-112			%	05/01/20	05/01/20

Quant Method: M0430W.M
Run #: 0501M11
Instrument: Max
Sequence: M200430
Initials: DG

GC SC-Blank-REG MDLs-DOD
Printed: 05/07/20 10:41:23 AM

EPA 8260B

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	Max
LCS ID:	200501AM-LCS	Time Analyzed:	1321

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501AM-LCS	Lab Control Spike	0501M06	05/01/20 1321
200501AM-LCSD	Lab Control SpikeD	0501M07	05/01/20 1350
200501AM-BLK	Blank	0501M11	05/01/20 1546
BA10503	ERH1079	0501M12	05/01/20 1615
BA10504	ERH1080	0501M13	05/01/20 1644
BA10505	ERH1081	0501M14	05/01/20 1713

Comments: Batch: #86BTO-200501AM

Laboratory Control Spike Recoveries
EPA 8260B BTEX & 1,2-DCA WATER

APPL ID: **200501W-10503 LCS - 252241**
Batch ID: #86BTO-200501AM

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
1,2-DICHLOROETHANE	10.00	10.6	11.3	106	113	73-128	6.4	20
BENZENE	10.00	9.85	10.3	98.5	103	79-120	4.5	20
ETHYLBENZENE	10.00	10.2	10.5	102	105	79-121	2.9	20
TOLUENE	10.00	10.2	10.5	102	105	80-121	2.9	20
XYLENES (TOTAL)	30.0	30.3	31.7	101	106	79-121	4.5	20
SURROGATE: 1,2-DICHLOROETHANE-D	25.0	28.1	28.2	112	113	81-118		
SURROGATE: 4-BROMOFLUOROBENZE	25.0	23.9	24.4	95.6	97.6	85-114		
SURROGATE: DIBROMOFLUOROMETH	25.0	26.1	26.2	104	105	80-119		
SURROGATE: TOLUENE-D8 (S)	25.0	23.8	24.6	95.2	98.4	89-112		

Comments:

Primary	SPK	DUP
Quant Method :	M0430W.M	M0430W.M
Extraction Date :	05/01/20	05/01/20
Analysis Date :	05/01/20	05/01/20
Instrument :	Max	Max
Run :	0501M06	0501M07
Initials :	DG	

Form 5
Tune Summary

Lab Name: APPL Inc. SDG No:
Case No: Date Analyzed: 04/30/20
Matrix: Water Instrument: Max
ID: 0430M17.D Time Analyzed: 19:17

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		0.3ug/L VOC STD 4/30	0430M18.D	04/30/20 19:46
2		0.5ug/L VOC STD 4/30	0430M19.D	04/30/20 20:15
3		1.0ug/L VOC STD 4/30	0430M20.D	04/30/20 20:44
4		2.0ug/L VOC STD 4/30	0430M21.D	04/30/20 21:13
5		5.0ug/L VOC STD 4/30	0430M22.D	04/30/20 21:42
6		10ug/L VOC STD 4/30/	0430M23.D	04/30/20 22:11
7		20ug/L VOC STD 4/30/	0430M24.D	04/30/20 22:40
8		40ug/L VOC STD 4/30/	0430M25.D	04/30/20 23:09
9		100ug/L VOC STD 4/30	0430M26.D	04/30/20 23:38
10		(SS)10ug/L VOC STD 4	0430M28.D	05/01/20 0:36
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
50	15.0 - 40.0% of mass 95	16.7
75	30.0 - 60.0% of mas 95	48.3
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.0
174	50.0 - 200.0% of mass 95	120.7
175	5.0 - 9.0% of mass 174	7.8
176	95.0 - 101.0% of mass 174	99.0
177	5.0 - 9.0% of mass 176	6.7

Form 5
Tune Summary

Form 5
Tune Summary

Lab Name: APPL Inc. SDG No: 92039
Case No: 92039 Date Analyzed: 05/01/20
Matrix: Water Instrument: Max
ID: 0501M04.D Time Analyzed: 12:23

	Client Sample No.	APPL ID.	File ID.	Date Analyzed
1		200501A CCV 10ug/L	0501M05.D	05/01/20 12:52
2	Lab Control Spike	200501A LCS 10ug/L	0501M06.D	05/01/20 13:21
3	Lab Control SpikeD	200501A LCSD 10ug/L	0501M07.D	05/01/20 13:50
4	Blank	200501A BLK	0501M11.D	05/01/20 15:46
5	ERH1079	BA10503W01	0501M12.D	05/01/20 16:15
6	ERH1080	BA10504W01	0501M13.D	05/01/20 16:44
7	ERH1081	BA10505W01	0501M14.D	05/01/20 17:13
8		Ending CCV 10ug/L 5/	0501M16.D	05/01/20 18:11
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

m/e		
50	15.0 - 40.0% of mass 95	19.2
75	30.0 - 60.0% of mas 95	52.3
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	0.0
174	50.0 - 200.0% of mass 95	123.8
175	5.0 - 9.0% of mass 174	8.2
176	95.0 - 101.0% of mass 174	96.6
177	5.0 - 9.0% of mass 176	6.1

Form 5
Tune Summary

8A
INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: APPL Inc. Contract:

Lab Code: SDG No.:

Lab File ID (Standard): 0430M23.D Date Analyzed: 04/30/20

Instrument ID: Max Time Analyzed: 22:11

GC Column: ID: Heated Purge: (Y/N)

		Fluorobenzene (IS)		Chlorobenzene-D5 (IS)		1,4-Dichlorobenzene-D (IS)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	1631280	6.47	1391380	9.63	912008	11.96
	UPPER LIMIT	3262560	6.64	2782760	9.80	1824016	12.13
	LOWER LIMIT	815640	6.30	695690	9.46	456004	11.79
	SAMPLE NO.						
01	200501A CCV 10ug/L	1283450	6.47	1118460	9.63	767274	11.96
02	200501A LCS 10ug/L	1235560	6.47	1104830	9.63	754196	11.96
03	200501A LCSD 10ug/L	1206780	6.47	1063670	9.63	722715	11.96
04	200501A BLK	1176500	6.47	1042330	9.63	680373	11.96
05	BA10503W01	1250760	6.47	1099450	9.63	733427	11.96
06	BA10504W01	1225630	6.47	1089670	9.63	715154	11.96
07	BA10505W01	1217220	6.47	1078880	9.63	718215	11.96
08	Ending CCV 10ug/L 5/1/	1197190	6.47	1068270	9.63	727933	11.96
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = -50% of internal standard area.
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

EPA 8260B

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/01/20

Matrix: WATER Instrument: Max

APPL ID.	Client Sample No.	SURROGATE: 4-BROMOFLUOROBENZENE (S)					
		Limits	Result	Qualifier	Limits	Result	Qualifier
200501AM-LCS	Lab Control Spike	85-114	96.8				
200501AM-LCSD	Lab Control SpikeD	85-114	94.8				
200501AM-BLK	Blank	85-114	98.7				
BA10503	ERH1079	85-114	91.8				
BA10504	ERH1080	85-114	92.1				
BA10505	ERH1081	85-114	92.7				

Comments: Batch: #GRO86-200501AM

EPA 8260B

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	Max
Blank ID:	200501AM-BLK	Time Analyzed:	1546

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501AM-LCS	Lab Control Spike	0501M09	05/01/20 1448
200501AM-LCSD	Lab Control SpikeD	0501M10	05/01/20 1517
200501AM-BLK	Blank	0501M11	05/01/20 1546
BA10503	ERH1079	0501M12	05/01/20 1615
BA10504	ERH1080	0501M13	05/01/20 1644
BA10505	ERH1081	0501M14	05/01/20 1713

Comments: Batch: #GRO86-200501AM

Method Blank
EPA 8260B GRO WATER

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200501W-10503 - 252242**
Batch ID: #GRO86-200501AM

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	GASOLINE RANGE ORGANICS	18.0 U	20	18.0	8.6	ug/L	05/01/20	05/01/20
BLANK	SURROGATE: 4-BROMOFLUORO	98.7	85-114			%	05/01/20	05/01/20

Quant Method: SUR430W.M
Run #: 0501M11
Instrument: Max
Sequence: M200430
Initials: DG

GC SC-Blank-REG MDLs-DOD
Printed: 05/07/20 10:54:55 AM

EPA 8260B

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	Max
LCS ID:	200501AM-LCS	Time Analyzed:	1448

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501AM-LCS	Lab Control Spike	0501M09	05/01/20 1448
200501AM-LCSD	Lab Control SpikeD	0501M10	05/01/20 1517
200501AM-BLK	Blank	0501M11	05/01/20 1546
BA10503	ERH1079	0501M12	05/01/20 1615
BA10504	ERH1080	0501M13	05/01/20 1644
BA10505	ERH1081	0501M14	05/01/20 1713

Comments: Batch: #GRO86-200501AM

Laboratory Control Spike Recoveries
EPA 8260B GRO WATER

APPL ID: **200501W-10503 LCS - 252242**
Batch ID: #GRO86-200501AM

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
GASOLINE RANGE ORGANICS	300	307	308	102	103	78-122	0.33	20
SURROGATE: 4-BROMOFLUOROBENZE	25.0	24.2	23.7	96.8	94.8	85-114		

Comments:

Primary	SPK	DUP
Quant Method :	SUR430W.M	SUR430W.M
Extraction Date :	05/01/20	05/01/20
Analysis Date :	05/01/20	05/01/20
Instrument :	Max	Max
Run :	0501M09	0501M10
Initials :	DG	

RSK 175

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/05/20

Matrix: WATER Instrument: Rocky

Blank ID: 200505A-BLK Time Analyzed: 1152

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200505A-LCS	Lab Control Spike	0505R01	05/05/20 1128
200505A-LCSD	Lab Control SpikeD	0505R03	05/05/20 1146
200505A-BLK	Blank	0505R05	05/05/20 1152
BA10503	ERH1079	0505R08	05/05/20 1204
BA10504	ERH1080	0505R09	05/05/20 1207

Comments: Batch: #RSKME-200505A

Method Blank
METHANE

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Blank Name/QCG: **200505W-10438 - 252264**
Batch ID: #RSKME-200505A

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	METHANE	1.00 U	5.0	1.00	0.25	ug/L	05/05/20	05/05/20

Quant Method: RSK0311.M
Run #: 0505R05
Instrument: Rocky
Sequence: 200311
Initials: CMO

GC SC-Blank-REG MDLs-DOD
Printed: 05/06/20 10:47:36 AM

RSK 175

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/05/20
Matrix:	WATER	Instrument:	Rocky
LCS ID:	200505A-LCS	Time Analyzed:	1128

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200505A-LCS	Lab Control Spike	0505R01	05/05/20 1128
200505A-LCSD	Lab Control SpikeD	0505R03	05/05/20 1146
200505A-BLK	Blank	0505R05	05/05/20 1152
BA10503	ERH1079	0505R08	05/05/20 1204
BA10504	ERH1080	0505R09	05/05/20 1207

Comments: Batch: #RSKME-200505A

Laboratory Control Spike Recoveries
METHANE

APPL ID: **200505W-10438 LCS - 252264**
Batch ID: #RSKME-200505A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	Spike Lvl ug/L	SPK Result ug/L	DUP Result ug/L	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
METHANE	83.4	73.9	74.8	88.6	89.7	72-125	1.2	30

Comments:

Primary	SPK	DUP
Quant Method :	RSK0311.M	RSK0311.M
Extraction Date :	05/05/20	05/05/20
Analysis Date :	05/05/20	05/05/20
Instrument :	Rocky	Rocky
Run :	0505R01	0505R03
Initials :	CMO	

EPA 300.0

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	04/30/20
Matrix:	WATER	Instrument:	Charlie
Blank ID:	200430A1-BLK	Time Analyzed:	1633

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A1-LCS	Lab Control Spike	12	04/30/20 1615
200430A1-BLK	Blank	13	04/30/20 1633
BA10504	ERH1080	20	04/30/20 1834
200430A1-LCSD	Lab Control SpikeD	21	04/30/20 1852

Comments: Batch: #300W-200430A1

EPA 300.0

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/06/20
Matrix:	WATER	Instrument:	Charlie
Blank ID:	200506A-BLK	Time Analyzed:	1645

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200506A-LCS	Lab Control Spike	13	05/06/20 1627
200506A-BLK	Blank	14	05/06/20 1645
200506A-LCSD	Lab Control SpikeD	6	05/06/20 1121
BA10504	ERH1080	9	05/06/20 1512

Comments: Batch: #300WD-200506A

WETLAB BLANK

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Analyte	Result	LOQ	LOD	DL	Units	Prep Date	Analysis Date	QC Group
EPA 300.0	CHLORIDE	0.27 J	1.0	0.20	0.08	mg/L	04/30/20	04/30/20	#300W-200430A1-BA10504
EPA 300.0	NITRATE	0.18 U	0.5	0.18	0.04	mg/L	04/30/20	04/30/20	#300W-200430A1-BA10504
EPA 300.0	SULFATE	0.20 U	1.0	0.20	0.09	mg/L	04/30/20	04/30/20	#300W-200430A1-BA10504
EPA 300.0	CHLORIDE	0.40 J	1.0	0.20	0.08	mg/L	05/06/20	05/06/20	#300WD-200506A-BA10504

J = Estimated value.

Wetlab SC-Blank-REG MDLs
Printed: 05/06/20 5:08:56 PM

EPA 300.0

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	04/30/20
Matrix:	WATER	Instrument:	Charlie
LCS ID:	200430A1-LCS	Time Analyzed:	1615

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200430A1-LCS	Lab Control Spike	12	04/30/20 1615
200430A1-BLK	Blank	13	04/30/20 1633
BA10504	ERH1080	20	04/30/20 1834
200430A1-LCSD	Lab Control SpikeD	21	04/30/20 1852

Comments: Batch: #300W-200430A1

EPA 300.0

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/06/20
Matrix:	WATER	Instrument:	Charlie
LCS ID:	200506A-LCS	Time Analyzed:	1627

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200506A-LCS	Lab Control Spike	13	05/06/20 1627
200506A-BLK	Blank	14	05/06/20 1645
200506A-LCSD	Lab Control SpikeD	6	05/06/20 1121
BA10504	ERH1080	9	05/06/20 1512

Comments: Batch: #300WD-200506A

Laboratory Control Spike Recoveries

WETLAB

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Lvl mg/L	SPK Res mg/L	DUP Res mg/L	SPK % Recov	DUP % Recov	RPD	RPD Max	QC Limits	Extract Date-Spk	Analysis Date-Spk	Extract Date-Dup	Analysis Date-Dup	QC Group
EPA 300.0	CHLORIDE	25.0	23.7	23.8	94.8	95.2	0.42	20	90-110	05/06/20	05/06/20	05/06/20	05/06/20	#300WD-200506A-BA1050
EPA 300.0	CHLORIDE	25.0	24.3	24.3	97.2	97.2	0.0	20	90-110	04/30/20	04/30/20	04/30/20	04/30/20	#300W-200430A1-BA1050
EPA 300.0	NITRATE	22.1	20.8	20.8	94.1	94.1	0.0	20	90-110	04/30/20	04/30/20	04/30/20	04/30/20	#300W-200430A1-BA1050
EPA 300.0	SULFATE	25.0	23.9	24.0	95.6	96.0	0.42	20	90-110	04/30/20	04/30/20	04/30/20	04/30/20	#300W-200430A1-BA1050

Comments:

EPA 353.2

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/01/20

Matrix: WATER Instrument: EVE

Blank ID: 200501A-BLK Time Analyzed: 1128

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501A-BLK	Blank	12	05/01/20 1128
200501A-LCS	Lab Control Spike	13	05/01/20 1130
200501A-LCSD	Lab Control SpikeD	14	05/01/20 1132
BA10504	ERH1080	19	05/01/20 1148

Comments: Batch: #35OF-200501A

SM 2320B

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Tiamo
Blank ID:	200504A-BLK	Time Analyzed:	1651

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	1	05/04/20 1651
BA10504	ERH1080	7	05/04/20 1805
200504A-LCS	Lab Control Spike	8	05/04/20 1949
200504A-LCSD	Lab Control SpikeD	9	05/04/20 2000

Comments: Batch: #232W-200504A

SM3500FeB

Form 4

Blank Summary

Lab Name: APPL, Inc. SDG No: 92039

Case No: 92039 Date Analyzed: 05/01/20

Matrix: WATER Instrument: Manual Spec

Blank ID: A200501-BLK Time Analyzed: 2031

APPL ID.	Client Sample No.	File ID.	Date Analyzed
A200501-BLK	Blank	24	05/01/20 2031
A200501-LCS	Lab Control Spike	25	05/01/20 2032
A200501-LCSD	Lab Control SpikeD	26	05/01/20 2033
BA10504	ERH1080	28	05/01/20 2036
A200501-MS	Matrix Spike	29	05/01/20 2037
A200501-MSD	Matrix SpikeD	30	05/01/20 2038

Comments: Batch: #35FE-A200501

SW846 9060A

Form 4

Blank Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	TICTOC
Blank ID:	200501A-BLK	Time Analyzed:	1846

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501A-LCS	Lab Control Spike	28	05/01/20 1807
200501A-BLK	Blank	29	05/01/20 1846
BA10504	ERH1080	31	05/01/20 2003
200501A-LCSD	Lab Control SpikeD	36	05/02/20 0101

Comments: Batch: #TOCW5-200501A

WETLAB BLANK

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Analyte	Result	LOQ	LOD	DL	Units	Prep Date	Analysis Date	QC Group
SM 2320B	BICARBONATE AS	3.5	2.0	1.70	0.85	mg/L	05/04/20	05/04/20	#232W-200504A-BA10439
SM 2320B	CARBONATE AS C	1.70 U	2.0	1.70	0.85	mg/L	05/04/20	05/04/20	#232W-200504A-BA10439
SM 2320B	TOTAL ALKALINITY	3.5	2.0	1.70	0.85	mg/L	05/04/20	05/04/20	#232W-200504A-BA10439
SM3500Fe	FERROUS IRON	0.32 U	1.0	0.32	0.16	mg/L	05/01/20	05/01/20	#35FE-A200501-BA10504
EPA 353.2	NITRATE-NITRITE-	0.090 U	0.10	0.090	0.028	mg/L	05/01/20	05/01/20	#35OF-200501A-BA10439
SW846 90	TOTAL ORGANIC C	0.350 U	0.93	0.350	0.130	mg/L	05/01/20	05/01/20	#TOCW5-200501A-BA10439

Wetlab SC-Blank-REG MDLs
Printed: 05/06/20 2:28:43 PM

EPA 353.2

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	EVE
LCS ID:	200501A-LCS	Time Analyzed:	1130

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501A-BLK	Blank	12	05/01/20 1128
200501A-LCS	Lab Control Spike	13	05/01/20 1130
200501A-LCSD	Lab Control SpikeD	14	05/01/20 1132
BA10504	ERH1080	19	05/01/20 1148

Comments: Batch: #35OF-200501A

SM 2320B

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/04/20
Matrix:	WATER	Instrument:	Tiamo
LCS ID:	200504A-LCS	Time Analyzed:	1949

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200504A-BLK	Blank	1	05/04/20 1651
BA10504	ERH1080	7	05/04/20 1805
200504A-LCS	Lab Control Spike	8	05/04/20 1949
200504A-LCSD	Lab Control SpikeD	9	05/04/20 2000

Comments: Batch: #232W-200504A

SM3500FeB

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	Manual Spec
LCS ID:	A200501-LCS	Time Analyzed:	2032

APPL ID.	Client Sample No.	File ID.	Date Analyzed
A200501-BLK	Blank	24	05/01/20 2031
A200501-LCS	Lab Control Spike	25	05/01/20 2032
A200501-LCSD	Lab Control SpikeD	26	05/01/20 2033
BA10504	ERH1080	28	05/01/20 2036
A200501-MS	Matrix Spike	29	05/01/20 2037
A200501-MSD	Matrix SpikeD	30	05/01/20 2038

Comments: Batch: #35FE-A200501

SW846 9060A

Form 4

LCS Summary

Lab Name:	APPL, Inc.	SDG No:	92039
Case No:	92039	Date Analyzed:	05/01/20
Matrix:	WATER	Instrument:	TICTOC
LCS ID:	200501A-LCS	Time Analyzed:	1807

APPL ID.	Client Sample No.	File ID.	Date Analyzed
200501A-LCS	Lab Control Spike	28	05/01/20 1807
200501A-BLK	Blank	29	05/01/20 1846
BA10504	ERH1080	31	05/01/20 2003
200501A-LCSD	Lab Control SpikeD	36	05/02/20 0101

Comments: Batch: #TOCW5-200501A

Laboratory Control Spike Recoveries

WETLAB

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Lvl mg/L	SPK Res mg/L	DUP Res mg/L	SPK % Recov	DUP % Recov	RPD	RPD Max	QC Limits	Extract Date-Spk	Analysis Date-Spk	Extract Date-Dup	Analysis Date-Dup	QC Group
EPA 353.2	NITRATE-NITRITE-N	3.00	3.05	3.06	102	102	0.33	20	90-110	05/01/20	05/01/20	05/01/20	05/01/20	#35OF-200501A-BA10439
SM 2320B	BICARBONATE AS CACO3	250	251	251	100	100	0.0	20	90-110	05/04/20	05/04/20	05/04/20	05/04/20	#232W-200504A-BA10439
SM 2320B	TOTAL ALKALINITY AS CA	250	274	269	110	108	1.8	20	90-110	05/04/20	05/04/20	05/04/20	05/04/20	#232W-200504A-BA10439
SM3500Fe	FERROUS IRON	3.00	2.99	2.99	99.7	99.7	0.0	20	80-120	05/01/20	05/01/20	05/01/20	05/01/20	#35FE-A200501-BA10504
SW846 90	TOTAL ORGANIC CARBO	5.00	5.06	5.11	101	102	0.98	20	80-120	05/01/20	05/01/20	05/02/20	05/02/20	#TOCW5-200501A-BA104

Comments:

Matrix Spike Recoveries

WETLAB

APPL ID: **200501W-10504 MS - 252206**

Sample ID: BA10504

Client ID: ERH1080

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Method	Compound Name	Spike Lvl mg/L	Matrix Res mg/L	SPK Res mg/L	DUP Res mg/L	SPK % Recovery	DUP % Recovery	RPD	RPD Max	Recovery Limits	Extract Date-Spk	Analysis Date-Spk	Extract Date-Dup	Analysis Date-Dup	QC Group	QC Sample
SM3500Fe	FERROUS IRON	3.00	0.15	3.08	3.08	97.7	97.7	0.0	20	80-120	05/01/20	05/01/20	05/01/20	05/01/20	252206	BA10504

Comments:

ORGANICS
Calibration Data

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/27/20
Matrix: Water Instrument: Herbie

Initials: SS/

0415059.D 0415060.D 0415061.D 0415062.D 0415063.D 0415064 D

		Compound	1	2	3	4	5	6					Avg	%RSD	Type	r^2	Q
1	TM	EDB	960275	899850	834866	818853	759309	771204					840726	9.2	TM		
2	TML	1,2,3-TCP	36375	207265	198548	185496	180463	175607					163959	39	TM	0.998	
3	S	1,3-DIBROMOPROPANE(S)	1001975	930625	841584	804786	752701	747788					846576	12	S		
4	TM	DBCP	2735975	2487160	2481396	2394301	2258606	2342415					2449976	6.7	TM		
5		Signal #2											0	0			
6																	
7																	
8																	
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11																	
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35																	

1.905049

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/27/20
Matrix: Water Instrument: Herbie Initials:

0415059.D 0415060.D 0415061.D 0415062.D 0415063.D 0415064.D

		Compound	1	2	3	4	5	6					Avg	%RSD	Type	r^2	Q
36	TM	EDB #2	4763350	4508730	4218204	4123172	3900906	3977083					4248574	7.8	TM		
37	TM	1,2,3-TCP #2	859850	815650	773492	736561	669808	675536					755149	10	TM		
38	S	1,3-DIBROMOPROPANE(S) #2	3477100	3310950	3153720	3001657	2704575	2810090					3076349	9.6	S		
39	TM	DBCP #2	11314550	11290080	11290178	11781011	11322228	11874927					11478829	2.4	TM		
40																	
41																	
42																	
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70																	

0.851729

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415059.D\ECD1A.CH Vial: 59
Signal #2 : G:\HERBIE\DATA\200415\0415059.D\ECD2B.CH
Acq On : 04-27-20 13:33:12 Operator: SS
Sample : 8011-1 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	40079	139084	0.024	0.023
	Spiked Amount 0.350			Recovery =		6.86%	6.57%
	Target Compounds						
1) TM	EDB	5.76	7.21	38411	190534	0.023	0.022
2) TM	1,2,3-TCP	9.23	10.44	1455	34394	N.D.	0.023
4) TM	DBCP	13.34	14.08	109439	452582	0.022	0.020

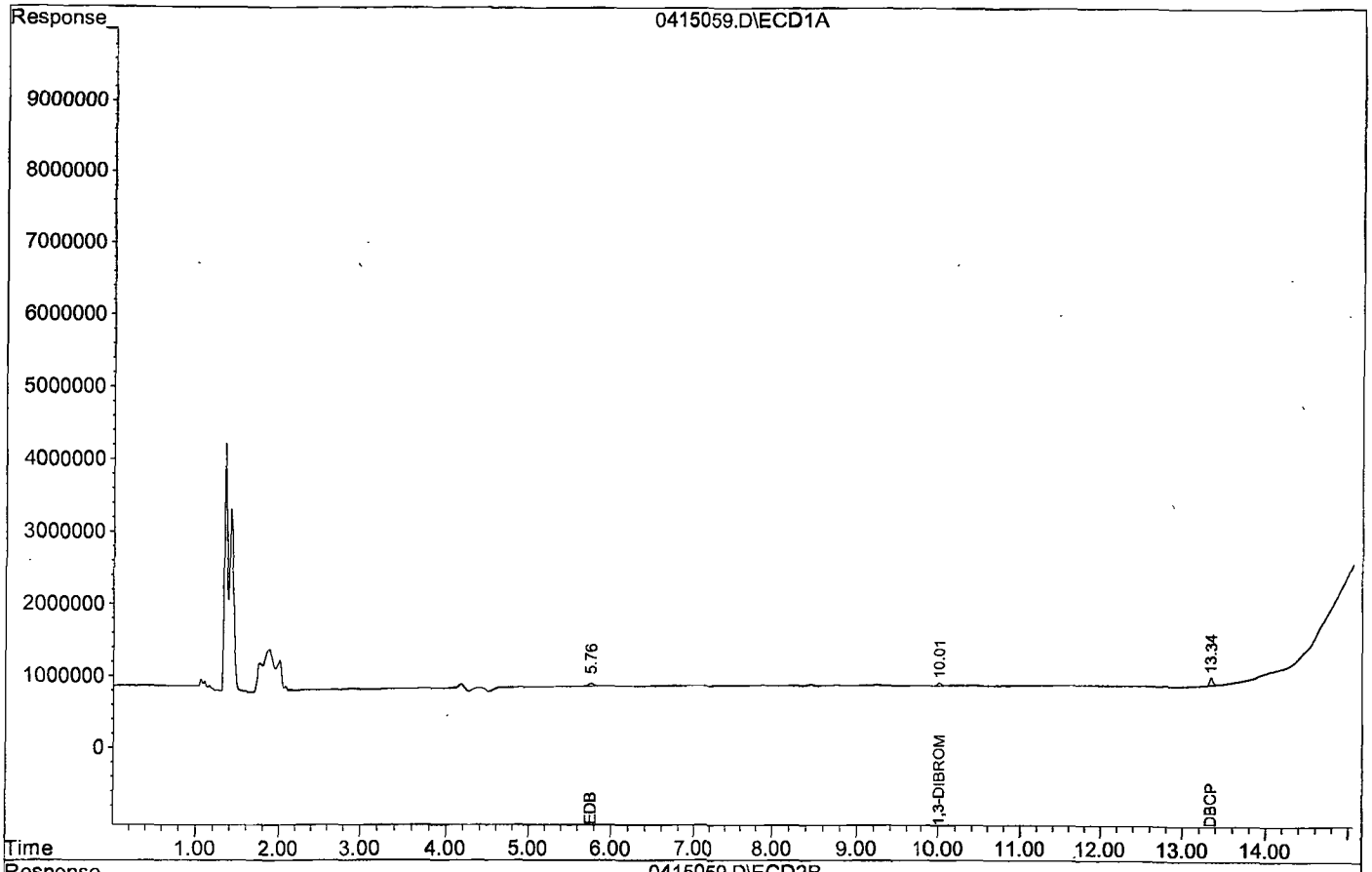
Target Compounds

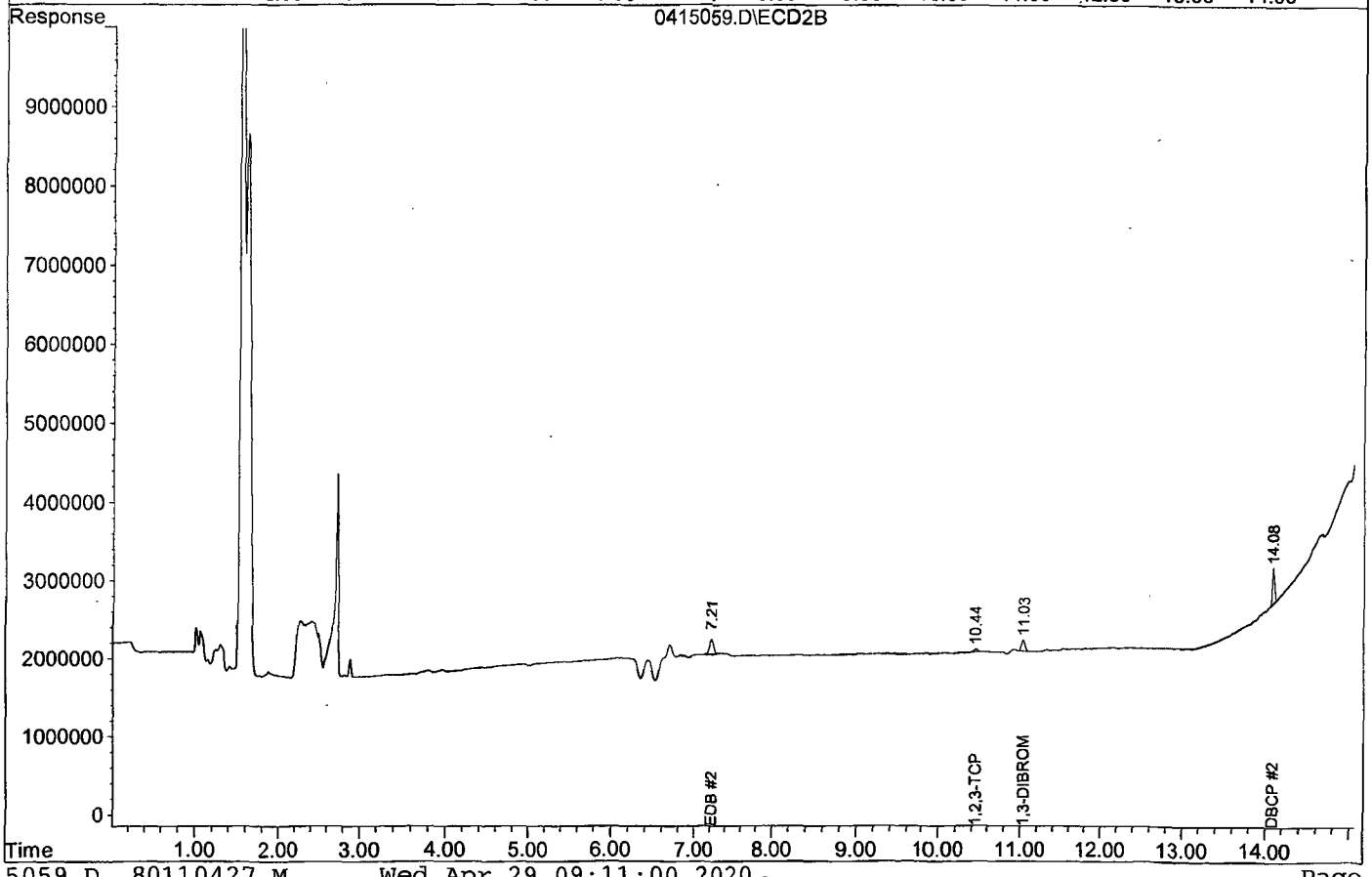
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415059.D
Acq On : 04-27-20 13:33:12
Sample : 8011-1 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 59
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415060.D\ECD1A.CH Vial: 60
Signal #2 : G:\HERBIE\DATA\200415\0415060.D\ECD2B.CH
Acq On : 04-27-20 13:53:33 Operator: SS
Sample : 8011-2 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	186125	662190	0.110	0.108
Spiked Amount	0.350			Recovery	=	31.43%	30.86%
	Target Compounds						
1) TM	EDB	5.76	7.22	179970	901746	0.107	0.106
2) TM	1,2,3-TCP	9.24	10.44	41453	163130	0.105	0.108
4) TM	DBCP	13.34	14.08	497432	2258016	0.102	0.098

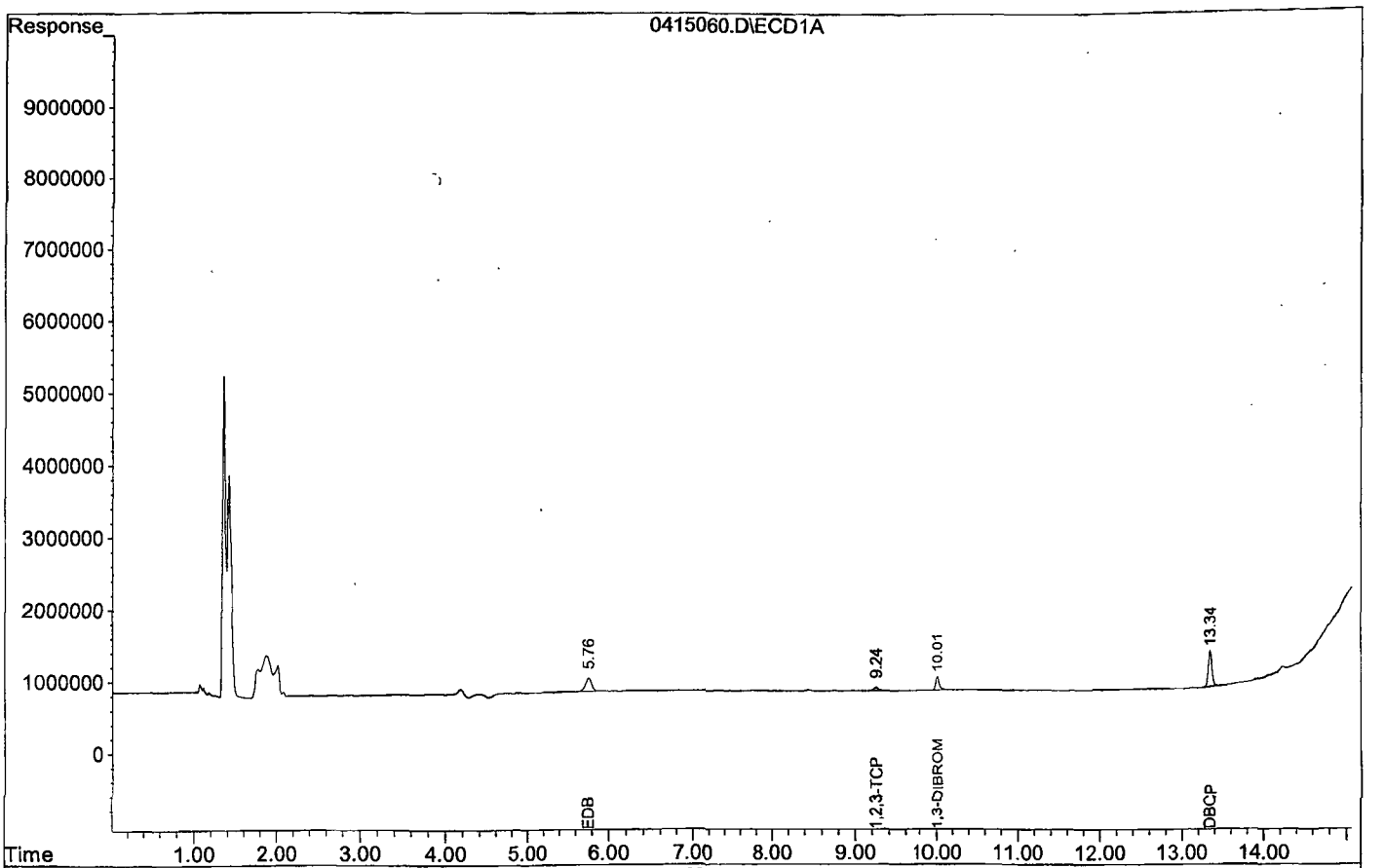
Target Compounds

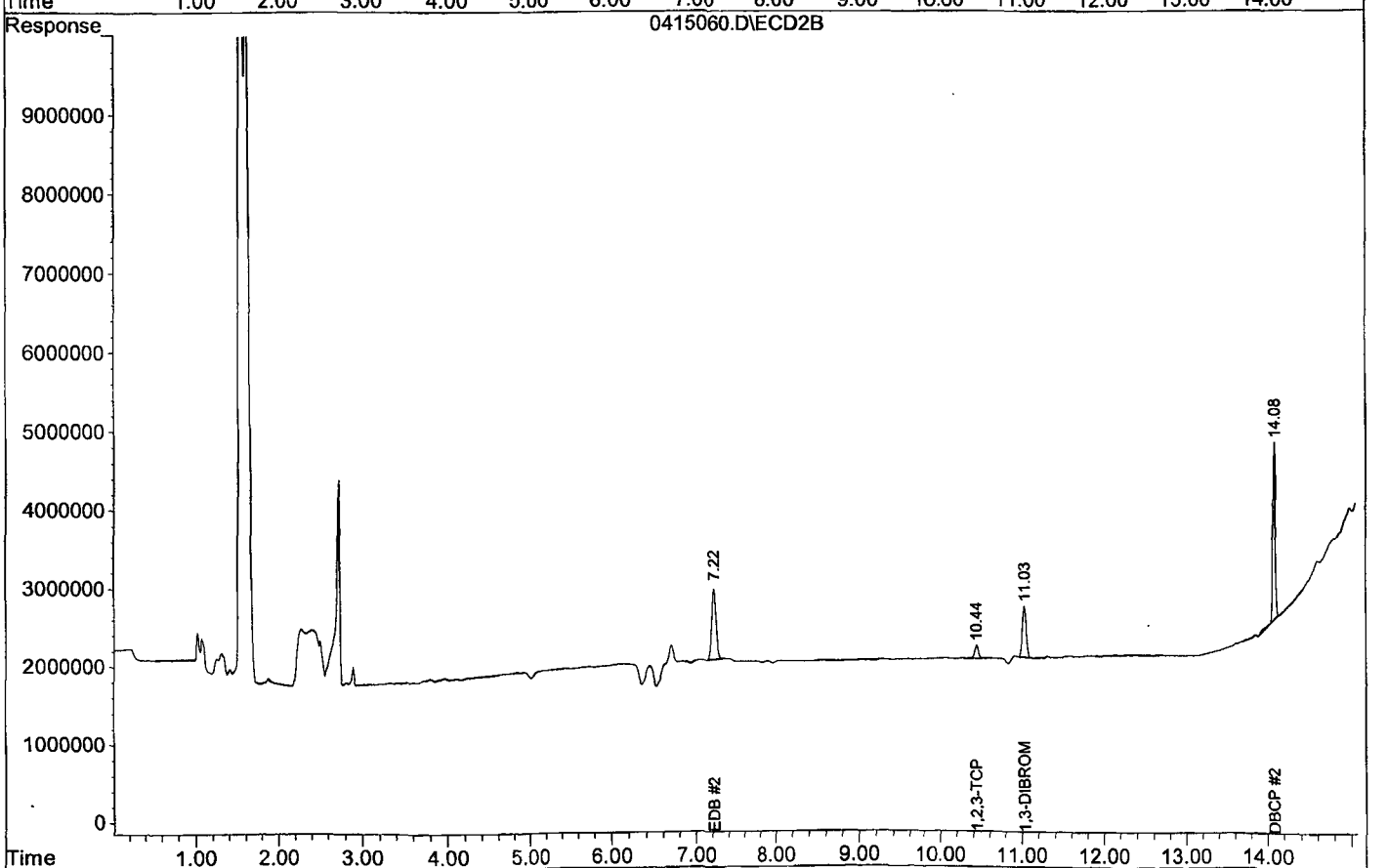
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415060.D
Acq On : 04-27-20 13:53:33
Sample : 8011-2 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 60
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415061.D\ECD1A.CH Vial: 61
Signal #2 : G:\HERBIE\DATA\200415\0415061.D\ECD2B.CH
Acq On : 04-27-20 14:14:01 Operator: SS
Sample : 8011-3 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3)	S 1,3-DIBROMOPROPA	10.01	11.03	420792	1576860	0.249	0.256
	Spiked Amount 0.350			Recovery =		71.14%	73.14%
	Target Compounds						
1)	TM EDB	5.76	7.22	417433	2109102	0.248	0.248
2)	TM 1,2,3-TCP	9.24	10.45	99274	386746	0.269	0.256
4)	TM DBCP	13.34	14.08	1240698	5645089	0.253	0.246

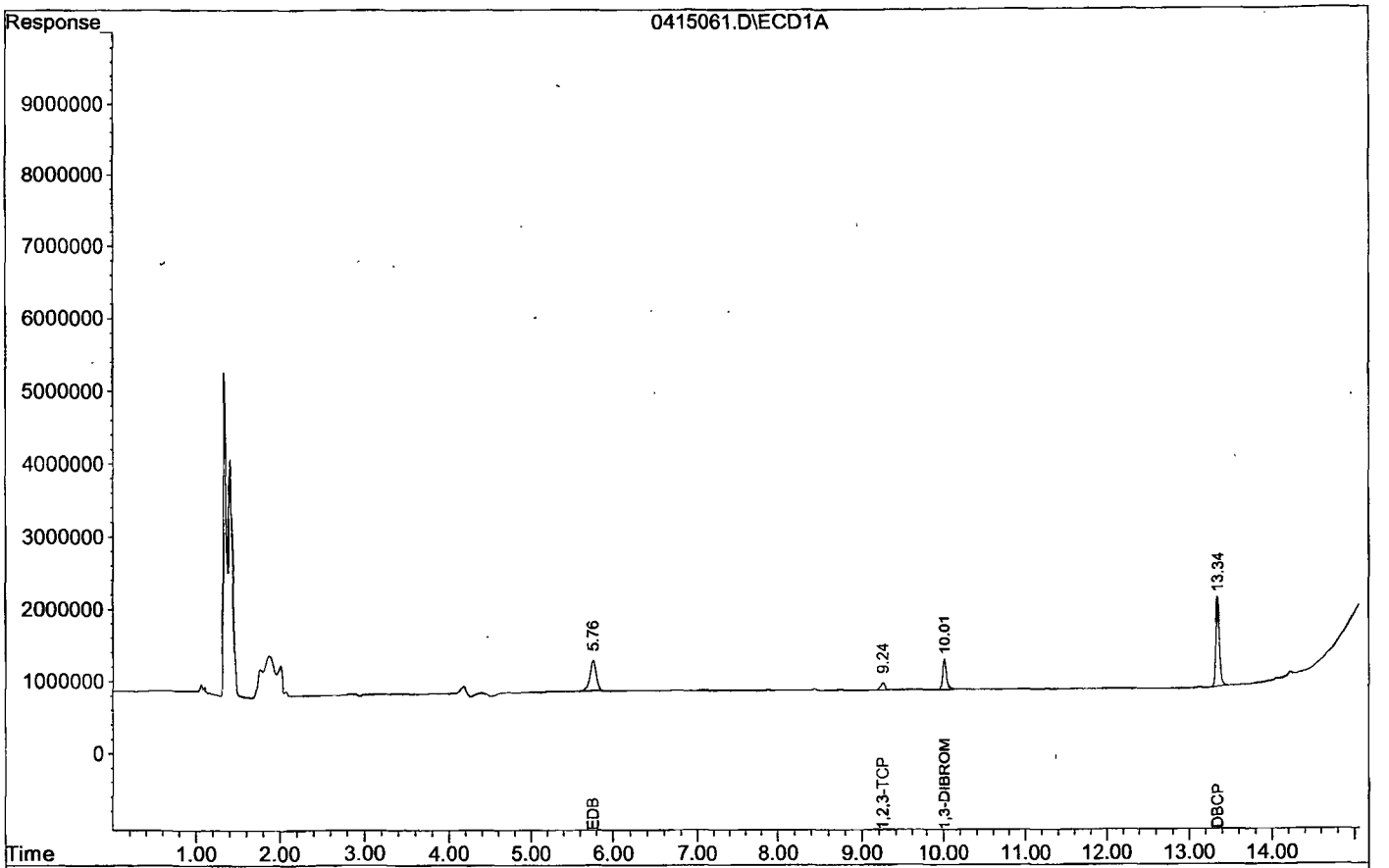
Target Compounds

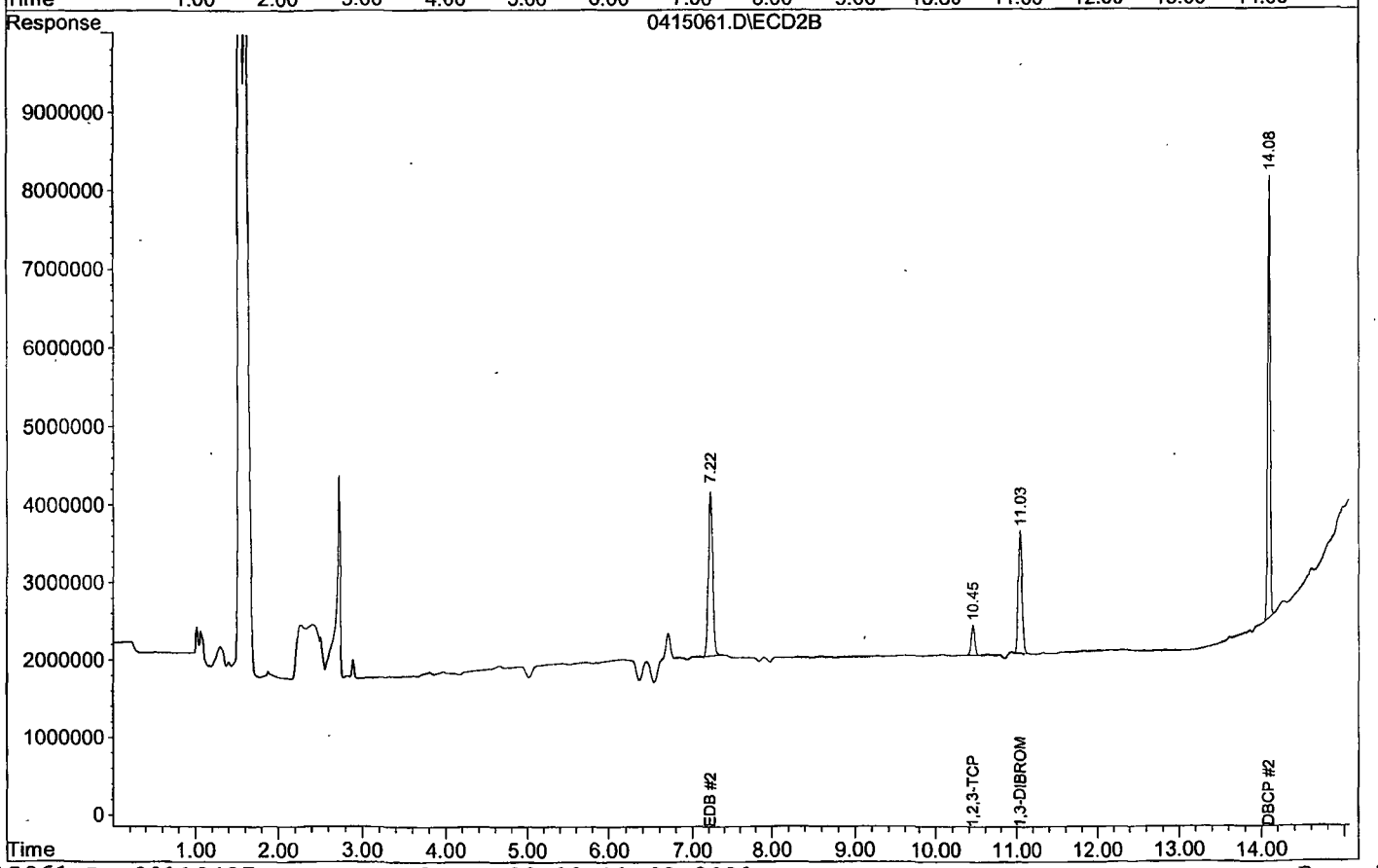
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415061.D
Acq On : 04-27-20 14:14:01
Sample : 8011-3 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 61
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415062.D\ECD1A.CH Vial: 62
Signal #2 : G:\HERBIE\DATA\200415\0415062.D\ECD2B.CH
Acq On : 04-27-20 14:34:31 Operator: SS
Sample : 8011-4 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
System Monitoring Compounds						
3) S 1,3-DIBROMOPROPA	10.01	11.03	804786	3001657	0.475	0.488
Spiked Amount 0.350			Recovery	=	135.71%	139.43%
Target Compounds						
1) TM EDB	5.76	7.22	818853	4123172	0.487	0.485
2) TM 1,2,3-TCP	9.24	10.45	185496	736561	0.514	0.488
4) TM DBCP	13.34	14.08	2394301	11781011	0.489	0.513

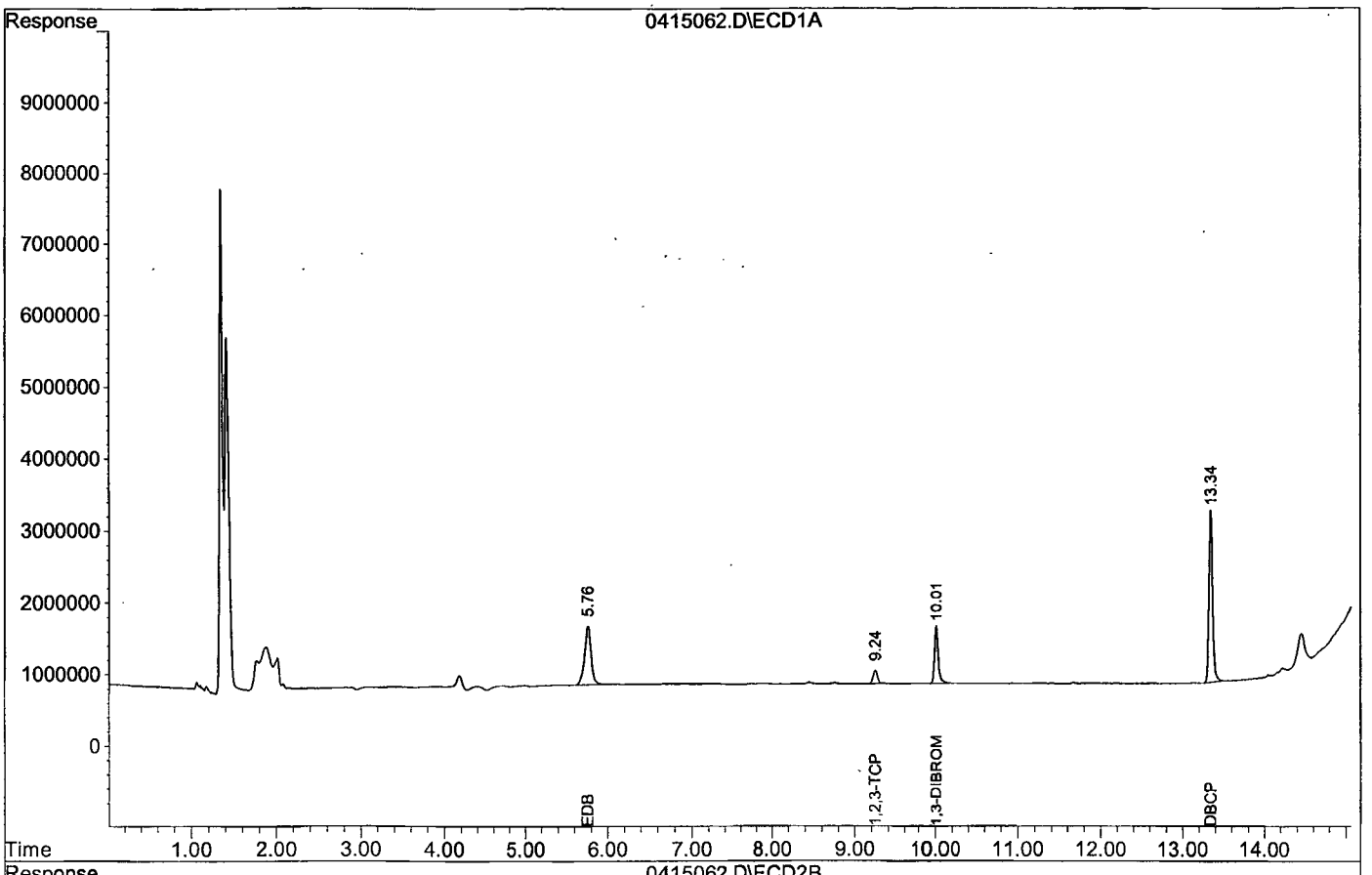
Target Compounds

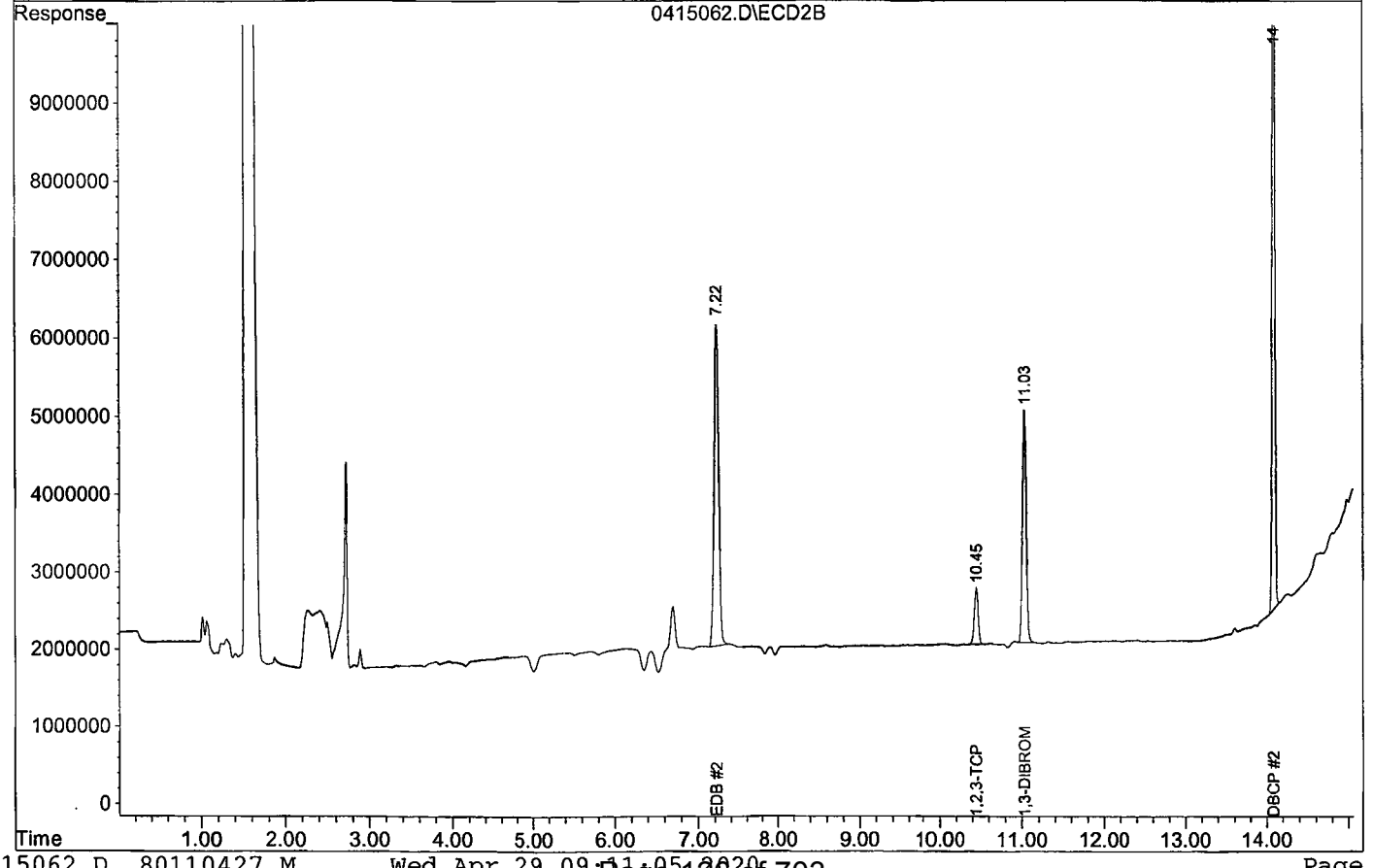
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415062.D
Acq On : 04-27-20 14:34:31
Sample : 8011-4 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 62
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415063.D\ECD1A.CH Vial: 63
Signal #2 : G:\HERBIE\DATA\200415\0415063.D\ECD2B.CH
Acq On : 04-27-20 14:54:56 Operator: SS
Sample : 8011-5 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3)	S 1,3-DIBROMOPROPA	10.01	11.03	1129051	4056863	0.667	0.659
	Spiked Amount 0.350			Recovery	=	190.57%	188.29%
	Target Compounds						
1)	TM EDB	5.76	7.22	1138964	5851359	0.677	0.689
2)	TM 1,2,3-TCP	9.24	10.44	270694	1004712	0.756	0.665
4)	TM DBCP	13.34	14.08	3387909	16983342	0.691	0.740

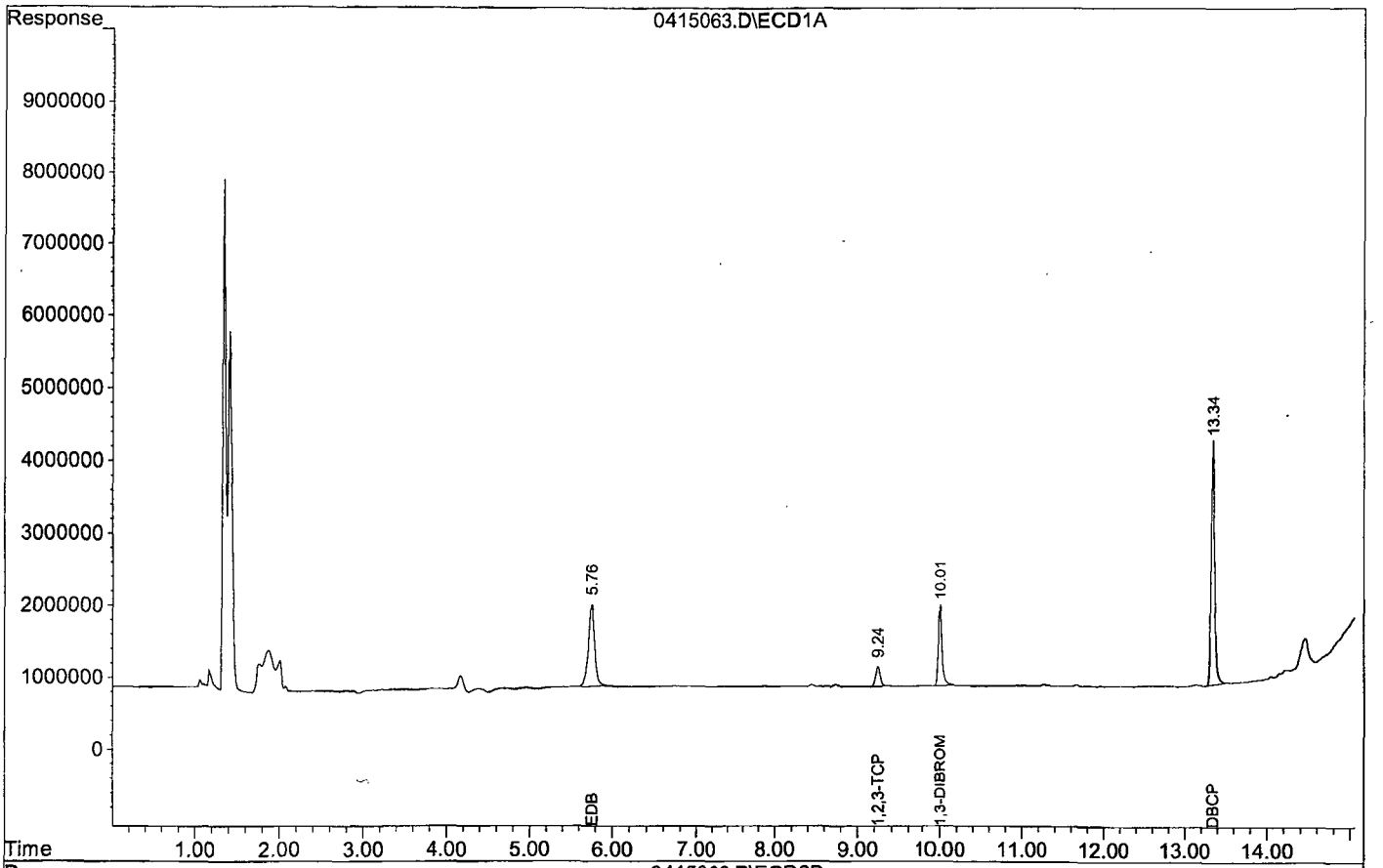
Target Compounds

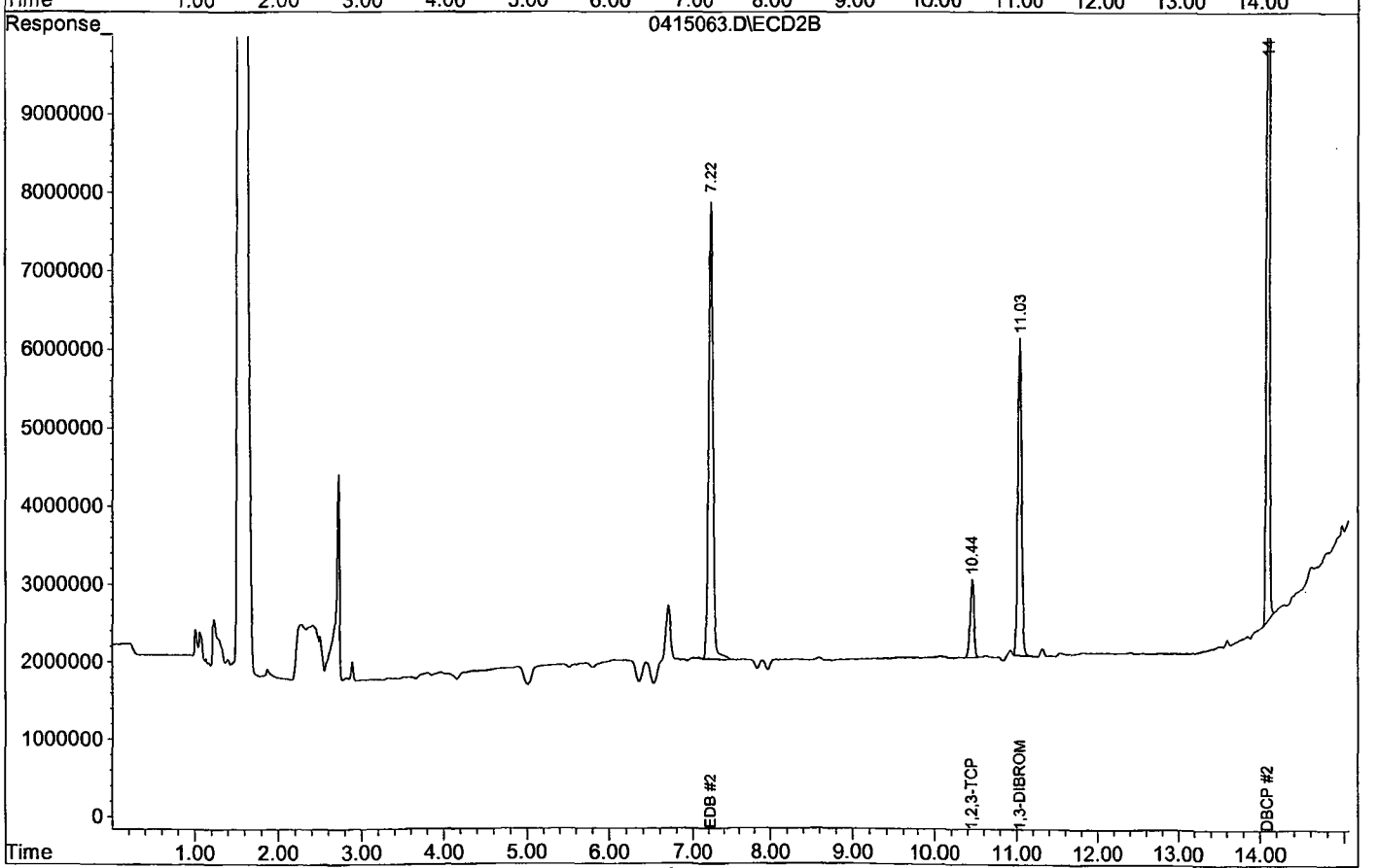
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415063.D
Acq On : 04-27-20 14:54:56
Sample : 8011-5 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 63
Operator: SS
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415064.D\ECD1A.CH Vial: 64
Signal #2 : G:\HERBIE\DATA\200415\0415064.D\ECD2B.CH
Acq On : 04-27-20 15:15:22 Operator: SS
Sample : 8011-6 4/27/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 29 9:09 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	1495575	5620180	0.883	0.913
	Spiked Amount 0.350			Recovery	=	252.29%	260.86%
	Target Compounds						
1) TM	EDB	5.76	7.22	1542407	7954165	0.917	0.936
2) TM	1,2,3-TCP	9.24	10.44	351213	1351071	0.984	0.895
4) TM	DBCP	13.34	14.08	4684830	23749854	0.956	1.035

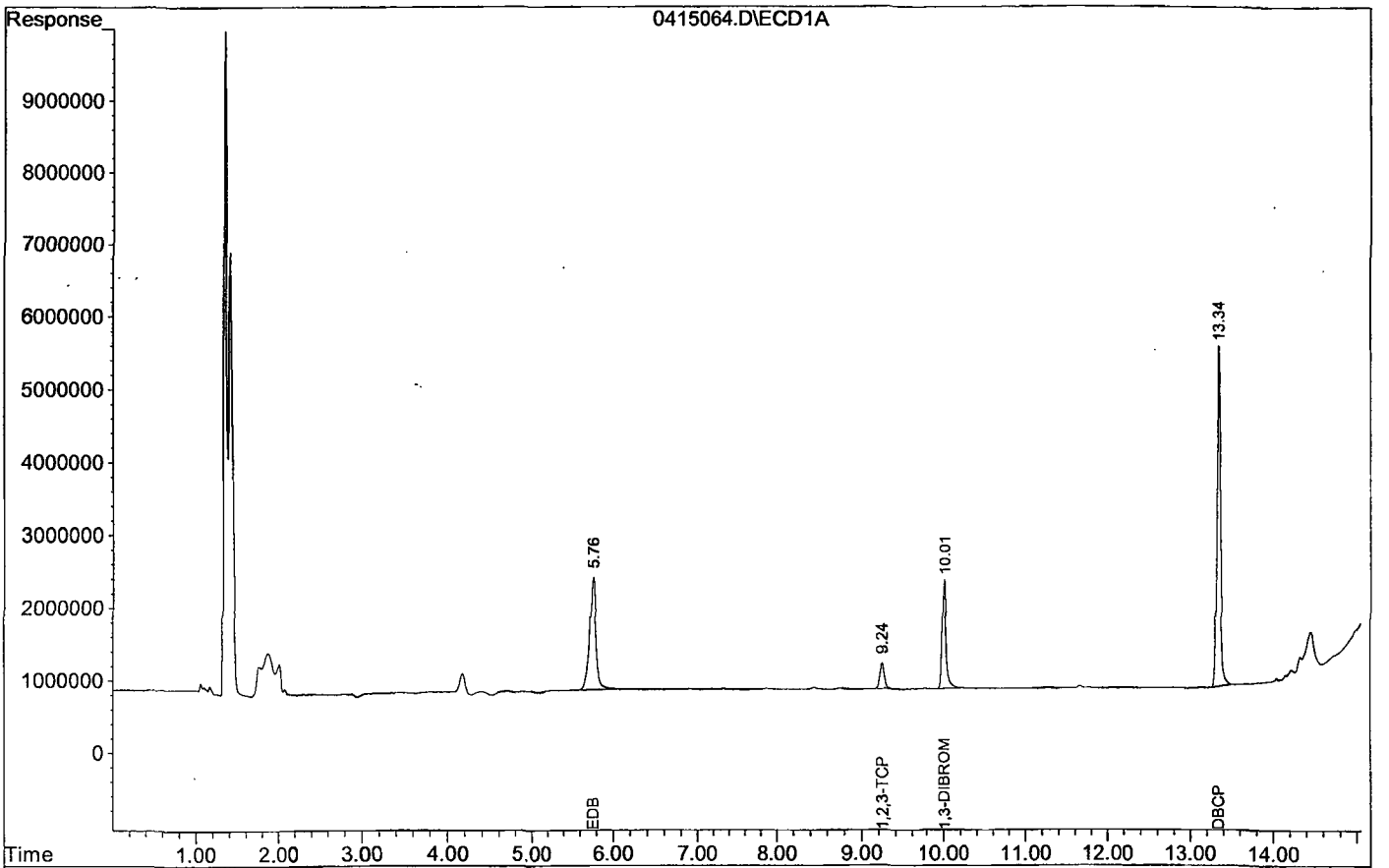
Target Compounds

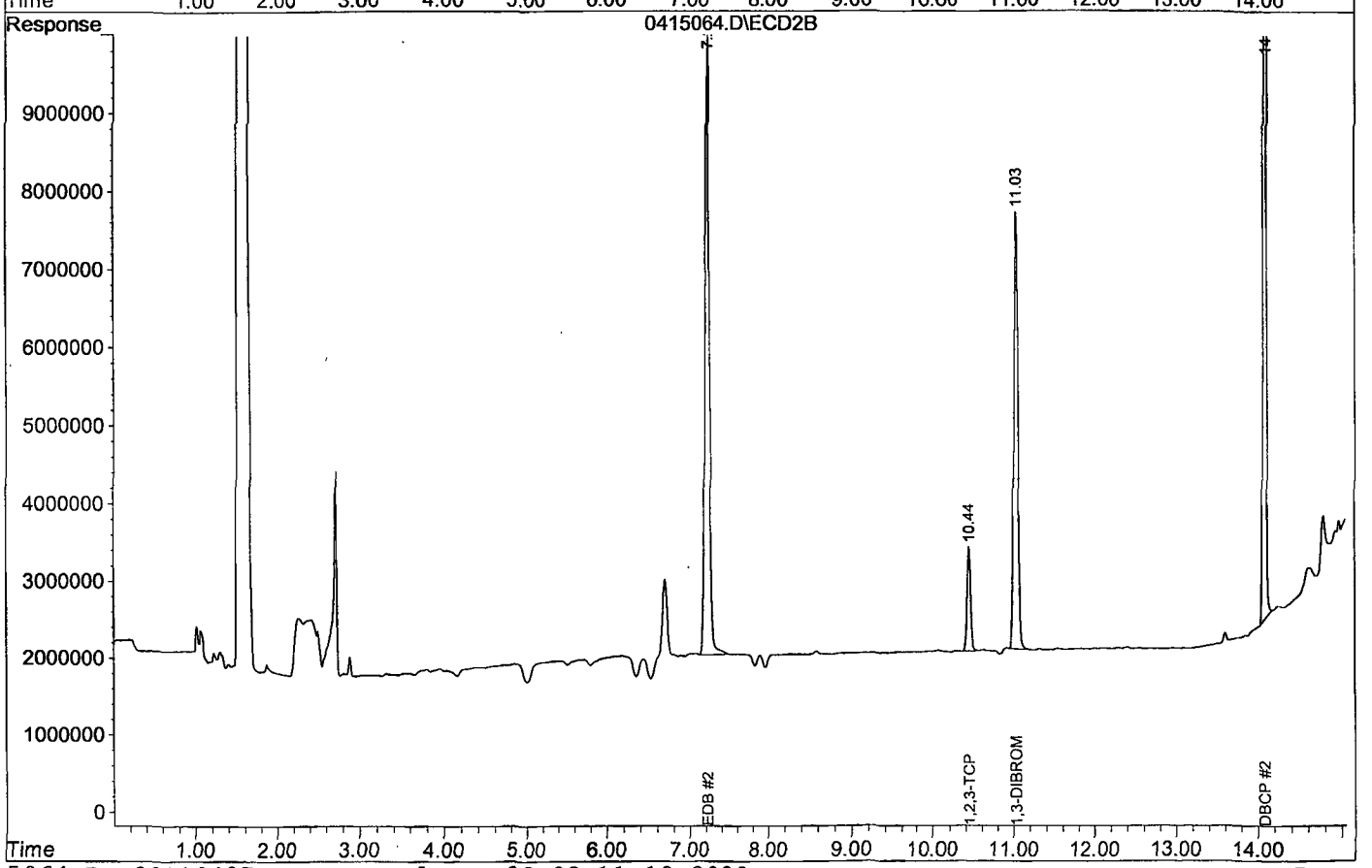
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415064.D
Acq On : 04-27-20 15:15:22
Sample : 8011-6 4/27/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 64
Operator: SS
Inst : Herbie
Multiplr: 1.00





DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 04/28/20
Instrument: Herbie
Initial Cal. Date: 04/27/20
Data File: 0415089.D

		Compound	MEAN	CCRF	%D	%Drift		
1	TM	EDB	840726	993645	18	TM		
2	TML	1,2,3-TCP	163959	248460	52	TML	29	*nt
3	TM	DBCP	2449980	3127230	28	TM		*nt
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
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36								
37								
38								
39								
40								
		Average			32.7			

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 04/28/20
Instrument: Herbie
Cal. Date: 04/27/20
Data File: 0415089.D

		Compound	MEAN	CCRF	%D		%Drift	
41	TM	EDB	4248570	5068940	19	TM		
42	TM	1,2,3-TCP	755149	979365	30	TM		*nt
43	TM	DBCP	11478800	13030500	14	TM		
44								
45								
46								
47								
48								
49								
50								
51								
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80								
		Average			21.0			

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200415\0415089.D\ECD1A.CH Vial: 89
Signal #2 : G:\HERBIE\DATA\200415\0415089.D\ECD2B.CH
Acq On : 04-28-20 8:29:21 Operator: SS
Sample : 8011-SS Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: Apr 28 9:03 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L	
	System Monitoring Compounds							
3) S	1,3-DIBROMOPROPA	9.97	0.00	1257	0	0.001	N.D.	#
	Spiked Amount 0.350			Recovery	=	0.29%	0.00%	
	Target Compounds							
1) TM	EDB	5.76	7.22	198729	1013788	0.118	0.119	
2) TM	1,2,3-TCP	9.24	10.45	49692	195873	0.129	0.130	
4) TM	DBCP	13.34	14.08	625445	2606099	0.128	0.114	

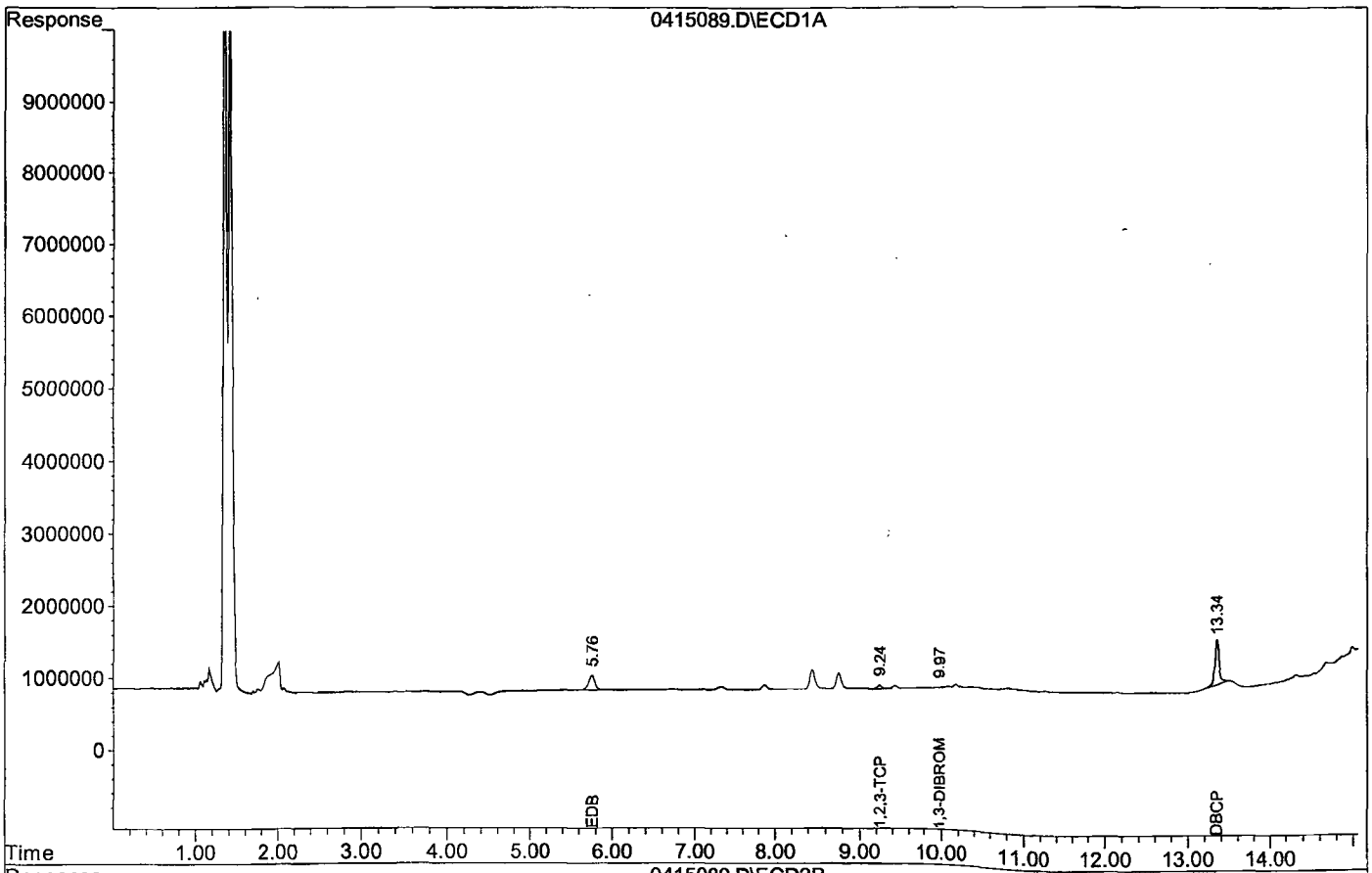
Target Compounds

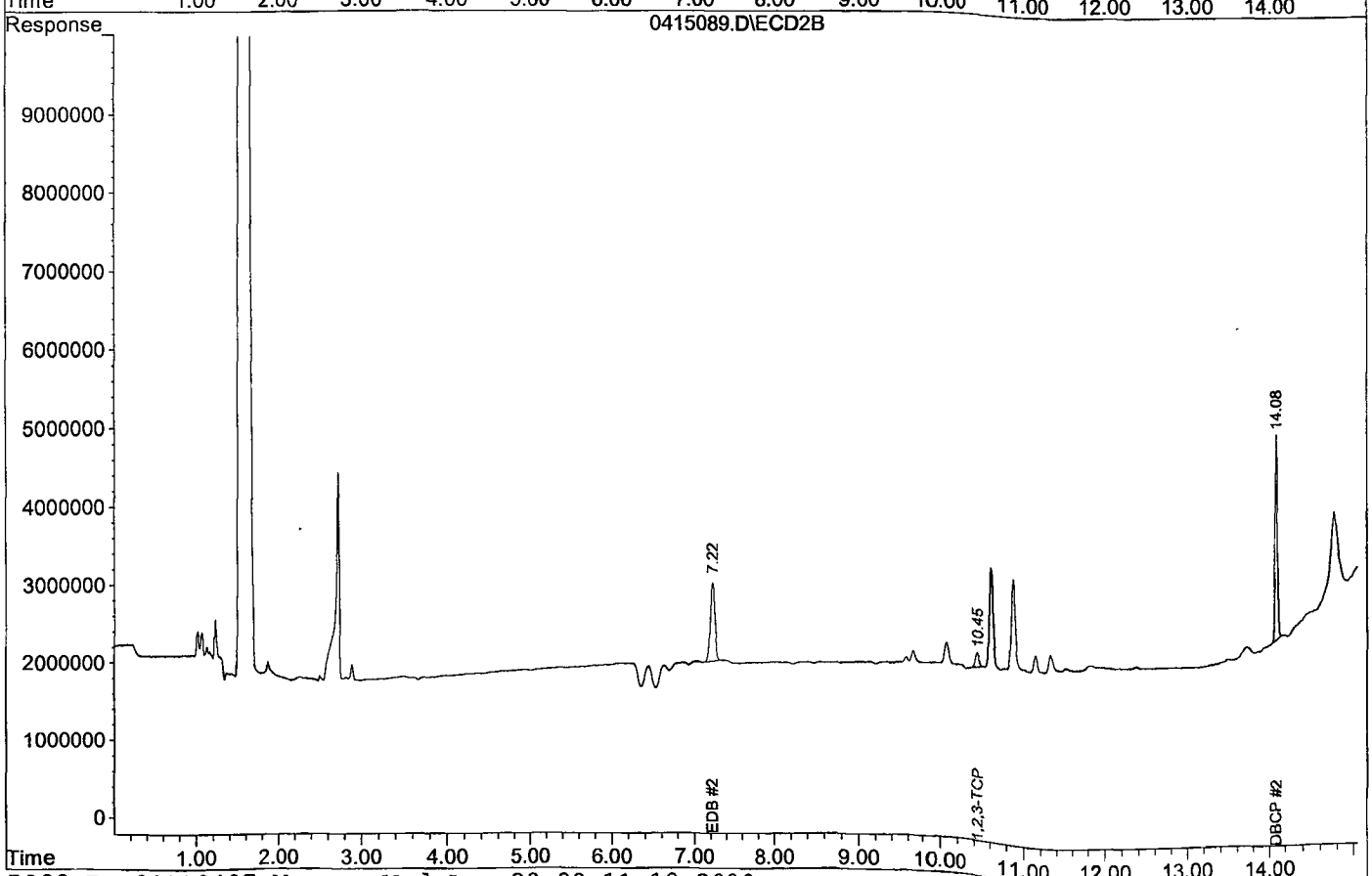
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200415\0415089.D
Acq On : 04-28-20 8:29:21
Sample : 8011-SS
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 89
Operator: SS
Inst : Herbie
Multiplr: 1.00





DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Herbie
Initial Cal. Date: 04/27/20
Data File: 0430018.D

		Compound	MEAN	CCRF	%D		%Drift
1	TM	EDB	840726	823328	2.1	TM	
2	TML	1,2,3-TCP	163959	193770	18	TML	5.0
3	S	1,3-DIBROMOPROPANE(S)	846576	830958	1.8	S	
4	TM	DBCP	2449980	2415410	1.4	TM	
5							
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37							
38							
39							
40							
		Average			5.8		

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 05/04/20
Matrix: Water Instrument: Herbie
Cal. Date: 04/27/20
Data File: 0430018.D

		Compound	MEAN	CCRF	%D	%Drift	
41	TM	EDB	4248570	4162230	2.0	TM	
42	TM	1,2,3-TCP	755149	740052	2.0	TM	
43	S	1,3-DIBROMOPROPANE(S)	3076350	2989390	2.8	S	
44	TM	DBCP	11478800	10431100	9.1	TM	
45							
46							
47							
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80							
		Average			4.0		

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430018.D\ECD1A.CH Vial: 18
Signal #2 : G:\HERBIE\DATA\200430\0430018.D\ECD2B.CH
Acq On : 05-04-20 10:31:10 Operator: SS/LP
Sample : 8011-3 CCV 05/04/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:51 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200415\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	415479	1494694	0.245	0.243
Spiked Amount	0.350			Recovery	=	70.00%	69.43%
	Target Compounds						
1) TM	EDB	5.76	7.22	411664	2081116	0.245	0.245
2) TM	1,2,3-TCP	9.24	10.44	96885	370026	0.263	0.245
4) TM	DBCP	13.34	14.08	1207706	5215541	0.246	0.227

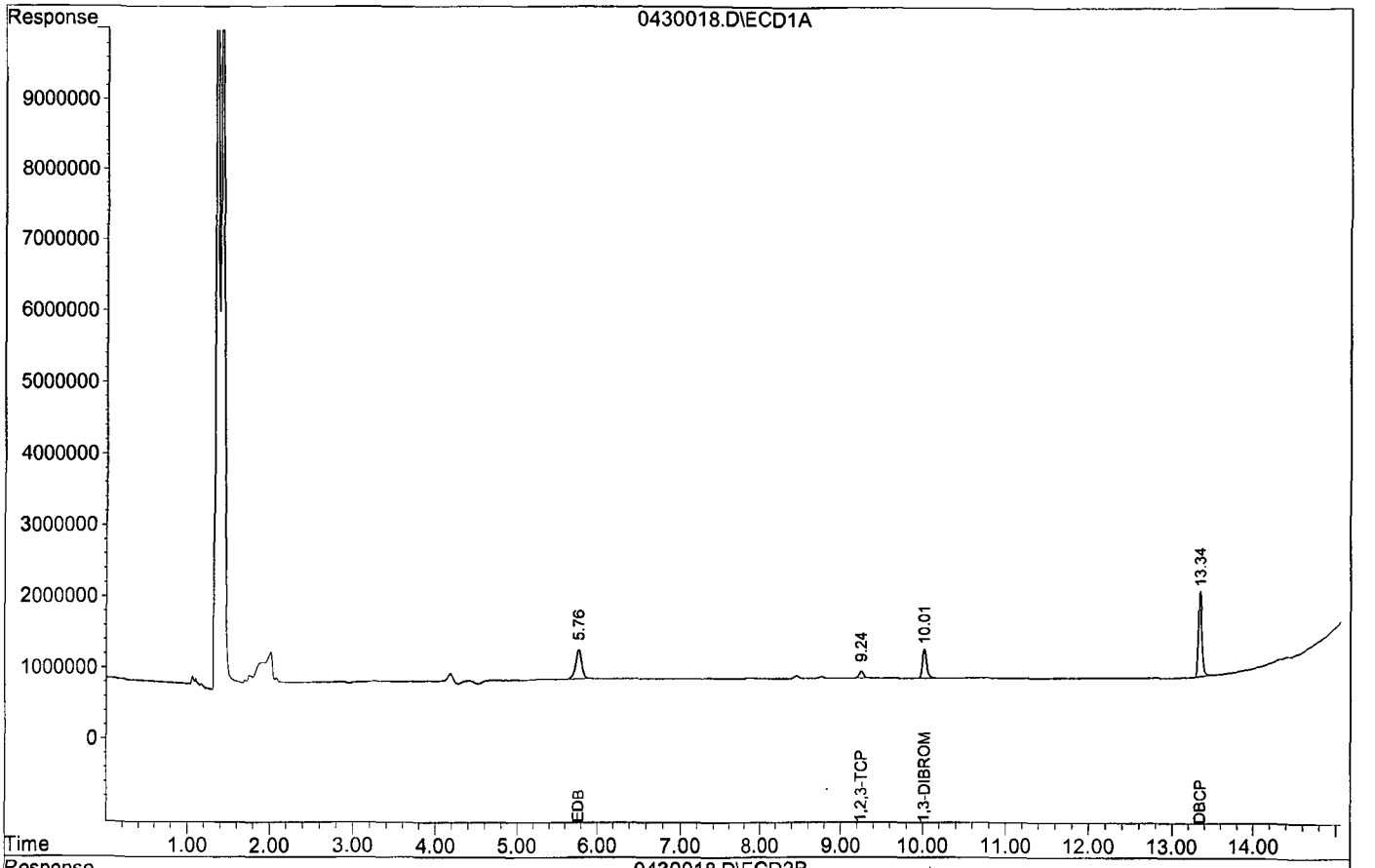
Target Compounds

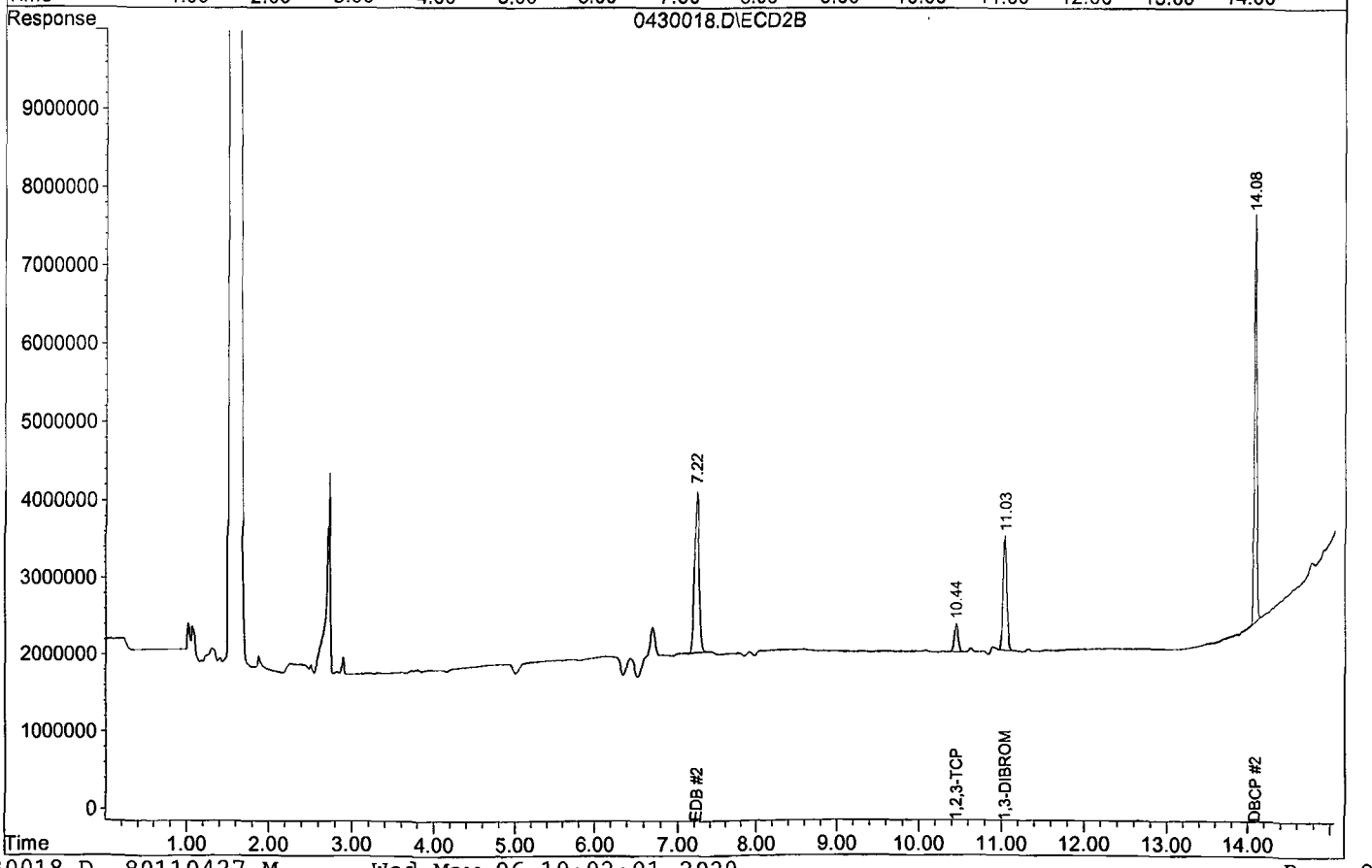
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430018.D
Acq On : 05-04-20 10:31:10
Sample : 8011-3 CCV 05/04/20
Misc : water
Quant Method : G:\HERBIE\DATA\200415\80110427.M

Vial: 18
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Herbie
Initial Cal. Date: 04/27/20
Data File: 0430027.D

		Compound	MEAN	CCRF	%D		%Drift
1	TM	EDB	840726	809166	3.8	TM	
2	TML	1,2,3-TCP	163959	188900	15	TML	2.3
3	S	1,3-DIBROMOPROPANE(S)	846576	832244	1.7	S	
4	TM	DBCP	2449980	2448980	0.04	TM	
5							
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39							
40							
		Average			5.1		

DBCP/EDB/1,2,3-TCP Analysis by
504 8011

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Herbie
Cal. Date: 04/27/20
Data File: 0430027.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	EDB	4248570	4036930	5.0	TM	
42	TM	1,2,3-TCP	755149	735746	2.6	TM	
43	S	1,3-DIBROMOPROPANE(S)	3076350	3057940	0.60	S	
44	TM	DBCP	11478800	11778300	2.6	TM	
45							
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80							
		Average			2.7		

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430027.D\ECD1A.CH Vial: 27
Signal #2 : G:\HERBIE\DATA\200430\0430027.D\ECD2B.CH
Acq On : 05-04-20 16:48:22 Operator: SS/LP
Sample : 8011-3 CCV 05/04/20 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:52 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	416122	1528971	0.246	0.249
Spiked Amount	0.350			Recovery	=	70.29%	71.14%
	Target Compounds						
1) TM	EDB	5.76	7.22	404583	2018465	0.241	0.238
2) TM	1,2,3-TCP	9.24	10.44	94450	367873	0.256	0.244
4) TM	DBCP	13.34	14.08	1224492	5889146	0.250	0.257

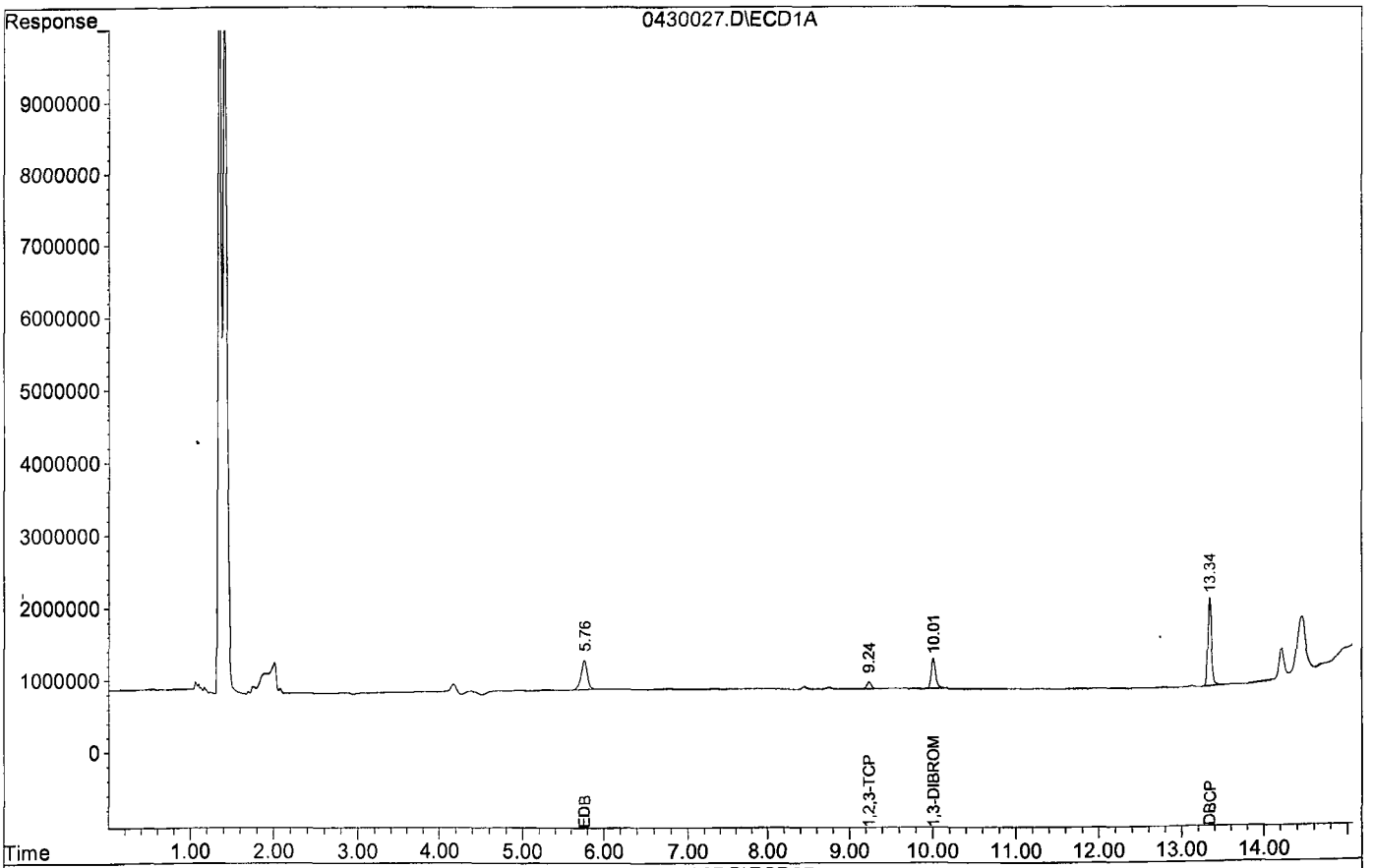
Target Compounds

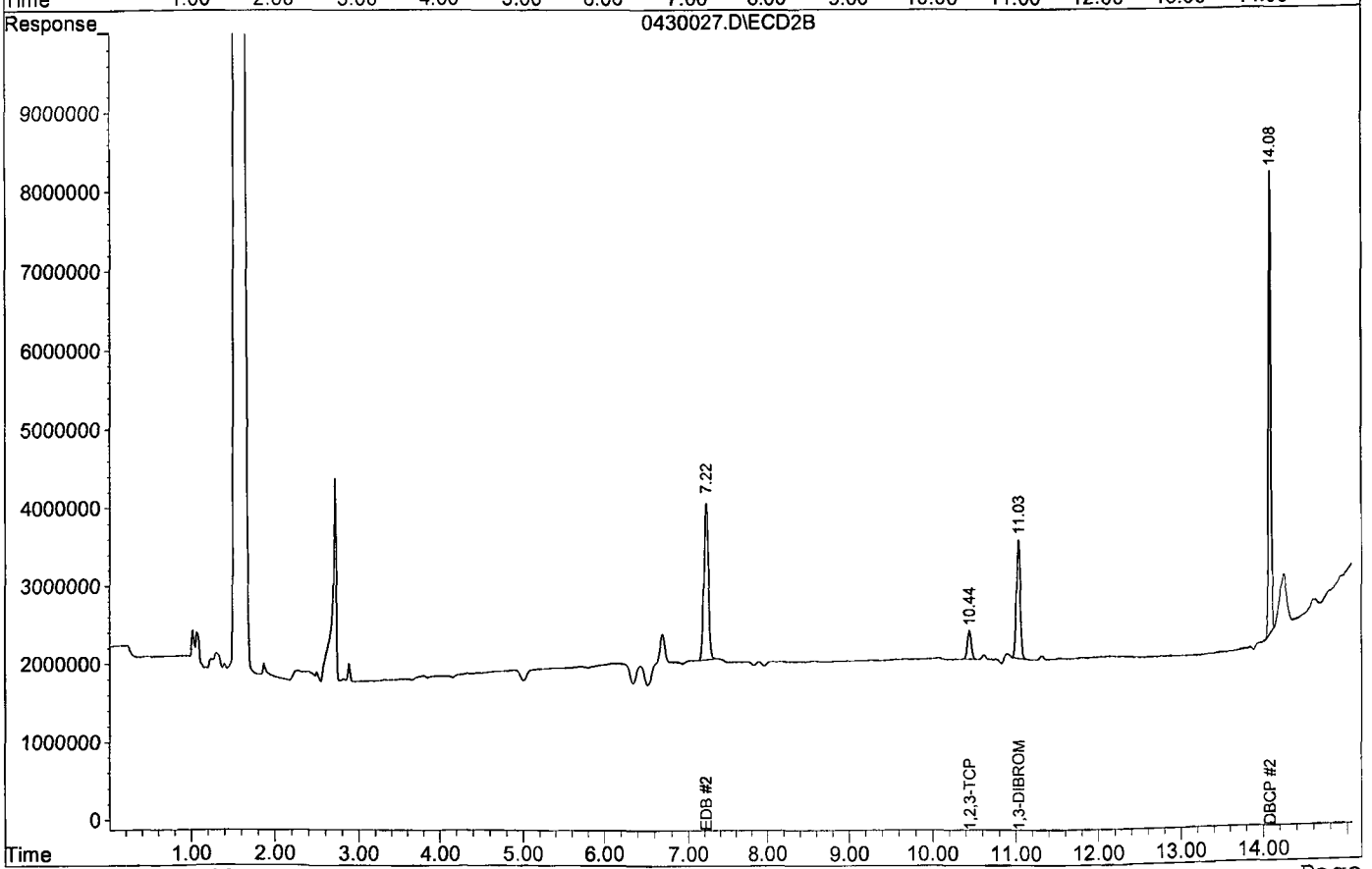
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430027.D
Acq On : 05-04-20 16:48:22
Sample : 8011-3 CCV 05/04/20
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 27
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430024.D\ECD1A.CH Vial: 24
Signal #2 : G:\HERBIE\DATA\200430\0430024.D\ECD2B.CH
Acq On : 05-04-20 15:46:59 Operator: SS/LP
Sample : BA10503W05 2/35.10 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:53 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

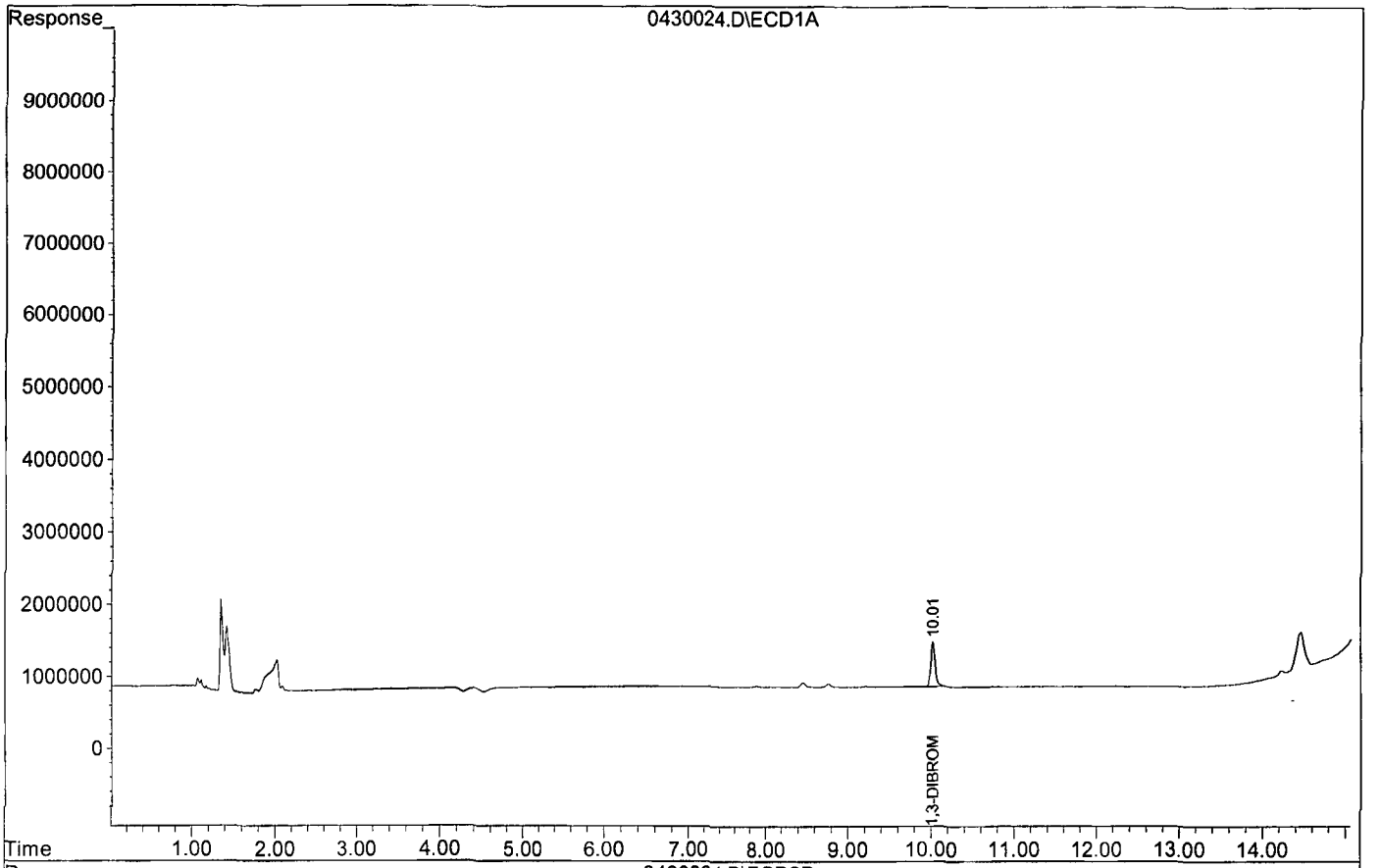
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	622058	2335672	0.367	0.380
Spiked Amount	0.350			Recovery	=	104.86%	108.57%
	Target Compounds						
	Target Compounds						
1) TM	EDB	0.00	0.00	0	0	N.D. d	N.D. d
2) TM	1,2,3-TCP	0.00	0.00	0	0	N.D. d	N.D. d
4) TM	DBCP	0.00	0.00	0	0	N.D. d	N.D. d

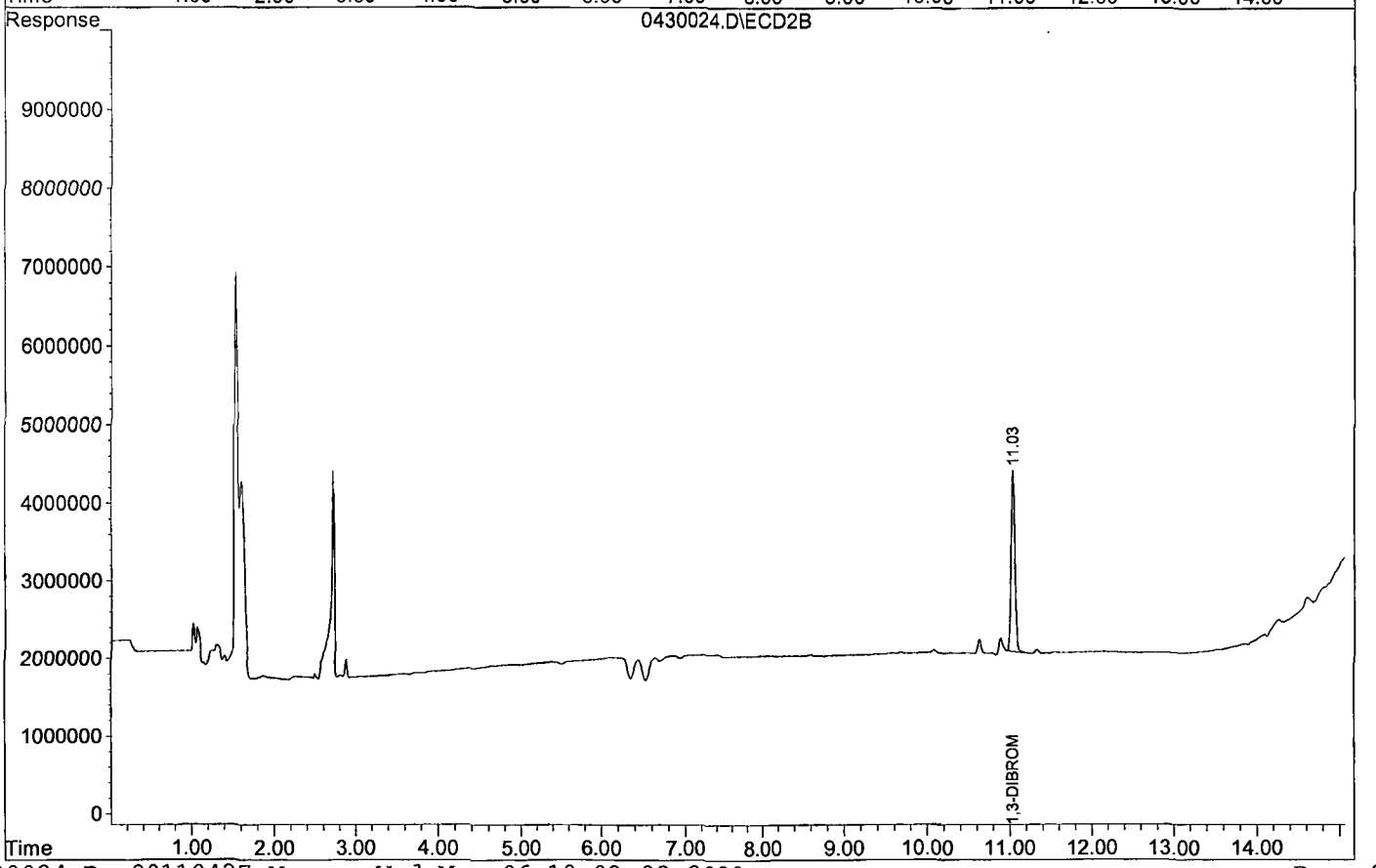
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430024.D
Acq On : 05-04-20 15:46:59
Sample : BA10503W05 2/35.10
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 24
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430025.D\ECD1A.CH Vial: 25
Signal #2 : G:\HERBIE\DATA\200430\0430025.D\ECD2B.CH
Acq On : 05-04-20 16:07:30 Operator: SS/LP
Sample : BA10504W06 2/35.37 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:53 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

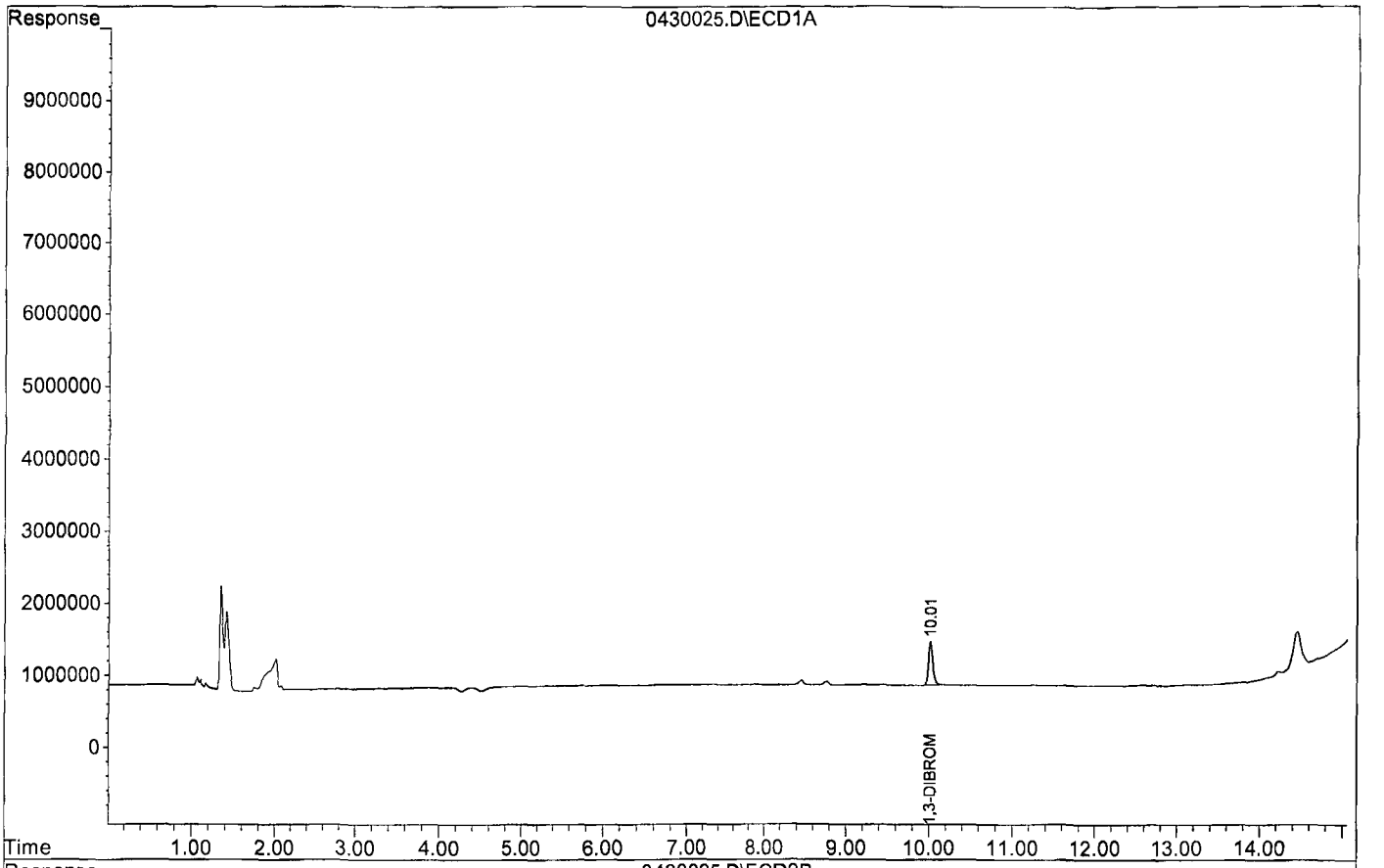
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	606291	2277887	0.358	0.370
Spiked Amount	0.350			Recovery	=	102.29%	105.71%
	Target Compounds						
	Target Compounds						
1) TM	EDB	0.00	0.00	0	0	N.D. d	N.D. d
2) TM	1,2,3-TCP	0.00	0.00	0	0	N.D. d	N.D. d
4) TM	DBCP	0.00	0.00	0	0	N.D. d	N.D. d

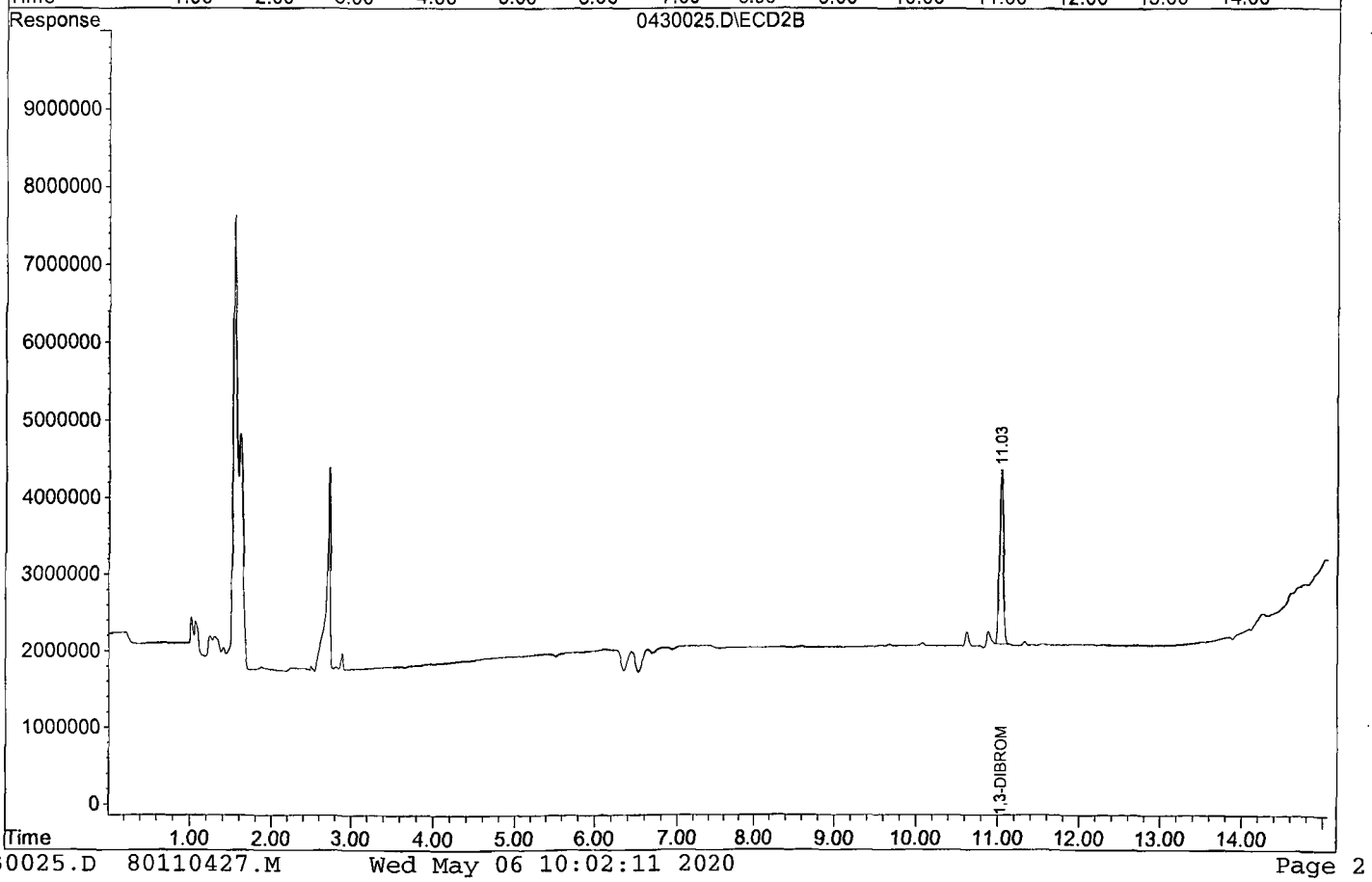
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430025.D
Acq On : 05-04-20 16:07:30
Sample : BA10504W06 2/35.37
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 25
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430026.D\ECD1A.CH Vial: 26
Signal #2 : G:\HERBIE\DATA\200430\0430026.D\ECD2B.CH
Acq On : 05-04-20 16:27:56 Operator: SS/LP
Sample : BA10505W06 2/35.32 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:53 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

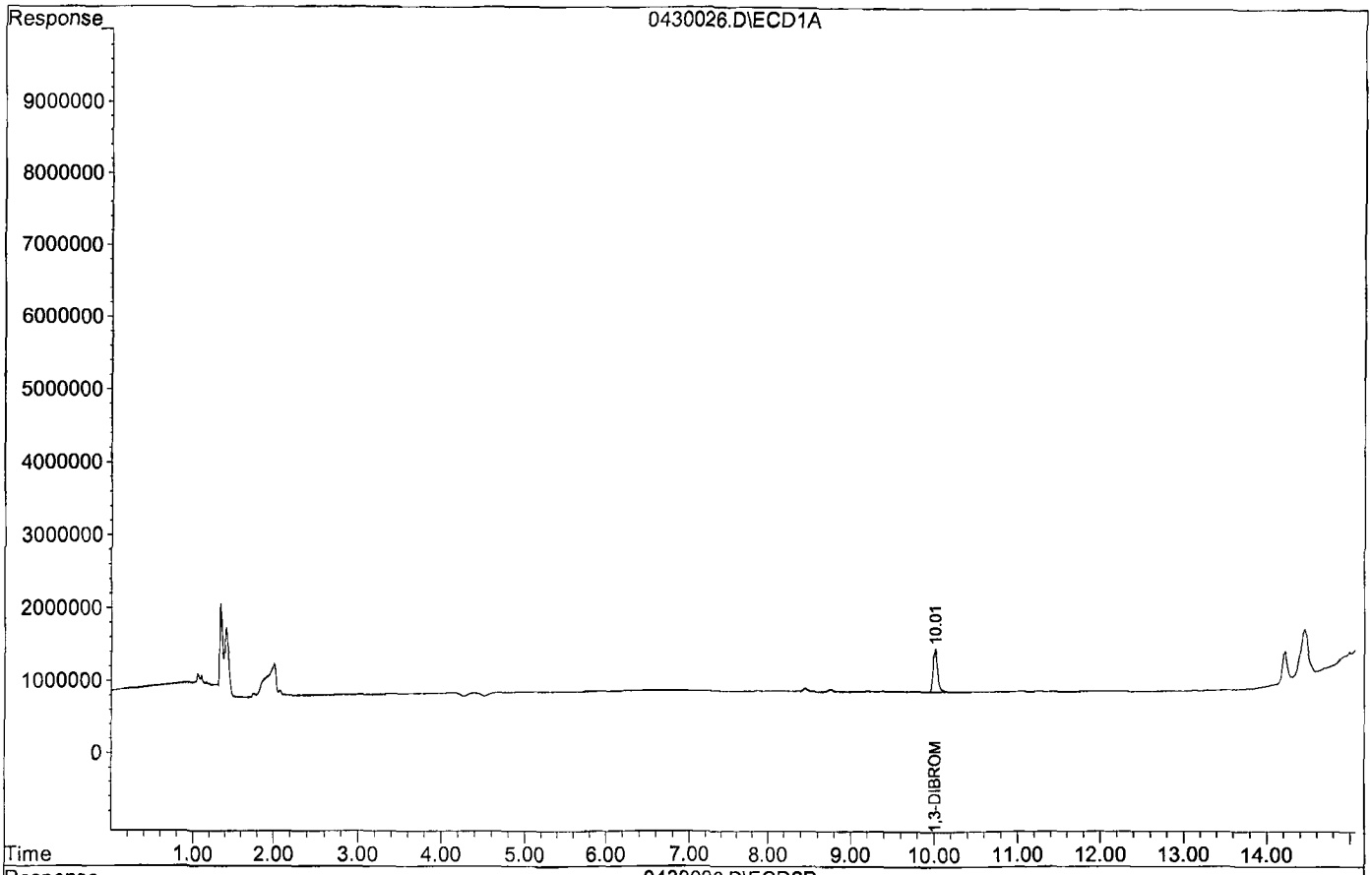
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	597328	2231509	0.353	0.363
Spiked Amount	0.350			Recovery	=	100.86%	103.71%
	Target Compounds						
	Target Compounds						
1) TM	EDB	0.00	0.00	0	0	N.D. d	N.D. d
2) TM	1,2,3-TCP	0.00	0.00	0	0	N.D. d	N.D. d
4) TM	DBCP	0.00	0.00	0	0	N.D. d	N.D. d

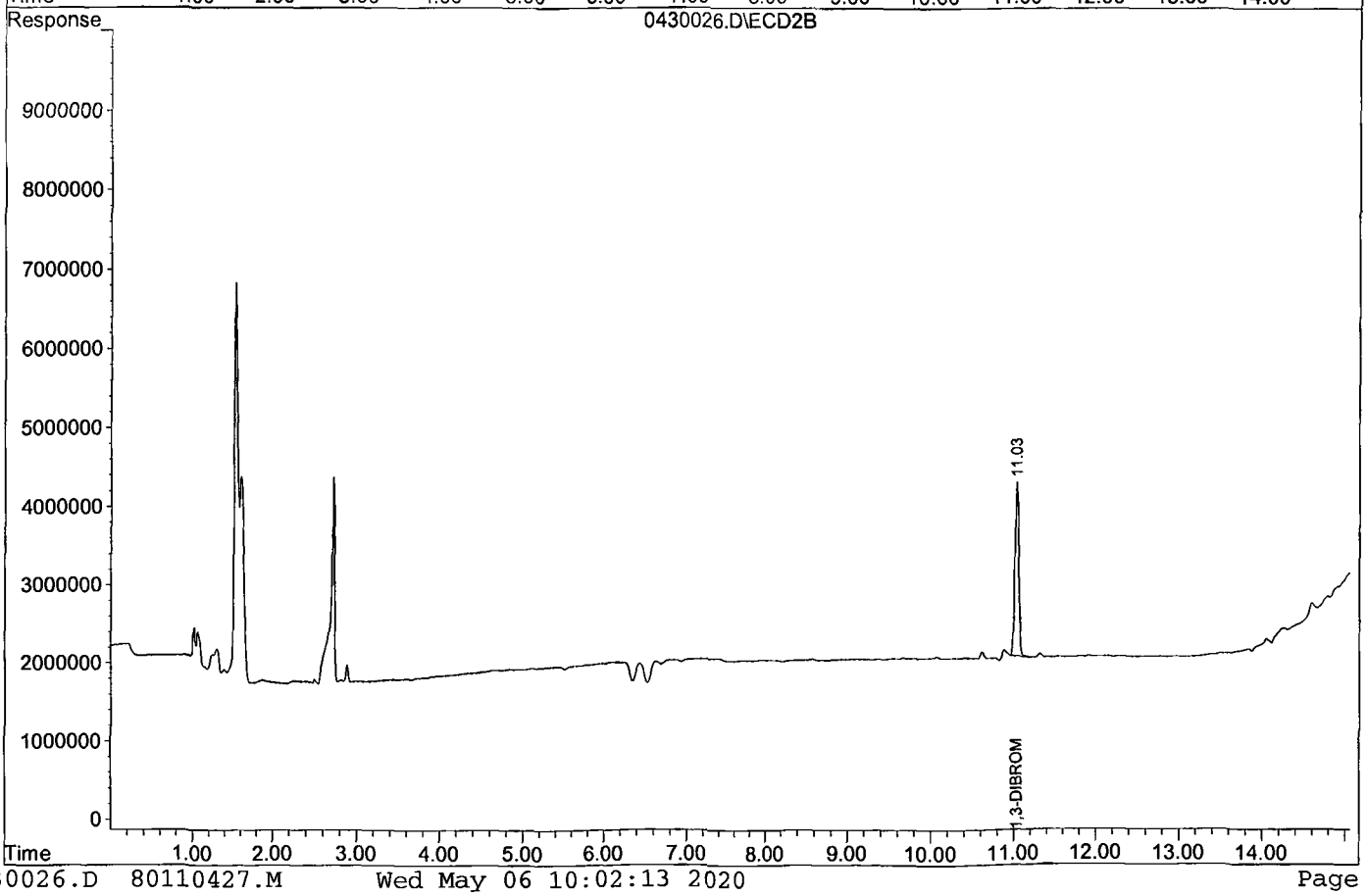
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430026.D
Acq On : 05-04-20 16:27:56
Sample : BA10505W06 2/35.32
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 26
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430019.D\ECD1A.CH Vial: 19
Signal #2 : G:\HERBIE\DATA\200430\0430019.D\ECD2B.CH
Acq On : 05-04-20 14:05:04 Operator: SS/LP
Sample : 200504A BLK 2/35.69 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:54 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

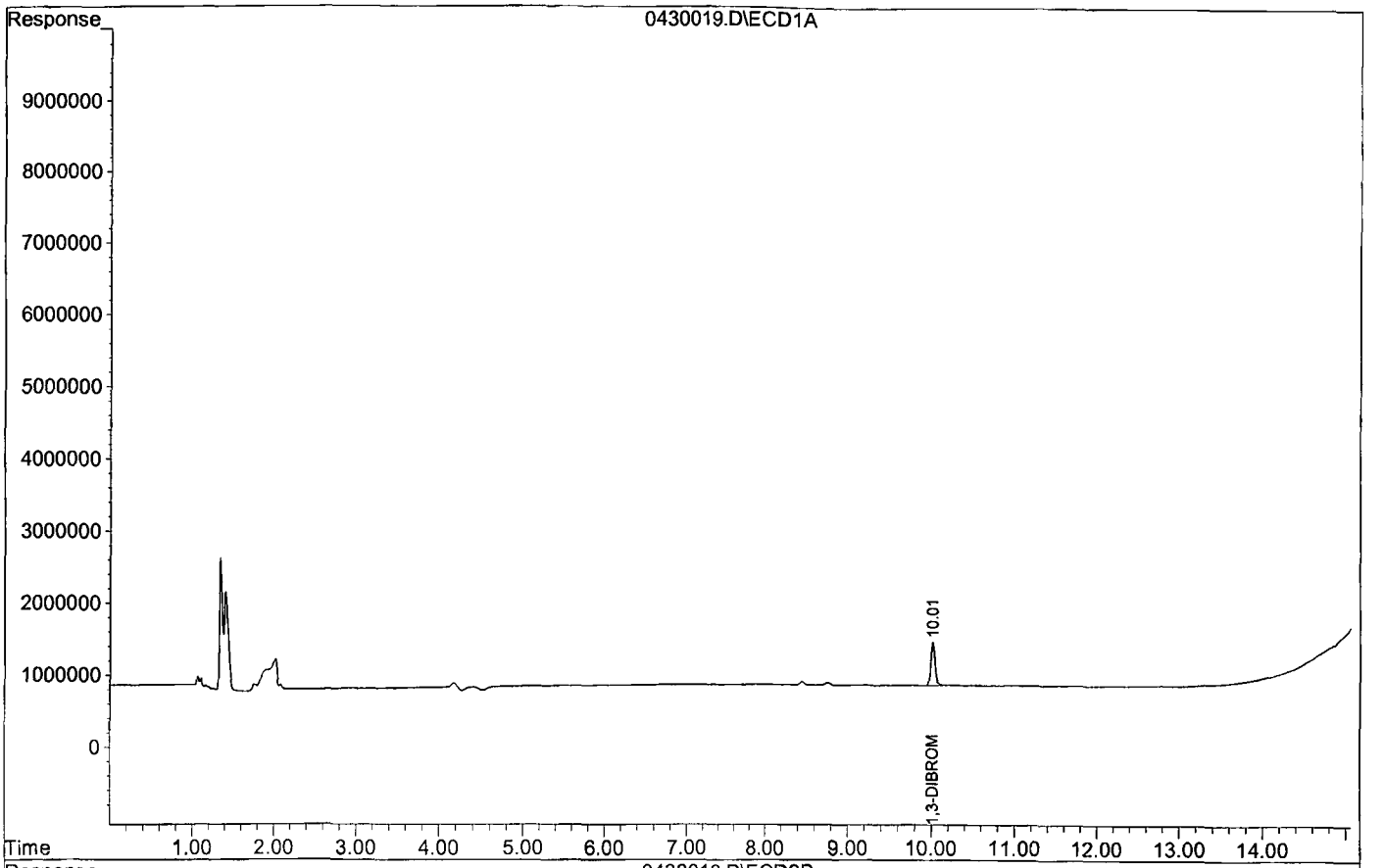
	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.03	600504	2203117	0.355	0.358
Spiked Amount	0.350			Recovery	=	101.43%	102.29%
	Target Compounds						
	Target Compounds						
1) TM	EDB	0.00	0.00	0	0	N.D. d	N.D. d
2) TM	1,2,3-TCP	0.00	0.00	0	0	N.D. d	N.D. d
4) TM	DBCP	0.00	0.00	0	0	N.D. d	N.D. d

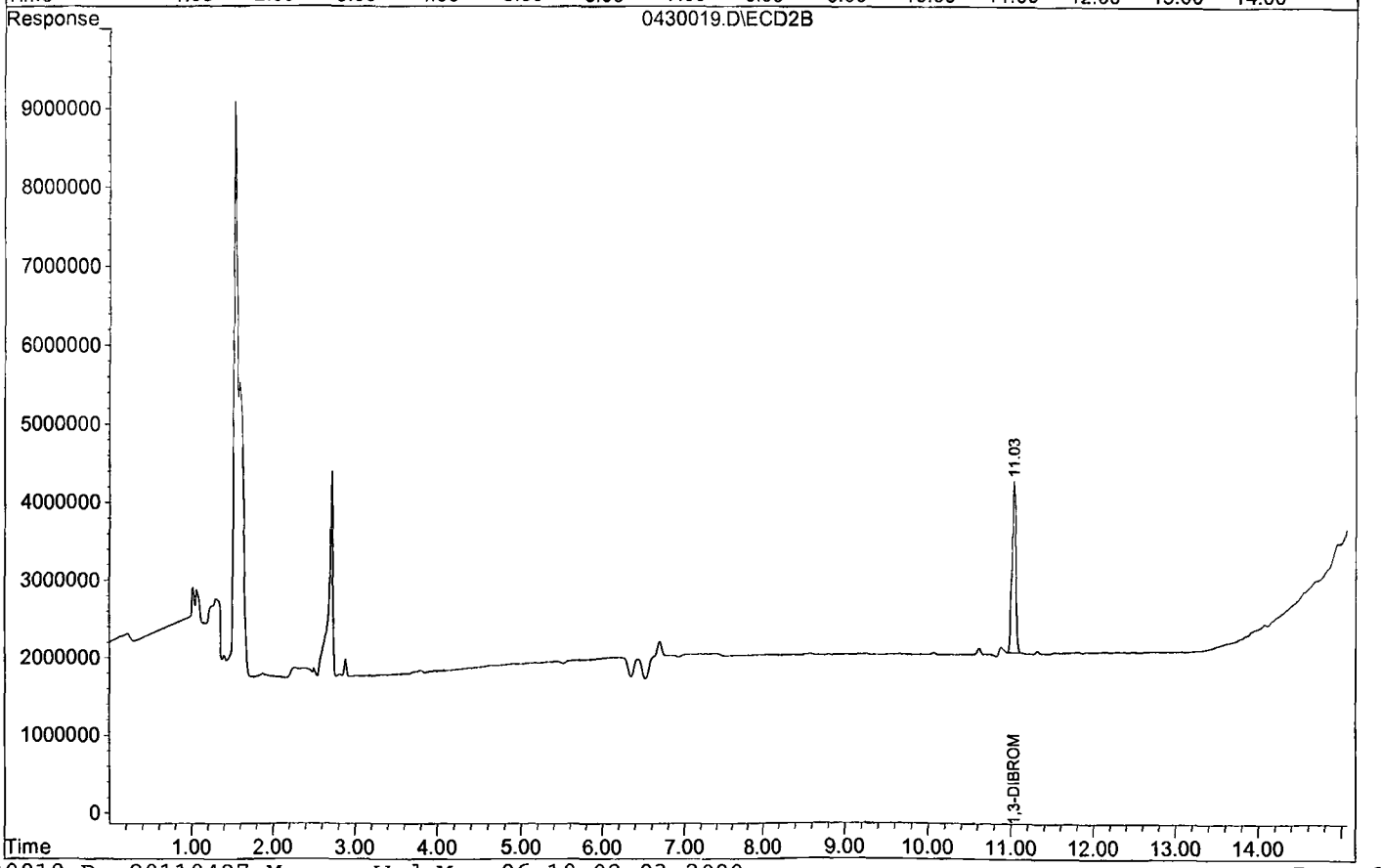
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430019.D
Acq On : 05-04-20 14:05:04
Sample : 200504A BLK 2/35.69
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 19
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430020.D\ECD1A.CH Vial: 20
Signal #2 : G:\HERBIE\DATA\200430\0430020.D\ECD2B.CH
Acq On : 05-04-20 14:25:21 Operator: SS/LP
Sample : 200504A LCS-1 2/35.45 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:52 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
System Monitoring Compounds						
3) S 1,3-DIBROMOPROPA	10.01	11.03	448164	1613099	0.265	0.262
Spiked Amount 0.350			Recovery =		75.71%	74.86%
Target Compounds						
1) TM EDB	5.76	7.22	424985	2137165	0.253	0.252
2) TM 1,2,3-TCP	9.24	10.44	103539	396502	0.281	0.263
4) TM DBCP	13.34	14.08	1264647	5791812	0.258	0.252

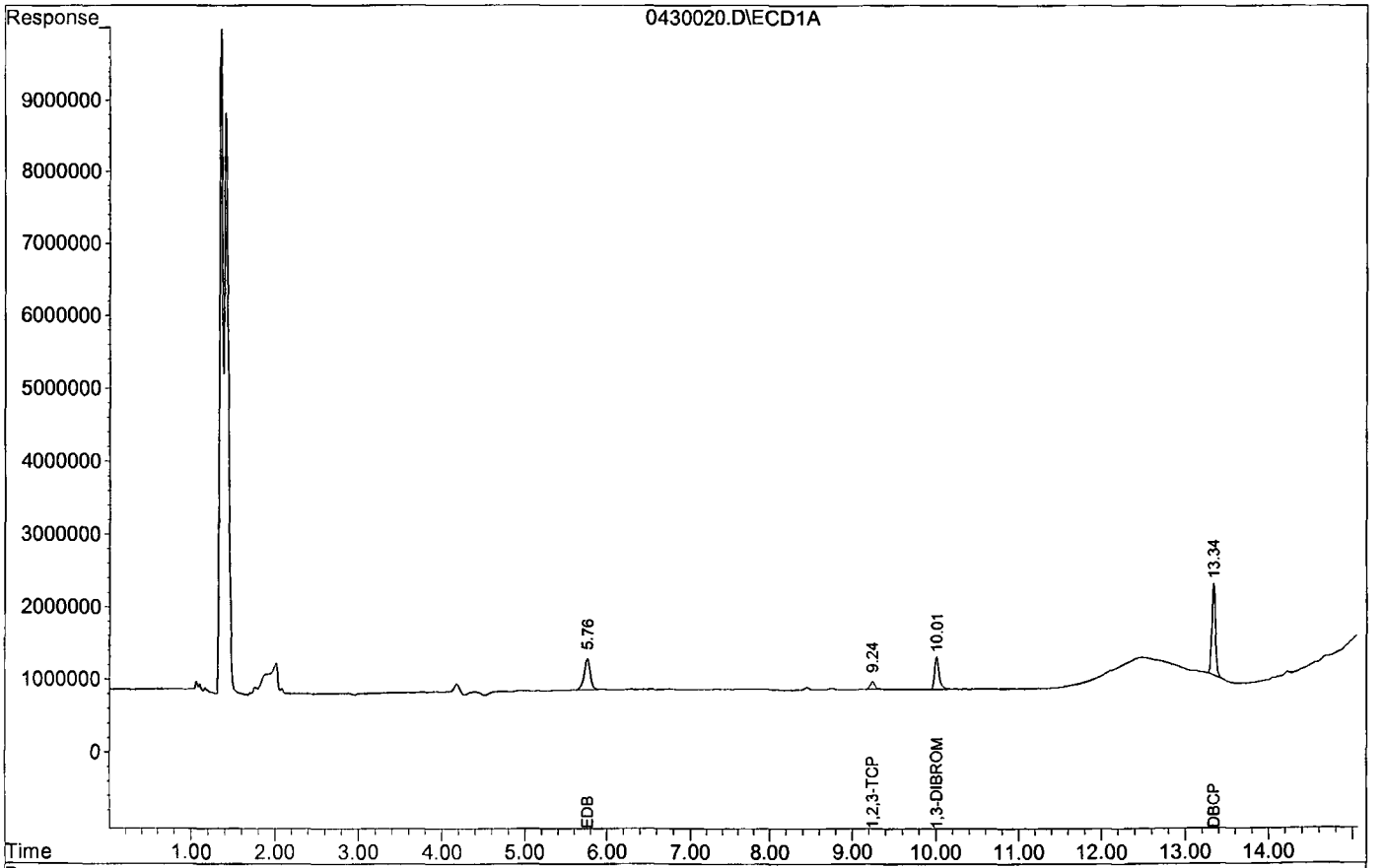
Target Compounds

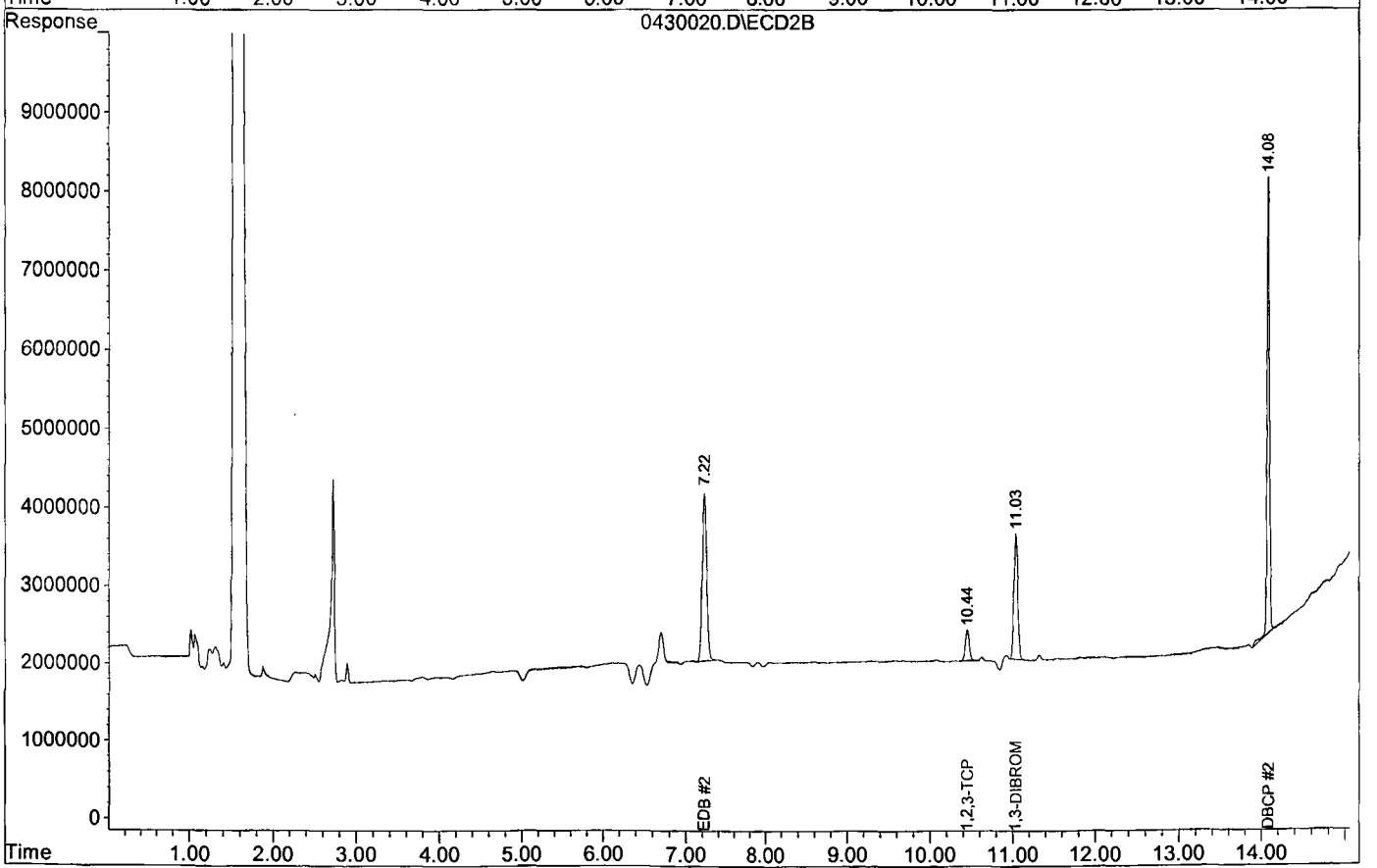
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430020.D
Acq On : 05-04-20 14:25:21
Sample : 200504A LCS-1 2/35.45
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 20
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Quantitation Report (QT Reviewed)

Signal #1 : G:\HERBIE\DATA\200430\0430021.D\ECD1A.CH Vial: 21
Signal #2 : G:\HERBIE\DATA\200430\0430021.D\ECD2B.CH
Acq On : 05-04-20 14:45:41 Operator: SS/LP
Sample : 200504A LCSD-1 2/35.62 Inst : Herbie
Misc : water Multiplr: 1.00
IntFile Signal #1: rteint.p IntFile Signal #2: rteint2.p
Quant Time: May 6 9:52 2020 Quant Results File: 80110427.RES

Quant Method : G:\HERBIE\DATA\200430\80110427.M (RTE Integrator)
Title : 504.1 OR 8011
Last Update : Tue Apr 28 07:55:45 2020
Response via : Initial Calibration
DataAcq Meth : DOHS504.M

Volume Inj. : 2µL
Signal #1 Phase : DB-35MS Signal #2 Phase: DB-XLB
Signal #1 Info : 0.25 Signal #2 Info : 0.50

	Compound	RT#1	RT#2	Resp#1	Resp#2	ug/L	ug/L
	System Monitoring Compounds						
3) S	1,3-DIBROMOPROPA	10.01	11.04	416391	1560091	0.246	0.254
Spiked Amount	0.350			Recovery	=	70.29%	72.57%
	Target Compounds						
1) TM	EDB	5.76	7.22	413425	2134771	0.246	0.251
2) TM	1,2,3-TCP	9.24	10.45	97279	388091	0.264	0.257
4) TM	DBCP	13.34	14.08	1219362	5083503	0.249	0.221

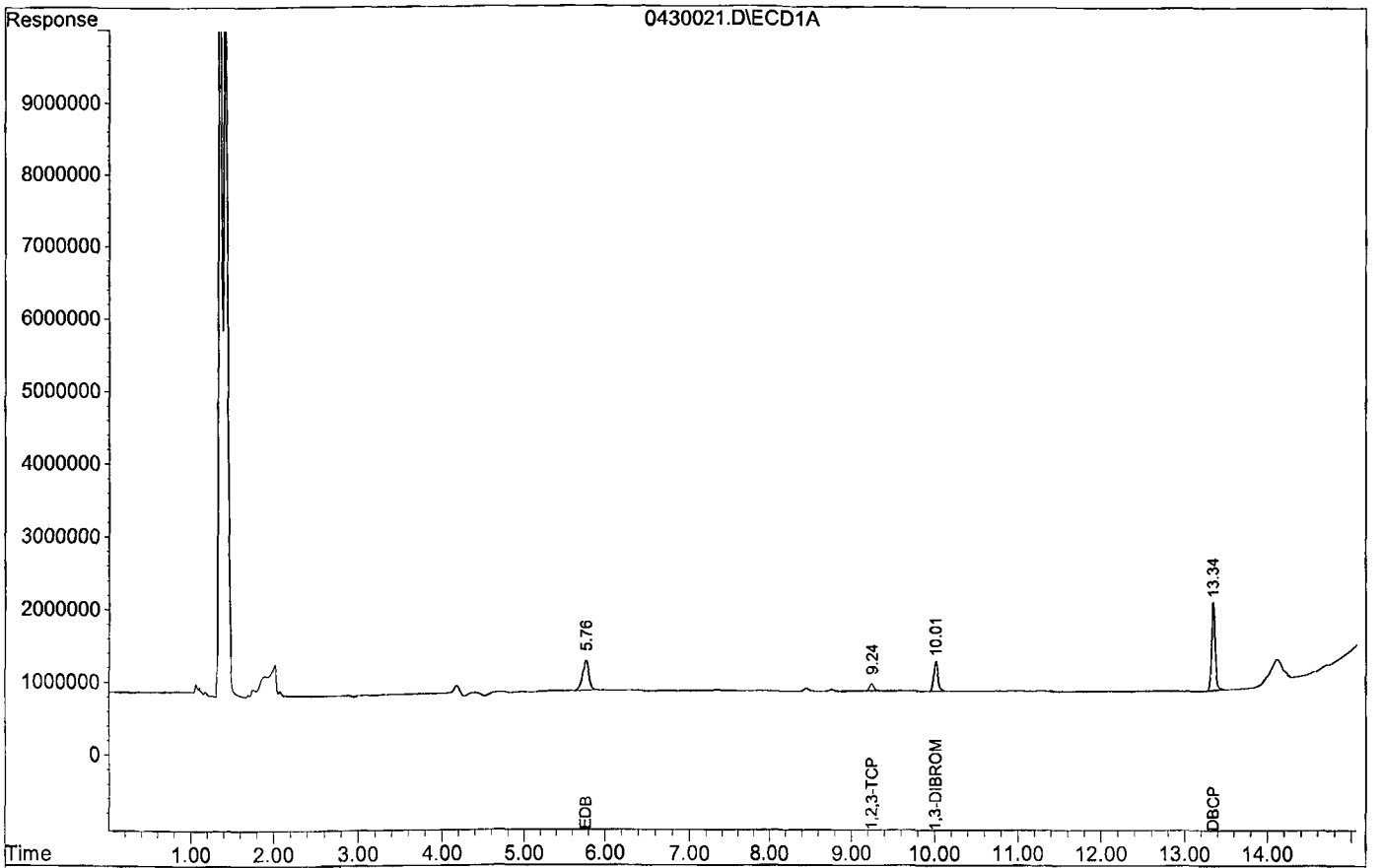
Target Compounds

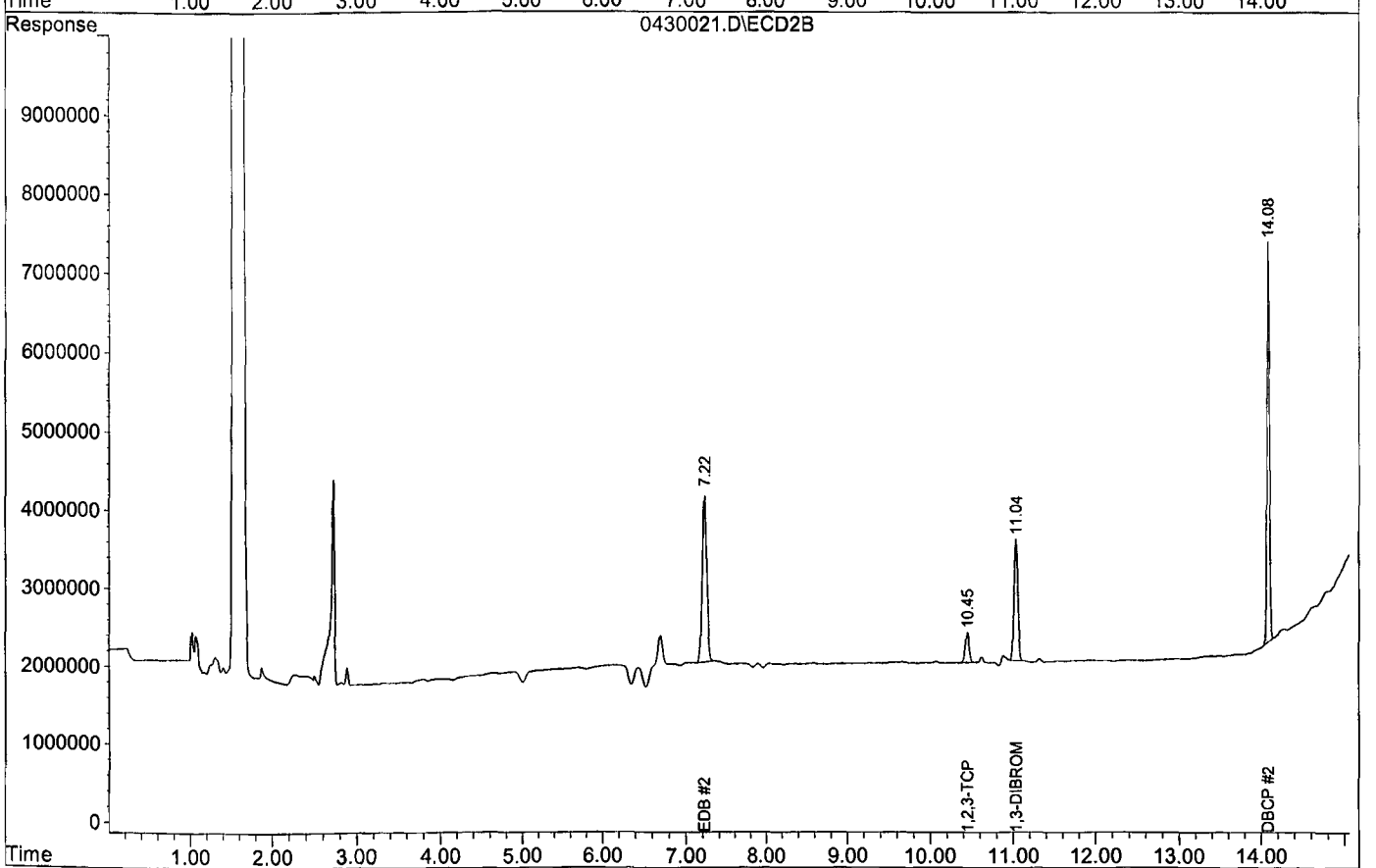
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\HERBIE\DATA\200430\0430021.D
Acq On : 05-04-20 14:45:41
Sample : 200504A LCSD-1 2/35.62
Misc : water
Quant Method : G:\HERBIE\DATA\200430\80110427.M

Vial: 21
Operator: SS/LP
Inst : Herbie
Multiplr: 1.00





Name of Final Standard 504/8011 Stock **Prep'd By (Initials)** GA

Prep Date 01/08/20

Exp Date 05/08/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
504/DOHS Stock	APPL	504/DOHS Stock	20 ug/mL	**01/07/20**	**01/07/21**	438 uL	25 mL	**Methanol #208858**	0.35 ug/mL
1,3 DBP Stock	APPL	1,3 DBP Stock	100 ug/mL	**01/07/20**	**01/07/21**	88 uL	"	"	"

Name of Final Standard 504/8011 Spike **Prep'd By (Initials)** **SS**

Prep Date **04/30/20**

Exp Date **05/08/20**

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
504/8011 Stock	APPL	504/8011 Stock	0.35 ug/mL	**01/08/20**	**05/08/20**	2.5 mL	25 mL	**Methanol #208858**	0.035 ug/mL

Name of Final Standard 504/8011 SS SPK **Prep'd By (Initials)** SS

Prep Date 04/27/20

Exp Date 04/27/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
504/8011 SS Stock	APPL	504/8011 SS Stock	0.35 ug/mL	**04/27/20**	**04/27/21**	1000 uL	10 mL	**Methanol #042317C**	0.035 ug/mL

Name of Final Standard 504/8011 SS Stock **Prep'd By (Initials)** SS

Prep Date 04/27/20

Exp Date 04/27/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
EDB TCP DBCP	Absolute	30096	200 ug/mL	**031218-49750**	**03/12/23**	44 uL	25 mL	**Methanol #042317C**	0.35 ug/mL

Name of Final Standard	504/8011 Surrogate	**Prep'd By (Initials)**	GA
Prep Date	01/08/20		
Exp Date	05/08/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
1,3 DBP Stock	APPL	1,3 DBP Stock	100 ug/mL	01/07/20	01/07/21	35 uL	10 mL	Methanol #208858	0.35ug/ml

Organic Extraction Worksheet

Method	EPA Method 8011 DBCP/EDB	Extraction Set	200504A	Extraction Method	MWE012	Units	mL

Spiked ID 1	504.1 Spike 4-30-20 5-8-20		Surrogate ID 1	504.1 Surrogate 1-8-20 5-8-20	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	05/04/20 9:05	
Spiked ID 8			Ext. End Time:	05/04/20 9:28	
			GC Requires Extract By:		

pH1			Water Bath Temp 1 °C	
pH2			Water Bath Temp 2 °C	
pH3			Water Bath Temp 3 °C	

Spiked By: KY **Date** 05/04/20 **Witnessed By:** CFM **Date** 05/04/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200504A Blk				0.035	1 equip	35.69	2	7	05/04/20 9:05	
2	200504A LCS-1		0.250	1	NA	NA equip	35.45	2	7	05/04/20 9:05	
3	200504A LCSD-1		0.250	1	NA	NA equip	35.62	2	7	05/04/20 9:05	
4	BA10438	BA10438W06			0.035	1 equip	35.92	2	7	05/04/20 9:05	92025
5	BA10439	BA10439W07			0.035	1 equip	35.47	2	7	05/04/20 9:05	92025
6	BA10503	BA10503W05			0.035	1 equip	35.10	2	7	05/04/20 9:05	92039
7	BA10504	BA10504W06			0.035	1 equip	35.37	2	7	05/04/20 9:05	92039
8	BA10505	BA10505W06			0.035	1 equip	35.32	2	7	05/04/20 9:05	92039

Solvent and Lot#	
Scale Blance ID	EB1
pH strip	hc998032
Sod. Thiosulfate	1016c241
NaCL	19h295201
GC2 Hexane (2mLs)	dv910

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	5/4/20
Time	9:45
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	KY
Extraction	KY
Concentration	KY

Modified	05/04/20 9:31:43 AM

Reviewed By: **Date**

Injection Log

Directory: G:\HERBIE\DATA\200415\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	59	0415059.D	1	8011-1 4/27/20	water	04-27-20 13:33:12
2	60	0415060.D	1	8011-2 4/27/20	water	04-27-20 13:53:33
3	61	0415061.D	1	8011-3 4/27/20	water	04-27-20 14:14:01
4	62	0415062.D	1	8011-4 4/27/20	water	04-27-20 14:34:31
5	63	0415063.D	1	8011-5 4/27/20	water	04-27-20 14:54:56
6	64	0415064.D	1	8011-6 4/27/20	water	04-27-20 15:15:22
7	89	0415089.D	1	8011-SS 4/27/20	water	04-28-20 8:29:21
8	18	0430018.D	1	8011-3 CCV 05/04/20	water	05-04-20 10:31:10
9	19	0430019.D	1	200504A BLK 2/35.69	water	05-04-20 14:05:04
10	20	0430020.D	1	200504A LCS-1 2/35.45	water	05-04-20 14:25:21
11	21	0430021.D	1	200504A LCSD-1 2/35.62	water	05-04-20 14:45:41
12	24	0430024.D	1	BA10503W05 2/35.10	water	05-04-20 15:46:59
13	25	0430025.D	1	BA10504W06 2/35.37	water	05-04-20 16:07:30
14	26	0430026.D	1	BA10505W06 2/35.32	water	05-04-20 16:27:56
15	27	0430027.D	1	8011-3 CCV 05/04/20	water	05-04-20 16:48:22

ORGANICS
Calibration Data

TPH Extractables
DOC0310

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 03/10/20
Matrix: Water Instrument: Apollo
Initials: SS/M

		Compound	310003.D	310004.D	310005.D	310006 D	310007.D	310008.D					Avg	%RSD	Type	r^2	Q
1	HATM	Diesel (C10-C24)	1402793	2048774	1956346	1950680	1978298	2168778					1917612	14	HATM		
2	HBTM	Motor Oil (C24-C40)	1787356	1629558	1383257	1334462	1324161	1387579					1474395	13	HBTM		
3	SA	Ortho-Terphenyl(S)	2782070	2786055	2347676	2294556	2308475	2544283					2510519	9.2	SA		
4	SA	Octacosane(S)	1771075	1912436	1683790	1654254	1670744	1785274					1746262	5.6	SA		
5																	
6																	
7																	
8																	
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1.184705

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310003.D Vial: 3
Acq On : 3-10-20 9:37:22 Operator: SS
Sample : Diesel Motor Oil-1 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

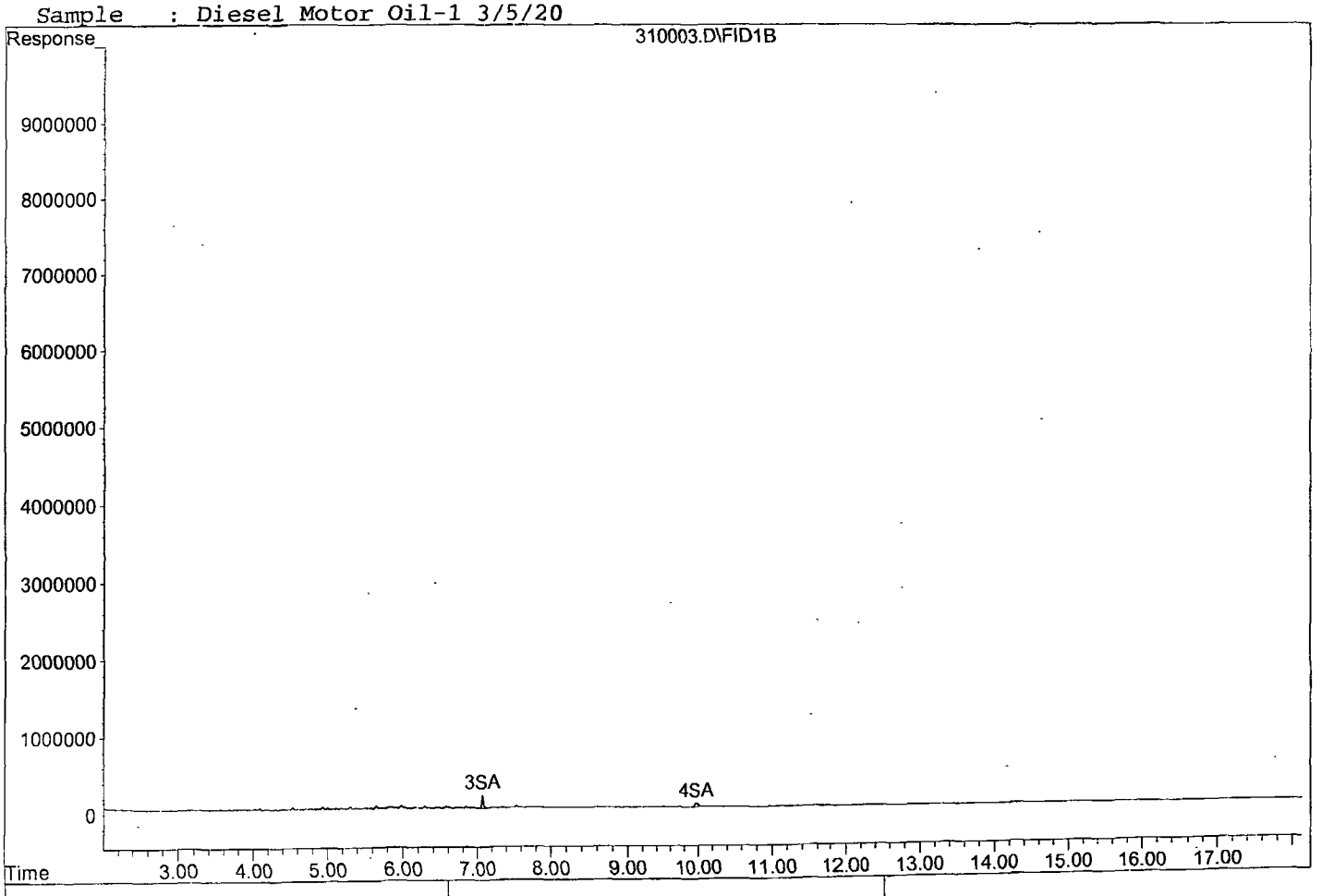
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

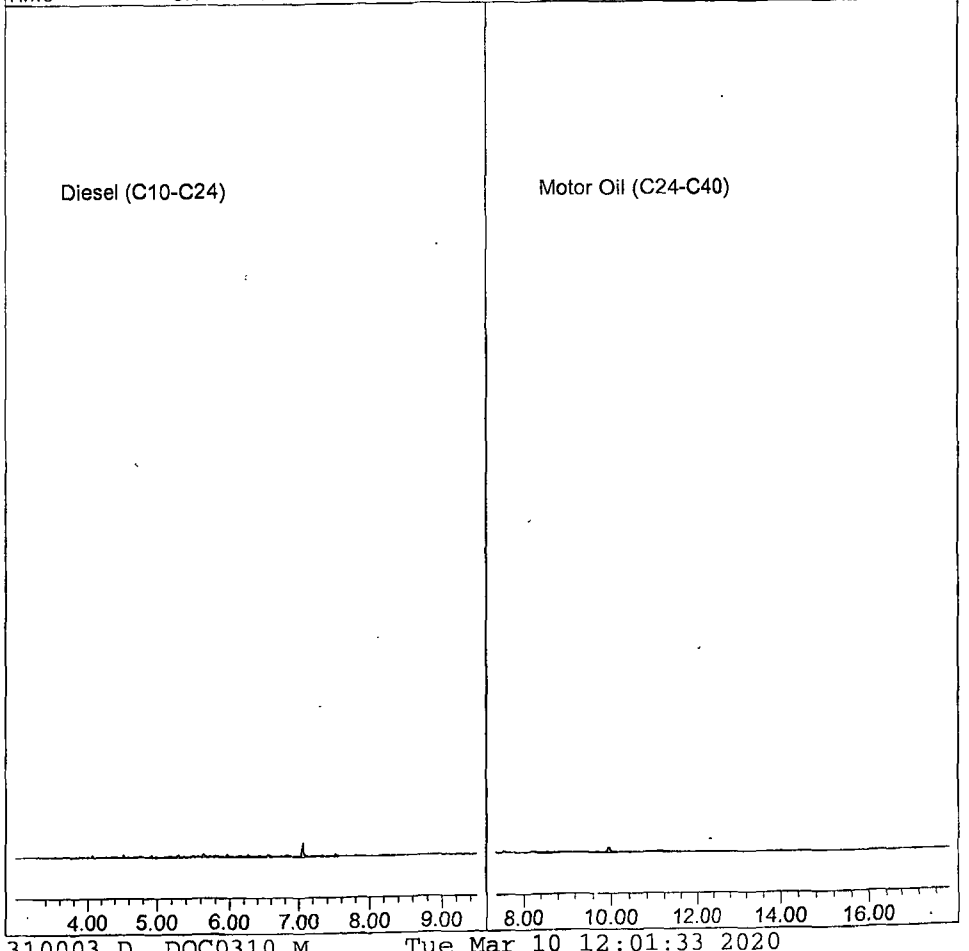
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	2782070	0.554 ppb
Surrogate Spike 30.000	Recovery =		1.85%
4) SA Octacosane(S)	9.97	1771075	0.507 ppb
Surrogate Spike 30.000	Recovery =		1.69%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	28055866	7.315 ppb
2) HBTM Motor Oil (C24-C40)	12.60	35747115	12.123 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310003.D
Sample : Diesel Motor Oil-1 3/5/20





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310004.D Vial: 4
Acq On : 3-10-20 9:59:49 Operator: SS
Sample : Diesel Motor Oil-2 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

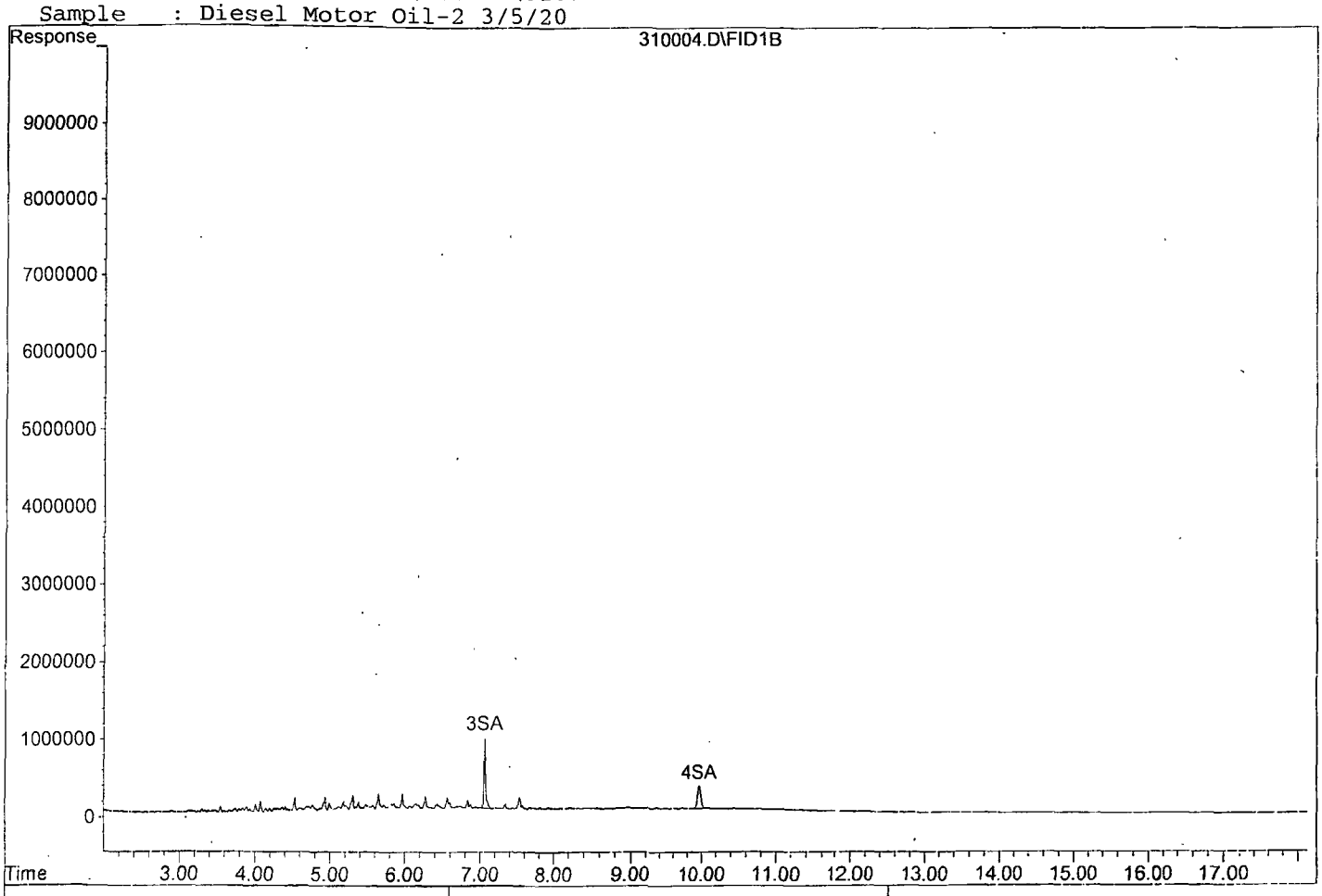
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

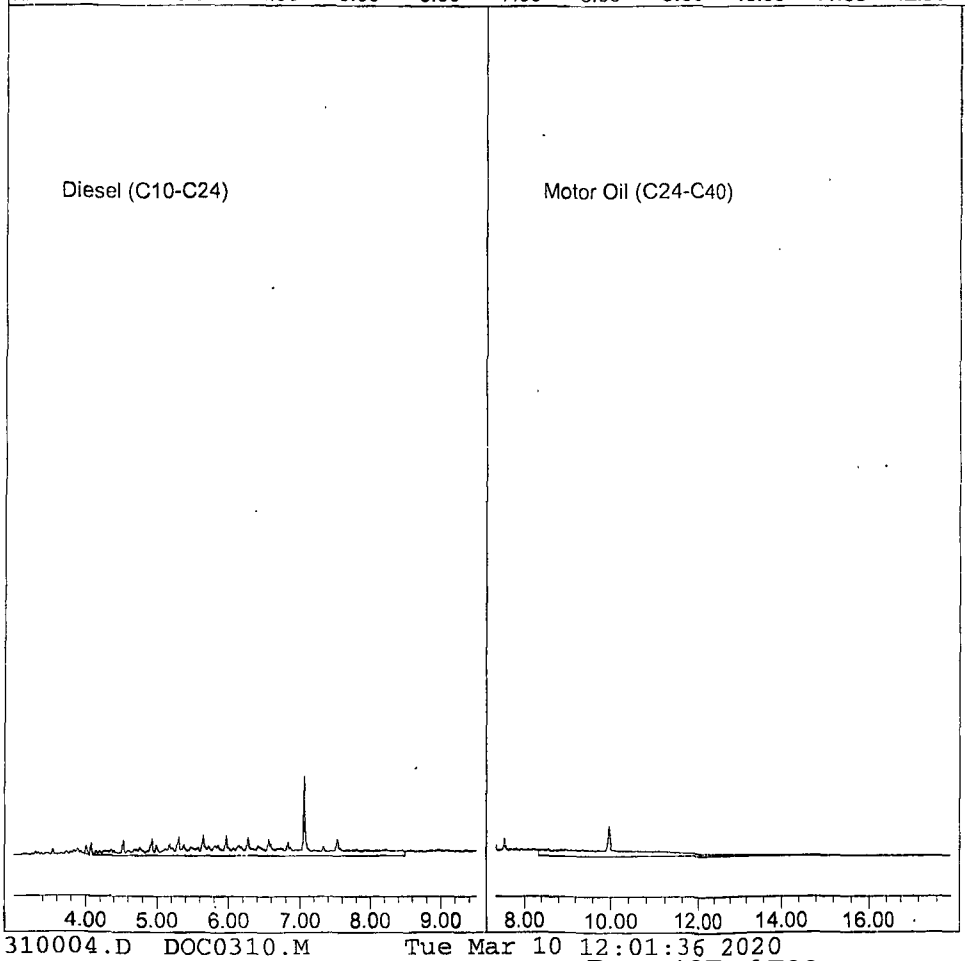
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	13930276	2.774 ppb
Surrogate Spike 30.000	Recovery =		9.25%
4) SA Octacosane(S)	9.97	9562178	2.738 ppb
Surrogate Spike 30.000	Recovery =		9.13%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	204877430	53.420 ppb
2) HBTM Motor Oil (C24-C40)	12.60	162955782	55.262 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310004.D
Sample : Diesel Motor Oil-2 3/5/20





310004.D DOC0310.M Tue Mar 10 12:01:36 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310005.D Vial: 5
Acq On : 3-10-20 10:22:19 Operator: SS
Sample : Diesel Motor Oil-3 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

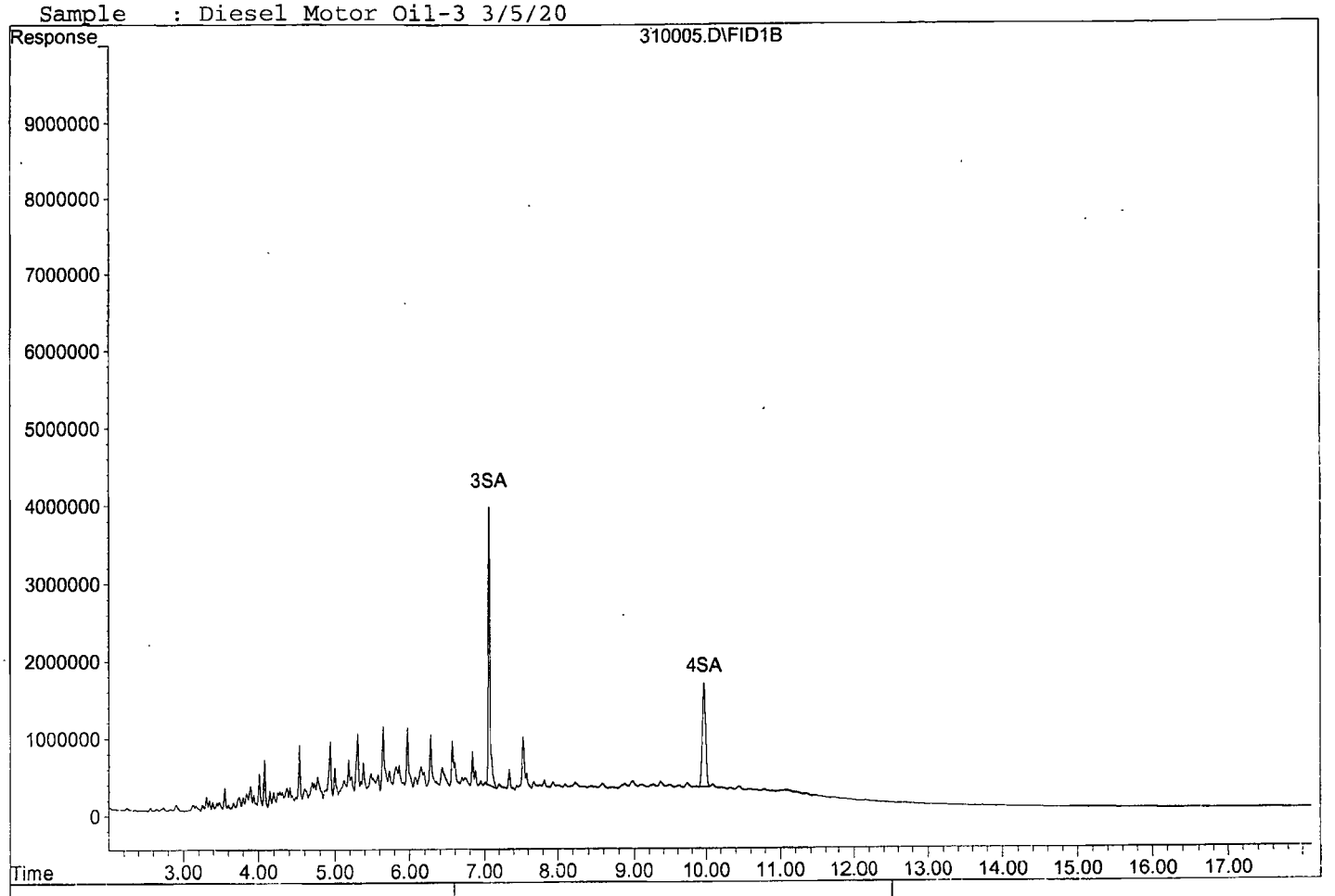
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

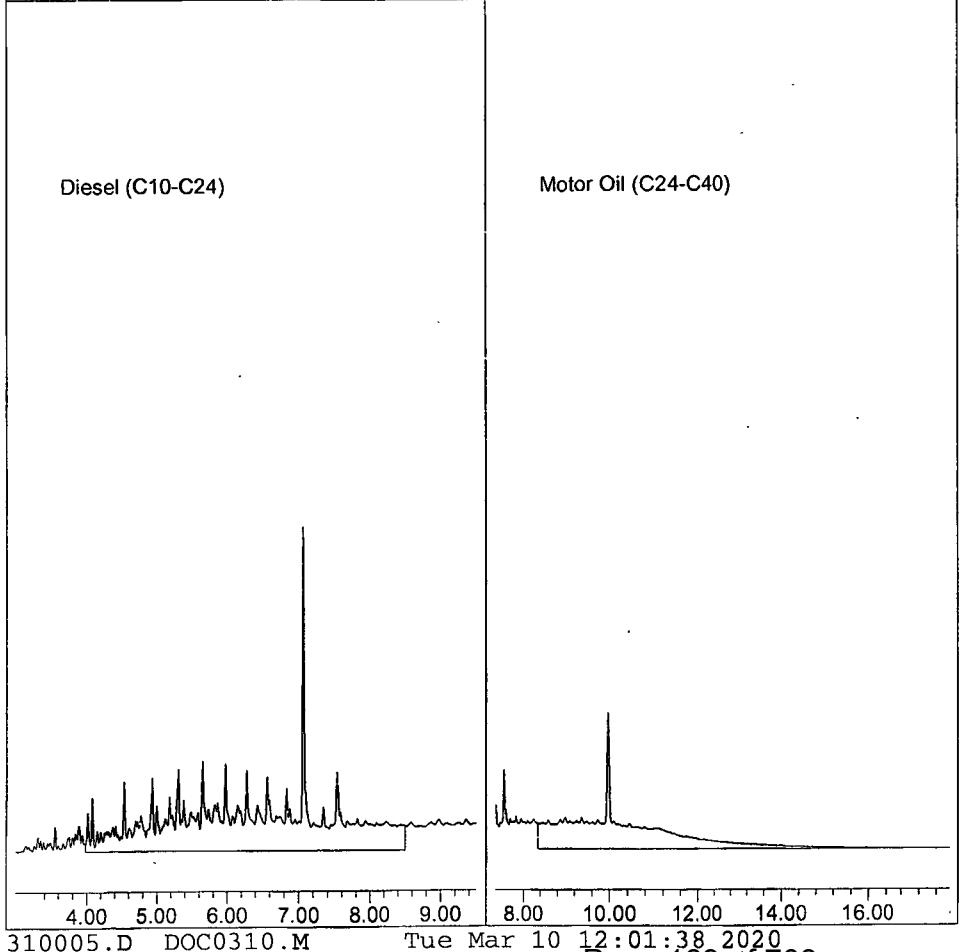
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	58691912	11.689 ppb
Surrogate Spike 30.000		Recovery =	38.96%
4) SA Octacosane(S)	9.97	42094760	12.053 ppb
Surrogate Spike 30.000		Recovery =	40.18%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	978173133	255.050 ppb
2) HBTM Motor Oil (C24-C40)	12.60	691628331	234.546 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310005.D
Sample : Diesel Motor Oil-3 3/5/20





310005.D DOC0310.M Tue Mar 10 12:01:38 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310006.D Vial: 6
Acq On : 3-10-20 10:44:50 Operator: SS
Sample : Diesel Motor Oil-4 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

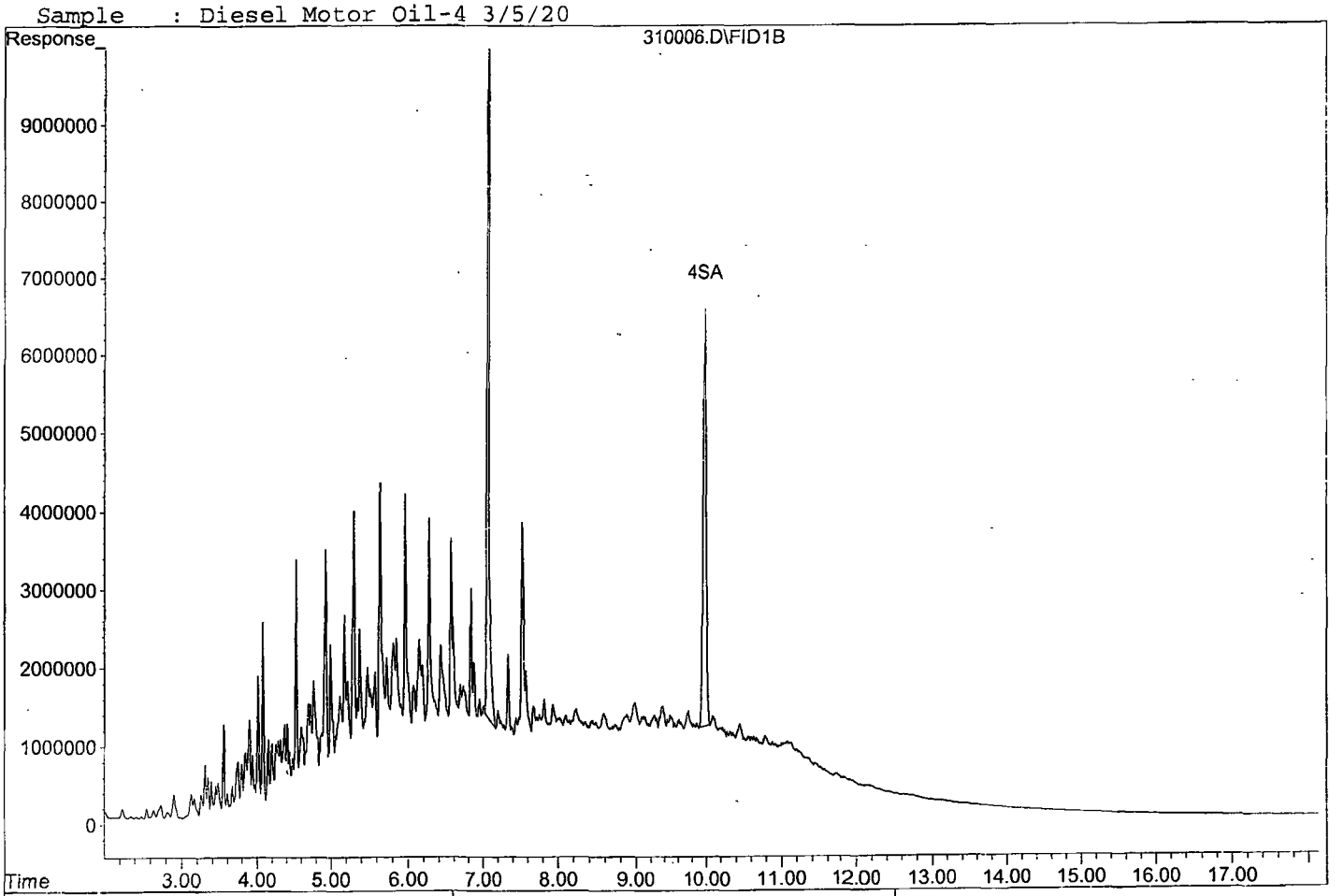
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

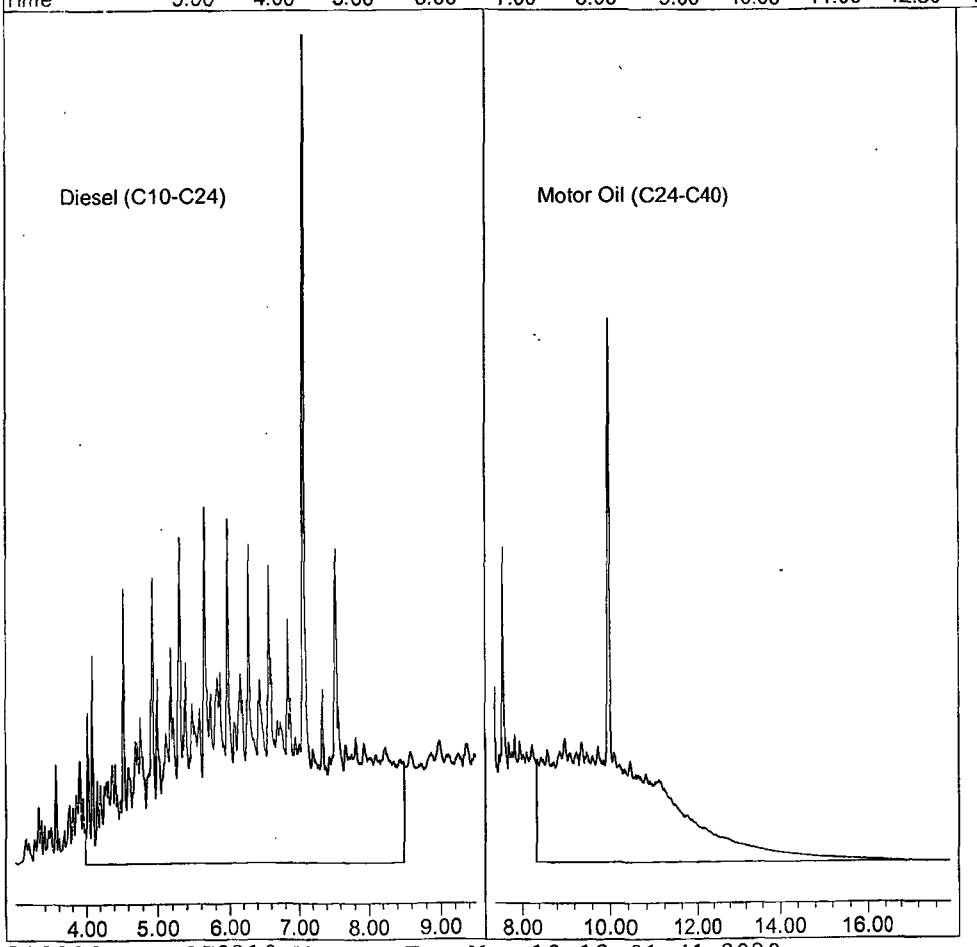
Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.07	229455620	45.699	ppb
Surrogate Spike 30.000	Recovery =		152.33%	
4) SA Octacosane(S)	9.98	165425400	47.366	ppb
Surrogate Spike 30.000	Recovery =		157.89%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	3901360613	1017.245	ppb
2) HBTM Motor Oil (C24-C40)	12.60	2668923786	905.091	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310006.D
Sample : Diesel Motor Oil-4 3/5/20





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310007.D Vial: 7
Acq On : 3-10-20 11:07:20 Operator: SS
Sample : Diesel Motor Oil-5 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

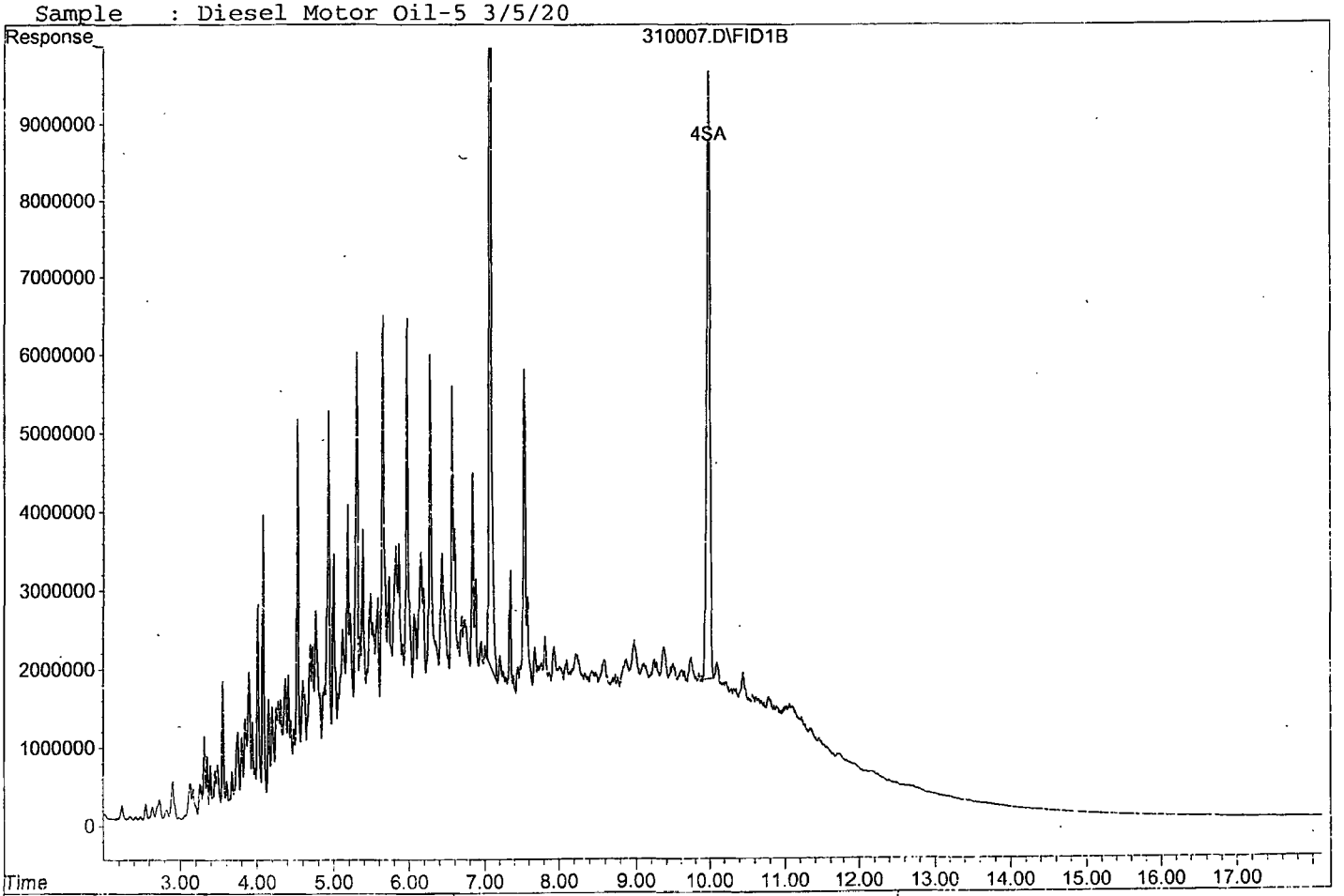
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

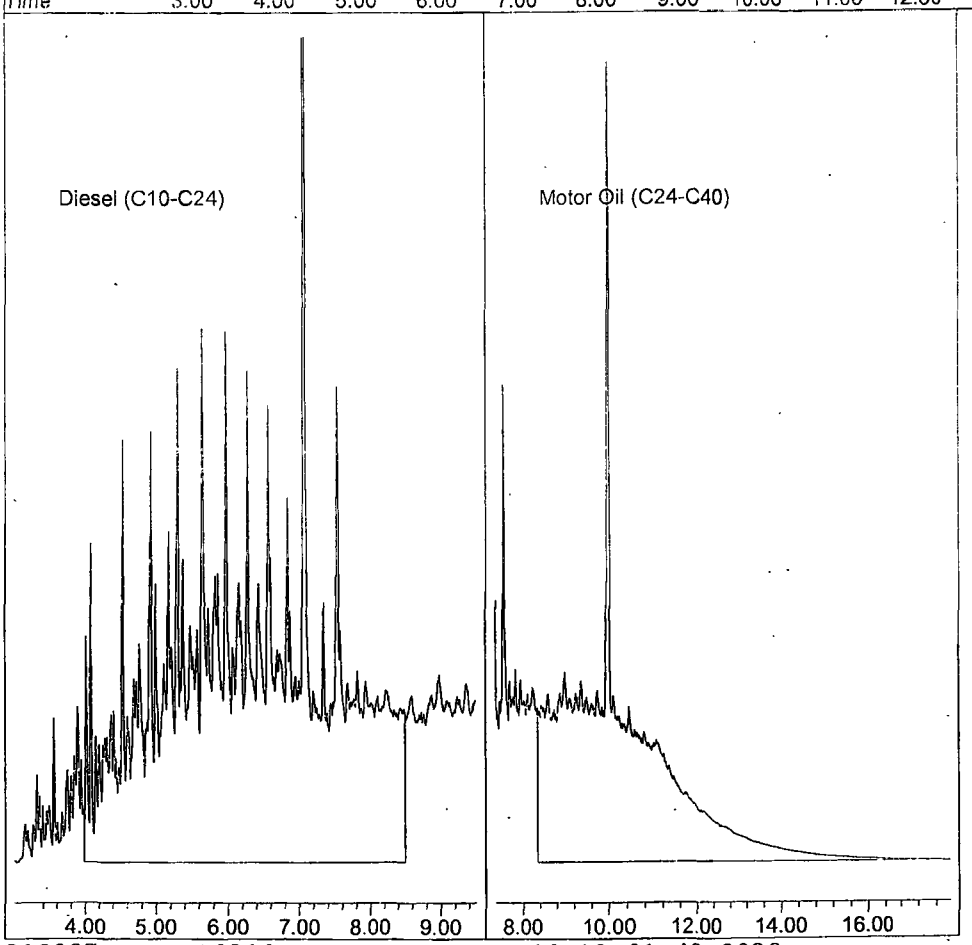
Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.07	346271320	68.964	ppb
Surrogate Spike 30.000		Recovery =	229.88%	
4) SA Octacosane(S)	9.98	250611670	71.757	ppb
Surrogate Spike 30.000		Recovery =	239.19%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	5934893648	1547.470	ppb
2) HBTM Motor Oil (C24-C40)	12.60	3972483300	1347.157	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310007.D
Sample : Diesel Motor Oil-5 3/5/20





310007.D DOC0310.M Tue Mar 10 12:01:43 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310008.D Vial: 8
Acq On : 3-10-20 11:29:51 Operator: SS
Sample : Diesel Motor Oil-6 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 11:58 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

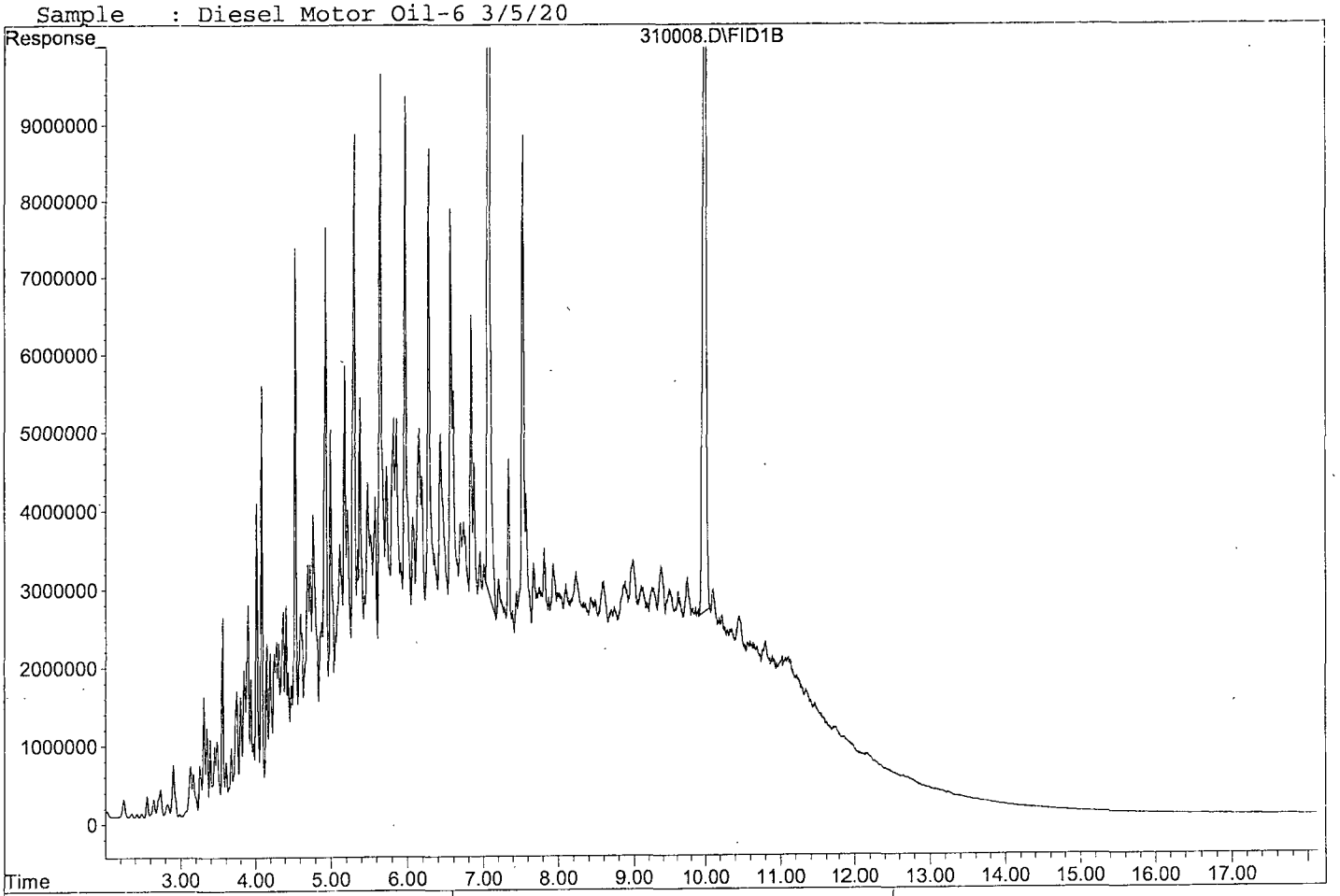
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

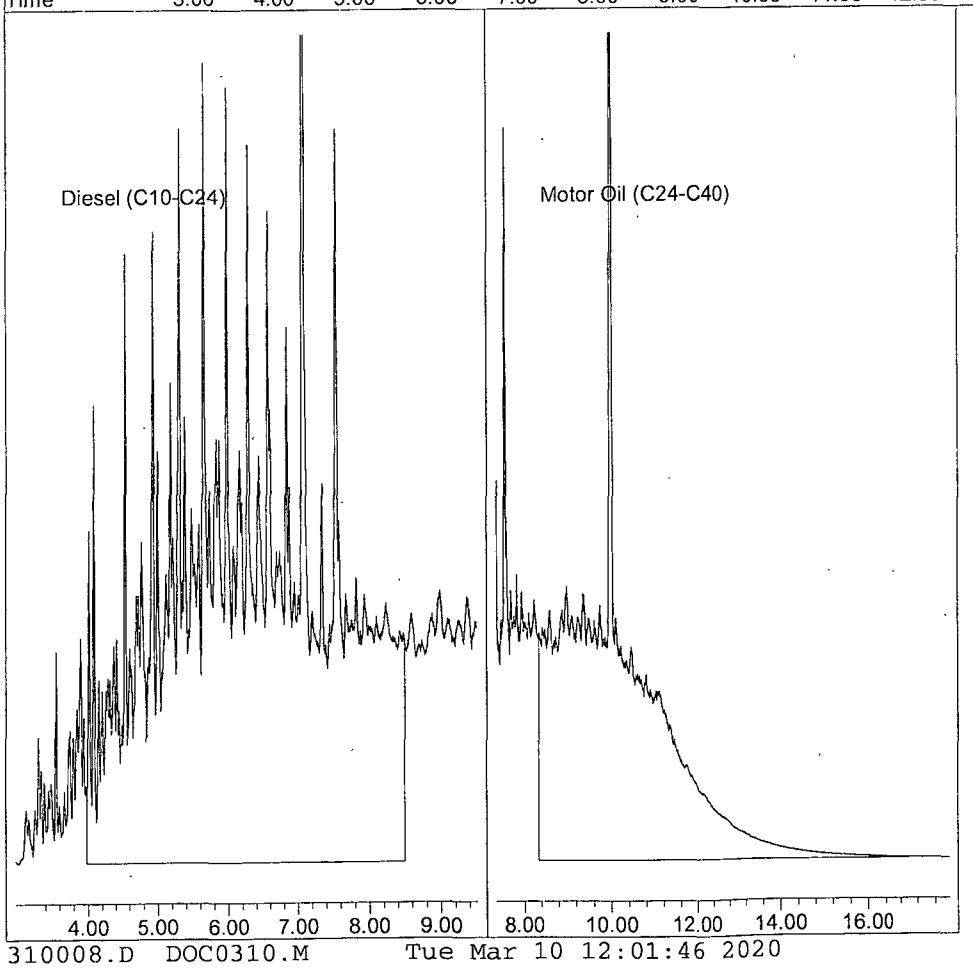
Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.07	508856564	101.345	ppb
Surrogate Spike 30.000		Recovery =	337.82%	
4) SA Octacosane(S)	9.99	357054728	102.234	ppb
Surrogate Spike 30.000		Recovery =	340.78%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	8675111292	2261.957	ppb
2) HBTM Motor Oil (C24-C40)	12.60	5550316563	1882.235	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310008.D
Sample : Diesel Motor Oil-6 3/5/20





310008.D DOC0310.M Tue Mar 10 12:01:46 2020

TPH Extractables
DOC0310

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 03/10/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 310009.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2127840	11	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1535490	4.1	HBTM	
3							
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40							
		Average			7.6		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200310\310009.D Vial: 9
Acq On : 3-10-20 11:52:24 Operator: SS
Sample : Diesel Motor Oil-SS 3/5/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 10 12:11 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

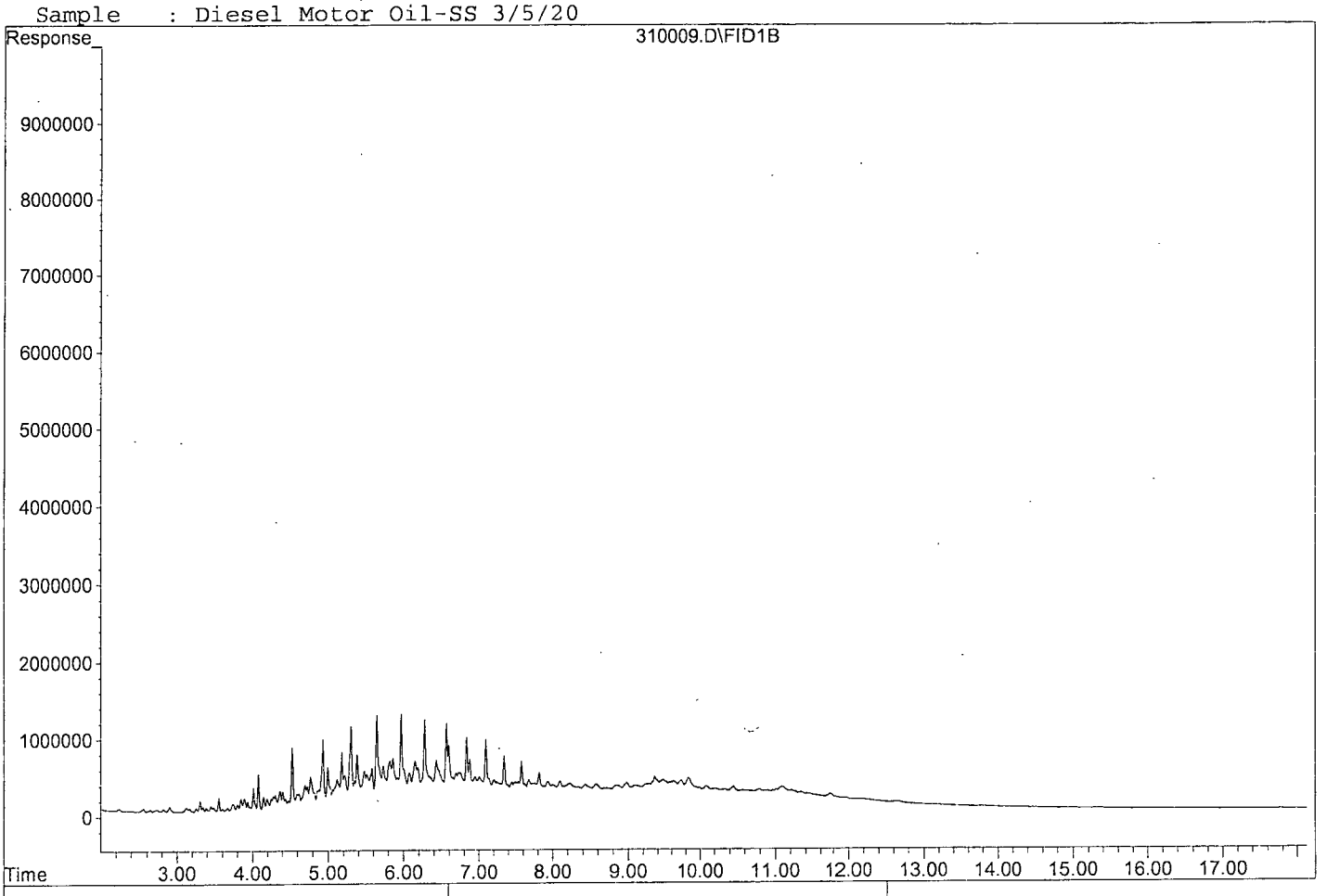
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

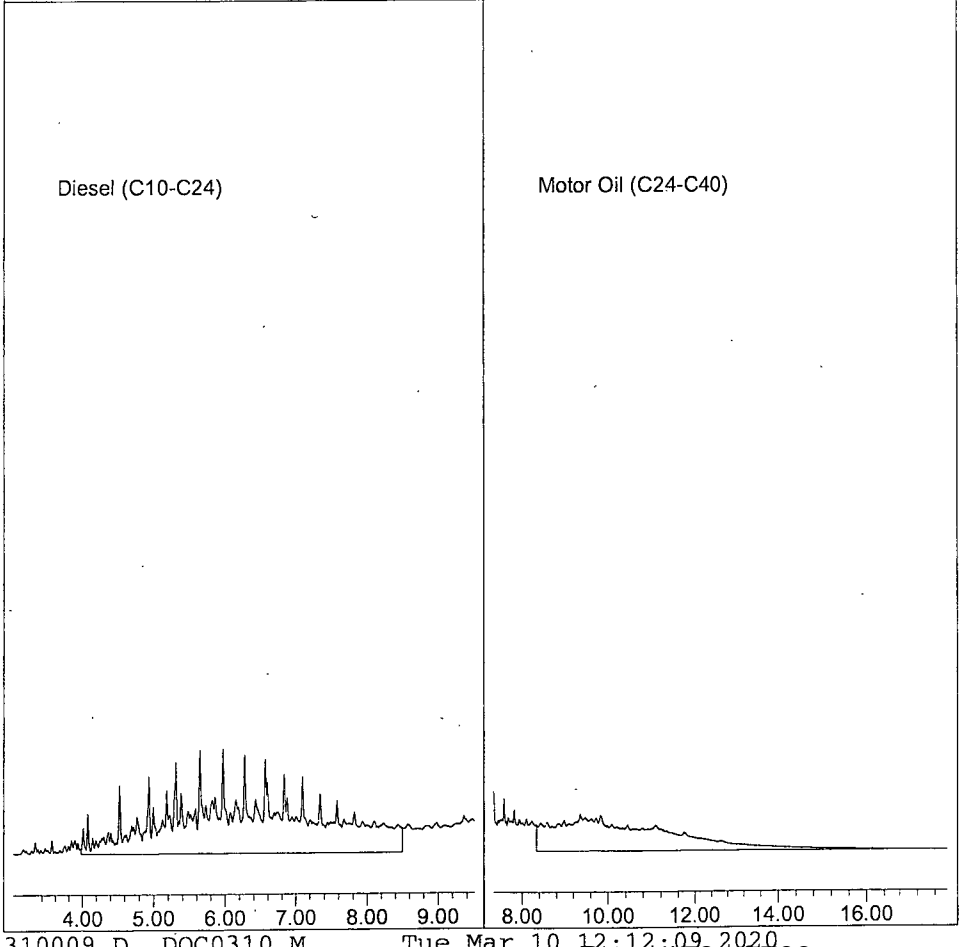
Compound	R.T.	Response	Conc	Units	
System Monitoring Compounds					
3) SA Ortho-Terphenyl(S)	0.00	0	N.D.	ppb	d
Surrogate Spike 30.000	Recovery	=	0.00%		
4) SA Octacosane(S)	0.00	0	N.D.	ppb	d
Surrogate Spike 30.000	Recovery	=	0.00%		
Target Compounds					
1) HATM Diesel (C10-C24)	6.24	1063920828	277.408	ppb	
2) HBTM Motor Oil (C24-C40)	12.60	767745055	260.359	ppb	

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200310\310009.D
Sample : Diesel Motor Oil-SS 3/5/20





TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424095.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2067120	7.8	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1399240	5.1	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2451320	2.4	SA	
4	SA	Octacosane(S)	1746260	1836860	5.2	SA	
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		Average			5.1		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424095.D Vial: 95
Acq On : 5-4-20 15:02:27 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 5 11:08 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

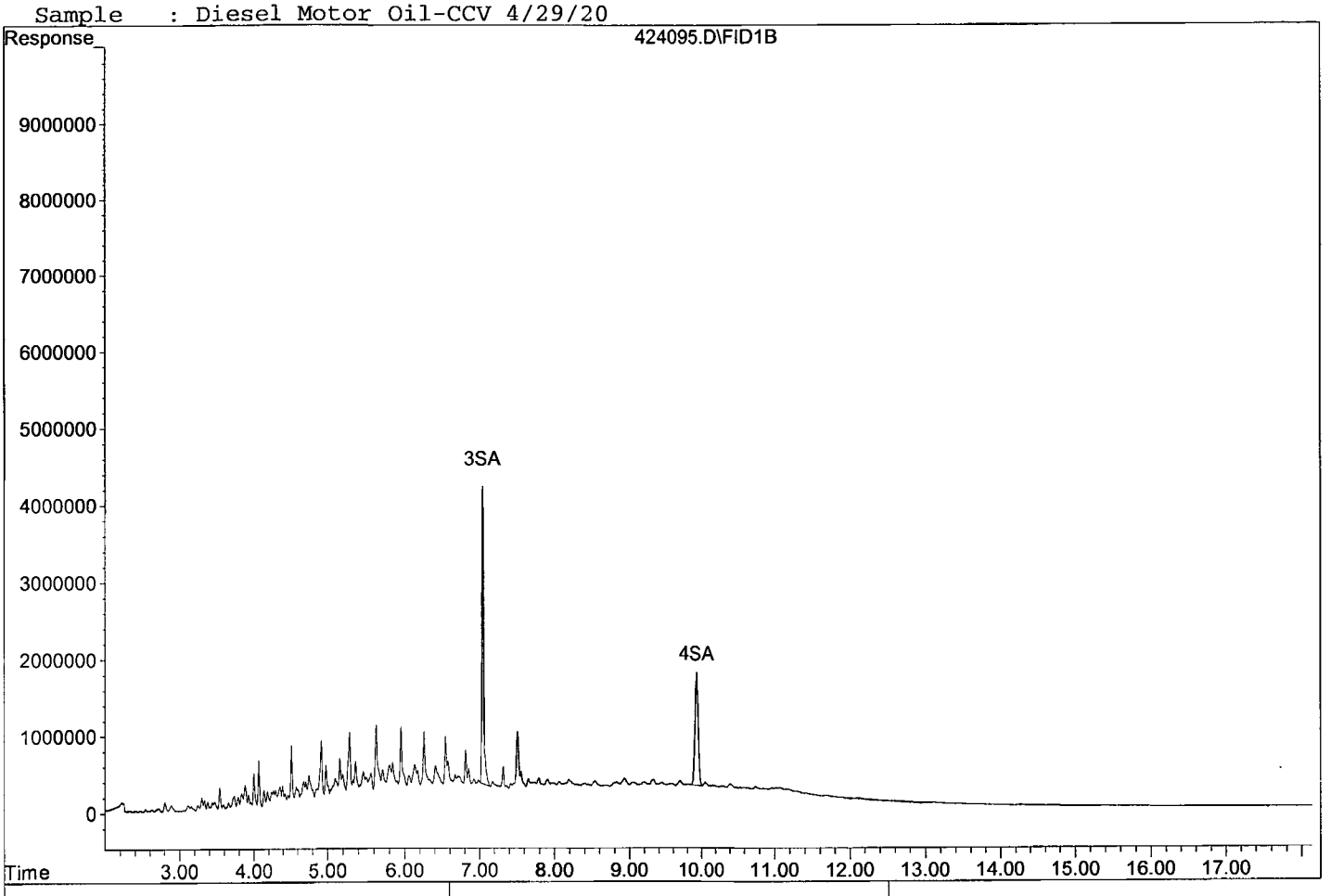
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

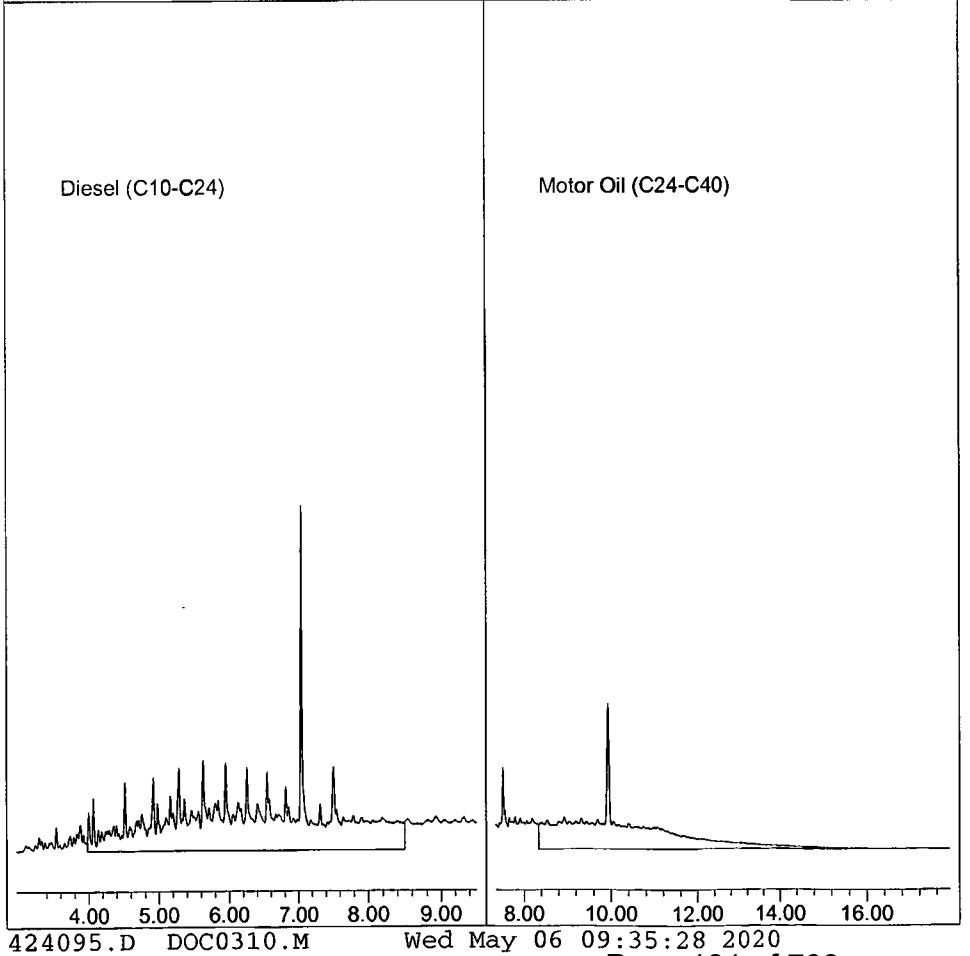
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	61283036	12.205 ppb
Surrogate Spike 30.000		Recovery =	40.68%
4) SA Octacosane(S)	9.93	45921597	13.149 ppb
Surrogate Spike 30.000		Recovery =	43.83%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1033560680	269.492 ppb
2) HBTM Motor Oil (C24-C40)	12.60	699618352	237.256 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424095.D
Sample : Diesel Motor Oil-CCV 4/29/20





424095.D DOC0310.M Wed May 06 09:35:28 2020

TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/04/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424109.D

		Compound	MEAN	CCRF	%D		%Drift
1	HATM	Diesel (C10-C24)	1917610	2178910	14	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1473420	0.07	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2592740	3.3	SA	
4	SA	Octacosane(S)	1746260	1917580	9.8	SA	
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		Average			6.8		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424109.D Vial: 9
Acq On : 5-4-20 20:22:31 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

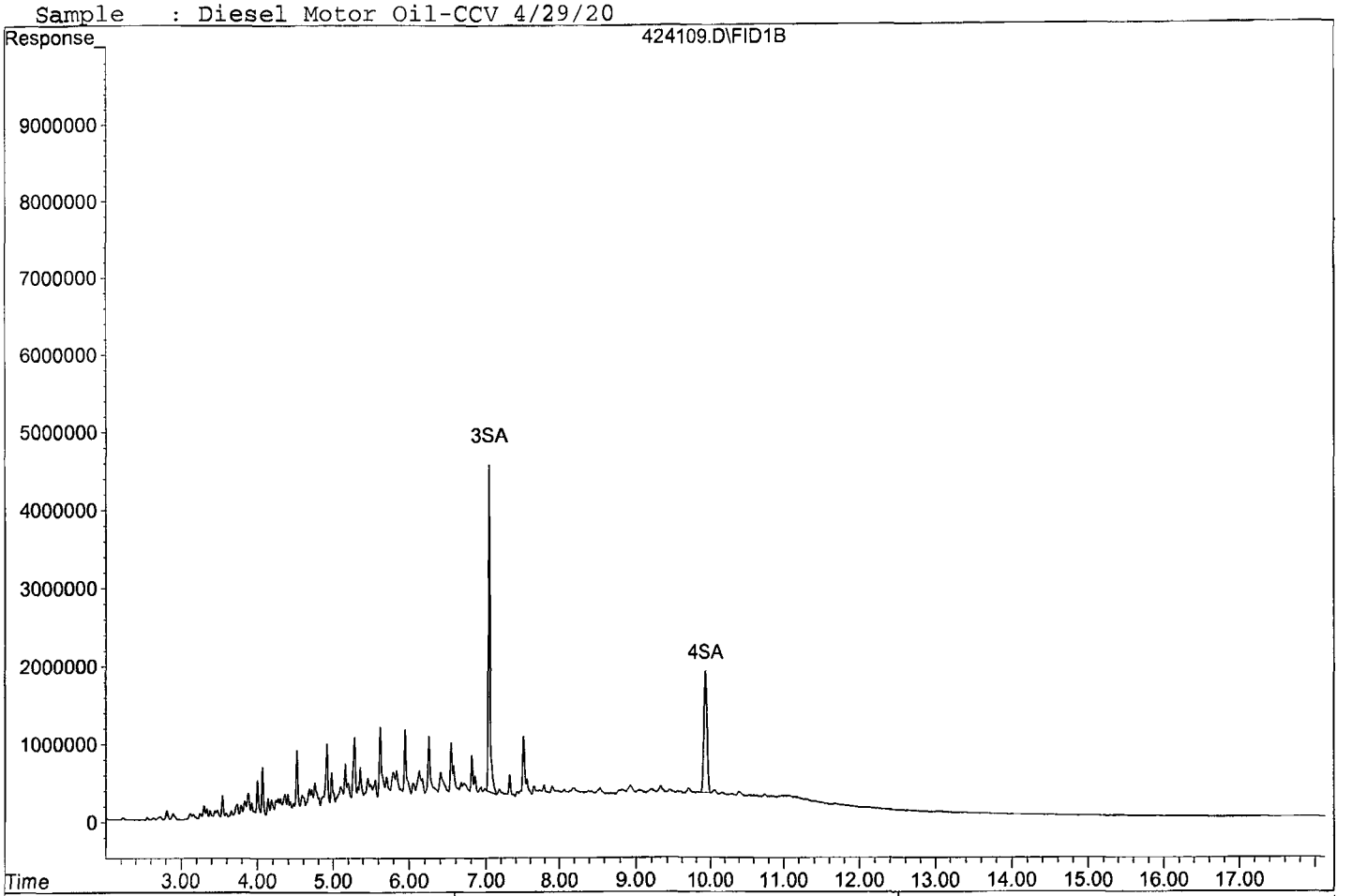
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

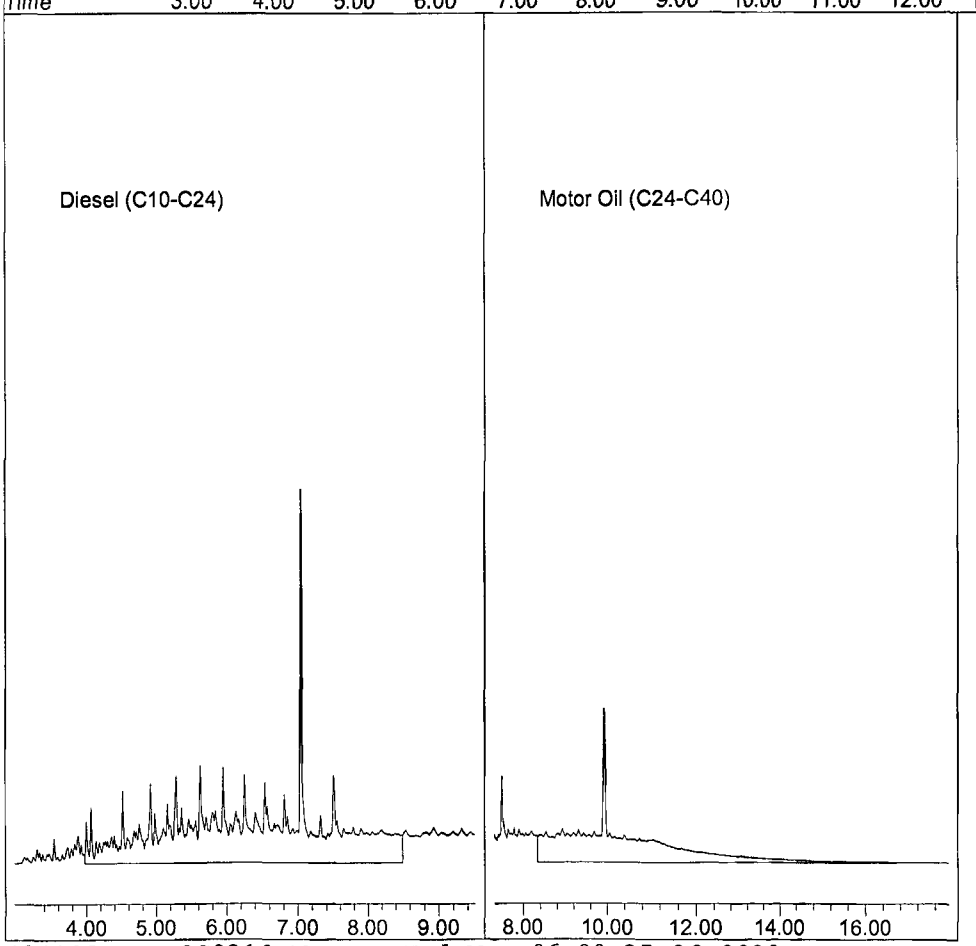
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	64818621	12.909 ppb
Surrogate Spike 30.000	Recovery =		43.03%
4) SA Octacosane(S)	9.93	47939624	13.726 ppb
Surrogate Spike 30.000	Recovery =		45.75%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1089454045	284.065 ppb
2) HBTM Motor Oil (C24-C40)	12.60	736709642	249.834 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424109.D
Sample : Diesel Motor Oil-CCV 4/29/20





TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/05/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424121.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2168790	13	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1457010	1.2	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2564210	2.1	SA	
4	SA	Octacosane(S)	1746260	1922620	10	SA	
5							
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40							
		Average			6.6		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424121.D Vial: 21
Acq On : 5-5-20 0:55:06 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

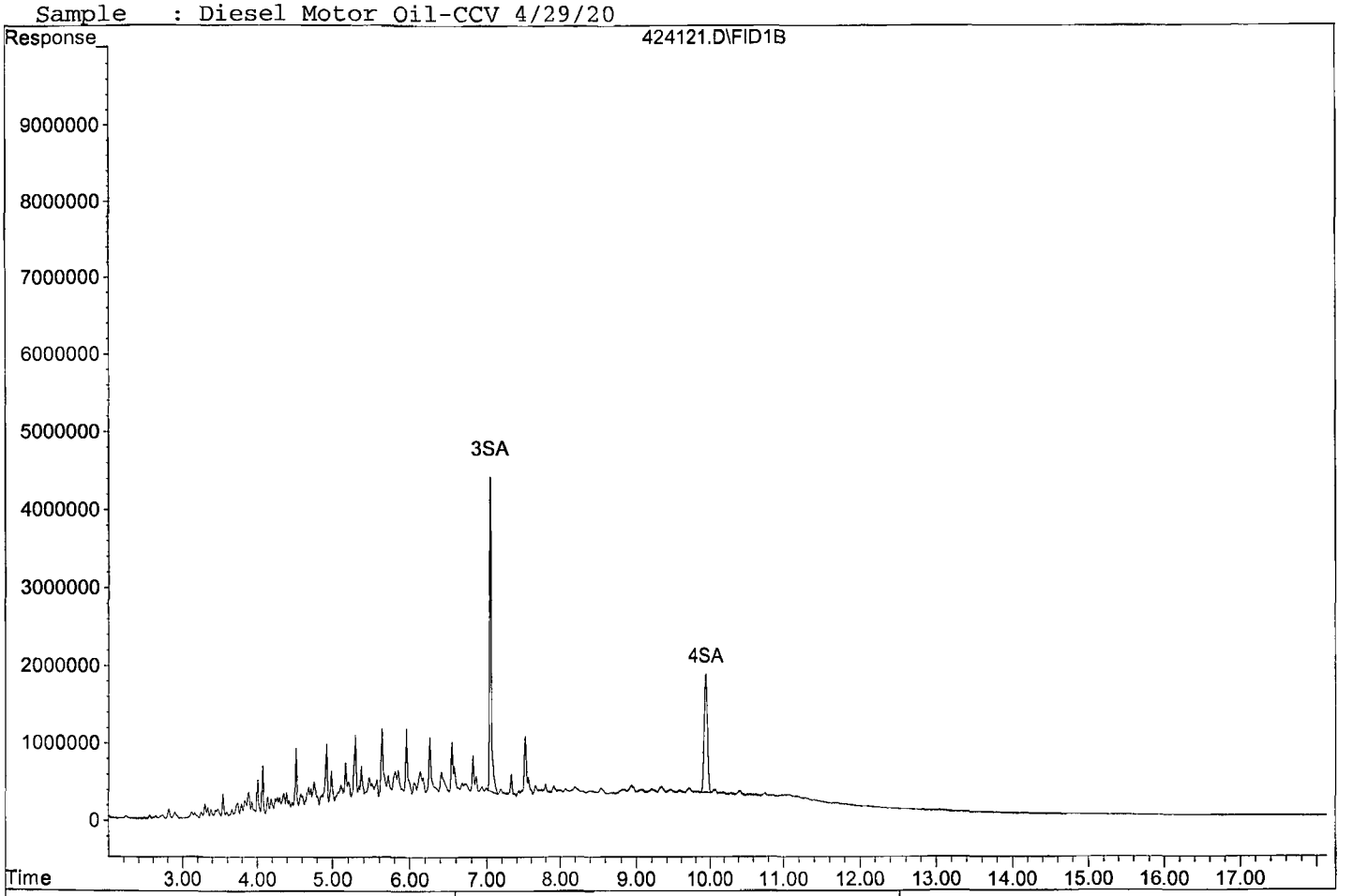
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

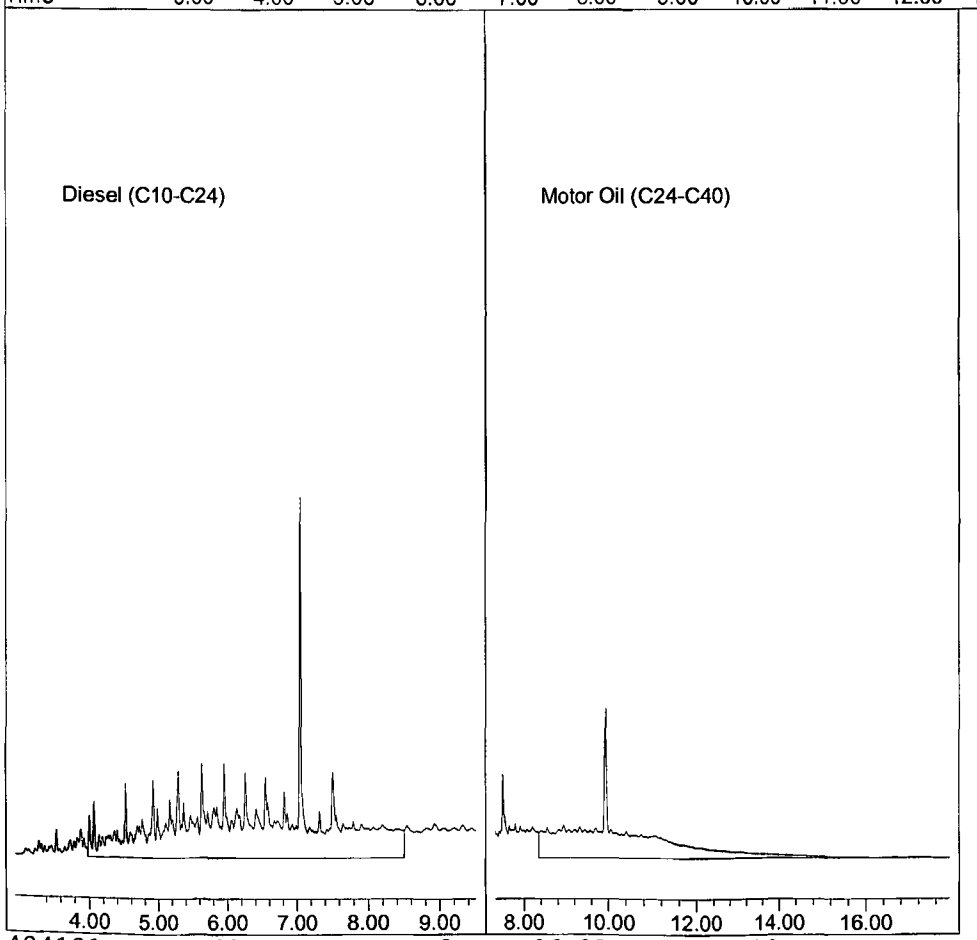
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	64105191	12.767 ppb
Surrogate Spike 30.000	Recovery =		42.56%
4) SA Octacosane(S)	9.93	48065454	13.762 ppb
Surrogate Spike 30.000	Recovery =		45.87%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1084393320	282.746 ppb
2) HBTM Motor Oil (C24-C40)	12.60	728506299	247.053 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424121.D
Sample : Diesel Motor Oil-CCV 4/29/20





TPH Extractables
DEC0317

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 03/17/20
Matrix: Water Instrument: Apollo

Initials: SS/AV

317002 D 317003.D 317004.D 317005.D 317006.D 317007.D

		Compound	1	2	3	4	5	6					Avg	%RSD	Type	r^2	Q
1	SC	Decanoic Acid(S)	1325318	1449828	1357030	1682528	1897028	1689607					1566890	14	SC		
2																	
3																	
4																	
5																	
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0.4106

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317002.D Vial: 2
Acq On : 3-17-20 8:14:08 Operator: SS
Sample : Decanoic Acid-1 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

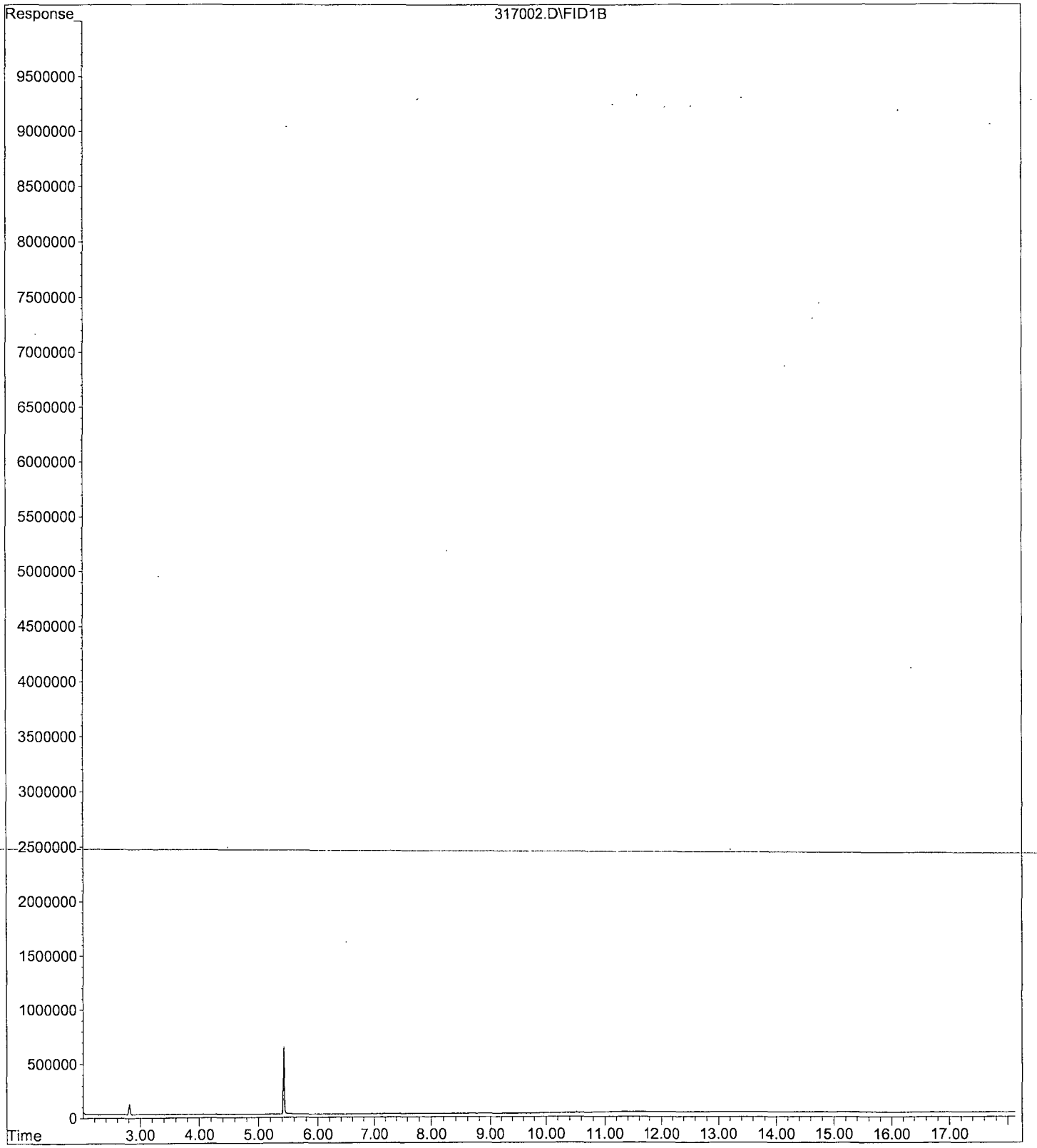
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.43	7951908	2.537 ppb
Surrogate Spike 24.000	Recovery =		10.57%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317002.D
Operator : SS
Acquired : 3-17-20 8:14:08 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-1 3/10/20
Misc Info : water
Vial Number: 2



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317003.D Vial: 3
Acq On : 3-17-20 8:36:27 Operator: SS
Sample : Decanoic Acid-2 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

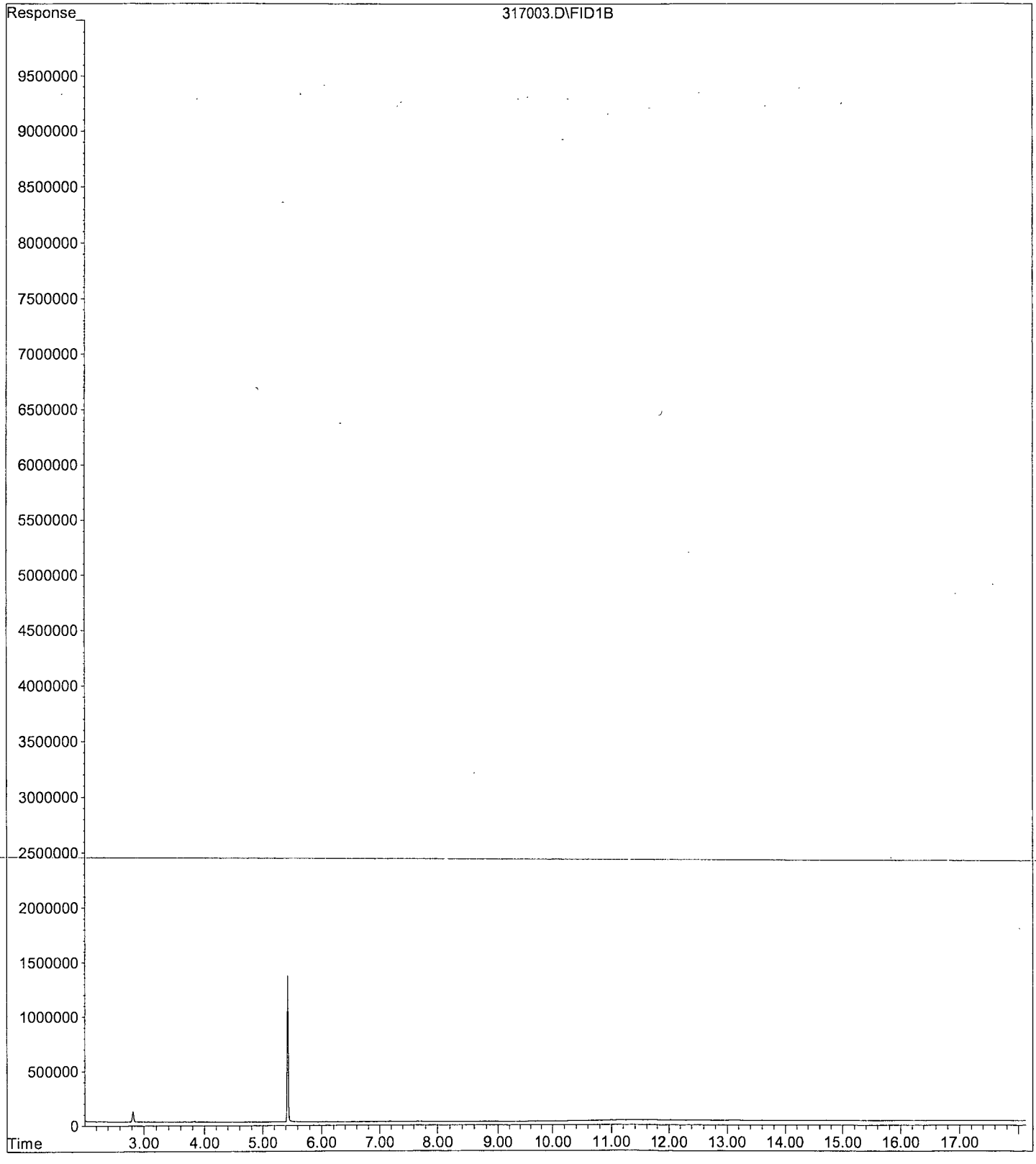
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.44	17397937	5.552 ppb
Surrogate Spike 24.000	Recovery =	23.13%	
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317003.D
Operator : SS
Acquired : 3-17-20 8:36:27 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-2 3/10/20
Misc Info : water
Vial Number: 3



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317004.D Vial: 4
Acq On : 3-17-20 8:58:53 Operator: SS
Sample : Decanoic Acid-3 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

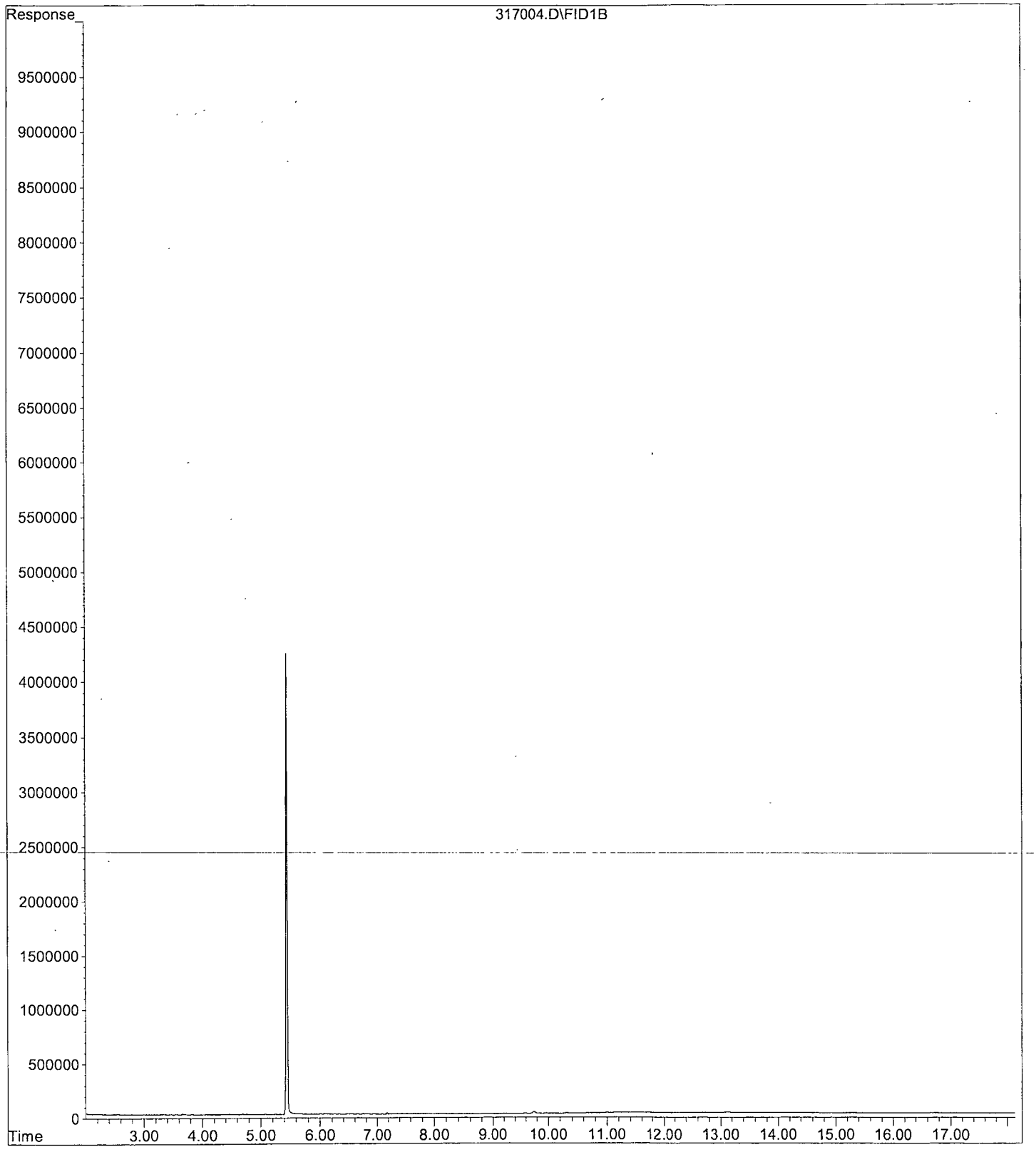
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.45	65137449	20.786 ppb
Surrogate Spike 24.000		Recovery =	86.61%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317004.D
Operator : SS
Acquired : 3-17-20 8:58:53 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-3 3/10/20
Misc Info : water
Vial Number: 4



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317005.D Vial: 5
Acq On : 3-17-20 9:21:15 Operator: SS
Sample : Decanoic Acid-4 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

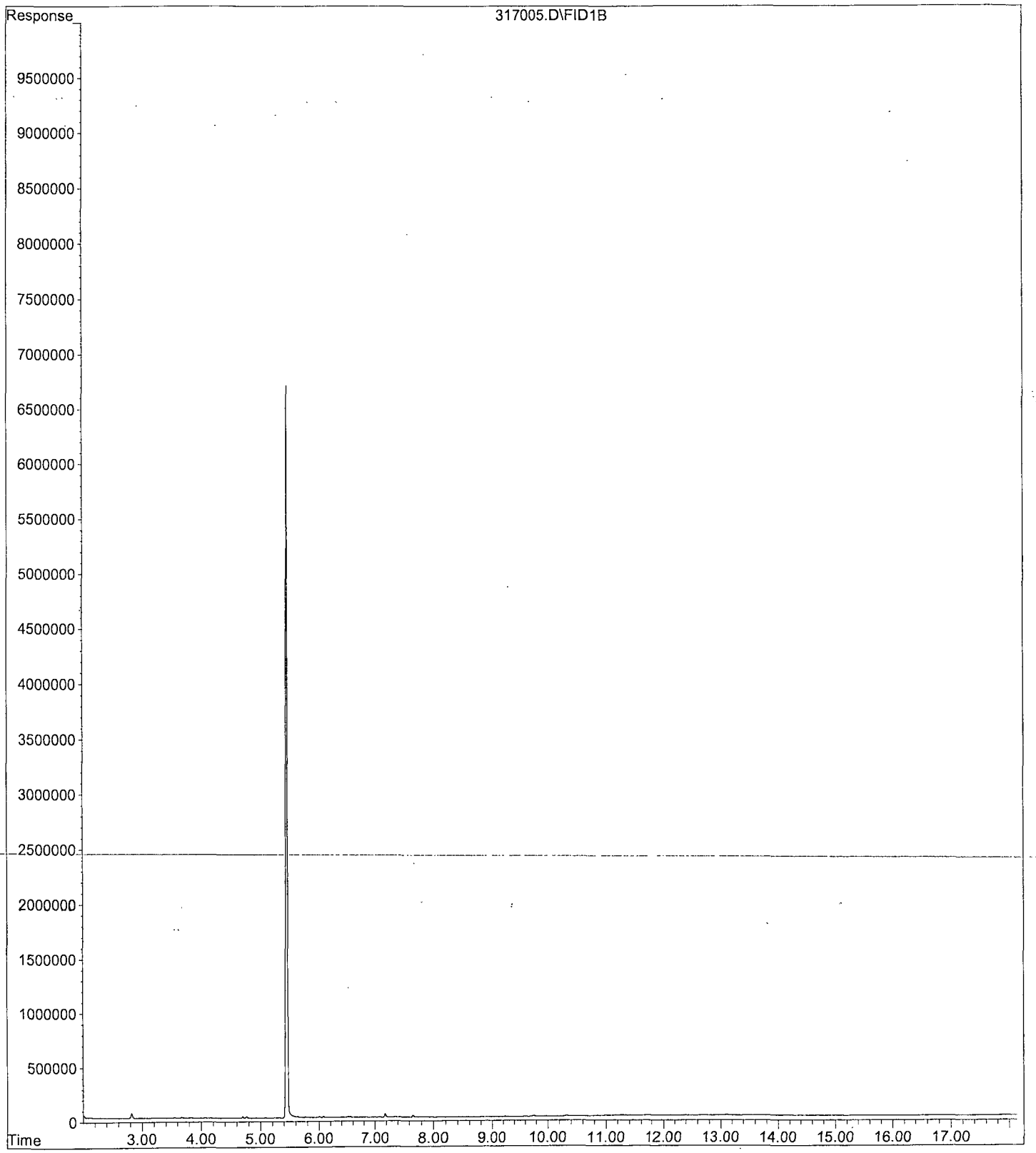
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.46	121142045	38.657 ppb
Surrogate Spike 24.000		Recovery =	161.07%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317005.D
Operator : SS
Acquired : 3-17-20 9:21:15 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-4 3/10/20
Misc Info : water
Vial Number: 5



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317006.D Vial: 6
Acq On : 3-17-20 9:43:41 Operator: SS
Sample : Decanoic Acid-5 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

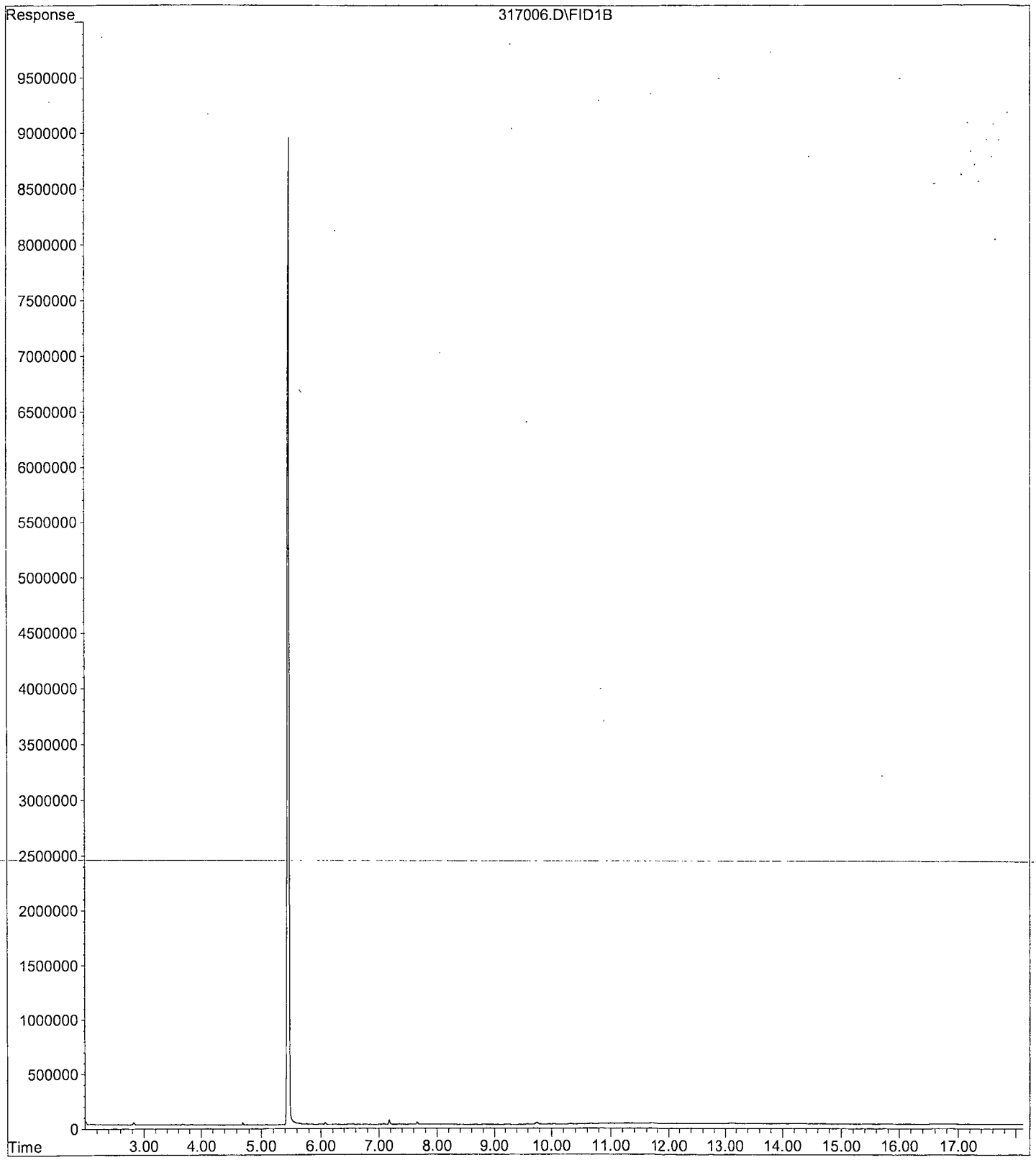
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.47	182114736	58.113 ppb
Surrogate Spike 24.000		Recovery =	242.14%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317006.D
Operator : SS
Acquired : 3-17-20 9:43:41 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-5 3/10/20
Misc Info : water
Vial Number: 6



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200317\317007.D Vial: 7
Acq On : 3-17-20 10:06:06 Operator: SS
Sample : Decanoic Acid-6 3/10/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: Mar 17 10:51 2020 Quant Results File: DEC0317.RES

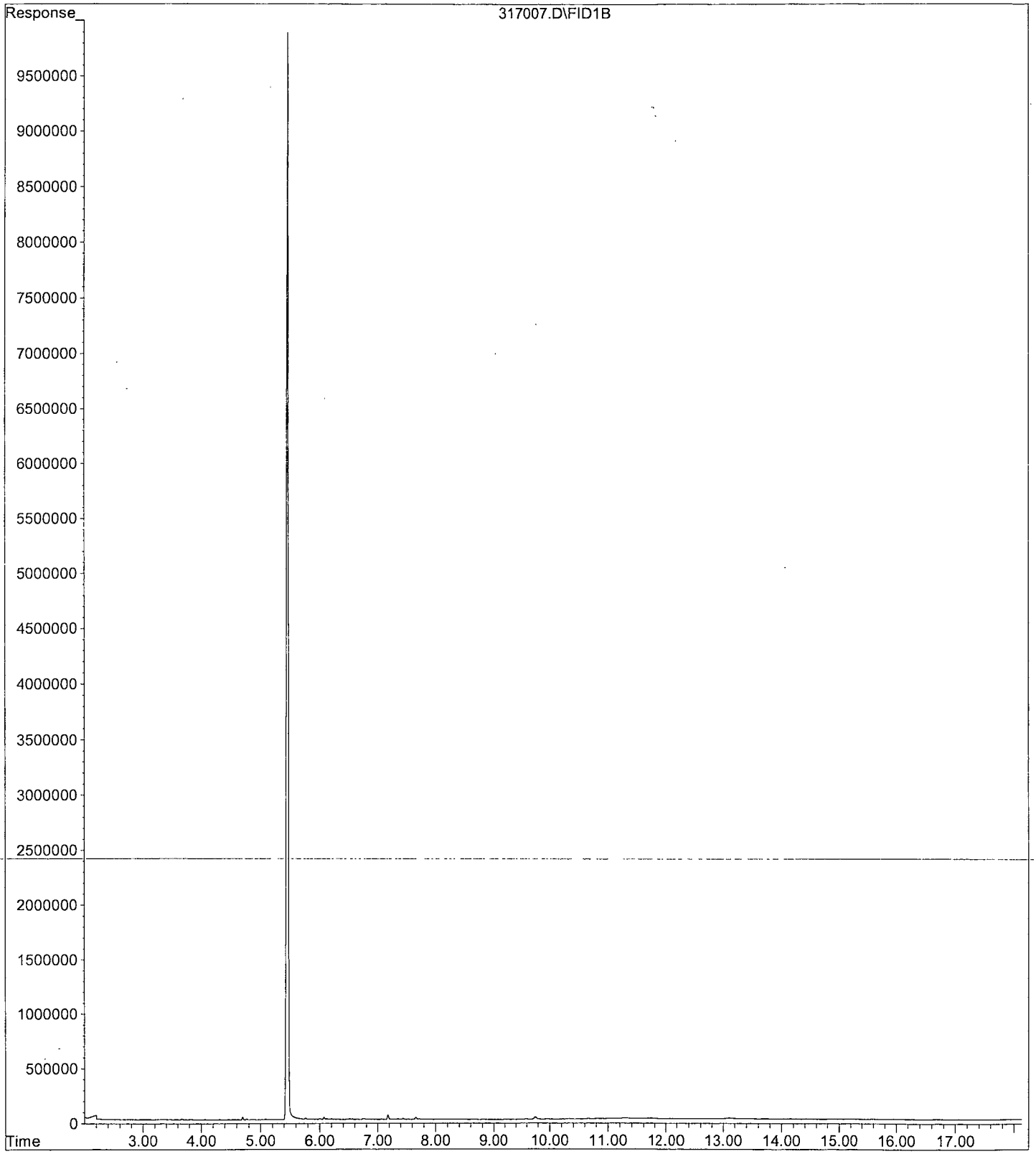
Method : G:\APOLLO\DATA\2019\191115\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.47	202752841	64.699 ppb
Surrogate Spike 24.000		Recovery =	269.58%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200317\317007.D
Operator : SS
Acquired : 3-17-20 10:06:06 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-6 3/10/20
Misc Info : water
Vial Number: 7



TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/07/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424180.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2106300	9.8	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1414190	4.1	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2494060	0.66	SA	
4	SA	Octacosane(S)	1746260	1881780	7.8	SA	
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		Average			5.6		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424180.D Vial: 80
Acq On : 5-7-20 14:35:12 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 7 14:56 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

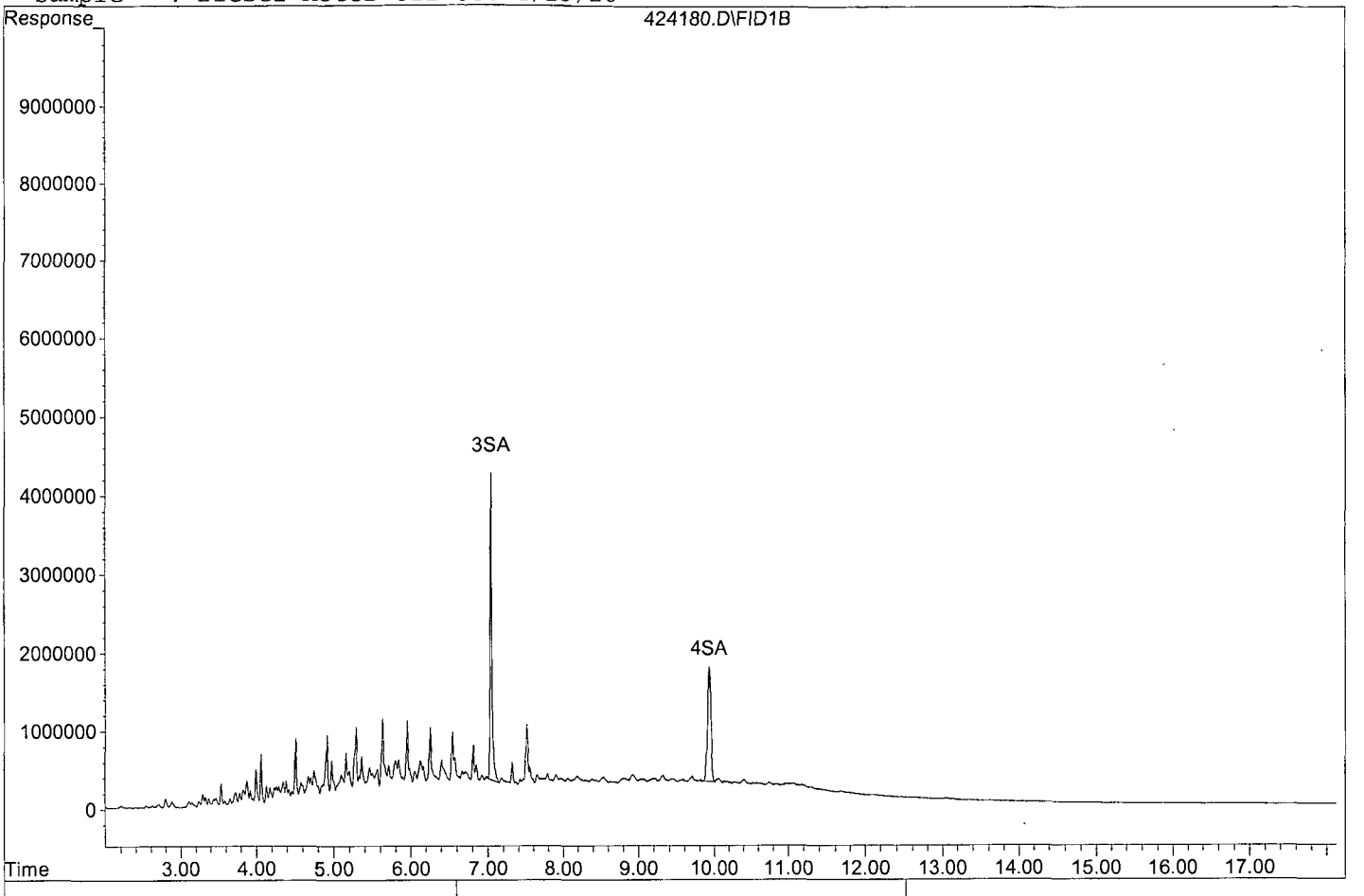
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

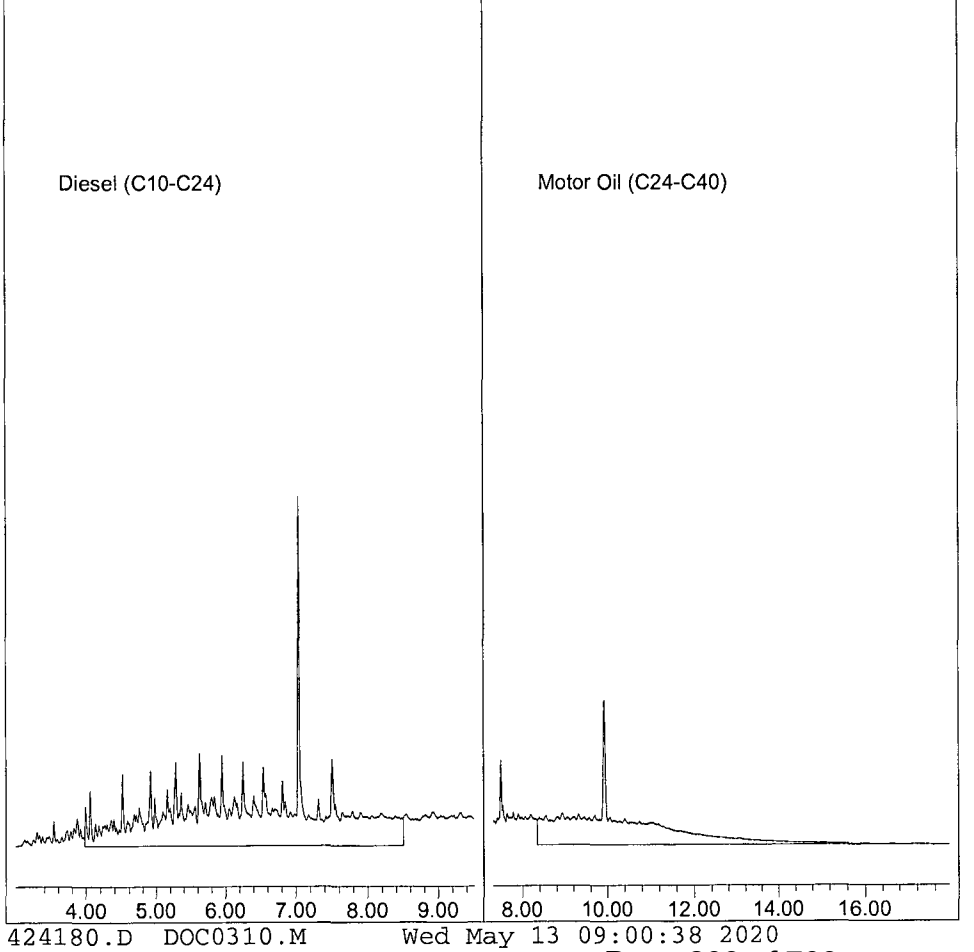
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	62351386	12.418 ppb
Surrogate Spike 30.000	Recovery =		41.39%
4) SA Octacosane(S)	9.93	47044435	13.470 ppb
Surrogate Spike 30.000	Recovery =		44.90%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1053149626	274.599 ppb
2) HBTM Motor Oil (C24-C40)	12.60	707097237	239.792 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424180.D
Sample : Diesel Motor Oil-CCV 4/29/20





TPH Extractables
DEC0317

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/07/20
Instrument: Apollo
Initial Cal. Date: 03/17/20
Data File: 424181.D

		Compound	MEAN	CCRF	%D	%Drift	
1	SC	Decanoic Acid(S)	1566890	1557620	0.59	SC	
2							
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39							
40							
		Average			0.6		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424181.D Vial: 81
Acq On : 5-7-20 15:24:14 Operator: SS
Sample : Decanoic Acid-CCV 3/20/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 9:11 2020 Quant Results File: DEC0317.RES

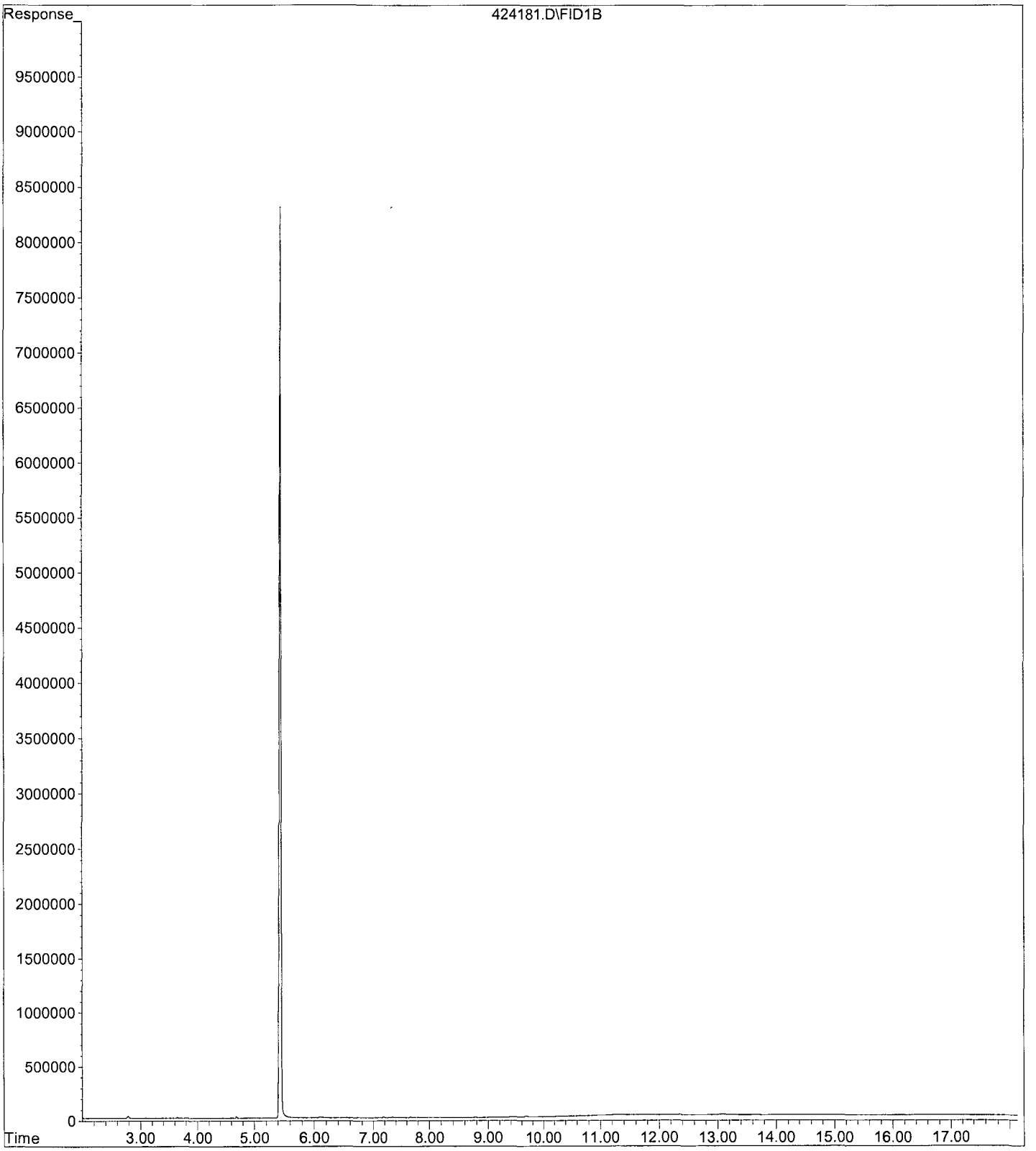
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.45	149531458	47.716 ppb
Surrogate Spike 24.000		Recovery =	198.82%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200424\424181.D
Operator : SS
Acquired : 5-7-20 15:24:14 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-CCV 3/20/20
Misc Info : water
Vial Number: 81



TPH Extractables
DEC0317

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/07/20
Instrument: Apollo
Initial Cal. Date: 03/17/20
Data File: 424192.D

		Compound	MEAN	CCRF	%D	%Drift	
1	SC	Decanoic Acid(S)	1566890	1603480	2.3	SC	
2							
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40							
		Average			2.3		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424192.D Vial: 92
Acq On : 5-7-20 19:49:42 Operator: SS
Sample : Decanoic Acid-CCV 3/20/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 9:13 2020 Quant Results File: DEC0317.RES

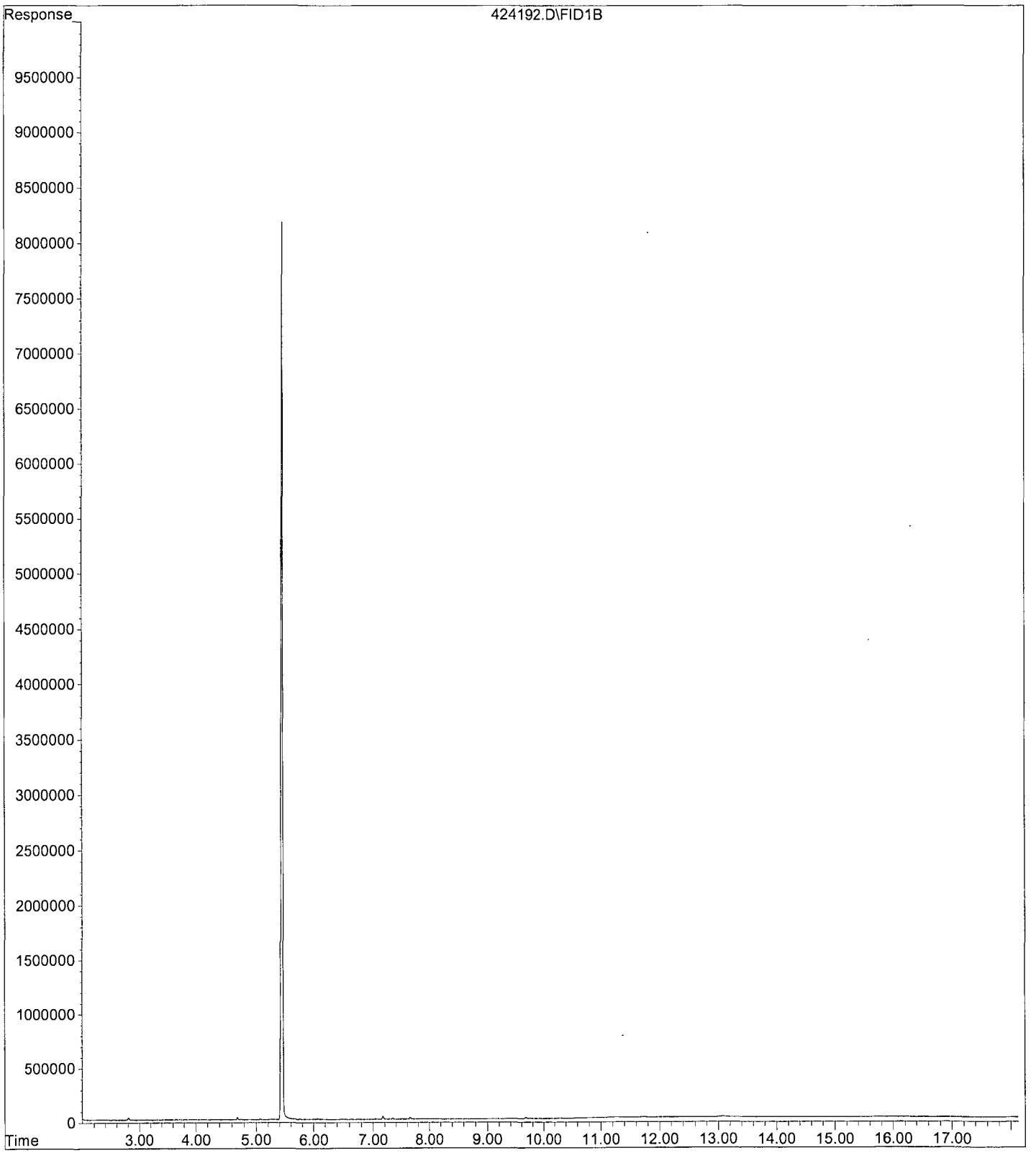
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.46	153933665	49.121 ppb
Surrogate Spike 24.000		Recovery =	204.67%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200424\424192.D
Operator : SS
Acquired : 5-7-20 19:49:42 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-CCV 3/20/20
Misc Info : water
Vial Number: 92



TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/07/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424193.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2104510	9.7	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1416120	4.0	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2495190	0.61	SA	
4	SA	Octacosane(S)	1746260	1863570	6.7	SA	
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		Average			5.3		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424193.D Vial: 93
Acq On : 5-7-20 20:12:24 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

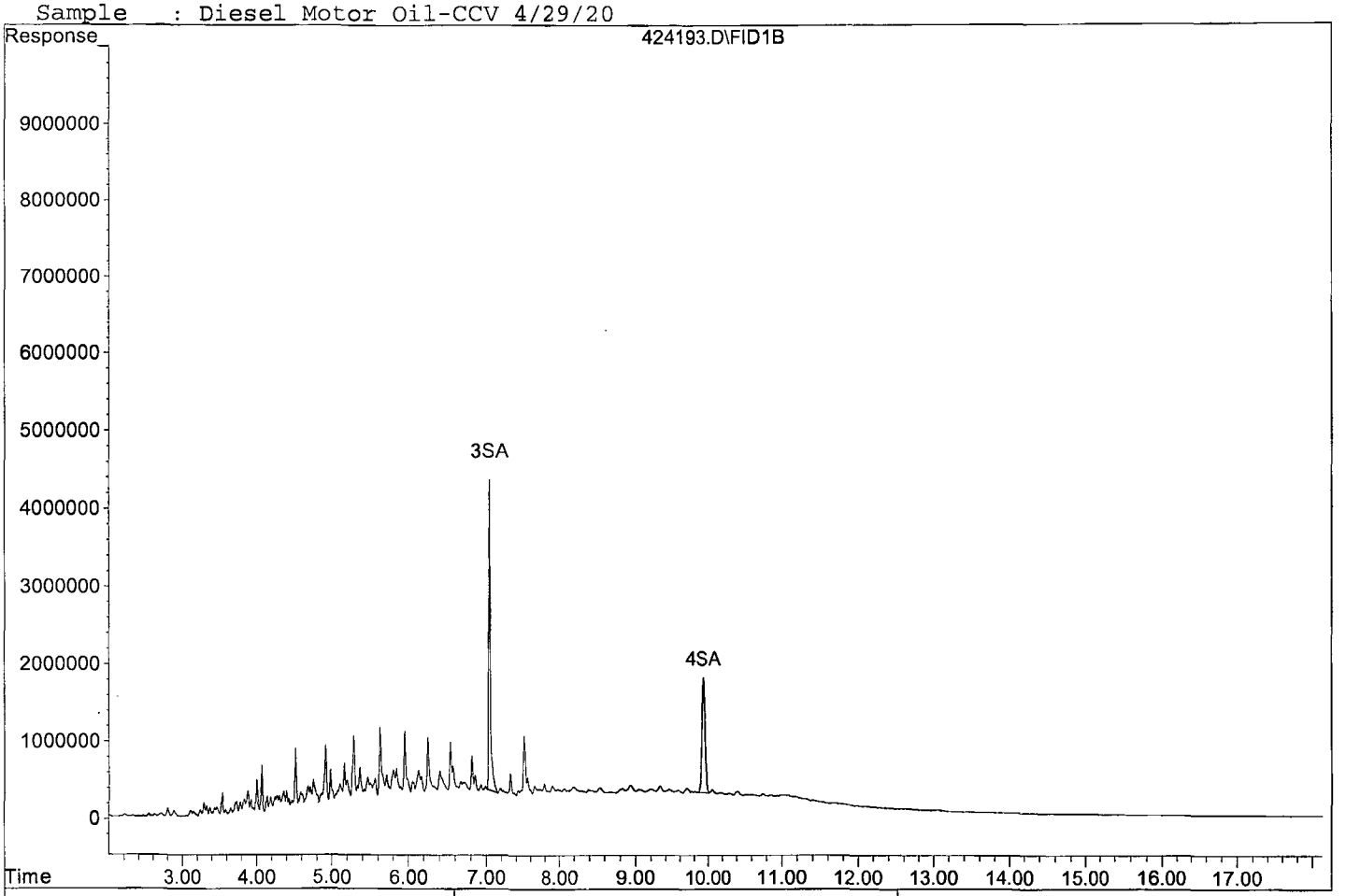
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

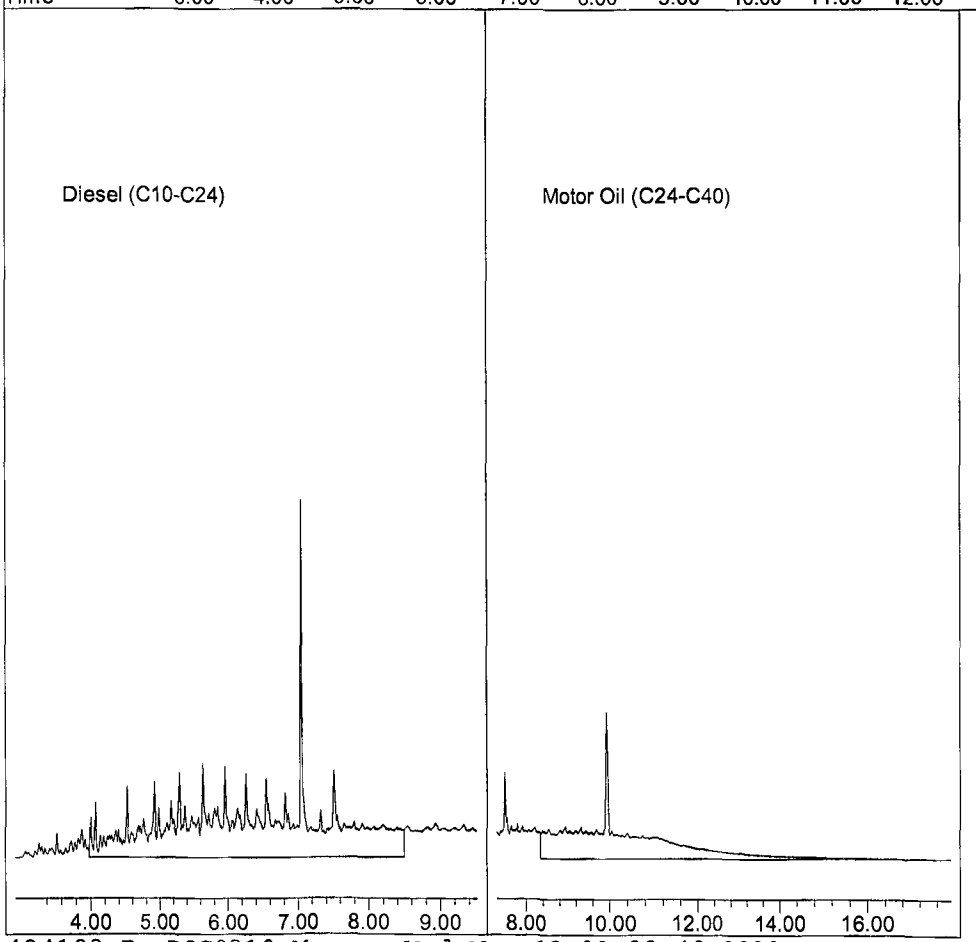
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	62379860	12.424 ppb
Surrogate Spike 30.000		Recovery =	41.41%
4) SA Octacosane(S)	9.93	46589171	13.340 ppb
Surrogate Spike 30.000		Recovery =	44.47%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1052255779	274.366 ppb
2) HBTM Motor Oil (C24-C40)	12.60	708061893	240.119 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424193.D
Sample : Diesel Motor Oil-CCV 4/29/20





424193.D DOC0310.M Wed May 13 09:00:49 2020

TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/12/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424254.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2065950	7.7	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1398630	5.1	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2441400	2.8	SA	
4	SA	Octacosane(S)	1746260	1851470	6.0	SA	
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40							
		Average			5.4		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424254.D Vial: 54
Acq On : 5-12-20 19:00:27 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

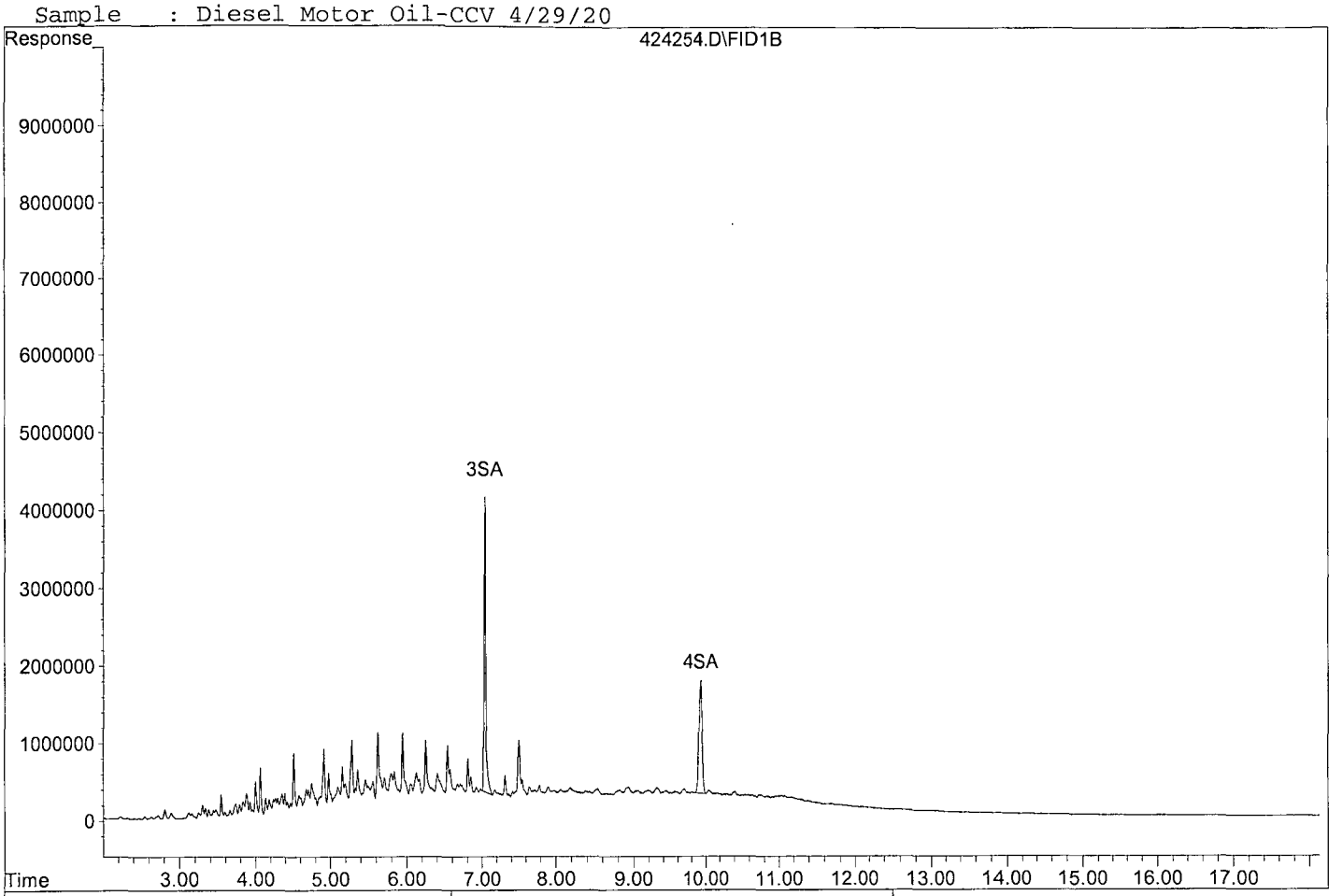
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

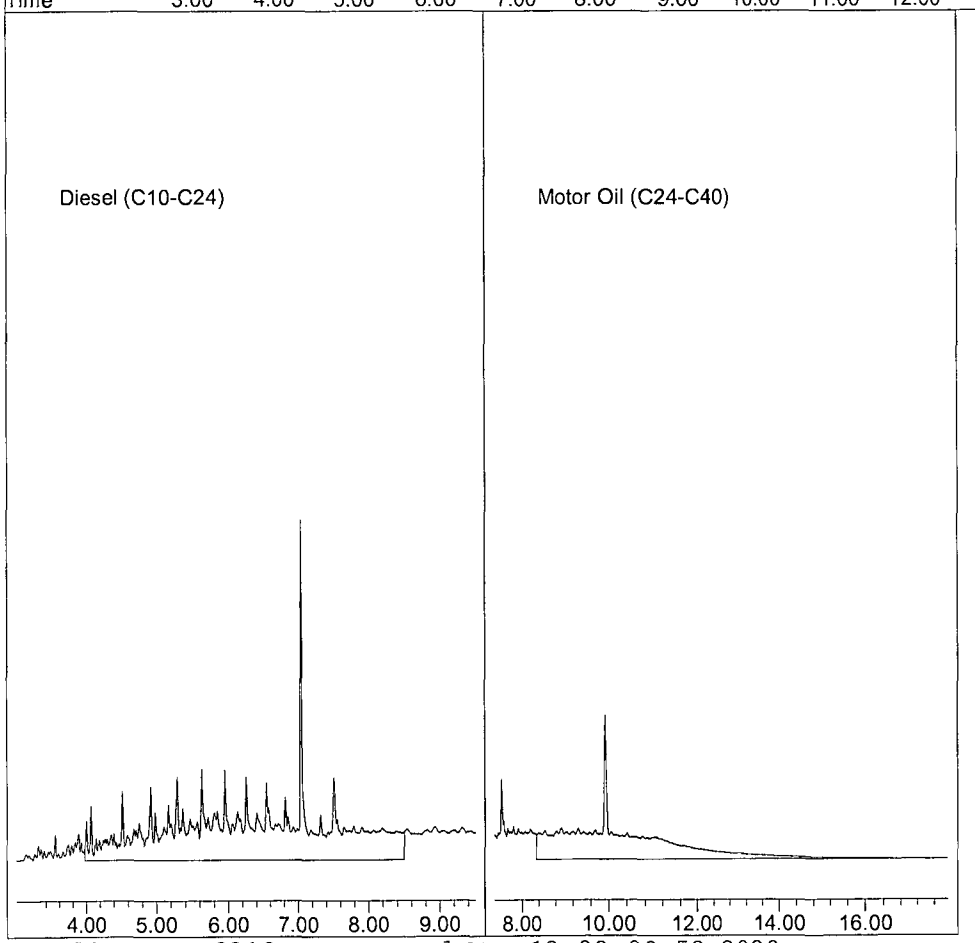
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	61035065	12.156 ppb
Surrogate Spike 30.000		Recovery =	40.52%
4) SA Octacosane(S)	9.93	46286714	13.253 ppb
Surrogate Spike 30.000		Recovery =	44.18%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1032974672	269.339 ppb
2) HBTM Motor Oil (C24-C40)	12.60	699317054	237.154 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424254.D
Sample : Diesel Motor Oil-CCV 4/29/20





TPH Extractables
DEC0317

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/12/20
Instrument: Apollo
Initial Cal. Date: 03/17/20
Data File: 424255.D

		Compound	MEAN	CCRF	%D	%Drift	
1	SC	Decanoic Acid(S)	1566890	1819110	16	SC	
2							
3							
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		Average			16.0		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424255.D Vial: 55
Acq On : 5-12-20 19:23:05 Operator: SS
Sample : Decanoic Acid-CCV 3/20/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 9:15 2020 Quant Results File: DEC0317.RES

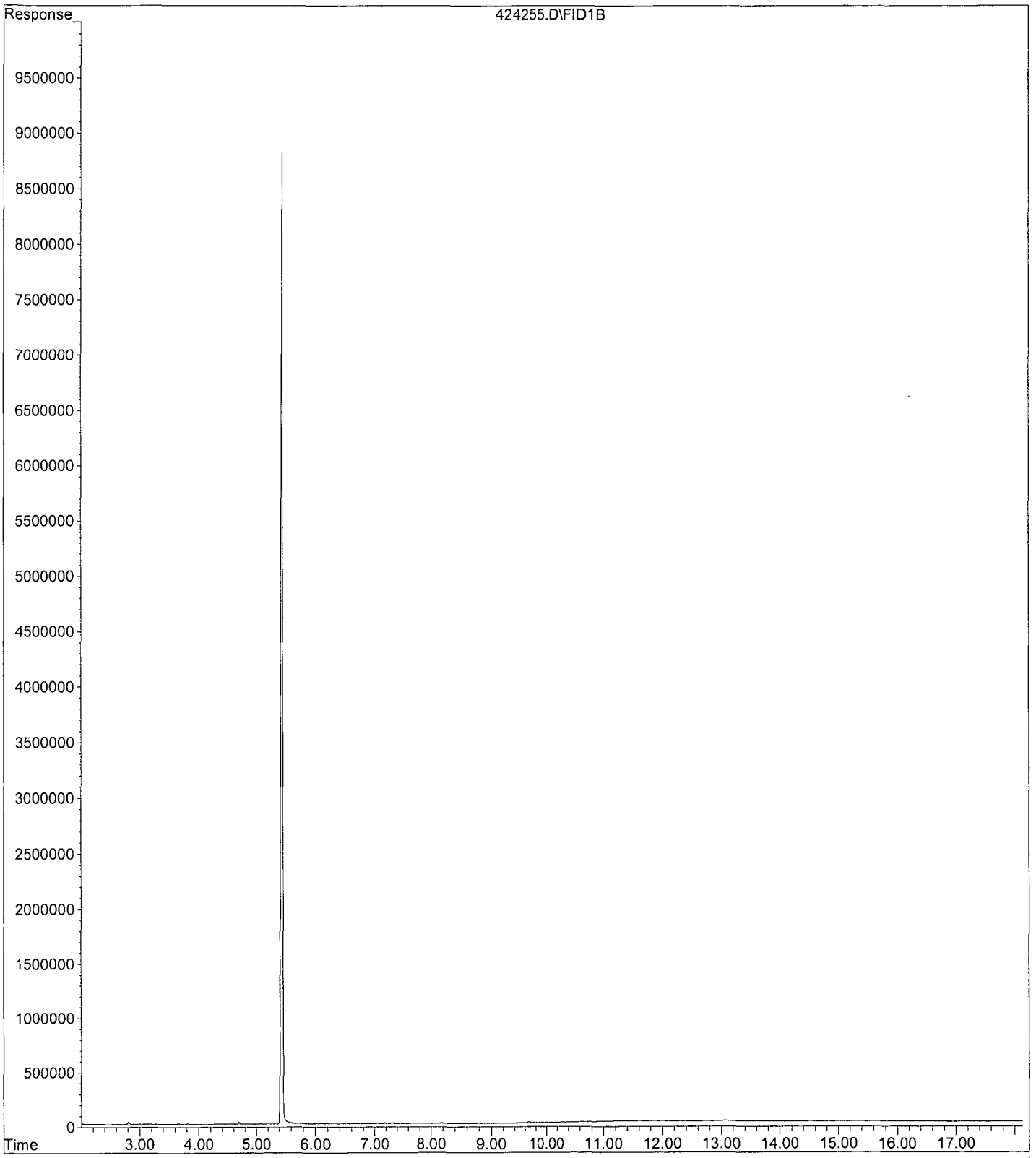
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.46	174634389	55.726 ppb
Surrogate Spike 24.000	Recovery =		232.19%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200424\424255.D
Operator : SS
Acquired : 5-12-20 19:23:05 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-CCV 3/20/20
Misc Info : water
Vial Number: 55



TPH Extractables
DOC0310

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/12/20
Instrument: Apollo
Initial Cal. Date: 03/10/20
Data File: 424266.D

		Compound	MEAN	CCRF	%D	%Drift	
1	HATM	Diesel (C10-C24)	1917610	2204890	15	HATM	
2	HBTM	Motor Oil (C24-C40)	1474400	1491910	1.2	HBTM	
3	SA	Ortho-Terphenyl(S)	2510520	2615440	4.2	SA	
4	SA	Octacosane(S)	1746260	1954290	12	SA	
5							
6							
7							
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		Average			8.1		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424266.D Vial: 66
Acq On : 5-12-20 23:32:39 Operator: SS
Sample : Diesel Motor Oil-CCV 4/29/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

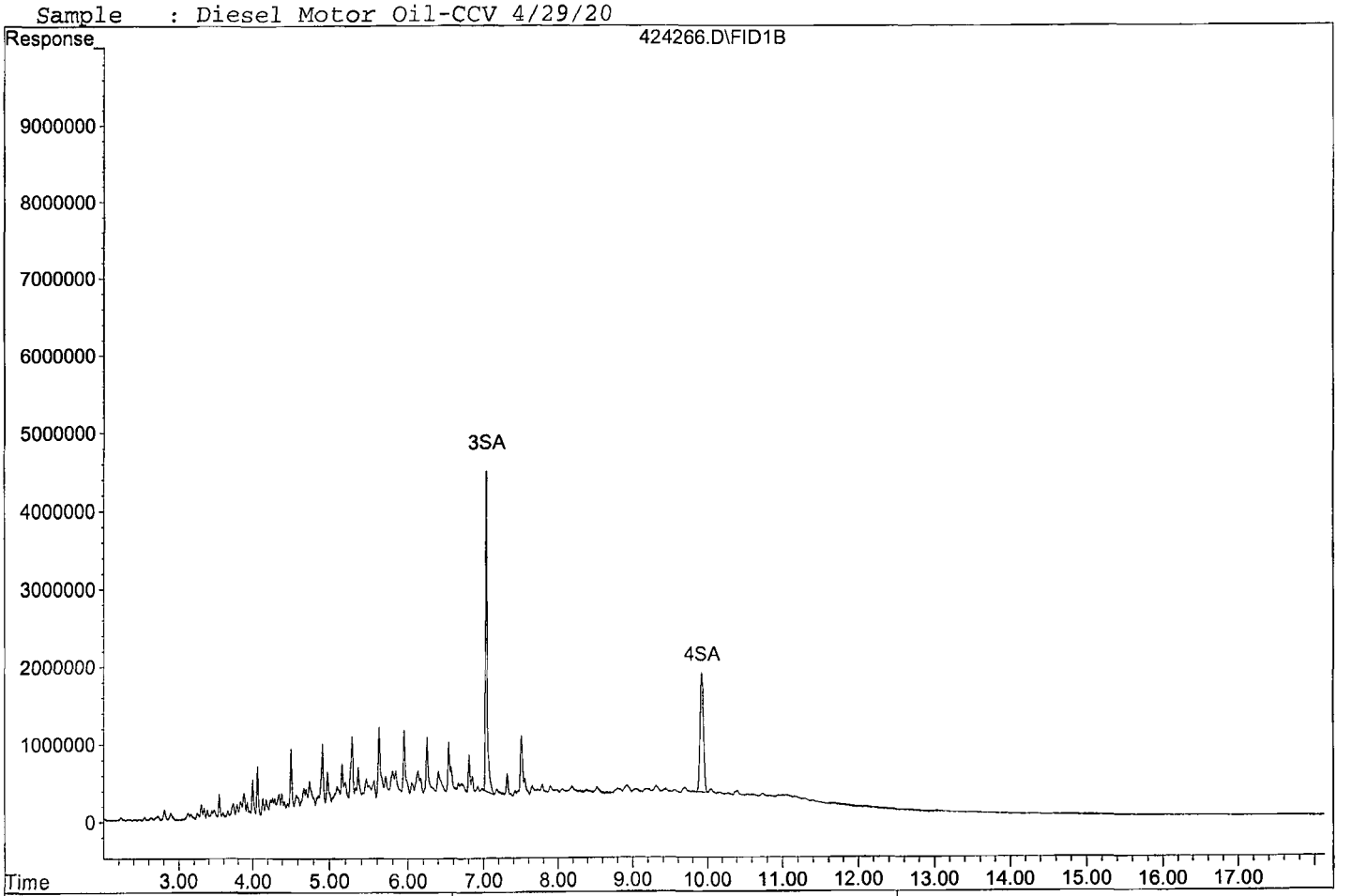
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

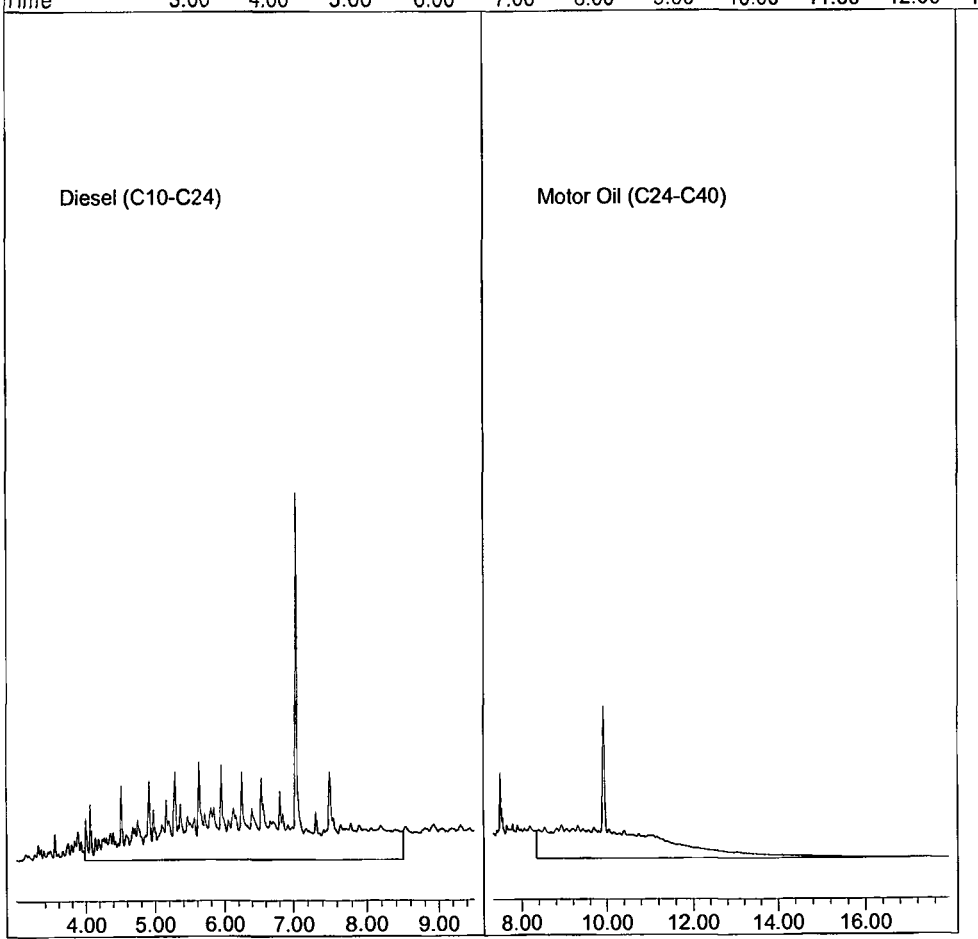
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	65385992	13.022 ppb
Surrogate Spike 30.000		Recovery =	43.41%
4) SA Octacosane(S)	9.92	48857258	13.989 ppb
Surrogate Spike 30.000		Recovery =	46.63%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1102443130	287.452 ppb
2) HBTM Motor Oil (C24-C40)	12.60	745952535	252.969 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424266.D
Sample : Diesel Motor Oil-CCV 4/29/20





424266.D DOC0310.M Wed May 13 09:01:00 2020

TPH Extractables
DEC0317

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: Water

SDG No:
Date Analyzed: 05/12/20
Instrument: Apollo
Initial Cal. Date: 03/17/20
Data File: 424267.D

		Compound	MEAN	CCRF	%D	%Drift	
1	SC	Decanoic Acid(S)	1566890	1816440	16	SC	
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			16.0		

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424267.D Vial: 67
Acq On : 5-12-20 23:55:17 Operator: SS
Sample : Decanoic Acid-CCV 3/20/20 Inst : Apollo
Misc : water Multiplr: 1.00
IntFile : events.e
Quant Time: May 13 9:16 2020 Quant Results File: DEC0317.RES

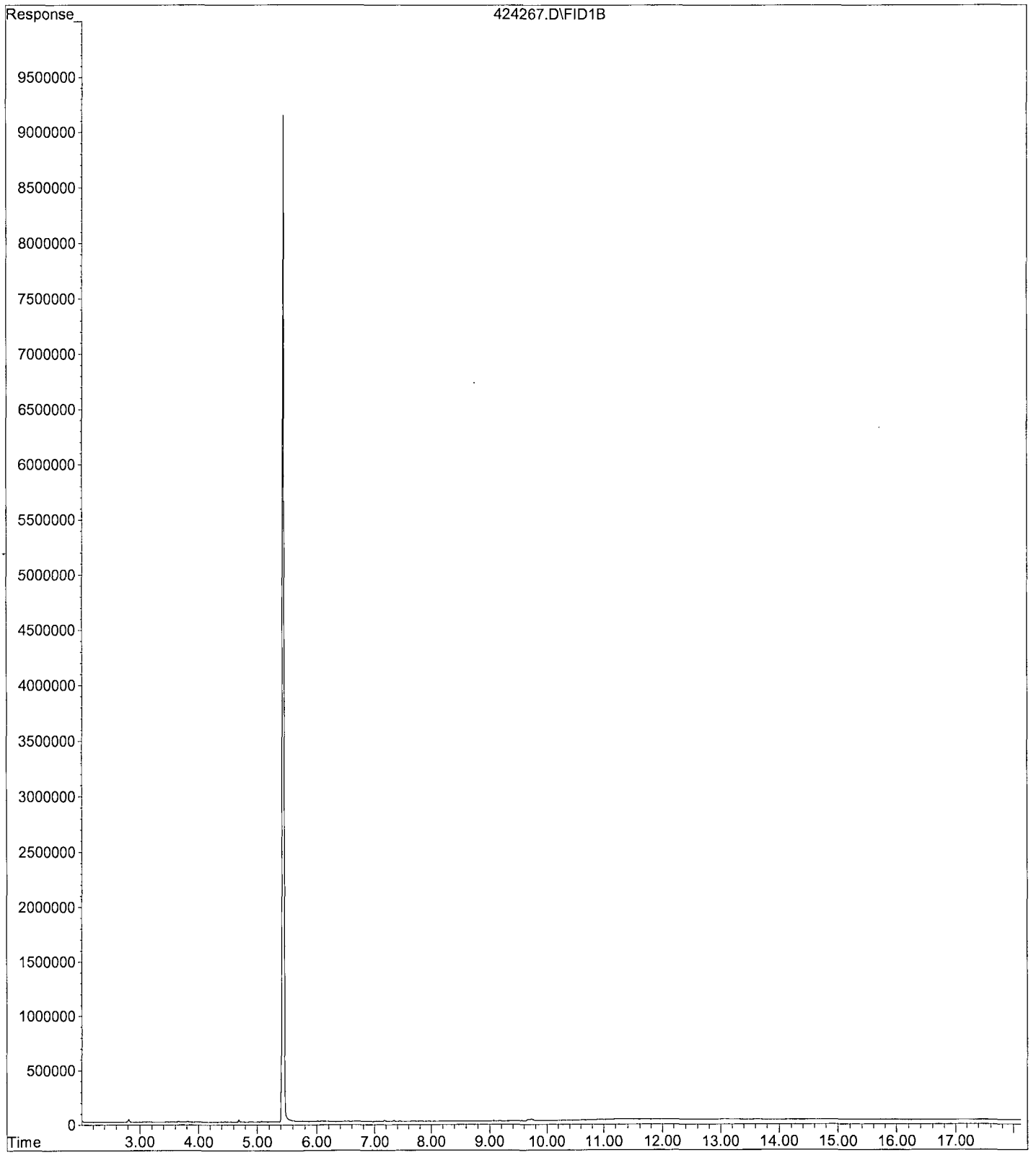
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	5.46	174378129	55.645 ppb
Surrogate Spike 24.000		Recovery =	231.85%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

File : G:\APOLLO\DATA\200424\424267.D
Operator : SS
Acquired : 5-12-20 23:55:17 using AcqMethod TPHSN.M
Instrument : Apollo
Sample Name: Decanoic Acid-CCV 3/20/20
Misc Info : water
Vial Number: 67



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424112.D Vial: 12
Acq On : 5-4-20 21:30:56 Operator: SS
Sample : BA10504W19 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

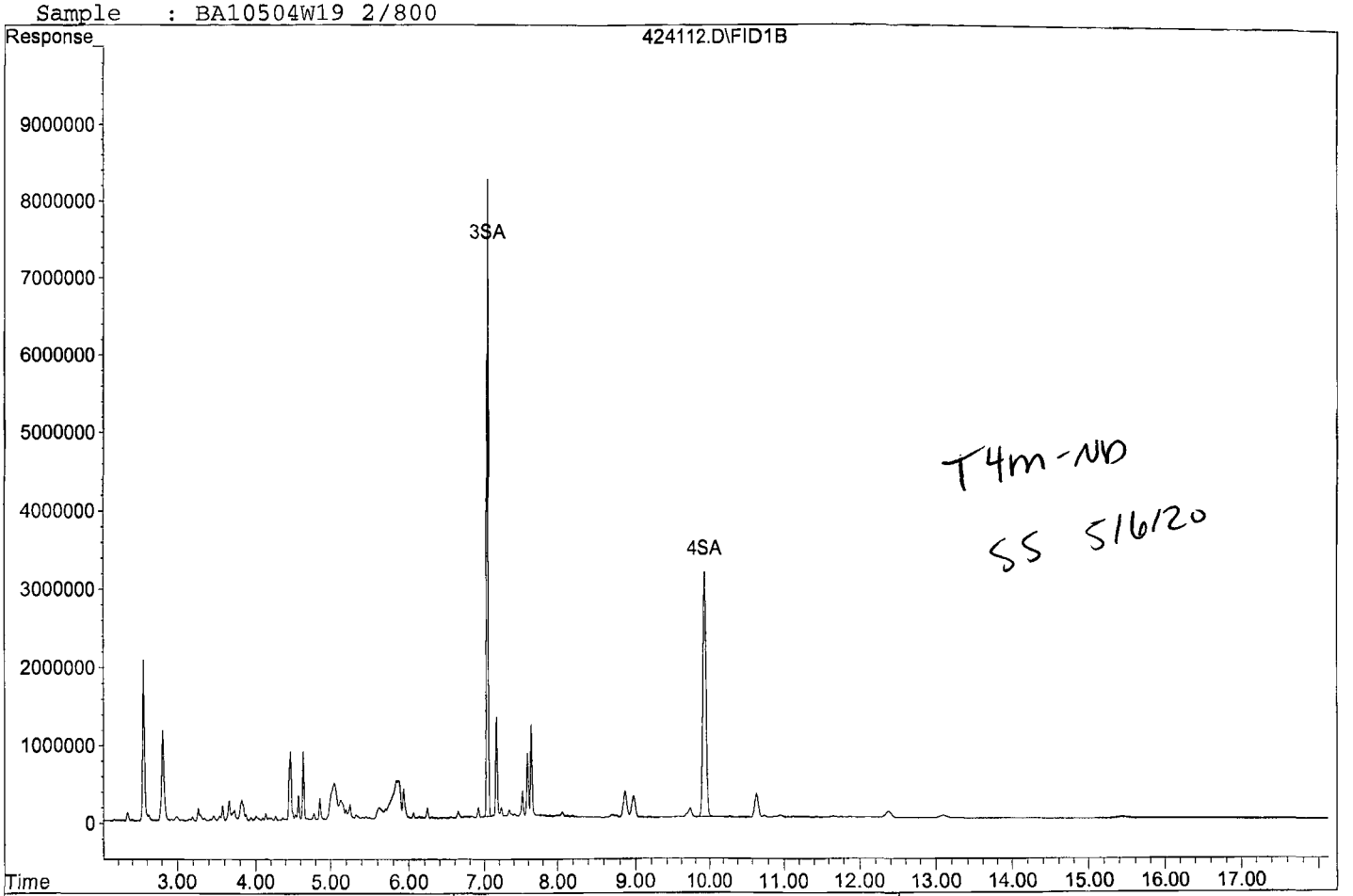
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.05	114300102	56.911	ppb
Surrogate Spike 75.000		Recovery =	75.88%	
4) SA Octacosane(S)	9.94	100363697	71.842	ppb
Surrogate Spike 75.000		Recovery =	95.79%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	315161989	205.439	ppb
2) HBTM Motor Oil (C24-C40)	12.60	104891178	88.927	ppb

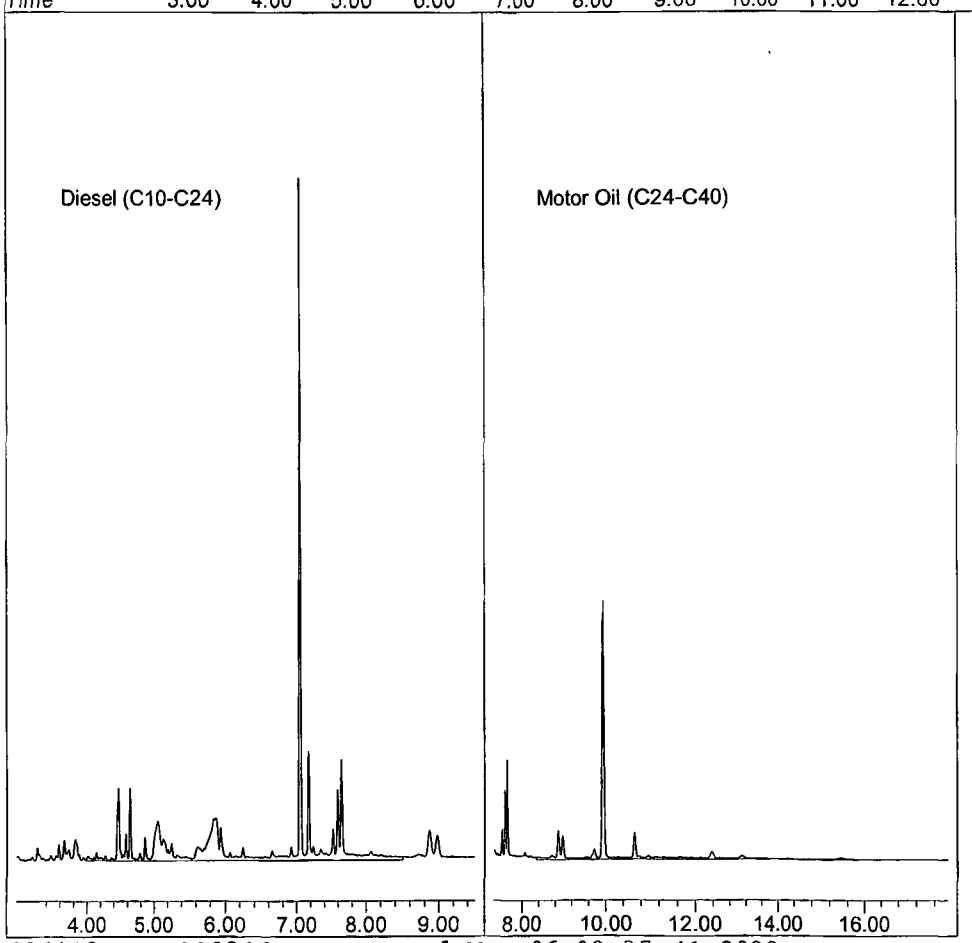
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424112.D
Sample : BA10504W19 2/800



T4m-ND
SS 5/6/20



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424113.D Vial: 13
Acq On : 5-4-20 21:53:42 Operator: SS
Sample : BA10505W14 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

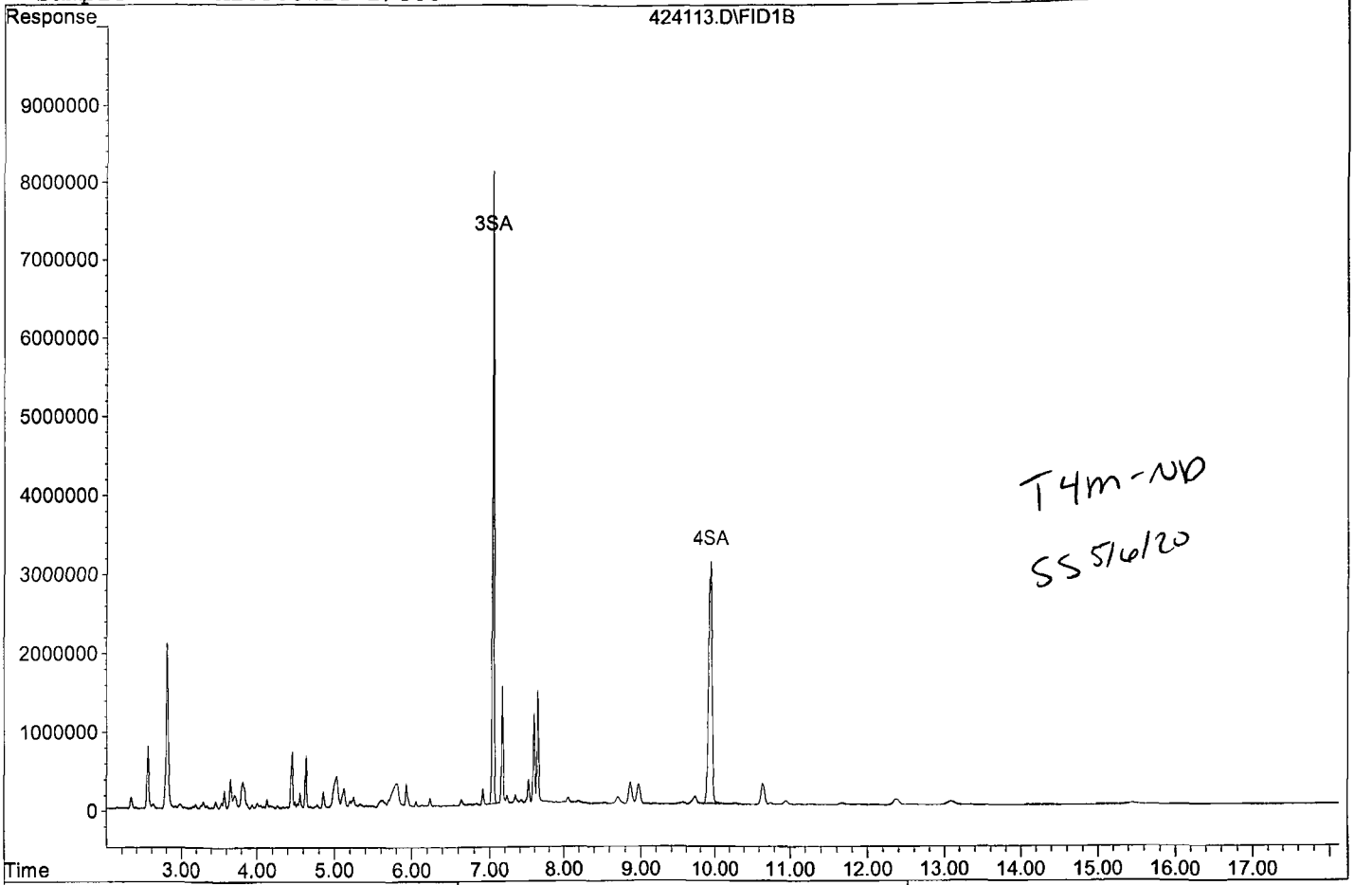
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	114502663	57.011 ppb
Surrogate Spike 75.000		Recovery =	76.01%
4) SA Octacosane(S)	9.93	100828493	72.175 ppb
Surrogate Spike 75.000		Recovery =	96.23%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	276385760	180.163 ppb
2) HBTM Motor Oil (C24-C40)	12.60	117934332	99.985 ppb

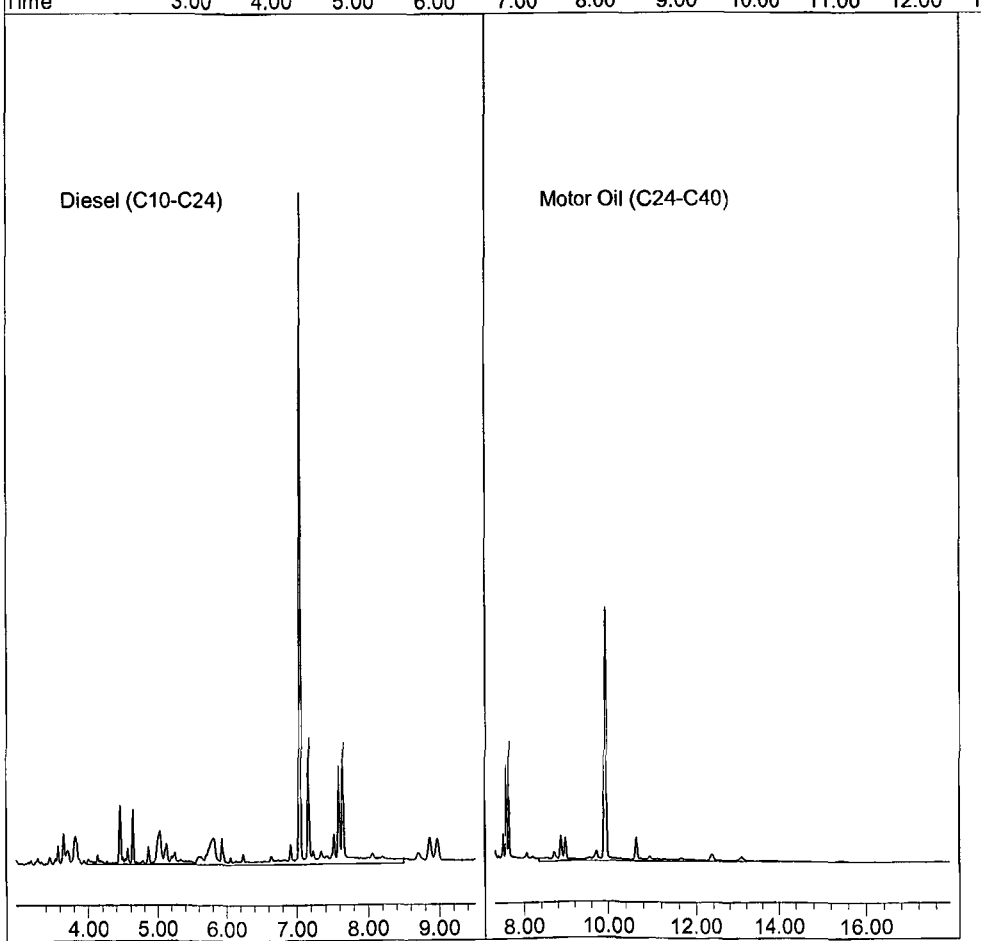
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424113.D
Sample : BA10505W14 2/800



T4m-ND
SS 5/6/20



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424096.D Vial: 96
Acq On : 5-4-20 15:27:53 Operator: SS
Sample : 200430A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:48 2020 Quant Results File: DOC0310.RES

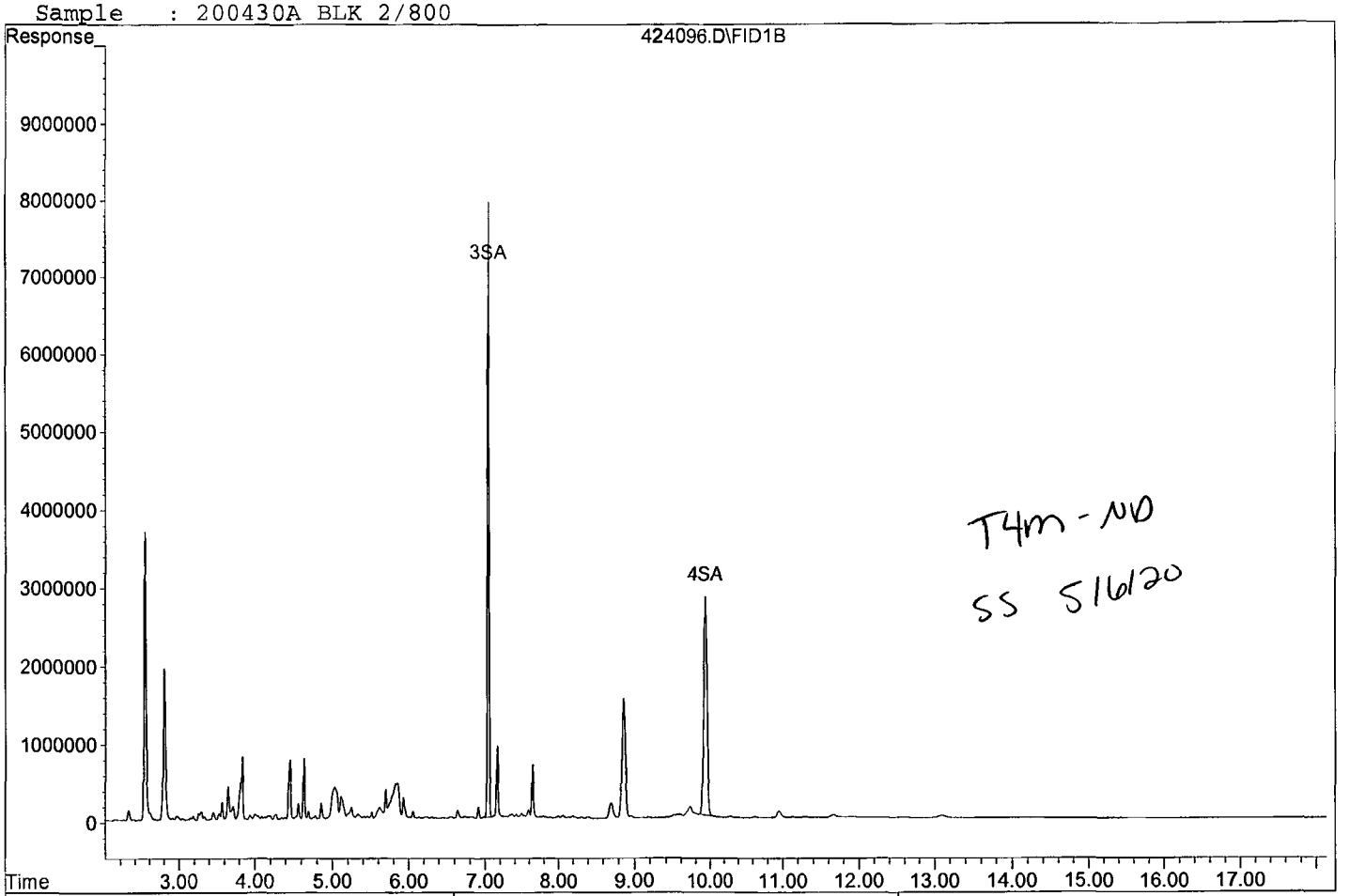
Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

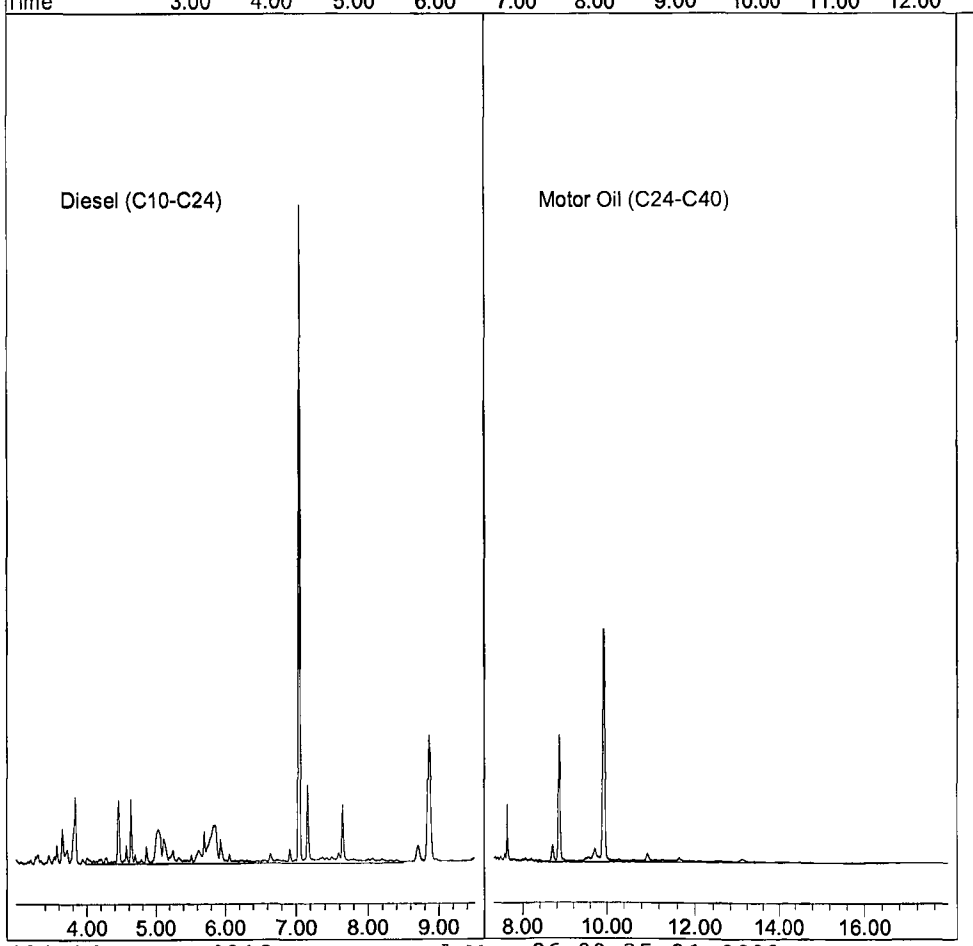
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	110088759	54.814 ppb
Surrogate Spike 75.000	Recovery =		73.09%
4) SA Octacosane(S)	9.93	91199024	65.282 ppb
Surrogate Spike 75.000	Recovery =		87.04%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	231719004	151.047 ppb
2) HBTM Motor Oil (C24-C40)	12.60	131413234	111.413 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424096.D
Sample : 200430A BLK 2/800



T4m - ND
SS 516120



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424097.D Vial: 97
Acq On : 5-4-20 15:50:26 Operator: SS
Sample : 200430A LCS-1 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:47 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

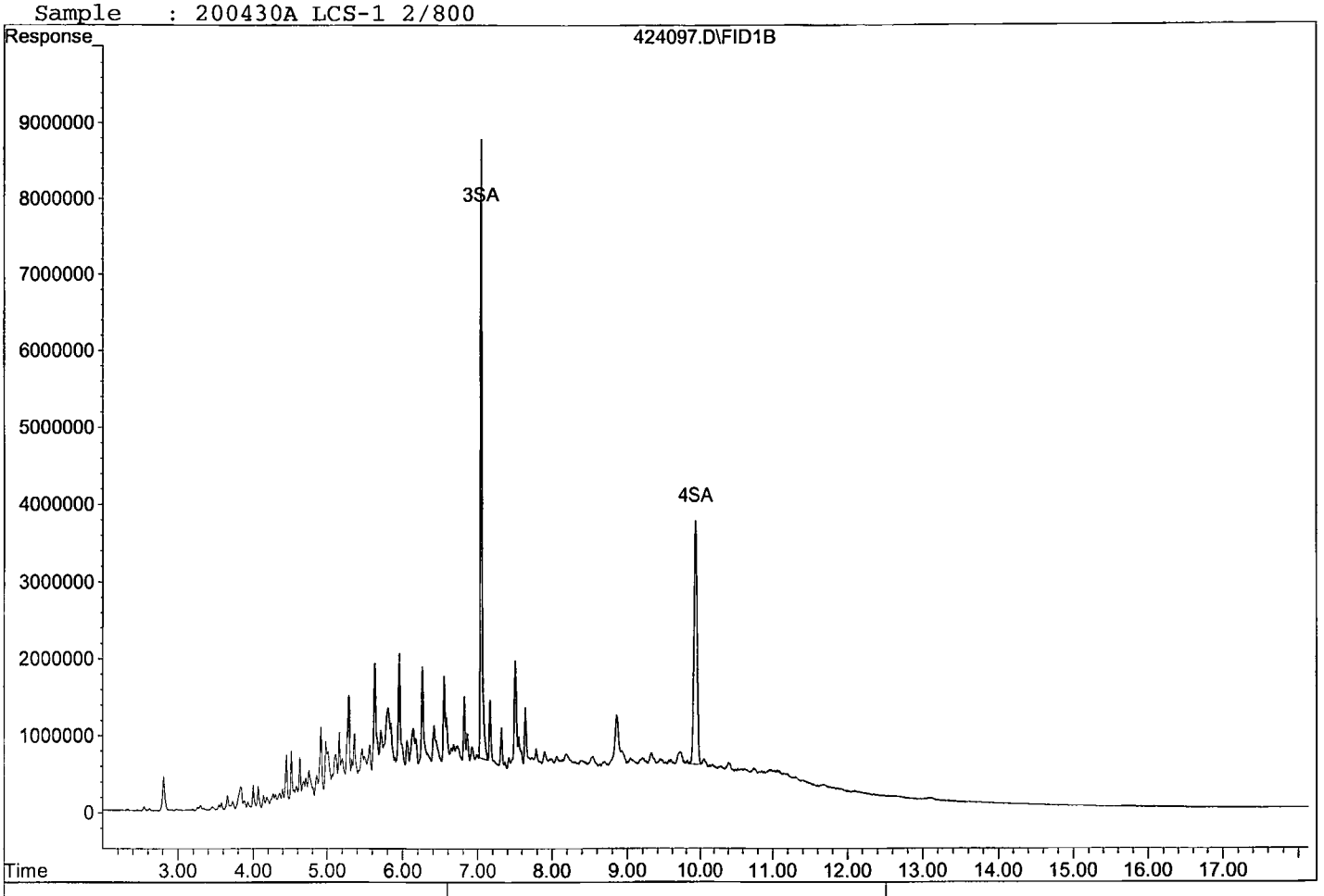
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

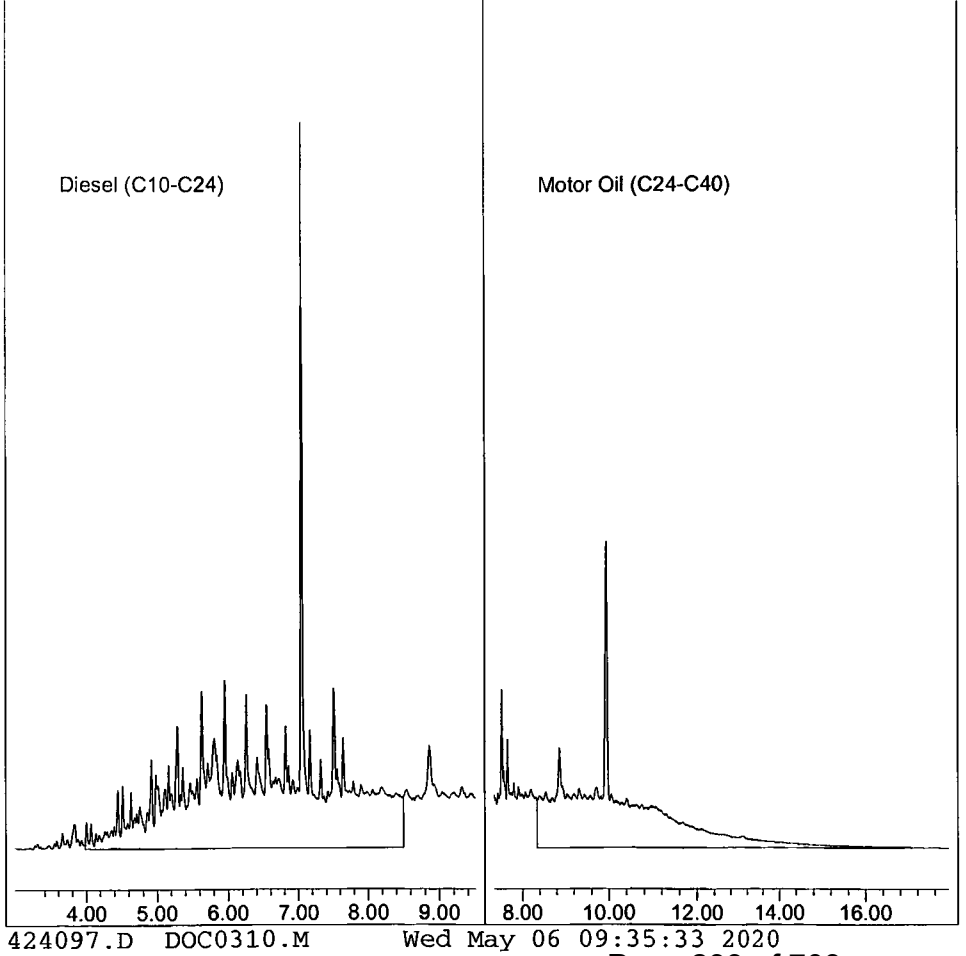
Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.05	127306065	63.386	ppb
Surrogate Spike 75.000		Recovery =	84.51%	
4) SA Octacosane(S)	9.94	99038275	70.893	ppb
Surrogate Spike 75.000		Recovery =	94.52%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	1833419363	1195.119	ppb
2) HBTM Motor Oil (C24-C40)	12.60	1355486807	1149.189	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424097.D
Sample : 200430A LCS-1 2/800





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424098.D Vial: 98
Acq On : 5-4-20 16:13:05 Operator: SS
Sample : 200430A LCSD-1 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 5 9:42 2020 Quant Results File: DOC0310.RES

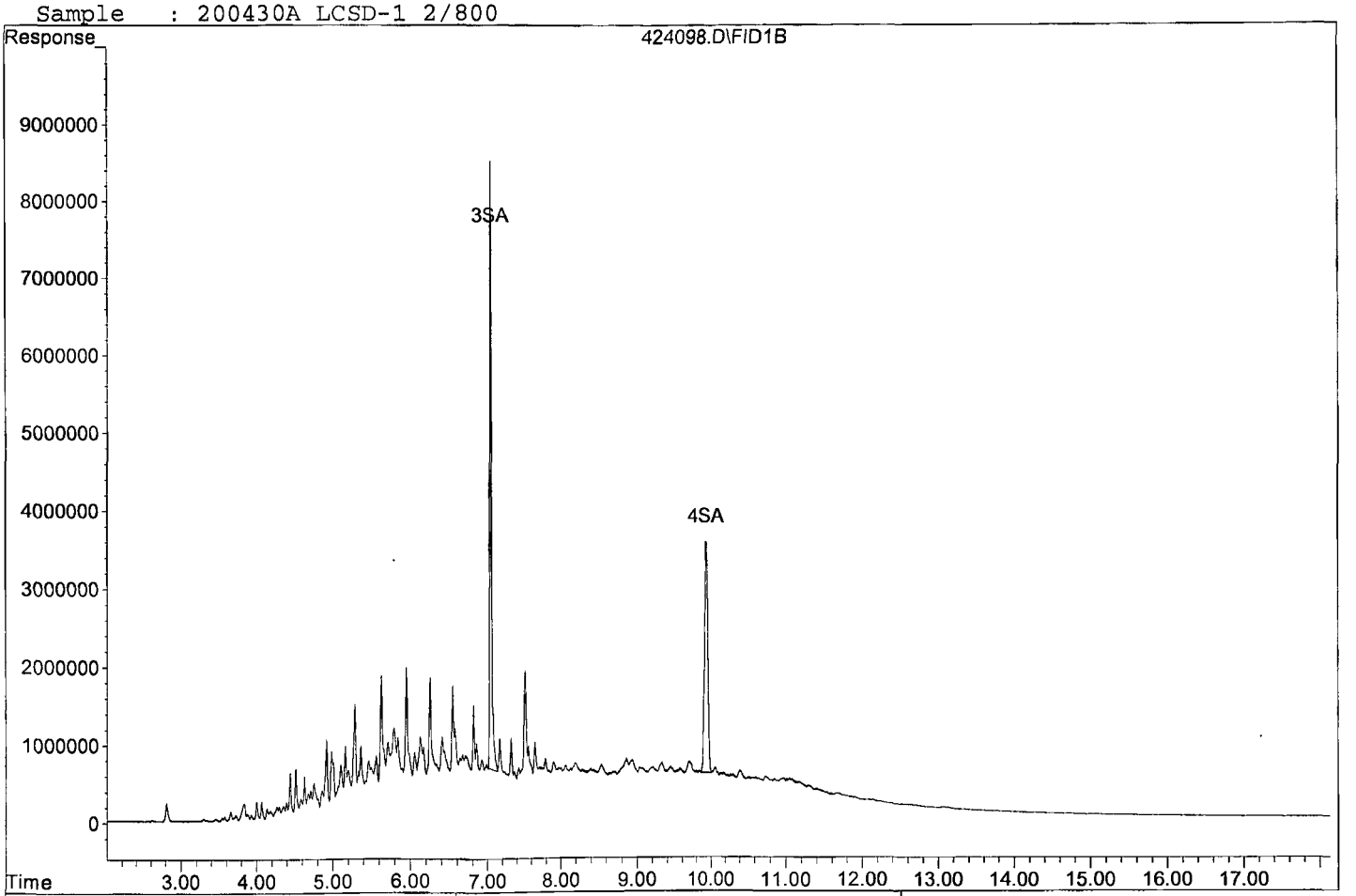
Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

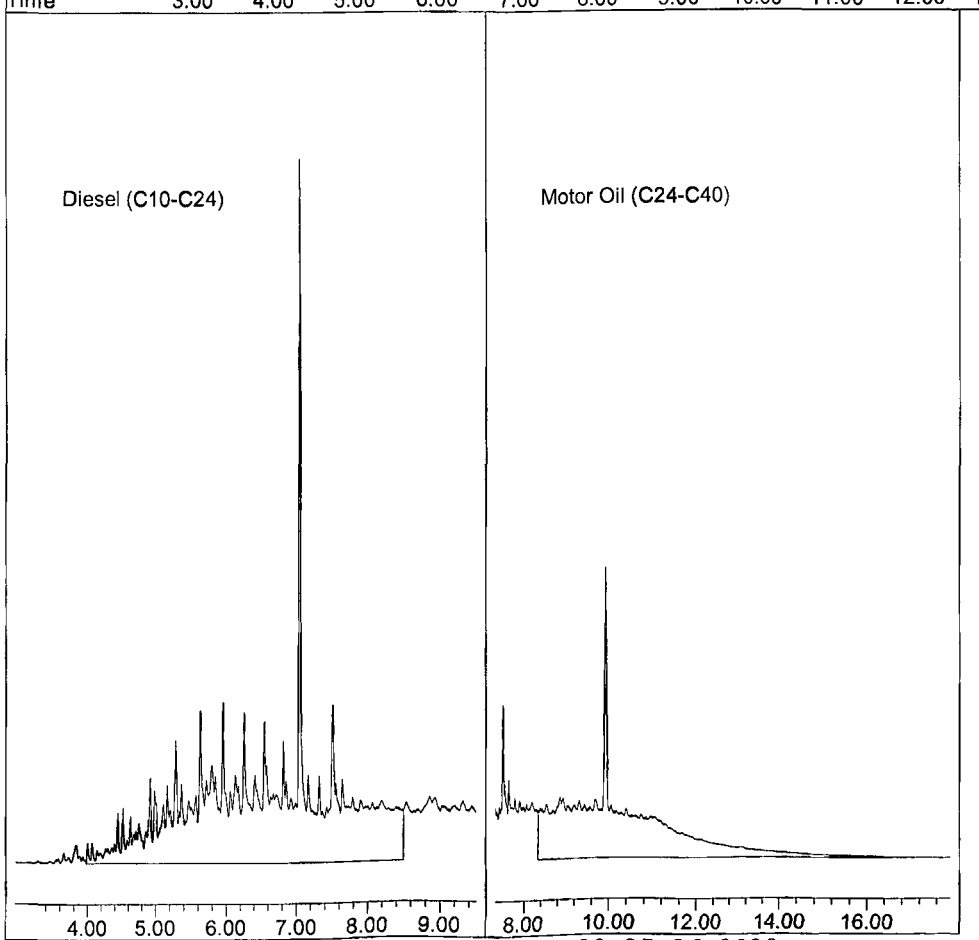
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	125367296	62.421 ppb
Surrogate Spike 75.000	Recovery =		83.23%
4) SA Octacosane(S)	9.94	95364544	68.263 ppb
Surrogate Spike 75.000	Recovery =		91.02%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1752873976	1142.615 ppb
2) HBTM Motor Oil (C24-C40)	12.60	1320919560	1119.882 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424098.D
Sample : 200430A LCSD-1 2/800





424098.D DOC0310.M Wed May 06 09:35:36 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424261.D Vial: 61
Acq On : 5-12-20 21:39:17 Operator: SS
Sample : BA10504W19 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.04	113395637	56.460	ppb
Surrogate Spike 75.000	Recovery =		75.28%	
4) SA Octacosane(S)	9.93	103563272	74.132	ppb
Surrogate Spike 75.000	Recovery =		98.84%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	31579692	20.585	ppb
2) HBTM Motor Oil (C24-C40)	12.60	64050024	54.302	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424261.D Vial: 61
Acq On : 5-12-20 21:39:17 Operator: SS
Sample : BA10504W19 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:19 2020 Quant Results File: DEC0317.RES

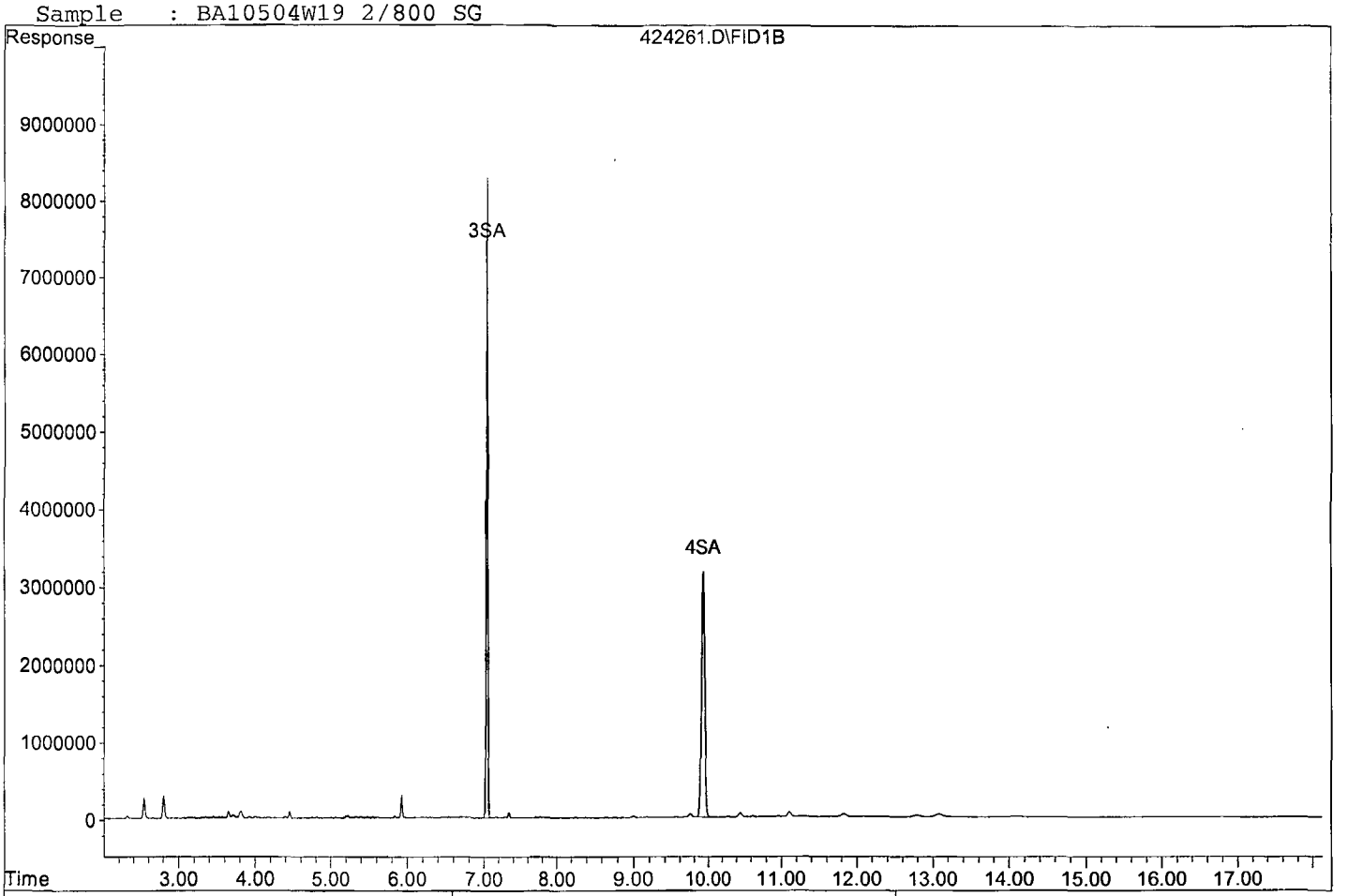
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

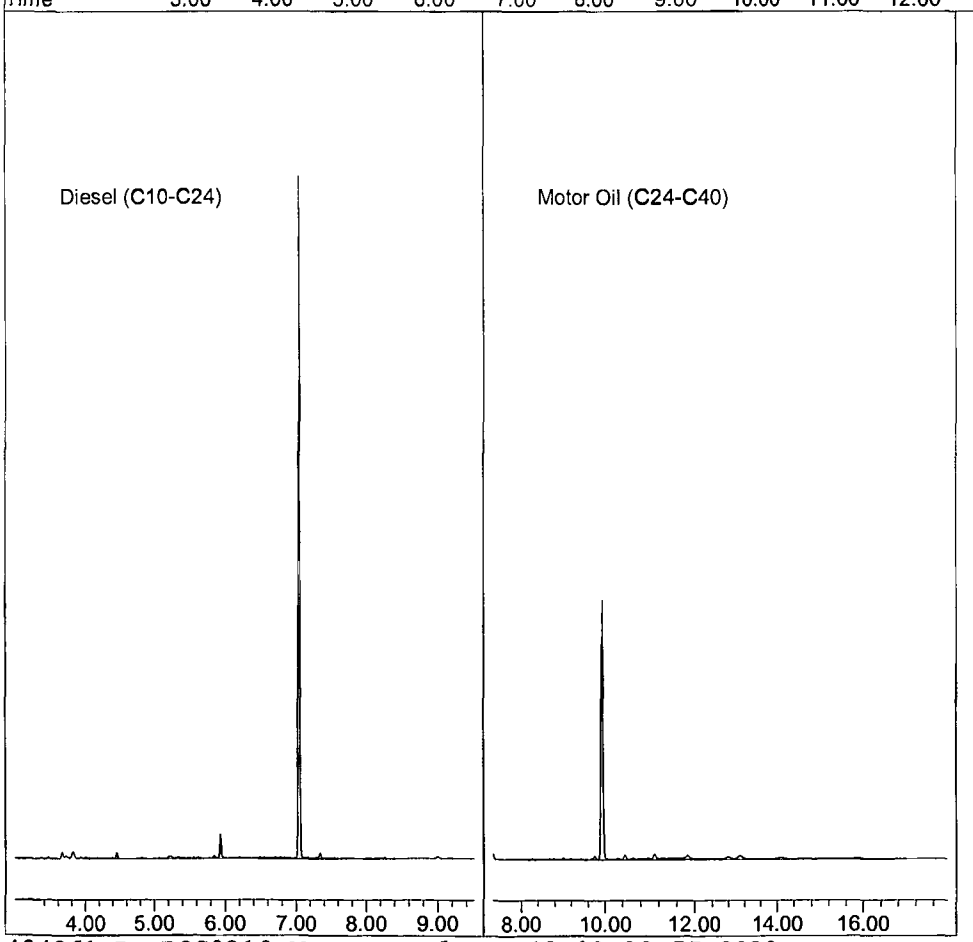
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	0.00	0	N.D. ppb
Surrogate Spike 60.000	Recovery	=	0.00%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424261.D
Sample : BA10504W19 2/800 SG





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424262.D Vial: 62
Acq On : 5-12-20 22:01:59 Operator: SS
Sample : BA10505W14 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	114481152	57.001 ppb
Surrogate Spike 75.000		Recovery =	76.00%
4) SA Octacosane(S)	9.93	103846139	74.335 ppb
Surrogate Spike 75.000		Recovery =	99.11%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	42119503	27.456 ppb
2) HBTM Motor Oil (C24-C40)	12.60	59205654	50.195 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424262.D Vial: 62
Acq On : 5-12-20 22:01:59 Operator: SS
Sample : BA10505W14 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:19 2020 Quant Results File: DEC0317.RES

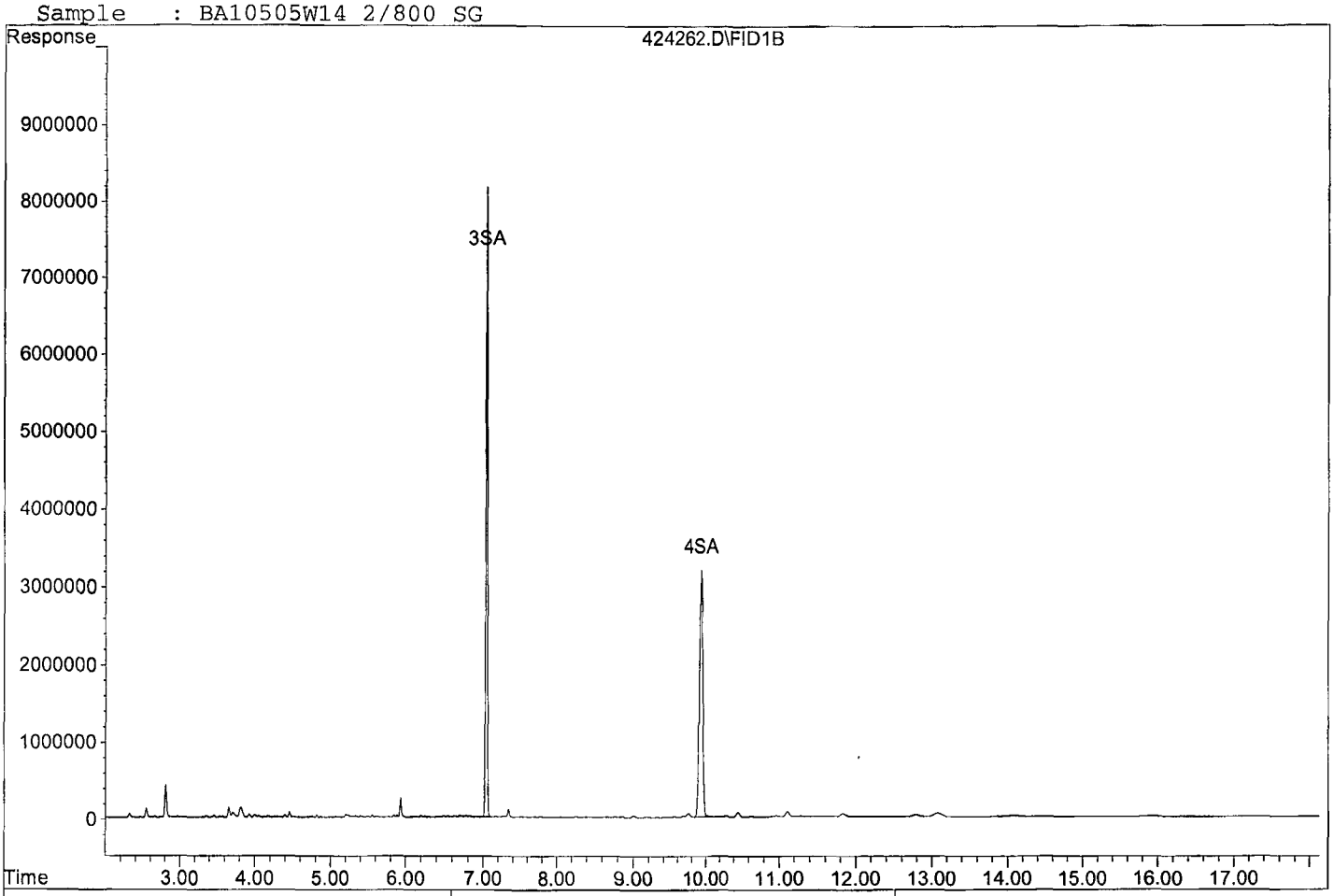
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

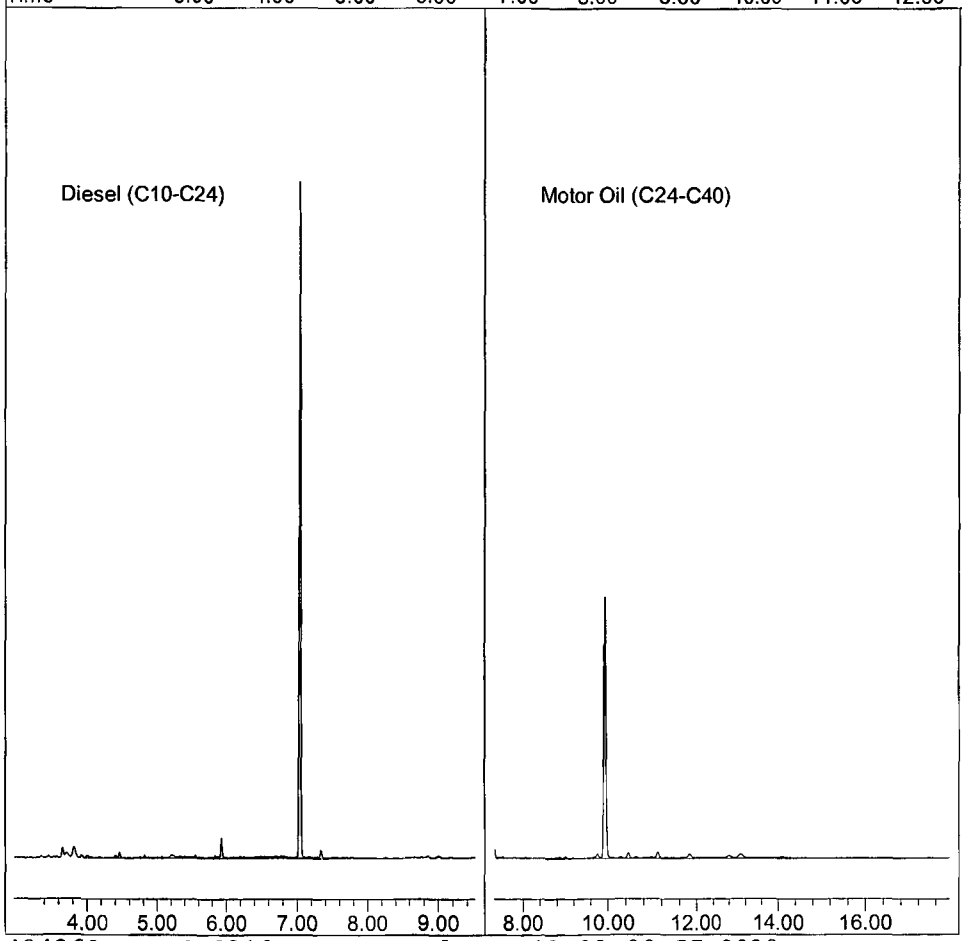
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	0.00	0	N.D. ppb
Surrogate Spike 60.000	Recovery	=	0.00%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424262.D
Sample : BA10505W14 2/800 SG





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424187.D Vial: 87
Acq On : 5-7-20 17:55:57 Operator: SS
Sample : 200430A BLK 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	111197776	55.366 ppb
Surrogate Spike 75.000	Recovery =		73.82%
4) SA Octacosane(S)	9.93	92539528	66.241 ppb
Surrogate Spike 75.000	Recovery =		88.32%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	42725399	27.851 ppb
2) HBTM Motor Oil (C24-C40)	12.60	101446591	86.007 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424187.D Vial: 87
Acq On : 5-7-20 17:55:57 Operator: SS
Sample : 200430A BLK 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:18 2020 Quant Results File: DEC0317.RES

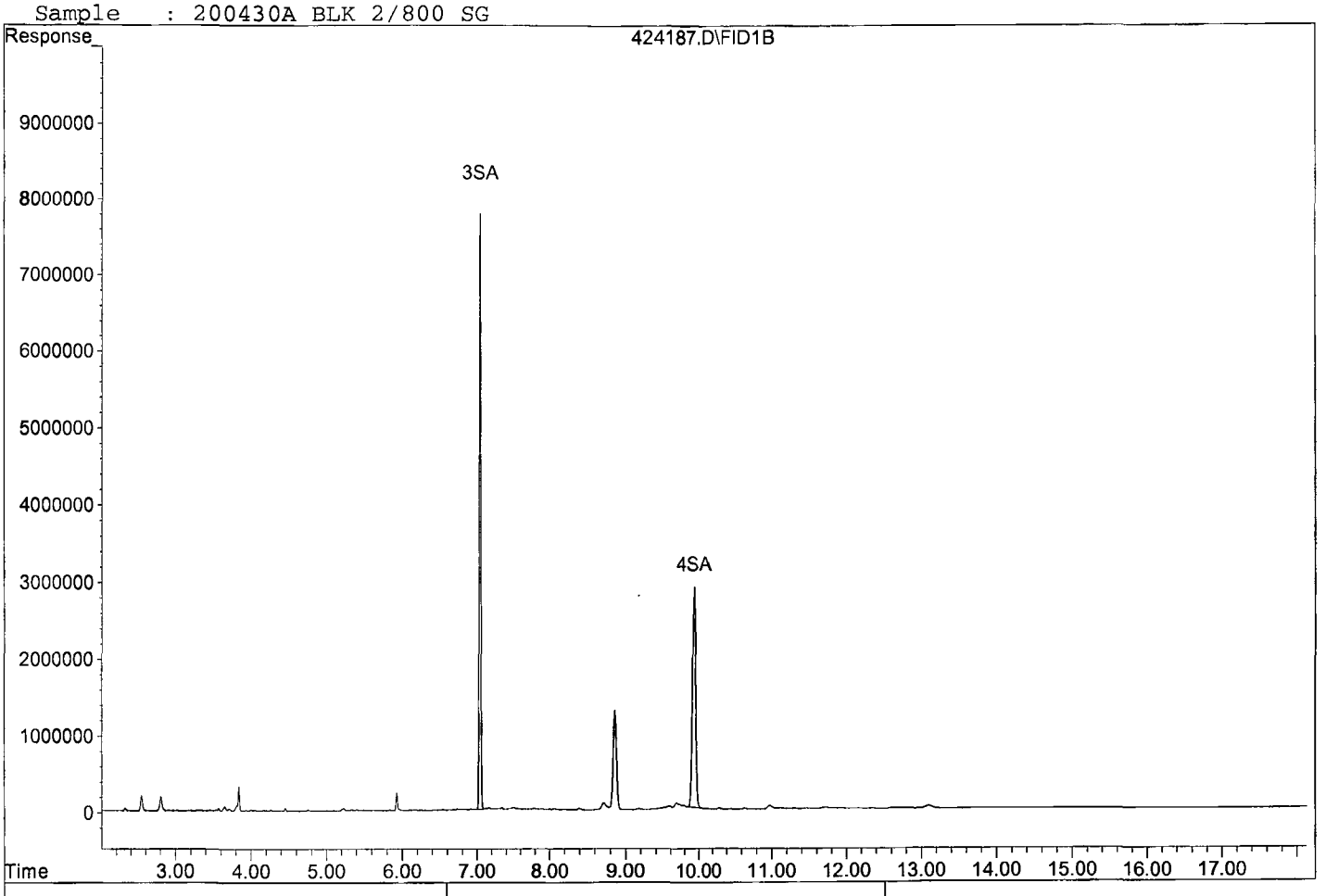
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

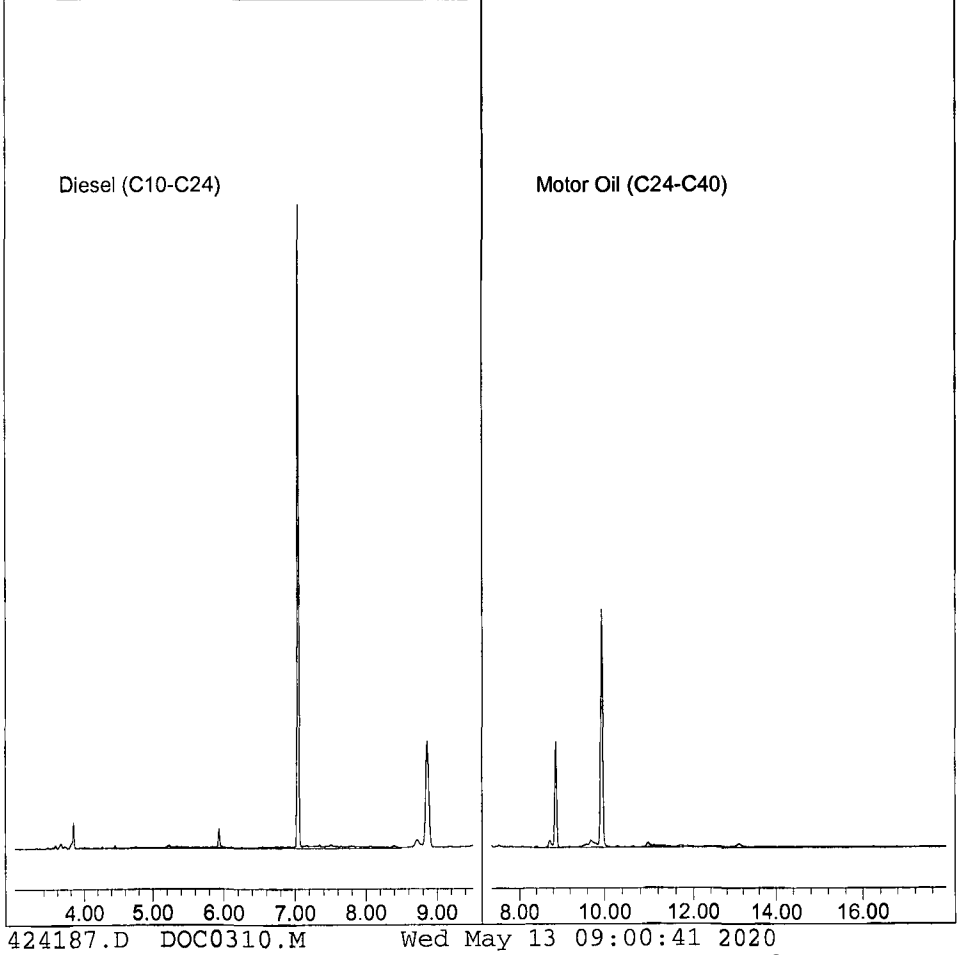
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
1) SC Decanoic Acid(S)	0.00	0	N.D. ppb
Surrogate Spike 60.000	Recovery	=	0.00%
Target Compounds			
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424187.D
Sample : 200430A BLK 2/800 SG





Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424188.D Vial: 88
Acq On : 5-7-20 18:18:45 Operator: SS
Sample : 200430A LCS-1 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	131559528	65.504 ppb
Surrogate Spike 75.000	Recovery =		87.34%
4) SA Octacosane(S)	9.93	101629696	72.748 ppb
Surrogate Spike 75.000	Recovery =		97.00%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1413147832	921.164 ppb
2) HBTM Motor Oil (C24-C40)	12.60	1374644914	1165.431 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424188.D Vial: 88
Acq On : 5-7-20 18:18:45 Operator: SS
Sample : 200430A LCS-1 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:23 2020 Quant Results File: DEC0317.RES

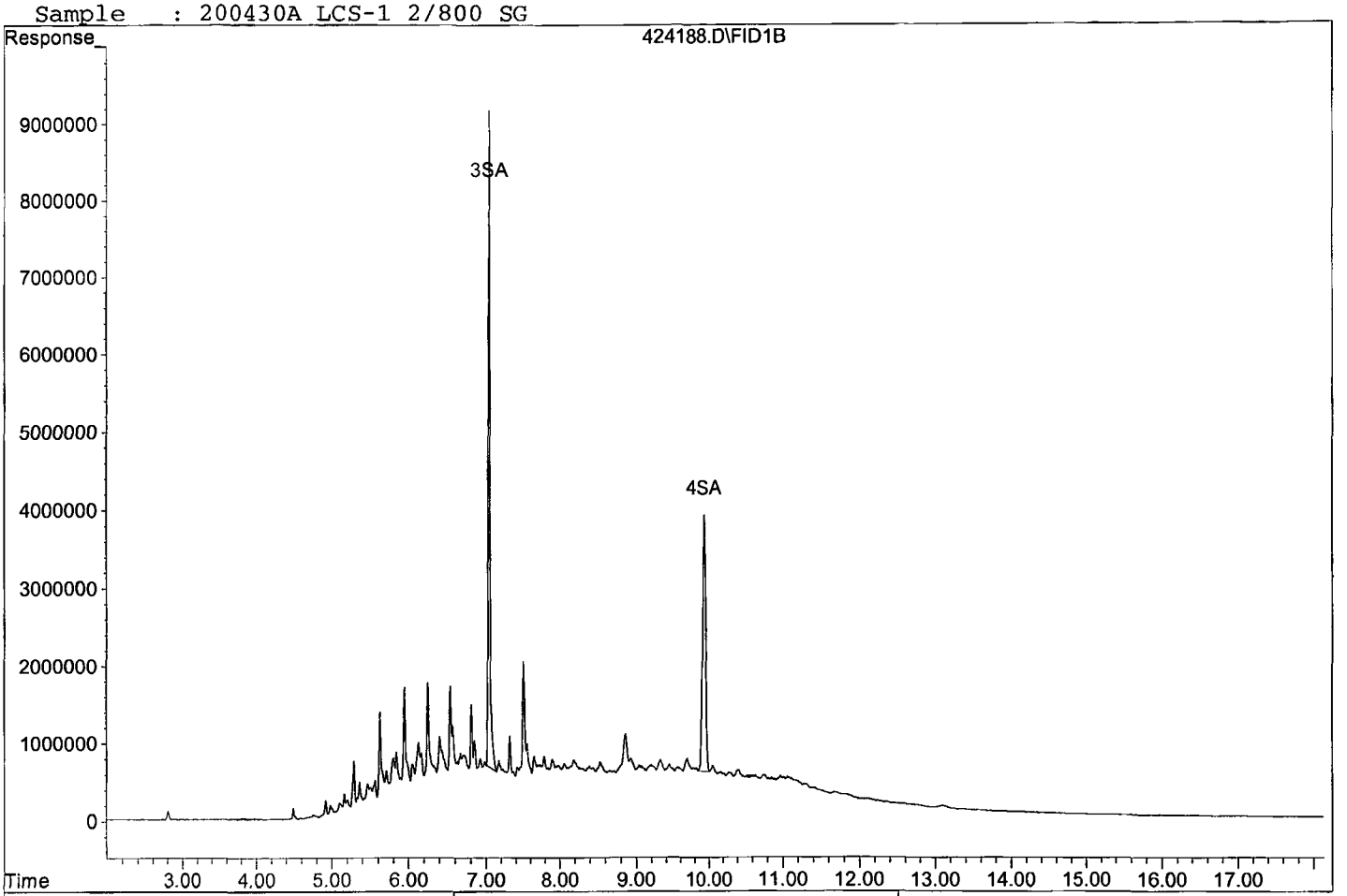
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

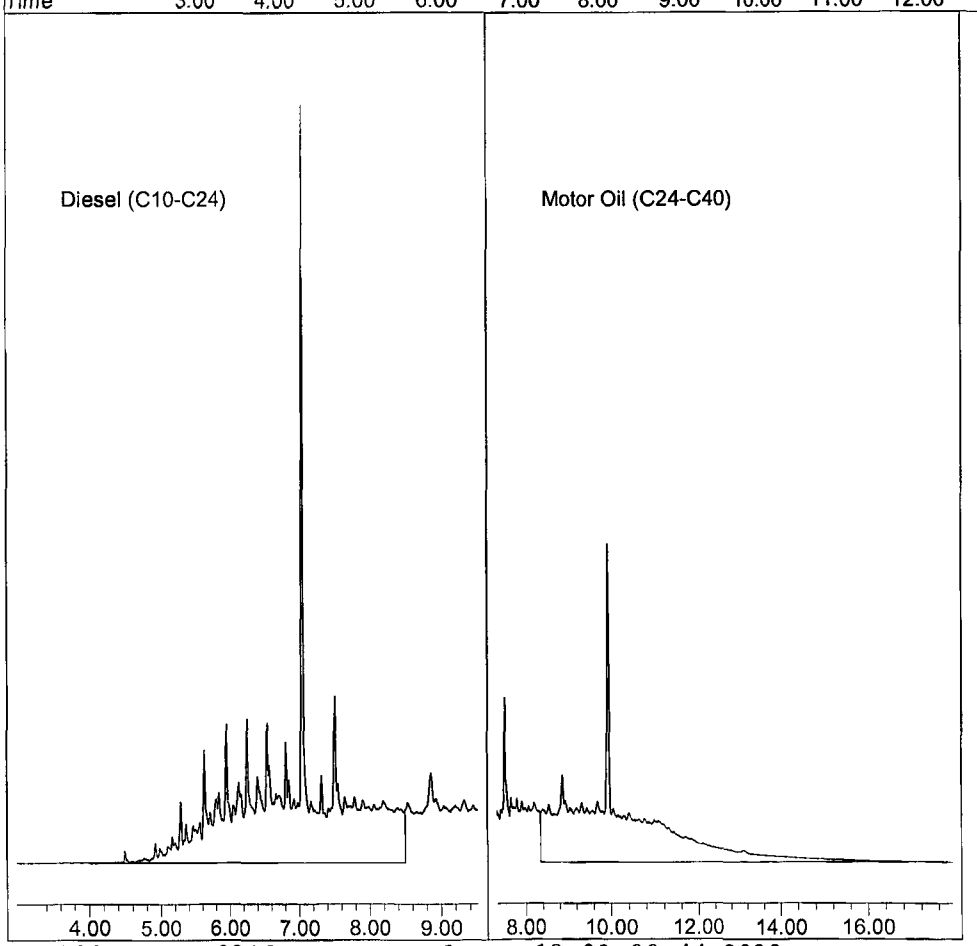
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc	Units	
System Monitoring Compounds					
1) SC Decanoic Acid(S)	0.00	0	N.D.	ppb	d
Surrogate Spike 60.000	Recovery	=	0.00%		
Target Compounds					
Target Compounds					

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424188.D
Sample : 200430A LCS-1 2/800 SG





424188.D DOC0310.M Wed May 13 09:00:44 2020

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424189.D Vial: 89
Acq On : 5-7-20 18:41:29 Operator: SS
Sample : 200430A LCSD-1 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 8:39 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200424\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.04	116618319	58.065 ppb
Surrogate Spike 75.000	Recovery =		77.42%
4) SA Octacosane(S)	9.94	85853890	61.455 ppb
Surrogate Spike 75.000	Recovery =		81.94%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	1329986388	866.955 ppb
2) HBTM Motor Oil (C24-C40)	12.60	1203263524	1020.133 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200424\424189.D Vial: 89
Acq On : 5-7-20 18:41:29 Operator: SS
Sample : 200430A LCSD-1 2/800 SG Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: May 13 9:23 2020 Quant Results File: DEC0317.RES

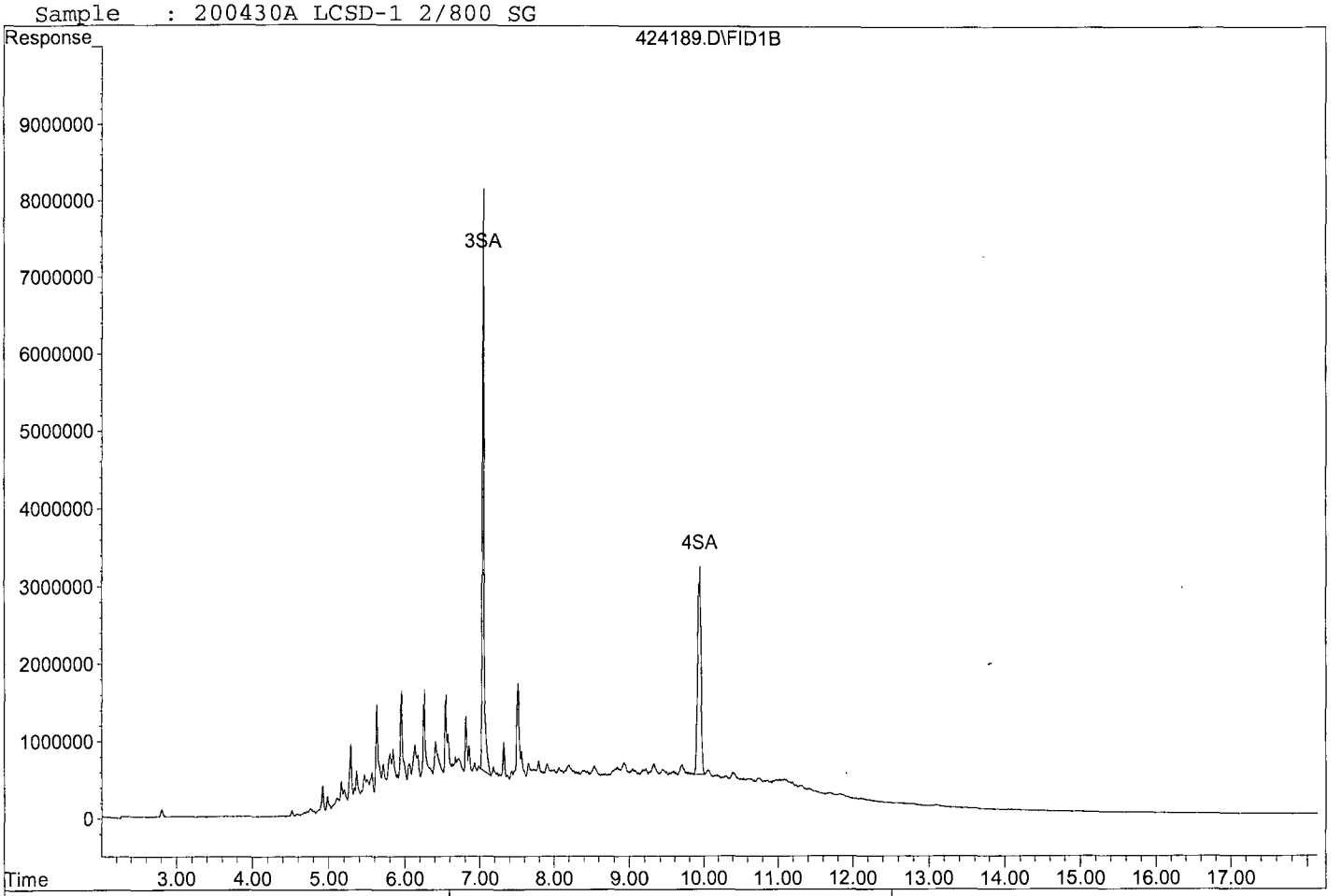
Method : G:\APOLLO\DATA\200424\DEC0317.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 17 10:50:54 2020
Response via : Multiple Level Calibration

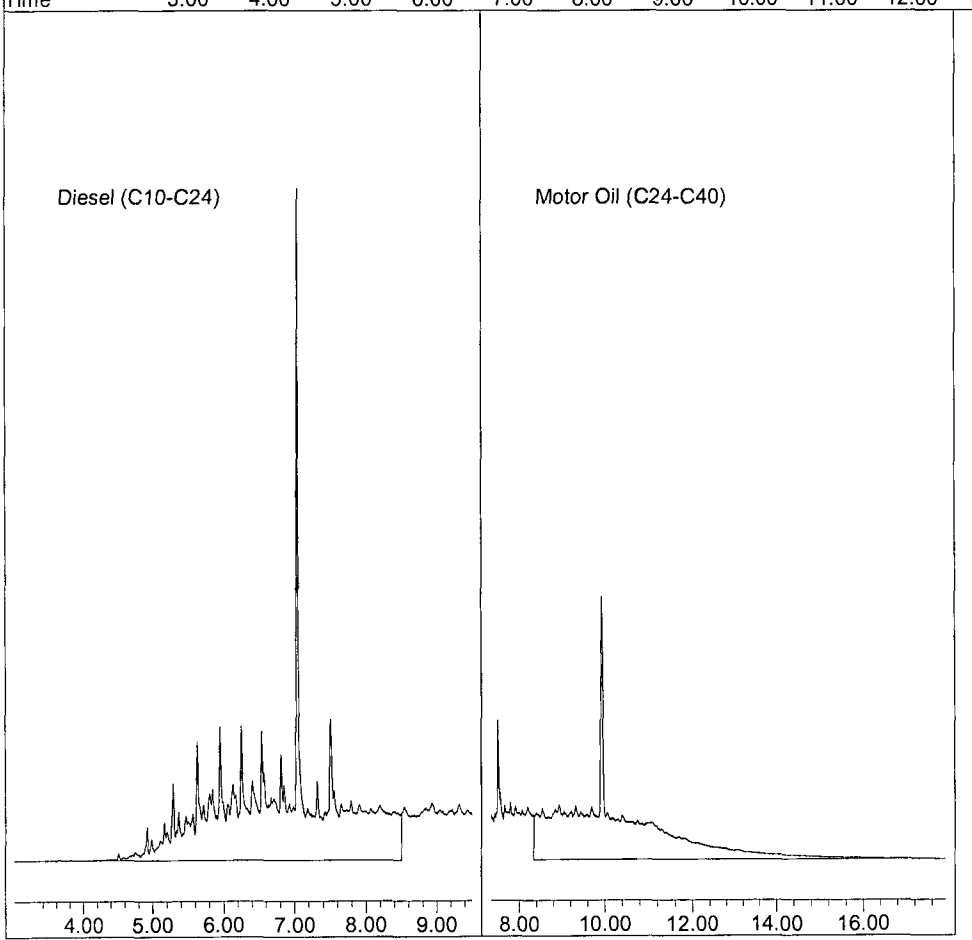
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
1) SC Decanoic Acid(S)	0.00	0	N.D.	ppb d
Surrogate Spike 60.000	Recovery	=	0.00%	
Target Compounds				
Target Compounds				

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200424\424189.D
Sample : 200430A LCSD-1 2/800 SG





Decanoic Acid Spike

Prepared: 03/17/20

Expires: 03/17/21

Prepared By (Initials): SS

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Decanoic Acid Spike	O2SI	011729-01-05-5PAK	1,000	**371298-40661**	**12/11/20**	**03/31/21**	N/A	N/A	N/A	1,000

Decanoic Acid Calibration Curve

Prepared: 03/10/20

Expires: 01/24/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Decanoic Acid STD	O2SI	Decanoic Acid-1	60	Prepared 01/24/20	01/24/21	N/A	50uL	1mL	MC	3
Decanoic Acid STD	O2SI	Decanoic Acid-2	60	Prepared 01/24/20	01/24/21	N/A	100uL	1mL	MC	6
Decanoic Acid STD	O2SI	Decanoic Acid-3	60	Prepared 01/24/20	01/24/21	N/A	400uL	1mL	MC	24
Decanoic Acid STD	O2SI	Decanoic Acid-4	60	Prepared 01/24/20	01/24/21	N/A	600uL	1mL	MC	36
Decanoic Acid STD	O2SI	Decanoic Acid-5	60	Prepared 01/24/20	01/24/21	N/A	800uL	1mL	MC	48
Decanoic Acid STD	O2SI	Decanoic Acid-6	60	Prepared 01/24/20	01/24/21	N/A	100uL	100uL	N/A	60

Decanoic Acid Standard

Prepared: 01/24/20

Expires: 01/24/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Decanoic Acid	O2SI	011729-01-05-5PAK	1,000	**397380**	**01/24/21**	**12/30/21**	600uL	10mL	MC	60

Decanoic Acid CCV

Prepared: 03/21/20 **Prepared By (Initials): SS**

Expires: 03/21/21

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Decanoic Acid	O2SI	011729-01-05-5PAK	1,000	**397380**	03/21/21	**12/30/21**	360uL	10mL	MC	36

Diesel Motor Oil Mix

Prepared: 04/01/20 **Prepared By (Initials): BT**

Expires: 04/01/21

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel Fuel #2	Restek	31258	50,000	**A0149066-41321, A0145169-49609, A0149169-49608**	**04/01/21**	**06/30/26**	3.5 mL	7.0 mL	NA	25,000
Motor Oil Composite	Restek	31464	50,000	**A0153599-49761, A0153599-49763, A0153577-49615**	**04/01/21**	**11/30/26**	3.5 mL			25,000

THC Surrogate

Prepared: 04/29/20 **Prepared By (Initials): LP**

Expires: 04/29/21

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
O-terphenyl / Octacosane Mix	Phenova	ALO-130161	600	**CL14921-49848**	**04/29/21**	**02/28/25**	N/A	N/A	N/A	600

Diesel / Motor Oil CCV

Prepared: 04/29/20

Expires: 02/13/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference to APPL Prep Date	Exp. Date	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel / Motor Oil STD	Restek	Diesel / Motor Oil CCV	2,000	04/13/20	03/25/21	03/25/21	1250uL	10mL	MC	250

Diesel / Motor Oil Second Source

Prepared: 03/05/20

Expires: 07/18/20

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel Fuel #2 Second Source	O2SI	G34-011598-03	50,000	**G34-319187-38959**	**10/13/20**	**09/29/21**	50uL	10mL	MC	250
Motor Oil Second Source	O2SI	116390-02-SS	50,000	**010918-39582**	**07/18/20**	**03/05/22**	50uL			

Diesel / Motor Oil Calibration Curve

Prepared: 03/05/20
Expires: 02/13/21

Prepared By (Initials): SS

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference to APPL Prep Date	Exp. Date	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 1	2,000	Prepared 03/05/20	02/13/21	N/A	5uL	1mL	MC	10
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil -2	2,000	Prepared 03/05/20	02/13/21	N/A	25uL	1mL	MC	50
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 3	2,000	Prepared 03/05/20	02/13/21	N/A	125uL	1mL	MC	250
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 4	2,000	Prepared 03/05/20	02/13/21	N/A	500uL	1mL	MC	1000
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 5	2,000	Prepared 03/05/20	02/13/21	N/A	750uL	1mL	MC	1500
Diesel / Motor Oil Calibration STD	Restek	Diesel / Motor Oil - 6	2,000	Prepared 03/05/20	02/13/21	N/A	100uL	100uL	N/A	2,000

Diesel / Motor Oil Calibration Standard

Prepared: 03/05/20 **Prepared By (Initials): SS**

Expires: 03/05/21

Methylene Chloride Lot No. 58059

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturer)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Diesel Fuel #2	Restek	31258	50,000	**A0153536-49756**	**04/13/21**	**06/30/26**	400uL	10mL	MC	**2000**
Motor Oil	Restek	31464	50,000	**A0153577-49615**	**04/01/21**	**05/31/26**	400uL			**2000**
THC Surrogate	Phenova	ALO-130161	600	**CL14921-49845**	**03/25/21**	**11/28/24**	1666uL			**100**

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200430A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 4-1-20 4-1-21		Surrogate ID 1	THC Surrogate 4-29-20 4-29-21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	04/30/20 14:35	
Spiked ID 8			Ext. End Time:	05/01/20 8:30	
			GC Requires Extract By:		

pH1	2	04/30/20 13:25	Water Bath Temp 1 °C	35/38.5 °C
pH2			Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: KY **Date** 04/30/20 **Witnessed By:** CFM **Date** 04/30/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200430A Blk				0.100	1	800	2	2	04/30/20 13:30	
						equip	E-HP51 E-WB1				
2	200430A LCS-1		0.040	1	0.100	1	800	2	2	04/30/20 13:30	
						equip	E-HP50 E-WB2				
3	200430A LCSD-1		0.040	1	0.100	1	800	2	2	04/30/20 13:30	
						equip	E-HP49 E-WB3				
4	BA09851	BA09851W13			0.100	1	800	2	2	04/30/20 13:30	91926
						equip	E-HP48 E-WB1				
5	BA09853	BA09853W13			0.100	1	800	2	2	04/30/20 13:30	91926
						equip	E-HP47 E-WB2				
6	BA09855	BA09855W16			0.100	1	800	2	2	04/30/20 13:30	91926
						equip	E-HP25 E-WB3				
7	BA09915	BA09915W13			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP26 E-WB1				
8	BA09917	BA09917W15			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP27 E-WB2				
9	BA09919	BA09919W15			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP28 E-WB3				
10	BA09921	BA09921W13			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP29 E-WB1				
11	BA09923	BA09923W11			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP30 E-WB2				
12	BA09924	BA09924W12			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP16 E-WB3				
13	BA09926	BA09926W13			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP15 E-WB1				
14	BA09928	BA09928W17			0.100	1	800	2	2	04/30/20 13:30	91941
						equip	E-HP14 E-WB2				
15	BA10439	BA10439W17			0.100	1	800	2	2	04/30/20 13:30	92025
						equip	E-HP13 E-WB3				
16	BA10504	BA10504W19			0.100	1	800	2	2	04/30/20 13:30	92039
						equip	E-HP12 E-WB1				

Solvent and Lot#	
1+1 HCL Amber Liter	4-30-20
PH Strips	HC998032
Dicholormethane	59239
Filter Paper	400171
B. Sodium Sulfate	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	5/4/20
Time	14:15
Refrigerator	HOBART

	Technician's Initials
Scanned By	KY
Sample Preparation	KY,CD,CFM
Extraction	KY,CD,CFM
Concentration	DL

Modified	05/04/20 2:28:46 PM

Reviewed By: KY **Date** 05/04/20

_LIQ005

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200430A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 4-1-20 4-1-21		Surrogate ID 1	THC Surrogate 4-29-20 4-29-21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	04/30/20 14:35	
Spiked ID 8			Ext. End Time:	05/01/20 8:30	
			GC Requires Extract By:		

pH1	2	04/30/20 13:25	Water Bath Temp 1 °C	35/38.5 °C
pH2			Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: KY **Date** 04/30/20 **Witnessed By:** CFM **Date** 04/30/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
17	BA10505	BA10505W14			0.100	1	800	2	2	04/30/20 13:30	92039
						equip	E-HP11 E-WB2				

Solvent and Lot#	
1+1 HCL Amber Liter	4-30-20
PH Strips	HC998032
Dicholormethane	59239
Filter Paper	400171
B. Sodium Sulfate	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	
Time	
Refrigerator	HOBART

	Technician's Initials
Scanned By	KY
Sample Preparation	KY,CD,CFM
Extraction	KY,CD,CFM
Concentration	DL

Modified	05/04/20 2:28:46 PM

Reviewed By: KY **Date** 05/04/20

Injection Log

Directory: G:\APOLLO\DATA\200310\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	3	310003.D	1	Diesel Motor Oil-1 3/5/20	water	3-10-20 9:37:22
2	4	310004.D	1	Diesel Motor Oil-2 3/5/20	water	3-10-20 9:59:49
3	5	310005.D	1	Diesel Motor Oil-3 3/5/20	water	3-10-20 10:22:19
4	6	310006.D	1	Diesel Motor Oil-4 3/5/20	water	3-10-20 10:44:50
5	7	310007.D	1	Diesel Motor Oil-5 3/5/20	water	3-10-20 11:07:20
6	8	310008.D	1	Diesel Motor Oil-6 3/5/20	water	3-10-20 11:29:51
7	9	310009.D	1	Diesel Motor Oil-SS 3/5/20	water	3-10-20 11:52:24
8	95	424095.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-4-20 15:02:27
9	96	424096.D	2.5	200430A BLK 2/800	water	5-4-20 15:27:53
10	97	424097.D	2.5	200430A LCS-1 2/800	water	5-4-20 15:50:26
11	98	424098.D	2.5	200430A LCSD-1 2/800	water	5-4-20 16:13:05
12	9	424109.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-4-20 20:22:31
13	12	424112.D	2.5	BA10504W19 2/800	water	5-4-20 21:30:56
14	13	424113.D	2.5	BA10505W14 2/800	water	5-4-20 21:53:42
15	21	424121.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-5-20 0:55:06

Injection Log

Directory: G:\APOLLO\DATA\200317\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	2	317002.D	1	Decanoic Acid-1 3/10/20	water	3-17-20 8:14:08
2	3	317003.D	1	Decanoic Acid-2 3/10/20	water	3-17-20 8:36:27
3	4	317004.D	1	Decanoic Acid-3 3/10/20	water	3-17-20 8:58:53
4	5	317005.D	1	Decanoic Acid-4 3/10/20	water	3-17-20 9:21:15
5	6	317006.D	1	Decanoic Acid-5 3/10/20	water	3-17-20 9:43:41
6	7	317007.D	1	Decanoic Acid-6 3/10/20	water	3-17-20 10:06:06
7	80	424180.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-7-20 14:35:12
8	81	424181.D	1	Decanoic Acid-CCV 3/20/20	water	5-7-20 15:24:14
9	87	424187.D	2.5	200430A BLK 2/800 SG	water	5-7-20 17:55:57
10	88	424188.D	2.5	200430A LCS-1 2/800 SG	water	5-7-20 18:18:45
11	89	424189.D	2.5	200430A LCSD-1 2/800 SG	water	5-7-20 18:41:29
12	92	424192.D	1	Decanoic Acid-CCV 3/20/20	water	5-7-20 19:49:42
13	93	424193.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-7-20 20:12:24
14	54	424254.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-12-20 19:00:27
15	55	424255.D	1	Decanoic Acid-CCV 3/20/20	water	5-12-20 19:23:05
16	61	424261.D	2.5	BA10504W19 2/800 SG	water	5-12-20 21:39:17
17	62	424262.D	2.5	BA10505W14 2/800 SG	water	5-12-20 22:01:59
18	66	424266.D	1	Diesel Motor Oil-CCV 4/29/20	water	5-12-20 23:32:39
19	67	424267.D	1	Decanoic Acid-CCV 3/20/20	water	5-12-20 23:55:17

ORGANICS
Calibration Data

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/20/20
Matrix: Instrument: Yoda
Initials: MA / [illegible]

		Compound	4	5	10	20	40	50	60	80	100		Avg	%RSD	Type	r^2	Q	MRF
			0420Y003.D	0420Y004.D	0420Y005.D	0420Y006.D	0420Y007.D	0420Y008.D	0420Y009.D	0420Y010.D	0420Y011.D							
1	I	1,4-dichlorobenzene-D4(IS)	ISTD															
2		1,4-Dioxane		0.5864	0.5354	0.4682	0.4345	0.4509	0.4717	0.4765	0.4405		0.48	11				
3	TM	n-Nitrosodimethylamine		0.6003	0.6335	0.7148	0.6880	0.6158	0.7455	0.7830	0.7263		0.69	9.6	TM			
4	TM	Pyridine		1.669	1.877	1.743	1.759	1.694	2.122	1.862	1.746		1.8	8.1	TM			
5	S	2-Fluorophenol (S)		1.147	1.301	1.366	1.513	1.454	1.750	1.661	1.571		1.5	13	S			
6	S	Phenol-D6 (S)		1.553	1.677	1.763	1.978	1.912	2.328	2.224	2.135		1.9	14	S			
7	*TM	Phenol		2.247	2.588	2.412	2.503	2.403	2.733	2.767	2.561		2.5	6.9	*TM			0.800
8	TM	Aniline		1.126	1.548	1.414	1.551	1.477	1.699	1.508	1.320		1.5	12	TM			
9	TM	Bis (2-chloroethyl) ether		0.9650	1.047	0.9876	1.011	0.9765	1.077	1.077	0.9908		1.0	4.4	TM			0.700
10	TM	2-Chlorophenol		1.743	1.964	1.828	1.896	1.816	2.039	2.036	1.886		1.9	5.6	TM			0.800
11	TM	1,3-DCB		1.908	2.144	1.964	2.023	1.970	2.176	2.164	2.027		2.0	5.0	TM			
12	*TM	1,4-DCB		2.002	2.203	2.006	2.055	1.986	2.188	2.187	2.061		2.1	4.4	*TM			
13	TM	Benzyl alcohol		0.8548	1.022	0.9933	1.053	1.025	1.159	1.189	1.104		1.0	10.0	TM			
14	TM	1,2-DCB		1.850	2.055	1.893	1.941	1.884	2.121	2.135	2.019		2.0	5.6	TM			
15	TM	2-Methylphenol		1.393	1.564	1.447	1.518	1.458	1.662	1.675	1.562		1.5	6.6	TM			0.700
16	TM	Bis (2-chloroisopropyl) ether		1.143	1.263	1.174	1.210	1.160	1.300	1.300	1.215		1.2	5.0	TM			0.010
17	TM	Acetophenone		2.153	2.437	2.279	2.378	2.295	2.599	2.592	2.421		2.4	6.4	TM			0.010
18	TM	3&4-Methylphenol		1.706	1.963	1.830	1.907	1.860	2.086	2.150	2.015		1.9	7.4	TM			0.600
19	**TM	n-Nitrosodi-n-propylamine		1.183	1.410	1.318	1.389	1.328	1.497	1.506	1.397		1.4	7.6	**TM			0.500
20	TM	Hexachloroethane		0.7178	0.8044	0.7414	0.7689	0.7504	0.8345	0.8254	0.7698		0.78	5.3	TM			0.300
21	I	Napthalene-D8(IS)	ISTD															
22	S	Nitrobenzene-D5(S)		0.3459	0.3683	0.3884	0.4101	0.4134	0.4847	0.4504	0.4080		0.41	11	S			
23	TM	Nitrobenzene		0.4241	0.4842	0.4590	0.4556	0.4666	0.5044	0.4976	0.4424		0.47	5.9	TM			0.200
24	TM	Isophorone		0.7098	0.7816	0.7688	0.7670	0.7856	0.8636	0.8464	0.7552		0.78	6.3	TM			0.400
25	*TM	2-Nitrophenol		0.2135	0.2402	0.2365	0.2367	0.2478	0.2667	0.2677	0.2403		0.24	7.2	*TM			0.100
26	TM	2,4-Dimethylphenol		0.3548	0.3853	0.3748	0.3693	0.3720	0.4138	0.4073	0.3680		0.38	5.3	TM			0.200
27	TM	Benzoic acid			0.2565	0.2948	0.3219	0.3275	0.3664	0.3449	0.3078		0.32	11	TM			
28	TM	Bis (2-chloroethoxy) methane		0.4396	0.4756	0.4462	0.4470	0.4546	0.4906	0.4818	0.4298		0.46	4.8	TM			0.300
29	*TM	2,4-Dichlorophenol		0.3429	0.3774	0.3615	0.3618	0.3670	0.4047	0.4062	0.3625		0.37	5.9	*TM			0.200
30	TM	1,2,4-Trichlorobenzene		0.3924	0.4320	0.4037	0.4024	0.4052	0.4449	0.4404	0.3956		0.41	5.1	TM			
31	TM	3,4-Dimethylphenol		0.5434	0.5880	0.5429	0.5343	0.5444	0.5953	0.5852	0.5254		0.56	4.9	TM			
32	TM	Naphthalene		1.173	1.283	1.200	1.185	1.222	1.314	1.309	1.166		1.2	5.0	TM			0.700
33	TM	4-Chloroaniline		0.4459	0.4956	0.4963	0.4786	0.4780	0.5335	0.5055	0.4230		0.48	7.2	TM			0.010
34	TM	2,6-Dichlorophenol		0.3343	0.3676	0.3541	0.3610	0.3646	0.4028	0.4098	0.3684		0.37	6.7	TM			
35	TM	Hexachloropropene		0.2703	0.3097	0.2957	0.3031	0.3151	0.3445	0.3447	0.3147		0.31	7.9	TM			

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/20/20
Matrix: Instrument: Yoda Initials:

		Compound	4	5	10	20	40	50	60	80	100		Avg	%RSD	Type		Q	
36	*TM	Hexachlorobutadiene		0.2424	0.2554	0.2430	0.2416	0.2436	0.2690	0.2657	0.2419		0.25	4.6	*TM			0.010
37	TM	Caprolactum		0.1057	0.1180	0.1235	0.1227	0.1236	0.1398	0.1344	0.1139		0.12	8.8	TM			0.010
38	*TM	4-Chloro-3-methylphenol		0.3679	0.4124	0.3998	0.4005	0.4039	0.4463	0.4428	0.3910		0.41	6.4	*TM			0.200
39	TM	2-Methylnaphthalene		0.7763	0.8452	0.7963	0.7956	0.8129	0.9082	0.8940	0.8003		0.83	5.9	TM			0.400
40	TM	1-Methylnaphthalene		0.8118	0.8571	0.8184	0.8211	0.8371	0.9112	0.9104	0.8199		0.85	4.8	TM			
41	I	Acenaphthene-D10(IS)	ISTD															
42	**TML	Hexachlorocyclopentadiene		0.2431	0.3477	0.3397	0.3969	0.4611	0.4652	0.4842			0.39	22	**TML	0.994		0.050
43	TM	1,2,4,5-Tetrachlorobenzene		0.6576	0.7065	0.6666	0.6567	0.6995	0.6969	0.7287	0.6844		0.69	3.7	TM			0.010
44	*TM	2,4,6-Trichlorophenol		0.4141	0.4673	0.4454	0.4436	0.4737	0.4731	0.4979	0.4641		0.46	5.5	*TM			0.200
45	TM	2,4,5-Trichlorophenol		0.4351	0.4940	0.4779	0.4634	0.4930	0.5031	0.5253	0.4882		0.49	5.6	TM			0.200
46	S	2-Fluorobiphenyl(S)		1.276	1.329	1.359	1.384	1.465	1.556	1.529	1.475		1.4	7.0	S			
47	TM	1,1'-Biphenyl		1.712	1.790	1.728	1.682	1.801	1.794	1.854	1.767		1.8	3.2	TM			0.010
48	TM	2-Chloronaphthalene		1.391	1.446	1.376	1.322	1.430	1.412	1.472	1.379		1.4	3.4	TM			0.800
49	TM	2-Nitroaniline		0.3352	0.3841	0.3938	0.3915	0.4105	0.4145	0.4227	0.3976		0.39	6.8	TM			0.010
50	TM	Dimethyl phthalate		1.639	1.710	1.652	1.615	1.714	1.730	1.768	1.648		1.7	3.2	TM			0.010
51	TM	2,6-DNT		0.3298	0.3649	0.3699	0.3693	0.3983	0.3969	0.4118	0.3832		0.38	6.8	TM			0.200
52	TM	Acenaphthylene		1.987	2.183	2.075	2.024	2.141	2.176	2.234	2.101		2.1	4.0	TM			0.900
53	TM	3-Nitroaniline		0.3682	0.4251	0.4382	0.4398	0.4675	0.4838	0.4968	0.4587		0.45	8.9	TM			0.010
54	*TM	Acenaphthene		1.340	1.417	1.318	1.270	1.361	1.369	1.439	1.331		1.4	4.0	*TM			0.900
55	**TML	2,4-Dinitrophenol		0.1256	0.1672	0.2087	0.2403	0.2577	0.2678	0.2801	0.2622		0.23	24	**TML	0.996		0.010
56	**TM	4-Nitrophenol		0.2449	0.2835	0.2976	0.3115	0.3318	0.3431	0.3536	0.3351		0.31	12	**TM			0.010
57	TM	Dibenzofuran		1.931	2.048	1.950	1.891	2.035	2.035	2.141	1.983		2.0	4.0	TM			0.800
58	TM	2,4-DNT		0.4480	0.5323	0.5354	0.5260	0.5578	0.5783	0.5931	0.5559		0.54	8.1	TM			0.200
59	TM	2,3,4,6-Tetrachlorophenol		0.3420	0.3829	0.3719	0.3728	0.3930	0.3993	0.4183	0.3871		0.38	5.9	TM			0.010
60	TM	Diethyl phthalate		1.614	1.736	1.621	1.566	1.668	1.663	1.703	1.611		1.6	3.4	TM			0.010
61	TM	4-Chlorophenyl phenyl ether		0.8543	0.8924	0.8560	0.8520	0.9144	0.9349	0.9779	0.9445		0.90	5.3	TM			0.400
62	TM	Fluorene		1.591	1.661	1.597	1.568	1.685	1.733	1.834	1.712		1.7	5.3	TM			0.900
63	TM	4-Nitroaniline		0.3161	0.3606	0.3604	0.3652	0.3806	0.3821	0.3821	0.3476		0.36	6.2	TM			0.010
64	S	2,4,6-Tribromophenol(S)		0.1648	0.1786	0.1856	0.2030	0.2078	0.2288	0.2385	0.2325		0.20	13	S			
65	I	Phenanthrene-D10(IS)	ISTD															
66	TM	4,6-Dinitro-2-methylphenol				0.1670	0.1752	0.1887	0.1828	0.2006	0.1915		0.18	6.5	TM			0.010
67	TM	Diphenyl amine		0.6352	0.6679	0.6304	0.6292	0.6704	0.6525	0.7076	0.6593		0.66	4.0	TM			
68	*TM	n-Nitrosodiphenylamine		0.6352	0.6679	0.6304	0.6292	0.6704	0.6525	0.7076	0.6593		0.66	4.0	*TM			0.010
69	TM	1,2-Diphenylhydrazine		0.7894	0.8393	0.7925	0.7895	0.8119	0.7763	0.9900	0.9199		0.84	9.1	TM			
70	TM	4-Bromophenyl phenyl ether		0.2322	0.2542	0.2372	0.2468	0.2645	0.2498	0.2744	0.2584		0.25	5.5	TM			0.100

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/20/20
Matrix: Instrument: Yoda Initials:

		Compound	4	5	10	20	40	50	60	80	100		Avg	%RSD	Type		Q	
71	TM	Hexachlorobenzene		0.2436	0.2617	0.2489	0.2492	0.2651	0.2551	0.2743	0.2625		0.26	4.0	TM			0.100
72	TM	Atrazine		0.2268	0.2477	0.2316	0.2397	0.2506	0.2369	0.2626	0.2396		0.24	4.7	TM			0.010
73	*TM	Pentachlorophenol		0.1244	0.1372	0.1458	0.1543	0.1647	0.1656	0.1845	0.1735		0.16	13	*TM			0.050
74	TM	Phenanthrene		1.200	1.270	1.186	1.184	1.233	1.183	1.264	1.200		1.2	3.0	TM			0.700
75	TM	Anthracene		1.241	1.329	1.236	1.208	1.277	1.231	1.348	1.260		1.3	3.9	TM			0.700
76	TM	Carbazol		1.114	1.184	1.099	1.105	1.169	1.132	1.198	1.141		1.1	3.3	TM			0.010
77	TM	Di-n-butylphthalate		1.334	1.469	1.415	1.447	1.517	1.476	1.577	1.423		1.5	5.0	TM			0.010
78		2-Nitrodiphenylamine				0.2897	0.3175	0.3385	0.3354	0.3603	0.3395		0.33	7.3				
79	*TM	Fluoranthene		1.346	1.443	1.356	1.352	1.434	1.393	1.478	1.389		1.4	3.5	*TM			0.600
80	I	Chrysene-D12(IS)	ISTD															
81	TM	Benzidine		0.3038	0.3700	0.3956	0.3288	0.3260	0.3178	0.2977	0.2740		0.33	12	TM			
82	TM	Pyrene		1.443	1.562	1.441	1.319	1.395	1.296	1.310	1.238		1.4	7.6	TM			0.600
83	S	Terphenyl-D14(S)		0.8981	0.9238	0.9229	0.8968	0.9160	0.9330	0.9065	0.8900		0.91	1.7	S			
84	TM	Butyl benzylphthalate		0.6203	0.6945	0.6643	0.6142	0.6462	0.6119	0.6206	0.6047		0.63	4.9	TM			0.010
85	TM	3,3'-Dichlorobenzidine		0.4443	0.5032	0.4675	0.4227	0.4341	0.4097	0.3992			0.44	8.1	TM			0.010
86	TM	Benz (a) anthracene		1.433	1.513	1.415	1.297	1.451	1.334	1.356	1.287		1.4	5.8	TM			0.800
87	TM	Bis (2-ethylhexyl) phthalate		0.9844	1.015	0.9906	0.9182	0.9908	0.9387	0.9518	0.8936		0.96	4.3	TM			0.010
88	TM	Chrysene		1.358	1.456	1.339	1.221	1.254	1.182	1.212	1.158		1.3	8.0	TM			0.700
89	*TM	Di-n-octylphthalate		1.555	1.678	1.580	1.514	1.607	1.478	1.456	1.419		1.5	5.6	*TM			0.010
90	I	Perylene-D12(IS)	ISTD															
91	TM	Benzo (b) fluoranthene		1.503	1.414	1.436	1.569	1.520	1.400	1.644	1.517		1.5	5.5	TM			0.700
92	TM	Benzo (k) fluoranthene		1.200	1.528	1.430	1.212	1.395	1.414	1.300	1.409		1.4	8.4	TM			0.700
93	*TM	Benzo (a) pyrene	0.9739	1.253	1.351	1.326	1.321	1.371	1.331	1.376	1.358		1.3	9.7	*TM			0.700
94	TM	Indeno (1,2,3-cd) pyrene		1.489	1.594	1.550	1.508	1.580	1.519	1.577	1.544		1.5	2.4	TM			0.500
95	TM	Dibenz (a,h) anthracene	1.025	1.296	1.405	1.370	1.338	1.398	1.356	1.417	1.393		1.3	9.1	TM			0.400
96	TM	Benzo (g,h,i) perylene		1.194	1.284	1.245	1.200	1.248	1.197	1.235	1.206		1.2	2.6	TM			0.500
97																		
98																		
99																		
100																		
101																		
102																		
103																		
104																		
105																		

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y003.D Vial: 3
Acq On : 20 Apr 20 9:28 Operator: MA
Sample : 4ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:49 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri Apr 17 16:03:50 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	455328	40.00000	ppb	0.00
21) Napthalene-D8(IS)	6.72	136	1940113	40.00000	ppb	0.00
41) Acenaphthene-D10(IS)	8.74	164	1151456	40.00000	ppb	0.00
65) Phenanthrene-D10(IS)	10.48	188	2224606	40.00000	ppb	0.00
80) Chrysene-D12(IS)	13.56	240	2167465	40.00000	ppb	0.00
90) Perylene-D12(IS)	15.35	264	2168500	40.00000	ppb	0.00
System Monitoring Compounds						
5) 2-Fluorophenol (S)	0.00	112	0d	0.00000	ppb	
Spiked Amount 200.000			Recovery =	0.000%		
6) Phenol-D6 (S)	0.00	99	0d	0.00000	ppb	
Spiked Amount 200.000			Recovery =	0.000%		
22) Nitrobenzene-D5(S)	0.00	82	0d	0.00000	ppb	
Spiked Amount 100.000			Recovery =	0.000%		
46) 2-Fluorobiphenyl(S)	0.00	172	0d	0.00000	ppb	
Spiked Amount 100.000			Recovery =	0.000%		
64) 2,4,6-Tribromophenol(S)	0.00	330	0d	0.00000	ppb	
Spiked Amount 200.000			Recovery =	0.000%		
83) Terphenyl-D14(S)	0.00	244	0d	0.00000	ppb	
Spiked Amount 100.000			Recovery =	0.000%		
Target Compounds						Qvalue
93) Benzo (a) pyrene	15.28	252	211187	2.97197	ppb	98
95) Dibenz (a,h) anthracene	17.19	278	222253	3.12409	ppb	98

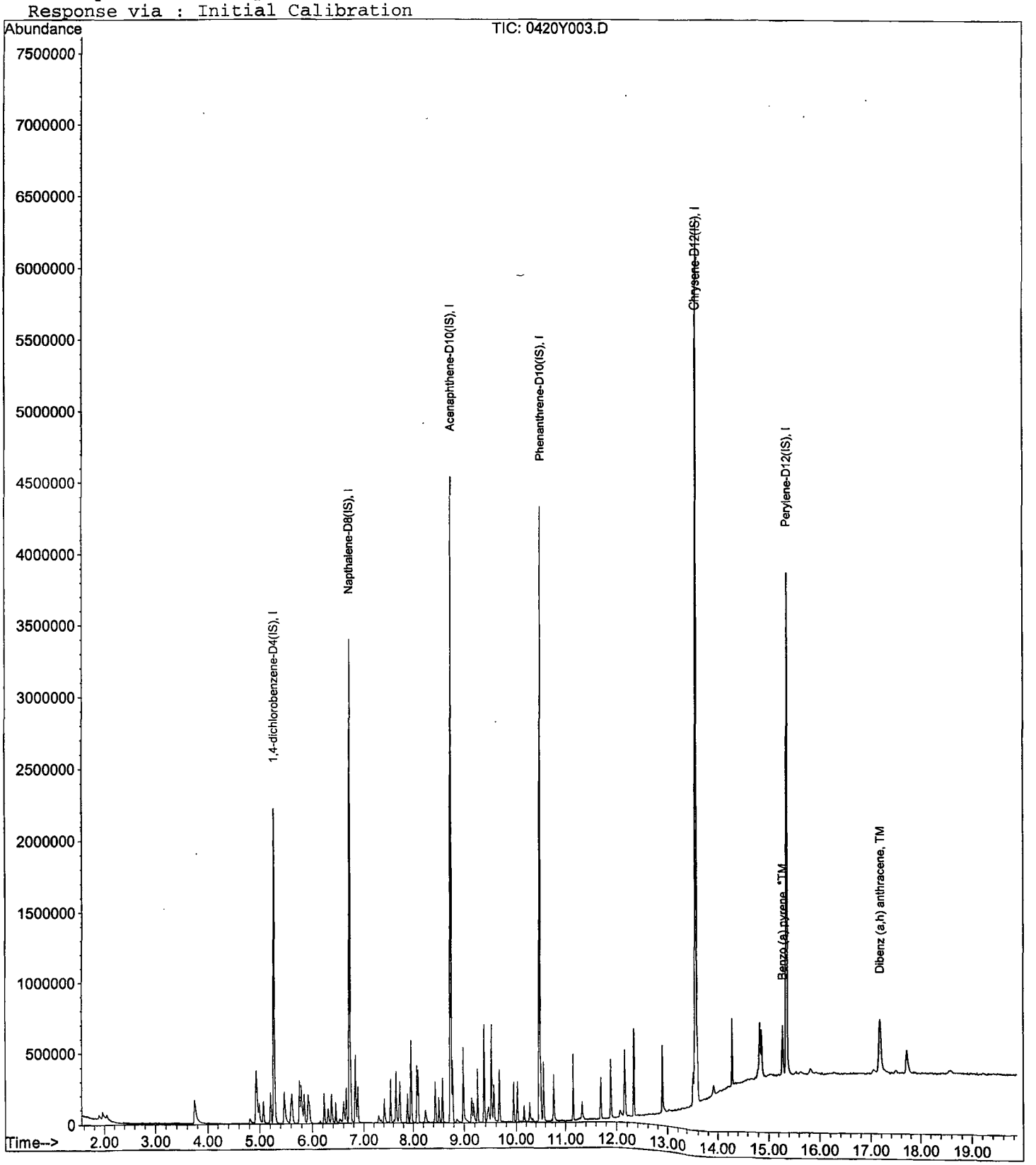
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y003.D Vial: 3
Acq On : 20 Apr 20 9:28 Operator: MA
Sample : 4ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:49 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y004.D Vial: 4
Acq On : 20 Apr 20 9:57 Operator: MA
Sample : 5ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:47 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri Apr 17 16:03:50 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	485305	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.72	136	2056071	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1224741	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.47	188	2325192	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.56	240	2299828	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.35	264	2263400	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.74	112	139102	7.38925	ppb		0.00
Spiked Amount 200.000			Recovery	= 3.695%			
6) Phenol-D6 (S)	4.92	99	188414	7.38130	ppb		0.00
Spiked Amount 200.000			Recovery	= 3.691%			
22) Nitrobenzene-D5(S)	5.92	82	88890	3.66922	ppb		0.00
Spiked Amount 100.000			Recovery	= 3.669%			
46) 2-Fluorobiphenyl(S)	7.96	172	195340	4.50559	ppb		0.00
Spiked Amount 100.000			Recovery	= 4.506%			
64) 2,4,6-Tribromophenol(S)	9.67	330	50444	8.97320	ppb		0.00
Spiked Amount 200.000			Recovery	= 4.487%			
83) Terphenyl-D14(S)	12.33	244	258181	5.13166	ppb		0.00
Spiked Amount 100.000			Recovery	= 5.132%			
Target Compounds							Qvalue
2) 1,4-Dioxane	1.65	58	3557	0.47324			63
3) n-Nitrosodimethylamine	1.89	42	36415	3.58785	ppb		93
4) Pyridine	1.95	79	101246	3.81947	ppb		99
7) Phenol	4.94	94	136305	4.10346	ppb		95
8) Aniline	4.92	93	68288	3.07178	ppb		88
9) Bis (2-chloroethyl) ether	4.99	63	58540	4.00795	ppb		99
10) 2-Chlorophenol	5.06	128	105741	4.47011	ppb		95
11) 1,3-DCB	5.21	146	115758	4.54967	ppb		98
12) 1,4-DCB	5.29	146	121425	4.67009	ppb		98
13) Benzyl alcohol	5.48	108	51857	3.73975	ppb		97
14) 1,2-DCB	5.47	146	112232	4.60728	ppb		99
15) 2-Methylphenol	5.61	107	84528	4.22315	ppb		95
16) Bis (2-chloroisopropyl) et	5.59	45	69360	3.79621	ppb	#	44
17) Acetophenone	5.76	105	130626	4.03445	ppb		97
18) 3&4-Methylphenol	5.79	107	206927	8.07643	ppb		96
19) n-Nitrosodi-n-propylamine	5.76	70	71755	3.56051	ppb		95
20) Hexachloroethane	5.84	117	43543	4.17246	ppb		84
23) Nitrobenzene	5.93	77	108990	3.94905	ppb		93
24) Isophorone	6.22	82	182430	3.95761	ppb		95
25) 2-Nitrophenol	6.30	139	54871	4.29915	ppb		97
26) 2,4-Dimethylphenol	6.36	122	91194	4.54434	ppb		99
27) Benzoic acid	6.52	105	49446	3.10954	ppb		92
28) Bis (2-chloroethoxy) metha	6.45	93	112980	4.37945	ppb		98
29) 2,4-Dichlorophenol	6.59	162	88132	4.68687	ppb		98
30) 1,2,4-Trichlorobenzene	6.66	180	100862	4.91827	ppb		96
31) 3,4-Dimethylphenol	6.71	107	139667	4.50710	ppb		99
32) Naphthalene	6.74	128	301529	4.63765	ppb		98
33) 4-Chloroaniline	6.83	127	114595	4.38024	ppb		97
34) 2,6-Dichlorophenol	6.83	162	85911	4.60939	ppb		97
35) Hexachloropropene	6.84	213	69461	4.36668	ppb		97
36) Hexachlorobutadiene	6.88	225	62299	5.00268	ppb		99
37) Caprolactum	7.28	55	27154	3.38198	ppb		93

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y004.D Vial: 4
Acq On : 20 Apr 20 9:57 Operator: MA
Sample : 5ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:47 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri Apr 17 16:03:50 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	94548	4.23772 ppb		99
39)	2-Methylnaphthalene	7.54	142	199522	4.68836 ppb		99
40)	1-Methylnaphthalene	7.65	142	208627	4.79123 ppb		100
42)	Hexachlorocyclopentadiene	7.72	237	37216	8.67075 ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	100673	5.02789 ppb		96
44)	2,4,6-Trichlorophenol	7.88	196	63397	4.77454 ppb		97
45)	2,4,5-Trichlorophenol	7.94	196	66618	4.70475 ppb	#	88
47)	1,1'-Biphenyl	8.07	154	262111	4.75810 ppb		97
48)	2-Chloronaphthalene	8.10	162	212882	4.94071 ppb		96
49)	2-Nitroaniline	8.24	65	51318	3.42456 ppb		89
50)	Dimethyl phthalate	8.44	163	250866	4.78899 ppb		99
51)	2,6-DNT	8.51	165	50484	4.26956 ppb		89
52)	Acenaphthylene	8.58	152	304219	4.58642 ppb		99
53)	3-Nitroaniline	8.24	138	56373	3.83644 ppb		88
54)	Acenaphthene	8.78	154	205134	4.83577 ppb		100
55)	2,4-Dinitrophenol	8.86	184	19235	8.75628 ppb		93
56)	4-Nitrophenol	8.99	65	37486	3.79923 ppb		81
57)	Dibenzofuran	8.98	168	295588	4.77235 ppb		100
58)	2,4-DNT	8.98	165	68587	4.03425 ppb	#	55
59)	2,3,4,6-Tetrachlorophenol	9.15	232	52362	4.97711 ppb	#	89
60)	Diethyl phthalate	9.25	149	247071	4.62888 ppb		99
61)	4-Chlorophenyl phenyl ethe	9.38	204	130794	4.77103 ppb		98
62)	Fluorene	9.38	166	243509	4.66236 ppb		98
63)	4-Nitroaniline	8.72	138	48390	3.98643 ppb	#	93
66)	4,6-Dinitro-2-methylphenol	9.46	198	38206	3.86312 ppb		94
67)	Diphenyl amine	9.52	169	369221	9.34910 ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	369221	9.34910 ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	229449	3.80899 ppb		93
70)	4-Bromophenyl phenyl ether	9.95	248	67488	4.83215 ppb		95
71)	Hexachlorobenzene	10.02	284	70803	5.12457 ppb	#	81
72)	Atrazine	10.16	200	32953	2.21238 ppb		97
73)	Pentachlorophenol	10.27	266	36146	4.92955 ppb		98
74)	Phenanthrene	10.50	178	348718	4.81638 ppb		99
75)	Anthracene	10.56	178	360825	4.74046 ppb		99
76)	Carbazol	10.76	167	323829	4.65797 ppb		98
77)	Di-n-butylphthalate	11.15	149	387592	4.25911 ppb		99
78)	2-Nitrodiphenylamine	11.33	167	32416	1.54869 ppb	#	88
79)	Fluoranthene	11.89	202	391335	4.79410 ppb	#	97
81)	Benzidine	12.06	184	87338	3.42242 ppb		96
82)	Pyrene	12.15	202	414898	5.14364 ppb		99
84)	Butyl benzylphthalate	12.90	149	178322	4.43257 ppb		93
85)	3,3'-Dichlorobenzidine	13.52	252	127727	5.19403 ppb		99
86)	Benz (a) anthracene	13.55	228	411997	5.11495 ppb		98
87)	Bis (2-ethylhexyl) phthala	13.56	149	282988	4.53966 ppb		97
88)	Chrysene	13.58	228	390448	5.53262 ppb		98
89)	Di-n-octylphthalate	14.29	149	447028	4.63195 ppb		96
91)	Benzo (b) fluoranthene	14.83	252	425367	4.98944 ppb		98
92)	Benzo (k) fluoranthene	14.86	252	339399	4.24236 ppb		100
93)	Benzo (a) pyrene	15.27	252	354632	4.78137 ppb		99
94)	Indeno (1,2,3-cd) pyrene	17.16	276	421365	4.87996 ppb		98
95)	Dibenz (a,h) anthracene	17.19	278	366544	4.93628 ppb		98
96)	Benzo (g,h,i) perylene	17.71	276	337705	4.98869 ppb		99

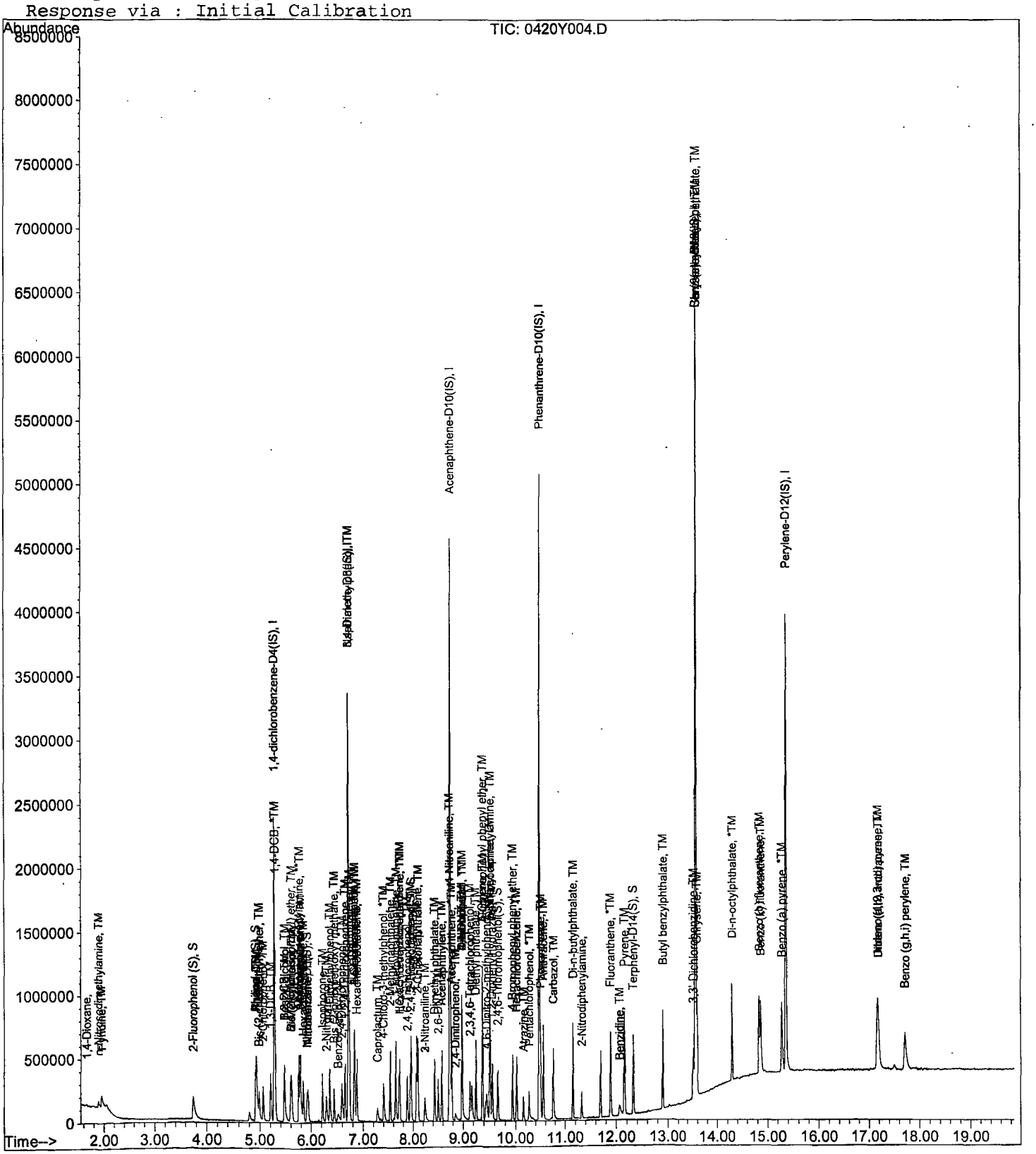
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y004.D Vial: 4
Acq On : 20 Apr 20 9:57 Operator: MA
Sample : 5ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 12:47 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y005.D Vial: 5
Acq On : 20 Apr 20 10:31 Operator: MA
Sample : 10ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:35 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:30:40 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	411517	40.00000 ppb		0.00
21) Napthalene-D8(IS)	6.72	136	1787905	40.00000 ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1077923	40.00000 ppb		0.00
65) Phenanthrene-D10(IS)	10.47	188	2053303	40.00000 ppb		0.00
80) Chrysene-D12(IS)	13.56	240	1987380	40.00000 ppb		0.00
90) Perylene-D12(IS)	15.36	264	1938494	40.00000 ppb		0.00
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.73	112	267768	17.70025 ppb		0.00
Spiked Amount 200.000			Recovery =	8.850%		
6) Phenol-D6 (S)	4.92	99	344978	17.23074 ppb		0.00
Spiked Amount 200.000			Recovery =	8.616%		
22) Nitrobenzene-D5(S)	5.92	82	164606	9.01156 ppb		0.00
Spiked Amount 100.000			Recovery =	9.012%		
46) 2-Fluorobiphenyl(S)	7.96	172	358099	9.34832 ppb		0.00
Spiked Amount 100.000			Recovery =	9.348%		
64) 2,4,6-Tribromophenol(S)	9.67	330	96267	17.43082 ppb		0.00
Spiked Amount 200.000			Recovery =	8.716%		
83) Terphenyl-D14(S)	12.33	244	459003	10.14184 ppb		0.00
Spiked Amount 100.000			Recovery =	10.142%		
Target Compounds						Qvalue
2) 1,4-Dioxane	1.65	58	5508m	1.11006		23
3) n-Nitrosodimethylamine	1.88	42	65173	9.20259 ppb		89
4) Pyridine	1.93	79	193080	10.37468 ppb		99
7) Phenol	4.93	94	266236	10.24195 ppb		86
8) Aniline	4.92	93	159232	10.63571 ppb		92
9) Bis (2-chloroethyl) ether	4.99	63	107729	10.30174 ppb		90
10) 2-Chlorophenol	5.06	128	202043	10.33126 ppb		97
11) 1,3-DCB	5.21	146	220621	10.47519 ppb		99
12) 1,4-DCB	5.29	146	226661	10.56157 ppb		97
13) Benzyl alcohol	5.47	108	105103	9.73097 ppb		96
14) 1,2-DCB	5.47	146	211415	10.34100 ppb		96
15) 2-Methylphenol	5.60	107	160916	10.19033 ppb		99
16) Bis (2-chloroisopropyl) et	5.59	45	129965	10.34754 ppb	#	49
17) Acetophenone	5.75	105	250669	10.17705 ppb		93
18) 3&4-Methylphenol	5.78	107	404001	20.24692 ppb		98
19) n-Nitrosodi-n-propylamine	5.75	70	145081	10.23017 ppb		98
20) Hexachloroethane	5.84	117	82754	10.35815 ppb		83
23) Nitrobenzene	5.93	77	216430	10.37437 ppb		96
24) Isophorone	6.22	82	349370	9.96039 ppb		98
25) 2-Nitrophenol	6.30	139	107342	9.85589 ppb		96
26) 2,4-Dimethylphenol	6.36	122	172223	10.12163 ppb		98
27) Benzoic acid	6.51	105	114649	8.08854 ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	212602	10.38199 ppb		98
29) 2,4-Dichlorophenol	6.59	162	168670	10.11668 ppb		96
30) 1,2,4-Trichlorobenzene	6.66	180	193098	10.42008 ppb		99
31) 3,4-Dimethylphenol	6.70	107	262842	10.55028 ppb		96
32) Naphthalene	6.74	128	573540	10.41828 ppb		99
33) 4-Chloroaniline	6.83	127	221542	10.28185 ppb		97
34) 2,6-Dichlorophenol	6.83	162	164290	9.92548 ppb		99
35) Hexachloropropene	6.84	213	138413	9.91819 ppb		98
36) Hexachlorobutadiene	6.88	225	114154	10.20203 ppb		98
37) Caprolactum	7.27	55	52746	9.61756 ppb		89

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y005.D Vial: 5
Acq On : 20 Apr 20 10:31 Operator: MA
Sample : 10ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:35 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:30:40 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	184351	10.10697 ppb		96
39)	2-Methylnaphthalene	7.54	142	377779	10.20026 ppb		99
40)	1-Methylnaphthalene	7.65	142	383100	10.10286 ppb		98
42)	Hexachlorocyclopentadiene	7.72	237	93696	11.47811 ppb		99
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	190382	10.28200 ppb		96
44)	2,4,6-Trichlorophenol	7.88	196	125929	10.16069 ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	133127	10.18579 ppb		95
47)	1,1'-Biphenyl	8.07	154	482438	10.13662 ppb	#	96
48)	2-Chloronaphthalene	8.10	162	389751	10.30456 ppb		96
49)	2-Nitroaniline	8.24	65	103517	9.75574 ppb		95
50)	Dimethyl phthalate	8.44	163	460735	10.14981 ppb		99
51)	2,6-DNT	8.51	165	98326	9.65272 ppb	#	80
52)	Acenaphthylene	8.58	152	588203	10.32058 ppb		99
53)	3-Nitroaniline	8.24	138	114565	9.50532 ppb		96
54)	Acenaphthene	8.78	154	381896	10.45441 ppb		99
55)	2,4-Dinitrophenol	8.85	184	45060	9.86539 ppb		93
56)	4-Nitrophenol	8.98	65	76411	9.06950 ppb		81
57)	Dibenzofuran	8.98	168	551906	10.23219 ppb		96
58)	2,4-DNT	8.98	165	143436	9.84144 ppb	#	68
59)	2,3,4,6-Tetrachlorophenol	9.14	232	103187	9.98710 ppb		98
60)	Diethyl phthalate	9.25	149	467864	10.53681 ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	240472	9.87872 ppb		99
62)	Fluorene	9.38	166	447706	9.93273 ppb		99
63)	4-Nitroaniline	8.72	138	97168	9.96508 ppb		96
66)	4,6-Dinitro-2-methylphenol	9.46	198	81447	9.09343 ppb		96
67)	Diphenyl amine	9.52	169	685707	20.34571 ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	685707	20.34571 ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	430809	10.00765 ppb	#	91
70)	4-Bromophenyl phenyl ether	9.94	248	130473	10.07873 ppb		94
71)	Hexachlorobenzene	10.02	284	134313	10.15931 ppb	#	82
72)	Atrazine	10.16	200	63588	5.11970 ppb		97
73)	Pentachlorophenol	10.27	266	70414	8.77873 ppb		95
74)	Phenanthrene	10.50	178	652123	10.45729 ppb		100
75)	Anthracene	10.56	178	681997	10.49054 ppb		99
76)	Carbazol	10.76	167	607585	10.35739 ppb		100
77)	Di-n-butylphthalate	11.15	149	753847	10.07823 ppb		99
78)	2-Nitrodiphenylamine	11.33	167	70186	4.41517 ppb		93
79)	Fluoranthene	11.89	202	740853	10.31566 ppb	#	97
81)	Benzidine	12.06	184	183847	11.32570 ppb		99
82)	Pyrene	12.15	202	775988	11.35435 ppb		99
84)	Butyl benzylphthalate	12.90	149	345065	10.94434 ppb		93
85)	3,3'-Dichlorobenzidine	13.52	252	250001	11.65740 ppb		100
86)	Benz (a) anthracene	13.55	228	751595	10.91705 ppb		99
87)	Bis (2-ethylhexyl) phthala	13.56	149	504381	10.57024 ppb		98
88)	Chrysene	13.58	228	723217	11.43853 ppb		99
89)	Di-n-octylphthalate	14.29	149	833555	10.92357 ppb	#	94
91)	Benzo (b) fluoranthene	14.83	252	685042	9.42031 ppb		98
92)	Benzo (k) fluoranthene	14.86	252	740283	11.22519 ppb		99
93)	Benzo (a) pyrene	15.27	252	654589	10.42513 ppb		98
94)	Indeno (1,2,3-cd) pyrene	17.16	276	772343	10.31389 ppb		98
95)	Dibenz (a,h) anthracene	17.18	278	681025	10.54134 ppb		97
96)	Benzo (g,h,i) perylene	17.71	276	622415	10.47443 ppb		99

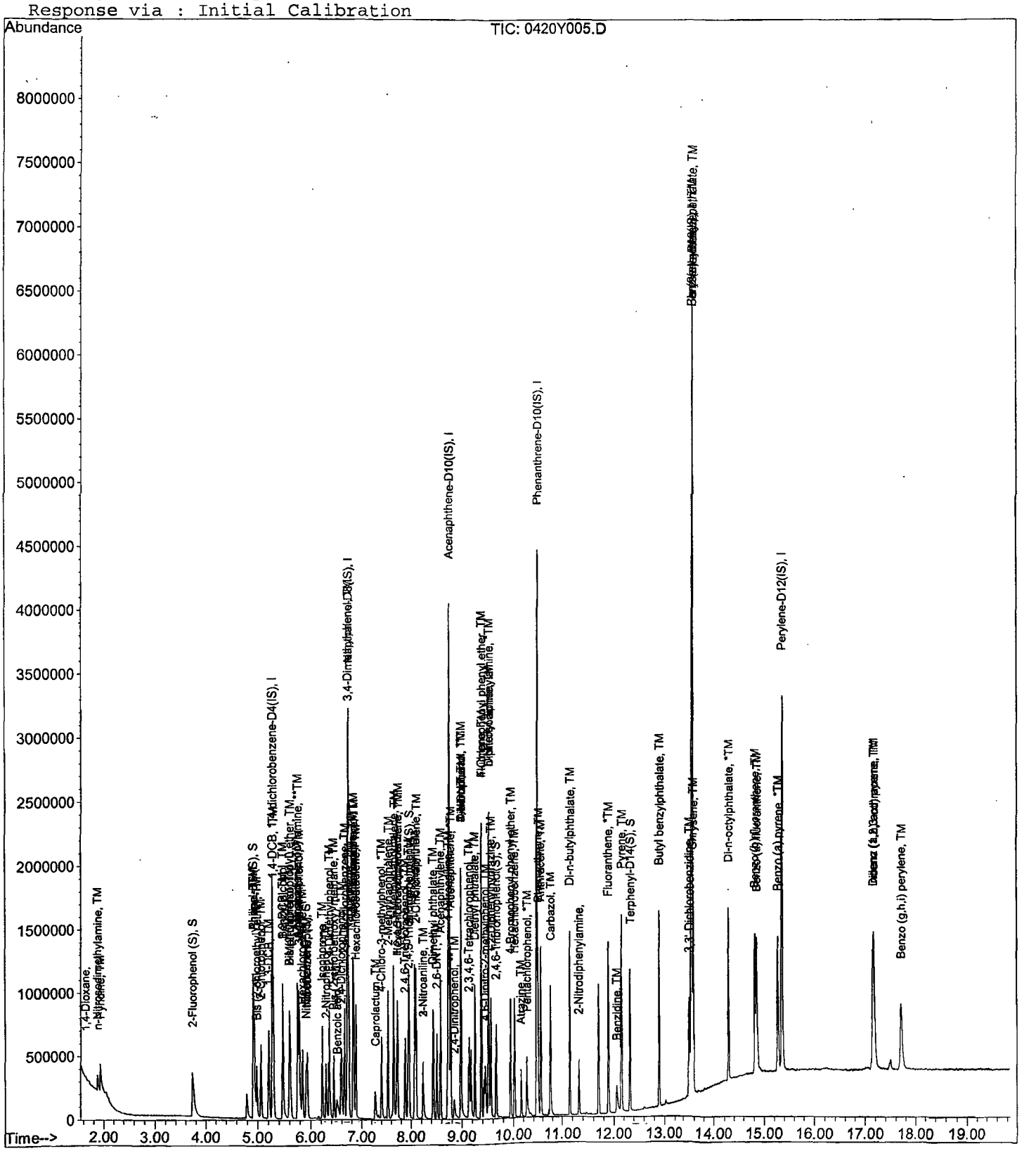
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y005.D Vial: 5
Acq On : 20 Apr 20 10:31 Operator: MA
Sample : 10ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:35 2020 Quant Results File: Y0420.RES

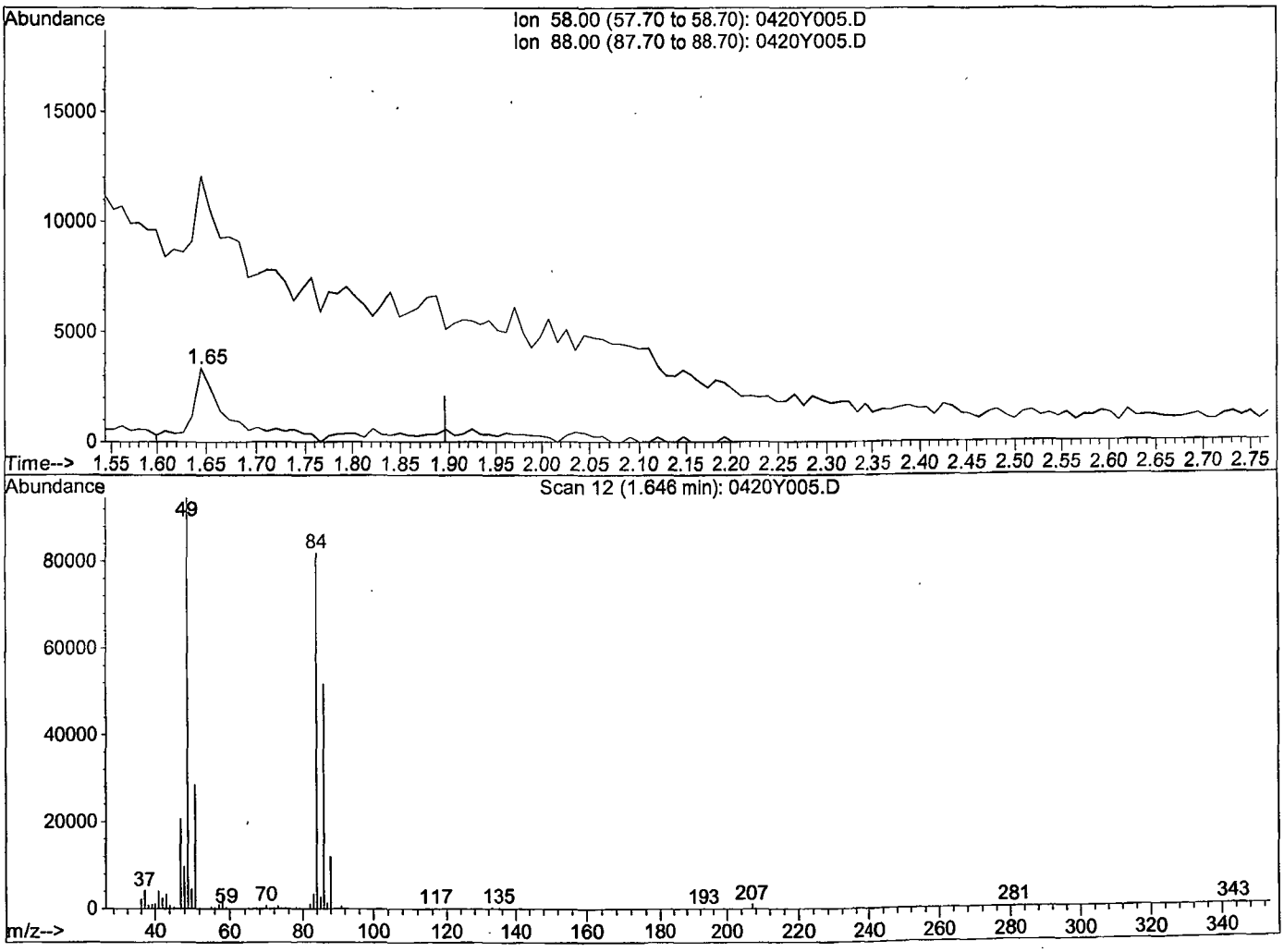
Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y005.D Vial: 5
Acq On : 20 Apr 20 10:31 Operator: MA
Sample : 10ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: Apr 20 14:31 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:32:11 2020
Response via : Multiple Level Calibration



TIC: 0420Y005.D

(2) 1,4-Dioxane

1.65min 1.7701

response 8783

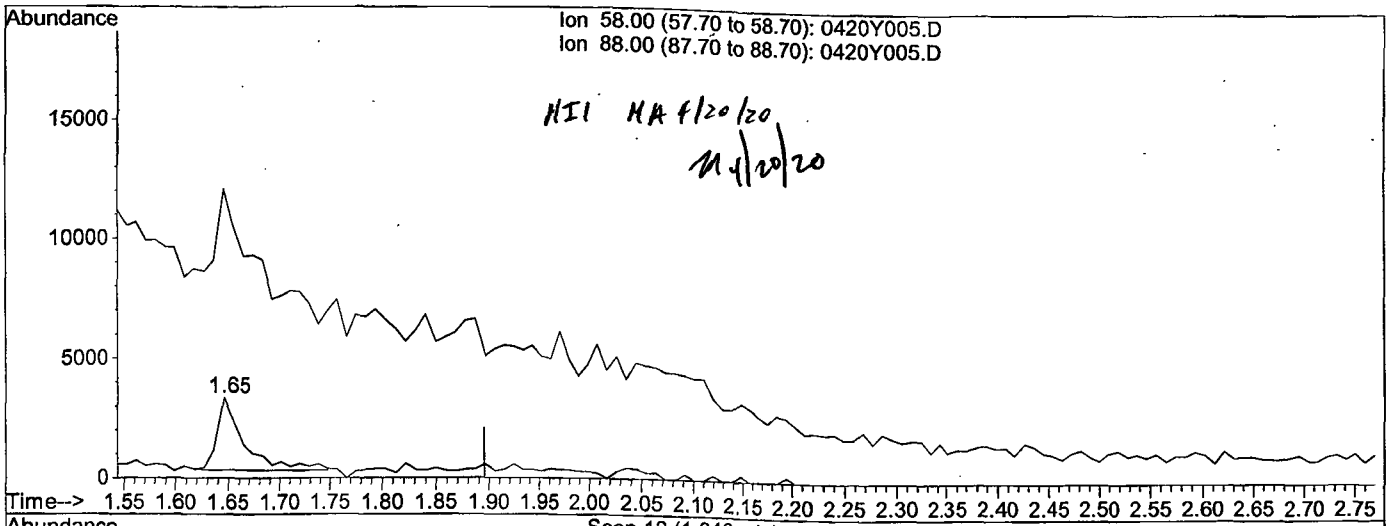
Ion	Exp%	Act%
58.00	100	100
88.00	205.20	85.96#
0.00	0.00	0.00
0.00	0.00	0.00

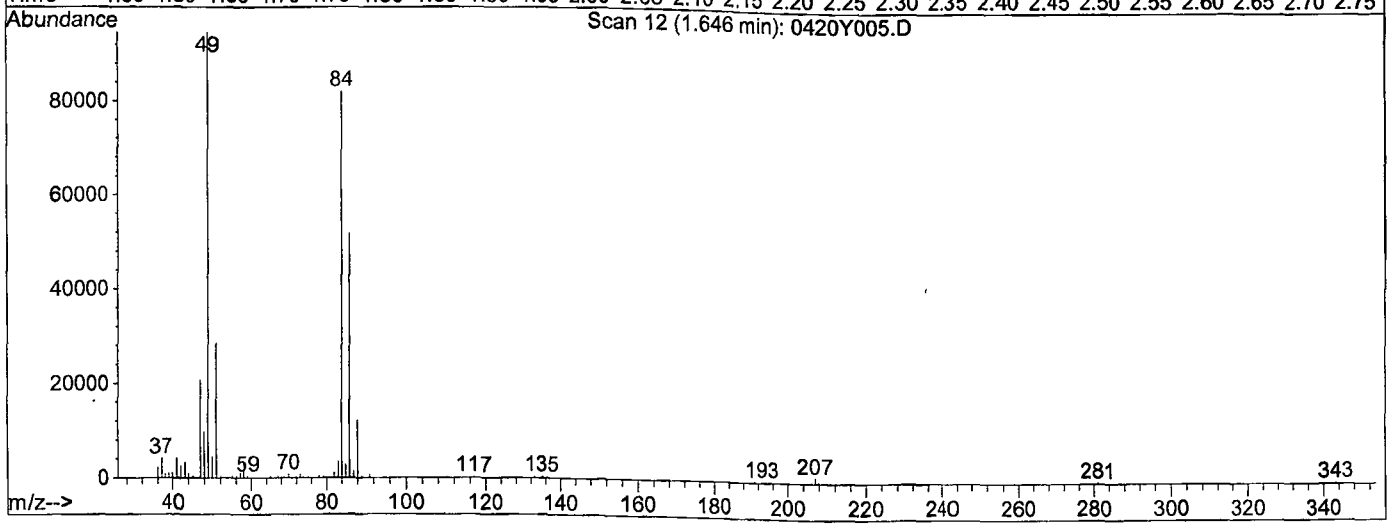
Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y005.D
Acq On : 20 Apr 20 10:31
Sample : 10ug/ml 8270 3/4/20
Misc :
Quant Time: Apr 20 14:35 2020

Vial: 5
Operator: MA
Inst : Yoda
Multiplr: 1.00
Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:32:11 2020
Response via : Multiple Level Calibration





TIC: 0420Y005.D

(2) 1,4-Dioxane

1.65min 1.1101 m

response 5508

Ion	Exp%	Act%
58.00	100	100
88.00	205.20	137.07
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y006.D Vial: 6
Acq On : 20 Apr 20 11:00 Operator: MA
Sample : 20ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	443176	40.00000 ppb	0.00
21) Napthalene-D8(IS)	6.73	136	1886740	40.00000 ppb	0.00
41) Acenaphthene-D10(IS)	8.74	164	1143699	40.00000 ppb	0.00
65) Phenanthrene-D10(IS)	10.48	188	2205691	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.56	240	2177433	40.00000 ppb	0.00
90) Perylene-D12(IS)	15.35	264	2036694	40.00000 ppb	0.00
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.74	112	605572	37.17047 ppb	0.00
Spiked Amount 200.000			Recovery =	18.585%	
6) Phenol-D6 (S)	4.92	99	781388	36.24021 ppb	0.00
Spiked Amount 200.000			Recovery =	18.120%	
22) Nitrobenzene-D5(S)	5.92	82	366441	19.01038 ppb	0.00
Spiked Amount 100.000			Recovery =	19.010%	
46) 2-Fluorobiphenyl(S)	7.96	172	776977	19.11677 ppb	0.00
Spiked Amount 100.000			Recovery =	19.117%	
64) 2,4,6-Tribromophenol(S)	9.67	330	212252	36.22165 ppb	0.00
Spiked Amount 200.000			Recovery =	18.111%	
83) Terphenyl-D14(S)	12.33	244	1004778	20.26318 ppb	0.00
Spiked Amount 100.000			Recovery =	20.263%	
Target Compounds					Qvalue
2) 1,4-Dioxane	1.65	58	10375	1.94157	52
3) n-Nitrosodimethylamine	1.87	42	158390	20.76737 ppb	88
4) Pyridine	1.93	79	386292	19.27368 ppb	99
7) Phenol	4.93	94	534526	19.09397 ppb	96
8) Aniline	4.92	93	313280	19.43034 ppb	91
9) Bis (2-chloroethyl) ether	4.99	63	218851	19.43292 ppb	93
10) 2-Chlorophenol	5.06	128	405018	19.23072 ppb	98
11) 1,3-DCB	5.21	146	435270	19.19045 ppb	99
12) 1,4-DCB	5.30	146	444445	19.23008 ppb	99
13) Benzyl alcohol	5.47	108	220095	18.92181 ppb	97
14) 1,2-DCB	5.47	146	419544	19.05530 ppb	99
15) 2-Methylphenol	5.60	107	320585	18.85141 ppb	99
16) Bis (2-chloroisopropyl) et	5.59	45	260241	19.23969 ppb #	66
17) Acetophenone	5.75	105	504953	19.03636 ppb	96
18) 3&4-Methylphenol	5.78	107	811203	37.75006 ppb	97
19) n-Nitrosodi-n-propylamine	5.76	70	292054	19.12261 ppb	94
20) Hexachloroethane	5.84	117	164276	19.09321 ppb	84
23) Nitrobenzene	5.94	77	433002	19.66830 ppb	95
24) Isophorone	6.22	82	725259	19.59369 ppb	99
25) 2-Nitrophenol	6.30	139	223124	19.41354 ppb	98
26) 2,4-Dimethylphenol	6.36	122	353585	19.69180 ppb	97
27) Benzoic acid	6.52	105	278076	18.59070 ppb	98
28) Bis (2-chloroethoxy) metha	6.45	93	420893	19.47679 ppb	98
29) 2,4-Dichlorophenol	6.59	162	341037	19.38359 ppb	99
30) 1,2,4-Trichlorobenzene	6.66	180	380839	19.47454 ppb	99
31) 3,4-Dimethylphenol	6.71	107	512127	19.47957 ppb	99
32) Naphthalene	6.74	128	1132470	19.49357 ppb	99
33) 4-Chloroaniline	6.82	127	468213	20.59165 ppb	95
34) 2,6-Dichlorophenol	6.83	162	334028	19.12299 ppb	95
35) Hexachloropropene	6.85	213	278972	18.94299 ppb	99
36) Hexachlorobutadiene	6.88	225	229269	19.41659 ppb	98
37) Caprolactum	7.27	55	116487	20.12729 ppb	94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y006.D Vial: 6
Acq On : 20 Apr 20 11:00 Operator: MA
Sample : 20ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SV0C1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	377120	19.59240	ppb		92
39)	2-Methylnaphthalene	7.53	142	751200	19.22035	ppb		97
40)	1-Methylnaphthalene	7.65	142	772050	19.29345	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	194240	18.08220	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	381178	19.40240	ppb		98
44)	2,4,6-Trichlorophenol	7.88	196	254711	19.36963	ppb		98
45)	2,4,5-Trichlorophenol	7.93	196	273305	19.70843	ppb	#	91
47)	1,1'-Biphenyl	8.07	154	988227	19.56970	ppb		98
48)	2-Chloronaphthalene	8.10	162	786722	19.60377	ppb		97
49)	2-Nitroaniline	8.23	65	225189	20.00193	ppb		87
50)	Dimethyl phthalate	8.43	163	944738	19.61527	ppb		99
51)	2,6-DNT	8.51	165	211533	19.57201	ppb		88
52)	Acenaphthylene	8.58	152	1186565	19.62204	ppb		99
53)	3-Nitroaniline	8.24	138	250585	19.59503	ppb		97
54)	Acenaphthene	8.78	154	753935	19.45201	ppb		98
55)	2,4-Dinitrophenol	8.84	184	119317	18.77672	ppb		93
56)	4-Nitrophenol	8.96	65	170165	19.03592	ppb		97
57)	Dibenzofuran	8.98	168	1115152	19.48559	ppb		99
58)	2,4-DNT	8.98	165	306156	19.79790	ppb		84
59)	2,3,4,6-Tetrachlorophenol	9.14	232	212675	19.40023	ppb		95
60)	Diethyl phthalate	9.25	149	926918	19.67465	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	489487	18.95193	ppb		94
62)	Fluorene	9.38	166	913187	19.09464	ppb		99
63)	4-Nitroaniline	8.71	138	206111	19.92207	ppb		88
66)	4,6-Dinitro-2-methylphenol	9.46	198	184193	19.14407	ppb		98
67)	Diphenyl amine	9.52	169	1390429	38.40533	ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	1390429	38.40533	ppb		100
69)	1,2-Diphenylhydrazine	9.57	77	873967	18.89952	ppb	#	89
70)	4-Bromophenyl phenyl ether	9.95	248	261557	18.80874	ppb		92
71)	Hexachlorobenzene	10.02	284	274478	19.32689	ppb	#	84
72)	Atrazine	10.15	200	127725	9.57313	ppb		95
73)	Pentachlorophenol	10.26	266	160842	18.66726	ppb		98
74)	Phenanthrene	10.50	178	1307537	19.51874	ppb		99
75)	Anthracene	10.56	178	1363551	19.52518	ppb		100
76)	Carbazol	10.76	167	1212012	19.23352	ppb		99
77)	Di-n-butylphthalate	11.15	149	1560218	19.41756	ppb		99
78)	2-Nitrodiphenylamine	11.32	167	159748	9.35494	ppb		86
79)	Fluoranthene	11.89	202	1495955	19.39063	ppb		98
81)	Benzidine	12.05	184	430743	24.21938	ppb		98
82)	Pyrene	12.16	202	1568719	20.95022	ppb		100
84)	Butyl benzylphthalate	12.90	149	723202	20.93556	ppb		91
85)	3,3'-Dichlorobenzidine	13.51	252	509016	21.66345	ppb	#	98
86)	Benz (a) anthracene	13.55	228	1540003	20.41641	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.56	149	1078473	20.62868	ppb		99
88)	Chrysene	13.59	228	1457536	21.04054	ppb		100
89)	Di-n-octylphthalate	14.29	149	1720241	20.57576	ppb	#	95
91)	Benzo (b) fluoranthene	14.82	252	1462840	19.14625	ppb		99
92)	Benzo (k) fluoranthene	14.86	252	1456250	21.01700	ppb		100
93)	Benzo (a) pyrene	15.28	252	1350265	20.46777	ppb		100
94)	Indeno (1,2,3-cd) pyrene	17.16	276	1578287	20.06028	ppb		98
95)	Dibenz (a,h) anthracene	17.18	278	1395501	20.55899	ppb		99
96)	Benzo (g,h,i) perylene	17.70	276	1267475	20.30152	ppb		99

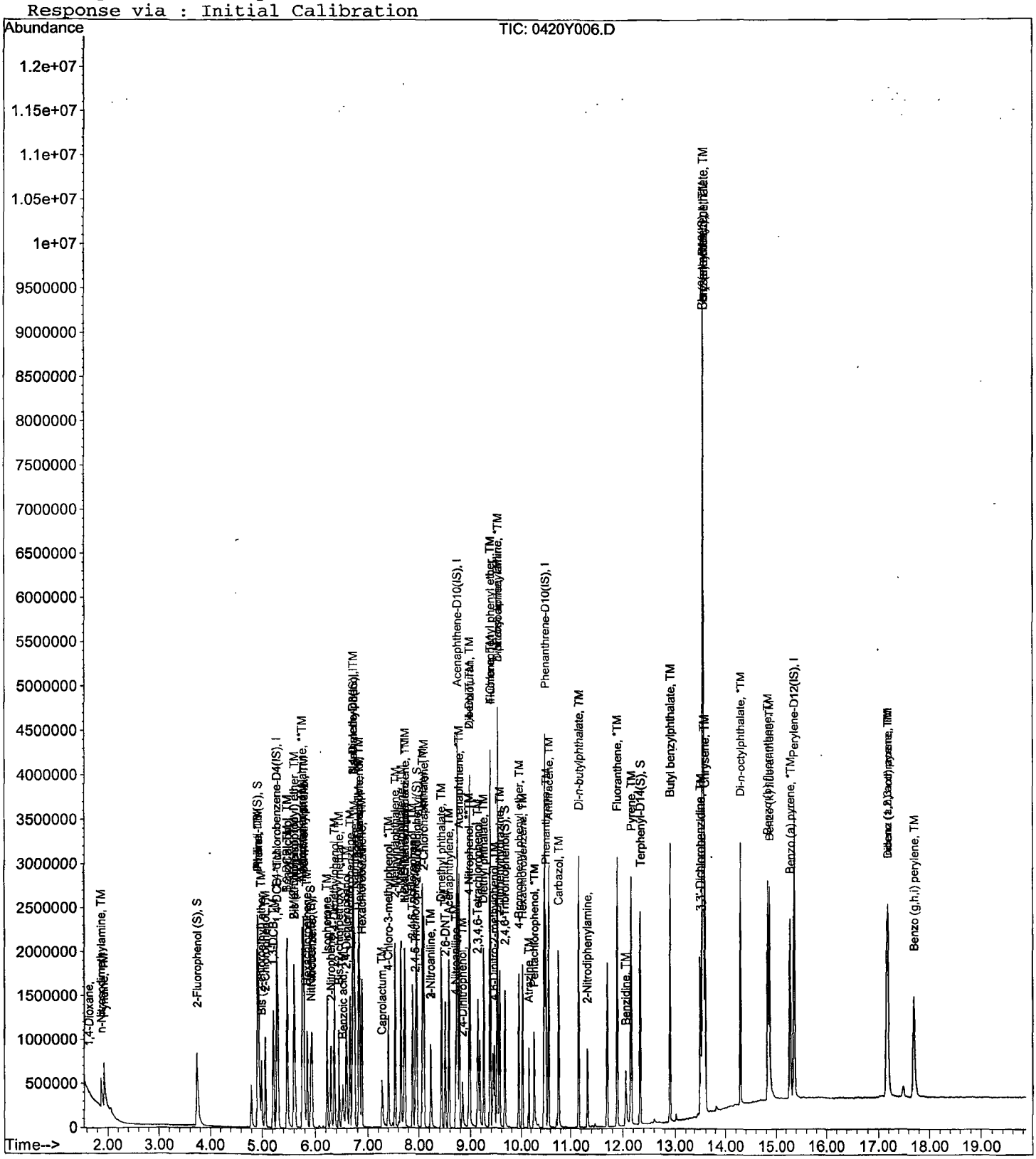
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y006.D Vial: 6
Acq On : 20 Apr 20 11:00 Operator: MA
Sample : 20ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y007.D Vial: 7
Acq On : 20 Apr 20 11:28 Operator: MA
Sample : 40ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	478543	40.00000 ppb		0.00
21) Napthalene-D8(IS)	6.73	136	2109187	40.00000 ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1307414	40.00000 ppb		0.00
65) Phenanthrene-D10(IS)	10.48	188	2474116	40.00000 ppb		0.00
80) Chrysene-D12(IS)	13.56	240	2659220	40.00000 ppb		0.00
90) Perylene-D12(IS)	15.35	264	2349652	40.00000 ppb		0.00
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.73	112	1448204	82.32226 ppb		0.00
Spiked Amount 200.000			Recovery	= 41.161%		
6) Phenol-D6 (S)	4.92	99	1893197	81.31582 ppb		0.00
Spiked Amount 200.000			Recovery	= 40.658%		
22) Nitrobenzene-D5(S)	5.92	82	865065	40.14510 ppb		0.00
Spiked Amount 100.000			Recovery	= 40.145%		
46) 2-Fluorobiphenyl(S)	7.96	172	1809860	38.95381 ppb		0.00
Spiked Amount 100.000			Recovery	= 38.954%		
64) 2,4,6-Tribromophenol(S)	9.67	330	530816	79.24266 ppb		0.00
Spiked Amount 200.000			Recovery	= 39.622%		
83) Terphenyl-D14(S)	12.33	244	2384888	39.38183 ppb		0.00
Spiked Amount 100.000			Recovery	= 39.382%		
Target Compounds						Qvalue
2) 1,4-Dioxane	1.65	58	20792	3.60344		76
3) n-Nitrosodimethylamine	1.87	42	329220	39.97562 ppb		99
4) Pyridine	1.92	79	841711	38.89262 ppb		99
7) Phenol	4.94	94	1197920	39.62875 ppb		94
8) Aniline	4.92	93	742208	42.63131 ppb		89
9) Bis (2-chloroethyl) ether	4.99	63	483623	39.76964 ppb		96
10) 2-Chlorophenol	5.06	128	907204	39.89160 ppb		95
11) 1,3-DCB	5.21	146	968171	39.53063 ppb		99
12) 1,4-DCB	5.30	146	983410	39.40515 ppb		98
13) Benzyl alcohol	5.47	108	503829	40.11354 ppb		99
14) 1,2-DCB	5.47	146	928743	39.06511 ppb		99
15) 2-Methylphenol	5.60	107	726322	39.55351 ppb		96
16) Bis (2-chloroisopropyl) et	5.59	45	579155	39.65266 ppb	#	71
17) Acetophenone	5.75	105	1137854	39.72599 ppb		93
18) 3&4-Methylphenol	5.78	107	1824689	78.63796 ppb		97
19) n-Nitrosodi-n-propylamine	5.76	70	664556	40.29682 ppb		96
20) Hexachloroethane	5.84	117	367955	39.60545 ppb		83
23) Nitrobenzene	5.94	77	960962	39.04631 ppb		95
24) Isophorone	6.23	82	1617712	39.09501 ppb		97
25) 2-Nitrophenol	6.30	139	499310	38.86204 ppb		97
26) 2,4-Dimethylphenol	6.36	122	778841	38.80050 ppb		96
27) Benzoic acid	6.55	105	679024	40.60825 ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	942706	39.02284 ppb		98
29) 2,4-Dichlorophenol	6.59	162	763131	38.79973 ppb		98
30) 1,2,4-Trichlorobenzene	6.66	180	848841	38.82837 ppb		99
31) 3,4-Dimethylphenol	6.71	107	1126965	38.34504 ppb		98
32) Naphthalene	6.75	128	2500115	38.49653 ppb		99
33) 4-Chloroaniline	6.82	127	1009533	39.71597 ppb		96
34) 2,6-Dichlorophenol	6.83	162	761439	38.99464 ppb		97
35) Hexachloropropene	6.85	213	639320	38.83320 ppb		99
36) Hexachlorobutadiene	6.88	225	509616	38.60715 ppb		98
37) Caprolactum	7.29	55	258802	40.00115 ppb		94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y007.D Vial: 7
Acq On : 20 Apr 20 11:28 Operator: MA
Sample : 40ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	844704	39.25632	ppb		94
39)	2-Methylnaphthalene	7.53	142	1677984	38.40524	ppb		99
40)	1-Methylnaphthalene	7.66	142	1731748	38.71205	ppb		98
42)	Hexachlorocyclopentadiene	7.72	237	518912	36.16827	ppb		99
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	858527	38.22788	ppb		99
44)	2,4,6-Trichlorophenol	7.88	196	579963	38.58091	ppb		99
45)	2,4,5-Trichlorophenol	7.93	196	605796	38.21461	ppb		92
47)	1,1'-Biphenyl	8.07	154	2198445	38.08393	ppb		98
48)	2-Chloronaphthalene	8.10	162	1728910	37.68679	ppb		97
49)	2-Nitroaniline	8.24	65	511828	39.76924	ppb		93
50)	Dimethyl phthalate	8.44	163	2111991	38.35955	ppb		99
51)	2,6-DNT	8.51	165	482775	39.07515	ppb	#	77
52)	Acenaphthylene	8.58	152	2645664	38.27242	ppb		99
53)	3-Nitroaniline	8.24	138	574989	39.33227	ppb		97
54)	Acenaphthene	8.78	154	1660209	37.47071	ppb		98
55)	2,4-Dinitrophenol	8.84	184	314165	38.15631	ppb		92
56)	4-Nitrophenol	8.95	65	407295	39.85761	ppb		92
57)	Dibenzofuran	8.98	168	2471698	37.78101	ppb		97
58)	2,4-DNT	8.98	165	687672	38.90061	ppb	#	73
59)	2,3,4,6-Tetrachlorophenol	9.14	232	487370	38.89090	ppb		96
60)	Diethyl phthalate	9.26	149	2047374	38.01556	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	1113936	37.72864	ppb		94
62)	Fluorene	9.38	166	2050012	37.49788	ppb		99
63)	4-Nitroaniline	8.71	138	477430	40.36841	ppb		85
66)	4,6-Dinitro-2-methylphenol	9.47	198	433550	40.17214	ppb	#	81
67)	Diphenyl amine	9.53	169	3113288	76.66314	ppb		100
68)	n-Nitrosodiphenylamine	9.53	169	3113288	76.66314	ppb		100
69)	1,2-Diphenylhydrazine	9.57	77	1953303	37.65736	ppb		95
70)	4-Bromophenyl phenyl ether	9.95	248	610642	39.14756	ppb		92
71)	Hexachlorobenzene	10.02	284	616540	38.70262	ppb	#	80
72)	Atrazine	10.16	200	296564	19.81623	ppb		98
73)	Pentachlorophenol	10.27	266	381705	39.49422	ppb		97
74)	Phenanthrene	10.51	178	2929901	38.99199	ppb		100
75)	Anthracene	10.56	178	2989528	38.16373	ppb		100
76)	Carbazol	10.76	167	2734506	38.68613	ppb		98
77)	Di-n-butylphthalate	11.15	149	3580869	39.73036	ppb		99
78)	2-Nitrodiphenylamine	11.32	167	392790	20.50646	ppb		87
79)	Fluoranthene	11.89	202	3345765	38.66281	ppb	#	97
81)	Benzidine	12.06	184	874294	40.25249	ppb		99
82)	Pyrene	12.16	202	3507174	38.35229	ppb		100
84)	Butyl benzylphthalate	12.90	149	1633249	38.71399	ppb		90
85)	3,3'-Dichlorobenzidine	13.51	252	1124049	39.17166	ppb	#	98
86)	Benz (a) anthracene	13.55	228	3448772	37.43801	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.56	149	2441659	38.24175	ppb		99
88)	Chrysene	13.60	228	3248232	38.39504	ppb		100
89)	Di-n-octylphthalate	14.29	149	4025742	39.42784	ppb	#	95
91)	Benzo (b) fluoranthene	14.83	252	3687014	41.82961	ppb		98
92)	Benzo (k) fluoranthene	14.87	252	2848022	35.62873	ppb		98
93)	Benzo (a) pyrene	15.28	252	3104017	40.78475	ppb		98
94)	Indeno (1,2,3-cd) pyrene	17.17	276	3544043	39.04562	ppb		100
95)	Dibenz (a,h) anthracene	17.19	278	3143980	40.14890	ppb		99
96)	Benzo (g,h,i) perylene	17.71	276	2819420	39.14453	ppb		99

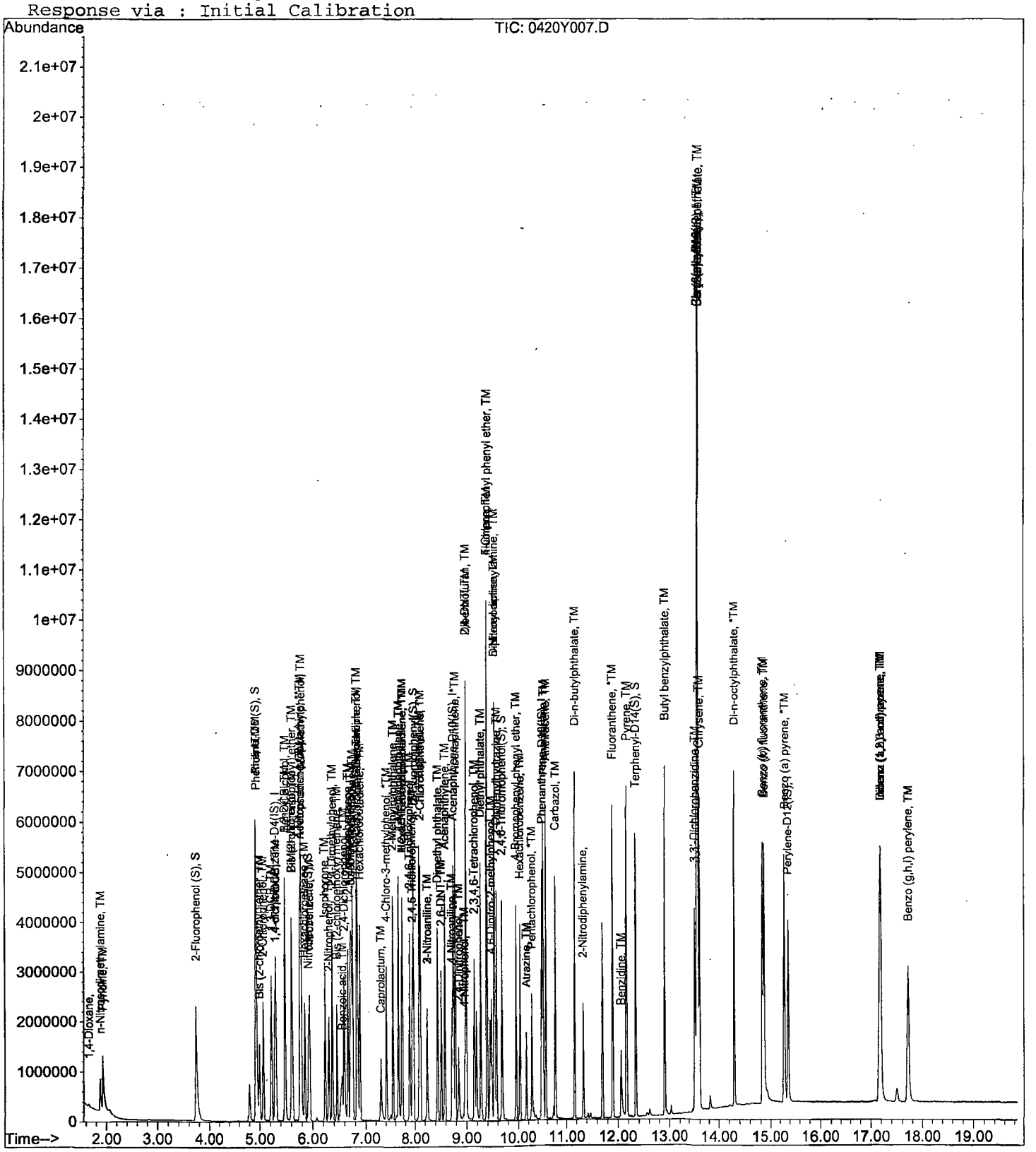
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y007.D Vial: 7
Acq On : 20 Apr 20 11:28 Operator: MA
Sample : 40ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y008.D Vial: 8
Acq On : 20 Apr 20 11:57 Operator: MA
Sample : 50ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	464082	40.00000 ppb	0.00
21) Napthalene-D8(IS)	6.72	136	1945448	40.00000 ppb	0.00
41) Acenaphthene-D10(IS)	8.74	164	1146170	40.00000 ppb	0.00
65) Phenanthrene-D10(IS)	10.47	188	2180724	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.57	240	2320927	40.00000 ppb	0.00
90) Perylene-D12(IS)	15.36	264	2075407	40.00000 ppb	0.00
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.73	112	1687452	98.91114 ppb	0.00
Spiked Amount 200.000			Recovery =	49.456%	
6) Phenol-D6 (S)	4.92	99	2217810	98.22677 ppb	0.00
Spiked Amount 200.000			Recovery =	49.114%	
22) Nitrobenzene-D5(S)	5.92	82	1005399	50.58452 ppb	0.00
Spiked Amount 100.000			Recovery =	50.585%	
46) 2-Fluorobiphenyl(S)	7.96	172	2099495	51.54469 ppb	0.00
Spiked Amount 100.000			Recovery =	51.545%	
64) 2,4,6-Tribromophenol(S)	9.68	330	595407	101.38952 ppb	0.00
Spiked Amount 200.000			Recovery =	50.695%	
83) Terphenyl-D14(S)	12.33	244	2657586	50.28148 ppb	0.00
Spiked Amount 100.000			Recovery =	50.281%	
Target Compounds					Qvalue
2) 1,4-Dioxane	1.65	58	26158	4.67468	100
3) n-Nitrosodimethylamine	1.87	42	357205	44.72525 ppb	100
4) Pyridine	1.91	79	982452	46.81034 ppb	100
7) Phenol	4.93	94	1393874	47.54801 ppb	100
8) Aniline	4.92	93	856768	50.74492 ppb	100
9) Bis (2-chloroethyl) ether	4.99	63	566496	48.03611 ppb	100
10) 2-Chlorophenol	5.06	128	1053302	47.75904 ppb	100
11) 1,3-DCB	5.21	146	1142818	48.11550 ppb	100
12) 1,4-DCB	5.30	146	1152364	47.61396 ppb	100
13) Benzyl alcohol	5.47	108	594585	48.81440 ppb	100
14) 1,2-DCB	5.47	146	1092963	47.40511 ppb	100
15) 2-Methylphenol	5.60	107	845527	47.47988 ppb	100
16) Bis (2-chloroisopropyl) et	5.60	45	672884	47.50551 ppb	100
17) Acetophenone	5.76	105	1331190	47.92416 ppb	100
18) 3&4-Methylphenol	5.78	107	2158011	95.90104 ppb	100
19) n-Nitrosodi-n-propylamine	5.76	70	770346	48.16719 ppb	100
20) Hexachloroethane	5.85	117	435299	48.31412 ppb	100
23) Nitrobenzene	5.94	77	1134639	49.98354 ppb	100
24) Isophorone	6.23	82	1910371	50.05337 ppb	100
25) 2-Nitrophenol	6.30	139	602537	50.84339 ppb	100
26) 2,4-Dimethylphenol	6.36	122	904670	48.86232 ppb	100
27) Benzoic acid	6.56	105	796444	51.63924 ppb	100
28) Bis (2-chloroethoxy) metha	6.45	93	1105565	49.61607 ppb	100
29) 2,4-Dichlorophenol	6.58	162	892544	49.19882 ppb	100
30) 1,2,4-Trichlorobenzene	6.66	180	985399	48.86865 ppb	100
31) 3,4-Dimethylphenol	6.71	107	1323759	48.83185 ppb	100
32) Naphthalene	6.75	128	2971757	49.61013 ppb	100
33) 4-Chloroaniline	6.83	127	1162424	49.57979 ppb	100
34) 2,6-Dichlorophenol	6.83	162	886600	49.22583 ppb	100
35) Hexachloropropene	6.84	213	766208	50.45765 ppb	100
36) Hexachlorobutadiene	6.88	225	592381	48.65430 ppb	100
37) Caprolactum	7.30	55	300663	50.38256 ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y008.D Vial: 8
Acq On : 20 Apr 20 11:57 Operator: MA
Sample : 50ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	982234	49.48977	ppb	100
39)	2-Methylnaphthalene	7.54	142	1976795	49.05235	ppb	100
40)	1-Methylnaphthalene	7.65	142	2035778	49.33866	ppb	100
42)	Hexachlorocyclopentadiene	7.72	237	660672	50.46713	ppb	100
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	1002192	50.90276	ppb	100
44)	2,4,6-Trichlorophenol	7.88	196	678711	51.50165	ppb	100
45)	2,4,5-Trichlorophenol	7.94	196	706356	50.82657	ppb	100
47)	1,1'-Biphenyl	8.08	154	2580728	50.99557	ppb	100
48)	2-Chloronaphthalene	8.11	162	2049050	50.94874	ppb	100
49)	2-Nitroaniline	8.24	65	588162	52.12959	ppb	100
50)	Dimethyl phthalate	8.44	163	2455281	50.86824	ppb	100
51)	2,6-DNT	8.52	165	570683	52.68839	ppb	100
52)	Acenaphthylene	8.58	152	3066777	50.60548	ppb	100
53)	3-Nitroaniline	8.24	138	669741	52.25893	ppb	100
54)	Acenaphthene	8.78	154	1949594	50.19234	ppb	100
55)	2,4-Dinitrophenol	8.84	184	369165	49.81386	ppb	100
56)	4-Nitrophenol	8.96	65	475348	53.06131	ppb	100
57)	Dibenzofuran	8.98	168	2915234	50.82949	ppb	100
58)	2,4-DNT	8.99	165	799228	51.57151	ppb	100
59)	2,3,4,6-Tetrachlorophenol	9.14	232	563014	51.24747	ppb	100
60)	Diethyl phthalate	9.26	149	2390030	50.62111	ppb	100
61)	4-Chlorophenyl phenyl ethe	9.38	204	1310131	50.61622	ppb	100
62)	Fluorene	9.38	166	2413683	50.36103	ppb	100
63)	4-Nitroaniline	8.72	138	545323	52.59566	ppb	100
66)	4,6-Dinitro-2-methylphenol	9.47	198	514339	54.06978	ppb	100
67)	Diphenyl amine	9.53	169	3654802	102.10583	ppb	100
68)	n-Nitrosodiphenylamine	9.53	169	3654802	102.10583	ppb	100
69)	1,2-Diphenylhydrazine	9.56	77	2213256	48.40958	ppb	100
70)	4-Bromophenyl phenyl ether	9.94	248	720976	52.43945	ppb	100
71)	Hexachlorobenzene	10.03	284	722770	51.47526	ppb	100
72)	Atrazine	10.16	200	341616	25.89764	ppb	100
73)	Pentachlorophenol	10.27	266	449056	52.71395	ppb	100
74)	Phenanthrene	10.50	178	3359807	50.72899	ppb	100
75)	Anthracene	10.57	178	3482202	50.43378	ppb	100
76)	Carbazol	10.76	167	3186921	51.15253	ppb	100
77)	Di-n-butylphthalate	11.15	149	4134400	52.04343	ppb	100
78)	2-Nitrodiphenylamine	11.33	167	461312	27.32400	ppb	100
79)	Fluoranthene	11.89	202	3908833	51.24653	ppb	100
81)	Benzidine	12.05	184	945762	49.88959	ppb	100
82)	Pyrene	12.15	202	4047593	50.71351	ppb	100
84)	Butyl benzylphthalate	12.90	149	1874606	50.91178	ppb	100
85)	3,3'-Dichlorobenzidine	13.52	252	1259534	50.29090	ppb	100
86)	Benz (a) anthracene	13.55	228	4208919	52.34939	ppb	100
87)	Bis (2-ethylhexyl) phthala	13.56	149	2874442	51.58211	ppb	100
88)	Chrysene	13.59	228	3638508	49.27699	ppb	100
89)	Di-n-octylphthalate	14.30	149	4661995	52.31445	ppb	100
91)	Benzo (b) fluoranthene	14.83	252	3942453	50.63792	ppb	100
92)	Benzo (k) fluoranthene	14.87	252	3619140	51.25812	ppb	100
93)	Benzo (a) pyrene	15.28	252	3556612	52.90667	ppb	100
94)	Indeno (1,2,3-cd) pyrene	17.18	276	4098411	51.11979	ppb	100
95)	Dibenz (a,h) anthracene	17.20	278	3627606	52.44622	ppb	100
96)	Benzo (g,h,i) perylene	17.72	276	3237849	50.89419	ppb	100

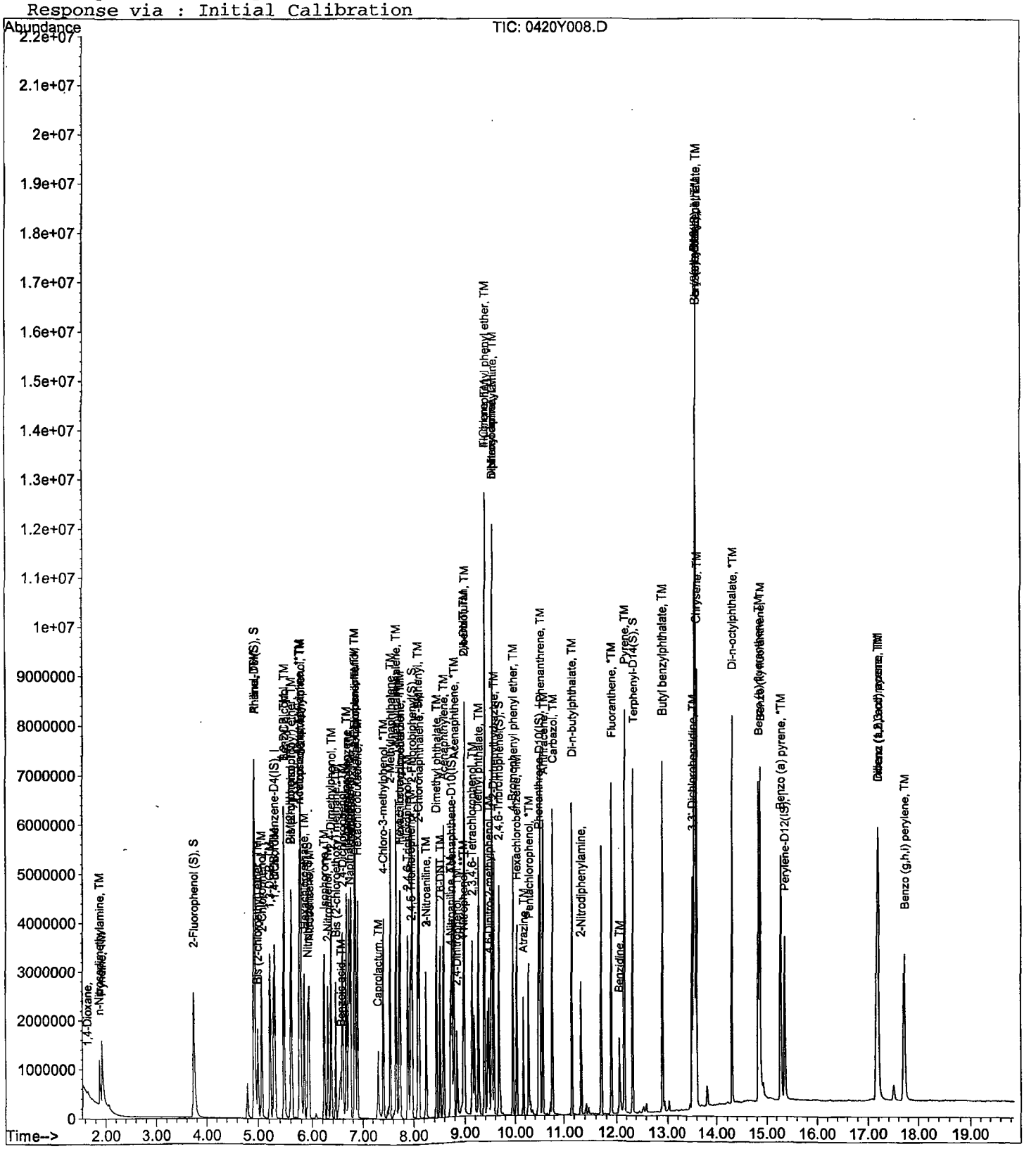
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y008.D Vial: 8
Acq On : 20 Apr 20 11:57 Operator: MA
Sample : 50ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y009.D Vial: 9
Acq On : 20 Apr 20 12:26 Operator: MA
Sample : 60ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	436364	40.00000	ppb	0.00
21) Napthalene-D8(IS)	6.72	136	1873852	40.00000	ppb	0.00
41) Acenaphthene-D10(IS)	8.75	164	1215037	40.00000	ppb	0.00
65) Phenanthrene-D10(IS)	10.47	188	2435855	40.00000	ppb	0.00
80) Chrysene-D12(IS)	13.57	240	2704658	40.00000	ppb	0.00
90) Perylene-D12(IS)	15.36	264	2324834	40.00000	ppb	0.00
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.72	112	2290754	142.80323	ppb	0.00
Spiked Amount 200.000			Recovery = 71.402%			
6) Phenol-D6 (S)	4.92	99	3046911	143.51956	ppb	0.00
Spiked Amount 200.000			Recovery = 71.760%			
22) Nitrobenzene-D5(S)	5.93	82	1362396	71.16508	ppb	0.00
Spiked Amount 100.000			Recovery = 71.165%			
46) 2-Fluorobiphenyl(S)	7.96	172	2835015	65.65745	ppb	0.00
Spiked Amount 100.000			Recovery = 65.657%			
64) 2,4,6-Tribromophenol(S)	9.68	330	834117	133.98792	ppb	0.00
Spiked Amount 200.000			Recovery = 66.994%			
83) Terphenyl-D14(S)	12.33	244	3785280	61.45651	ppb	0.00
Spiked Amount 100.000			Recovery = 61.457%			
Target Compounds						Qvalue
2) 1,4-Dioxane	1.65	58	30878	5.86871		91
3) n-Nitrosodimethylamine	1.87	42	487954	64.97705	ppb	99
4) Pyridine	1.91	79	1389157	70.39269	ppb	95
7) Phenol	4.93	94	1788637	64.88986	ppb	93
8) Aniline	4.92	93	1112064	70.04948	ppb	94
9) Bis (2-chloroethyl) ether	4.99	63	704999	63.57777	ppb	98
10) 2-Chlorophenol	5.06	128	1334652	64.36007	ppb	99
11) 1,3-DCB	5.21	146	1423967	63.76078	ppb	98
12) 1,4-DCB	5.30	146	1431999	62.92643	ppb	99
13) Benzyl alcohol	5.47	108	758761	66.24984	ppb	98
14) 1,2-DCB	5.47	146	1388054	64.02829	ppb	99
15) 2-Methylphenol	5.60	107	1087943	64.97317	ppb	98
16) Bis (2-chloroisopropyl) et	5.60	45	851154	63.90837	ppb	94
17) Acetophenone	5.76	105	1700883	65.12305	ppb	99
18) 3&4-Methylphenol	5.79	107	2730310	129.04091	ppb	94
19) n-Nitrosodi-n-propylamine	5.77	70	980125	65.17676	ppb	94
20) Hexachloroethane	5.85	117	546249	64.47968	ppb	99
23) Nitrobenzene	5.94	77	1417690	64.83879	ppb	98
24) Isophorone	6.23	82	2427271	66.02649	ppb	97
25) 2-Nitrophenol	6.30	139	749560	65.66615	ppb	95
26) 2,4-Dimethylphenol	6.36	122	1163119	65.22175	ppb	99
27) Benzoic acid	6.57	105	1029933	69.32948	ppb	99
28) Bis (2-chloroethoxy) metha	6.45	93	1378851	64.24506	ppb	99
29) 2,4-Dichlorophenol	6.58	162	1137617	65.10367	ppb	98
30) 1,2,4-Trichlorobenzene	6.66	180	1250463	64.38333	ppb	99
31) 3,4-Dimethylphenol	6.70	107	1673256	64.08272	ppb	100
32) Naphthalene	6.75	128	3694094	64.02496	ppb	99
33) 4-Chloroaniline	6.83	127	1499581	66.40402	ppb	99
34) 2,6-Dichlorophenol	6.83	162	1132074	65.25660	ppb	94
35) Hexachloropropene	6.84	213	968406	66.20979	ppb	99
36) Hexachlorobutadiene	6.88	225	756000	64.46534	ppb	100
37) Caprolactum	7.31	55	392980	68.36834	ppb	99

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y009.D Vial: 9
Acq On : 20 Apr 20 12:26 Operator: MA
Sample : 60ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	1254539	65.62495	ppb		97
39)	2-Methylnaphthalene	7.54	142	2552843	65.76678	ppb		99
40)	1-Methylnaphthalene	7.65	142	2561184	64.44393	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	847872	60.13674	ppb		99
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	1270197	60.85847	ppb		100
44)	2,4,6-Trichlorophenol	7.88	196	862309	61.72466	ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	916998	62.24365	ppb		98
47)	1,1'-Biphenyl	8.08	154	3269599	60.94586	ppb		99
48)	2-Chloronaphthalene	8.11	162	2573329	60.35813	ppb		99
49)	2-Nitroaniline	8.24	65	755474	63.16353	ppb		96
50)	Dimethyl phthalate	8.44	163	3153562	61.63203	ppb		99
51)	2,6-DNT	8.52	165	723384	63.00114	ppb		91
52)	Acenaphthylene	8.58	152	3965447	61.72585	ppb		99
53)	3-Nitroaniline	8.24	138	881704	64.89869	ppb		97
54)	Acenaphthene	8.78	154	2494385	60.57819	ppb		100
55)	2,4-Dinitrophenol	8.85	184	488003	61.15213	ppb		85
56)	4-Nitrophenol	8.96	65	625328	65.84665	ppb		98
57)	Dibenzofuran	8.99	168	3709254	61.00823	ppb		93
58)	2,4-DNT	8.99	165	1053960	64.15386	ppb		93
59)	2,3,4,6-Tetrachlorophenol	9.15	232	727683	62.48201	ppb		90
60)	Diethyl phthalate	9.27	149	3030096	60.54025	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	1703996	62.10165	ppb		96
62)	Fluorene	9.39	166	3158644	62.16910	ppb		99
63)	4-Nitroaniline	8.72	138	696363	63.35651	ppb		92
66)	4,6-Dinitro-2-methylphenol	9.47	198	667804	62.84973	ppb	#	83
67)	Diphenyl amine	9.53	169	4768523	119.26688	ppb		100
68)	n-Nitrosodiphenylamine	9.53	169	4768523	119.26688	ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	2836579	55.54485	ppb		96
70)	4-Bromophenyl phenyl ether	9.95	248	912850	59.44099	ppb	#	83
71)	Hexachlorobenzene	10.03	284	932164	59.43469	ppb		92
72)	Atrazine	10.16	200	432801	29.37376	ppb		99
73)	Pentachlorophenol	10.27	266	605108	63.59269	ppb		97
74)	Phenanthrene	10.50	178	4320899	58.40705	ppb		99
75)	Anthracene	10.57	178	4496066	58.29745	ppb		100
76)	Carbazol	10.76	167	4135479	59.42523	ppb		99
77)	Di-n-butylphthalate	11.16	149	5393506	60.78184	ppb		98
78)	2-Nitrodiphenylamine	11.33	167	612797	32.49492	ppb		96
79)	Fluoranthene	11.89	202	5089956	59.74212	ppb		99
81)	Benzidine	12.05	184	1289227	58.35883	ppb		99
82)	Pyrene	12.15	202	5258838	56.54129	ppb		100
84)	Butyl benzylphthalate	12.91	149	2482533	57.85653	ppb		80
85)	3,3'-Dichlorobenzidine	13.52	252	1662033	56.94666	ppb		99
86)	Benz (a) anthracene	13.56	228	5410816	57.75012	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.57	149	3808428	58.64628	ppb	#	94
88)	Chrysene	13.59	228	4795255	55.72905	ppb		99
89)	Di-n-octylphthalate	14.30	149	5995928	57.73715	ppb		99
91)	Benzo (b) fluoranthene	14.84	252	4883355	55.99367	ppb		99
92)	Benzo (k) fluoranthene	14.87	252	4929989	62.33250	ppb		97
93)	Benzo (a) pyrene	15.28	252	4642725	61.65357	ppb		99
94)	Indeno (1,2,3-cd) pyrene	17.18	276	5297580	58.98783	ppb		98
95)	Dibenz (a,h) anthracene	17.20	278	4729500	61.04086	ppb		97
96)	Benzo (g,h,i) perylene	17.72	276	4174992	58.58394	ppb		99

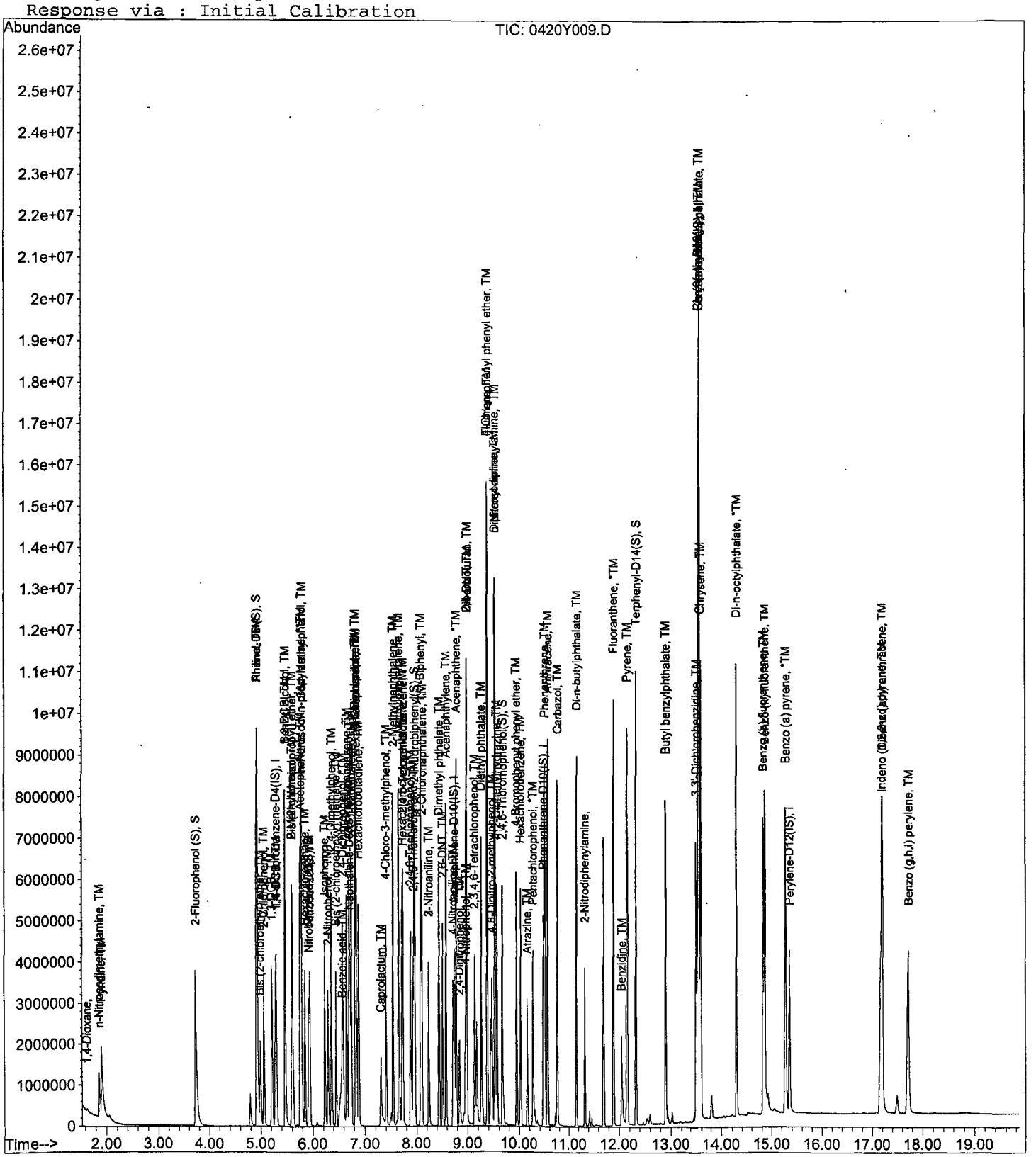
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y009.D Vial: 9
Acq On : 20 Apr 20 12:26 Operator: MA
Sample : 60ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y010.D Vial: 10
Acq On : 20 Apr 20 12:55 Operator: MA
Sample : 80ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.29	152	452784	40.00000 ppb	0.00
21) Napthalene-D8(IS)	6.73	136	1977757	40.00000 ppb	0.00
41) Acenaphthene-D10(IS)	8.75	164	1230776	40.00000 ppb	0.01
65) Phenanthrene-D10(IS)	10.48	188	2370466	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.57	240	2794538	40.00000 ppb	0.00
90) Perylene-D12(IS)	15.36	264	2317807	40.00000 ppb	0.00
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.73	112	3008842	180.76603 ppb	0.00
Spiked Amount 200.000			Recovery =	90.383%	
6) Phenol-D6 (S)	4.92	99	4027615	182.83406 ppb	0.00
Spiked Amount 200.000			Recovery =	91.417%	
22) Nitrobenzene-D5(S)	5.93	82	1781724	88.17924 ppb	0.01
Spiked Amount 100.000			Recovery =	88.179%	
46) 2-Fluorobiphenyl(S)	7.97	172	3762552	86.02440 ppb	0.01
Spiked Amount 100.000			Recovery =	86.024%	
64) 2,4,6-Tribromophenol(S)	9.68	330	1174080	186.18592 ppb	0.00
Spiked Amount 200.000			Recovery =	93.093%	
83) Terphenyl-D14(S)	12.33	244	5066753	79.61629 ppb	0.00
Spiked Amount 100.000			Recovery =	79.616%	
Target Compounds					Qvalue
2) 1,4-Dioxane	1.64	58	43148	7.90336	65
3) n-Nitrosodimethylamine	1.86	42	709089	90.99964 ppb	85
4) Pyridine	1.91	79	1686334	82.35267 ppb	99
7) Phenol	4.94	94	2506107	87.62178 ppb	84
8) Aniline	4.92	93	1365504	82.89454 ppb	92
9) Bis (2-chloroethyl) ether	4.99	63	975240	84.75906 ppb	100
10) 2-Chlorophenol	5.06	128	1843861	85.69086 ppb	99
11) 1,3-DCB	5.21	146	1960017	84.58072 ppb	97
12) 1,4-DCB	5.30	146	1980642	83.87919 ppb	100
13) Benzyl alcohol	5.47	108	1076387	90.57454 ppb	99
14) 1,2-DCB	5.47	146	1933356	85.94789 ppb	100
15) 2-Methylphenol	5.61	107	1517234	87.32494 ppb	94
16) Bis (2-chloroisopropyl) et	5.60	45	1177311	85.19197 ppb	93
17) Acetophenone	5.76	105	2347582	86.62413 ppb	97
18) 3&4-Methylphenol	5.79	107	3893930	177.36235 ppb	95
19) n-Nitrosodi-n-propylamine	5.77	70	1363675	87.39367 ppb	96
20) Hexachloroethane	5.85	117	747477	85.03308 ppb	98
23) Nitrobenzene	5.95	77	1968426	85.29726 ppb	96
24) Isophorone	6.23	82	3347838	86.28330 ppb	95
25) 2-Nitrophenol	6.30	139	1058730	87.87851 ppb	96
26) 2,4-Dimethylphenol	6.37	122	1611248	85.60380 ppb	96
27) Benzoic acid	6.59	105	1364255	87.00954 ppb	97
28) Bis (2-chloroethoxy) metha	6.46	93	1905828	84.13341 ppb	99
29) 2,4-Dichlorophenol	6.59	162	1606545	87.10932 ppb	98
30) 1,2,4-Trichlorobenzene	6.66	180	1742176	84.98787 ppb	100
31) 3,4-Dimethylphenol	6.71	107	2314909	83.99914 ppb	100
32) Naphthalene	6.75	128	5178136	85.03098 ppb	99
33) 4-Chloroaniline	6.83	127	1999533	83.89100 ppb	98
34) 2,6-Dichlorophenol	6.84	162	1621140	88.53857 ppb	95
35) Hexachloropropene	6.85	213	1363366	88.31603 ppb	99
36) Hexachlorobutadiene	6.88	225	1051175	84.92623 ppb	99
37) Caprolactum	7.32	55	531480	87.60601 ppb	97

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y010.D Vial: 10
Acq On : 20 Apr 20 12:55 Operator: MA
Sample : 80ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.41	107	1751478	86.80642	ppb		92
39)	2-Methylnaphthalene	7.54	142	3536264	86.31565	ppb		100
40)	1-Methylnaphthalene	7.65	142	3601084	85.84932	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	1191936	81.69261	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	1793743	84.84390	ppb		99
44)	2,4,6-Trichlorophenol	7.89	196	1225719	86.61581	ppb		100
45)	2,4,5-Trichlorophenol	7.94	196	1292942	86.63956	ppb		98
47)	1,1'-Biphenyl	8.08	154	4564938	84.00306	ppb		99
48)	2-Chloronaphthalene	8.11	162	3624398	83.92412	ppb		99
49)	2-Nitroaniline	8.24	65	1040554	85.88593	ppb		94
50)	Dimethyl phthalate	8.44	163	4351564	83.95778	ppb		100
51)	2,6-DNT	8.52	165	1013664	87.15334	ppb		87
52)	Acenaphthylene	8.58	152	5498405	84.49327	ppb		99
53)	3-Nitroaniline	8.24	138	1222808	88.85501	ppb		96
54)	Acenaphthene	8.79	154	3541529	84.90907	ppb		99
55)	2,4-Dinitrophenol	8.85	184	689451	83.74861	ppb		87
56)	4-Nitrophenol	8.96	65	870397	90.48023	ppb		99
57)	Dibenzofuran	8.99	168	5268974	85.55362	ppb		92
58)	2,4-DNT	8.99	165	1460028	87.73449	ppb		84
59)	2,3,4,6-Tetrachlorophenol	9.15	232	1029581	87.27378	ppb	#	89
60)	Diethyl phthalate	9.27	149	4192098	82.68558	ppb		98
61)	4-Chlorophenyl phenyl ethe	9.38	204	2407029	86.60169	ppb		98
62)	Fluorene	9.39	166	4514876	87.72639	ppb		100
63)	4-Nitroaniline	8.72	138	940606	84.48387	ppb		89
66)	4,6-Dinitro-2-methylphenol	9.48	198	950855	91.95735	ppb		96
67)	Diphenyl amine	9.54	169	6709428	172.44045	ppb		99
68)	n-Nitrosodiphenylamine	9.54	169	6709428	172.44045	ppb		99
69)	1,2-Diphenylhydrazine	9.57	77	4693590	94.44344	ppb		97
70)	4-Bromophenyl phenyl ether	9.96	248	1300852	87.04267	ppb	#	84
71)	Hexachlorobenzene	10.03	284	1300583	85.21253	ppb		91
72)	Atrazine	10.16	200	622536	43.41636	ppb		97
73)	Pentachlorophenol	10.27	266	874821	94.47376	ppb		97
74)	Phenanthrene	10.50	178	5991749	83.22666	ppb		100
75)	Anthracene	10.57	178	6392996	85.18026	ppb		100
76)	Carbazol	10.76	167	5681395	83.89146	ppb		99
77)	Di-n-butylphthalate	11.16	149	7477407	86.59073	ppb		98
78)	2-Nitrodiphenylamine	11.33	167	854111	46.54047	ppb		97
79)	Fluoranthene	11.90	202	7008686	84.53196	ppb		98
81)	Benzidine	12.05	184	1664108	72.90562	ppb		100
82)	Pyrene	12.16	202	7321650	76.18811	ppb		99
84)	Butyl benzylphthalate	12.90	149	3468723	78.24009	ppb		99
85)	3,3'-Dichlorobenzidine	13.52	252	2231267	73.99161	ppb		99
86)	Benz (a) anthracene	13.56	228	7580340	78.30350	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.57	149	5319516	79.28100	ppb	#	92
88)	Chrysene	13.60	228	6774081	76.19433	ppb		99
89)	Di-n-octylphthalate	14.30	149	8137690	75.84072	ppb		98
91)	Benzo (b) fluoranthene	14.84	252	7622010	87.66069	ppb		99
92)	Benzo (k) fluoranthene	14.88	252	6024028	76.39594	ppb		99
93)	Benzo (a) pyrene	15.28	252	6377422	84.94642	ppb		98
94)	Indeno (1,2,3-cd) pyrene	17.19	276	7312568	81.67131	ppb		99
95)	Dibenz (a,h) anthracene	17.22	278	6566929	85.01243	ppb		97
96)	Benzo (g,h,i) perylene	17.74	276	5724960	80.57681	ppb		98

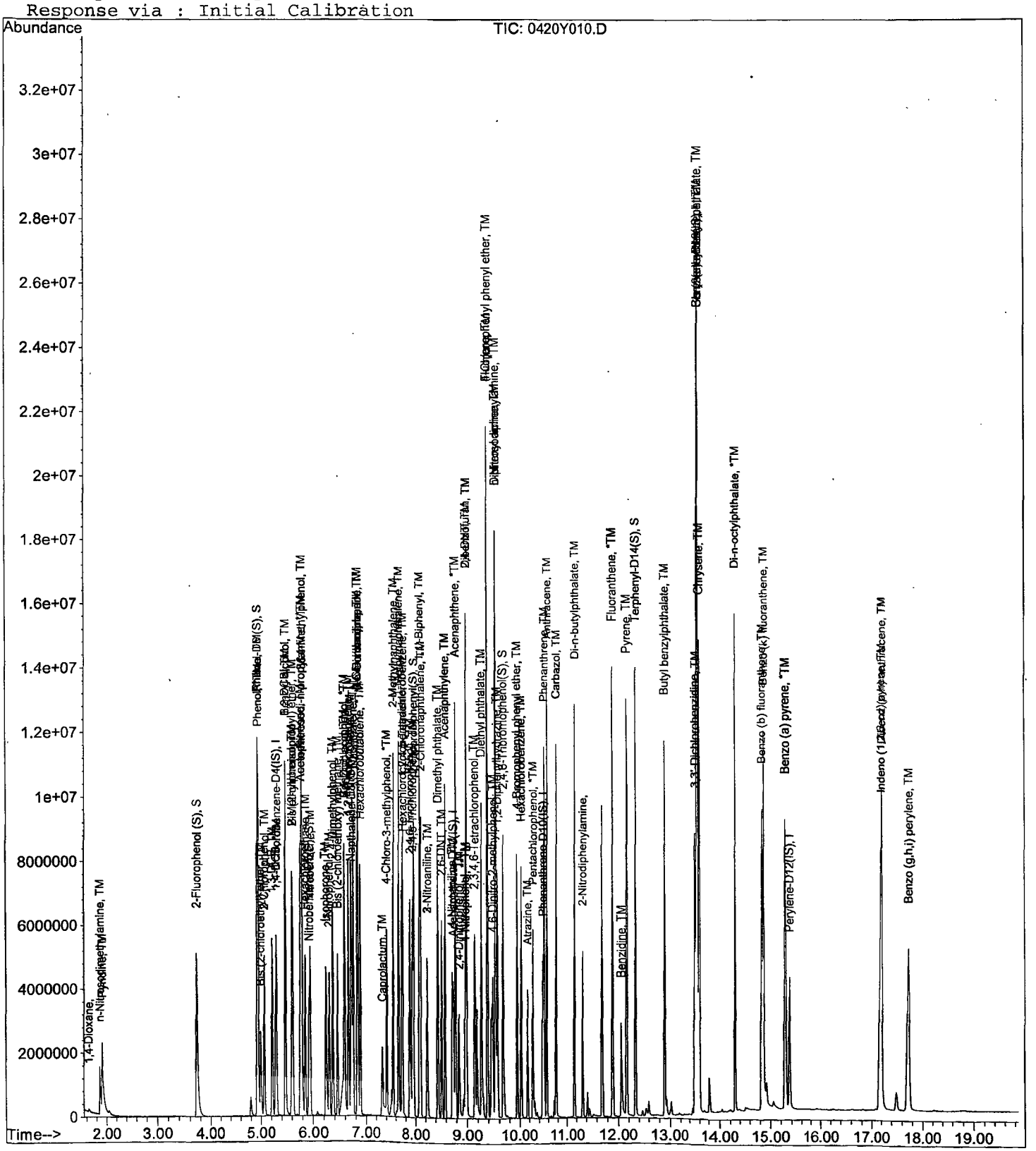
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y010.D Vial: 10
Acq On : 20 Apr 20 12:55 Operator: MA
Sample : 80ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y011.D Vial: 11
Acq On : 20 Apr 20 13:24 Operator: MA
Sample : 100ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	467031	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.72	136	2117800	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.75	164	1252418	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.47	188	2386542	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.57	240	2768036	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.36	264	2214064	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.73	112	3667481	213.61447	ppb		0.00
Spiked Amount 200.000			Recovery	= 106.807%			
6) Phenol-D6 (S)	4.93	99	4985381	219.40821	ppb		0.00
Spiked Amount 200.000			Recovery	= 109.704%			
22) Nitrobenzene-D5(S)	5.92	82	2160063	99.83442	ppb		0.00
Spiked Amount 100.000			Recovery	= 99.834%			
46) 2-Fluorobiphenyl(S)	7.97	172	4617050	103.73694	ppb		0.00
Spiked Amount 100.000			Recovery	= 103.737%			
64) 2,4,6-Tribromophenol(S)	9.68	330	1455823	226.87542	ppb		0.00
Spiked Amount 200.000			Recovery	= 113.438%			
83) Terphenyl-D14(S)	12.33	244	6159158	97.70839	ppb		0.00
Spiked Amount 100.000			Recovery	= 97.708%			
Target Compounds							Qvalue
2) 1,4-Dioxane	1.64	58	51428	9.13263			77
3) n-Nitrosodimethylamine	1.87	42	847956	105.50125	ppb		98
4) Pyridine	1.91	79	2038407	96.50956	ppb		100
7) Phenol	4.94	94	2989652	101.33943	ppb		93
8) Aniline	4.92	93	1541120	90.70157	ppb		88
9) Bis (2-chloroethyl) ether	5.00	63	1156820	97.47333	ppb		96
10) 2-Chlorophenol	5.06	128	2201912	99.20914	ppb		97
11) 1,3-DCB	5.22	146	2367137	99.03309	ppb		97
12) 1,4-DCB	5.30	146	2406688	98.81285	ppb		98
13) Benzyl alcohol	5.48	108	1288433	105.11021	ppb		98
14) 1,2-DCB	5.47	146	2357182	101.59255	ppb		99
15) 2-Methylphenol	5.61	107	1823863	101.77083	ppb		95
16) Bis (2-chloroisopropyl) et	5.60	45	1418682	99.52630	ppb	#	73
17) Acetophenone	5.77	105	2826815	101.12554	ppb		98
18) 3&4-Methylphenol	5.79	107	4704377	207.74031	ppb		93
19) n-Nitrosodi-n-propylamine	5.78	70	1630899	101.33082	ppb		95
20) Hexachloroethane	5.85	117	898747	99.12265	ppb		97
23) Nitrobenzene	5.95	77	2342307	94.78678	ppb		98
24) Isophorone	6.24	82	3998243	96.23199	ppb		97
25) 2-Nitrophenol	6.31	139	1272264	98.61948	ppb		93
26) 2,4-Dimethylphenol	6.37	122	1948607	96.68139	ppb		97
27) Benzoic acid	6.59	105	1629448	97.05095	ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	2275587	93.81369	ppb		98
29) 2,4-Dichlorophenol	6.59	162	1919439	97.19279	ppb		98
30) 1,2,4-Trichlorobenzene	6.66	180	2094526	95.41984	ppb		99
31) 3,4-Dimethylphenol	6.71	107	2781939	94.27065	ppb		97
32) Naphthalene	6.75	128	6170977	94.63366	ppb		99
33) 4-Chloroaniline	6.83	127	2239400	87.74179	ppb		96
34) 2,6-Dichlorophenol	6.83	162	1950680	99.49150	ppb		97
35) Hexachloropropene	6.84	213	1666221	100.79701	ppb		99
36) Hexachlorobutadiene	6.89	225	1280857	96.63967	ppb		98
37) Caprolactum	7.33	55	603224	92.85677	ppb		96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y011.D Vial: 11
Acq On : 20 Apr 20 13:24 Operator: MA
Sample : 100ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:31:21 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.41	107	2070139	95.81526	ppb		98
39)	2-Methylnaphthalene	7.54	142	4236980	96.58045	ppb		100
40)	1-Methylnaphthalene	7.66	142	4340964	96.64464	ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	1172480	79.12228	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	2142767	99.60132	ppb		98
44)	2,4,6-Trichlorophenol	7.88	196	1453027	100.90430	ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	1528443	100.65055	ppb	#	91
47)	1,1'-Biphenyl	8.09	154	5533265	100.06251	ppb		99
48)	2-Chloronaphthalene	8.11	162	4317529	98.24623	ppb		97
49)	2-Nitroaniline	8.25	65	1245049	100.98888	ppb		96
50)	Dimethyl phthalate	8.45	163	5160425	97.84322	ppb		100
51)	2,6-DNT	8.52	165	1199699	101.36594	ppb		99
52)	Acenaphthylene	8.59	152	6578257	99.34041	ppb		99
53)	3-Nitroaniline	8.25	138	1436226	102.55956	ppb		99
54)	Acenaphthene	8.78	154	4167355	98.18689	ppb		99
55)	2,4-Dinitrophenol	8.85	184	821014	97.34121	ppb		96
56)	4-Nitrophenol	8.96	65	1049316	107.19446	ppb		91
57)	Dibenzofuran	8.99	168	6207595	99.05249	ppb		97
58)	2,4-DNT	9.00	165	1740398	102.77499	ppb		95
59)	2,3,4,6-Tetrachlorophenol	9.15	232	1212086	100.96862	ppb		95
60)	Diethyl phthalate	9.28	149	5044263	97.77454	ppb		96
61)	4-Chlorophenyl phenyl ethe	9.39	204	2957398	104.56456	ppb		92
62)	Fluorene	9.39	166	5360800	102.36317	ppb		100
63)	4-Nitroaniline	8.73	138	1088440	96.07276	ppb		98
66)	4,6-Dinitro-2-methylphenol	9.49	198	1142448	109.74209	ppb		97
67)	Diphenyl amine	9.54	169	7867178	200.83402	ppb		98
68)	n-Nitrosodiphenylamine	9.54	169	7867178	200.83402	ppb		98
69)	1,2-Diphenylhydrazine	9.57	77	5488668	109.69788	ppb		97
70)	4-Bromophenyl phenyl ether	9.95	248	1541887	102.47585	ppb		93
71)	Hexachlorobenzene	10.03	284	1565936	101.90701	ppb	#	80
72)	Atrazine	10.17	200	714815	49.51620	ppb		99
73)	Pentachlorophenol	10.27	266	1035226	111.04317	ppb		97
74)	Phenanthrene	10.51	178	7157932	98.75545	ppb		99
75)	Anthracene	10.57	178	7520586	99.52928	ppb		99
76)	Carbazol	10.77	167	6807094	99.83646	ppb		99
77)	Di-n-butylphthalate	11.16	149	8490383	97.65901	ppb		99
78)	2-Nitrodiphenylamine	11.33	167	1012711	54.81087	ppb		92
79)	Fluoranthene	11.89	202	8286368	99.26890	ppb	#	97
81)	Benzidine	12.05	184	1895787	83.85083	ppb		99
82)	Pyrene	12.16	202	8567473	90.00555	ppb		99
84)	Butyl benzylphthalate	12.91	149	4184742	95.29425	ppb		87
85)	3,3'-Dichlorobenzidine	13.53	252	2576658	86.26329	ppb		99
86)	Benz (a) anthracene	13.56	228	8907876	92.89770	ppb		99
87)	Bis (2-ethylhexyl) phthala	13.57	149	6183758	93.04388	ppb	#	94
88)	Chrysene	13.60	228	8015189	91.01738	ppb		98
89)	Di-n-octylphthalate	14.30	149	9821626	92.41085	ppb	#	95
91)	Benzo (b) fluoranthene	14.84	252	8398942	101.12232	ppb		100
92)	Benzo (k) fluoranthene	14.87	252	7798903	103.53899	ppb		99
93)	Benzo (a) pyrene	15.29	252	7514718	104.78515	ppb		99
94)	Indeno (1,2,3-cd) pyrene	17.20	276	8546059	99.92004	ppb		96
95)	Dibenz (a,h) anthracene	17.22	278	7708096	104.46104	ppb		98
96)	Benzo (g,h,i) perylene	17.74	276	6677747	98.39084	ppb		100

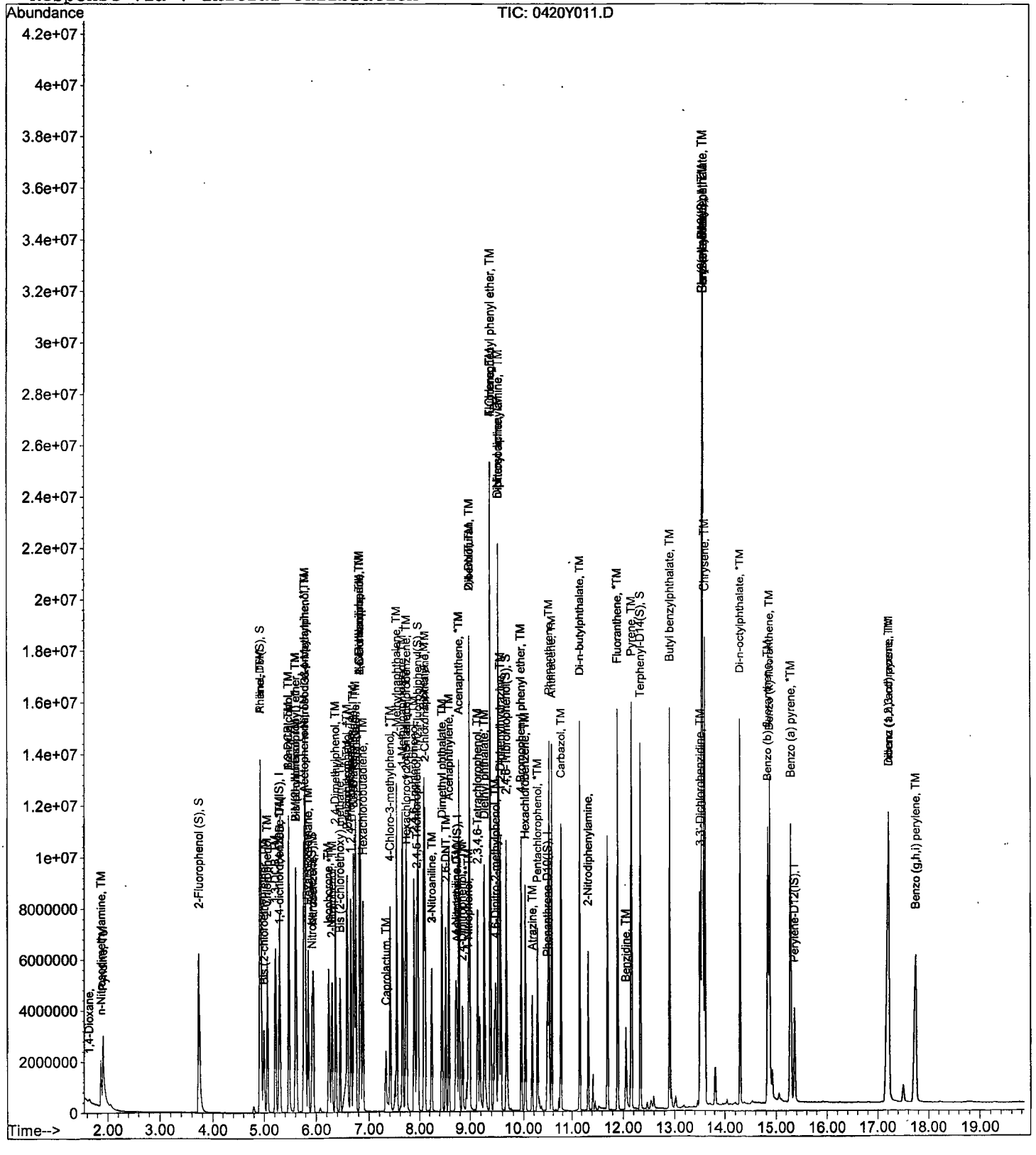
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y011.D Vial: 11
Acq On : 20 Apr 20 13:24 Operator: MA
Sample : 100ug/ml 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 20 14:31 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon Apr 20 14:37:25 2020
Response via : Initial Calibration



Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 04/20/20
Instrument: Yoda
Initial Cal. Date: 04/20/20
Data File: 0420Y012.D

		Compound	MEAN	CCRF	%D		%Drift
1		1,4-Dioxane	0.4830	0.4696	2.8		
2	TM	n-Nitrosodimethylamine	0.6884	0.7485	8.7	TM	
3	TM	Pyridine	1.809	1.792	0.95	TM	
4	*TM	Phenol	2.527	2.512	0.58	*TM	
5	TM	Aniline	1.455	1.444	0.78	TM	
6	TM	Bis (2-chloroethyl) ether	1.016	0.9778	3.8	TM	
7	TM	2-Chlorophenol	1.901	1.841	3.2	TM	
8	TM	1,3-DCB	2.047	1.947	4.9	TM	
9	*TM	1,4-DCB	2.086	1.992	4.5	*TM	
10	TM	Benzyl alcohol	1.050	1.097	4.5	TM	
11	TM	1,2-DCB	1.987	1.914	3.7	TM	
12	TM	2-Methylphenol	1.535	1.518	1.1	TM	
13	TM	Bis (2-chloroisopropyl) ether	1.221	1.198	1.9	TM	
14	TM	Acetophenone	2.394	2.399	0.19	TM	
15	TM	3&4-Methylphenol	1.940	1.889	2.6	TM	
16	**TM	n-Nitrosodi-n-propylamine	1.378	1.356	1.7	**TM	
17	TM	Hexachloroethane	0.7766	0.7531	3.0	TM	
18	TM	Nitrobenzene	0.4667	0.4529	3.0	TM	
19	TM	Isophorone	0.7847	0.7601	3.1	TM	
20	*TM	2-Nitrophenol	0.2437	0.2398	1.6	*TM	
21	TM	2,4-Dimethylphenol	0.3807	0.3700	2.8	TM	
22	TM	Benzoic acid	0.3171	0.3339	5.3	TM	
23	TM	Bis (2-chloroethoxy) methane	0.4581	0.4444	3.0	TM	
24	*TM	2,4-Dichlorophenol	0.3730	0.3595	3.6	*TM	
25	TM	1,2,4-Trichlorobenzene	0.4146	0.3917	5.5	TM	
26	TM	3,4-Dimethylphenol	0.5574	0.5419	2.8	TM	
27	TM	Naphthalene	1.232	1.208	1.9	TM	
28	TM	4-Chloroaniline	0.4821	0.4736	1.7	TM	
29	TM	2,6-Dichlorophenol	0.3703	0.3565	3.7	TM	
30	TM	Hexachloropropene	0.3122	0.3024	3.1	TM	
31	*TM	Hexachlorobutadiene	0.2503	0.2390	4.5	*TM	
32	TM	Caprolactum	0.1227	0.1245	1.5	TM	
33	*TM	4-Chloro-3-methylphenol	0.4081	0.3945	3.3	*TM	
34	TM	2-Methylnaphthalene	0.8286	0.8297	0.14	TM	
35	TM	1-Methylnaphthalene	0.8484	0.8187	3.5	TM	
36	**TML	Hexachlorocyclopentadiene	0.3911	0.4295	9.8	**TML	5.4
37	TM	1,2,4,5-Tetrachlorobenzene	0.6871	0.6662	3.0	TM	
38	*TM	2,4,6-Trichlorophenol	0.4599	0.4556	0.94	*TM	
39	TM	2,4,5-Trichlorophenol	0.4850	0.4809	0.84	TM	
40	TM	1,1'-Biphenyl	1.766	1.710	3.2	TM	
		Average			3.0		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 04/20/20
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y012.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	2-Chloronaphthalene	1.404	1.339	4.6	TM	
42	TM	2-Nitroaniline	0.3938	0.4185	6.3	TM	
43	TM	Dimethyl phthalate	1.684	1.634	3.0	TM	
44	TM	2,6-DNT	0.3780	0.3798	0.47	TM	
45	TM	Acenaphthylene	2.115	2.097	0.84	TM	
46	TM	3-Nitroaniline	0.4473	0.4783	6.9	TM	
47	*TM	Acenaphthene	1.356	1.335	1.5	*TM	
48	**TML	2,4-Dinitrophenol	0.2262	0.2483	9.8	**TML	3.7
49	**TM	4-Nitrophenol	0.3126	0.3281	4.9	**TM	
50	TM	Dibenzofuran	2.002	2.050	2.4	TM	
51	TM	2,4-DNT	0.5408	0.5427	0.34	TM	
52	TM	2,3,4,6-Tetrachlorophenol	0.3834	0.3804	0.77	TM	
53	TM	Diethyl phthalate	1.648	1.593	3.3	TM	
54	TM	4-Chlorophenyl phenyl ether	0.9033	0.8837	2.2	TM	
55	TM	Fluorene	1.673	1.648	1.5	TM	
56	TM	4-Nitroaniline	0.3618	0.3808	5.2	TM	
57	TM	4,6-Dinitro-2-methylphenol	0.1843	0.1866	1.2	TM	
58	TM	Diphenyl amine	0.6566	0.6862	4.5	TM	
59	*TM	n-Nitrosodiphenylamine	0.6566	0.6862	4.5	*TM	
60	TM	1,2-Diphenylhydrazine	0.8386	0.7749	7.6	TM	
61	TM	4-Bromophenyl phenyl ether	0.2522	0.2470	2.0	TM	
62	TM	Hexachlorobenzene	0.2576	0.2593	0.68	TM	
63	TM	Atrazine	0.2420	0.2350	2.9	TM	
64	*TM	Pentachlorophenol	0.1563	0.1539	1.5	*TM	
65	TM	Phenanthrene	1.215	1.207	0.65	TM	
66	TM	Anthracene	1.266	1.260	0.51	TM	
67	TM	Carbazol	1.143	1.141	0.16	TM	
68	TM	Di-n-butylphthalate	1.457	1.462	0.30	TM	
69		2-Nitrodiphenylamine	0.3302	0.3242	1.8		
70	*TM	Fluoranthene	1.399	1.406	0.48	*TM	
71	TM	Benzidine	0.3267	0.3067	6.1	TM	
72	TM	Pyrene	1.376	1.349	1.9	TM	
73	TM	Butyl benzylphthalate	0.6346	0.6170	2.8	TM	
74	TM	3,3'-Dichlorobenzidine	0.4401	0.4376	0.56	TM	
75	TM	Benz (a) anthracene	1.386	1.384	0.13	TM	
76	TM	Bis (2-ethylhexyl) phthalate	0.9604	0.9242	3.8	TM	
77	TM	Chrysene	1.273	1.199	5.8	TM	
78	*TM	Di-n-octylphthalate	1.536	1.521	0.99	*TM	
79	TM	Benzo (b) fluoranthene	1.501	1.489	0.77	TM	
80	TM	Benzo (k) fluoranthene	1.361	1.345	1.1	TM	
		Average			2.7		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 04/20/20
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y012.D

		Compound	MEAN	CCRF	%D	%Drift	
81	*TM	Benzo (a) pyrene	1.296	1.329	2.6	*TM	
82	TM	Indeno (1,2,3-cd) pyrene	1.545	1.454	5.9	TM	
83	TM	Dibenz (a,h) anthracene	1.333	1.347	1.1	TM	
84	TM	Benzo (g,h,i) perylene	1.226	1.268	3.5	TM	
85							
86							
87							
88							
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90							
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111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
		Average			3.3		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y012.D Vial: 12
Acq On : 20 Apr 20 13:53 Operator: MA
Sample : SS 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 21 10:39 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	460635	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.72	136	2017163	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1209528	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.47	188	2303576	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.57	240	2505055	40.00000	ppb		0.00
90) Perylene-D12(IS)	15.36	264	2209029	40.00000	ppb		0.00
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.72	112	3807650	224.85813	ppb		0.00
Spiked Amount 200.000			Recovery	= 112.429%			
6) Phenol-D6 (S)	4.92	99	5026037	224.26886	ppb		0.00
Spiked Amount 200.000			Recovery	= 112.135%			
22) Nitrobenzene-D5(S)	5.92	82	2241284	108.75638	ppb		0.00
Spiked Amount 100.000			Recovery	= 108.756%			
46) 2-Fluorobiphenyl(S)	7.97	172	4771488	111.00845	ppb		0.00
Spiked Amount 100.000			Recovery	= 111.008%			
64) 2,4,6-Tribromophenol(S)	9.68	330	1494454	241.15418	ppb		0.00
Spiked Amount 200.000			Recovery	= 120.577%			
83) Terphenyl-D14(S)	12.33	244	6329316	110.94858	ppb		0.00
Spiked Amount 100.000			Recovery	= 110.949%			
Target Compounds							Qvalue
2) 1,4-Dioxane	1.64	58	27041	4.86154			94
3) n-Nitrosodimethylamine	1.87	42	430996	54.36837	ppb		100
4) Pyridine	1.91	79	1031727	49.52597	ppb		100
7) Phenol	4.93	94	1446483	49.71185	ppb		92
8) Aniline	4.92	93	831424	49.61233	ppb	#	88
9) Bis (2-chloroethyl) ether	4.99	63	562987	48.09580	ppb		98
10) 2-Chlorophenol	5.06	128	1059962	48.42067	ppb		99
11) 1,3-DCB	5.21	146	1120940	47.54754	ppb		99
12) 1,4-DCB	5.30	146	1146747	47.73644	ppb		99
13) Benzyl alcohol	5.47	108	631662	52.24643	ppb		98
14) 1,2-DCB	5.47	146	1101886	48.14977	ppb		100
15) 2-Methylphenol	5.60	107	873986	49.44522	ppb		99
16) Bis (2-chloroisopropyl) et	5.60	45	689531	49.04507	ppb		99
17) Acetophenone	5.76	105	1381133	50.09424	ppb		100
18) 3&4-Methylphenol	5.78	107	2175292	97.39239	ppb		100
19) n-Nitrosodi-n-propylamine	5.77	70	780569	49.17162	ppb		93
20) Hexachloroethane	5.85	117	433627	48.48870	ppb		100
23) Nitrobenzene	5.94	77	1141858	48.51321	ppb		100
24) Isophorone	6.22	82	1916528	48.42944	ppb		95
25) 2-Nitrophenol	6.30	139	604602	49.20384	ppb		99
26) 2,4-Dimethylphenol	6.36	122	933031	48.60250	ppb		98
27) Benzoic acid	6.56	105	841898	52.64568	ppb		98
28) Bis (2-chloroethoxy) metha	6.45	93	1120421	48.49511	ppb		100
29) 2,4-Dichlorophenol	6.58	162	906505	48.19188	ppb		99
30) 1,2,4-Trichlorobenzene	6.66	180	987748	47.24361	ppb		99
31) 3,4-Dimethylphenol	6.70	107	1366327	48.61021	ppb		99
32) Naphthalene	6.75	128	3046750	49.05378	ppb		100
33) 4-Chloroaniline	6.83	127	1194266	49.12695	ppb		99
34) 2,6-Dichlorophenol	6.83	162	898883	48.13346	ppb		99
35) Hexachloropropene	6.84	213	762467	48.42616	ppb		100
36) Hexachlorobutadiene	6.88	225	602576	47.73210	ppb		99
37) Caprolactum	7.29	55	313945	50.73790	ppb		95

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y012.D Vial: 12
Acq On : 20 Apr 20 13:53 Operator: MA
Sample : SS 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 21 10:39 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.40	107	994721	48.33708 ppb		99
39)	2-Methylnaphthalene	7.54	142	2092125	50.06848 ppb		99
40)	1-Methylnaphthalene	7.65	142	2064257	48.25022 ppb		99
42)	Hexachlorocyclopentadiene	7.72	237	649408	47.32035 ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.74	216	1007203	48.47753 ppb		99
44)	2,4,6-Trichlorophenol	7.88	196	688836	49.53192 ppb		99
45)	2,4,5-Trichlorophenol	7.94	196	727143	49.58155 ppb		96
47)	1,1'-Biphenyl	8.08	154	2585858	48.42036 ppb		99
48)	2-Chloronaphthalene	8.11	162	2023815	47.68533 ppb		99
49)	2-Nitroaniline	8.24	65	632800	53.14800 ppb		100
50)	Dimethyl phthalate	8.44	163	2470849	48.50928 ppb		100
51)	2,6-DNT	8.51	165	574192	50.23544 ppb		97
52)	Acenaphthylene	8.58	152	3170565	49.57756 ppb		99
53)	3-Nitroaniline	8.24	138	723169	53.47201 ppb		99
54)	Acenaphthene	8.78	154	2019070	49.25811 ppb		99
55)	2,4-Dinitrophenol	8.84	184	375458	48.15072 ppb		99
56)	4-Nitrophenol	8.95	65	496069	52.47368 ppb		89
57)	Dibenzofuran	8.98	168	3099167	51.20595 ppb		99
58)	2,4-DNT	8.99	165	820469	50.16888 ppb		99
59)	2,3,4,6-Tetrachlorophenol	9.14	232	575204	49.61446 ppb		100
60)	Diethyl phthalate	9.27	149	2407964	48.32940 ppb		96
61)	4-Chlorophenyl phenyl ethe	9.38	204	1336146	48.91725 ppb		99
62)	Fluorene	9.38	166	2491835	49.26821 ppb		99
63)	4-Nitroaniline	8.72	138	575778	52.62405 ppb		99
66)	4,6-Dinitro-2-methylphenol	9.47	198	537205	50.61641 ppb		92
67)	Diphenyl amine	9.53	169	3951790	104.51502 ppb		100
68)	n-Nitrosodiphenylamine	9.53	169	3951790	104.51502 ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	2231212	46.19965 ppb		100
70)	4-Bromophenyl phenyl ether	9.94	248	711342	48.97946 ppb		94
71)	Hexachlorobenzene	10.03	284	746662	50.34086 ppb		97
72)	Atrazine	10.16	200	338327	24.28045 ppb		99
73)	Pentachlorophenol	10.27	266	443187	49.25045 ppb		99
74)	Phenanthrene	10.50	178	3475244	49.67356 ppb		100
75)	Anthracene	10.57	178	3628033	49.74357 ppb		100
76)	Carbazol	10.76	167	3285414	49.92109 ppb		100
77)	Di-n-butylphthalate	11.16	149	4208371	50.14938 ppb		98
78)	2-Nitrodiphenylamine	11.33	167	466724	24.54738 ppb		99
79)	Fluoranthene	11.89	202	4047928	50.23985 ppb		100
81)	Benzidine	12.05	184	960440	46.93994 ppb		99
82)	Pyrene	12.15	202	4224931	49.04454 ppb		100
84)	Butyl benzylphthalate	12.90	149	1932102	48.61637 ppb		99
85)	3,3'-Dichlorobenzidine	13.52	252	1370351	49.71822 ppb		99
86)	Benz (a) anthracene	13.55	228	4333439	49.93648 ppb		99
87)	Bis (2-ethylhexyl) phthala	13.56	149	2893922	48.11457 ppb		99
88)	Chrysene	13.59	228	3754529	47.11080 ppb		100
89)	Di-n-octylphthalate	14.30	149	4761432	49.50301 ppb		97
91)	Benzo (b) fluoranthene	14.83	252	4111371	49.61327 ppb		99
92)	Benzo (k) fluoranthene	14.86	252	3715241	49.43632 ppb		100
93)	Benzo (a) pyrene	15.27	252	3669419	51.28296 ppb	#	97
94)	Indeno (1,2,3-cd) pyrene	17.17	276	4014423	47.04339 ppb		99
95)	Dibenz (a,h) anthracene	17.19	278	3719968	50.52836 ppb		99
96)	Benzo (g,h,i) perylene	17.71	276	3502576	51.72506 ppb		98

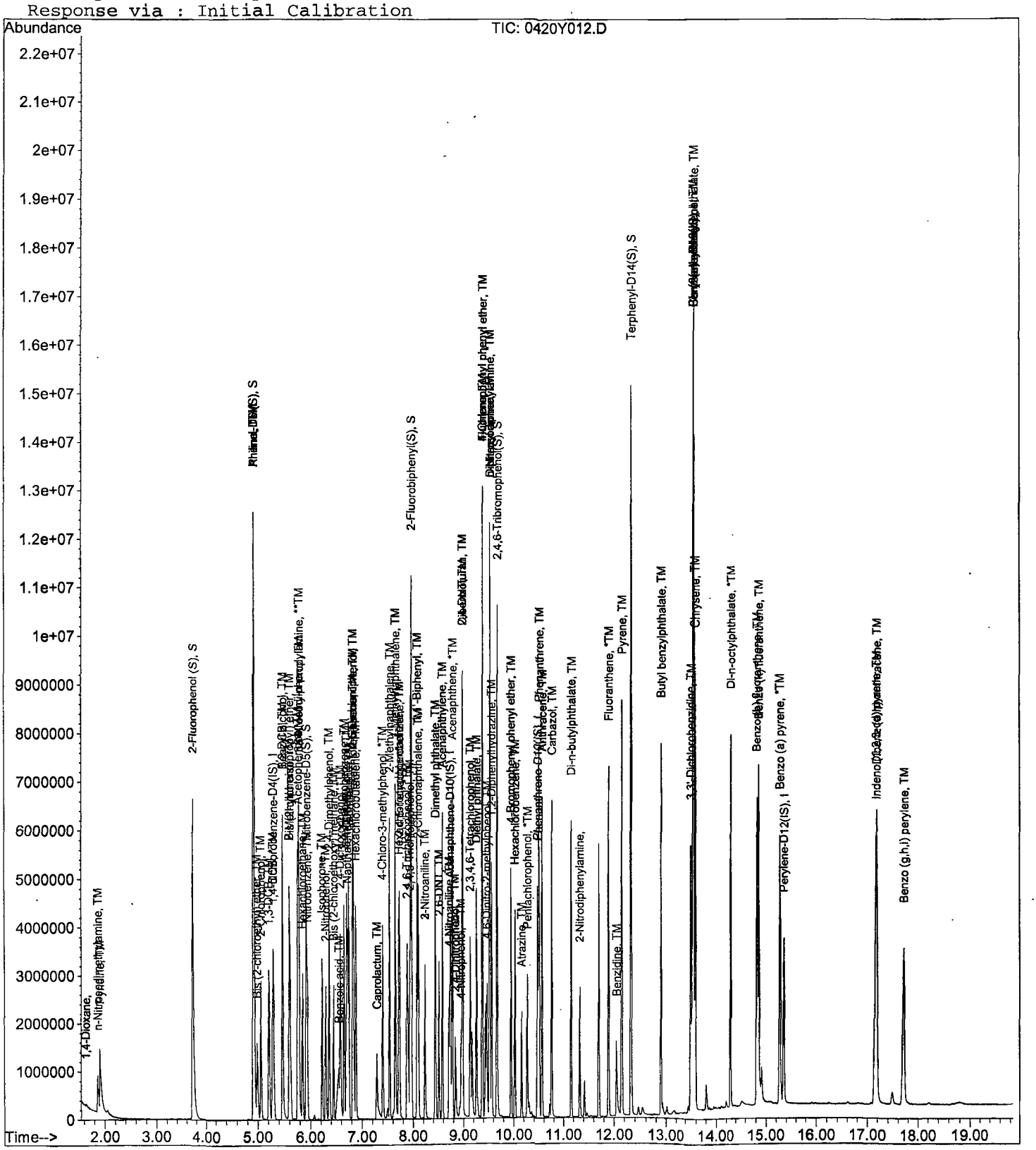
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y012.D Vial: 12
Acq On : 20 Apr 20 13:53 Operator: MA
Sample : SS 8270 3/4/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: Apr 21 10:39 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 6 May 20 10:10
Instrument: Yoda
Initial Cal. Date: 04/20/20
Data File: 0420Y191.D

		Compound	MEAN	CCRF	%D		%Drift	
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I		
2		1,4-Dioxane	0.4830	0.4677	3.2			
3	TM	n-Nitrosodimethylamine	0.6884	0.8564	24	TM		*NT
4	TM	Pyridine	1.809	2.179	20	TM		
5	S	2-Fluorophenol (S)	1.470	1.563	6.3	S		
6	S	Phenol-D6 (S)	1.946	2.152	11	S		
7	*TM	Phenol	2.527	2.628	4.0	*TM		
8	TM	Aniline	1.455	1.427	1.9	TM		
9	TM	Bis (2-chloroethyl) ether	1.016	1.059	4.2	TM		
10	TM	2-Chlorophenol	1.901	1.892	0.49	TM		
11	TM	1,3-DCB	2.047	1.965	4.0	TM		
12	*TM	1,4-DCB	2.086	2.030	2.7	*TM		
13	TM	Benzyl alcohol	1.050	1.129	7.5	TM		
14	TM	1,2-DCB	1.987	1.972	0.77	TM		
15	TM	2-Methylphenol	1.535	1.606	4.6	TM		
16	TM	Bis (2-chloroisopropyl) ether	1.221	1.259	3.1	TM		
17	TM	Acetophenone	2.394	2.576	7.6	TM		
18	TM	3&4-Methylphenol	1.940	2.056	6.0	TM		
19	**TM	n-Nitrosodi-n-propylamine	1.378	1.522	10	**TM		
20	TM	Hexachloroethane	0.7766	0.7888	1.6	TM		
21	I	Napthalene-D8(IS)	ISTD			I		
22	S	Nitrobenzene-D5(S)	0.4087	0.4532	11	S		
23	TM	Nitrobenzene	0.4667	0.4909	5.2	TM		
24	TM	Isophorone	0.7847	0.8310	5.9	TM		
25	*TM	2-Nitrophenol	0.2437	0.2468	1.3	*TM		
26	TM	2,4-Dimethylphenol	0.3807	0.3885	2.1	TM		
27	TM	Benzoic acid	0.3171	0.1832	42	TM		*NT
28	TM	Bis (2-chloroethoxy) methane	0.4581	0.4709	2.8	TM		
29	*TM	2,4-Dichlorophenol	0.3730	0.3685	1.2	*TM		
30	TM	1,2,4-Trichlorobenzene	0.4146	0.3979	4.0	TM		
31	TM	3,4-Dimethylphenol	0.5574	0.5831	4.6	TM		
32	TM	Naphthalene	1.232	1.230	0.11	TM		
33	TM	4-Chloroaniline	0.4821	0.4937	2.4	TM		
34	TM	2,6-Dichlorophenol	0.3703	0.3789	2.3	TM		
35	TM	Hexachloropropene	0.3122	0.3190	2.2	TM		
36	*TM	Hexachlorobutadiene	0.2503	0.2470	1.3	*TM		
37	TM	Caprolactum	0.1227	0.1385	13	TM		
38	*TM	4-Chloro-3-methylphenol	0.4081	0.4167	2.1	*TM		
39	TM	2-Methylnaphthalene	0.8286	0.8266	0.24	TM		
40	TM	1-Methylnaphthalene	0.8484	0.8394	1.1	TM		
		Average			6.0			

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 6 May 20 10:10
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y191.D

		Compound	MEAN	CCRF	%D	%Drift		
41	I	Acenaphthene-D10(IS)	ISTD			I		
42	**TML	Hexachlorocyclopentadiene	0.3911	0.3298	16	**TML	25	*NT
43	TM	1,2,4,5-Tetrachlorobenzene	0.6871	0.6626	3.6	TM		
44	*TM	2,4,6-Trichlorophenol	0.4599	0.4574	0.54	*TM		
45	TM	2,4,5-Trichlorophenol	0.4850	0.4823	0.57	TM		
46	S	2-Fluorobiphenyl(S)	1.421	1.483	4.3	S		
47	TM	1,1'-Biphenyl	1.766	1.763	0.17	TM		
48	TM	2-Chloronaphthalene	1.404	1.384	1.4	TM		
49	TM	2-Nitroaniline	0.3938	0.4509	15	TM		
50	TM	Dimethyl phthalate	1.684	1.685	0.00	TM		
51	TM	2,6-DNT	0.3780	0.3873	2.5	TM		
52	TM	Acenaphthylene	2.115	2.154	1.8	TM		
53	TM	3-Nitroaniline	0.4473	0.4808	7.5	TM		
54	*TM	Acenaphthene	1.356	1.354	0.11	*TM		
55	**TML	2,4-Dinitrophenol	0.2262	0.1606	29	**TML	35	*NT
56	**TM	4-Nitrophenol	0.3126	0.3217	2.9	**TM		
57	TM	Dibenzofuran	2.002	2.069	3.4	TM		
58	TM	2,4-DNT	0.5408	0.5794	7.1	TM		
59	TM	2,3,4,6-Tetrachlorophenol	0.3834	0.3597	6.2	TM		
60	TM	Diethyl phthalate	1.648	1.688	2.4	TM		
61	TM	4-Chlorophenyl phenyl ether	0.9033	0.9526	5.5	TM		
62	TM	Fluorene	1.673	1.773	6.0	TM		
63	TM	4-Nitroaniline	0.3618	0.3793	4.8	TM		
64	S	2,4,6-Tribromophenol(S)	0.2049	0.2094	2.2	S		
65	I	Phenanthrene-D10(IS)	ISTD			I		
66	TM	4,6-Dinitro-2-methylphenol	0.1843	0.1706	7.4	TM		
67	TM	Diphenyl amine	0.6566	0.7049	7.4	TM		
68	*TM	n-Nitrosodiphenylamine	0.6566	0.7049	7.4	*TM		
69	TM	1,2-Diphenylhydrazine	0.8386	0.8647	3.1	TM		
70	TM	4-Bromophenyl phenyl ether	0.2522	0.2560	1.5	TM		
71	TM	Hexachlorobenzene	0.2576	0.2533	1.7	TM		
72	TM	Atrazine	0.2420	0.1953	19	TM		
73	*TM	Pentachlorophenol	0.1563	0.1401	10	*TM		
74	TM	Phenanthrene	1.215	1.241	2.2	TM		
75	TM	Anthracene	1.266	1.293	2.1	TM		
76	TM	Carbazol	1.143	1.205	5.5	TM		
77	TM	Di-n-butylphthalate	1.457	1.571	7.8	TM		
78		2-Nitrodiphenylamine	0.3302	0.3734	13			
79	*TM	Fluoranthene	1.399	1.454	4.0	*TM		
80	I	Chrysene-D12(IS)	ISTD			I		
		Average			5.8			

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 6 May 20 10:10
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y191.D

		Compound	MEAN	CCRF	%D		%Drift
81	TM	Benzidine	0.3267	0.2932	10	TM	
82	TM	Pyrene	1.376	1.305	5.2	TM	
83	S	Terphenyl-D14(S)	0.9109	0.8449	7.2	S	
84	TM	Butyl benzylphthalate	0.6346	0.6229	1.8	TM	
85	TM	3,3'-Dichlorobenzidine	0.4401	0.4663	6.0	TM	
86	TM	Benz (a) anthracene	1.386	1.380	0.42	TM	
87	TM	Bis (2-ethylhexyl) phthalate	0.9604	1.035	7.8	TM	
88	TM	Chrysene	1.273	1.195	6.1	TM	
89	*TM	Di-n-octylphthalate	1.536	1.565	1.9	*TM	
90	I	Perylene-D12(IS)	ISTD			I	
91	TM	Benzo (b) fluoranthene	1.501	1.455	3.0	TM	
92	TM	Benzo (k) fluoranthene	1.361	1.477	8.6	TM	
93	*TM	Benzo (a) pyrene	1.296	1.378	6.3	*TM	
94	TM	Indeno (1,2,3-cd) pyrene	1.545	1.549	0.23	TM	
95	TM	Dibenz (a,h) anthracene	1.333	1.396	4.7	TM	
96	TM	Benzo (g,h,i) perylene	1.226	1.180	3.8	TM	
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
		Average			4.9		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y191.D Vial: 91
Acq On : 6 May 20 10:10 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (3) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 10:36 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	560488	40.00000 ppb		0.00
21) Napthalene-D8(IS)	6.71	136	2480989	40.00000 ppb		0.00
41) Acenaphthene-D10(IS)	8.74	164	1519105	40.00000 ppb		0.00
65) Phenanthrene-D10(IS)	10.46	188	2861197	40.00000 ppb		0.00
80) Chrysene-D12(IS)	13.56	240	3331175	40.00000 ppb		0.00
90) Perylene-D12(IS)	15.35	264	2679200	40.00000 ppb		0.00
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.72	112	2190390	106.30743 ppb		-0.02
Spiked Amount 200.000			Recovery = 53.154%			
6) Phenol-D6 (S)	4.91	99	3015953	110.60085 ppb		0.00
Spiked Amount 200.000			Recovery = 55.301%			
22) Nitrobenzene-D5(S)	5.92	82	1405582	55.45366 ppb		0.00
Spiked Amount 100.000			Recovery = 55.454%			
46) 2-Fluorobiphenyl(S)	7.96	172	2816368	52.16987 ppb		0.00
Spiked Amount 100.000			Recovery = 52.170%			
64) 2,4,6-Tribromophenol(S)	9.67	330	795138	102.16047 ppb		0.00
Spiked Amount 200.000			Recovery = 51.080%			
83) Terphenyl-D14(S)	12.32	244	3518153	46.37666 ppb		0.00
Spiked Amount 100.000			Recovery = 46.377%			
Target Compounds						Qvalue
2) 1,4-Dioxane	1.65	58	32764	4.84104		71
3) n-Nitrosodimethylamine	1.86	42	600006	62.20414 ppb		92
4) Pyridine	1.88	79	1526531	60.22329 ppb		99
7) Phenol	4.92	94	1841239	52.00527 ppb		98
8) Aniline	4.90	93	999744	49.02827 ppb	#	87
9) Bis (2-chloroethyl) ether	4.98	63	742038	52.09854 ppb		97
10) 2-Chlorophenol	5.05	128	1325220	49.75298 ppb		96
11) 1,3-DCB	5.21	146	1377044	48.00474 ppb		98
12) 1,4-DCB	5.29	146	1422391	48.66223 ppb		98
13) Benzyl alcohol	5.46	108	790863	53.76055 ppb		99
14) 1,2-DCB	5.47	146	1381528	49.61441 ppb		99
15) 2-Methylphenol	5.60	107	1125319	52.32222 ppb		96
16) Bis (2-chloroisopropyl) et	5.59	45	881825	51.54833 ppb		91
17) Acetophenone	5.74	105	1804948	53.80313 ppb		96
18) 3&4-Methylphenol	5.78	107	2881348	106.02146 ppb		93
19) n-Nitrosodi-n-propylamine	5.75	70	1066488	55.21408 ppb		99
20) Hexachloroethane	5.84	117	552618	50.78552 ppb		87
23) Nitrobenzene	5.93	77	1522327	52.58623 ppb		94
24) Isophorone	6.21	82	2577189	52.94887 ppb		99
25) 2-Nitrophenol	6.29	139	765320	50.63941 ppb		89
26) 2,4-Dimethylphenol	6.35	122	1204944	51.03235 ppb		98
27) Benzoic acid	6.53	105	568291	28.89284 ppb		98
28) Bis (2-chloroethoxy) metha	6.44	93	1460287	51.38911 ppb		99
29) 2,4-Dichlorophenol	6.57	162	1142886	49.39952 ppb		97
30) 1,2,4-Trichlorobenzene	6.65	180	1233895	47.98342 ppb		98
31) 3,4-Dimethylphenol	6.70	107	1808361	52.30873 ppb		98
32) Naphthalene	6.74	128	3815221	49.94264 ppb		99
33) 4-Chloroaniline	6.82	127	1531176	51.21062 ppb		96
34) 2,6-Dichlorophenol	6.83	162	1174914	51.15242 ppb		95
35) Hexachloropropene	6.83	213	989218	51.08192 ppb		99
36) Hexachlorobutadiene	6.88	225	766029	49.33557 ppb		98
37) Caprolactum	7.27	55	429491	56.43508 ppb		94

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y191.D Vial: 91
Acq On : 6 May 20 10:10 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (3) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 10:36 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Compound	R.T.	QIon	Response	Conc Unit		Qvalue
38) 4-Chloro-3-methylphenol	7.39	107	1292193	51.05316 ppb		94
39) 2-Methylnaphthalene	7.53	142	2563410	49.87823 ppb		99
40) 1-Methylnaphthalene	7.64	142	2603045	49.46903 ppb		99
42) Hexachlorocyclopentadiene	7.71	237	626176	37.38702 ppb		97
43) 1,2,4,5-Tetrachlorobenzene	7.73	216	1258110	48.21368 ppb		99
44) 2,4,6-Trichlorophenol	7.87	196	868594	49.72953 ppb		99
45) 2,4,5-Trichlorophenol	7.94	196	915735	49.71623 ppb		97
47) 1,1'-Biphenyl	8.07	154	3347884	49.91394 ppb		98
48) 2-Chloronaphthalene	8.10	162	2627825	49.29905 ppb		97
49) 2-Nitroaniline	8.23	65	856115	57.25069 ppb		88
50) Dimethyl phthalate	8.43	163	3198680	50.00087 ppb		100
51) 2,6-DNT	8.51	165	735467	51.23237 ppb	#	77
52) Acenaphthylene	8.57	152	4089613	50.91653 ppb		99
53) 3-Nitroaniline	8.23	138	913009	53.75142 ppb		93
54) Acenaphthene	8.78	154	2571335	49.94743 ppb		99
55) 2,4-Dinitrophenol	8.84	184	304986	32.52241 ppb		96
56) 4-Nitrophenol	8.96	65	610964	51.45685 ppb		98
57) Dibenzofuran	8.98	168	3929510	51.69422 ppb		96
58) 2,4-DNT	8.98	165	1100118	53.55989 ppb	#	80
59) 2,3,4,6-Tetrachlorophenol	9.14	232	683103	46.91381 ppb		96
60) Diethyl phthalate	9.25	149	3205304	51.22227 ppb		99
61) 4-Chlorophenyl phenyl ethe	9.37	204	1808923	52.72983 ppb		94
62) Fluorene	9.38	166	3366411	52.99596 ppb		99
63) 4-Nitroaniline	8.71	138	720244	52.41275 ppb		83
66) 4,6-Dinitro-2-methylphenol	9.47	198	610021	46.27547 ppb		94
67) Diphenyl amine	9.52	169	5041963	107.35920 ppb		100
68) n-Nitrosodiphenylamine	9.52	169	5041963	107.35920 ppb		100
69) 1,2-Diphenylhydrazine	9.55	77	3092559	51.55498 ppb		93
70) 4-Bromophenyl phenyl ether	9.94	248	915427	50.74742 ppb		89
71) Hexachlorobenzene	10.02	284	905773	49.16666 ppb	#	81
72) Atrazine	10.14	200	349212	20.17735 ppb		97
73) Pentachlorophenol	10.26	266	500966	44.82149 ppb		97
74) Phenanthrene	10.49	178	4439030	51.08376 ppb		99
75) Anthracene	10.56	178	4625786	51.06297 ppb		100
76) Carbazol	10.75	167	4311349	52.74265 ppb		99
77) Di-n-butylphthalate	11.14	149	5619946	53.91859 ppb		99
78) 2-Nitrodiphenylamine	11.32	167	667683	28.27288 ppb		93
79) Fluoranthene	11.89	202	5201632	51.97685 ppb		99
81) Benzidine	12.04	184	1221077	44.87817 ppb		99
82) Pyrene	12.15	202	5432653	47.42450 ppb		99
84) Butyl benzylphthalate	12.89	149	2593780	49.08010 ppb		99
85) 3,3'-Dichlorobenzidine	13.51	252	1941795	52.97938 ppb	#	98
86) Benz (a) anthracene	13.55	228	5745740	49.79102 ppb		99
87) Bis (2-ethylhexyl) phthala	13.55	149	4310072	53.88825 ppb		100
88) Chrysene	13.58	228	4976619	46.95905 ppb		99
89) Di-n-octylphthalate	14.29	149	6515040	50.93672 ppb		99
91) Benzo (b) fluoranthene	14.83	252	4873749	48.49206 ppb		99
92) Benzo (k) fluoranthene	14.87	252	4947592	54.28118 ppb		98
93) Benzo (a) pyrene	15.27	252	4613965	53.16752 ppb		100
94) Indeno (1,2,3-cd) pyrene	17.17	276	5186844	50.11583 ppb		98
95) Dibenz (a,h) anthracene	17.19	278	4676146	52.36973 ppb		99
96) Benzo (g,h,i) perylene	17.71	276	3952060	48.12085 ppb		98

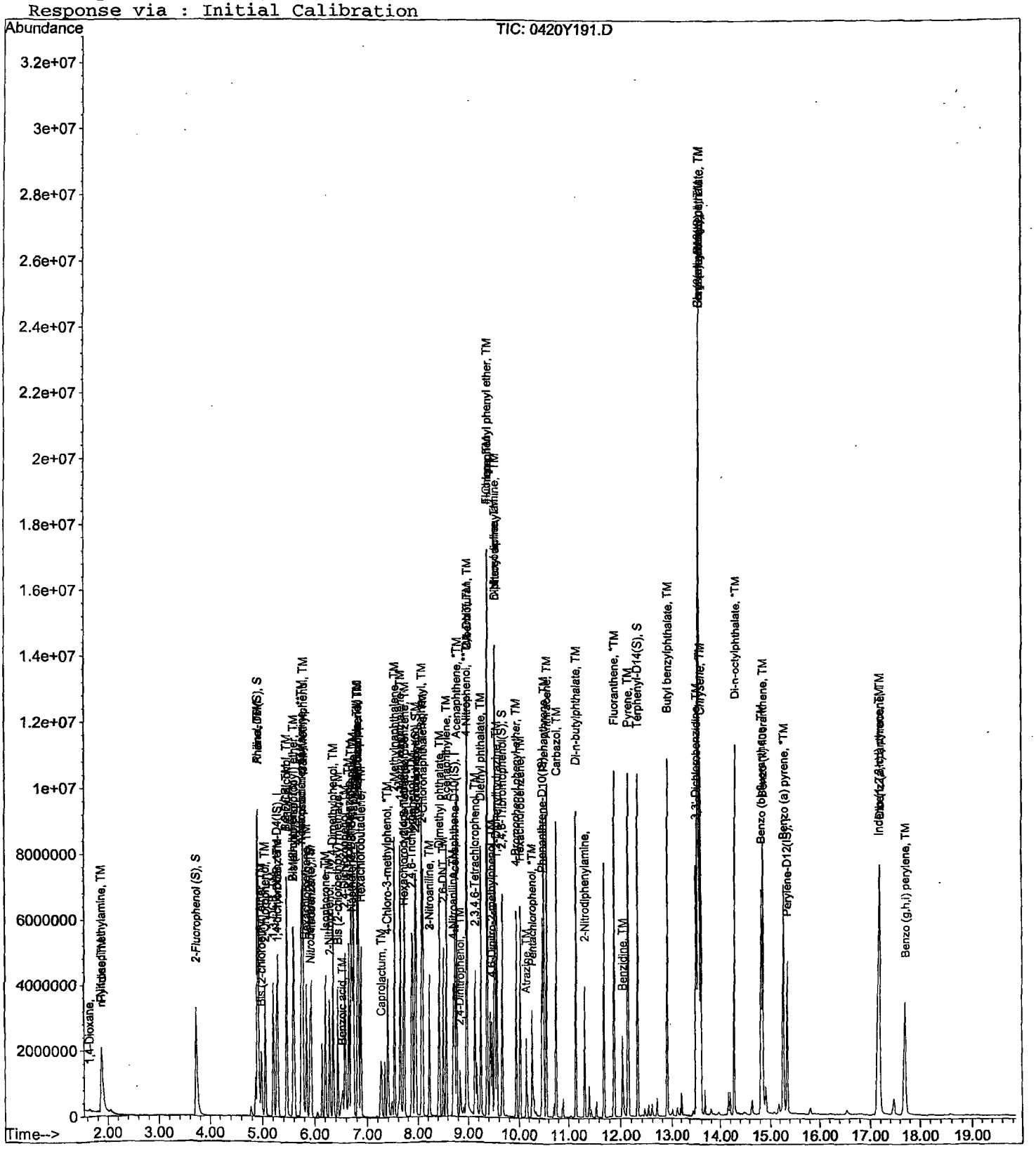
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y191.D Vial: 91
Acq On : 6 May 20 10:10 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (3) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 10:36 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Page 302 of 703

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 6 May 20 13:32
Instrument: Yoda
Initial Cal. Date: 04/20/20
Data File: 0420Y198.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2		1,4-Dioxane	0.4830	0.4752	1.6		
3	TM	n-Nitrosodimethylamine	0.6884	0.8079	17	TM	
4	TM	Pyridine	1.809	2.103	16	TM	
5	S	2-Fluorophenol (S)	1.470	1.473	0.14	S	
6	S	Phenol-D6 (S)	1.946	1.990	2.2	S	
7	*TM	Phenol	2.527	2.412	4.5	*TM	
8	TM	Aniline	1.455	1.456	0.08	TM	
9	TM	Bis (2-chloroethyl) ether	1.016	0.9900	2.6	TM	
10	TM	2-Chlorophenol	1.901	1.790	5.9	TM	
11	TM	1,3-DCB	2.047	1.902	7.1	TM	
12	*TM	1,4-DCB	2.086	1.958	6.2	*TM	
13	TM	Benzyl alcohol	1.050	1.026	2.3	TM	
14	TM	1,2-DCB	1.987	1.855	6.6	TM	
15	TM	2-Methylphenol	1.535	1.477	3.8	TM	
16	TM	Bis (2-chloroisopropyl) ether	1.221	1.154	5.5	TM	
17	TM	Acetophenone	2.394	2.395	0.06	TM	
18	TM	3&4-Methylphenol	1.940	1.849	4.7	TM	
19	**TM	n-Nitrosodi-n-propylamine	1.378	1.404	1.8	**TM	
20	TM	Hexachloroethane	0.7766	0.7631	1.7	TM	
21	I	Napthalene-D8(IS)	ISTD			I	
22	S	Nitrobenzene-D5(S)	0.4087	0.4595	12	S	
23	TM	Nitrobenzene	0.4667	0.4975	6.6	TM	
24	TM	Isophorone	0.7847	0.8291	5.7	TM	
25	*TM	2-Nitrophenol	0.2437	0.2423	0.54	*TM	
26	TM	2,4-Dimethylphenol	0.3807	0.3857	1.3	TM	
27	TM	Benzoic acid	0.3171	0.3093	2.5	TM	
28	TM	Bis (2-chloroethoxy) methane	0.4581	0.4588	0.15	TM	
29	*TM	2,4-Dichlorophenol	0.3730	0.3641	2.4	*TM	
30	TM	1,2,4-Trichlorobenzene	0.4146	0.4011	3.2	TM	
31	TM	3,4-Dimethylphenol	0.5574	0.5689	2.1	TM	
32	TM	Naphthalene	1.232	1.235	0.28	TM	
33	TM	4-Chloroaniline	0.4821	0.4686	2.8	TM	
34	TM	2,6-Dichlorophenol	0.3703	0.3704	0.03	TM	
35	TM	Hexachloropropene	0.3122	0.3229	3.4	TM	
36	*TM	Hexachlorobutadiene	0.2503	0.2465	1.5	*TM	
37	TM	Caprolactum	0.1227	0.1360	11	TM	
38	*TM	4-Chloro-3-methylphenol	0.4081	0.4141	1.5	*TM	
39	TM	2-Methylnaphthalene	0.8286	0.8232	0.66	TM	
40	TM	1-Methylnaphthalene	0.8484	0.8448	0.42	TM	
		Average			3.9		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 6 May 20 13:32
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y198.D

		Compound	MEAN	CCRF	%D		%Drift
41	I	Acenaphthene-D10(IS)	ISTD			I	
42	**TML	Hexachlorocyclopentadiene	0.3911	0.3685	5.8	**TML	18
43	TM	1,2,4,5-Tetrachlorobenzene	0.6871	0.6850	0.31	TM	
44	*TM	2,4,6-Trichlorophenol	0.4599	0.4685	1.9	*TM	
45	TM	2,4,5-Trichlorophenol	0.4850	0.4901	1.1	TM	
46	S	2-Fluorobiphenyl(S)	1.421	1.563	9.9	S	
47	TM	1,1'-Biphenyl	1.766	1.834	3.9	TM	
48	TM	2-Chloronaphthalene	1.404	1.442	2.7	TM	
49	TM	2-Nitroaniline	0.3938	0.4565	16	TM	
50	TM	Dimethyl phthalate	1.684	1.741	3.4	TM	
51	TM	2,6-DNT	0.3780	0.3969	5.0	TM	
52	TM	Acenaphthylene	2.115	2.195	3.8	TM	
53	TM	3-Nitroaniline	0.4473	0.4850	8.4	TM	
54	*TM	Acenaphthene	1.356	1.400	3.3	*TM	
55	**TML	2,4-Dinitrophenol	0.2262	0.2169	4.1	**TML	15
56	**TM	4-Nitrophenol	0.3126	0.3198	2.3	**TM	
57	TM	Dibenzofuran	2.002	2.118	5.8	TM	
58	TM	2,4-DNT	0.5408	0.5990	11	TM	
59	TM	2,3,4,6-Tetrachlorophenol	0.3834	0.3608	5.9	TM	
60	TM	Diethyl phthalate	1.648	1.762	7.0	TM	
61	TM	4-Chlorophenyl phenyl ether	0.9033	0.9563	5.9	TM	
62	TM	Fluorene	1.673	1.799	7.6	TM	
63	TM	4-Nitroaniline	0.3618	0.3987	10	TM	
64	S	2,4,6-Tribromophenol(S)	0.2049	0.2122	3.5	S	
65	I	Phenanthrene-D10(IS)	ISTD			I	
66	TM	4,6-Dinitro-2-methylphenol	0.1843	0.1852	0.49	TM	
67	TM	Diphenyl amine	0.6566	0.7164	9.1	TM	
68	*TM	n-Nitrosodiphenylamine	0.6566	0.7164	9.1	*TM	
69	TM	1,2-Diphenylhydrazine	0.8386	0.9263	10	TM	
70	TM	4-Bromophenyl phenyl ether	0.2522	0.2593	2.8	TM	
71	TM	Hexachlorobenzene	0.2576	0.2586	0.42	TM	
72	TM	Atrazine	0.2420	0.2358	2.6	TM	
73	*TM	Pentachlorophenol	0.1563	0.1361	13	*TM	
74	TM	Phenanthrene	1.215	1.289	6.1	TM	
75	TM	Anthracene	1.266	1.365	7.8	TM	
76	TM	Carbazol	1.143	1.226	7.3	TM	
77	TM	Di-n-butylphthalate	1.457	1.591	9.2	TM	
78		2-Nitrodiphenylamine	0.3302	0.3831	16		
79	*TM	Fluoranthene	1.399	1.496	6.9	*TM	
80	I	Chrysene-D12(IS)	ISTD			I	
		Average			6.2		

Semi-Volatile Analysis by GC-MS
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: 0

SDG No:
Date Analyzed: 6 May 20 13:32
Instrument: Yoda
Cal. Date: 04/20/20
Data File: 0420Y198.D

		Compound	MEAN	CCRF	%D	%Drift		
81	TM	Benzidine	0.3267	0.2126	35	TM		*NT
82	TM	Pyrene	1.376	1.392	1.2	TM		
83	S	Terphenyl-D14(S)	0.9109	0.9381	3.0	S		
84	TM	Butyl benzylphthalate	0.6346	0.6747	6.3	TM		
85	TM	3,3'-Dichlorobenzidine	0.4401	0.4608	4.7	TM		
86	TM	Benz (a) anthracene	1.386	1.470	6.1	TM		
87	TM	Bis (2-ethylhexyl) phthalate	0.9604	1.053	9.6	TM		
88	TM	Chrysene	1.273	1.206	5.2	TM		
89	*TM	Di-n-octylphthalate	1.536	1.629	6.1	*TM		
90	I	Perylene-D12(IS)	ISTD			I		
91	TM	Benzo (b) fluoranthene	1.501	1.636	9.1	TM		
92	TM	Benzo (k) fluoranthene	1.361	1.411	3.7	TM		
93	*TM	Benzo (a) pyrene	1.296	1.417	9.3	*TM		
94	TM	Indeno (1,2,3-cd) pyrene	1.545	1.591	3.0	TM		
95	TM	Dibenz (a,h) anthracene	1.333	1.415	6.2	TM		
96	TM	Benzo (g,h,i) perylene	1.226	1.211	1.2	TM		
97								
98								
99								
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
		Average			7.3			

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 14:21 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	400214	40.00000 ppb	0.00
21) Napthalene-D8(IS)	6.71	136	1651962	40.00000 ppb	0.00
41) Acenaphthene-D10(IS)	8.74	164	974422	40.00000 ppb	0.00
65) Phenanthrene-D10(IS)	10.47	188	1820287	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.56	240	2031760	40.00000 ppb	0.00
90) Perylene-D12(IS)	15.34	264	1660394	40.00000 ppb	-0.02
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.72	112	1473354	100.14363 ppb	-0.02
Spiked Amount 200.000			Recovery = 50.072%		
6) Phenol-D6 (S)	4.90	99	1990893	102.24825 ppb	-0.02
Spiked Amount 200.000			Recovery = 51.124%		
22) Nitrobenzene-D5(S)	5.91	82	948804	56.21799 ppb	0.00
Spiked Amount 100.000			Recovery = 56.218%		
46) 2-Fluorobiphenyl(S)	7.95	172	1903570	54.97179 ppb	0.00
Spiked Amount 100.000			Recovery = 54.972%		
64) 2,4,6-Tribromophenol(S)	9.67	330	516864	103.52789 ppb	0.00
Spiked Amount 200.000			Recovery = 51.764%		
83) Terphenyl-D14(S)	12.32	244	2382514	51.49265 ppb	0.00
Spiked Amount 100.000			Recovery = 51.493%		
Target Compounds					Qvalue
2) 1,4-Dioxane	1.64	58	23771	4.91884	91
3) n-Nitrosodimethylamine	1.85	42	404149m	58.67853 ppb	88
4) Pyridine	1.87	79	1051906	58.11789 ppb	100
7) Phenol	4.92	94	1206783	47.73539 ppb	95
8) Aniline	4.90	93	728576	50.03877 ppb	89
9) Bis (2-chloroethyl) ether	4.98	63	495288	48.70025 ppb	98
10) 2-Chlorophenol	5.05	128	895231	47.06957 ppb	99
11) 1,3-DCB	5.21	146	951264	46.44205 ppb	98
12) 1,4-DCB	5.29	146	979360	46.92339 ppb	99
13) Benzyl alcohol	5.45	108	513243	48.86068 ppb	85
14) 1,2-DCB	5.46	146	928071	46.67705 ppb	98
15) 2-Methylphenol	5.59	107	738906	48.11425 ppb	97
16) Bis (2-chloroisopropyl) et	5.59	45	577353	47.26587 ppb	97
17) Acetophenone	5.74	105	1198375	50.02760 ppb	96
18) 3&4-Methylphenol	5.77	107	1850291	95.34812 ppb	98
19) n-Nitrosodi-n-propylamine	5.75	70	702136	50.90837 ppb	96
20) Hexachloroethane	5.84	117	381751	49.13252 ppb	88
23) Nitrobenzene	5.94	77	1027267	53.29325 ppb	97
24) Isophorone	6.20	82	1712061	52.82681 ppb	97
25) 2-Nitrophenol	6.29	139	500417	49.72816 ppb	89
26) 2,4-Dimethylphenol	6.35	122	796445	50.65931 ppb	100
27) Benzoic acid	6.53	105	638617m	48.76235 ppb	97
28) Bis (2-chloroethoxy) metha	6.45	93	947501	50.07689 ppb	99
29) 2,4-Dichlorophenol	6.58	162	751826	48.80474 ppb	97
30) 1,2,4-Trichlorobenzene	6.65	180	828318	48.37655 ppb	98
31) 3,4-Dimethylphenol	6.70	107	1174847	51.03817 ppb	98
32) Naphthalene	6.74	128	2550442	50.14089 ppb	99
33) 4-Chloroaniline	6.82	127	967646	48.60447 ppb	99
34) 2,6-Dichlorophenol	6.83	162	764954	50.01729 ppb	96
35) Hexachloropropene	6.84	213	666791	51.71180 ppb	99
36) Hexachlorobutadiene	6.88	225	508934	49.22675 ppb	98
37) Caprolactum	7.25	55	280878	55.42907 ppb	96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 14:21 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.39	107	854996	50.73225 ppb		95
39)	2-Methylnaphthalene	7.53	142	1699795	49.67230 ppb		99
40)	1-Methylnaphthalene	7.64	142	1744555	49.79218 ppb		100
42)	Hexachlorocyclopentadiene	7.71	237	448896	41.24843 ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	834298	49.84408 ppb		99
44)	2,4,6-Trichlorophenol	7.88	196	570668	50.93564 ppb		99
45)	2,4,5-Trichlorophenol	7.93	196	596969	50.52670 ppb	#	89
47)	1,1'-Biphenyl	8.07	154	2234396	51.93406 ppb		99
48)	2-Chloronaphthalene	8.10	162	1756296	51.36657 ppb		98
49)	2-Nitroaniline	8.23	65	556033	57.96821 ppb		97
50)	Dimethyl phthalate	8.43	163	2120568	51.67729 ppb		99
51)	2,6-DNT	8.51	165	483493	52.50639 ppb		93
52)	Acenaphthylene	8.57	152	2673920	51.89981 ppb		99
53)	3-Nitroaniline	8.23	138	590798	54.22438 ppb		97
54)	Acenaphthene	8.78	154	1705410	51.64449 ppb		99
55)	2,4-Dinitrophenol	8.84	184	264131	42.54183 ppb		99
56)	4-Nitrophenol	8.97	65	389472	51.13809 ppb		80
57)	Dibenzofuran	8.97	168	2579740	52.90786 ppb		93
58)	2,4-DNT	8.98	165	729619	55.37800 ppb		93
59)	2,3,4,6-Tetrachlorophenol	9.14	232	439513	47.05729 ppb		92
60)	Diethyl phthalate	9.25	149	2146641	53.47979 ppb		97
61)	4-Chlorophenyl phenyl ethe	9.37	204	1164775	52.93209 ppb		98
62)	Fluorene	9.37	166	2191369	53.78137 ppb		99
63)	4-Nitroaniline	8.71	138	485664	55.09776 ppb		100
66)	4,6-Dinitro-2-methylphenol	9.46	198	421398	50.24657 ppb		87
67)	Diphenyl amine	9.52	169	3260082	109.11289 ppb		100
68)	n-Nitrosodiphenylamine	9.52	169	3260082	109.11289 ppb		100
69)	1,2-Diphenylhydrazine	9.56	77	2107626	55.22733 ppb		95
70)	4-Bromophenyl phenyl ether	9.94	248	590062	51.41571 ppb		92
71)	Hexachlorobenzene	10.02	284	588460	50.20838 ppb	#	89
72)	Atrazine	10.14	200	268234	24.36109 ppb		99
73)	Pentachlorophenol	10.26	266	309693	43.55292 ppb		97
74)	Phenanthrene	10.49	178	2932196	53.03904 ppb		100
75)	Anthracene	10.55	178	3106550	53.90223 ppb		99
76)	Carbazol	10.75	167	2788785	53.62554 ppb		100
77)	Di-n-butylphthalate	11.14	149	3621001	54.60632 ppb		100
78)	2-Nitrodiphenylamine	11.32	167	435883	29.01200 ppb		96
79)	Fluoranthene	11.89	202	3403882	53.46292 ppb		99
81)	Benzidine	12.04	184	539891	32.53293 ppb		97
82)	Pyrene	12.15	202	3534902	50.59333 ppb		100
84)	Butyl benzylphthalate	12.89	149	1713580	53.16205 ppb		95
85)	3,3'-Dichlorobenzidine	13.51	252	1170387	52.35499 ppb		99
86)	Benz (a) anthracene	13.54	228	3732515	53.03123 ppb		99
87)	Bis (2-ethylhexyl) phthala	13.55	149	2674498	54.82478 ppb		99
88)	Chrysene	13.58	228	3063272	47.39096 ppb		100
89)	Di-n-octylphthalate	14.28	149	4138101	53.04446 ppb	#	94
91)	Benzo (b) fluoranthene	14.82	252	3396460	54.52905 ppb		100
92)	Benzo (k) fluoranthene	14.86	252	2927936	51.83356 ppb		99
93)	Benzo (a) pyrene	15.27	252	2940484	54.67451 ppb		98
94)	Indeno (1,2,3-cd) pyrene	17.16	276	3302610	51.49001 ppb		99
95)	Dibenz (a,h) anthracene	17.18	278	2937215	53.07891 ppb		99
96)	Benzo (g,h,i) perylene	17.70	276	2514046	49.39431 ppb		99

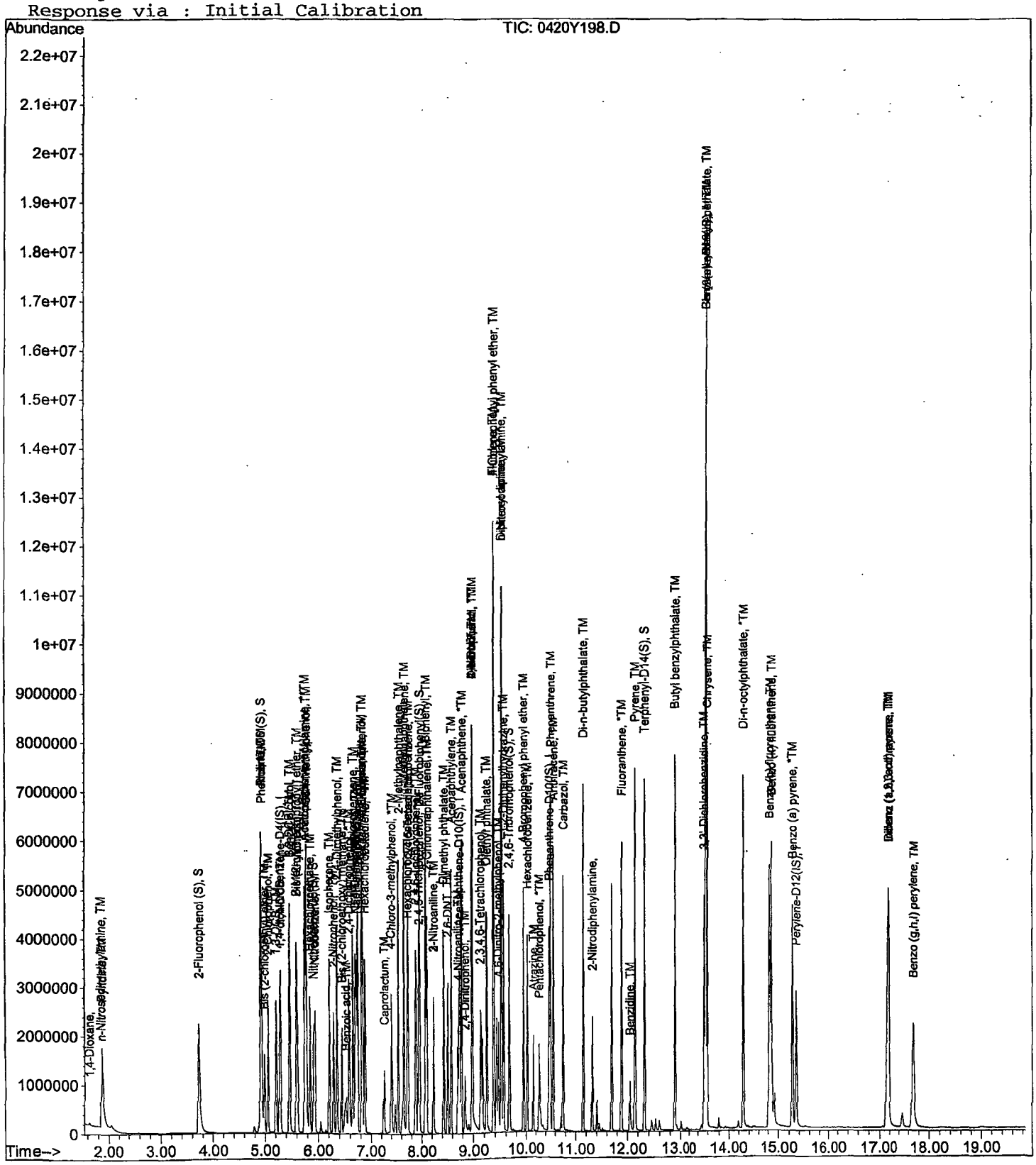
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 6 14:21 2020 Quant Results File: Y0420.RES

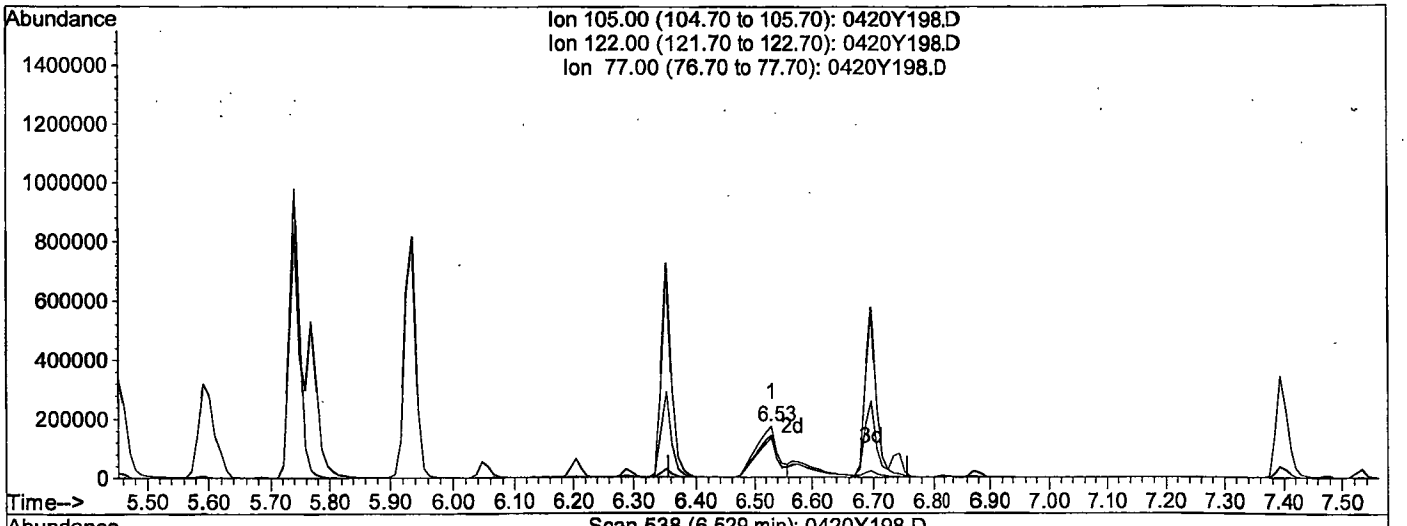
Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration

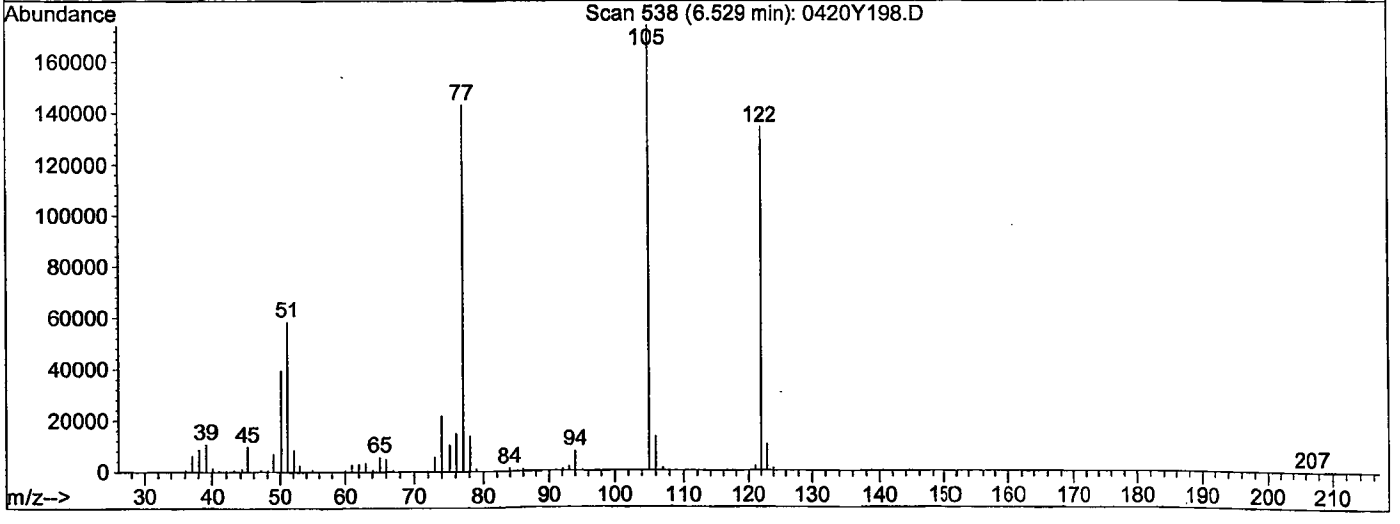


Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 14:16 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Multiple Level Calibration





TIC: 0420Y198.D

(27) Benzoic acid (TM)

6.53min 35.8588ppb

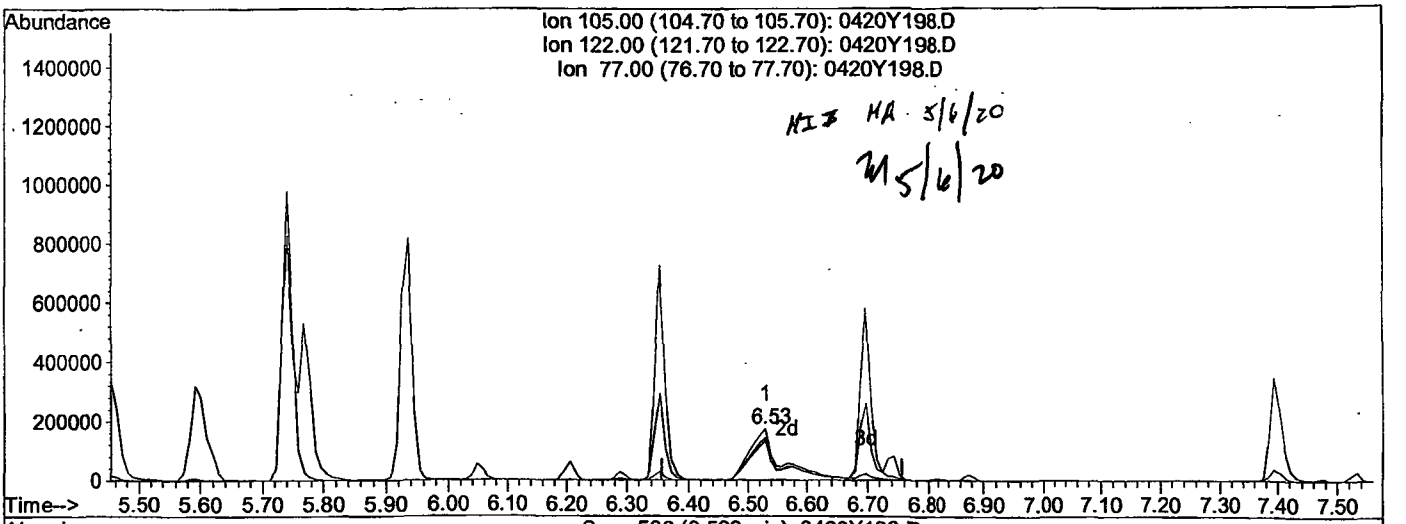
response 469625

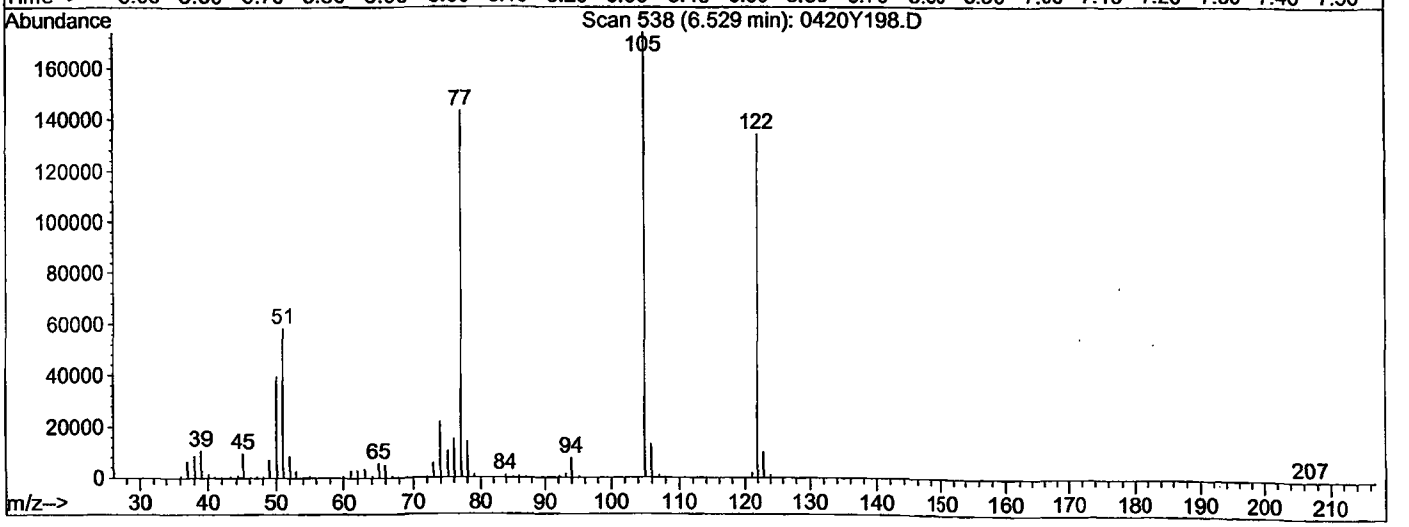
Ion	Exp%	Act%
105.00	100	100
122.00	76.00	76.48
77.00	76.90	81.70
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 14:17 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Multiple Level Calibration





TIC: 0420Y198.D

(27) Benzoic acid (TM)

6.53min 48.7624ppb m

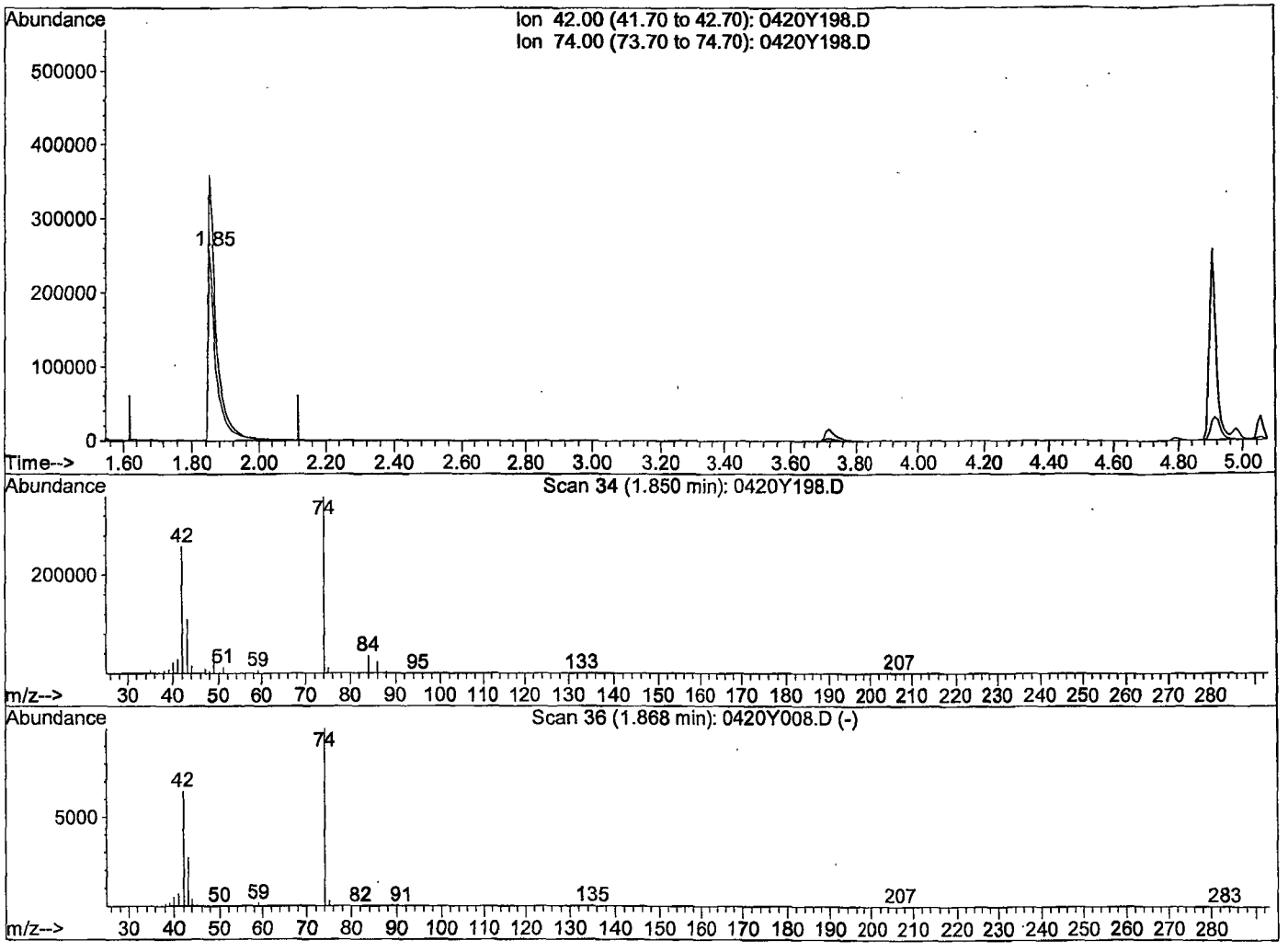
response 638617

Ion	Exp%	Act%
105.00	100	100
122.00	76.00	77.16
77.00	76.90	82.35
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 14:17 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Multiple Level Calibration



TIC: 0420Y198.D

(3) n-Nitrosodimethylamine (TM)

1.85min 61.3256ppb

response 422381

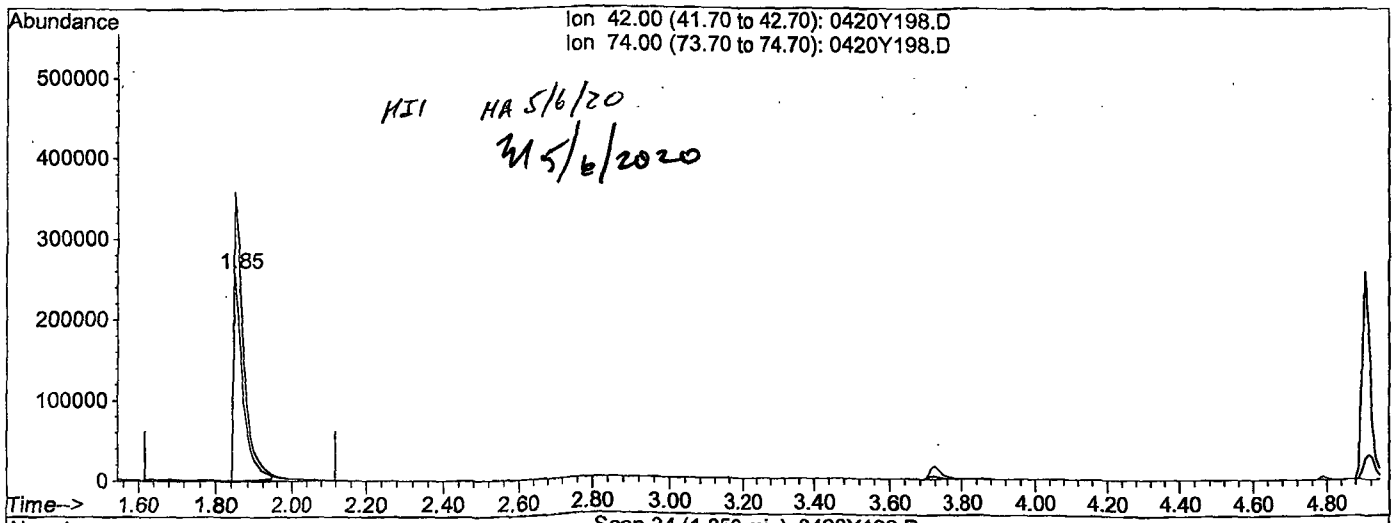
Ion	Exp%	Act%
42.00	100	100
74.00	154.30	139.29
0.00	0.00	0.00
0.00	0.00	0.00

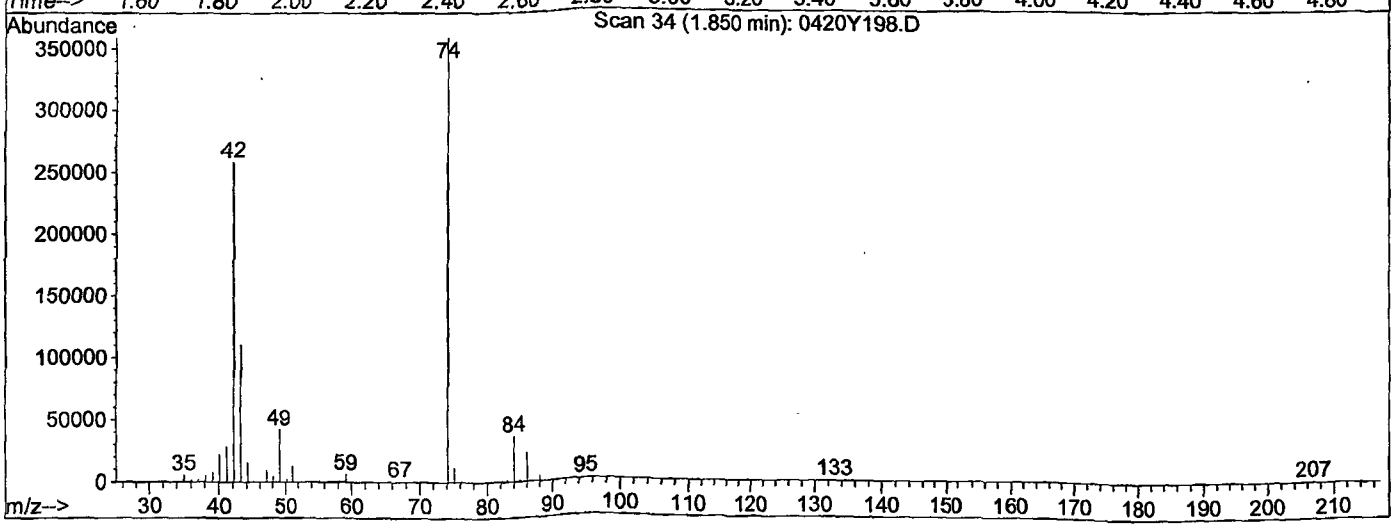
2017703

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y198.D Vial: 98
Acq On : 6 May 20 13:32 Operator: MA
Sample : 50ug/ml 8270 3/30/20 (5) Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 14:21 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Multiple Level Calibration





TIC: 0420Y198.D

(3) n-Nitrosodimethylamine (TM)

1.85min 58.6785ppb m

response 404149

Ion	Exp%	Act%
42.00	100	100
74.00	154.30	138.76
0.00	0.00	0.00
0.00	0.00	0.00

ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y196.D Vial: 96
Acq On : 6 May 20 12:34 Operator: MA
Sample : BA10504W18 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 12:44 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.27	152	463276	40.00000 ppb	-0.01
21) Napthalene-D8(IS)	6.71	136	1961185	40.00000 ppb	-0.01
41) Acenaphthene-D10(IS)	8.73	164	1054586	40.00000 ppb	-0.01
65) Phenanthrene-D10(IS)	10.46	188	2192916	40.00000 ppb	-0.01
80) Chrysene-D12(IS)	13.55	240	2138097	40.00000 ppb	-0.02
90) Perylene-D12(IS)	15.34	264	403898	40.00000 ppb	-0.02
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.71	112	2278317	167.22179 ppb	-0.03
Spiked Amount 250.000			Recovery =	66.889%	
6) Phenol-D6 (S)	4.90	99	2168246	120.24831 ppb	-0.02
Spiked Amount 250.000			Recovery =	48.099%	
22) Nitrobenzene-D5(S)	5.91	82	1655980	103.31072 ppb	-0.01
Spiked Amount 125.000			Recovery =	82.649%	
46) 2-Fluorobiphenyl(S)	7.95	172	3351819	111.79611 ppb	-0.01
Spiked Amount 125.000			Recovery =	89.437%	
64) 2,4,6-Tribromophenol(S)	9.66	330	950492	219.88958 ppb	-0.02
Spiked Amount 250.000			Recovery =	87.956%	
83) Terphenyl-D14(S)	12.32	244	4245812	108.99977 ppb	-0.01
Spiked Amount 125.000			Recovery =	87.200%	
Target Compounds					Qvalue

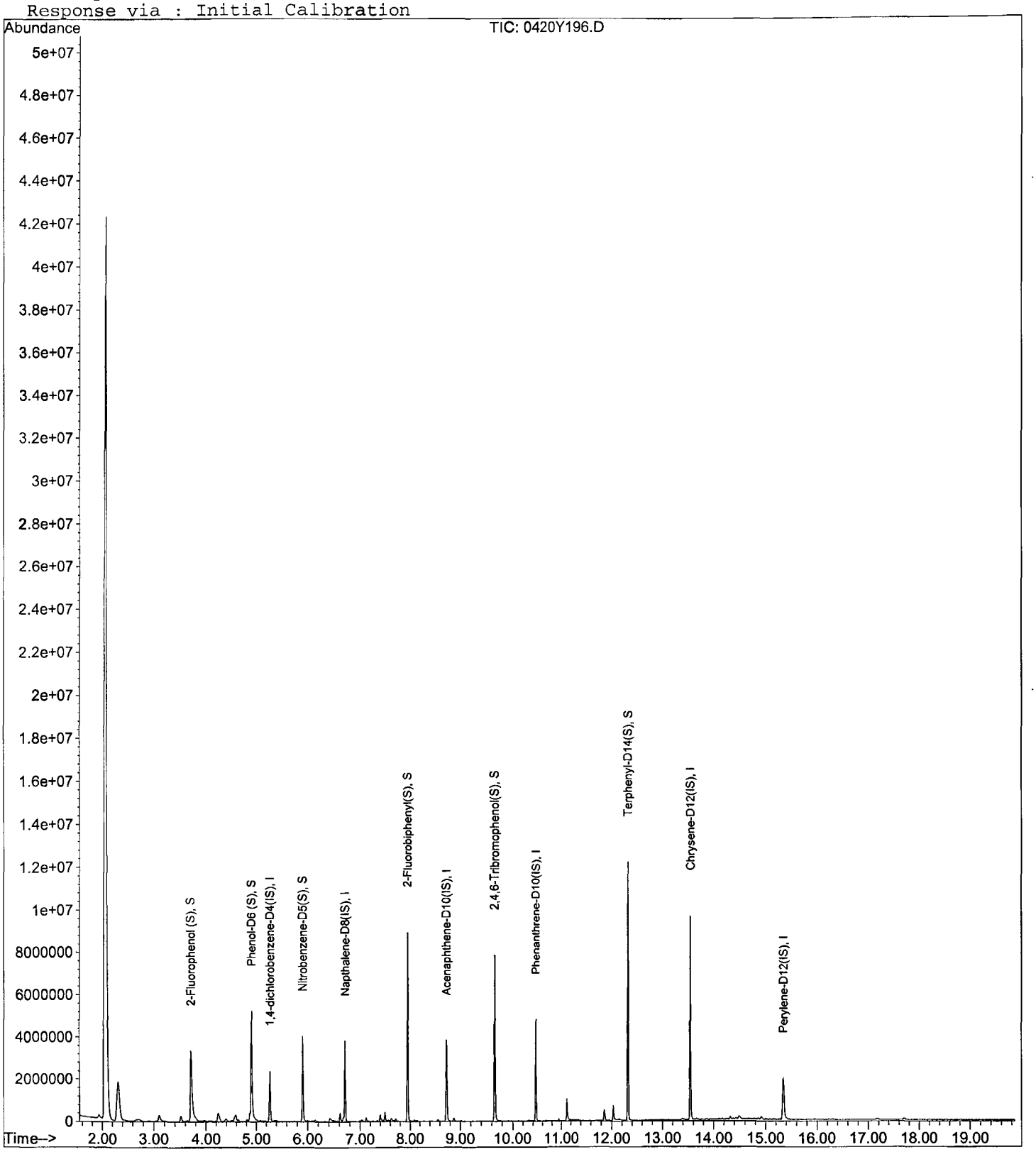
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y196.D Vial: 96
Acq On : 6 May 20 12:34 Operator: MA
Sample : BA10504W18 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 12:44 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y197.D Vial: 97
Acq On : 6 May 20 13:02 Operator: MA
Sample : BA10505W11 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 13:07 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	439143	40.00000	ppb	0.00
21) Napthalene-D8(IS)	6.71	136	1821966	40.00000	ppb	0.00
41) Acenaphthene-D10(IS)	8.73	164	1058887	40.00000	ppb	0.00
65) Phenanthrene-D10(IS)	10.47	188	2004561	40.00000	ppb	0.00
80) Chrysene-D12(IS)	13.55	240	2030195	40.00000	ppb	-0.02
90) Perylene-D12(IS)	15.34	264	1688936	40.00000	ppb	-0.02
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.71	112	1763532	136.55132	ppb	-0.03
Spiked Amount 250.000			Recovery =	54.620%		
6) Phenol-D6 (S)	4.90	99	2261595	132.31806	ppb	-0.02
Spiked Amount 250.000			Recovery =	52.927%		
22) Nitrobenzene-D5(S)	5.91	82	1422445	95.52215	ppb	0.00
Spiked Amount 125.000			Recovery =	76.418%		
46) 2-Fluorobiphenyl(S)	7.95	172	2849715	94.66293	ppb	0.00
Spiked Amount 125.000			Recovery =	75.730%		
64) 2,4,6-Tribromophenol(S)	9.66	330	798319	183.93528	ppb	-0.02
Spiked Amount 250.000			Recovery =	73.574%		
83) Terphenyl-D14(S)	12.32	244	3713317	100.39602	ppb	0.00
Spiked Amount 125.000			Recovery =	80.317%		

Target Compounds Qvalue

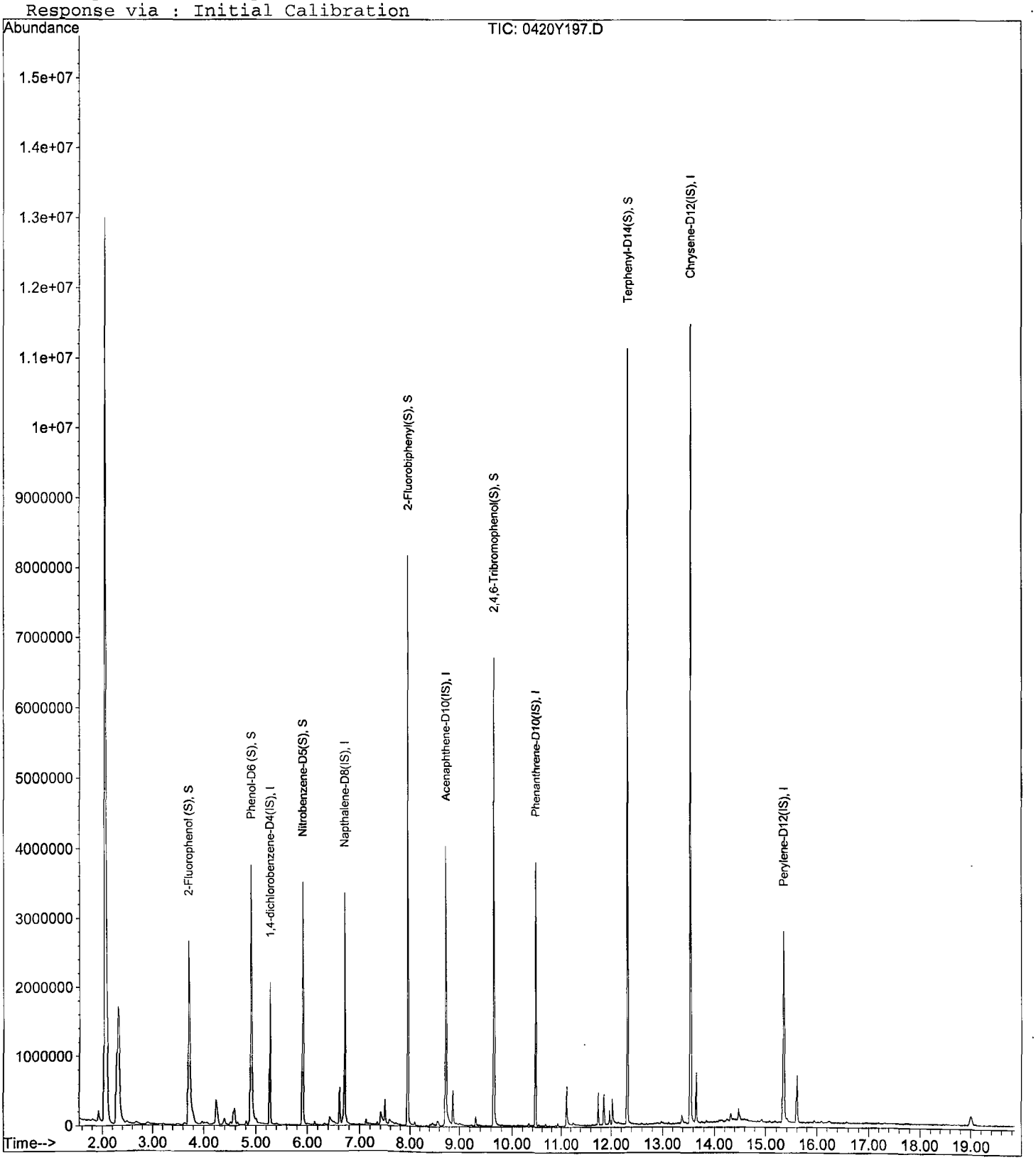
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y197.D Vial: 97
Acq On : 6 May 20 13:02 Operator: MA
Sample : BA10505W11 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 13:07 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y192.D Vial: 92
Acq On : 6 May 20 10:40 Operator: MA
Sample : 200504A BLK 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:42 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.27	152	490692	40.00000 ppb	-0.01
21) Napthalene-D8(IS)	6.71	136	2027577	40.00000 ppb	-0.01
41) Acenaphthene-D10(IS)	8.73	164	1094664	40.00000 ppb	0.00
65) Phenanthrene-D10(IS)	10.46	188	2246300	40.00000 ppb	0.00
80) Chrysene-D12(IS)	13.55	240	2168050	40.00000 ppb	-0.02
90) Perylene-D12(IS)	15.34	264	445281	40.00000 ppb	-0.02
System Monitoring Compounds					
5) 2-Fluorophenol (S)	3.72	112	2344003	162.43054 ppb	-0.02
Spiked Amount 250.000			Recovery =	64.972%	
6) Phenol-D6 (S)	4.90	99	2734234	143.16503 ppb	-0.02
Spiked Amount 250.000			Recovery =	57.266%	
22) Nitrobenzene-D5(S)	5.91	82	1681293	101.45534 ppb	0.00
Spiked Amount 125.000			Recovery =	81.164%	
46) 2-Fluorobiphenyl(S)	7.95	172	3310067	106.36141 ppb	-0.01
Spiked Amount 125.000			Recovery =	85.089%	
64) 2,4,6-Tribromophenol(S)	9.66	330	927091	206.62350 ppb	-0.02
Spiked Amount 250.000			Recovery =	82.650%	
83) Terphenyl-D14(S)	12.32	244	4413538	111.74030 ppb	-0.01
Spiked Amount 125.000			Recovery =	89.392%	

Target Compounds Qvalue

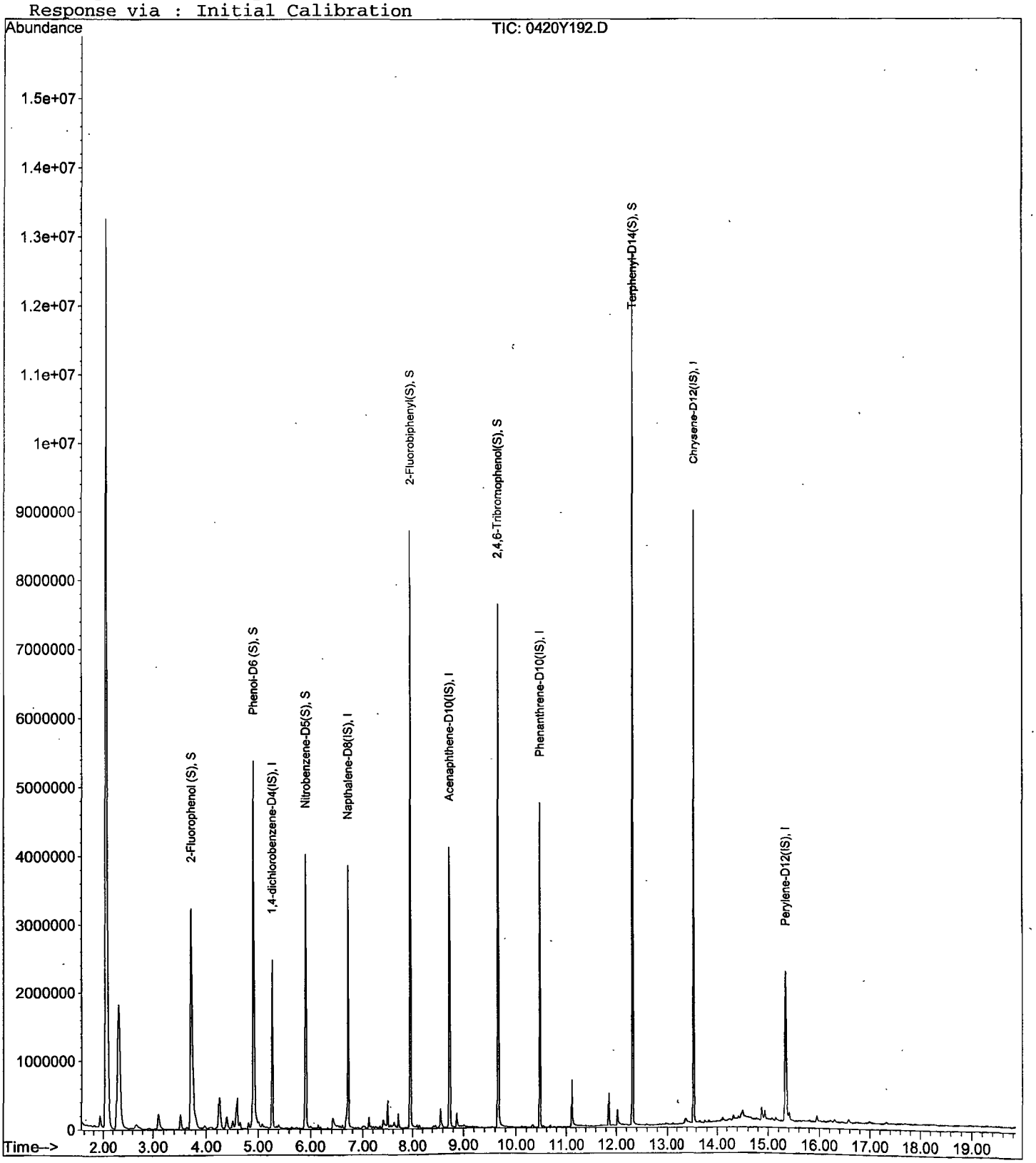
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y192.D Vial: 92
Acq On : 6 May 20 10:40 Operator: MA
Sample : 200504A BLK 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:42 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y193.D Vial: 93
Acq On : 6 May 20 11:09 Operator: MA
Sample : 200504A LCS-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	429277	40.00000	ppb		0.00
21) Napthalene-D8(IS)	6.71	136	1870437	40.00000	ppb		0.00
41) Acenaphthene-D10(IS)	8.73	164	552807	40.00000	ppb		0.00
65) Phenanthrene-D10(IS)	10.46	188	1989455	40.00000	ppb		0.00
80) Chrysene-D12(IS)	13.55	240	1946171	40.00000	ppb		-0.02
90) Perylene-D12(IS)	15.34	264	21401	40.00000	ppb		-0.02
System Monitoring Compounds							
5) 2-Fluorophenol (S)	3.72	112	2365801	187.39548	ppb		-0.02
Spiked Amount 250.000			Recovery = 74.958%				
6) Phenol-D6 (S)	4.90	99	2167501	129.72746	ppb		-0.02
Spiked Amount 250.000			Recovery = 51.891%				
22) Nitrobenzene-D5(S)	5.91	82	1633287	106.83862	ppb		0.00
Spiked Amount 125.000			Recovery = 85.471%				
46) 2-Fluorobiphenyl(S)	7.96	172	3317651	211.09858	ppb		0.00
Spiked Amount 125.000			Recovery = 168.879%				
64) 2,4,6-Tribromophenol(S)	9.67	330	971223	428.63103	ppb		0.00
Spiked Amount 250.000			Recovery = 171.452%				
83) Terphenyl-D14(S)	12.32	244	4251129	119.89899	ppb		0.00
Spiked Amount 125.000			Recovery = 95.919%				
Target Compounds							Qvalue
2) 1,4-Dioxane	1.65	58	23367	5.63486			63
3) n-Nitrosodimethylamine	1.87	42	206617	34.95976	ppb		95
4) Pyridine	1.95	79	104407	6.72244	ppb		98
7) Phenol	4.92	94	811386	37.40274	ppb		88
8) Aniline	4.92	93	45136	3.61260	ppb	#	1
9) Bis (2-chloroethyl) ether	4.98	63	410493	47.03746	ppb		96
10) 2-Chlorophenol	5.05	128	704281	43.15348	ppb		98
11) 1,3-DCB	5.21	146	713145	40.57447	ppb		98
12) 1,4-DCB	5.29	146	732143	40.87969	ppb		97
13) Benzyl alcohol	5.46	108	25853	2.86822	ppb		83
14) 1,2-DCB	5.47	146	691908	40.55414	ppb		98
15) 2-Methylphenol	5.59	107	495343	37.58852	ppb		96
16) Bis (2-chloroisopropyl) et	5.59	45	463777	44.24662	ppb		88
17) Acetophenone	5.74	105	993707	48.34371	ppb		97
18) 3&4-Methylphenol	5.77	107	1203538	72.27641	ppb		98
19) n-Nitrosodi-n-propylamine	5.75	70	519891	43.92835	ppb		95
20) Hexachloroethane	5.84	117	261428	39.21080	ppb		88
23) Nitrobenzene	5.93	77	878869	50.33615	ppb		97
24) Isophorone	6.20	82	1365332	46.50937	ppb		98
25) 2-Nitrophenol	6.29	139	408831	44.85193	ppb		92
26) 2,4-Dimethylphenol	6.35	122	526584	36.97755	ppb		99
27) Benzoic acid	6.52	105	505944	42.64947	ppb		97
28) Bis (2-chloroethoxy) metha	6.44	93	20046	1.16964	ppb		97
29) 2,4-Dichlorophenol	6.57	162	601884	43.13446	ppb		96
30) 1,2,4-Trichlorobenzene	6.65	180	640448	41.29416	ppb		98
31) 3,4-Dimethylphenol	6.70	107	480174	23.02923	ppb		100
32) Naphthalene	6.74	128	2013783	43.70753	ppb		100
33) 4-Chloroaniline	6.82	127	73672	4.08535	ppb	#	80
34) 2,6-Dichlorophenol	6.82	162	577817	41.71019	ppb		99
35) Hexachloropropene	6.83	213	189609	16.23401	ppb		99
36) Hexachlorobutadiene	6.87	225	330487	35.29076	ppb		98
37) Caprolactum	7.24	55	196503	42.81106	ppb		95

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y193.D Vial: 93
Acq On : 6 May 20 11:09 Operator: MA
Sample : 200504A LCS-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
38)	4-Chloro-3-methylphenol	7.39	107	649831	42.56841	ppb		95
39)	2-Methylnaphthalene	7.53	142	1324589	42.73324	ppb		97
40)	1-Methylnaphthalene	7.64	142	1337384	42.14049	ppb		98
42)	Hexachlorocyclopentadiene	7.71	237	56224	15.81957	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	623894	82.12714	ppb		99
44)	2,4,6-Trichlorophenol	7.87	196	454403	89.36407	ppb		100
45)	2,4,5-Trichlorophenol	7.93	196	472007	88.02400	ppb	#	89
47)	1,1'-Biphenyl	8.07	154	1763060	90.29066	ppb		99
48)	2-Chloronaphthalene	8.10	162	1420675	91.55059	ppb		98
49)	2-Nitroaniline	8.23	65	78296	17.98508	ppb		92
50)	Dimethyl phthalate	8.42	163	1725317	92.64030	ppb		99
51)	2,6-DNT	8.51	165	398713	95.40385	ppb		99
52)	Acenaphthylene	8.57	152	241556	10.33044	ppb		99
53)	3-Nitroaniline	8.23	138	82039	16.59050	ppb		93
54)	Acenaphthene	8.77	154	953780	63.63953	ppb		100
55)	2,4-Dinitrophenol	8.84	184	221820	76.37333	ppb		90
56)	4-Nitrophenol	8.97	65	307114	88.84877	ppb	#	68
57)	Dibenzofuran	8.97	168	2069565	93.52052	ppb		97
58)	2,4-DNT	8.98	165	598012	100.00796	ppb		98
59)	2,3,4,6-Tetrachlorophenol	9.14	232	352910	83.25354	ppb		94
60)	Diethyl phthalate	9.24	149	1631017	89.53077	ppb		100
61)	4-Chlorophenyl phenyl ethe	9.37	204	935827	93.70356	ppb		97
62)	Fluorene	9.37	166	1685528	91.14564	ppb		99
63)	4-Nitroaniline	8.72	138	12843	3.21032	ppb	#	49
66)	4,6-Dinitro-2-methylphenol	9.45	198	340239	46.39955	ppb	#	82
67)	Diphenyl amine	9.51	169	194487	7.44481	ppb		99
68)	n-Nitrosodiphenylamine	9.51	169	194487	7.44481	ppb		99
69)	1,2-Diphenylhydrazine	9.55	77	28701	0.86015	ppb		91
70)	4-Bromophenyl phenyl ether	9.94	248	481939	48.02927	ppb		94
71)	Hexachlorobenzene	10.02	284	487064	47.52926	ppb		92
72)	Atrazine	10.26	200	55435	5.75815	ppb	#	33
73)	Pentachlorophenol	10.26	266	262017	42.14355	ppb		98
74)	Phenanthrene	10.49	178	2312782	47.84683	ppb		99
75)	Anthracene	10.55	178	1951261	38.72216	ppb		95
77)	Di-n-butylphthalate	11.14	149	2718397	46.88597	ppb		99
79)	Fluoranthene	11.88	202	2453806	44.07925	ppb	#	96
82)	Pyrene	12.14	202	1391011	25.98052	ppb		95
84)	Butyl benzylphthalate	12.89	149	113480	4.59429	ppb		85
86)	Benz (a) anthracene	13.54	228	2284425	42.35537	ppb		95
87)	Bis (2-ethylhexyl) phthala	13.56	149	6546815	175.13225	ppb	#	90
88)	Chrysene	13.58	228	2318902	46.81594	ppb		99
89)	Di-n-octylphthalate	14.28	149	2939532	49.17207	ppb		95
91)	Benzo (b) fluoranthene	14.82	252	2428062	3780.49213	ppb		98
92)	Benzo (k) fluoranthene	14.85	252	1254319	2153.49825	ppb		95
93)	Benzo (a) pyrene	15.26	252	826276	1489.97263	ppb		93
94)	Indeno (1,2,3-cd) pyrene	17.15	276	1024041	1548.35363	ppb	#	84
95)	Dibenz (a,h) anthracene	17.16	278	1812762	3176.97735	ppb		92
96)	Benzo (g,h,i) perylene	17.68	276	785332	1496.38762	ppb	#	90

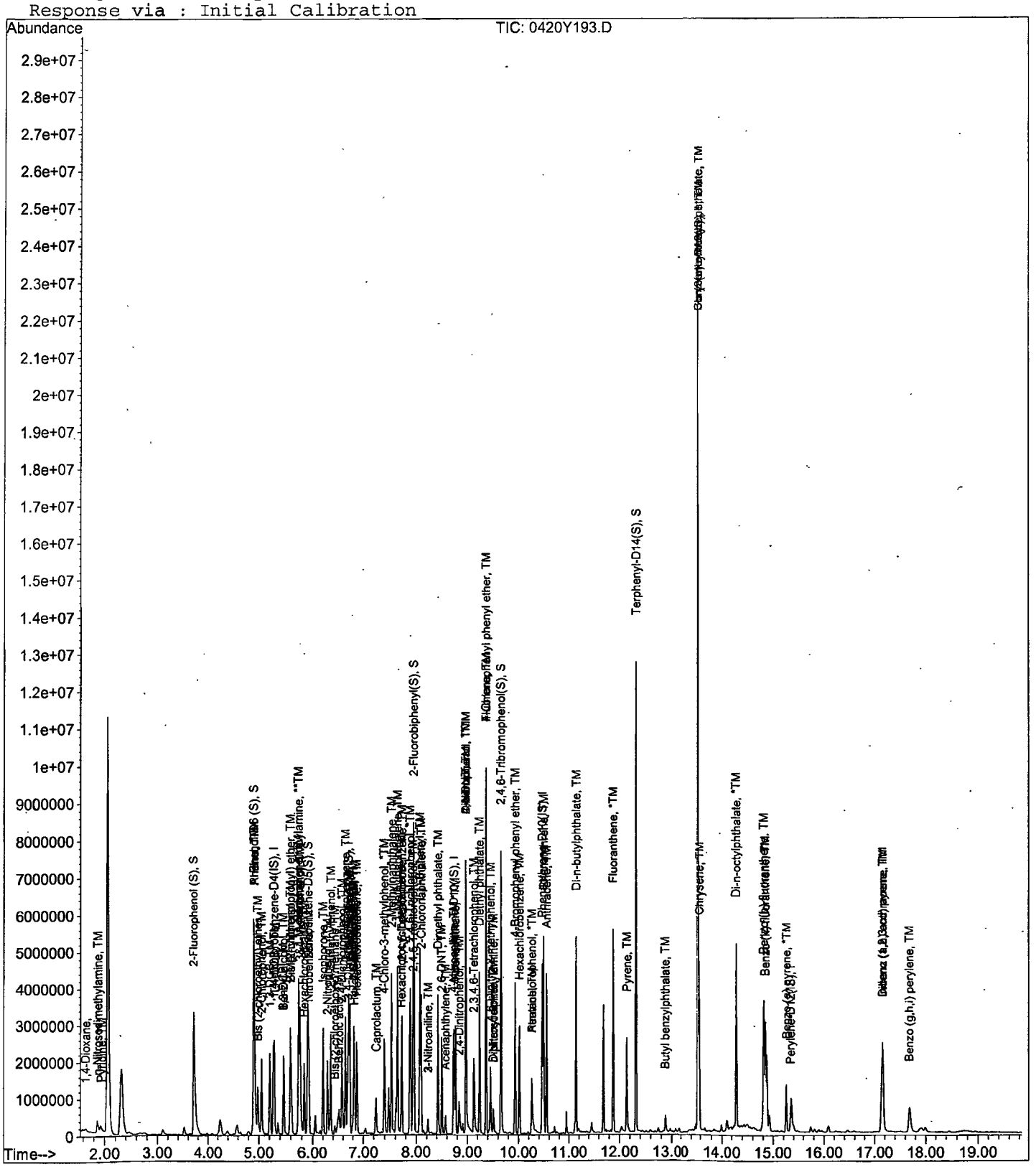
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y193.D Vial: 93
Acq On : 6 May 20 11:09 Operator: MA
Sample : 200504A LCS-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200420\0420Y194.D Vial: 94
Acq On : 6 May 20 11:37 Operator: MA
Sample : 200504A LCSD-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.28	152	451589	40.00000 ppb		0.00
21) Napthalene-D8(IS)	6.71	136	1898693	40.00000 ppb		0.00
41) Acenaphthene-D10(IS)	8.73	164	216990	40.00000 ppb		0.00
65) Phenanthrene-D10(IS)	10.46	188	1695321	40.00000 ppb		0.00
80) Chrysene-D12(IS)	13.55	240	699718	40.00000 ppb		-0.02
90) Perylene-D12(IS)	15.34	264	4267	40.00000 ppb		-0.02
System Monitoring Compounds						
5) 2-Fluorophenol (S)	3.71	112	2422570	182.41120 ppb		-0.03
Spiked Amount 250.000			Recovery =	72.964%		
6) Phenol-D6 (S)	4.90	99	1197423	68.12625 ppb		-0.02
Spiked Amount 250.000			Recovery =	27.250%		
22) Nitrobenzene-D5(S)	5.91	82	1667221	107.43537 ppb		0.00
Spiked Amount 125.000			Recovery =	85.948%		
46) 2-Fluorobiphenyl(S)	7.96	172	3337004	540.93510 ppb		0.00
Spiked Amount 125.000			Recovery =	432.748%		
64) 2,4,6-Tribromophenol(S)	9.66	330	977090	1098.58340 ppb		-0.02
Spiked Amount 250.000			Recovery =	439.433%		
83) Terphenyl-D14(S)	12.32	244	3756832	294.70735 ppb		0.00
Spiked Amount 125.000			Recovery =	235.766%		
Target Compounds						Qvalue
2) 1,4-Dioxane	1.64	58	25561	5.85939		80
3) n-Nitrosodimethylamine	1.87	42	91313	14.68687 ppb		86
7) Phenol	4.91	94	760985	33.34620 ppb	#	95
8) Aniline	4.92	93	24992	1.90148 ppb	#	1
9) Bis (2-chloroethyl) ether	4.98	63	420604	45.81480 ppb		98
10) 2-Chlorophenol	5.05	128	718139	41.82853 ppb		99
11) 1,3-DCB	5.21	146	730985	39.53464 ppb		97
12) 1,4-DCB	5.29	146	761072	40.39538 ppb		98
13) Benzyl alcohol	5.59	108	446952	47.13639 ppb	#	56
14) 1,2-DCB	5.46	146	714102	39.78702 ppb		99
15) 2-Methylphenol	5.59	107	432008	31.16271 ppb		93
16) Bis (2-chloroisopropyl) et	5.59	45	480370	43.56534 ppb		81
17) Acetophenone	5.74	105	1009045	46.66448 ppb		98
18) 3&4-Methylphenol	5.77	107	1048567	59.85869 ppb		96
19) n-Nitrosodi-n-propylamine	5.74	70	492243	39.53724 ppb		97
20) Hexachloroethane	5.84	117	264790	37.75282 ppb		93
23) Nitrobenzene	5.93	77	908152	51.23925 ppb		99
24) Isophorone	6.20	82	1358038	45.57245 ppb		98
25) 2-Nitrophenol	6.29	139	416129	44.97319 ppb		91
26) 2,4-Dimethylphenol	6.35	122	451892	31.26032 ppb		97
27) Benzoic acid	6.52	105	535596	44.47714 ppb		97
29) 2,4-Dichlorophenol	6.58	162	617146	43.57003 ppb		98
30) 1,2,4-Trichlorobenzene	6.65	180	651215	41.36352 ppb		99
31) 3,4-Dimethylphenol	6.70	107	425535	20.10502 ppb		100
32) Naphthalene	6.74	128	2066975	44.19439 ppb		100
33) 4-Chloroaniline	6.82	127	46064	2.51638 ppb	#	55
34) 2,6-Dichlorophenol	6.82	162	594049	42.24375 ppb		98
35) Hexachloropropene	6.84	213	200339	16.89743 ppb		99
36) Hexachlorobutadiene	6.87	225	342144	35.99183 ppb		99
37) Caprolactum	7.24	55	187532	40.24858 ppb		95
38) 4-Chloro-3-methylphenol	7.39	107	646121	41.69550 ppb		91
39) 2-Methylnaphthalene	7.53	142	1333602	42.38374 ppb		99

(#) = qualifier out of range (m) = manual integration

Data File : M:\YODA\DATA\Y200420\0420Y194.D Vial: 94
Acq On : 6 May 20 11:37 Operator: MA
Sample : 200504A LCSD-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Quant Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration
DataAcq Meth : SVOC1011

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
40)	1-Methylnaphthalene	7.64	142	1357228	42.12933	ppb		98
42)	Hexachlorocyclopentadiene	7.71	237	76192	40.65345	ppb		98
43)	1,2,4,5-Tetrachlorobenzene	7.73	216	640722	214.87177	ppb		100
44)	2,4,6-Trichlorophenol	7.87	196	461892	231.41740	ppb		99
45)	2,4,5-Trichlorophenol	7.93	196	491895	233.70010	ppb	#	91
47)	1,1'-Biphenyl	8.07	154	1785012	232.88991	ppb		99
48)	2-Chloronaphthalene	8.10	162	1424567	233.87463	ppb		98
49)	2-Nitroaniline	8.23	65	67856	39.70955	ppb		90
50)	Dimethyl phthalate	8.42	163	1529376	209.20841	ppb		99
51)	2,6-DNT	8.50	165	407042	248.12959	ppb	#	70
52)	Acenaphthylene	8.57	152	84016	9.15370	ppb		100
53)	3-Nitroaniline	8.23	138	71247	36.70621	ppb	#	91
54)	Acenaphthene	8.77	154	651076	110.67366	ppb		98
55)	2,4-Dinitrophenol	8.84	184	249983	210.13453	ppb		90
56)	4-Nitrophenol	8.97	65	317527	234.02718	ppb		73
57)	Dibenzofuran	8.97	168	2054520	236.52225	ppb		97
58)	2,4-DNT	8.98	165	603336	257.05006	ppb		98
59)	2,3,4,6-Tetrachlorophenol	9.13	232	367270	220.72830	ppb		96
60)	Diethyl phthalate	9.24	149	970285	135.68973	ppb		99
61)	4-Chlorophenyl phenyl ethe	9.37	204	937502	239.14789	ppb		99
62)	Fluorene	9.37	166	1593864	219.57606	ppb		100
63)	4-Nitroaniline	8.71	138	13008	8.28373	ppb	#	69
66)	4,6-Dinitro-2-methylphenol	9.45	198	348958	55.84509	ppb		87
67)	Diphenyl amine	9.51	169	106706	4.79330	ppb		99
68)	n-Nitrosodiphenylamine	9.51	169	106706	4.79330	ppb		99
70)	4-Bromophenyl phenyl ether	9.94	248	475914	55.65762	ppb		96
71)	Hexachlorobenzene	10.02	284	488643	55.95628	ppb		94
72)	Atrazine	10.26	200	56782	6.92136	ppb	#	33
73)	Pentachlorophenol	10.26	266	275807	52.05820	ppb		97
74)	Phenanthrene	10.49	178	2252796	54.69184	ppb		99
75)	Anthracene	10.55	178	1608824	37.46579	ppb	#	94
77)	Di-n-butylphthalate	11.14	149	1380418	27.93977	ppb		99
79)	Fluoranthene	11.88	202	2013110	42.43690	ppb	#	93
82)	Pyrene	12.15	202	1214962	63.11578	ppb		94
84)	Butyl benzylphthalate	12.89	149	14173	1.59595	ppb		82
85)	3,3'-Dichlorobenzidine	13.50	252	4949	0.80354	ppb	#	44
86)	Benz (a) anthracene	13.54	228	1485762	76.61940	ppb		94
87)	Bis (2-ethylhexyl) phthala	13.55	149	1281656	95.35983	ppb		99
88)	Chrysene	13.58	228	1975641	110.93723	ppb		98
89)	Di-n-octylphthalate	14.28	149	1088544	50.64590	ppb		99
91)	Benzo (b) fluoranthene	14.81	252	2155888	16835.50644	ppb		94
92)	Benzo (k) fluoranthene	14.81	252	2158820	18589.35746	ppb		94
93)	Benzo (a) pyrene	15.26	252	475866	4303.77196	ppb		91
94)	Indeno (1,2,3-cd) pyrene	17.15	276	575957	4367.71506	ppb	#	85
95)	Dibenz (a,h) anthracene	17.16	278	1167033	10258.12272	ppb		92
96)	Benzo (g,h,i) perylene	17.69	276	459610	4392.29707	ppb	#	90

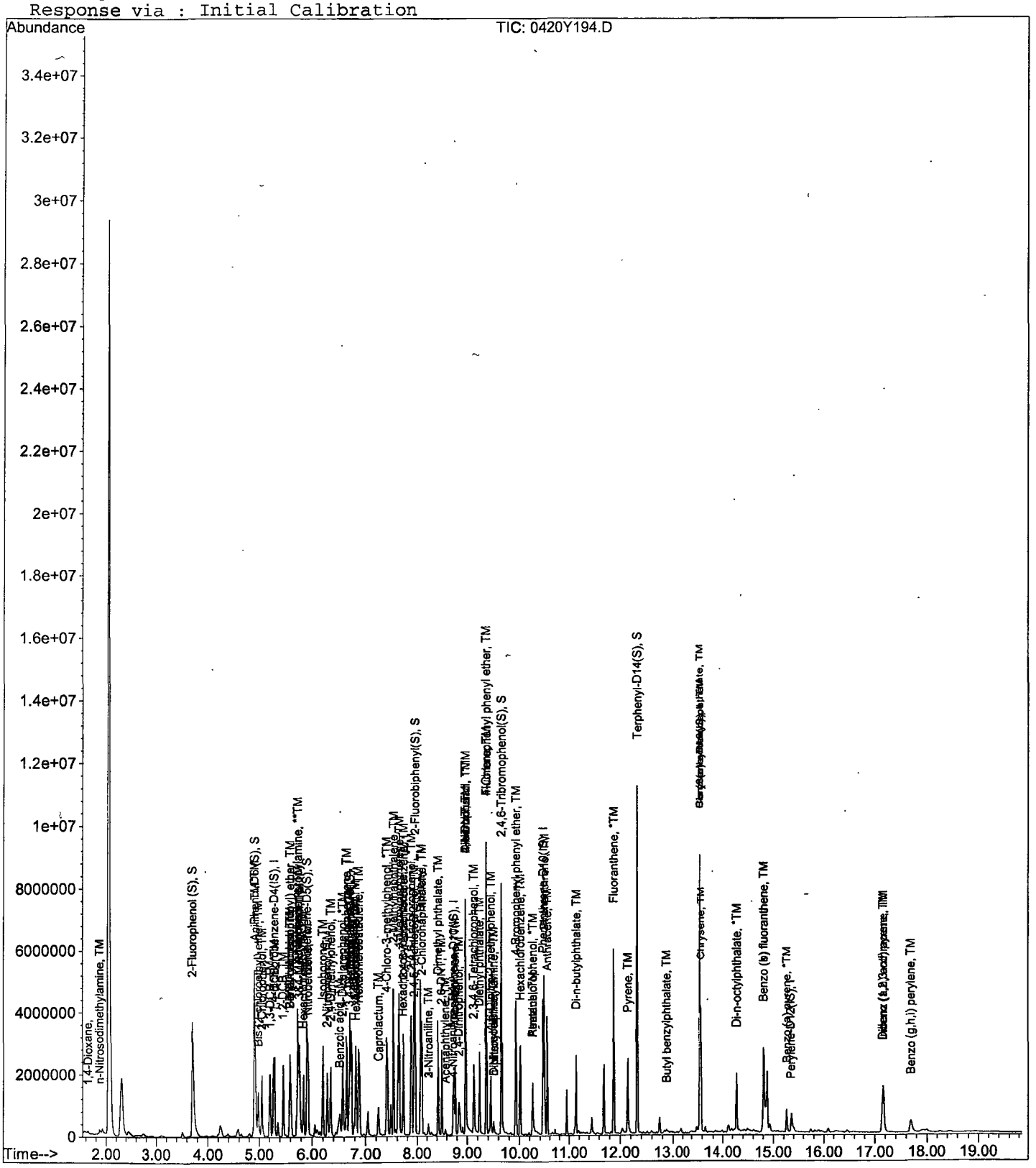
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y194.D Vial: 94
Acq On : 6 May 20 11:37 Operator: MA
Sample : 200504A LCSD-1 1/800 Inst : Yoda
Misc : Multiplr: 1.25

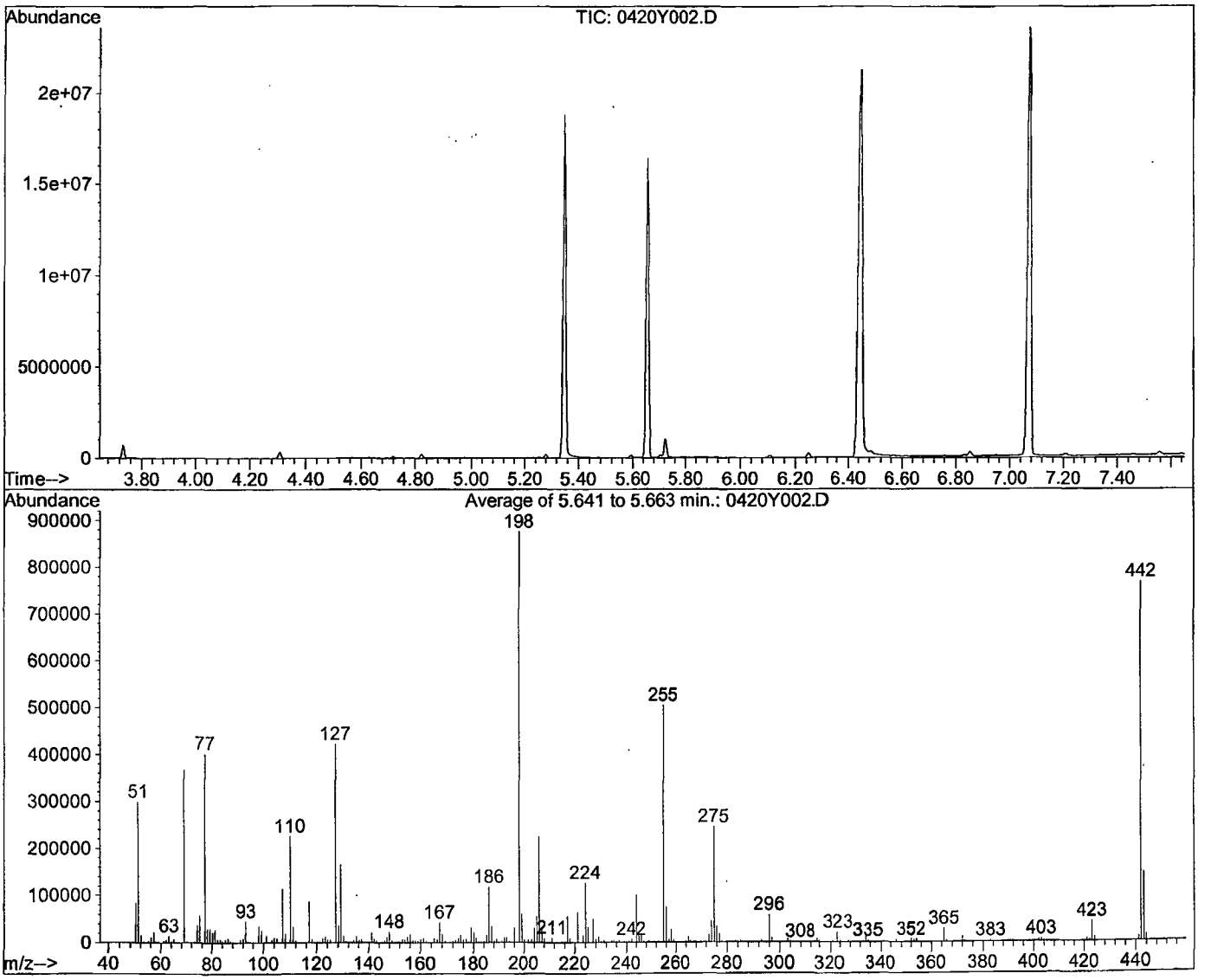
Quant Time: May 6 11:43 2020 Quant Results File: Y0420.RES

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue Apr 21 09:58:57 2020
Response via : Initial Calibration



Data File : M:\YODA\DATA\Y200420\0420Y002.D Vial: 2
Acq On : 20 Apr 20 9:12 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C



Spectrum Information: Average of 5.641 to 5.663 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	34.1	299140	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.8	2967	PASS
127	198	10	80	48.2	422251	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	876450	PASS
199	198	5	9	6.9	60492	PASS
275	198	10	60	27.9	244772	PASS
365	198	1	100	3.2	28377	PASS
441	442	0.01	24	1.3	10096	PASS
442	198	50	500	87.6	767865	PASS
443	442	15	24	19.0	145807	PASS

Data File Name:	**0420Y002.D**
Data File Path:	**M:\YODA\DATA\Y200420**
Operator:	**MA**
Date Acquired:	**20 Apr 2020 09:12**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/01/19**
Vial Number:	**2**
Instrument Name:	**Yoda**

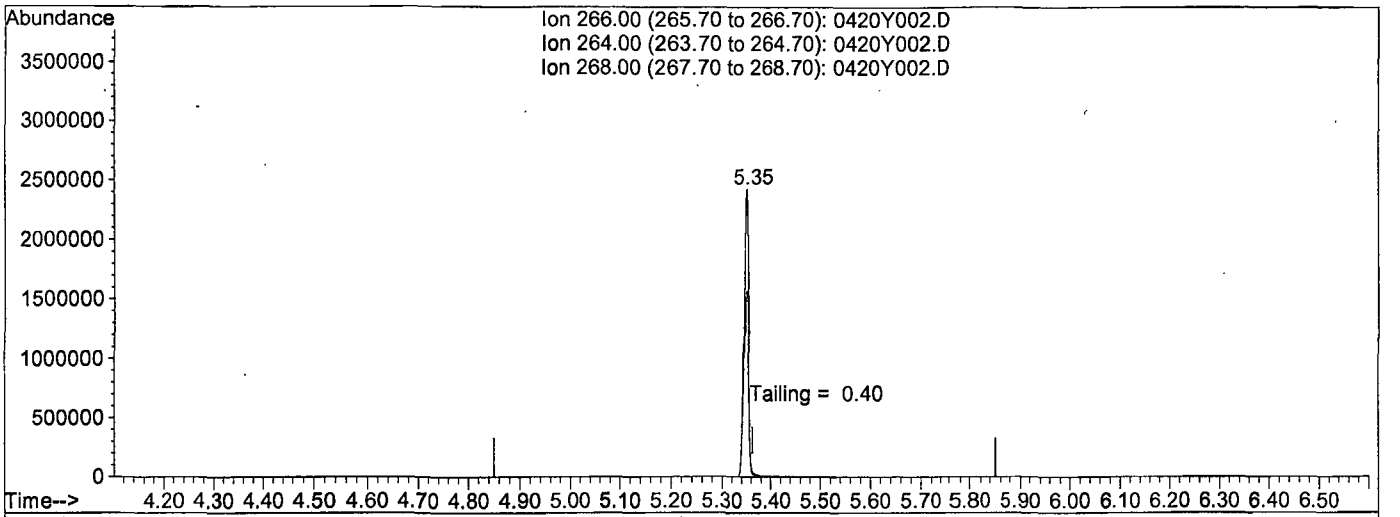
#	Name	Ret Time	Target Response
1)	DDT	7.07	213156000
2)	DDD	6.83	776778
3)	DDE	6.57	433718

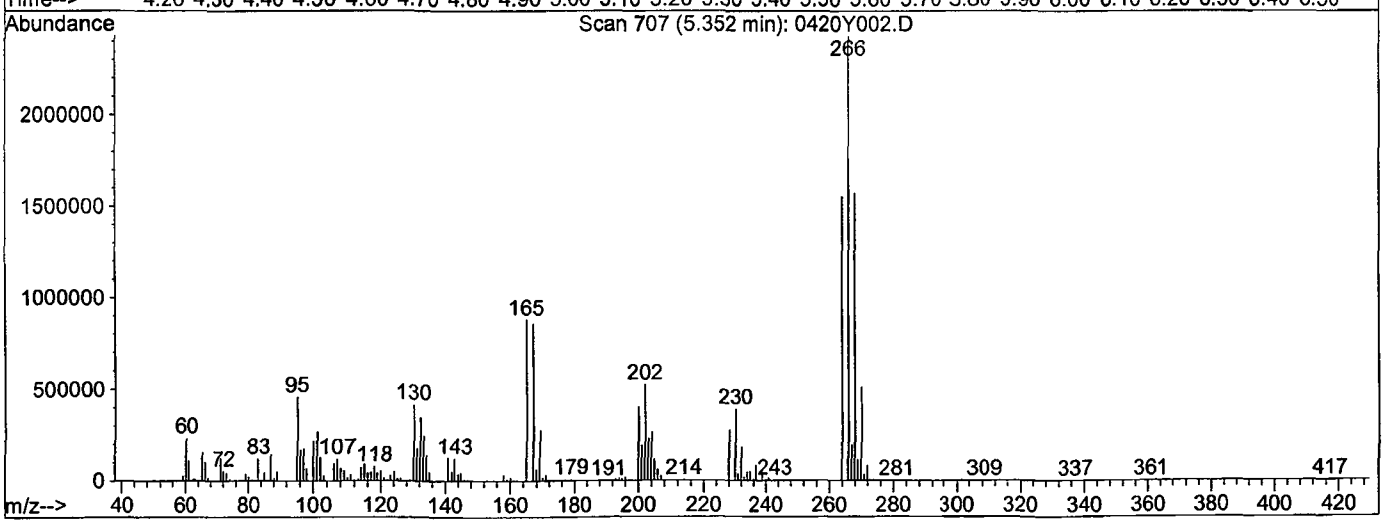
Breakdown **0.56**

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y002.D Vial: 2
Acq On : 20 Apr 20 9:12 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: Apr 20 9:43 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200327\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 20 09:43:48 2020
Response via : Single Level Calibration





TIC: 0420Y002.D

(5) Pentachlorophenol

5.35min 0.0000

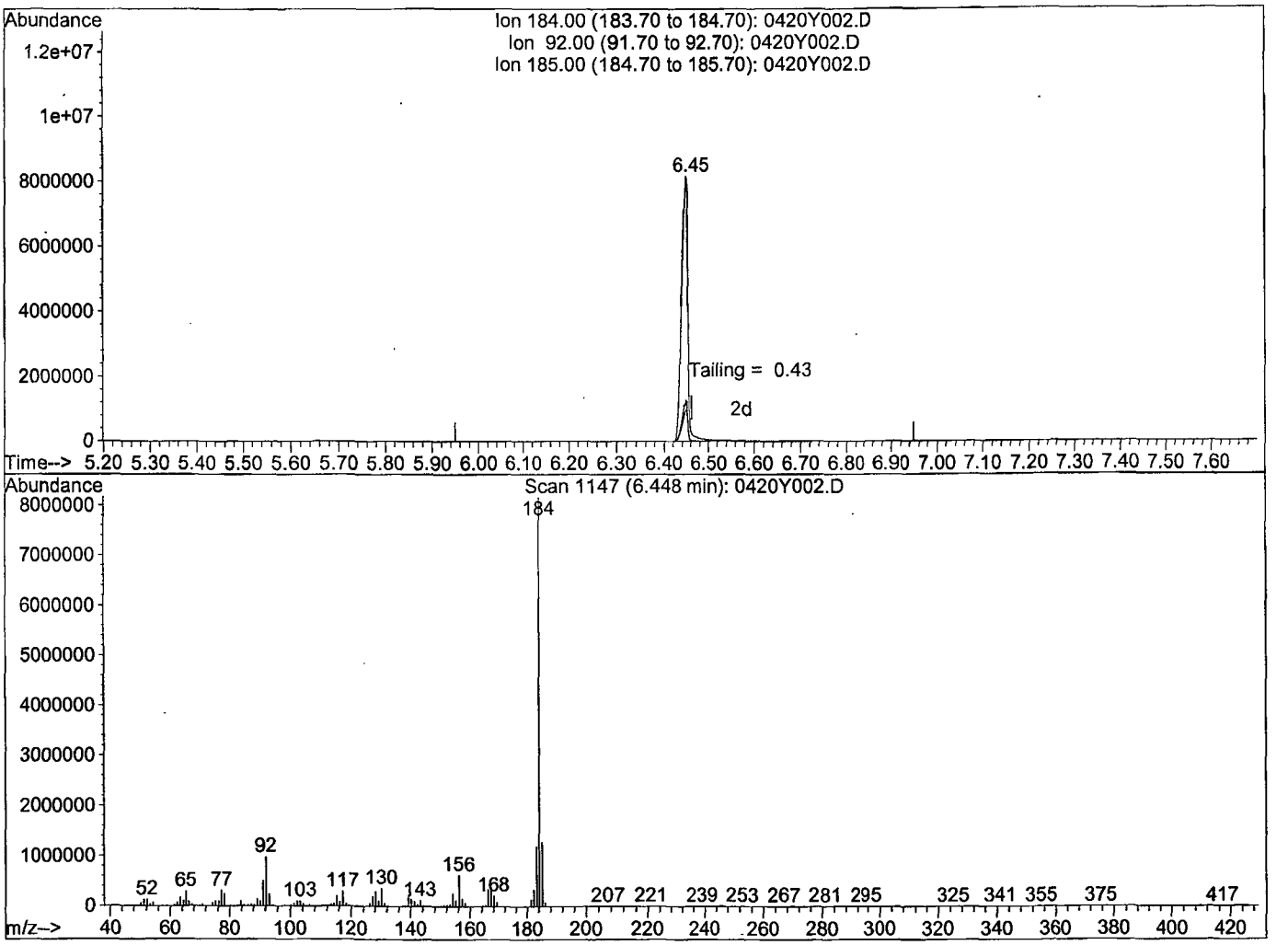
response 17135451

Ion	Exp%	Act%
266.00	100	100
264.00	63.90	62.86
268.00	64.60	63.17
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y002.D Vial: 2
Acq On : 20 Apr 20 9:12 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: Apr 20 9:43 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200327\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 20 09:43:48 2020
Response via : Single Level Calibration



TIC: 0420Y002.D

(6) Benzidine

6.45min 0.0000

response 81506245

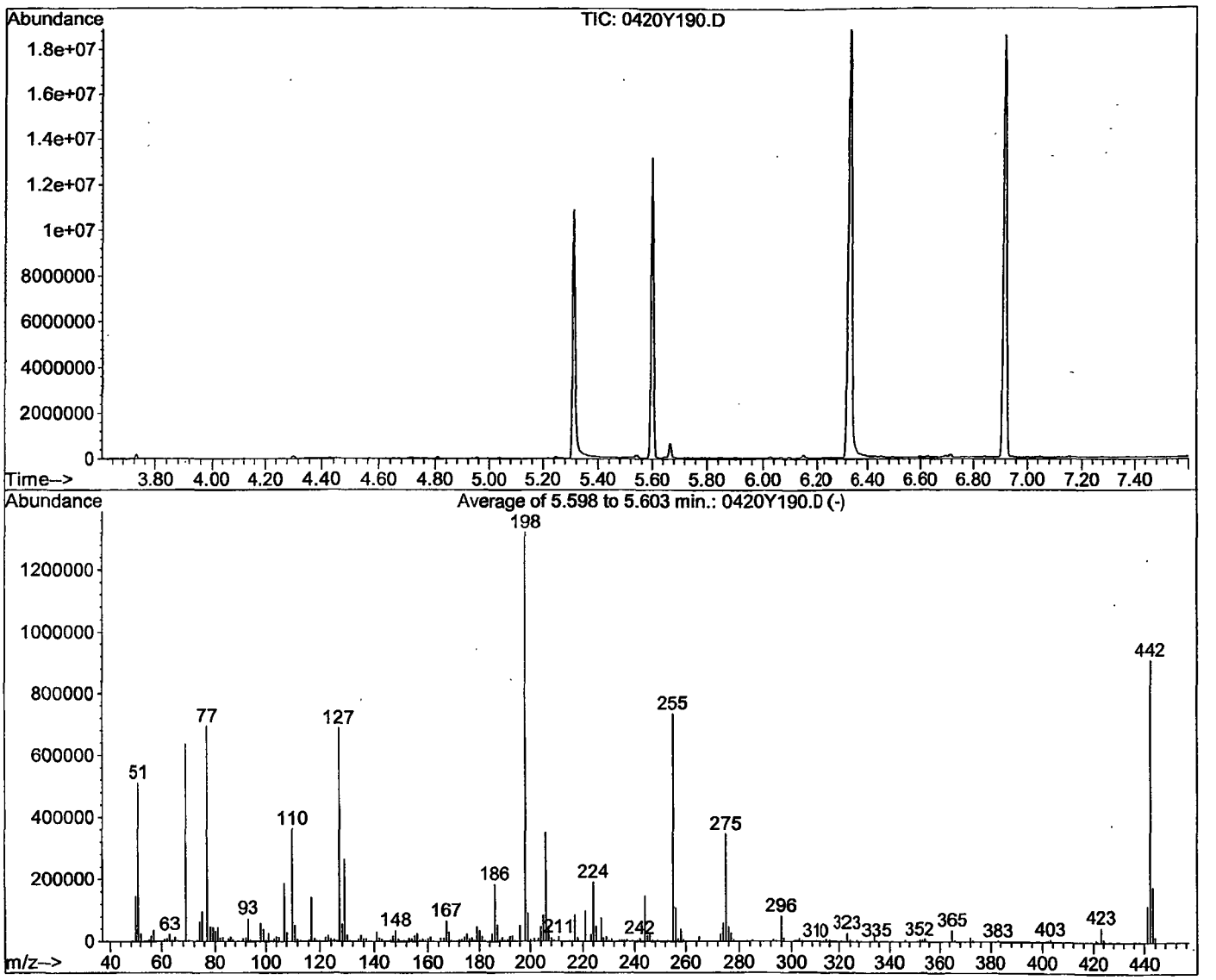
Ion	Exp%	Act%
184.00	100	100
92.00	12.10	10.47
185.00	15.70	14.64
0.00	0.00	0.00

DFTPP

Data File : M:\YODA\DATA\Y200420\0420Y190.D
Acq On : 6 May 20 9:54
Sample : SV TUNE 10/01/19
Misc :

Vial: 90
Operator: MA
Inst : Yoda
Multiplr: 1.00

Method : M:\YODA\DATA\Y200420\Y0420.M (RTE Integrator)
Title : EPA 8270C



AutoFind: Scans 806, 807, 808; Background Corrected with Scan 798

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	38.7	511207	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.6	3836	PASS
127	198	10	80	51.9	686912	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	1322496	PASS
199	198	5	9	6.9	90592	PASS
275	198	10	60	26.2	345920	PASS
365	198	1	100	2.8	37157	PASS
441	442	0.01	24	12.8	116907	PASS
442	198	50	500	68.8	910144	PASS
443	442	15	24	19.5	177045	PASS

M:\YODA\DATA\Y200420\0420Y190.D

Data File Name:	**0420Y190.D**
Data File Path:	**M:\YODA\DATA\Y200420**
Operator:	**MA**
Date Acquired:	**6 May 20 9:54**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/01/19**
Vial Number:	**90**
Instrument Name:	**Yoda**

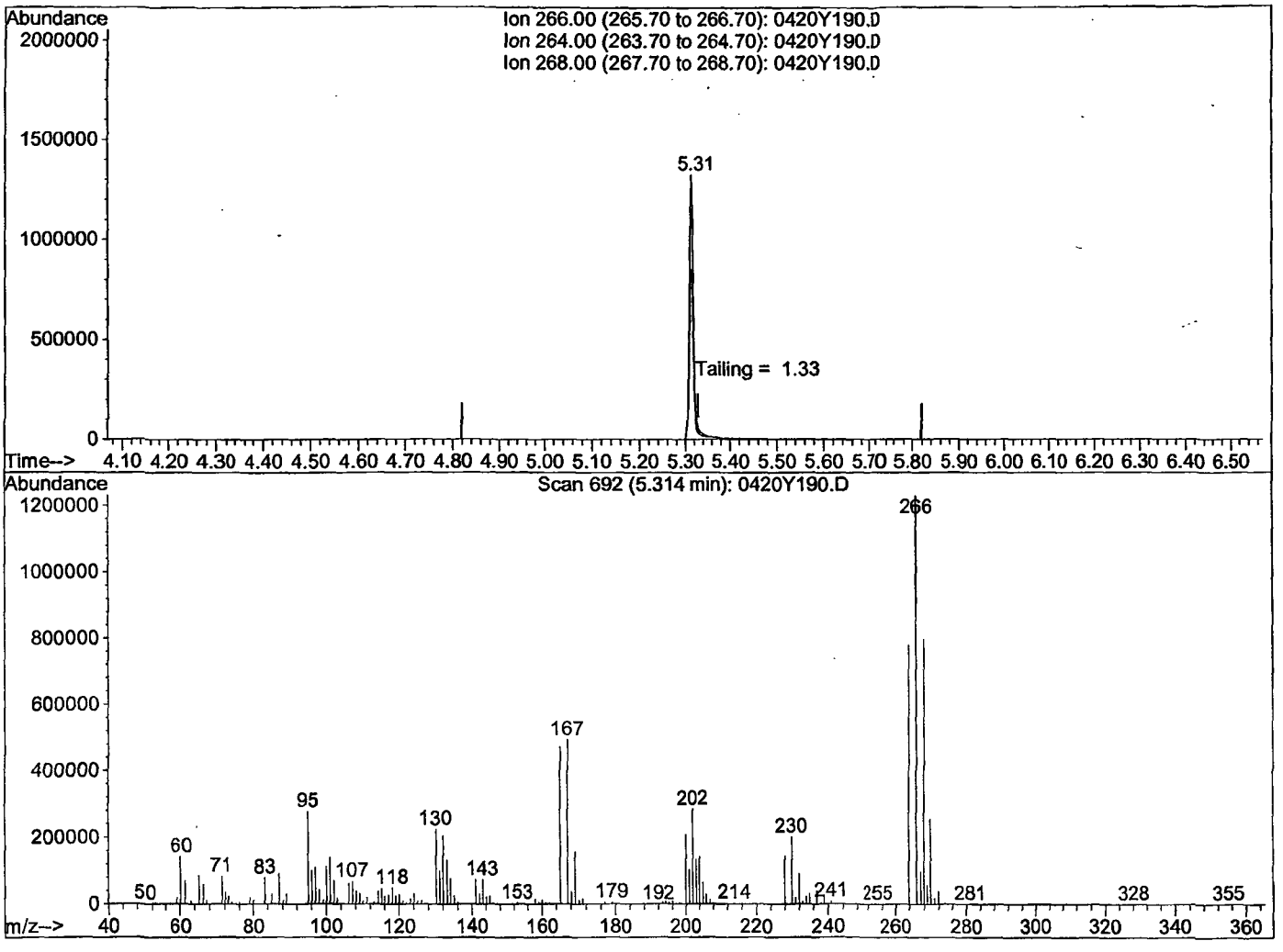
#	Name	Ret Time	Target Response
1)	DDT	6.96	136004000
2)	DDD	6.73	1179160
3)	DDE	6.48	189143

Breakdown **1.00**

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y190.D Vial: 90
Acq On : 6 May 20 9:54 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 9:48 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Tue May 05 14:09:36 2020
Response via : Single Level Calibration



TIC: 0420Y190.D

(5) Pentachlorophenol

5.31min 0.0000

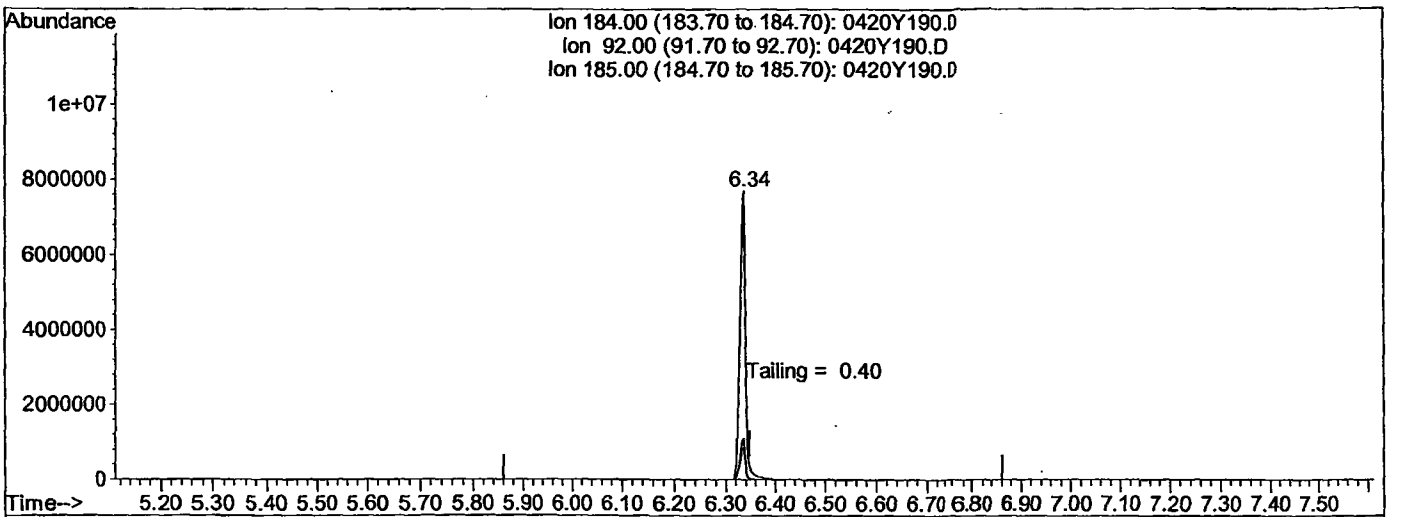
response 8641789

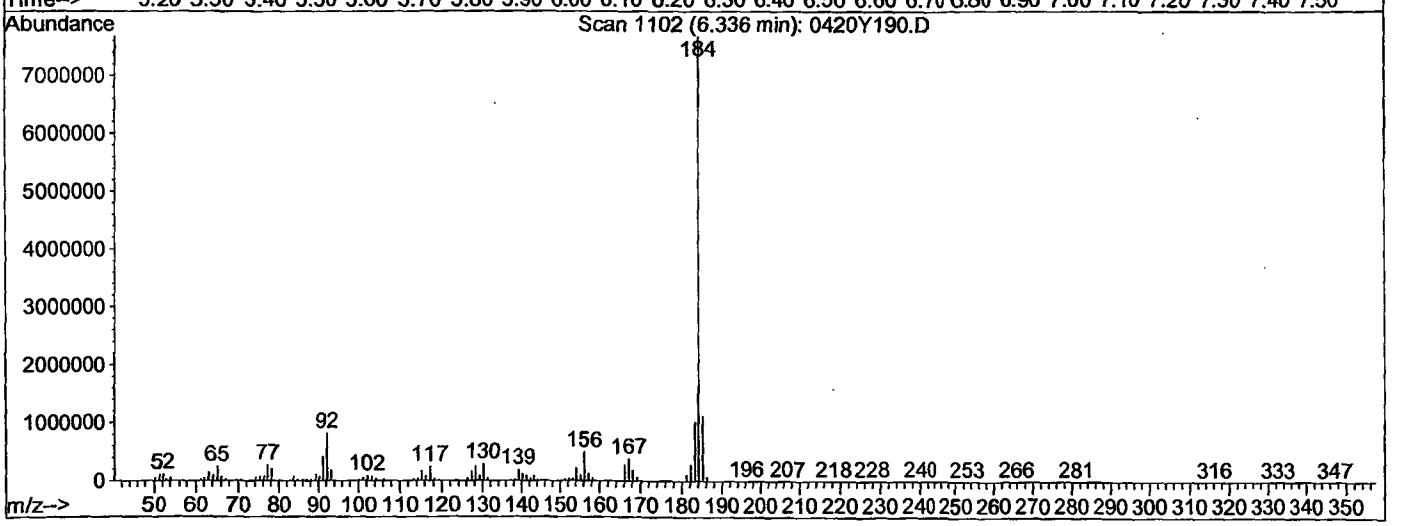
Ion	Exp%	Act%
266.00	100	100
264.00	63.70	63.20
268.00	63.60	63.10
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200420\0420Y190.D Vial: 90
Acq On : 6 May 20 9:54 Operator: MA
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : Multiplr: 1.00
Quant Time: May 6 9:48 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200420\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Tue May 05 14:09:36 2020
Response via : Single Level Calibration





TIC: 0420Y190.D

(6) Benzidine

6.34min 0.0000

response 59996713

Ion	Exp%	Act%
184.00	100	100
92.00	11.50	10.52
185.00	14.60	14.28
0.00	0.00	0.00

Name of Final Standard: **8270 Full Scan Standard Curve** Prep'd By (Initials): JP

Prep Date: 03/04/20
Exp Date: 03/03/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
8270 Working Stock	APPL	8270 Working Stock	50:100 ug/mL	03/03/20	03/03/21	8 uL	200uL	MC DW717 188 uL	4 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	8 uL	200uL	MC DW717 187 uL	5 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	5 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	8 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	8 uL	100uL	MC DW717 87 uL	10 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	5 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	16 uL	100uL	MC DW717 74 uL	20 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	10 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	32 uL	100uL	MC DW717 48 uL	40 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	20 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	80 uL	200 uL	MC DW717 70 uL	50 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	50 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	48 uL	100uL	MC DW717 22 uL	60 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	30 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	64 uL	100uL	MC DW717 28 uL	80 ug/mL
8270 Surrogate Stock	APPL	8270 Surrogate Stock	1000:2000 ug/mL	03/03/20	03/03/21	8 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	80 uL	100uL	MC DW717 10 uL	100 ug/mL
8270 Surrogate Stock	APPL	8270 Surrogate Stock	1000:2000 ug/mL	03/03/20	03/03/21	10 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"

Name of Final Standard: **8270 Full Scan Second Source** Prep'd By (Initials): JP

Prep Date: 03/04/20
Exp Date: 06/30/20

Initial Standard Information						Final Standard Information			
(from container Label)	Supplier	APPL Mix Name)	Conc.(range)	APPL prep date)	Exp Date	Stock	Volume	APPL Prep Date)	Conc (range)
8270 SS Stock	APPL	8270 SS Stock	100:50 ug/mL	11/20/19	06/30/20	100 uL	200uL	MC DW717 100uL	50:25 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	50 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"

Name of Final Standard	8270 Stock	Prep'd By (Initials)	JP
Prep Date	03/03/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
10001	Absolute	10001	2000	081419-49297	08/14/22	1.0 mL	16 mL	MC DW717 5mL	125 ug/mL
10002	Absolute	10002	2000	90919-49206	09/09/22	1.0 mL	"	"	125 ug/mL
10004	Absolute	10004	2000	071618-49216	07/16/23	1.0 mL	"	"	125 ug/mL
10005	Absolute	10005	2000	032018-40226	03/20/23	1.0 mL	"	"	125 ug/mL
10006	Absolute	10006	2000	030119-49237	03/01/22	1.0 mL	"	"	125 ug/mL
10007	Absolute	10007	2000	080116-40247	08/01/21	1.0 mL	"	"	125 ug/mL
10018	Absolute	10018	2000	021719-49257	05/17/24	1.0 mL	"	"	125 ug/mL
70023	Absolute	70023	1000	012819-49273	01/28/24	1.0 mL	"	"	62.5 ug/mL
82705	Absolute	82705	2000	090919-49288	09/09/22	1.0 mL	"	"	125 ug/mL
94552	Absolute	94552	various	111319-49576	05/31/21	1.0 mL	"	"	various
72304	Absolute	70023	1000	090519-49479	09/05/24	1.0 mL	"	"	62.5 ug/mL

Name of Final Standard	8270 Working Stock	Prep'd By (Initials)	JP
Prep Date	03/03/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	2.5 mL	4 mL	MC DW717 1.5 mL	100 ug/mL

Name of Final Standard	8270 Surrogate Stock	Prep'd By (Initials)	JP
Prep Date	03/03/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
8270 Acid Surrogate Mix	Restek	33029	10,000 ug/mL	A0152714-49437	09/30/27	10 mL	50 mL	MC DW717 30 mL	2000 ug/mL
8270 B/N Surrogate Mix	Restek	31086	5000 ug/mL	A0153473-49443	08/31/25	10 mL	"	"	1000 ug/mL

Name of Final Standard	8270 Working Surrogate Stock	Prep'd By (Initials)	JP
Prep Date	03/03/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
8270 Surrogate Stock	APPL	8270 Surrogate Stock	2000:1000 ug/mL	03/03/20	03/03/21	1.5 mL	7.5 mL	MC DW717 6 mL	400:200 ug/mL

Name of Final Standard	8270 Internal Standard Ampules (2)	Prep'd By (Initials)	MA
Prep Date	11/20/19		
Exp Date	11/20/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Semivolatile Internal Standard	Restek	31206	2000 ug/mL	AO157142-49871,872,873	07/31/25	3 mL	3 mL	NA	2000ug/mL

Name of Final Standard	8270 SS STOCK	Prep'd By (Initials)	JP
Prep Date	11/20/19		
Exp Date	06/30/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
10001	Absolute	10001	2000 ug/mL	051019-40534	05/10/21	1.0 mL	20 mL	**Methanol Lot 208858**	100 ug/mL
10002	Absolute	10002	2000 ug/mL	020217-39199	06/30/20	1.0 mL	*	*	100 ug/mL
10004	Absolute	10004	2000 ug/mL	051018-39196	05/10/21	1.0 mL	*	*	100 ug/mL
10005	Absolute	10005	2000 ug/mL	031618-39207	03/16/23	1.0 mL	*	*	100 ug/mL
10006	Absolute	10006	2000 ug/mL	011718-39208	01/17/21	1.0 mL	*	*	100 ug/mL
10007	Absolute	10007	2000 ug/mL	060118-39213	06/01/23	1.0 mL	*	*	100 ug/mL
10018	Absolute	10018	2000 ug/mL	062718-40535	06/27/23	1.0 mL	*	*	100 ug/mL
70023	Absolute	70023	1000 ug/mL	051618-39214	05/16/23	1.0 mL	*	*	50 ug/mL
82705	Absolute	82705	2000 ug/mL	090617-40540	09/06/20	1.0 mL	*	*	100 ug/mL
94552	Absolute	94552	various	013118-40542	06/30/20	1.0 mL	*	*	various
72304	Absolute	72304	1000 ug/mL	110719-49477	11/07/24	1.0 mL	*	*	50 ug/mL

10002 lot 020217-39199 was re-certified with 10002 lot 90919-49206, injected in Yoda Seq Y200327/0327Y013

94552 lot 013118-40542was re-certified with 94552 lot 111319-49576, injected in Yoda Seq Y200327/0327Y013

Name of Final Standard	8270 Full Scan CCV	Prep'd By (Initials)	MA
Prep Date	03/30/20		
Exp Date	03/03/21		

Initial Standard Information						Final Standard Information			
8270 Stock	APPL	8270 Stock	62.5:125 ug/mL	03/03/20	03/03/21	80 uL	200 uL	MC DW717 70 uL	50 ug/mL
8270 Working Surrogate Stock	APPL	8270 Working Surrogate Stock	200:400 ug/mL	03/03/20	03/03/21	50 uL	"	"	"
SV Internal Standard	APPL	SV Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"

Name of Final Standard	Semivolatile (SV) Tuning Solution	Prep'd By (Initials)	JP
Prep Date	10/01/19		
Exp Date	11/30/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Semivolatile GC/MS Tuning Standard	Ultra Scientific	GCM-150-1	1,000 ug/mL	CR3789A-41241	11/30/20	1,250 uL	25 mL	MC #58240	50 ug/mL

Name of Final Standard	8270 Full Scan Spike	Prep'd By (Initials)	MA
Prep Date	04/01/20		
Exp Date	04/01/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
10001	Absolute	10001	2000	081419 - 49569, 49570	08/14/22	2.0 mL	80 mL	**Methanol Lot# 235140**	50 ug/mL
10002	Absolute	10002	2000	090919-49205, 49810	09/09/22	2.0 mL	*	*	50 ug/mL
10004	Absolute	10004	2000	071618-49215, 103119-49814	07/16/23	2.0 mL	*	*	50 ug/mL
10005	Absolute	10005	2000	032018-40225, 49800	03/20/23	2.0 mL	*	*	50 ug/mL
10006	Absolute	10006	2000	030119-49236, 110119-49818	03/01/22	2.0 mL	*	*	50 ug/mL
10007	Absolute	10007	2000	080116-40246, 080116-49805	08/01/21	2.0 mL	*	*	50 ug/mL
10018	Absolute	10018	2000	091919-49564, 49565	01/19/24	2.0 mL	*	*	50 ug/mL
70023	Absolute	70023	1000	012819-49272, 112119-49822	01/28/24	2.0 mL	*	*	25 ug/mL
82705	Absolute	82705	2000	090919--49287, 49826	09/09/22	2.0 mL	*	*	50 ug/mL
94552	Absolute	94552	various	111319-49577, 49799	11/13/21	2.0 mL	*	*	various

Organic Extraction Worksheet

Method	Continuous Liquid/Liquid SVOC 3520C	Extraction Set	200504A	Extraction Method	LIQ003	Units	mL

Spiked ID 1	8270T Spike 4-1-20 4-1-21		Surrogate ID 1	8270 Surrogate 4-15-20 3-2-21	
Spiked ID 2	Sim Spike 4-1-20 4-1-21		Surrogate ID 2	SIM Surrogate 4-1-20 4-1-21	
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	05/04/20 12:20	
Spiked ID 8			Ext. End Time:	05/05/20 7:00	
			GC Requires Extract By:		

pH1	2	05/04/20 11:15	Water Bath Temp 1 °C	75/74.9 E-WB6 °
pH2	14	05/05/20 10:15	Water Bath Temp 2 °C	
pH3			Water Bath Temp 3 °C	

Spiked By: KY **Date** 05/04/20 **Witnessed By:** CFM **Date** 05/04/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200504A Blk				1,0.050	1,2	800	1	2/1	05/04/20 11:00	
						equip	E-HP51 E-WB6				
2	200504A LCS-1		1	1	1	1	800	1	2/1	05/04/20 11:00	
						equip	E-HP50 E-WB6				
3	200504A LCS-2		0.125	2	0.050	2	800	1	2/1	05/04/20 11:00	
						equip	E-HP49 E-WB6				
4	200504A LCSD-1		1	1	1	1	800	1	2/1	05/04/20 11:00	
						equip	E-HP48 E-WB6				
5	200504A LCSD-2		0.125	2	0.050	2	800	1	2/1	05/04/20 11:00	
						equip	E-HP47 E-WB6				
6	BA10439	BA10439W19			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92025
						equip	E-HP25 E-WB6				
7	BA10504	BA10504W18			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92039
						equip	E-HP26 E-WB6				
8	BA10505	BA10505W11			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92039
						equip	E-HP27 E-WB6				

Solvent and Lot#	
PH Strips	HC998032
Dichloromethane (DCM)	59239
1+1 H2SO4	4-2-20
10N NaOH	4-2-20
Filter Paper	400171
Na2SO4	2019070279

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	05/05/20
Time	7:30
Refrigerator	GC-C

	Technician's Initials
Scanned By	DL
Sample Preparation	KY,DL
Extraction	KY,DL
Concentration	DL

Modified	05/07/20 8:44:51 AM

Reviewed By: KY **Date** 05/07/20

Injection Log

Directory: M:\YODA\DATA\Y200420\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
2	0420Y002.D	1	SV TUNE 10/01/19		20 Apr 20 9:12
3	0420Y003.D	1	4ug/ml 8270 3/4/20		20 Apr 20 9:28
4	0420Y004.D	1	5ug/ml 8270 3/4/20		20 Apr 20 9:57
5	0420Y005.D	1	10ug/ml 8270 3/4/20		20 Apr 20 10:31
6	0420Y006.D	1	20ug/ml 8270 3/4/20		20 Apr 20 11:00
7	0420Y007.D	1	40ug/ml 8270 3/4/20		20 Apr 20 11:28
8	0420Y008.D	1	50ug/ml 8270 3/4/20		20 Apr 20 11:57
9	0420Y009.D	1	60ug/ml 8270 3/4/20		20 Apr 20 12:26
10	0420Y010.D	1	80ug/ml 8270 3/4/20		20 Apr 20 12:55
11	0420Y011.D	1	100ug/ml 8270 3/4/20		20 Apr 20 13:24
12	0420Y012.D	1	SS 8270 3/4/20		20 Apr 20 13:53
90	0420Y190.D	1	SV TUNE 10/01/19		6 May 20 9:54
91	0420Y191.D	1	50ug/ml 8270 3/30/20 (3)		6 May 20 10:10
92	0420Y192.D	1.25	200504A BLK 1/800		6 May 20 10:40
93	0420Y193.D	1.25	200504A LCS-1 1/800		6 May 20 11:09
94	0420Y194.D	1.25	200504A LCSD-1 1/800		6 May 20 11:37
96	0420Y196.D	1.25	BA10504W18 1/800		6 May 20 12:34
97	0420Y197.D	1.25	BA10505W11 1/800		6 May 20 13:02
98	0420Y198.D	1	50ug/ml 8270 3/30/20 (5)		6 May 20 13:32

ORGANICS
Calibration Data

PAH by GCMS SIM
EPA 8270 SIM

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 02/04/20
Matrix: Instrument: Linus Initials: MA

			0204L003.D	0204L004.D	0204L005.D	0204L006.D	0204L007.D	0204L008.D	0204L009.D	0204L010.D								
		Compound	0.1	0.2	0.5	1	5	10	50	100			Avg	%RSD	Type	r^2	Q	MRF
1	I	Napthalene-D8(IS)																
2	TM	Naphthalene	1.120	1.131	1.072	1.083	1.129	1.047	0.9772	0.9334			1.1	6.9	TM			0.700
3	S	2-Methylnaphthalene-D10 (2M	1.257	1.211	1.175	1.198	1.255	1.218	1.180	1.133			1.2	3.5	S			
4	TM	2-Methylnaphthalene	0.6849	0.6892	0.6742	0.6957	0.7468	0.6960	0.6554	0.6145			0.68	5.5	TM			0.400
5	TM	1-Methylnaphthalene	0.7412	0.7479	0.7192	0.7336	0.7676	0.7029	0.6628	0.6175			0.71	7.0	TM			
6	I	Acenaphthene-D10(IS)																
7	TM	Acenaphthylene	3.869	3.855	3.806	3.892	4.393	4.113	3.818	3.434			3.9	7.0	TM			0.900
8	*TM	Acenaphthene	1.372	1.277	1.234	1.238	1.309	1.218	1.155	1.036			1.2	8.3	*TM			0.900
9	TM	Fluorene	1.476	1.471	1.412	1.485	1.636	1.549	1.427	1.385			1.5	5.5	TM			0.900
10	I	Phenanthrene-D10(IS)																
11	TM	Phenanthrene	1.231	1.222	1.179	1.198	1.290	1.205	1.041	0.9371			1.2	9.9	TM			0.700
12	TM	Anthracene	1.002	1.028	0.9886	1.045	1.160	1.099	0.9848	0.8800			1.0	8.1	TM			0.700
13	S	Fluoranthene-D10 (FRT)	1.457	1.470	1.320	1.355	1.491	1.476	1.437	1.389			1.4	4.4	S			
14	*TM	Fluoranthene	1.604	1.635	1.531	1.601	1.817	1.668	1.480	1.357			1.6	8.6	*TM			0.600
15	I	Chrysene-D12(IS)																
16	TM	Pyrene	1.291	1.315	1.240	1.301	1.386	1.308	1.220	1.113			1.3	6.4	TM			0.600
17	TM	Benz (a) anthracene	1.177	1.123	1.047	1.077	1.191	1.159	1.141	1.081			1.1	4.6	TM			0.800
18	TM	Chrysene	1.461	1.411	1.370	1.360	1.367	1.267	1.174	1.065			1.3	10	TM			0.700
19	TM	Indeno (1,2,3-cd) pyrene	1.438	1.382	1.382	1.402	1.574	1.526	1.551	1.517			1.5	5.4	TM			0.500
20	I	Perylene-D12(IS)																
21	TM	Benzo (b) fluoranthene	0.8206	0.8277	0.8502	0.9180	1.141	1.084	1.118	1.129			0.99	15	TM			0.700
22	TM	Benzo (k) fluoranthene	1.252	1.341	1.294	1.323	1.396	1.330	1.094	1.089			1.3	9.1	TM			0.700
23	*TM	Benzo (a) pyrene	0.8229	0.8399	0.9301	0.9711	1.126	1.087	1.069	1.029			0.98	12	*TM			0.700
24	TM	Dibenz (a,h) anthracene	0.9746	0.9893	0.9980	1.034	1.209	1.157	1.169	1.136			1.1	8.7	TM			0.400
25	TM	Benzo (g,h,i) perylene	1.063	1.069	1.094	1.118	1.274	1.216	1.188	1.145			1.1	6.5	TM			0.500
26																		
27																		
28																		
29																		
30																		
31																		
32																		
33																		
34																		
35																		

Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L003.D Vial: 3
Acq On : 4 Feb 20 9:48 Operator: MA
Sample : 0.1 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:38:46 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	98990	2.50000 ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	52942	2.50000 ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	98572	2.50000 ppb		0.00
15) Chrysene-D12(IS)	11.01	240	123137	2.50000 ppb		0.00
20) Perylene-D12(IS)	13.43	264	142515	2.50000 ppb		0.00
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.96	152	2488	0.05046 ppb		0.00
Spiked Amount 5.000			Recovery =	1.000%		
13) Fluoranthene-D10 (FRT)	9.28	212	2873	0.04174 ppb		0.00
Spiked Amount 5.000			Recovery =	0.840%		
Target Compounds						Qvalue
2) Naphthalene	4.21	128	4434	0.09312 ppb		99
4) 2-Methylnaphthalene	5.00	142	2712	0.09372 ppb		100
5) 1-Methylnaphthalene	5.11	142	2935	0.09787 ppb		97
7) Acenaphthylene	6.02	152	8194	0.08489 ppb		100
8) Acenaphthene	6.22	154	2905	0.10261 ppb		96
9) Fluorene	6.82	166	3126	0.09002 ppb		94
11) Phenanthrene	7.93	178	4855	0.08909 ppb		99
12) Anthracene	7.99	178	3951	0.08269 ppb		98
14) Fluoranthene	9.30	202	6323	0.08364 ppb	#	92
16) Pyrene	9.57	202	6359	0.07717 ppb	#	94
17) Benz (a) anthracene	11.00	228	5798	0.08414 ppb		99
18) Chrysene	11.04	228	7198	0.09744 ppb		99
19) Indeno (1,2,3-cd) pyrene	14.93	276	7083	0.09610 ppb	#	99
21) Benzo (b) fluoranthene	12.79	252	4678	0.06579 ppb	#	99
22) Benzo (k) fluoranthene	12.85	252	7135	0.09052 ppb		98
23) Benzo (a) pyrene	13.35	252	4691	0.07030 ppb		98
24) Dibenz (a,h) anthracene	14.97	278	5556	0.08385 ppb		99
25) Benzo (g,h,i) perylene	15.29	276	6060	0.08386 ppb		97

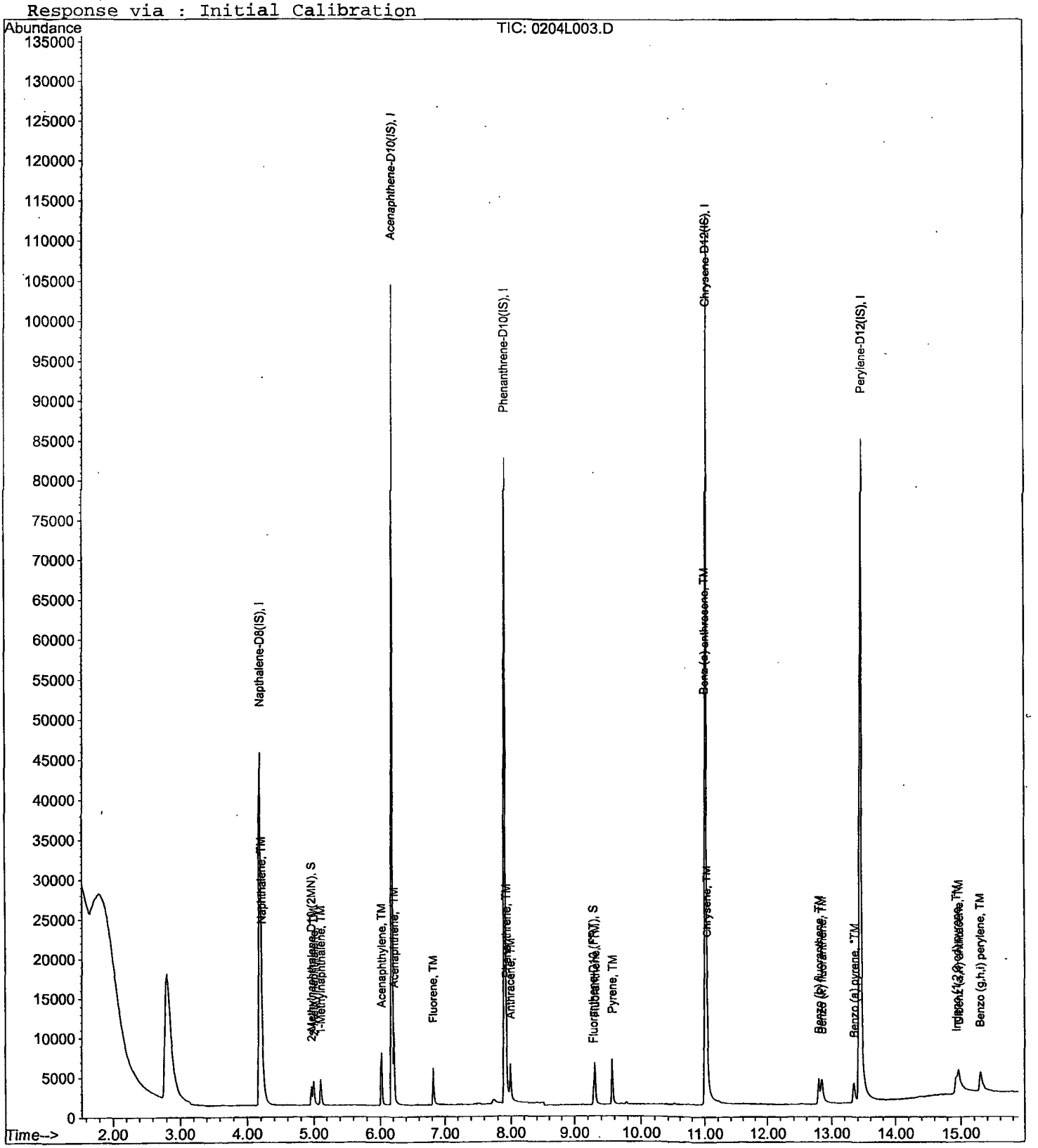
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L003.D Vial: 3
Acq On : 4 Feb 20 9:48 Operator: MA
Sample : 0.1 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L004.D Vial: 4
Acq On : 4 Feb 20 10:09 Operator: MA
Sample : 0.2 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

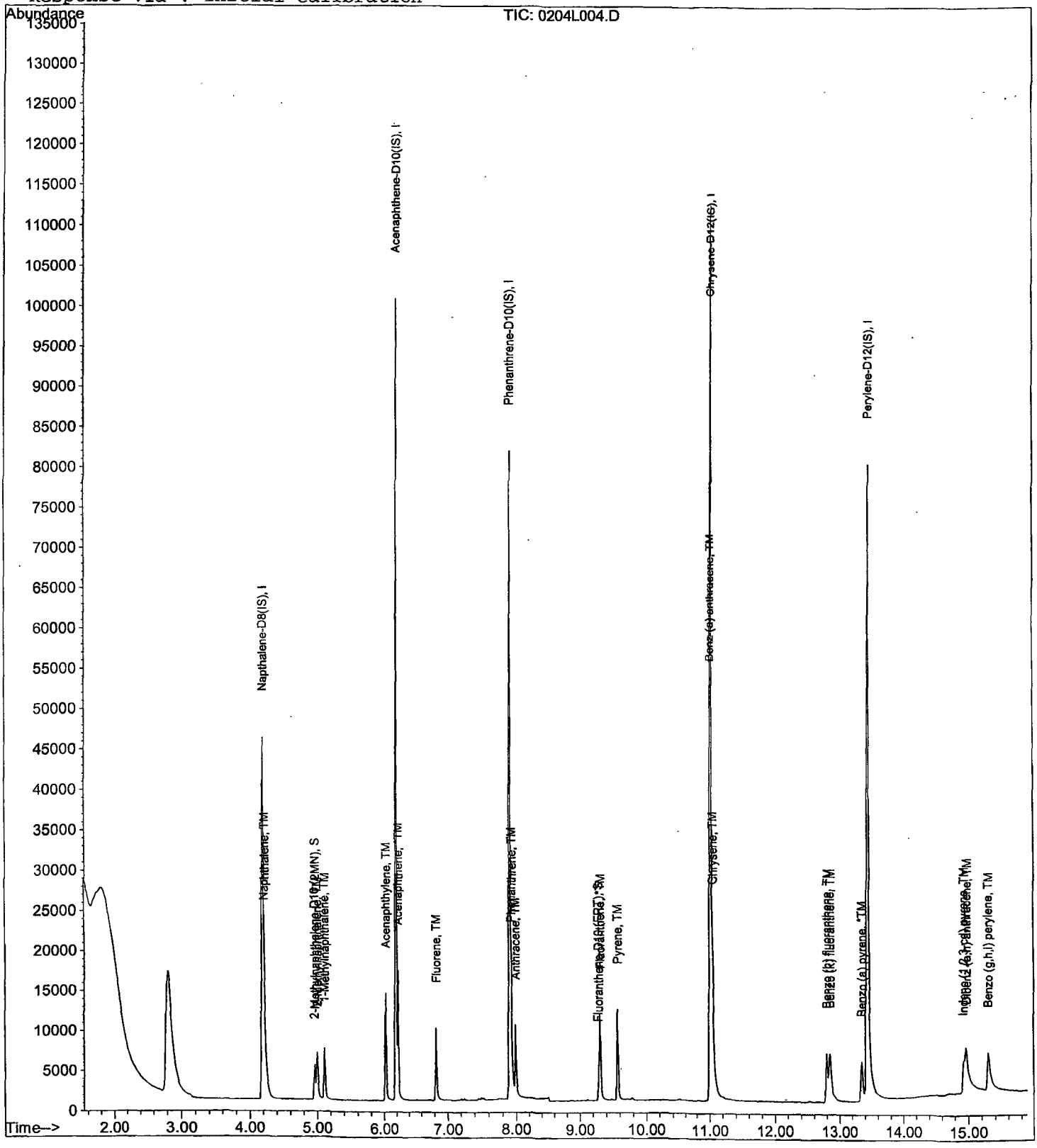
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	95871	2.50000	ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	51059	2.50000	ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	94452	2.50000	ppb		0.00
15) Chrysene-D12(IS)	11.01	240	119835	2.50000	ppb		0.00
20) Perylene-D12(IS)	13.43	264	136582	2.50000	ppb		0.00
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.96	152	4644	0.09724	ppb		0.00
Spiked Amount 5.000			Recovery =	1.940%			
13) Fluoranthene-D10 (FRT)	9.28	212	5554	0.08422	ppb		0.00
Spiked Amount 5.000			Recovery =	1.680%			
Target Compounds							Qvalue
2) Naphthalene	4.21	128	8673	0.18807	ppb		99
4) 2-Methylnaphthalene	5.00	142	5286	0.18862	ppb		99
5) 1-Methylnaphthalene	5.11	142	5736	0.19749	ppb		100
7) Acenaphthylene	6.02	152	15747	0.16915	ppb		99
8) Acenaphthene	6.22	154	5216	0.19104	ppb		99
9) Fluorene	6.82	166	6007	0.17936	ppb		96
11) Phenanthrene	7.93	178	9231	0.17678	ppb		99
12) Anthracene	7.99	178	7770	0.16971	ppb		99
14) Fluoranthene	9.30	202	12353	0.17053	ppb	#	93
16) Pyrene	9.57	202	12608	0.15723	ppb	#	91
17) Benz (a) anthracene	11.00	228	10767	0.16055	ppb		99
18) Chrysene	11.04	228	13529	0.18818	ppb		99
19) Indeno (1,2,3-cd) pyrene	14.92	276	13247	0.18469	ppb	#	100
21) Benzo (b) fluoranthene	12.79	252	9044	0.13271	ppb		99
22) Benzo (k) fluoranthene	12.85	252	14654	0.19398	ppb		98
23) Benzo (a) pyrene	13.35	252	9177	0.14350	ppb	#	97
24) Dibenz (a,h) anthracene	14.97	278	10810	0.17022	ppb		99
25) Benzo (g,h,i) perylene	15.29	276	11681	0.16867	ppb		98

(#) = qualifier out of range (m) = manual integration

Data File : M:\LINUS\DATA\L200204\0204L004.D Vial: 4
Acq On : 4 Feb 20 10:09 Operator: MA
Sample : 0.2 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L005.D Vial: 5
Acq On : 4 Feb 20 10:31 Operator: MA
Sample : 0.5 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	93485	2.50000 ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	49653	2.50000 ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	91991	2.50000 ppb		0.00
15) Chrysene-D12(IS)	11.01	240	112785	2.50000 ppb		0.00
20) Perylene-D12(IS)	13.43	264	128599	2.50000 ppb		0.00
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.96	152	10986	0.23591 ppb		0.00
Spiked Amount 5.000			Recovery	= 4.720%		
13) Fluoranthene-D10 (FRT)	9.28	212	12142	0.18904 ppb		0.00
Spiked Amount 5.000			Recovery	= 3.780%		
Target Compounds						Qvalue
2) Naphthalene	4.21	128	20052	0.44592 ppb		100
4) 2-Methylnaphthalene	5.00	142	12606	0.46129 ppb		100
5) 1-Methylnaphthalene	5.11	142	13447	0.47479 ppb		99
7) Acenaphthylene	6.02	152	37792	0.41744 ppb		100
8) Acenaphthene	6.22	154	12256	0.46158 ppb		99
9) Fluorene	6.82	166	14018	0.43041 ppb		96
11) Phenanthrene	7.93	178	21699	0.42667 ppb		98
12) Anthracene	7.99	178	18188	0.40788 ppb		98
14) Fluoranthene	9.30	202	28175	0.39935 ppb	#	93
16) Pyrene	9.57	202	27975	0.37067 ppb	#	93
17) Benz (a) anthracene	11.00	228	23610	0.37407 ppb		100
18) Chrysene	11.04	228	30897	0.45662 ppb		99
19) Indeno (1,2,3-cd) pyrene	14.92	276	31178	0.46186 ppb	#	100
21) Benzo (b) fluoranthene	12.79	252	21866	0.34077 ppb		98
22) Benzo (k) fluoranthene	12.85	252	33289	0.46801 ppb		98
23) Benzo (a) pyrene	13.35	252	23923	0.39730 ppb		98
24) Dibenz (a,h) anthracene	14.96	278	25669	0.42930 ppb	#	95
25) Benzo (g,h,i) perylene	15.29	276	28135	0.43148 ppb		99

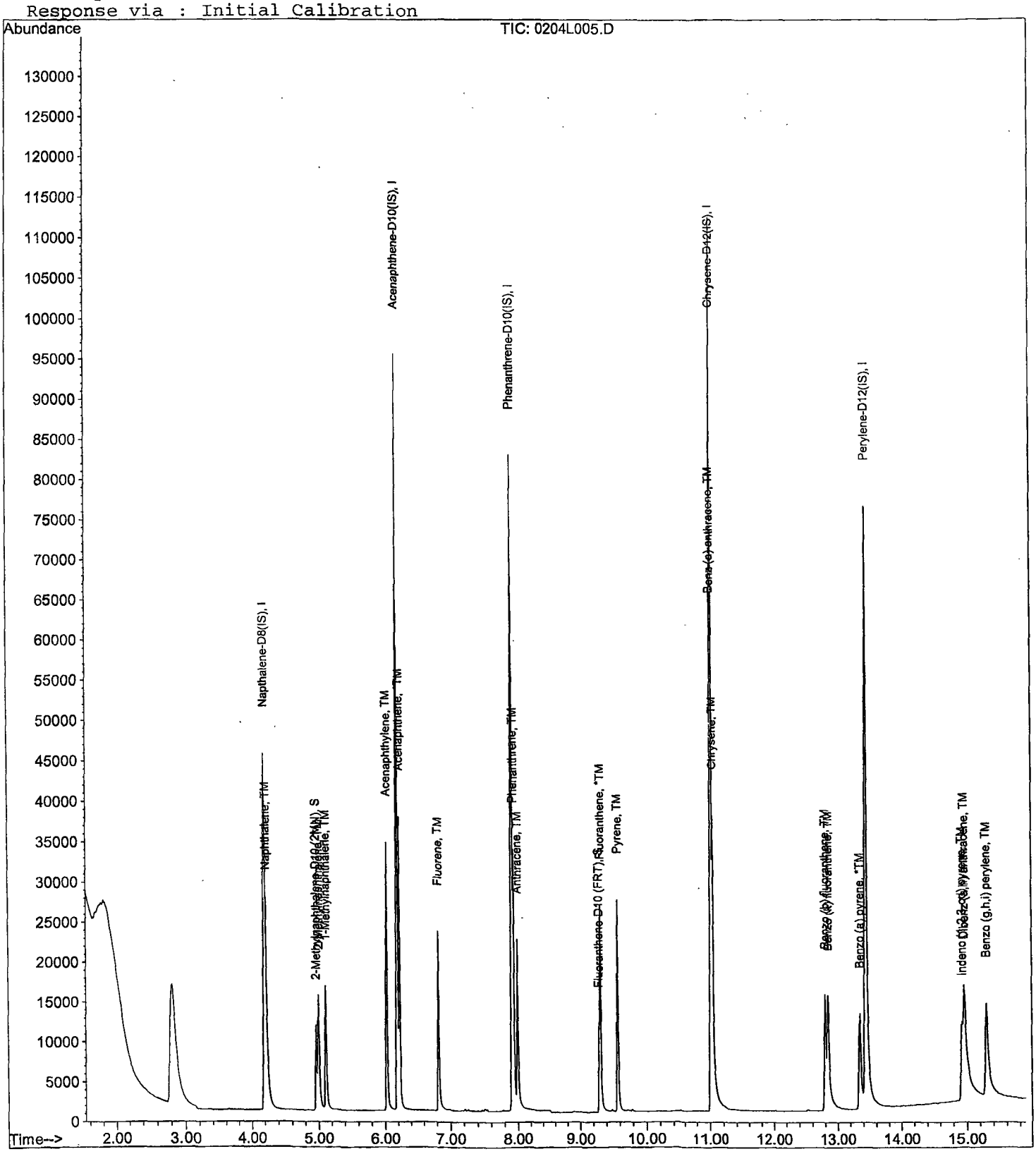
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L005.D Vial: 5
Acq On : 4 Feb 20 10:31 Operator: MA
Sample : 0.5 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L006.D Vial: 6
Acq On : 4 Feb 20 10:53 Operator: MA
Sample : 1 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Napthalene-D8(IS)	4.19	136	95074	2.50000 ppb	0.00
6) Acenaphthene-D10(IS)	6.18	164	50320	2.50000 ppb	0.00
10) Phenanthrene-D10(IS)	7.91	188	93982	2.50000 ppb	0.00
15) Chrysene-D12(IS)	11.01	240	115986	2.50000 ppb	0.00
20) Perylene-D12(IS)	13.43	264	130643	2.50000 ppb	0.00
System Monitoring Compounds					
3) 2-Methylnaphthalene-D10 (2	4.96	152	22777	0.48093 ppb	0.00
Spiked Amount 5.000			Recovery	= 9.620%	
13) Fluoranthene-D10 (FRT)	9.28	212	25468	0.38812 ppb	0.00
Spiked Amount 5.000			Recovery	= 7.760%	
Target Compounds					Qvalue
2) Naphthalene	4.21	128	41177	0.90039 ppb	100
4) 2-Methylnaphthalene	5.00	142	26456	0.95192 ppb	99
5) 1-Methylnaphthalene	5.11	142	27900	0.96864 ppb	98
7) Acenaphthylene	6.02	152	78337	0.85382 ppb	100
8) Acenaphthene	6.22	154	24913	0.92584 ppb	99
9) Fluorene	6.82	166	29892	0.90564 ppb	99
11) Phenanthrene	7.93	178	45036	0.86678 ppb	99
12) Anthracene	7.99	178	39270	0.86199 ppb	99
14) Fluoranthene	9.30	202	60200	0.83519 ppb	97
16) Pyrene	9.57	202	60381	0.77797 ppb	96
17) Benz (a) anthracene	11.00	228	49969	0.76984 ppb	99
18) Chrysene	11.04	228	63085	0.90659 ppb	99
19) Indeno (1,2,3-cd) pyrene	14.92	276	65048	0.93700 ppb	98
21) Benzo (b) fluoranthene	12.79	252	47971	0.73591 ppb	99
22) Benzo (k) fluoranthene	12.84	252	69126	0.95663 ppb	98
23) Benzo (a) pyrene	13.35	252	50746	0.82958 ppb	97
24) Dibenz (a,h) anthracene	14.96	278	54045	0.88973 ppb	97
25) Benzo (g,h,i) perylene	15.29	276	58422	0.88195 ppb	99

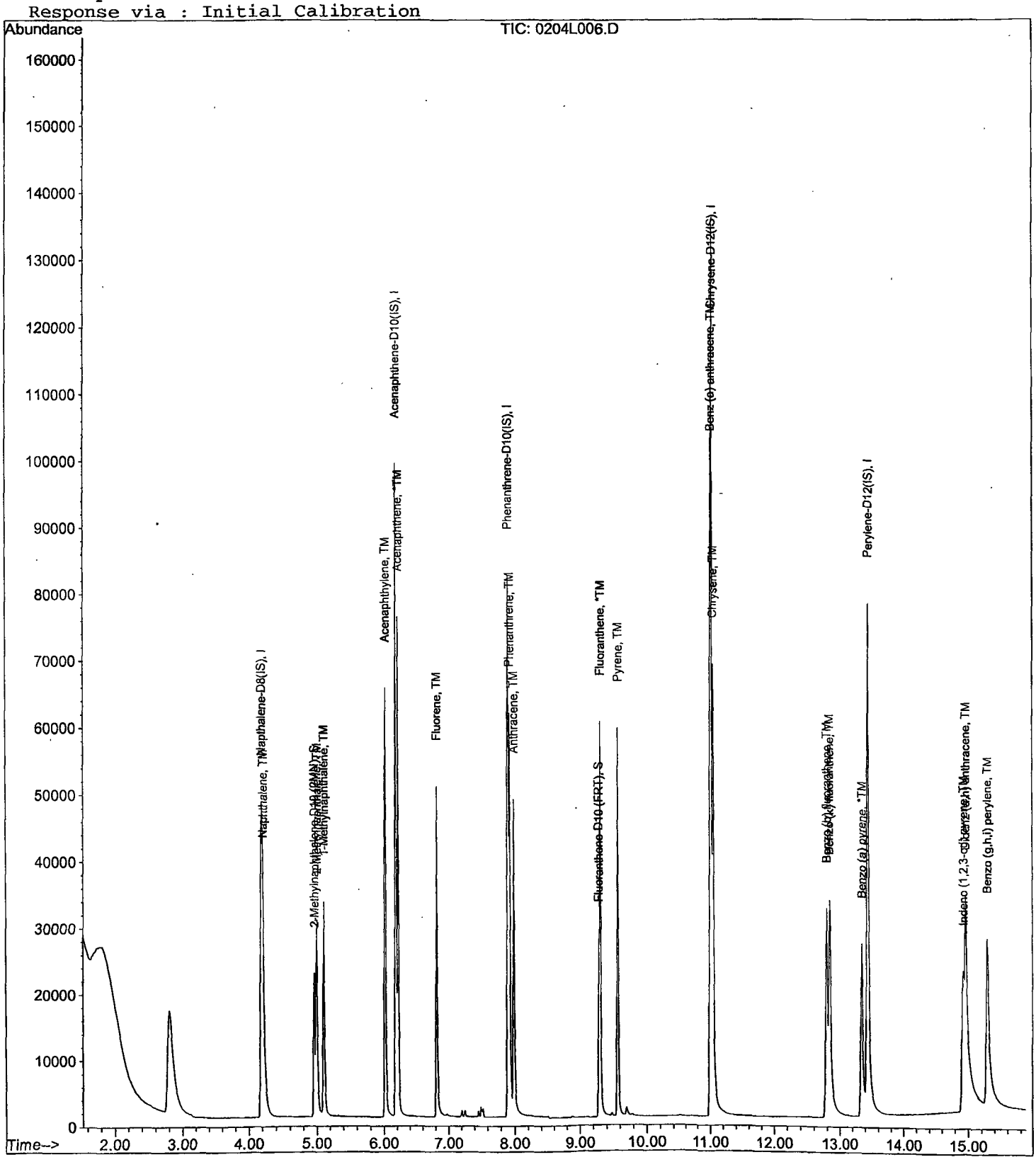
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L006.D Vial: 6
Acq On : 4 Feb 20 10:53 Operator: MA
Sample : 1 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L007.D Vial: 7
Acq On : 4 Feb 20 11:15 Operator: MA
Sample : 5 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Napthalene-D8(IS)	4.19	136	93559	2.50000 ppb	0.00
6) Acenaphthene-D10(IS)	6.18	164	49173	2.50000 ppb	0.00
10) Phenanthrene-D10(IS)	7.91	188	92273	2.50000 ppb	0.00
15) Chrysene-D12(IS)	11.01	240	120189	2.50000 ppb	0.00
20) Perylene-D12(IS)	13.43	264	131131	2.50000 ppb	0.00
System Monitoring Compounds					
3) 2-Methylnaphthalene-D10 (2	4.96	152	117393	2.51887 ppb	0.00
Spiked Amount 5.000			Recovery	= 50.380%	
13) Fluoranthene-D10 (FRT)	9.28	212	137624	2.13617 ppb	0.00
Spiked Amount 5.000			Recovery	= 42.720%	
Target Compounds					Qvalue
2) Naphthalene	4.21	128	211249	4.69404 ppb	100
4) 2-Methylnaphthalene	5.00	142	139742	5.10952 ppb	100
5) 1-Methylnaphthalene	5.11	142	143640	5.06770 ppb	100
7) Acenaphthylene	6.02	152	431994	4.81826 ppb	100
8) Acenaphthene	6.22	154	128780	4.89745 ppb	100
9) Fluorene	6.82	166	160921	4.98915 ppb	100
11) Phenanthrene	7.93	178	238077	4.66698 ppb	100
12) Anthracene	7.99	178	213985	4.78406 ppb	100
14) Fluoranthene	9.30	202	335331	4.73840 ppb	100
16) Pyrene	9.57	202	333150	4.14232 ppb	100
17) Benz (a) anthracene	11.00	228	286178	4.25478 ppb	100
18) Chrysene	11.04	228	328507	4.55588 ppb	100
19) Indeno (1,2,3-cd) pyrene	14.91	276	378390	5.26003 ppb #	100
21) Benzo (b) fluoranthene	12.79	252	299210	4.57302 ppb	100
22) Benzo (k) fluoranthene	12.84	252	366067	5.04713 ppb	100
23) Benzo (a) pyrene	13.34	252	295305	4.80957 ppb	100
24) Dibenz (a,h) anthracene	14.96	278	317098	5.20088 ppb	100
25) Benzo (g,h,i) perylene	15.28	276	334159	5.02577 ppb	100

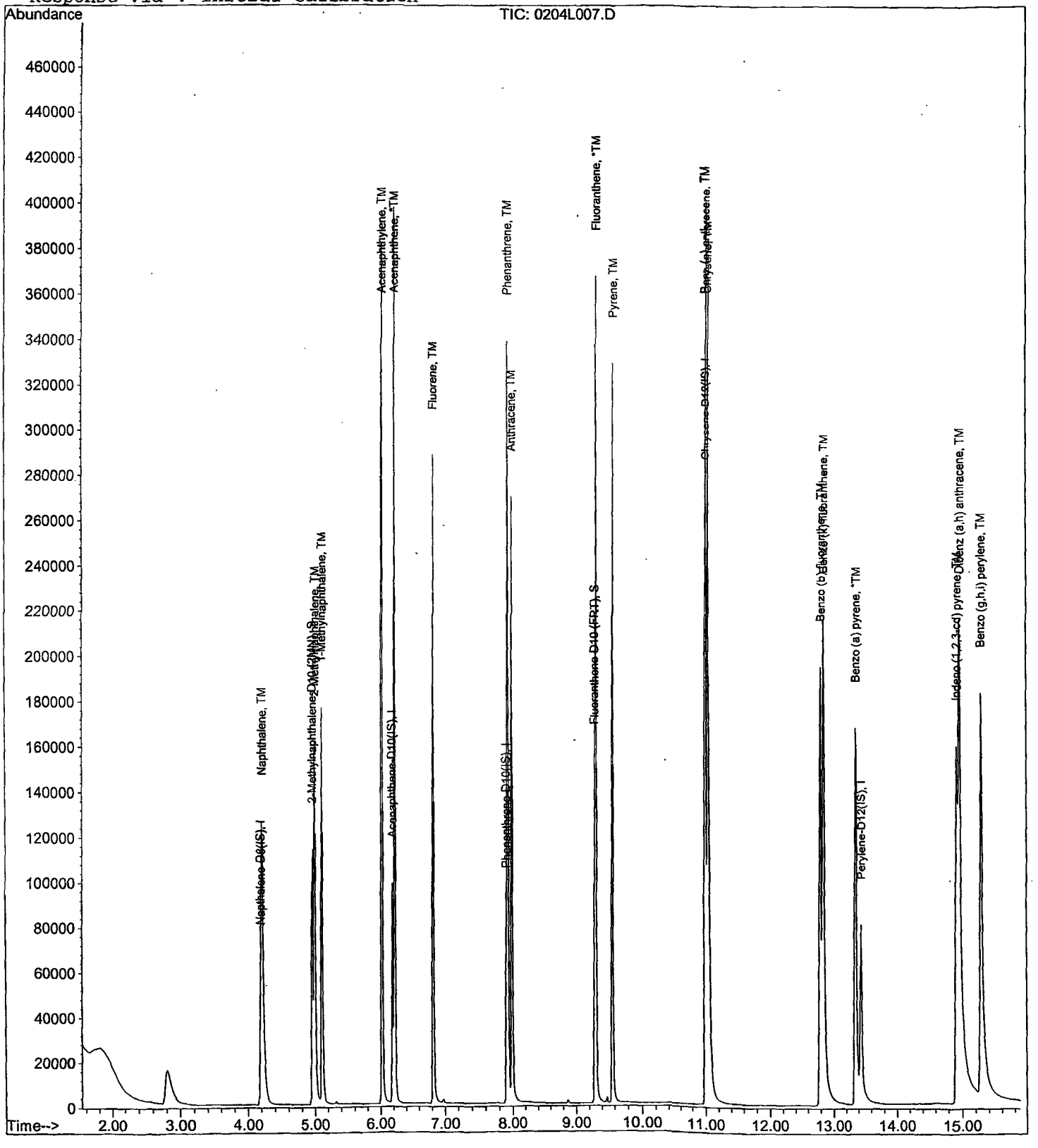
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L007.D Vial: 7
Acq On : 4 Feb 20 11:15 Operator: MA
Sample : 5 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L008.D Vial: 8
Acq On : 4 Feb 20 11:37 Operator: MA
Sample : 10 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	98020	2.50000 ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	51392	2.50000 ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	97154	2.50000 ppb		0.00
15) Chrysene-D12(IS)	11.01	240	126338	2.50000 ppb		0.00
20) Perylene-D12(IS)	13.43	264	139162	2.50000 ppb		0.00
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.96	152	238748	4.88961 ppb		0.00
Spiked Amount 5.000			Recovery	= 97.800%		
13) Fluoranthene-D10 (FRT)	9.28	212	286889	4.22932 ppb		0.00
Spiked Amount 5.000			Recovery	= 84.580%		
Target Compounds						Qvalue
2) Naphthalene	4.21	128	410435	8.70497 ppb		100
4) 2-Methylnaphthalene	5.00	142	272886	9.52368 ppb		99
5) 1-Methylnaphthalene	5.11	142	275593	9.28058 ppb		98
7) Acenaphthylene	6.02	152	845596	9.02415 ppb		99
8) Acenaphthene	6.22	154	250345	9.10944 ppb		98
9) Fluorene	6.82	166	318435	9.44639 ppb		99
11) Phenanthrene	7.93	178	468302	8.71883 ppb		100
12) Anthracene	7.99	178	427236	9.07184 ppb		100
14) Fluoranthene	9.30	202	648356	8.70132 ppb		99
16) Pyrene	9.57	202	660769	7.81599 ppb		100
17) Benz (a) anthracene	11.00	228	585928	8.28736 ppb		99
18) Chrysene	11.04	228	640149	8.44578 ppb		99
19) Indeno (1,2,3-cd) pyrene	14.92	276	770951	10.19544 ppb	#	94
21) Benzo (b) fluoranthene	12.79	252	603563	8.69229 ppb		99
22) Benzo (k) fluoranthene	12.84	252	740450	9.61977 ppb		99
23) Benzo (a) pyrene	13.35	252	605339	9.29007 ppb	#	96
24) Dibenz (a,h) anthracene	14.96	278	643860	9.95084 ppb		99
25) Benzo (g,h,i) perylene	15.28	276	676724	9.59060 ppb		97

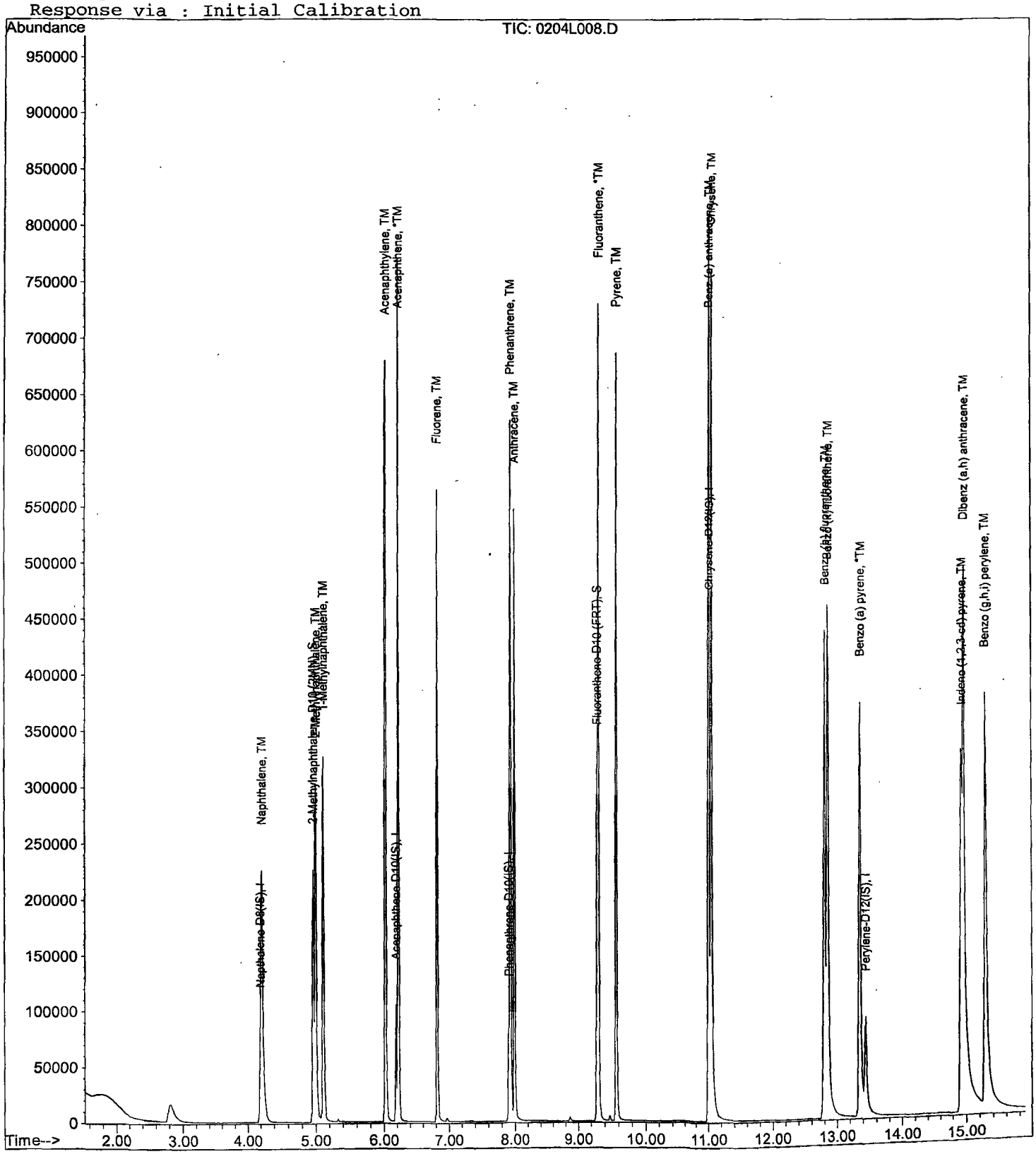
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L008.D Vial: 8
Acq On : 4 Feb 20 11:37 Operator: MA
Sample : 10 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L009.D Vial: 9
Acq On : 4 Feb 20 11:59 Operator: MA
Sample : 50 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 13:42 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:42:22 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	91741	2.50000	ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	48249	2.50000	ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	92859	2.50000	ppb		0.00
15) Chrysene-D12(IS)	11.02	240	119843	2.50000	ppb		0.01
20) Perylene-D12(IS)	13.43	264	135287	2.50000	ppb		0.00
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.96	152	1082689	23.69132	ppb		0.00
Spiked Amount 5.000			Recovery = 473.820%				
13) Fluoranthene-D10 (FRT)	9.28	212	1334204	20.57858	ppb		0.00
Spiked Amount 5.000			Recovery = 411.580%				
Target Compounds							Qvalue
2) Naphthalene	4.21	128	1792980	40.63028	ppb		99
4) 2-Methylnaphthalene	5.00	142	1202511	44.83983	ppb		98
5) 1-Methylnaphthalene	5.11	142	1216206	43.75878	ppb		98
7) Acenaphthylene	6.02	152	3684033	41.87685	ppb		98
8) Acenaphthene	6.22	154	1114731	43.20461	ppb		98
9) Fluorene	6.82	166	1376652	43.49873	ppb		99
11) Phenanthrene	7.93	178	1932753	37.64827	ppb		97
12) Anthracene	7.99	178	1828963	40.63210	ppb		97
14) Fluoranthene	9.32	202	2749439	38.60579	ppb		97
16) Pyrene	9.58	202	2924684	36.46993	ppb		98
17) Benz (a) anthracene	11.01	228	2735399	40.78626	ppb		97
18) Chrysene	11.07	228	2813476	39.13121	ppb		97
19) Indeno (1,2,3-cd) pyrene	14.95	276	3717110	51.82101	ppb		98
21) Benzo (b) fluoranthene	12.82	252	3024809	44.80994	ppb		97
22) Benzo (k) fluoranthene	12.82	252	2960397	39.56247	ppb		97
23) Benzo (a) pyrene	13.36	252	2893742	45.68194	ppb		97
24) Dibenz (a,h) anthracene	14.99	278	3162117	50.27021	ppb	#	95
25) Benzo (g,h,i) perylene	15.32	276	3213468	46.84602	ppb		94

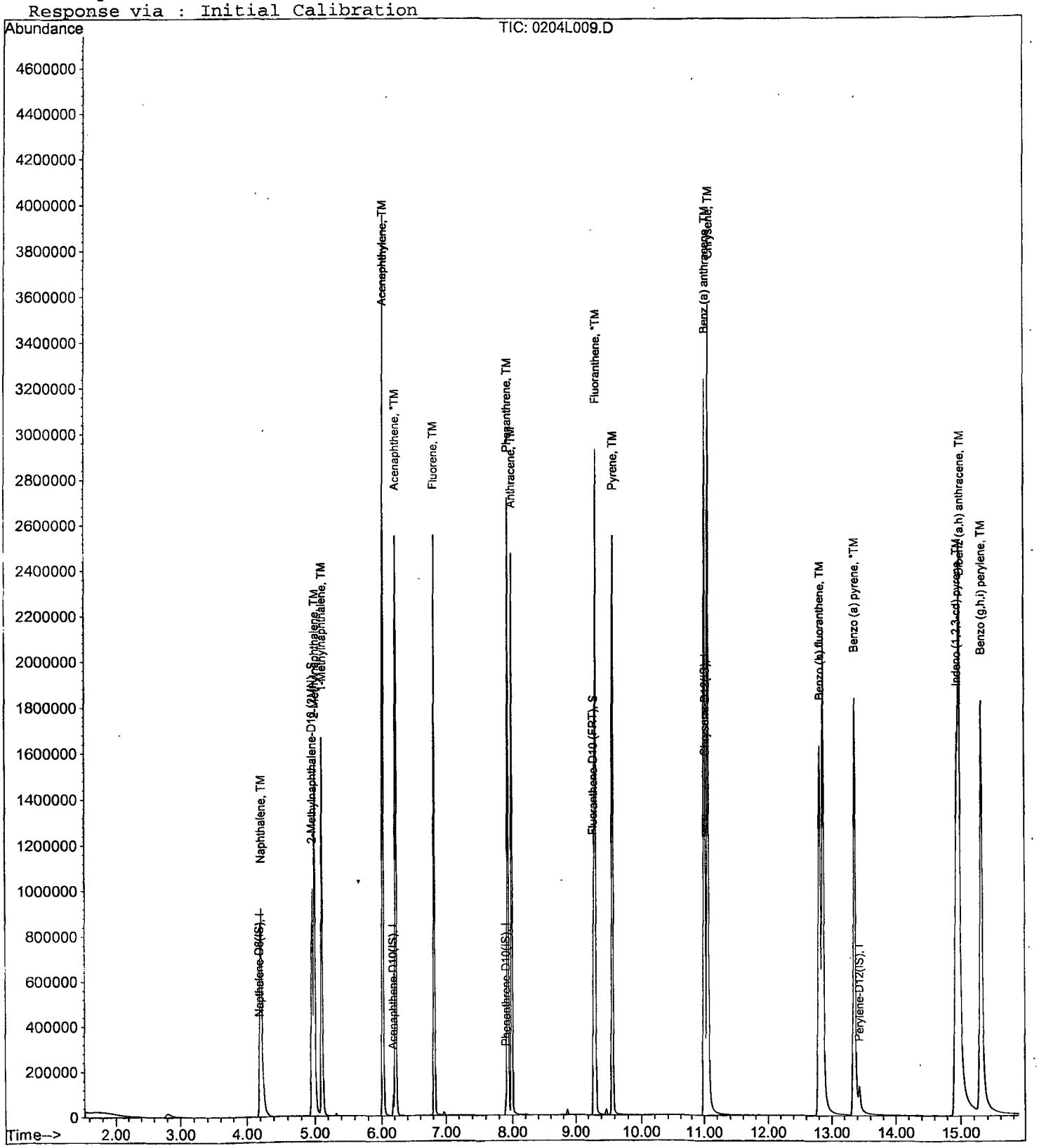
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L009.D Vial: 9
Acq On : 4 Feb 20 11:59 Operator: MA
Sample : 50 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 13:42 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L010.D Vial: 10
Acq On : 4 Feb 20 12:21 Operator: MA
Sample : 100 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:49 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:48:59 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	94154	2.50000	ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	49526	2.50000	ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	95687	2.50000	ppb		0.00
15) Chrysene-D12(IS)	11.03	240	125316	2.50000	ppb		0.02
20) Perylene-D12(IS)	13.45	264	141618	2.50000	ppb		0.01
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.96	152	2132841	47.06510	ppb		0.00
Spiked Amount 5.000			Recovery = 941.300%				
13) Fluoranthene-D10 (FRT)	9.29	212	2657919	48.74975	ppb		0.01
Spiked Amount 5.000			Recovery = 975.000%				
Target Compounds							Qvalue
2) Naphthalene	4.21	128	3515265	87.92823	ppb		98
4) 2-Methylnaphthalene	5.00	142	2314267	90.08958	ppb		99
5) 1-Methylnaphthalene	5.11	142	2325445	86.77018	ppb		99
7) Acenaphthylene	6.02	152	6802585	88.10489	ppb		97
8) Acenaphthene	6.23	154	2052134	84.22717	ppb		97
9) Fluorene	6.83	166	2744719	93.60760	ppb		100
11) Phenanthrene	7.94	178	3586911	80.58577	ppb		95
12) Anthracene	8.00	178	3368369	85.99155	ppb		95
14) Fluoranthene	9.33	202	5194710	85.53200	ppb		95
16) Pyrene	9.58	202	5580274	87.52935	ppb	#	84
17) Benz (a) anthracene	11.02	228	5418653	96.12929	ppb		94
18) Chrysene	11.08	228	5338591	81.34404	ppb		95
19) Indeno (1,2,3-cd) pyrene	14.99	276	7605000	103.10512	ppb	#	84
21) Benzo (b) fluoranthene	12.84	252	6397741	114.52991	ppb		95
22) Benzo (k) fluoranthene	12.90	252	6168270	86.51444	ppb		100
23) Benzo (a) pyrene	13.38	252	5827644	104.49972	ppb		95
24) Dibenz (a,h) anthracene	15.01	278	6436791	104.88555	ppb	#	94
25) Benzo (g,h,i) perylene	15.35	276	6483695	99.89693	ppb	#	93

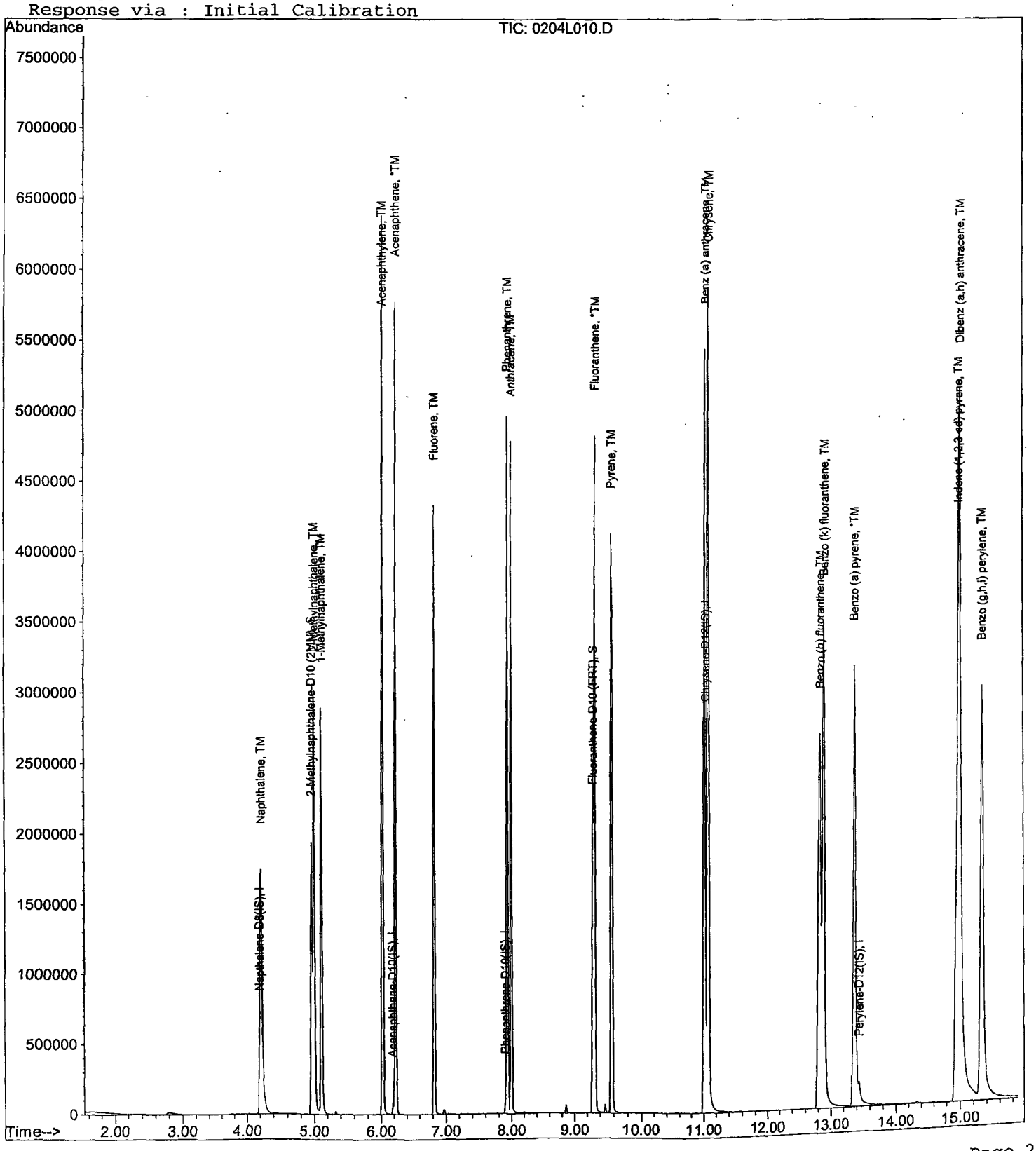
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L010.D Vial: 10
Acq On : 4 Feb 20 12:21 Operator: MA
Sample : 100 SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 12:49 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



PAH by GCMS SIM
EPA 8270 SIM

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 4 Feb 20 13:21
Instrument: Linus
Initial Cal. Date: 02/04/20
Data File: 0204L011.D

		Compound	MEAN	CCRF	%D		%Drift
1	TM	Naphthalene	1.062	1.033	2.7	TM	
2	TM	2-Methylnaphthalene	0.6821	0.6822	0.02	TM	
3	TM	1-Methylnaphthalene	0.7116	0.6901	3.0	TM	
4	TM	Acenaphthylene	3.897	3.871	0.68	TM	
5	*TM	Acenaphthene	1.230	1.178	4.2	*TM	
6	TM	Fluorene	1.480	1.459	1.5	TM	
7	TM	Phenanthrene	1.163	1.148	1.3	TM	
8	TM	Anthracene	1.023	1.104	7.8	TM	
9	*TM	Fluoranthene	1.587	1.568	1.2	*TM	
10	TM	Pyrene	1.272	1.242	2.3	TM	
11	TM	Benz (a) anthracene	1.125	1.066	5.2	TM	
12	TM	Chrysene	1.309	1.222	6.7	TM	
13	TM	Indeno (1,2,3-cd) pyrene	1.471	1.421	3.4	TM	
14	TM	Benzo (b) fluoranthene	0.9861	0.9690	1.7	TM	
15	TM	Benzo (k) fluoranthene	1.265	1.329	5.1	TM	
16	*TM	Benzo (a) pyrene	0.9845	1.048	6.4	*TM	
17	TM	Dibenz (a,h) anthracene	1.083	1.080	0.29	TM	
18	TM	Benzo (g,h,i) perylene	1.146	1.138	0.70	TM	
19							
20							
21							
22							
23							
24							
25							
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28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			3.0		

Quantitation Report (QT Reviewed)

Data File : M:\LINUS\DATA\L200204\0204L011.D Vial: 11
Acq On : 4 Feb 20 13:21 Operator: MA
Sample : SS SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 13:39 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.19	136	96451	2.50000	ppb		0.00
6) Acenaphthene-D10(IS)	6.18	164	52672	2.50000	ppb		0.00
10) Phenanthrene-D10(IS)	7.91	188	97686	2.50000	ppb		0.00
15) Chrysene-D12(IS)	11.01	240	126057	2.50000	ppb		0.00
20) Perylene-D12(IS)	13.43	264	136401	2.50000	ppb		0.00
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	0.00	152	0d	0.00000	ppb		
Spiked Amount 5.000			Recovery	=	0.000%		
13) Fluoranthene-D10 (FRT)	0.00	212	0d	0.00000	ppb		
Spiked Amount 5.000			Recovery	=	0.000%		
Target Compounds							Qvalue
2) Naphthalene	4.21	128	199297	4.86635	ppb		100
4) 2-Methylnaphthalene	5.00	142	131606	5.00114	ppb		100
5) 1-Methylnaphthalene	5.11	142	133123	4.84897	ppb		100
7) Acenaphthylene	6.02	152	407798	4.96620	ppb		100
8) Acenaphthene	6.22	154	124072	4.78822	ppb		100
9) Fluorene	6.82	166	153651	4.92722	ppb		99
11) Phenanthrene	7.93	178	224305	4.93625	ppb		99
12) Anthracene	7.99	178	215622	5.39200	ppb		100
14) Fluoranthene	9.30	202	306319	4.94040	ppb		98
16) Pyrene	9.57	202	313161	4.88321	ppb		98
17) Benz (a) anthracene	11.00	228	268691	4.73868	ppb		100
18) Chrysene	11.05	228	308124	4.66728	ppb	#	96
19) Indeno (1,2,3-cd) pyrene	14.92	276	358273	4.82875	ppb	#	95
21) Benzo (b) fluoranthene	12.79	252	264332	4.91296	ppb		99
22) Benzo (k) fluoranthene	12.84	252	362562	5.25367	ppb		99
23) Benzo (a) pyrene	13.35	252	285781	5.32055	ppb		97
24) Dibenz (a,h) anthracene	14.96	278	294697	4.98566	ppb		98
25) Benzo (g,h,i) perylene	15.29	276	310388	4.96518	ppb		99

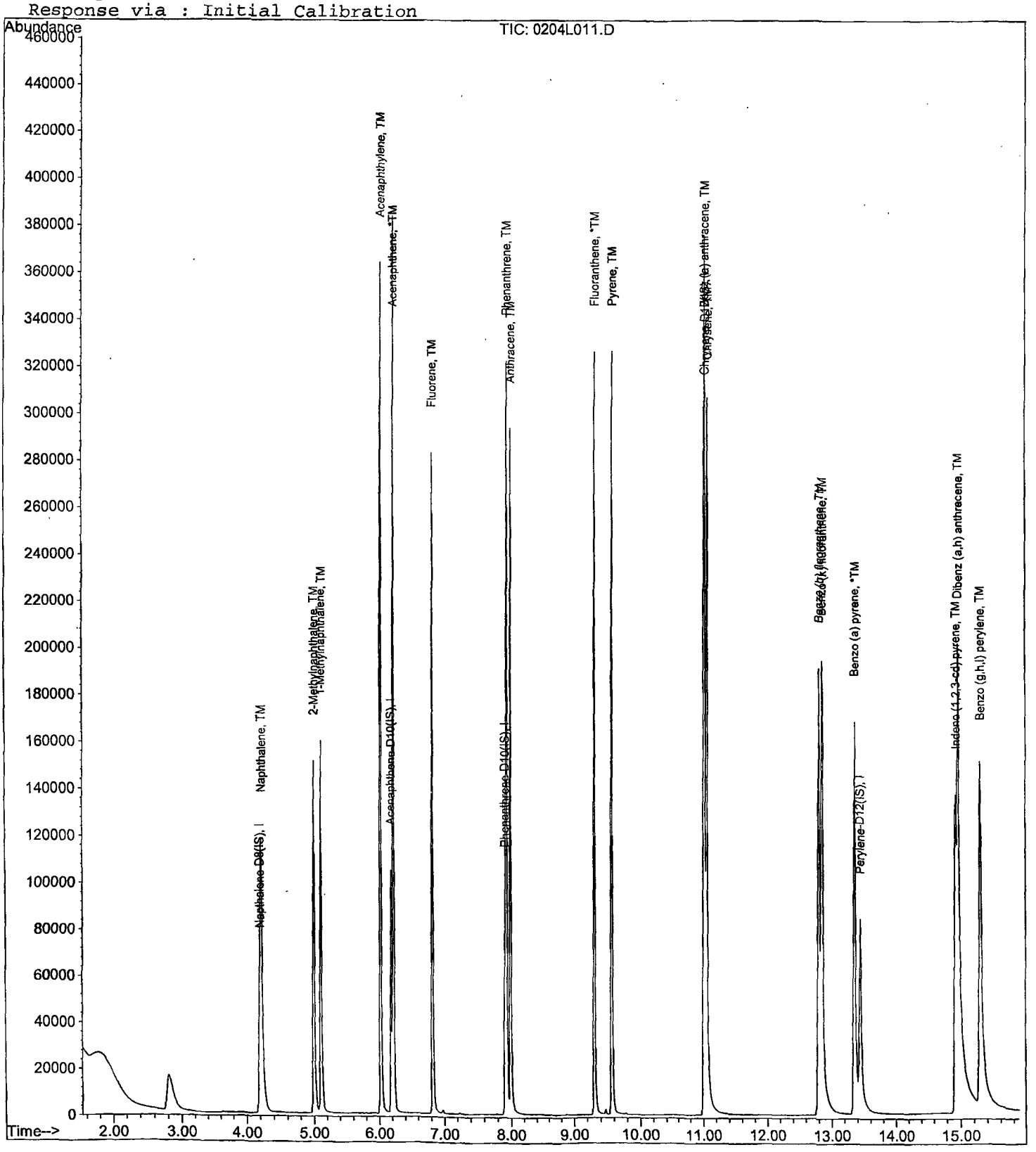
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200204\0204L011.D Vial: 11
Acq On : 4 Feb 20 13:21 Operator: MA
Sample : SS SIM 02/03/20 Inst : Linus
Misc : Multiplr: 1.00

Quant Time: Feb 4 13:39 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Tue Feb 04 12:55:27 2020
Response via : Initial Calibration



PAH by GCMS SIM
EPA 8270 SIM

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 6 May 20 8:54
Instrument: Linus
Initial Cal. Date: 02/04/20
Data File: 0424L171.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Napthalene-D8(IS)	ISTD			I	
2	TM	Naphthalene	1.062	1.030	3.0	TM	
3	S	2-Methylnaphthalene-D10 (2MN)	1.203	1.303	8.3	S	
4	TM	2-Methylnaphthalene	0.6821	0.6957	2.0	TM	
5	TM	1-Methylnaphthalene	0.7116	0.7245	1.8	TM	
6	I	Acenaphthene-D10(IS)	ISTD			I	
7	TM	Acenaphthylene	3.897	3.981	2.1	TM	
8	*TM	Acenaphthene	1.230	1.168	5.1	*TM	
9	TM	Fluorene	1.480	1.523	2.9	TM	
10	I	Phenanthrene-D10(IS)	ISTD			I	
11	TM	Phenanthrene	1.163	1.111	4.5	TM	
12	TM	Anthracene	1.023	1.042	1.8	TM	
13	S	Fluoranthene-D10 (FRT)	1.424	1.487	4.4	S	
14	*TM	Fluoranthene	1.587	1.559	1.8	*TM	
15	I	Chrysene-D12(IS)	ISTD			I	
16	TM	Pyrene	1.272	1.212	4.7	TM	
17	TM	Benz (a) anthracene	1.125	1.258	12	TM	
18	TM	Chrysene	1.309	1.170	11	TM	
19	TM	Indeno (1,2,3-cd) pyrene	1.471	1.720	17	TM	
20	I	Perylene-D12(IS)	ISTD			I	
21	TM	Benzo (b) fluoranthene	0.9861	1.052	6.7	TM	
22	TM	Benzo (k) fluoranthene	1.265	1.192	5.8	TM	
23	*TM	Benzo (a) pyrene	0.9845	1.051	6.8	*TM	
24	TM	Dibenz (a,h) anthracene	1.083	1.209	12	TM	
25	TM	Benzo (g,h,i) perylene	1.146	1.218	6.3	TM	
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			6.0		

Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L171.D Vial: 71
Acq On : 6 May 20 8:54 Operator: MA
Sample : 5 SIM 2/4/20 (3) Inst : Linus
Misc : Multiplr: 1.00

Quant Time: May 6 9:16 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.14	136	92595	2.500	ppb		-0.01
6) Acenaphthene-D10(IS)	6.13	164	51356	2.500	ppb		-0.02
10) Phenanthrene-D10(IS)	7.87	188	99414	2.500	ppb		-0.01
15) Chrysene-D12(IS)	10.99	240	128459	2.500	ppb		-0.01
20) Perylene-D12(IS)	13.42	264	157407	2.500	ppb		0.01
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.91	152	120647	2.707	ppb		0.00
Spiked Amount 5.000			Recovery =	54.140%			
13) Fluoranthene-D10 (FRT)	9.25	212	147788	2.609	ppb		0.00
Spiked Amount 5.000			Recovery =	52.180%			
Target Compounds							Qvalue
2) Naphthalene	4.15	128	190783	4.852	ppb		99
4) 2-Methylnaphthalene	4.95	142	128837	5.100	ppb		98
5) 1-Methylnaphthalene	5.06	142	134176	5.091	ppb		97
7) Acenaphthylene	5.98	152	408888	5.107	ppb		99
8) Acenaphthene	6.17	154	119942	4.747	ppb		98
9) Fluorene	6.77	166	156477	5.146	ppb		95
11) Phenanthrene	7.89	178	220868	4.776	ppb		100
12) Anthracene	7.95	178	207142	5.090	ppb		100
14) Fluoranthene	9.27	202	309929	4.912	ppb		96
16) Pyrene	9.53	202	311430	4.765	ppb		94
17) Benz (a) anthracene	10.97	228	323238	5.594	ppb		99
18) Chrysene	11.02	228	300570	4.468	ppb	#	97
19) Indeno (1,2,3-cd) pyrene	14.91	276	442015	5.846	ppb		97
21) Benzo (b) fluoranthene	12.76	252	331216	5.335	ppb	#	99
22) Benzo (k) fluoranthene	12.82	252	375164	4.711	ppb		100
23) Benzo (a) pyrene	13.33	252	330956	5.339	ppb		98
24) Dibenz (a,h) anthracene	14.95	278	380514	5.578	ppb		99
25) Benzo (g,h,i) perylene	15.29	276	383337	5.314	ppb	#	96

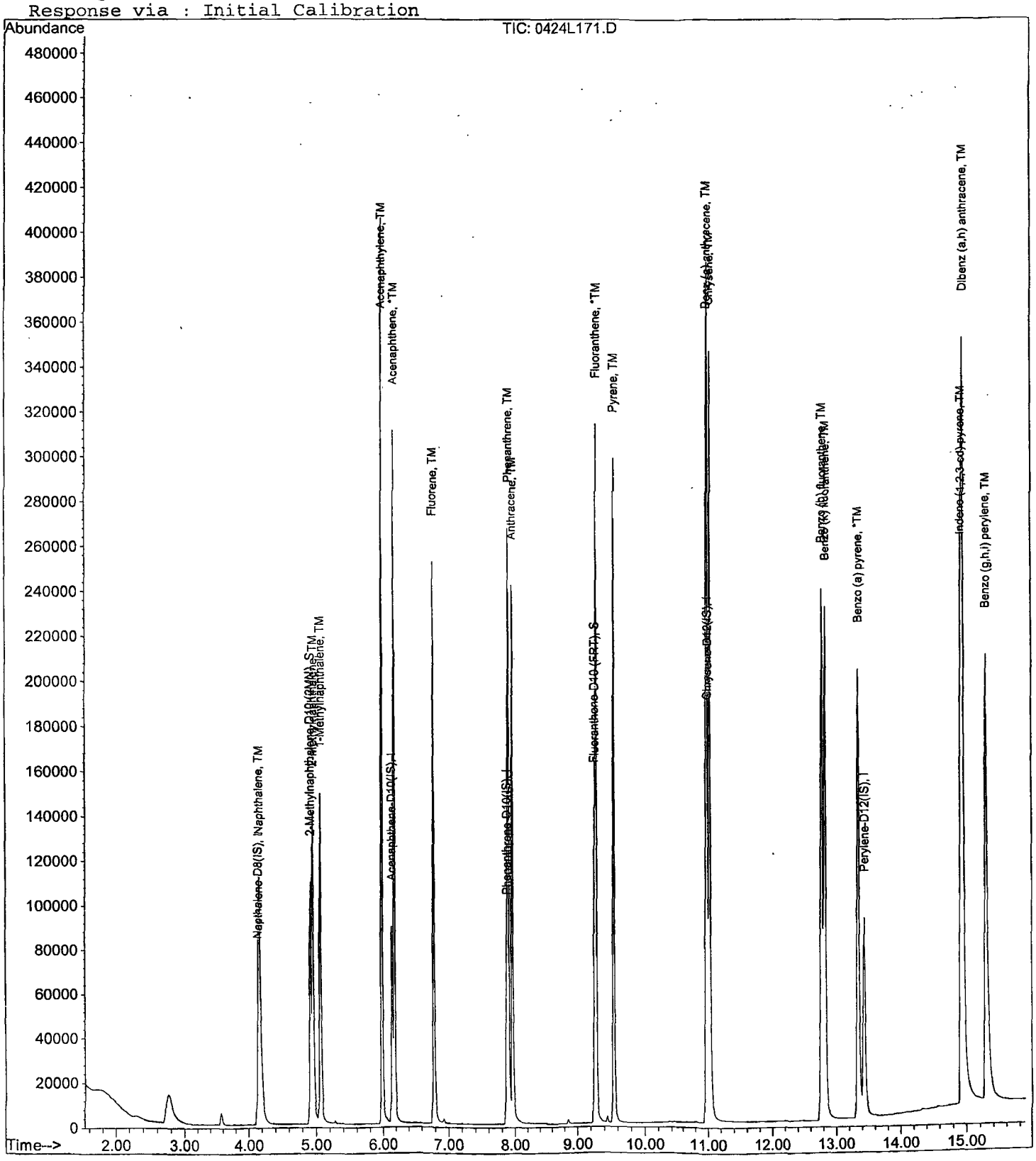
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L171.D Vial: 71
Acq On : 6 May 20 8:54 Operator: MA
Sample : 5 SIM 2/4/20 (3) Inst : Linus
Misc : Multiplr: 1.00

Quant Time: May 6 9:16 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



PAH by GCMS SIM
EPA 8270 SIM

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 6 May 20 12:52
Instrument: Linus
Initial Cal. Date: 02/04/20
Data File: 0424L178.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Napthalene-D8(IS)	ISTD			I	
2	TM	Naphthalene	1.062	0.9711	8.5	TM	
3	S	2-Methylnaphthalene-D10 (2MN)	1.203	1.208	0.39	S	
4	TM	2-Methylnaphthalene	0.6821	0.6459	5.3	TM	
5	TM	1-Methylnaphthalene	0.7116	0.6802	4.4	TM	
6	I	Acenaphthene-D10(IS)	ISTD			I	
7	TM	Acenaphthylene	3.897	3.719	4.6	TM	
8	*TM	Acenaphthene	1.230	1.102	10	*TM	
9	TM	Fluorene	1.480	1.404	5.2	TM	
10	I	Phenanthrene-D10(IS)	ISTD			I	
11	TM	Phenanthrene	1.163	1.030	11	TM	
12	TM	Anthracene	1.023	0.9855	3.7	TM	
13	S	Fluoranthene-D10 (FRT)	1.424	1.377	3.4	S	
14	*TM	Fluoranthene	1.587	1.452	8.5	*TM	
15	I	Chrysene-D12(IS)	ISTD			I	
16	TM	Pyrene	1.272	1.143	10	TM	
17	TM	Benz (a) anthracene	1.125	1.118	0.59	TM	
18	TM	Chrysene	1.309	1.149	12	TM	
19	TM	Indeno (1,2,3-cd) pyrene	1.471	1.587	7.8	TM	
20	I	Perylene-D12(IS)	ISTD			I	
21	TM	Benzo (b) fluoranthene	0.9861	0.9998	1.4	TM	
22	TM	Benzo (k) fluoranthene	1.265	1.116	12	TM	
23	*TM	Benzo (a) pyrene	0.9845	0.9875	0.31	*TM	
24	TM	Dibenz (a,h) anthracene	1.083	1.132	4.5	TM	
25	TM	Benzo (g,h,i) perylene	1.146	1.109	3.2	TM	
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			5.8		

Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L178.D Vial: 78
Acq On : 6 May 20 12:52 Operator: MA
Sample : 5 SIM 2/4/20 (4) Inst : Linus
Misc : Multiplr: 1.00

Quant Time: May 6 14:32 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.14	136	73064	2.50000 ppb		-0.01
6) Acenaphthene-D10(IS)	6.14	164	40148	2.50000 ppb		-0.01
10) Phenanthrene-D10(IS)	7.87	188	78468	2.50000 ppb		-0.01
15) Chrysene-D12(IS)	10.99	240	100616	2.50000 ppb		-0.01
20) Perylene-D12(IS)	13.43	264	122260	2.50000 ppb		0.02
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.91	152	88257	2.50972 ppb		0.00
Spiked Amount 5.000			Recovery	= 50.200%		
13) Fluoranthene-D10 (FRT)	9.26	212	108012	2.41581 ppb		0.00
Spiked Amount 5.000			Recovery	= 48.320%		
Target Compounds						Qvalue
2) Naphthalene	4.17	128	141911	4.57427 ppb		100
4) 2-Methylnaphthalene	4.95	142	94389	4.73498 ppb		99
5) 1-Methylnaphthalene	5.06	142	99391	4.77911 ppb		98
7) Acenaphthylene	5.98	152	298630	4.77121 ppb		98
8) Acenaphthene	6.18	154	88503	4.48099 ppb		93
9) Fluorene	6.78	166	112707	4.74169 ppb		100
11) Phenanthrene	7.89	178	161711	4.43035 ppb		99
12) Anthracene	7.95	178	154668	4.81501 ppb		99
14) Fluoranthene	9.28	202	227856	4.57497 ppb		96
16) Pyrene	9.54	202	229907	4.49148 ppb		99
17) Benz (a) anthracene	10.98	228	224953	4.97045 ppb		99
18) Chrysene	11.02	228	231272	4.38896 ppb	#	96
19) Indeno (1,2,3-cd) pyrene	14.93	276	319262	5.39098 ppb		100
21) Benzo (b) fluoranthene	12.77	252	244463	5.06920 ppb	#	99
22) Benzo (k) fluoranthene	12.82	252	272771	4.40973 ppb		99
23) Benzo (a) pyrene	13.34	252	241467	5.01550 ppb		98
24) Dibenz (a,h) anthracene	14.96	278	276876	5.22595 ppb		99
25) Benzo (g,h,i) perylene	15.30	276	271132	4.83888 ppb	#	95

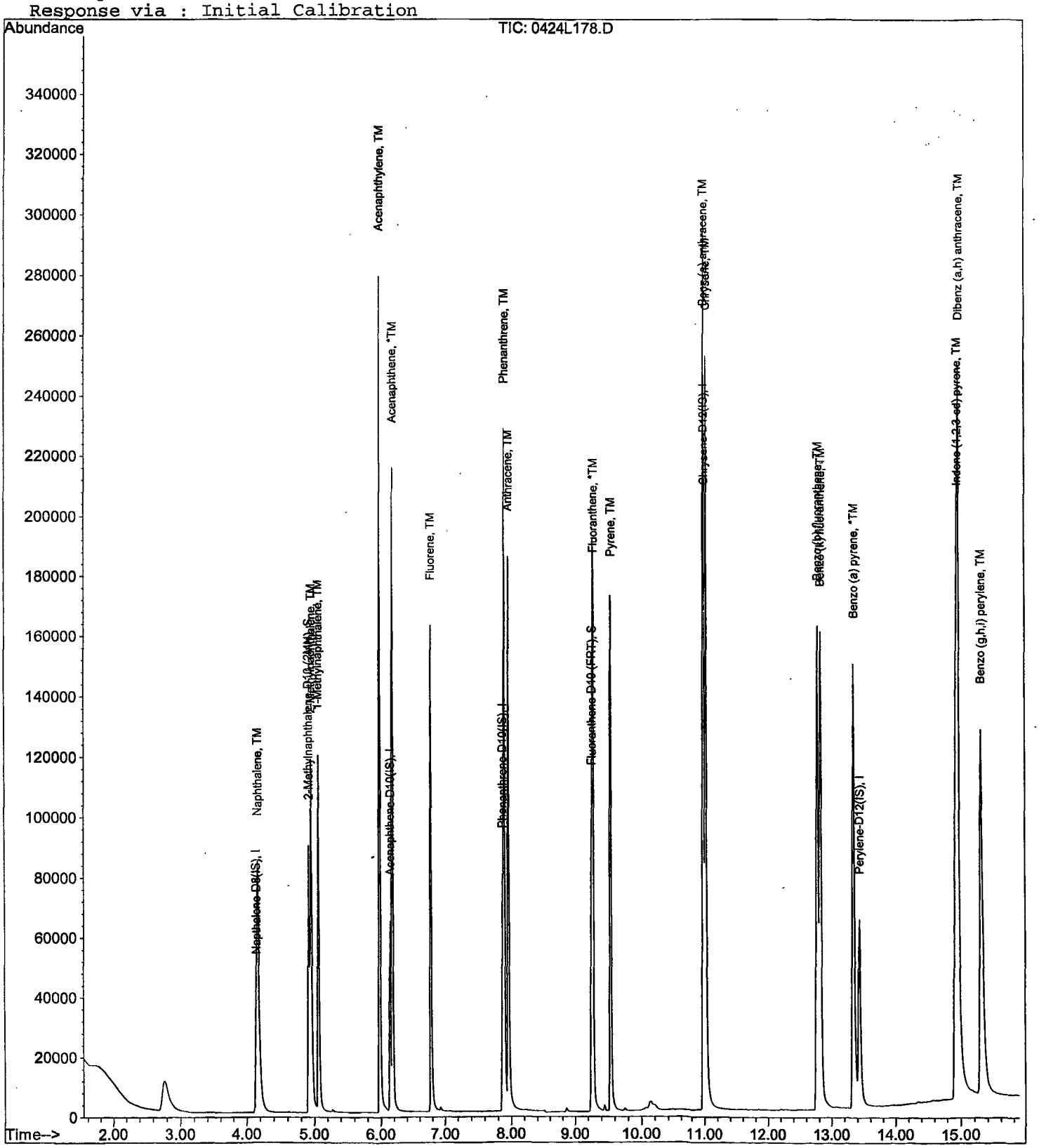
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L178.D Vial: 78
Acq On : 6 May 20 12:52 Operator: MA
Sample : 5 SIM 2/4/20 (4) Inst : Linus
Misc : Multiplr: 1.00

Quant Time: May 6 14:32 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L176.D Vial: 76
Acq On : 6 May 20 11:51 Operator: MA
Sample : BA10504W18 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 12:13 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Napthalene-D8(IS)	4.14	136	84871	2.50000 ppb	-0.01
6) Acenaphthene-D10(IS)	6.13	164	45755	2.50000 ppb	-0.02
10) Phenanthrene-D10(IS)	7.87	188	94491	2.50000 ppb	-0.01
15) Chrysene-D12(IS)	10.99	240	124300	2.50000 ppb	-0.01
20) Perylene-D12(IS)	13.43	264	44184	2.50000 ppb	0.02
System Monitoring Compounds					
3) 2-Methylnaphthalene-D10 (2	4.91	152	159694	4.88673 ppb	0.00
Spiked Amount 6.250			Recovery	= 78.192%	
13) Fluoranthene-D10 (FRT)	9.25	212	196039	4.55141 ppb	0.00
Spiked Amount 6.250			Recovery	= 72.816%	

Target Compounds Qvalue

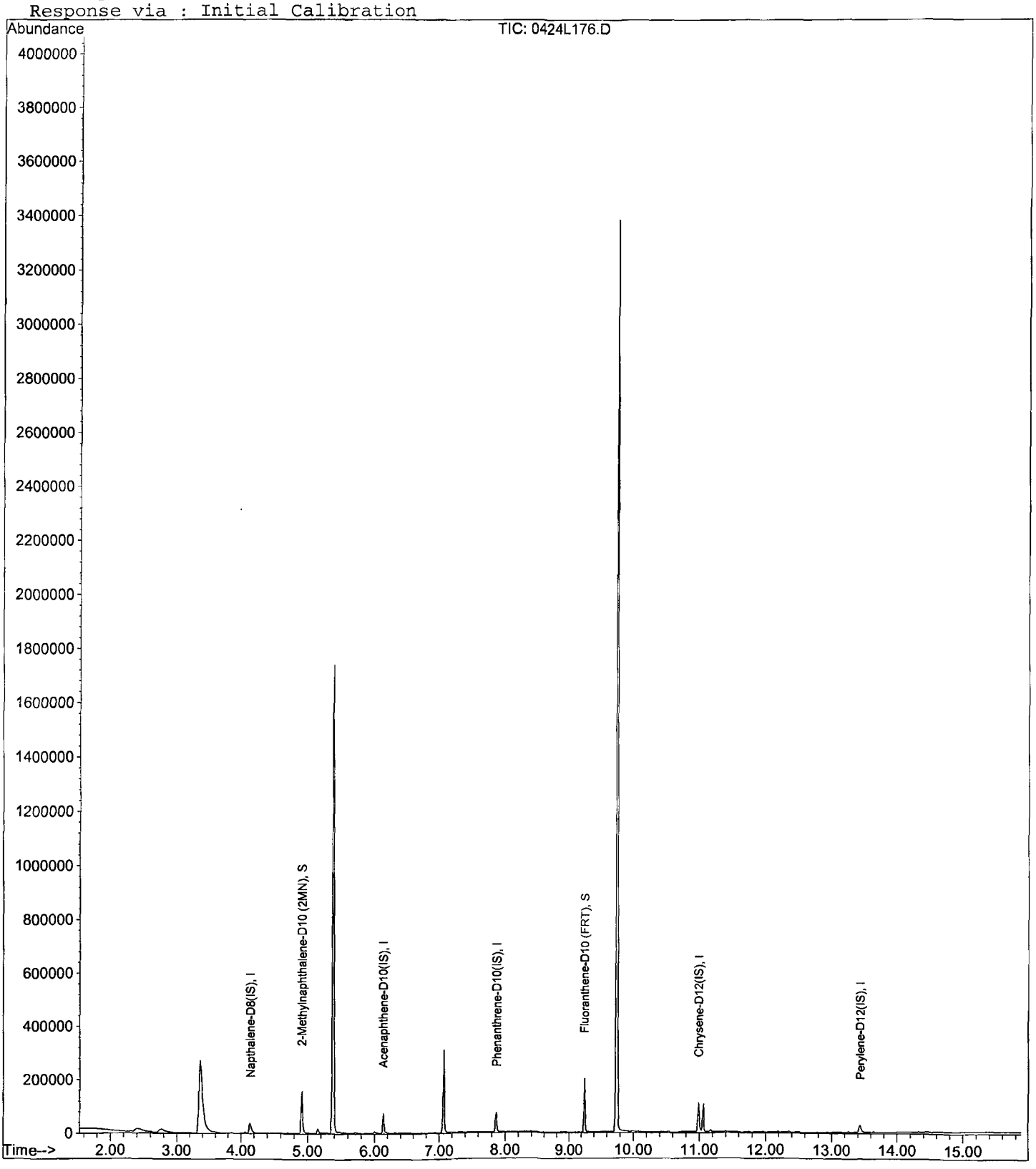
(#) = qualifier out of range (m) = manual integration
0424L176.D L0204.M Wed May 06 16:43:37 2020 Page 1

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L176.D Vial: 76
Acq On : 6 May 20 11:51 Operator: MA
Sample : BA10504W18 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 12:13 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L177.D Vial: 77
Acq On : 6 May 20 12:13 Operator: MA
Sample : BA10505W11 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 12:31 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Napthalene-D8(IS)	4.14	136	88846	2.50000 ppb	-0.01
6) Acenaphthene-D10(IS)	6.13	164	48973	2.50000 ppb	-0.02
10) Phenanthrene-D10(IS)	7.87	188	94421	2.50000 ppb	-0.01
15) Chrysene-D12(IS)	10.99	240	125503	2.50000 ppb	-0.01
20) Perylene-D12(IS)	13.42	264	153307	2.50000 ppb	0.01
System Monitoring Compounds					
3) 2-Methylnaphthalene-D10 (2	4.91	152	149013	4.35588 ppb	0.00
Spiked Amount 6.250			Recovery =	69.696%	
13) Fluoranthene-D10 (FRT)	9.25	212	194250	4.51322 ppb	0.00
Spiked Amount 6.250			Recovery =	72.208%	

Target Compounds	Qvalue

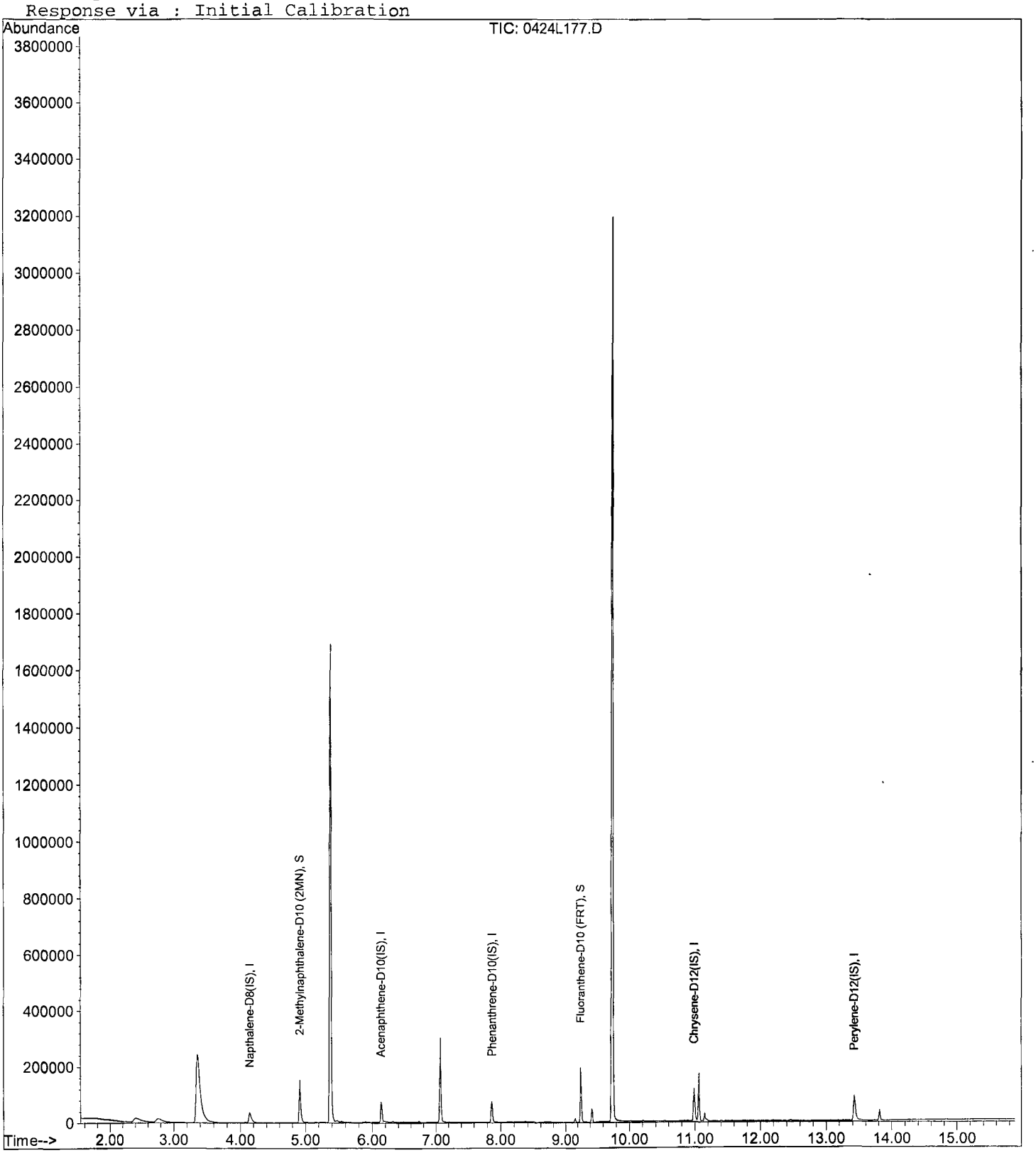
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L177.D Vial: 77
Acq On : 6 May 20 12:13 Operator: MA
Sample : BA10505W11 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 12:31 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L172.D Vial: 72
Acq On : 6 May 20 10:23 Operator: MA
Sample : 200504A BLK 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:39 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Napthalene-D8(IS)	4.14	136	80484	2.50000 ppb	-0.01
6) Acenaphthene-D10(IS)	6.13	164	42134	2.50000 ppb	-0.02
10) Phenanthrene-D10(IS)	7.87	188	91708	2.50000 ppb	-0.01
15) Chrysene-D12(IS)	10.99	240	114406	2.50000 ppb	-0.01
20) Perylene-D12(IS)	13.43	264	19823	2.50000 ppb	0.02
System Monitoring Compounds					
3) 2-Methylnaphthalene-D10 (2	4.91	152	162227	5.23483 ppb	0.00
Spiked Amount 6.250			Recovery	= 83.760%	
13) Fluoranthene-D10 (FRT)	9.25	212	195922	4.68673 ppb	0.00
Spiked Amount 6.250			Recovery	= 74.992%	
Target Compounds					Qvalue

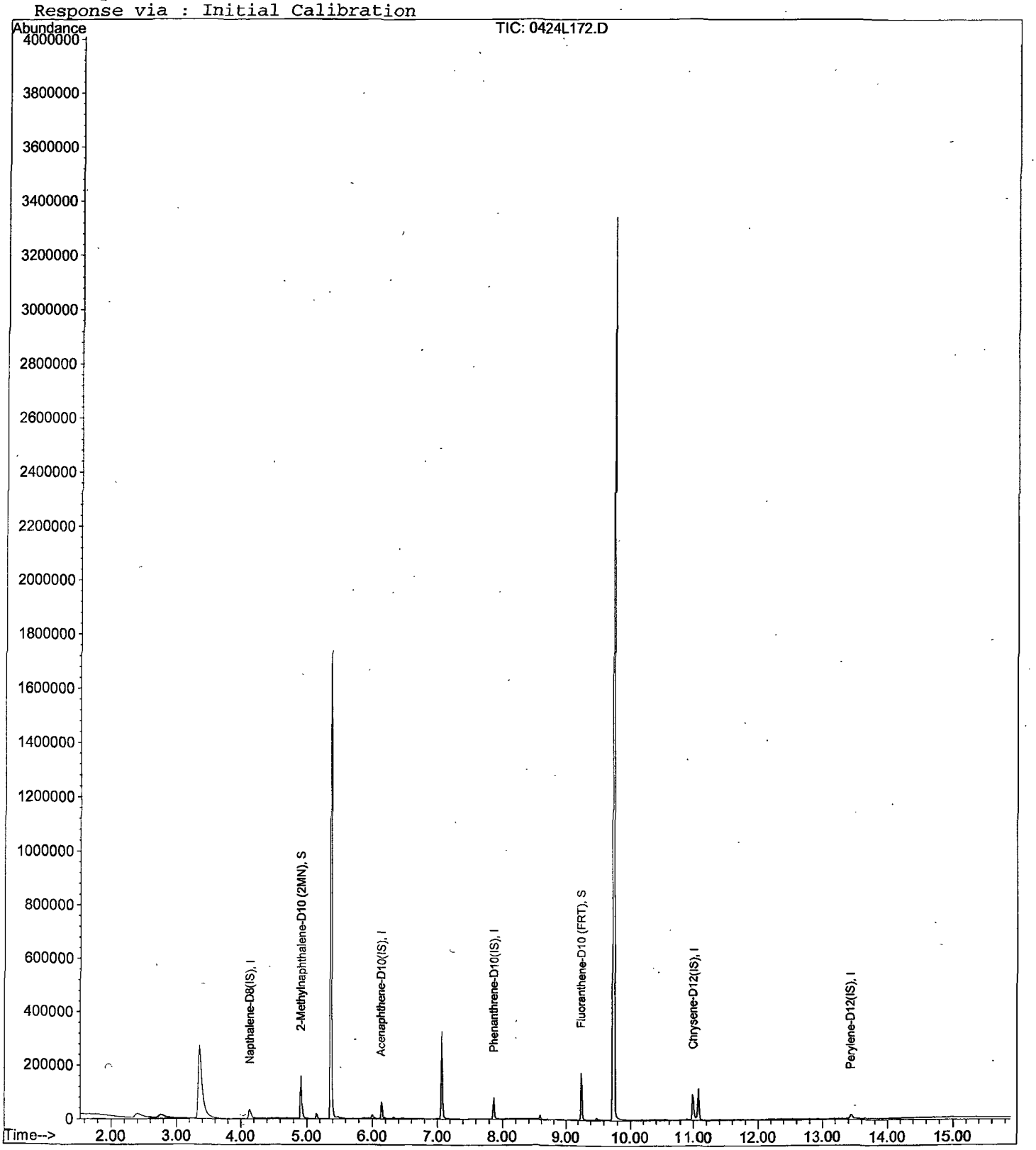
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L172.D Vial: 72
Acq On : 6 May 20 10:23 Operator: MA
Sample : 200504A BLK 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:39 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L173.D Vial: 73
Acq On : 6 May 20 10:45 Operator: MA
Sample : 200504A LCS-2 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:39 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Napthalene-D8(IS)	4.14	136	82766	2.50000	ppb		-0.01
6) Acenaphthene-D10(IS)	6.13	164	30697	2.50000	ppb		-0.02
10) Phenanthrene-D10(IS)	7.86	188	87731	2.50000	ppb		-0.02
15) Chrysene-D12(IS)	10.99	240	99404	2.50000	ppb		-0.01
20) Perylene-D12(IS)	13.43	264	5072	2.50000	ppb		0.02
System Monitoring Compounds							
3) 2-Methylnaphthalene-D10 (2	4.91	152	149089	4.67824	ppb		0.00
Spiked Amount 6.250			Recovery	= 74.848%			
13) Fluoranthene-D10 (FRT)	9.25	212	172653	4.31732	ppb		0.00
Spiked Amount 6.250			Recovery	= 69.072%			
Target Compounds							Qvalue
2) Naphthalene	4.17	128	125746	4.47261	ppb		100
4) 2-Methylnaphthalene	4.95	142	83558	4.62536	ppb		97
5) 1-Methylnaphthalene	5.06	142	84206	4.46791	ppb		96
7) Acenaphthylene	5.98	152	77425	2.02234	ppb		100
8) Acenaphthene	6.17	154	67255	5.56696	ppb		99
9) Fluorene	6.77	166	103418	7.11306	ppb		95
11) Phenanthrene	7.89	178	146947	4.50099	ppb		100
12) Anthracene	7.95	178	109041	3.79521	ppb		100
14) Fluoranthene	9.27	202	201595	4.52540	ppb		99
16) Pyrene	9.53	202	148387	3.66781	ppb		97
17) Benz (a) anthracene	10.97	228	191959	5.36643	ppb		99
18) Chrysene	11.02	228	195234	4.68778	ppb	#	98
19) Indeno (1,2,3-cd) pyrene	14.93	276	207636	4.43605	ppb	#	91
21) Benzo (b) fluoranthene	12.77	252	226755	141.67667	ppb		99
22) Benzo (k) fluoranthene	12.82	252	201144	97.97967	ppb		99
23) Benzo (a) pyrene	13.34	252	71686	44.86479	ppb		98
24) Dibenz (a,h) anthracene	14.96	278	232532	132.24468	ppb		99
25) Benzo (g,h,i) perylene	15.30	276	167858	90.26530	ppb	#	95

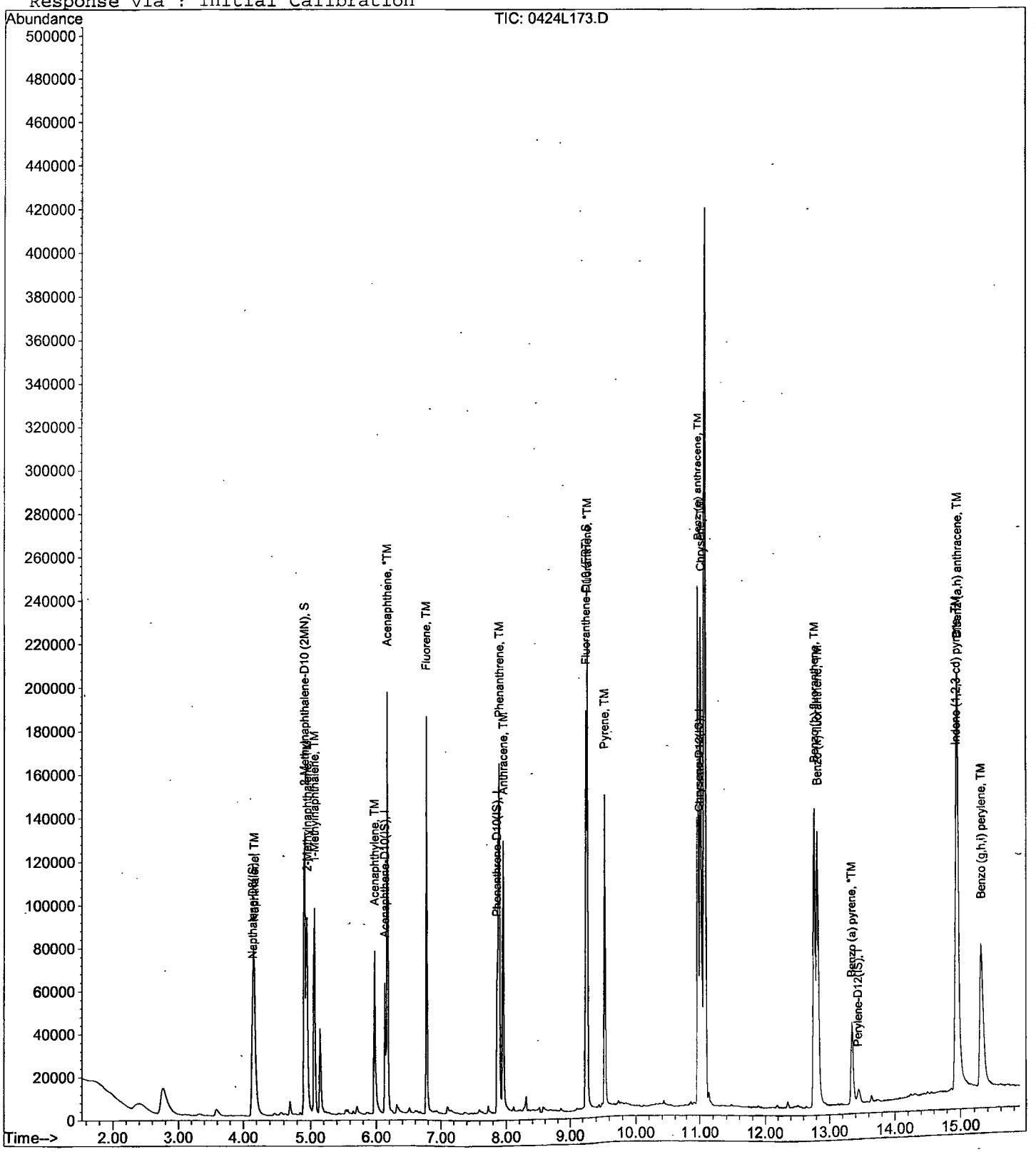
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L173.D Vial: 73
Acq On : 6 May 20 10:45 Operator: MA
Sample : 200504A LCS-2 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:39 2020 Quant Results File: L0204.RES

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\LINUS\DATA\L200424\0424L174.D Vial: 74
Acq On : 6 May 20 11:07 Operator: MA
Sample : 200504A LCSD-2 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:40 2020 Quant Results File: L0204.RES

Quant Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration
DataAcq Meth : SIM_2

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Napthalene-D8(IS)	4.14	136	84996	2.50000 ppb		-0.01
6) Acenaphthene-D10(IS)	6.13	164	46150	2.50000 ppb		-0.02
10) Phenanthrene-D10(IS)	7.86	188	92781	2.50000 ppb		-0.02
15) Chrysene-D12(IS)	10.98	240	119811	2.50000 ppb		-0.02
20) Perylene-D12(IS)	13.42	264	87066	2.50000 ppb		0.01
System Monitoring Compounds						
3) 2-Methylnaphthalene-D10 (2	4.91	152	148414	4.53488 ppb		0.00
Spiked Amount 6.250			Recovery	= 72.560%		
13) Fluoranthene-D10 (FRT)	9.25	212	189933	4.49092 ppb		0.00
Spiked Amount 6.250			Recovery	= 71.856%		
Target Compounds						Qvalue
2) Naphthalene	4.17	128	125714	4.35416 ppb		100
4) 2-Methylnaphthalene	4.95	142	84481	4.55376 ppb		97
5) 1-Methylnaphthalene	5.06	142	84578	4.36991 ppb		97
7) Acenaphthylene	5.98	152	200242	3.47899 ppb		99
8) Acenaphthene	6.17	154	76090	4.18934 ppb		100
9) Fluorene	6.77	166	103256	4.72389 ppb		96
11) Phenanthrene	7.89	178	150607	4.36201 ppb		100
12) Anthracene	7.95	178	91669	3.01691 ppb		100
14) Fluoranthene	9.27	202	208779	4.43157 ppb		100
16) Pyrene	9.53	202	201268	4.12755 ppb		98
17) Benz (a) anthracene	10.97	228	197717	4.58594 ppb		99
18) Chrysene	11.02	228	216521	4.31339 ppb	#	98
19) Indeno (1,2,3-cd) pyrene	14.92	276	287293	5.09244 ppb		100
21) Benzo (b) fluoranthene	12.76	252	253812	9.23813 ppb	#	98
22) Benzo (k) fluoranthene	12.82	252	222222	6.30589 ppb		99
23) Benzo (a) pyrene	13.34	252	163977	5.97840 ppb	#	97
24) Dibenz (a,h) anthracene	14.95	278	254855	8.44344 ppb		98
25) Benzo (g,h,i) perylene	15.29	276	237700	7.44627 ppb	#	94

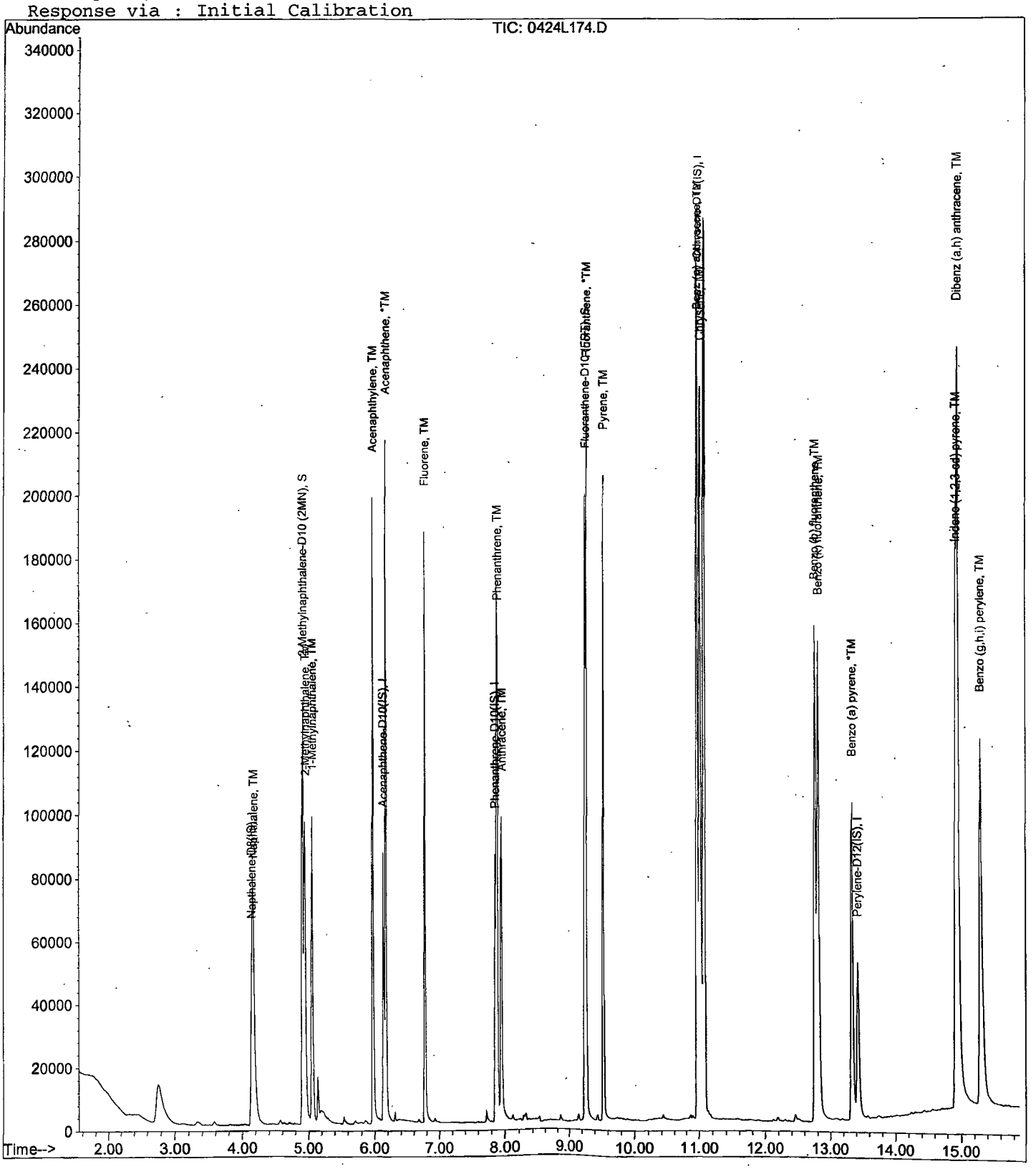
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\LINUS\DATA\L200424\0424L174.D Vial: 74
Acq On : 6 May 20 11:07 Operator: MA
Sample : 200504A LCSD-2 1/800 Inst : Linus
Misc : Multiplr: 1.25

Quant Time: May 6 11:40 2020 Quant Results File: L0204.RES

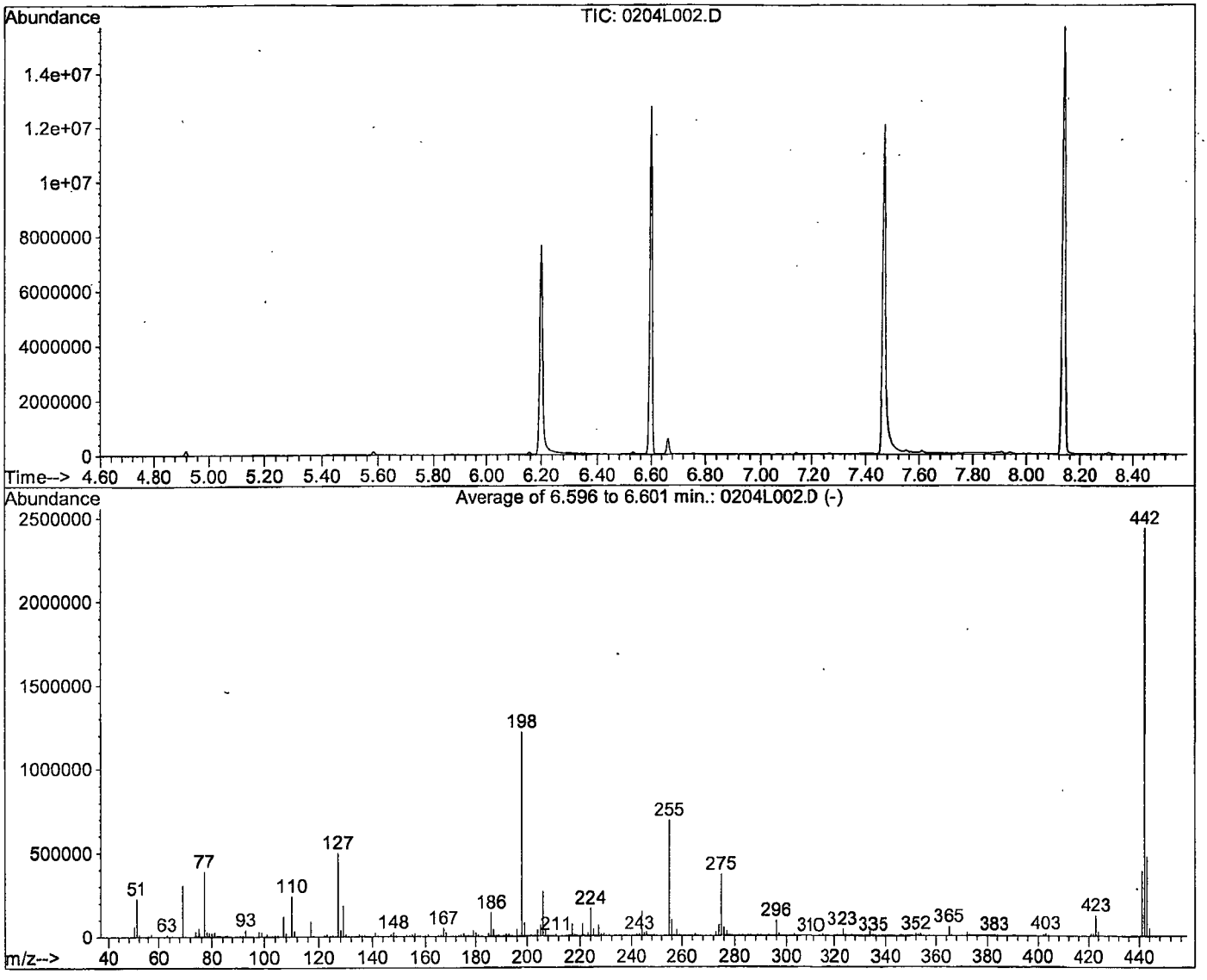
Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270
Last Update : Thu Mar 05 12:40:10 2020
Response via : Initial Calibration



DFTPP

Data File : M:\LINUS\DATA\L200204\0204L002.D Vial: 2
Acq On : 4 Feb 20 9:32 Operator: MA
Sample : SV Tune 10/01/19 Inst : Linus
Misc : Multiplr: 1.00

Method : M:\LINUS\DATA\L200204\L0204.M (RTE Integrator)
Title : EPA 8270



AutoFind: Scans 1611, 1612, 1613; Background Corrected with Scan 1602

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	18.6	226705	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.4	1215	PASS
127	198	10	80	40.9	497237	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	1216619	PASS
199	198	5	9	6.3	77030	PASS
275	198	10	60	30.0	364907	PASS
365	198	1	100	4.7	56864	PASS
441	442	0.01	24	15.8	386027	PASS
442	198	50	500	200.3	2437461	PASS
443	442	15	24	19.3	470891	PASS

Data File Name:	**0204L002.D**
Data File Path:	**M:\LINUS\DATA\L200204**
Operator:	**MA**
Date Acquired:	**4 Feb 20 9:32**
Method File:	**DFTPP2.M**
Sample Name:	**SV Tune 10/01/19**
Vial Number:	**2**
Instrument Name:	**Linus**

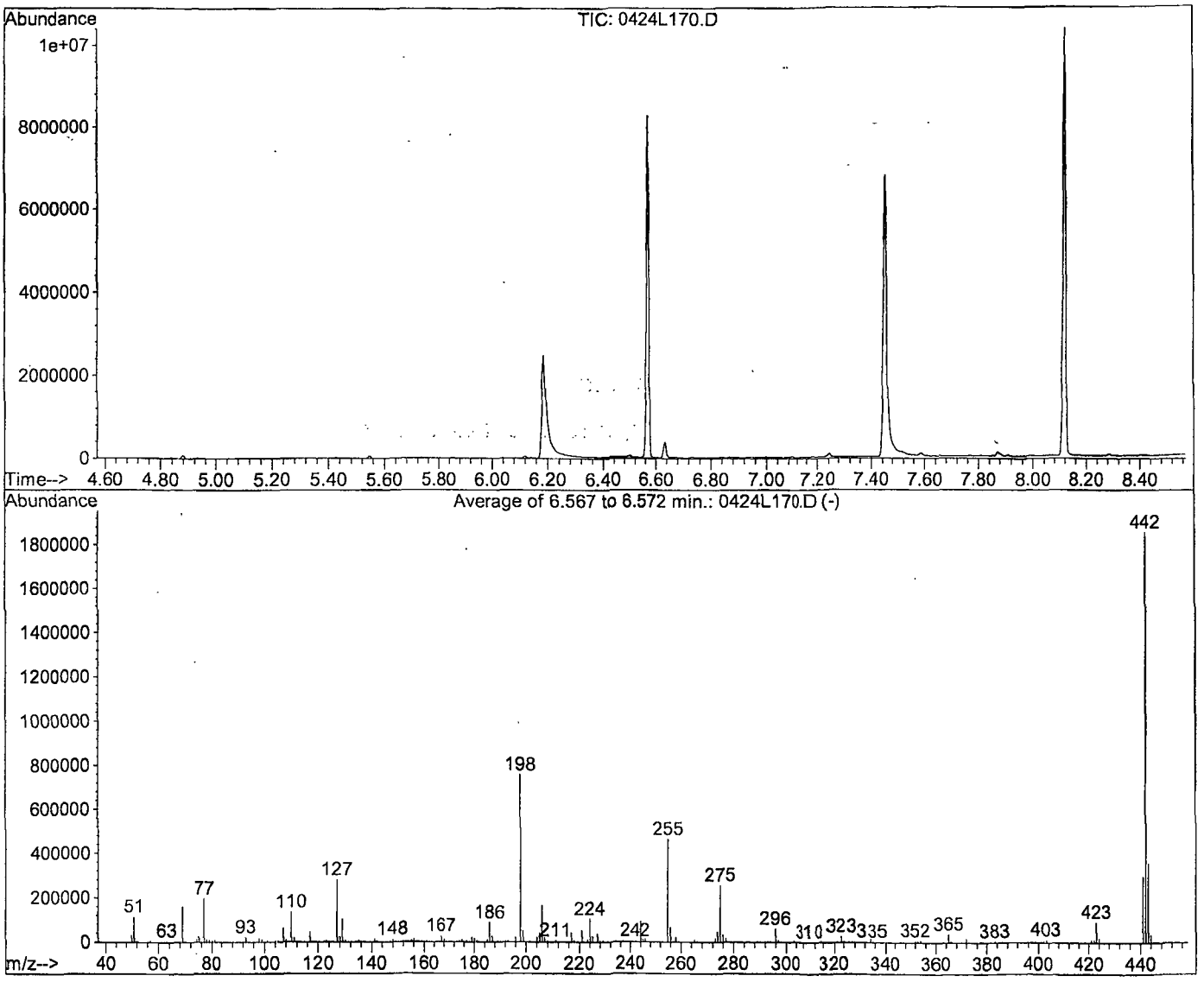
#	Name	Ret Time	Target Response
1)	DDT	8.16	112940000
2)	DDD	7.91	651825
3)	DDE	7.63	587422

Breakdown **1.09**

DFTPP

Data File : M:\LINUS\DATA\L200424\0424L170.D Vial: 70
Acq On : 6 May 20 8:38 Operator: MA
Sample : SV TUNE 10/1/19 Inst : Linus
Misc : Multiplr: 1.00

Method : M:\LINUS\DATA\L200424\L0204.M (RTE Integrator)
Title : EPA 8270



AutoFind: Scans 1599, 1600, 1601; Background Corrected with Scan 1590

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	15.2	114862	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.5	859	PASS
127	198	10	80	37.0	280354	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	757696	PASS
199	198	5	9	6.6	50349	PASS
275	198	10	60	33.6	254421	PASS
365	198	1	100	4.8	36515	PASS
441	442	0.01	24	15.9	295829	PASS
442	198	50	500	245.4	1859413	PASS
443	442	15	24	19.1	354517	PASS

Data File Name:	**0424L170.D**
Data File Path:	**M:\LINUS\DATA\L200424**
Operator:	**MA**
Date Acquired:	**6 May 20 8:38**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/1/19**
Vial Number:	**70**
Instrument Name:	**Linus**

#	Name	Ret Time	Target Response
1)	DDT	8.12	72191800
2)	DDD	7.87	1176610
3)	DDE	7.59	543426

Breakdown **2.33**

Name of Final Standard SIM Curve

Prep'd By (Initials) MA

Prep Date 02/03/20

Exp Date 08/10/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
1.0 ug/mL SIM	APPL	1.0 ug/mL SIM	1.0 ug/mL	02/03/20	08/10/20	10 uL	100uL	MC 59130 90uL	0.1 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
1.0 ug/mL SIM	APPL	1.0 ug/mL SIM	1.0 ug/mL	02/03/20	08/10/20	20 uL	100uL	MC 59130 80uL	0.2 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
5.0 ug/mL SIM	APPL	5.0 ug/mL SIM	5.0 ug/mL	02/03/20	08/10/20	10 uL	100uL	MC 59130 90uL	0.5 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
5.0 ug/mL SIM	APPL	5.0 ug/mL SIM	5.0 ug/mL	02/03/20	08/10/20	20 uL	100uL	MC 59130 80 uL	1.0 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
SIM STOCK	APPL	PAH SIM STOCK	200 ug/mL	08/10/19	08/10/20	5 uL	200uL	MC 59130 190 uL	5.0 ug/mL
SIM SURROGATE	APPL	SIM SURR	100 ug/mL	12/17/19	12/17/20	5 uL	"	"	2.5ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	4 uL	"	"	2.5ug/mL
SIM STOCK	APPL	PAH SIM STOCK	200 ug/mL	08/10/19	08/10/20	5 uL	100 uL	MC 59130 80 uL	10 ug/mL
SIM SURROGATE	APPL	SIM SURR	100 ug/mL	12/17/19	12/17/20	5 uL	"	"	5 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
SIM STOCK	APPL	PAH SIM STOCK	200	08/10/19	08/10/20	25 uL	100uL	MC 59130 50 uL	50 ug/mL
SIM SURROGATE	APPL	SIM SURR	100 ug/mL	12/17/19	12/17/20	25 uL	"	"	25 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL
SIM STOCK	APPL	PAH SIM STOCK	200 ug/mL	08/10/19	08/10/20	50 uL	100uL	na	100 ug/mL
SIM SURROGATE	APPL	SIM SURR	100 ug/mL	12/17/19	12/17/20	50 uL	"	"	50 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	2 uL	"	"	2.5ug/mL

Name of Final Standard 8270 PAH SIM Second Source

Prep'd By (Initials) MA

Prep Date 02/03/20

Exp Date 10/28/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
PAH SIM SS Stock	Phenova	AL0-130490	200 ug/mL	CL13117-40623. Open 7/24/19	12/31/22	5 uL	200uL	MC 59130 195uL	5 ug/mL
SIM Internal Standard	APPL	SIM Internal Standard	125 ug/mL	10/28/19	10/28/20	4 uL	"	"	2.5ug/mL

Name of Final Standard	**PAH SIM Stock (Ampule)**
Prep Date	**08/10/19**
Exp Date	**08/10/20**

Prep'd By (I **MA**

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Custom PAH SIM Mix	Phenova	ALO-130490	200 ug/mL	**CL13121-41102**	**08/10/20**	1000 uL	1mL	**NA**	200ug/mL

Name of Final Standard	SIM Surrogate	Prep'd By (Initials)	MA
Prep Date	12/17/19		
Exp Date	12/17/20		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Sim Surrogate Deuterated	Restek	33913	2000 ug/mL	**A0149554-41363,41364, 41365,41366**	**04/30/25**	2500 uL	50 mL	**Acetone #0231086**	100 ug/mL

Name of Final Standard	**8270 SIM PAH Internal Standard**
Prep Date	**10/28/19**
Exp Date	**10/28/20**

Prep'd By (Initials) **MA**

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
SV Internal Standard	Restek	31206	2000 ug/mL	**A0151843-49414**	**07/35/25**	625uL	10mL	**MC 59130**	125 ug/mL

Name of Final Standard	SIM Surrogate	Prep'd By (Initials)	MA
Prep Date	04/01/20		
Exp Date	04/01/21		

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Sim Surrogate Deuterated	Restek	33913	2000 ug/mL	**A0149554-41366,49991-995**	**04/30/25**	5mL	100 mL	**Acetone #0234320**	100 ug/mL

Name of Final Standard	SIM Spike	Prep'd By (Initials)	MA
Prep Date	12/19/19		
Exp Date	11/31/20		

Initial Standard Information						Final Standard Information			
Standard (from contianer Label)	Supplier	P/N# (or APPL Mix	Conc.(range)	(or reference to APPL prep date)	Exp Date	from Stock	Final Volume	Solvent + Lot# (or	Standard Conc (range)
Custom PAH Sim Mix	Phenova	AL0-13049	200 ug/mL	**CL13121-41379-382**	**12/31/22**	5 mL	25 mL	**Acetone 0231086**	40 ug/mL

Organic Extraction Worksheet

Method	Continuous Liquid/Liquid SVOC 3520C	Extraction Set	200504A	Extraction Method	LIQ003	Units	mL

Spiked ID 1	8270T Spike 4-1-20 4-1-21		Surrogate ID 1	8270 Surrogate 4-15-20 3-2-21	
Spiked ID 2	Sim Spike 4-1-20 4-1-21		Surrogate ID 2	SIM Surrogate 4-1-20 4-1-21	
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	05/04/20 12:20	
Spiked ID 8			Ext. End Time:	05/05/20 7:00	
			GC Requires Extract By:		

pH1	2	05/04/20 11:15	Water Bath Temp 1 °C	75/74.9 E-WB6 °
pH2	14	05/05/20 10:15	Water Bath Temp 2 °C	
pH3			Water Bath Temp 3 °C	

Spiked By: KY **Date** 05/04/20 **Witnessed By:** CFM **Date** 05/04/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200504A Blk				1,0.050	1,2	800	1	2/1	05/04/20 11:00	
						equip	E-HP51 E-WB6				
2	200504A LCS-1		1	1	1	1	800	1	2/1	05/04/20 11:00	
						equip	E-HP50 E-WB6				
3	200504A LCS-2		0.125	2	0.050	2	800	1	2/1	05/04/20 11:00	
						equip	E-HP49 E-WB6				
4	200504A LCSD-1		1	1	1	1	800	1	2/1	05/04/20 11:00	
						equip	E-HP48 E-WB6				
5	200504A LCSD-2		0.125	2	0.050	2	800	1	2/1	05/04/20 11:00	
						equip	E-HP47 E-WB6				
6	BA10439	BA10439W19			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92025
						equip	E-HP25 E-WB6				
7	BA10504	BA10504W18			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92039
						equip	E-HP26 E-WB6				
8	BA10505	BA10505W11			1,0.050	1,2	800	1	2/1	05/04/20 11:00	92039
						equip	E-HP27 E-WB6				

Solvent and Lot#	
PH Strips	HC998032
Dichloromethane (DCM)	59239
1+1 H2SO4	4-2-20
10N NaOH	4-2-20
Filter Paper	400171
Na2SO4	2019070279

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	
Time	
Refrigerator	GC-C

	Technician's Initials
Scanned By	DL
Sample Preparation	KY,DL
Extraction	KY,DL
Concentration	DL

Modified	05/07/20 8:44:51 AM

Reviewed By: KY **Date** 05/07/20

Injection Log

Directory: M:\LINUS\DATA\L200204\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
2	0204L002.D	1	SV Tune 10/01/19		4 Feb 20 9:32
3	0204L003.D	1	0.1 SIM 02/03/20		4 Feb 20 9:48
4	0204L004.D	1	0.2 SIM 02/03/20		4 Feb 20 10:09
5	0204L005.D	1	0.5 SIM 02/03/20		4 Feb 20 10:31
6	0204L006.D	1	1 SIM 02/03/20		4 Feb 20 10:53
7	0204L007.D	1	5 SIM 02/03/20		4 Feb 20 11:15
8	0204L008.D	1	10 SIM 02/03/20		4 Feb 20 11:37
9	0204L009.D	1	50 SIM 02/03/20		4 Feb 20 11:59
10	0204L010.D	1	100 SIM 02/03/20		4 Feb 20 12:21
11	0204L011.D	1	SS SIM 02/03/20		4 Feb 20 13:21
70	0424L170.D	1	SV TUNE 10/1/19		6 May 20 8:38
71	0424L171.D	1	5 SIM 2/4/20 (3)		6 May 20 8:54
72	0424L172.D	1.25	200504A BLK 1/800		6 May 20 10:23
73	0424L173.D	1.25	200504A LCS-2 1/800		6 May 20 10:45
74	0424L174.D	1.25	200504A LCSD-2 1/800		6 May 20 11:07
76	0424L176.D	1.25	BA10504W18 1/800		6 May 20 11:51
77	0424L177.D	1.25	BA10505W11 1/800		6 May 20 12:13
78	0424L178.D	1	5 SIM 2/4/20 (4)		6 May 20 12:52

ORGANICS
Calibration Data

2MEE
EPA 8270

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 05/01/20
Matrix: Instrument: Yoda Initials: MA

			0501Y003.D	0501Y004.D	0501Y006.D	0501Y007.D	0501Y008.D	0501Y009.D	0501Y010.D	0501Y011.D									
		Compound	1	2	3	4	5	6	7	8			Avg	%RSD	Type	r^2	Q	MRF
1	I	1,4-dichlorobenzene-D4(IS)																
2	TM	2-(2-Methoxyethoxy)ethanol	0.1264	0.1827	0.1475	0.1625	0.1354	0.1644	0.1592	0.1806			0.16	13	TM			
3																		
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35																		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y003.D Vial: 39
Acq On : 1 May 20 9:39 Operator: MA,SS
Sample : 50ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:24 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	428206	40.00000 ppb	-0.01
System Monitoring Compounds					
Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.28	45	67679	26.91018 ppb	95

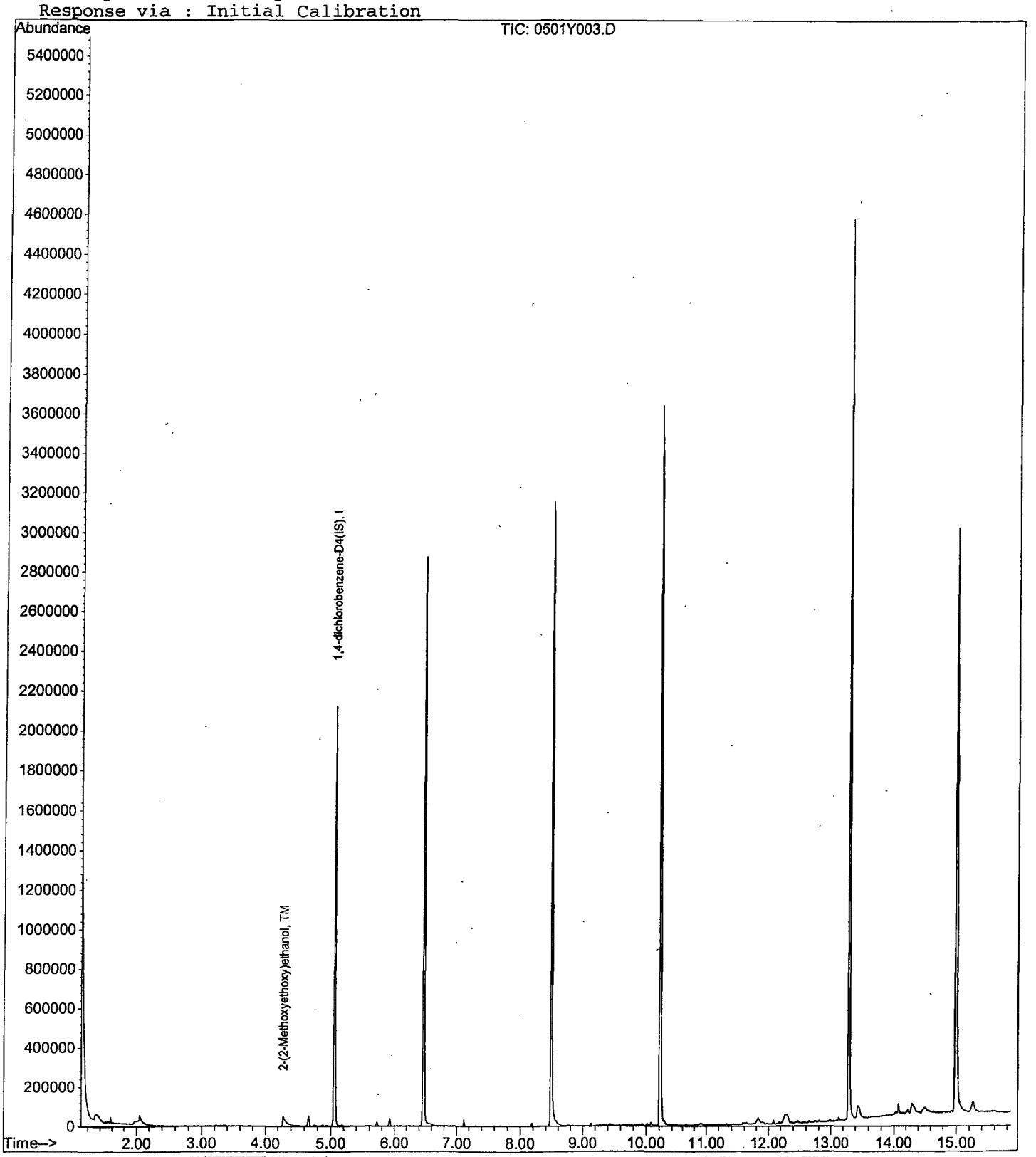
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y003.D Vial: 39
Acq On : 1 May 20 9:39 Operator: MA,SS
Sample : 50ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y004.D Vial: 40
Acq On : 1 May 20 10:03 Operator: MA,SS
Sample : 100ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:44 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	358512	40.00000 ppb	-0.01

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	163785	77.78322 ppb	99

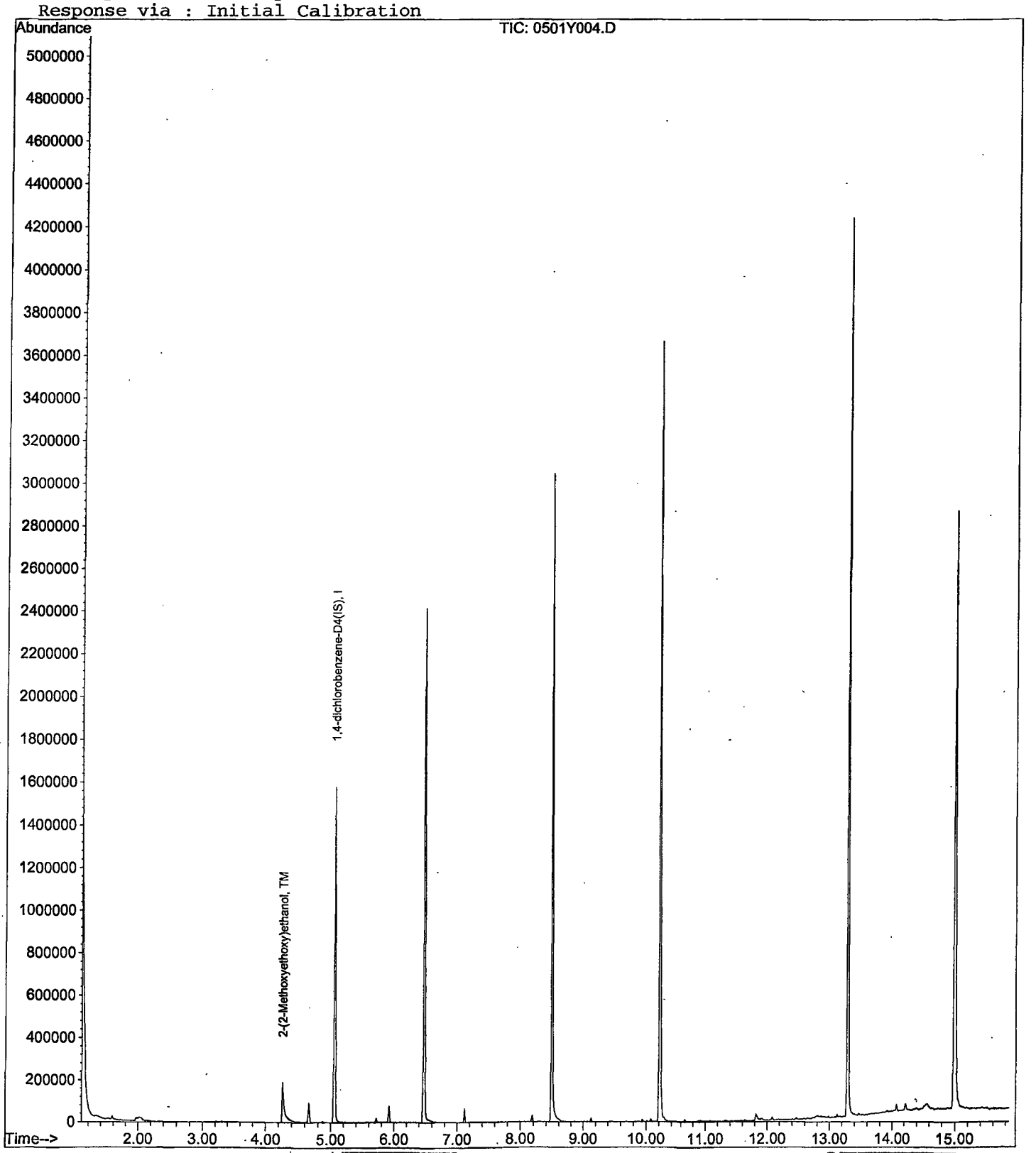
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y004.D Vial: 40
Acq On : 1 May 20 10:03 Operator: MA,SS
Sample : 100ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y006.D Vial: 42
Acq On : 1 May 20 10:51 Operator: MA,SS
Sample : 200ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil MultiplIr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:44 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	431824	40.00000 ppb	-0.01
System Monitoring Compounds					
Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	318364	125.52571 ppb	98

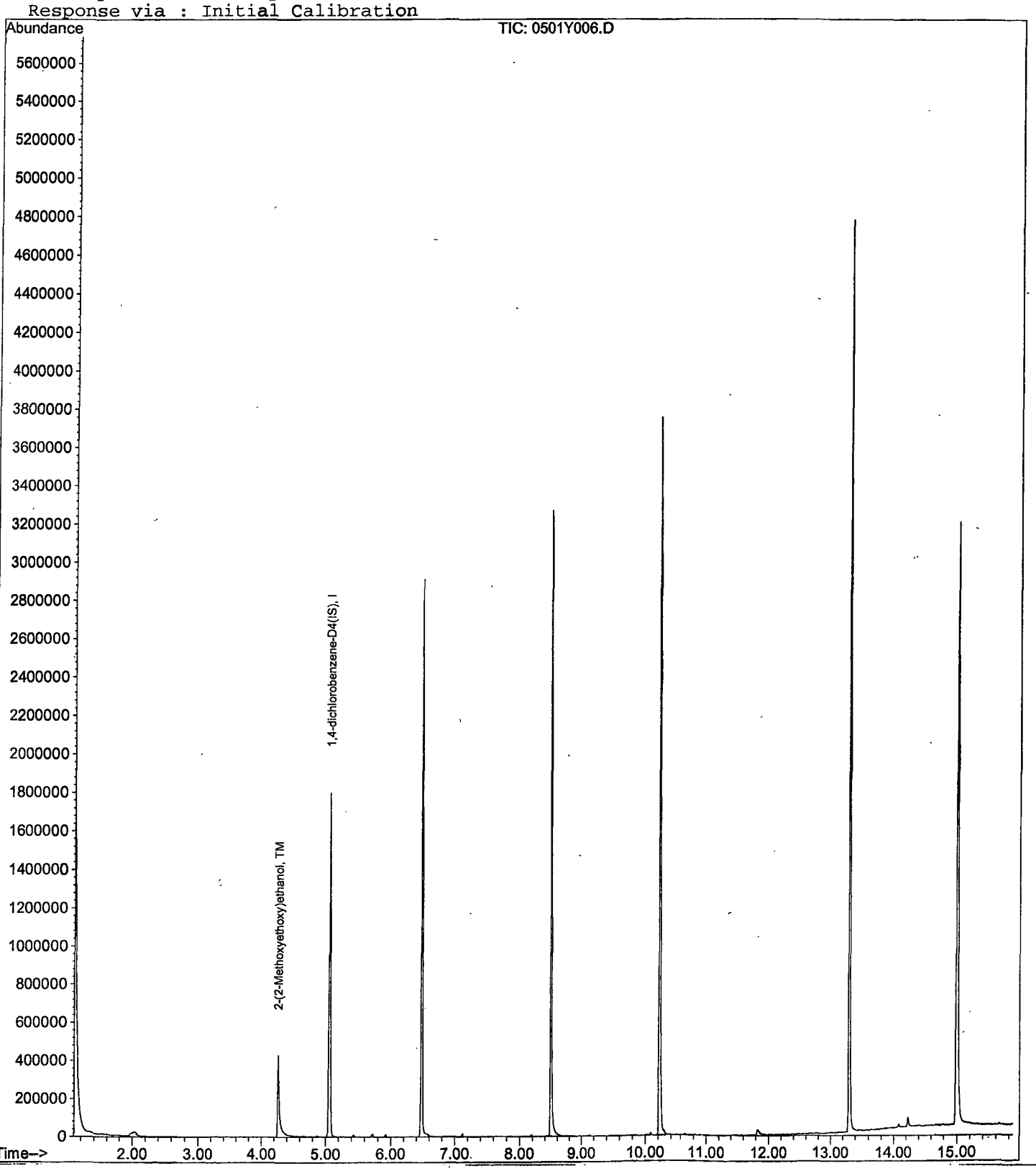
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y006.D Vial: 42
Acq On : 1 May 20 10:51 Operator: MA,SS
Sample : 200ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y007.D Vial: 7
Acq On : 1 May 20 11:24 Operator: MA,SS
Sample : 400ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:44 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	425852	40.00000	ppb	-0.01
System Monitoring Compounds						
Target Compounds						Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	692148	276.72970	ppb	99

(#) = qualifier out of range (m) = manual integration

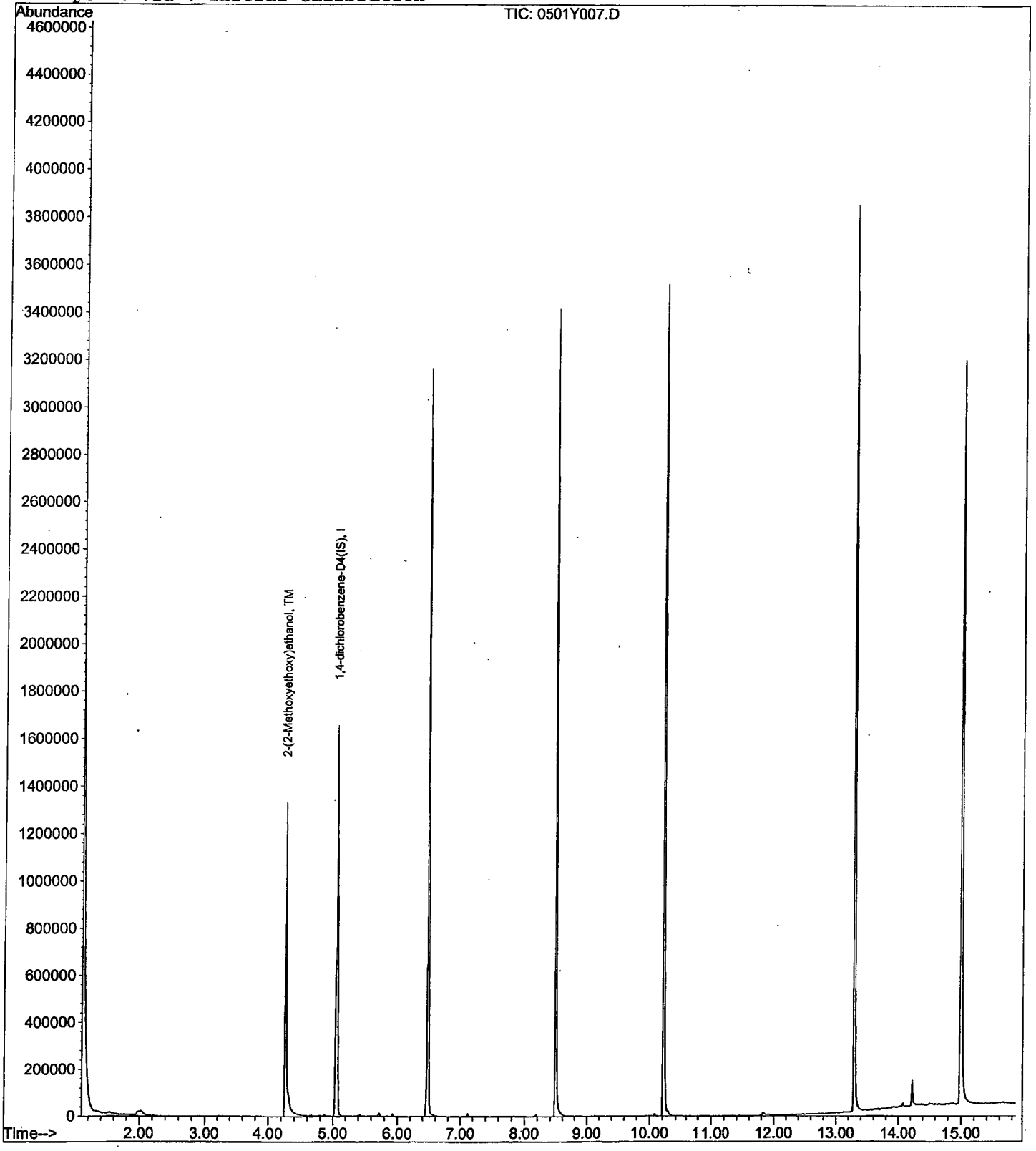
Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y007.D
Acq On : 1 May 20 11:24
Sample : 400ug/ml MEE 05/01/20
Misc : soil

Vial: 7
Operator: MA,SS
Inst : Yoda
Multiplr: 1.00

Quant Time: May 1 11:49 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y008.D Vial: 8
Acq On : 1 May 20 11:48 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:16 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 12:15:50 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.07	152	483204	40.00000	ppb	0.00

System Monitoring Compounds

Target Compounds						Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.28	45	818058	442.11333	ppb	100

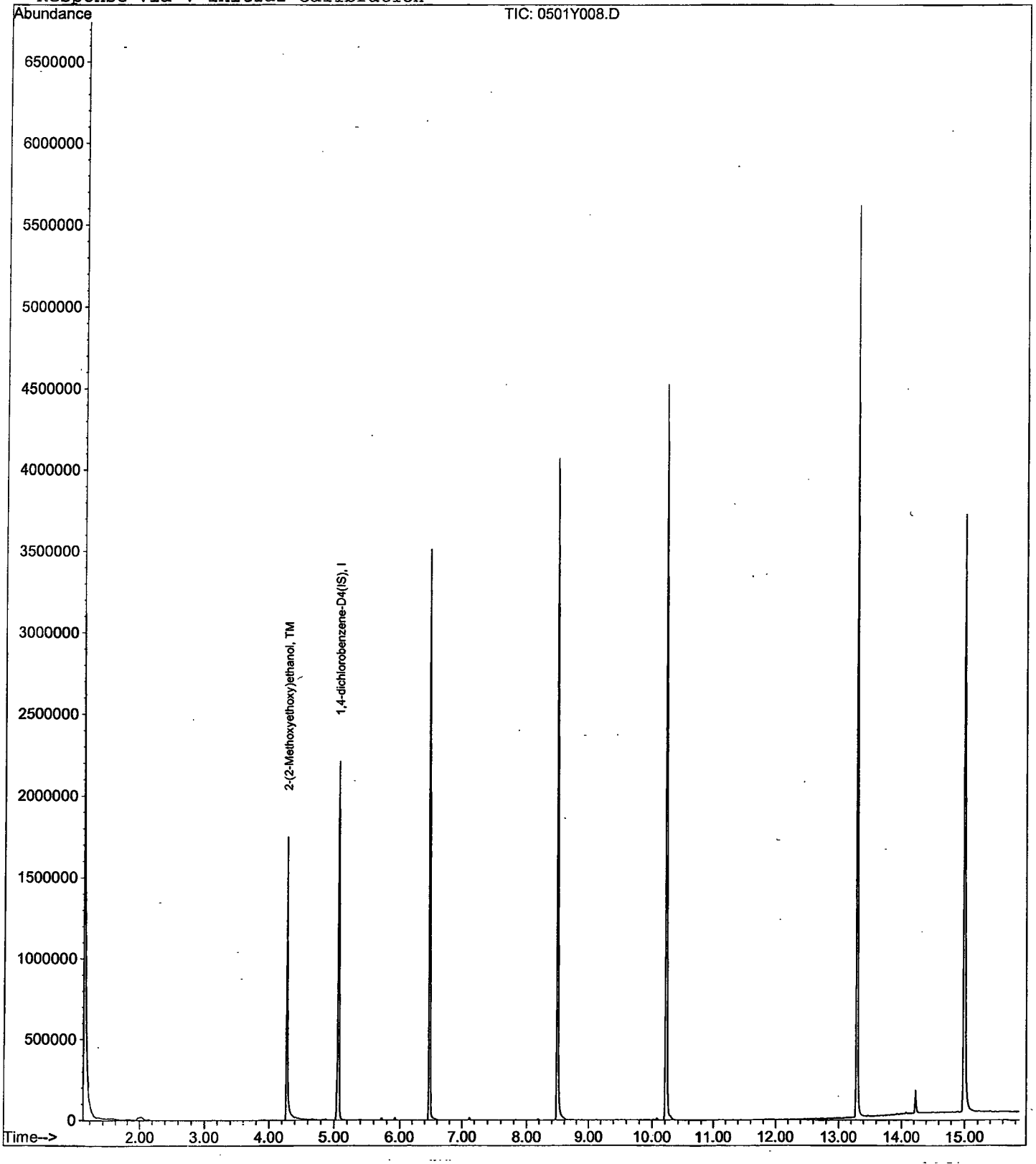
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y008.D Vial: 8
Acq On : 1 May 20 11:48 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:16 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y009.D Vial: 9
Acq On : 1 May 20 12:13 Operator: MA,SS
Sample : 600ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:14 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 11:48:44 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	445147	40.00000 ppb	-0.01

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.27	45	1097935	518.98742 ppb	99

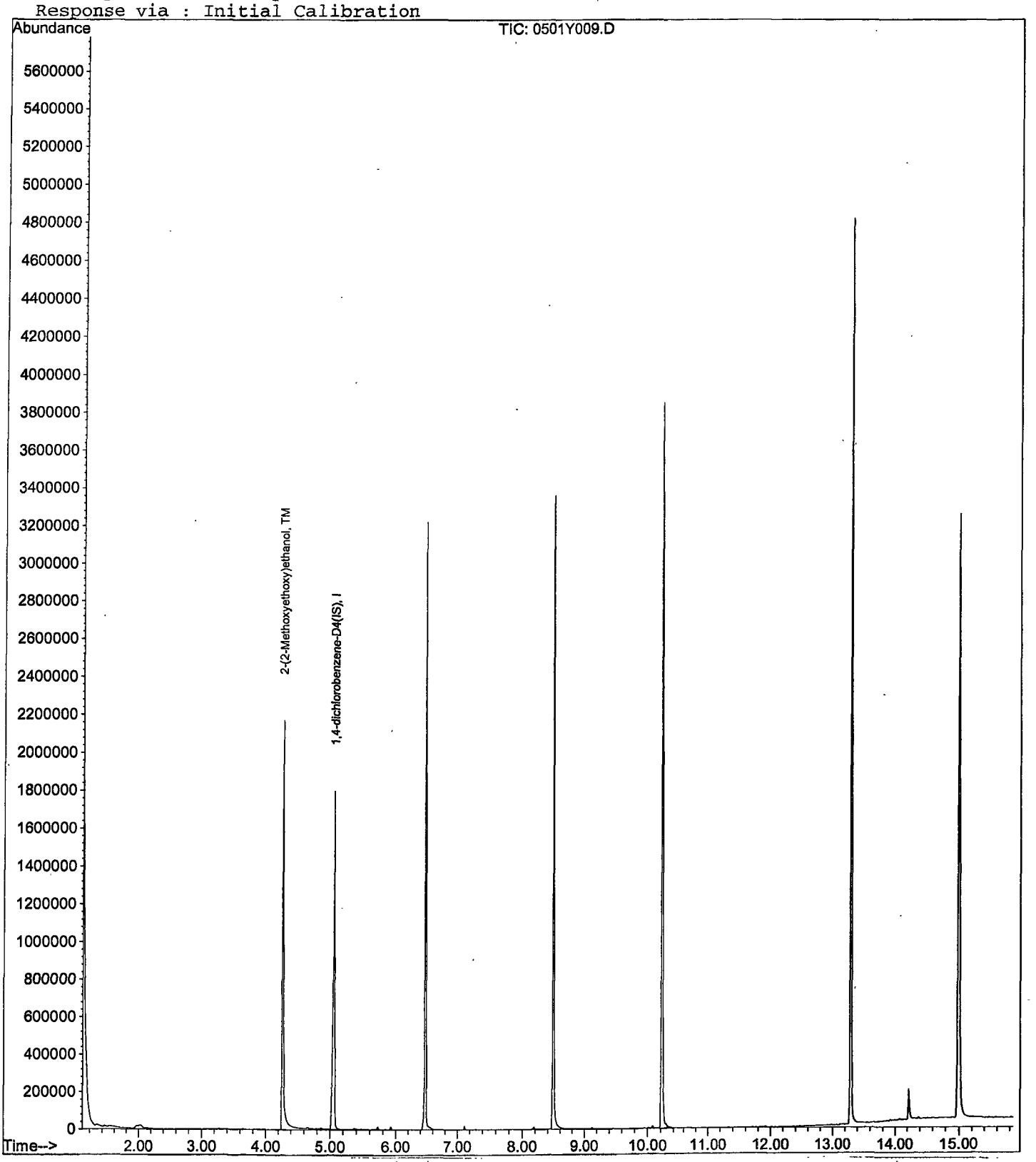
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y009.D Vial: 9
Acq On : 1 May 20 12:13 Operator: MA,SS
Sample : 600ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:14 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y010.D Vial: 10
Acq On : 1 May 20 12:37 Operator: MA,SS
Sample : 800ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:36 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 12:15:50 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.07	152	461483	40.00000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.30	45	1469246	831.41690	ppb	99

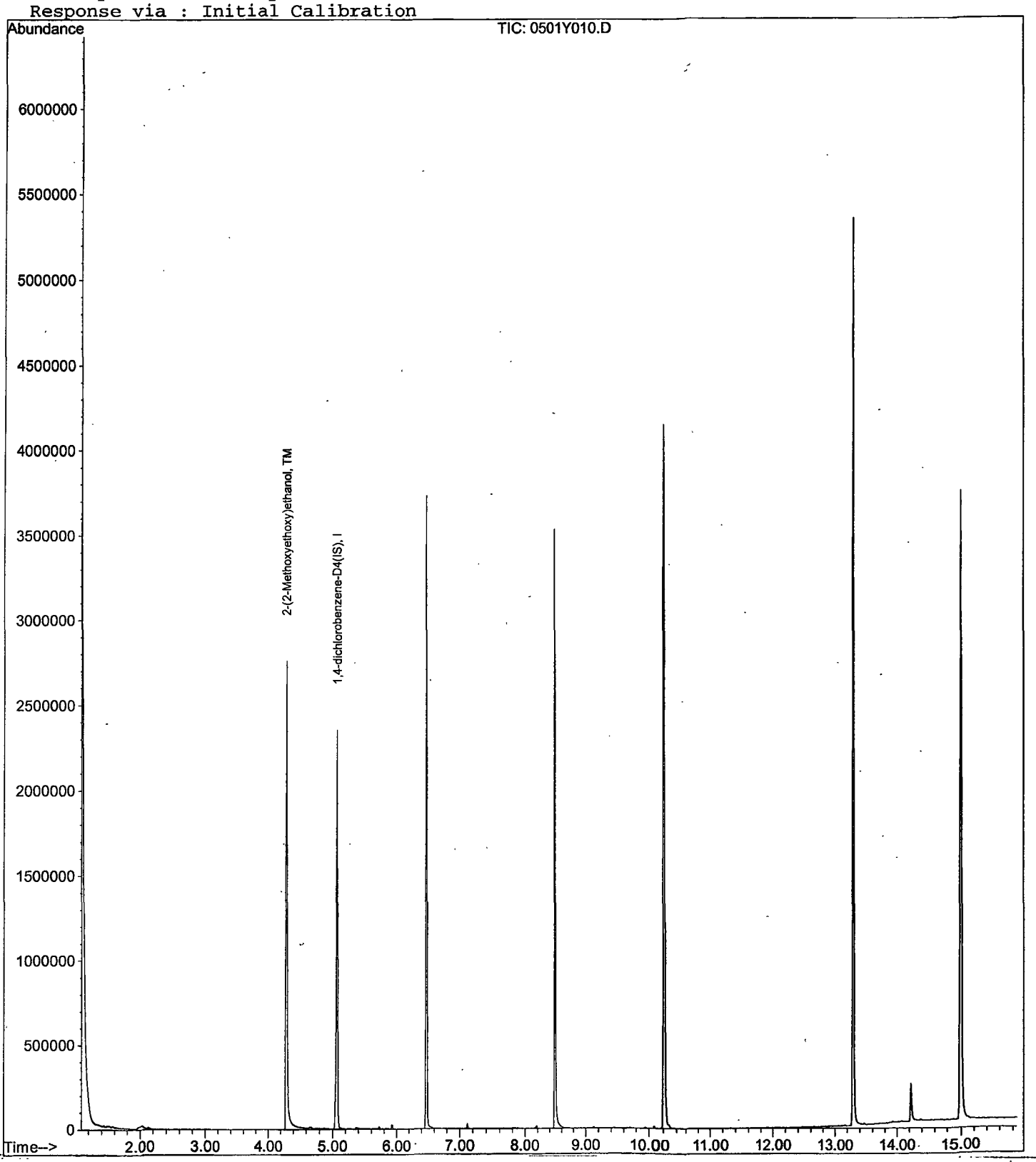
(#) = qualifier out of range (m) = manual integration
0501Y010.D YMEE0501.M Fri May 01 14:33:32 2020

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y010.D Vial: 10
Acq On : 1 May 20 12:37 Operator: MA,SS
Sample : 800ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 12:36 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y011.D Vial: 11
Acq On : 1 May 20 13:01 Operator: MA,SS
Sample : 1000ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 13:03 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 12:15:50 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	445958	40.00000	ppb	-0.01

System Monitoring Compounds

Target Compounds						Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.29	45	2014018	1172.78870	ppb	100

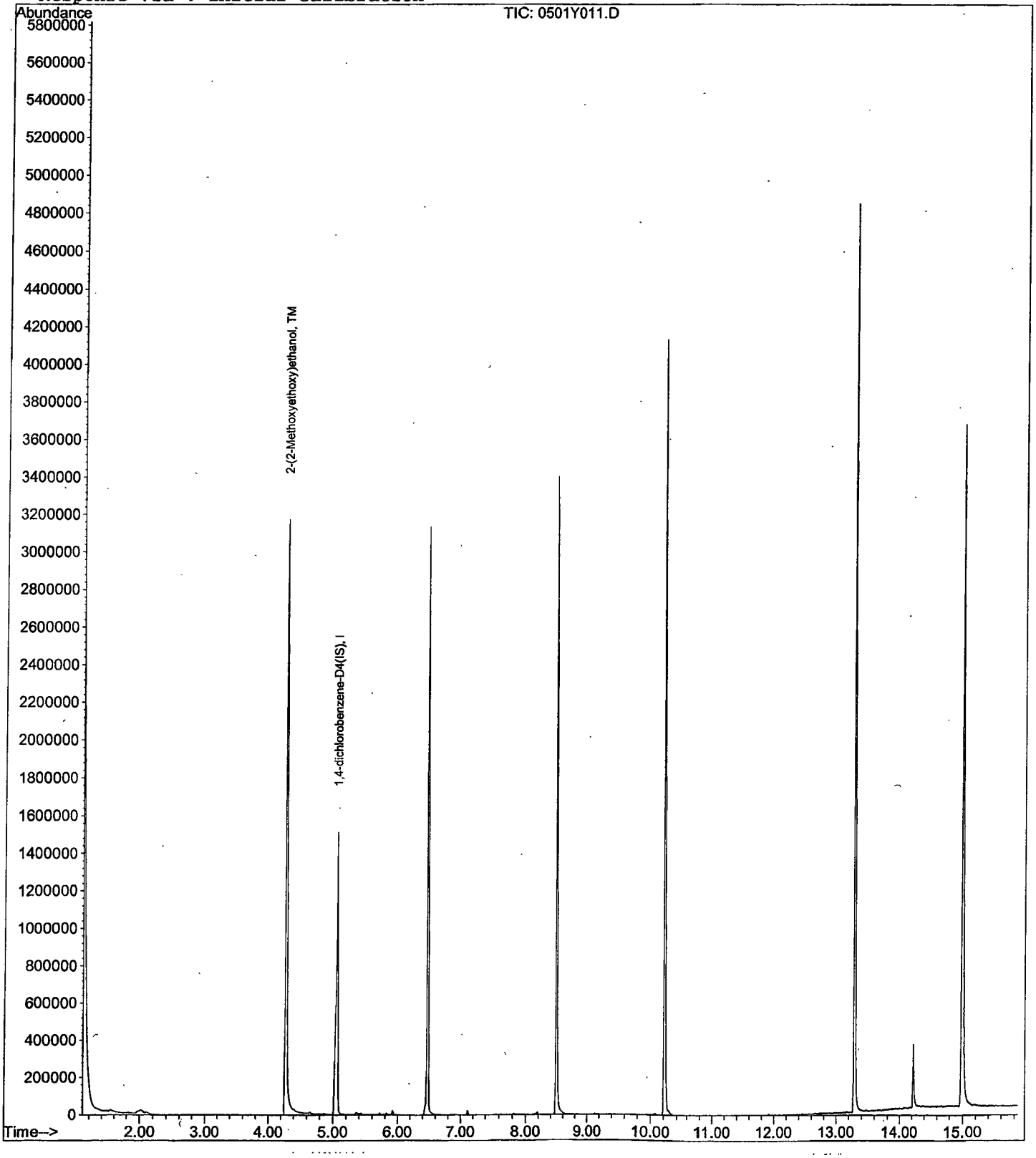
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y011.D Vial: 11
Acq On : 1 May 20 13:01 Operator: MA,SS
Sample : 1000ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 13:03 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



2MEE
EPA 8270

Form 7

Second Source

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 1 May 20 13:50
Instrument: Yoda
Initial Cal. Date: 05/01/20
Data File: 0501Y013.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2	TM	2-(2-Methoxyethoxy)ethanol	0.1574	0.1794	14	TM	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
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29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			14.0		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y013.D Vial: 13
Acq On : 1 May 20 13:50 Operator: MA,SS
Sample : SSug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 14:30 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	461050	40.00000	ppb	-0.01

System Monitoring Compounds

Target Compounds						Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	1033684	569.91471	ppb	100

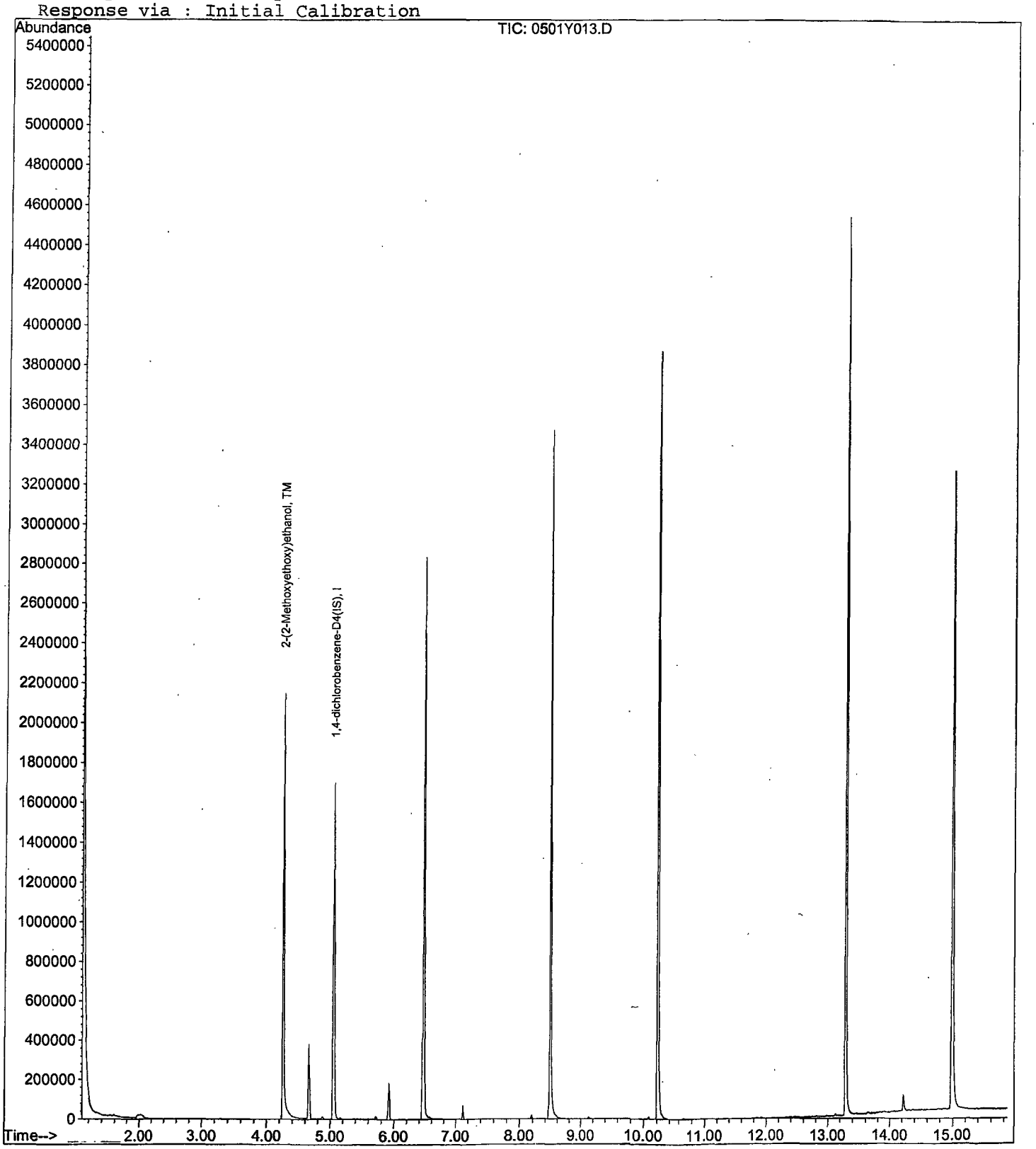
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y013.D Vial: 13
Acq On : 1 May 20 13:50 Operator: MA,SS
Sample : SSug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 1 14:30 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Fri May 01 13:05:24 2020
Response via : Initial Calibration



2MEE
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 4 May 20 15:07
Instrument: Yoda
Initial Cal. Date: 05/01/20
Data File: 0501Y031.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2	TM	2-(2-Methoxyethoxy)ethanol	0.1574	0.1846	17	TM	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
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29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			17.0		

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y031.D Vial: 45
Acq On : 4 May 20 15:07 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 4 15:27 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	450181	40.00000 ppb	-0.01
System Monitoring Compounds					
Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	1038881	586.60903 ppb	98

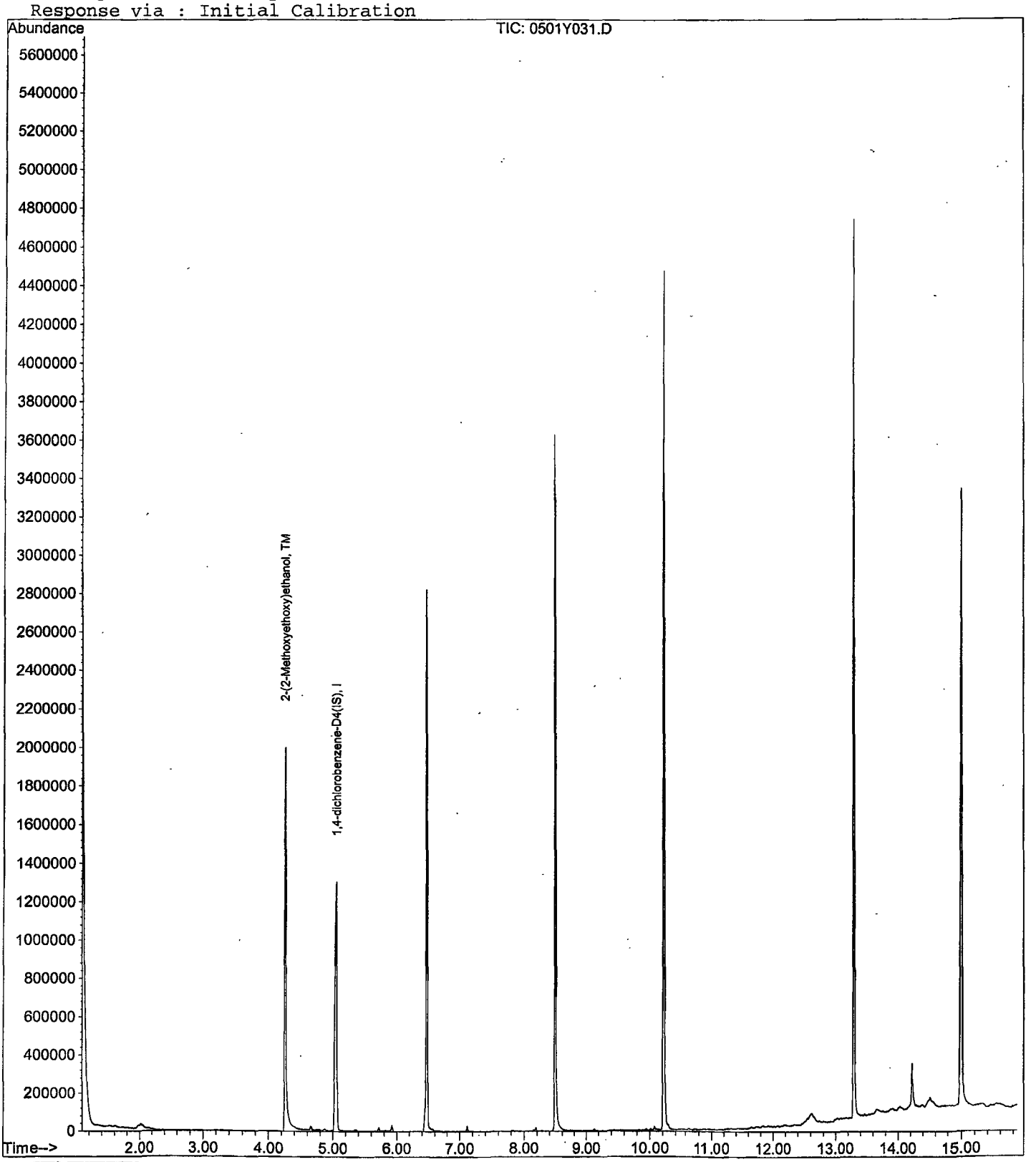
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y031.D Vial: 45
Acq On : 4 May 20 15:07 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : soil Multiplr: 1.00

Quant Time: May 4 15:27 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration



2MEE
EPA 8270

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 4 May 20 18:21
Instrument: Yoda
Initial Cal. Date: 05/01/20
Data File: 0501Y038.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	1,4-dichlorobenzene-D4(IS)	ISTD			I	
2	TM	2-(2-Methoxyethoxy)ethanol	0.1574	0.1804	15	TM	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
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28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			15.0		

Quantitation Report (QT Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y038.D Vial: 38
Acq On : 4 May 20 18:21 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 7:48 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.06	152	391416	40.00000 ppb	-0.01
System Monitoring Compounds					
Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.26	45	882788	573.30793 ppb	100

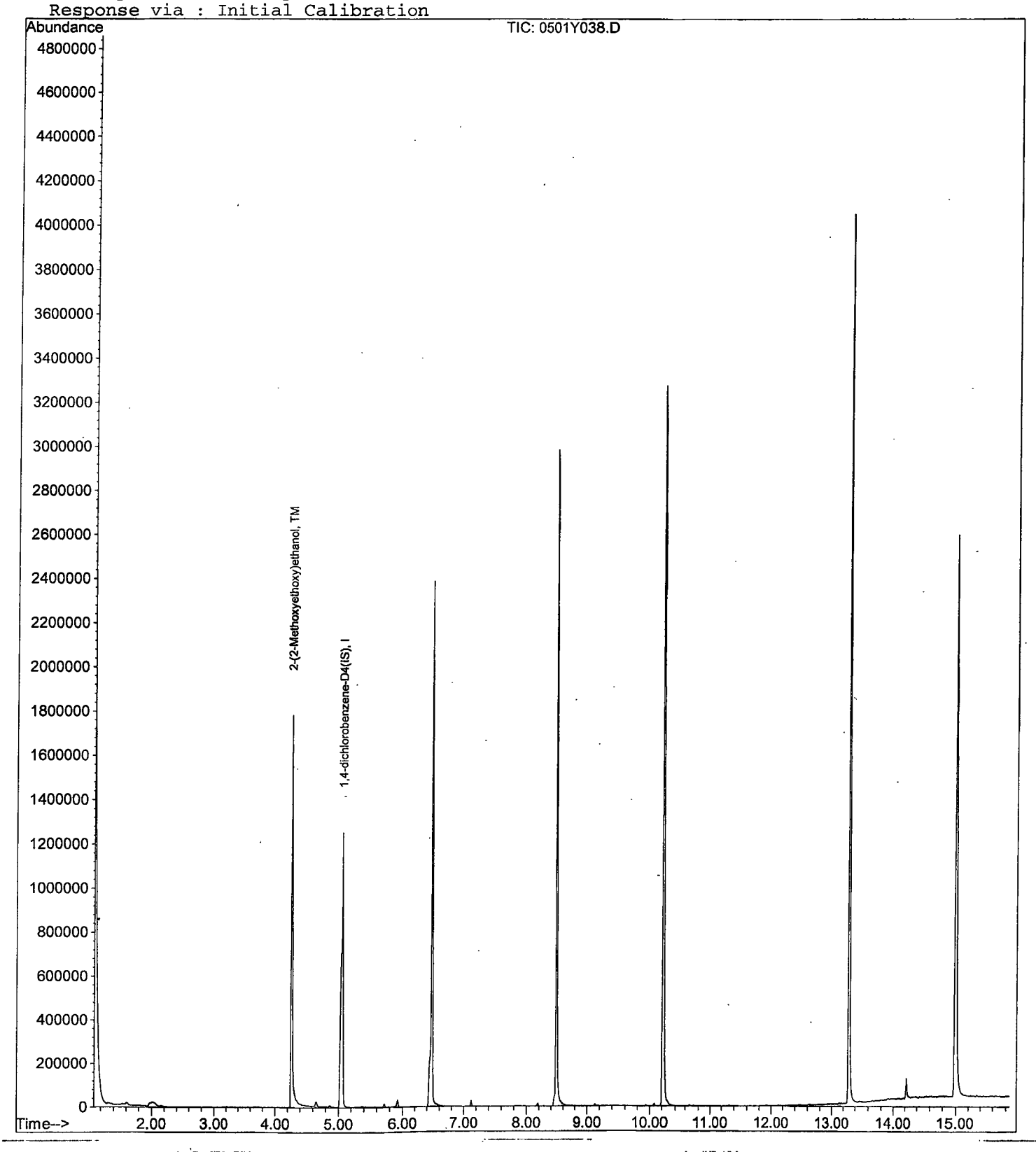
(#) = qualifier-out-of-range (m) = manual integration

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y038.D Vial: 38
Acq On : 4 May 20 18:21 Operator: MA,SS
Sample : 500ug/ml MEE 05/01/20 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 7:48 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y036.D Vial: 36
Acq On : 4 May 20 17:33 Operator: MA,SS
Sample : BA10504W15 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.04	152	309114	40.0000	ppb	-0.03

System Monitoring Compounds

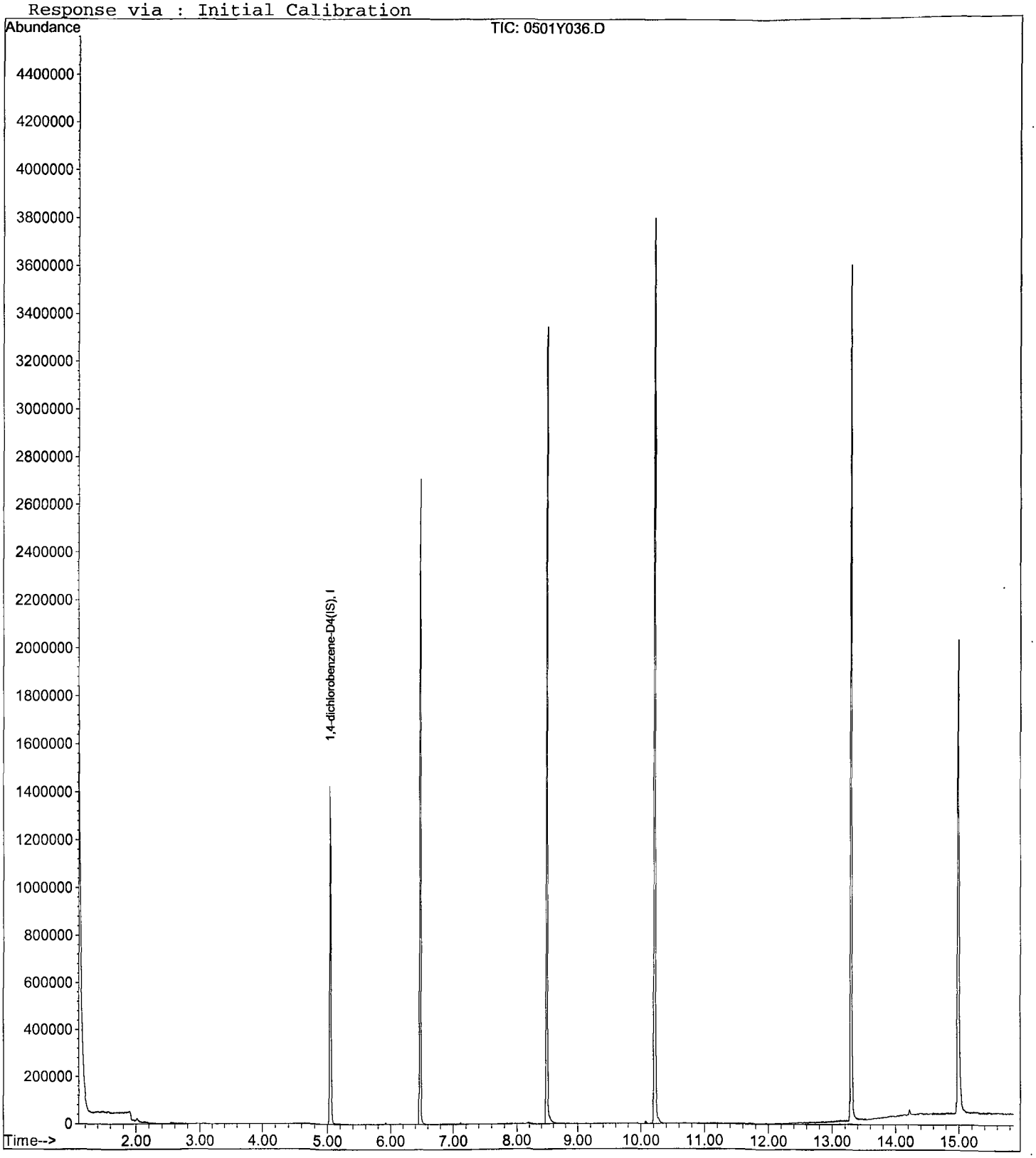
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Data File : M:\YODA\DATA\Y200501M\0501Y036.D Vial: 36
Acq On : 4 May 20 17:33 Operator: MA,SS
Sample : BA10504W15 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y037.D Vial: 37
Acq On : 4 May 20 17:56 Operator: MA,SS
Sample : BA10505W08 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.05	152	385597	40.0000 ppb	-0.02

System Monitoring Compounds

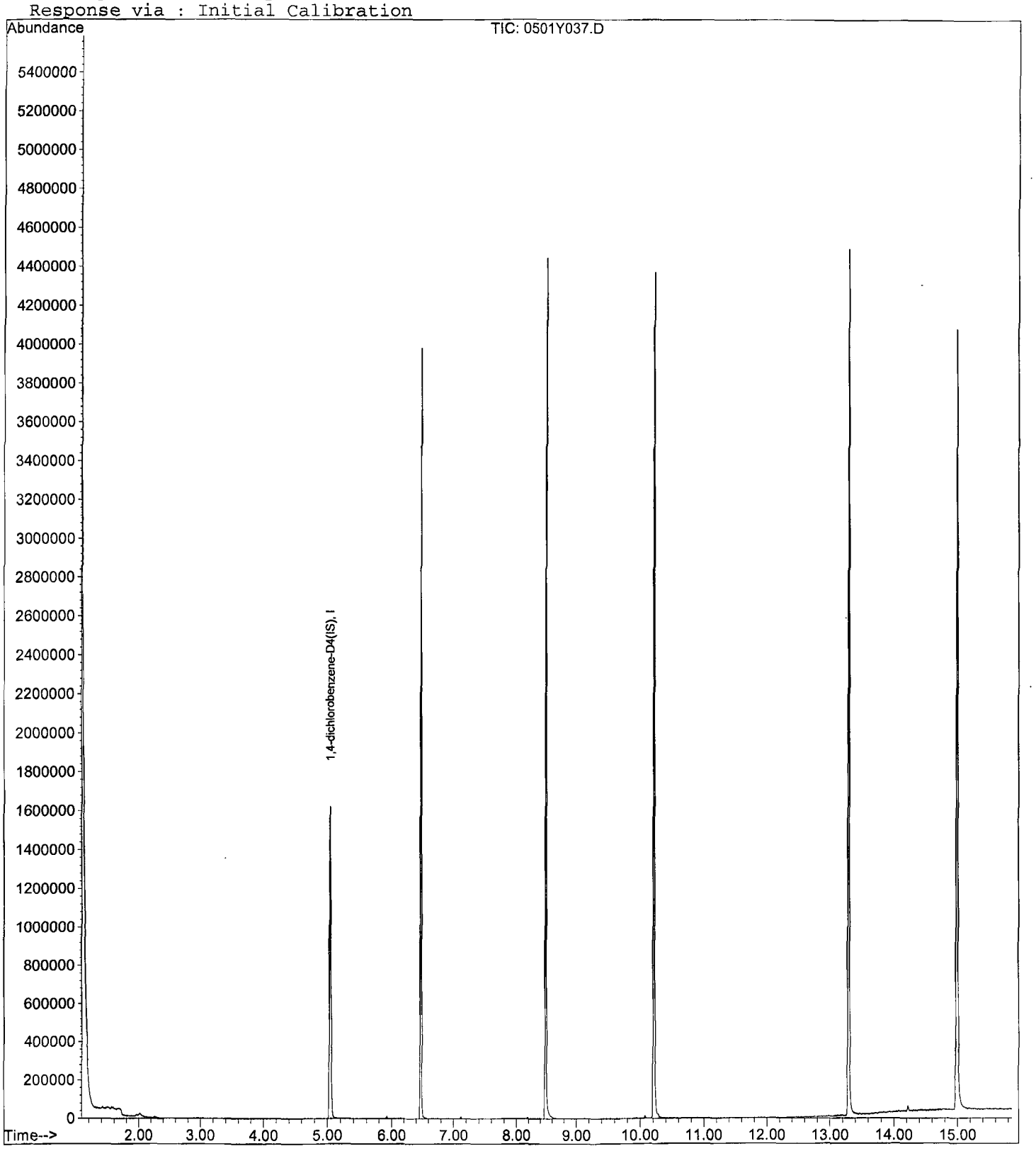
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration
0501Y037.D YMEE0501.M Wed May 06 14:39:08 2020 Page 1

Data File : M:\YODA\DATA\Y200501M\0501Y037.D Vial: 37
Acq On : 4 May 20 17:56 Operator: MA,SS
Sample : BA10505W08 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y032.D Vial: 32
Acq On : 4 May 20 15:56 Operator: MA,SS
Sample : 200504A BLK 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Mon May 04 07:27:42 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.04	152	476418	40.0000 ppb	-0.03

System Monitoring Compounds

Target Compounds Qvalue

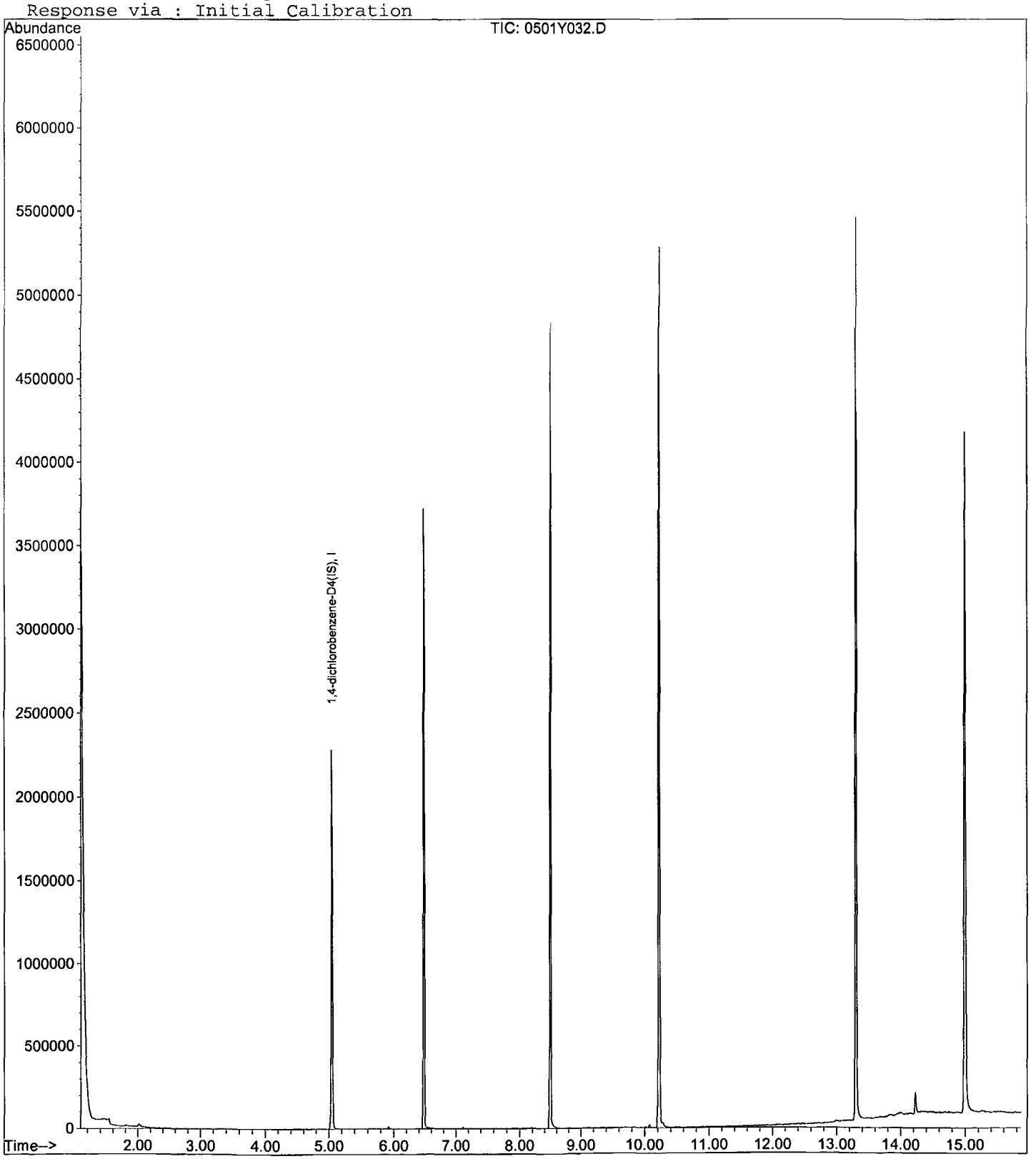
(#) = qualifier out of range (m) = manual integration
0501Y032.D YMEE0501.M Wed May 06 14:39:02 2020 Page 1

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y032.D Vial: 32
Acq On : 4 May 20 15:56 Operator: MA,SS
Sample : 200504A BLK 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:51 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y033.D Vial: 33
Acq On : 4 May 20 16:20 Operator: MA,SS
Sample : 200504A LCS-1 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:54 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.05	152	460181	40.0000 ppb	-0.02

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.47	45	100339	55.4257 ppb	100

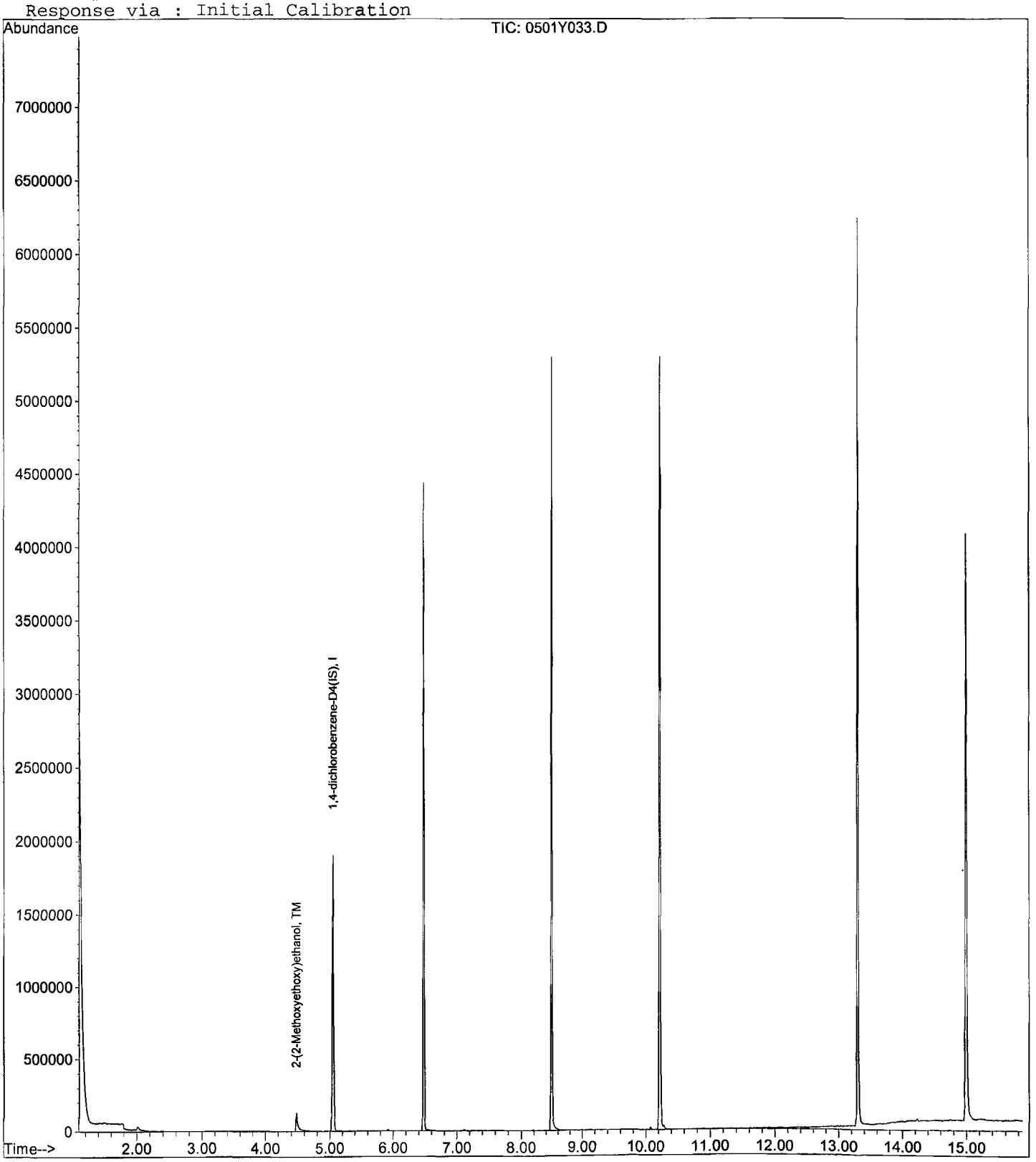
(#) = qualifier out of range (m) = manual integration
0501Y033.D YMEE0501.M Wed May 06 14:39:03 2020 Page 1

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y033.D Vial: 33
Acq On : 4 May 20 16:20 Operator: MA,SS
Sample : 200504A LCS-1 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:54 2020 Quant Results File: YMEE0501.RES

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\YODA\DATA\Y200501M\0501Y034.D Vial: 34
Acq On : 4 May 20 16:44 Operator: MA,SS
Sample : 200504A LCSD-1 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:54 2020 Quant Results File: YMEE0501.RES

Quant Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration
DataAcq Meth : GED

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-dichlorobenzene-D4(IS)	5.04	152	495995	40.0000 ppb	-0.03

System Monitoring Compounds

Target Compounds					Qvalue
2) 2-(2-Methoxyethoxy)ethanol	4.48	45	82352	42.2053 ppb	98

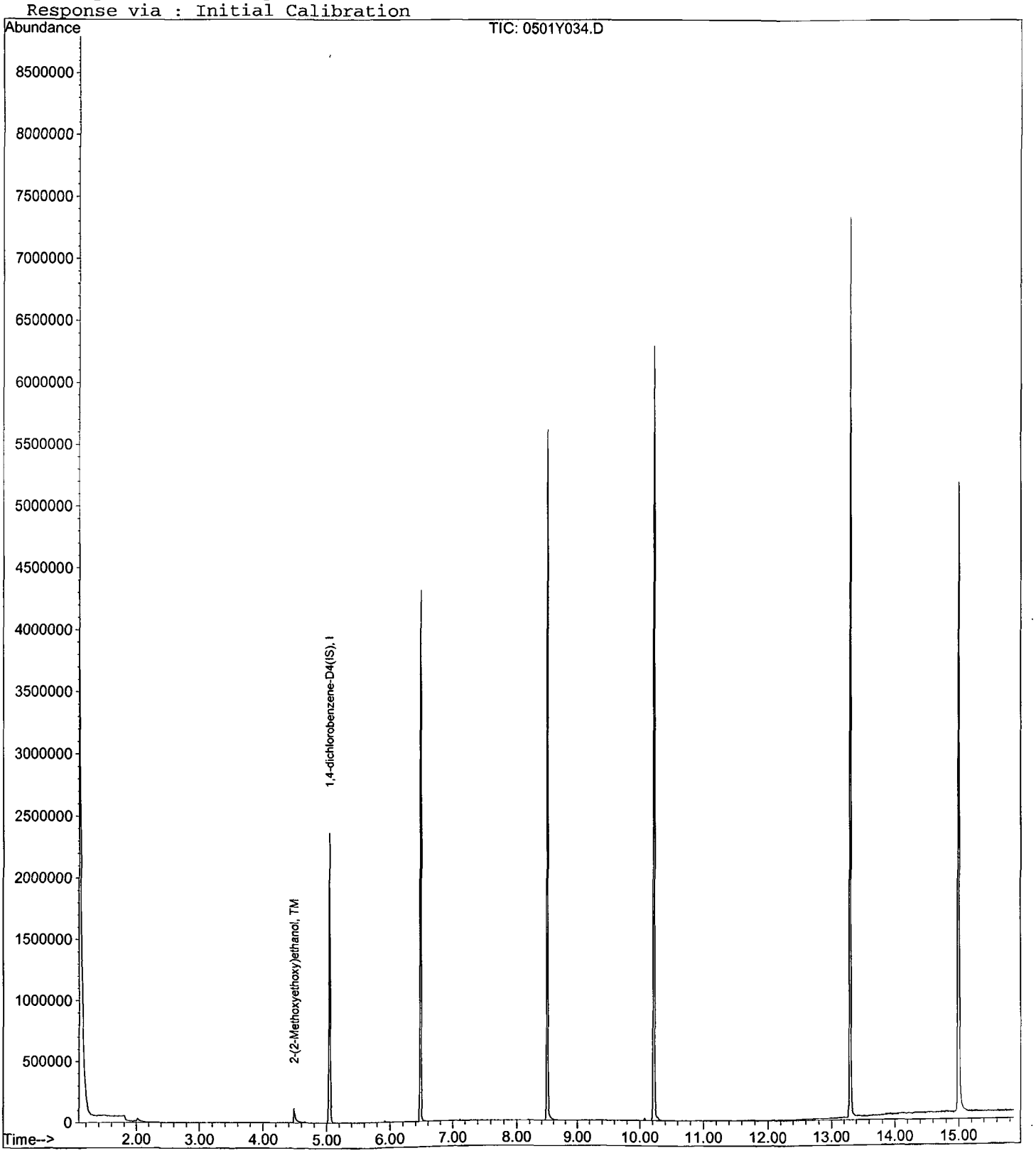
(#) = qualifier out of range (m) = manual integration
0501Y034.D YMEE0501.M Wed May 06 14:39:05 2020 Page 1

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y034.D Vial: 34
Acq On : 4 May 20 16:44 Operator: MA,SS
Sample : 200504A LCSD-1 2/500 Inst : Yoda
Misc : Multiplr: 1.00

Quant Time: May 5 9:54 2020 Quant Results File: YMEE0501.RES

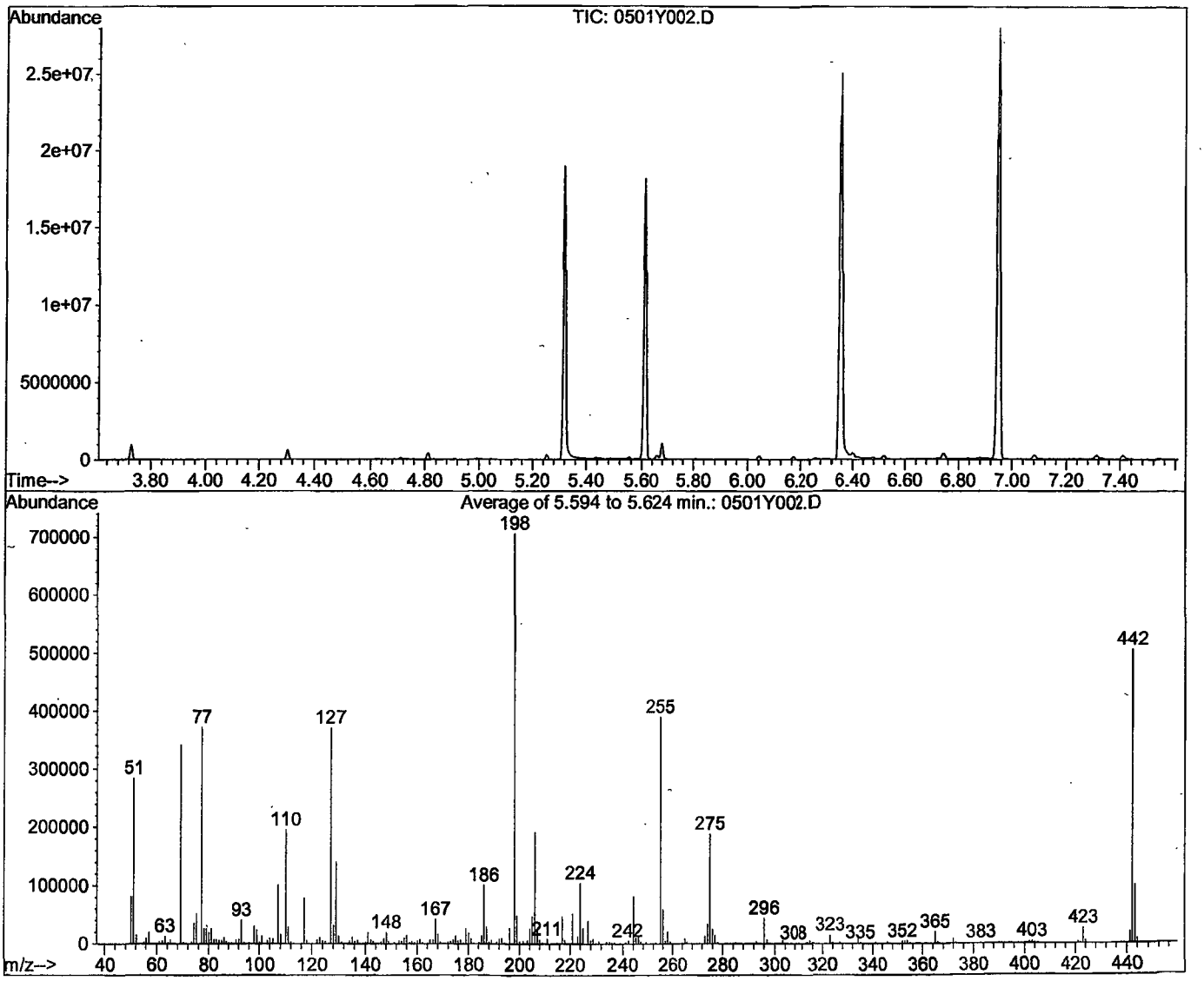
Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C
Last Update : Tue May 05 09:54:41 2020
Response via : Initial Calibration



DFTPP

Data File : M:\YODA\DATA\Y200501M\0501Y002.D Vial: 38
Acq On : 1 May 20 9:23 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C



Spectrum Information: Average of 5.594 to 5.624 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	40.1	283365	PASS
68	69	0.00	2	0.0	30	PASS
70	69	0.00	2	0.5	1711	PASS
127	198	10	80	52.5	370953	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	706767	PASS
199	198	5	9	6.8	48387	PASS
275	198	10	60	26.7	188525	PASS
365	198	1	100	2.8	20013	PASS
441	442	0.01	24	3.9	19955	PASS
442	198	50	500	71.6	506304	PASS
443	442	15	24	19.8	100283	PASS

Data File Name:	**0122Y138.D**
Data File Path:	**M:\YODA\DATA\Y200122M**
Operator:	**MA,SS**
Date Acquired:	**1 May 20 9:23**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/01/19**
Vial Number:	**38**
Instrument Name:	**Yoda**

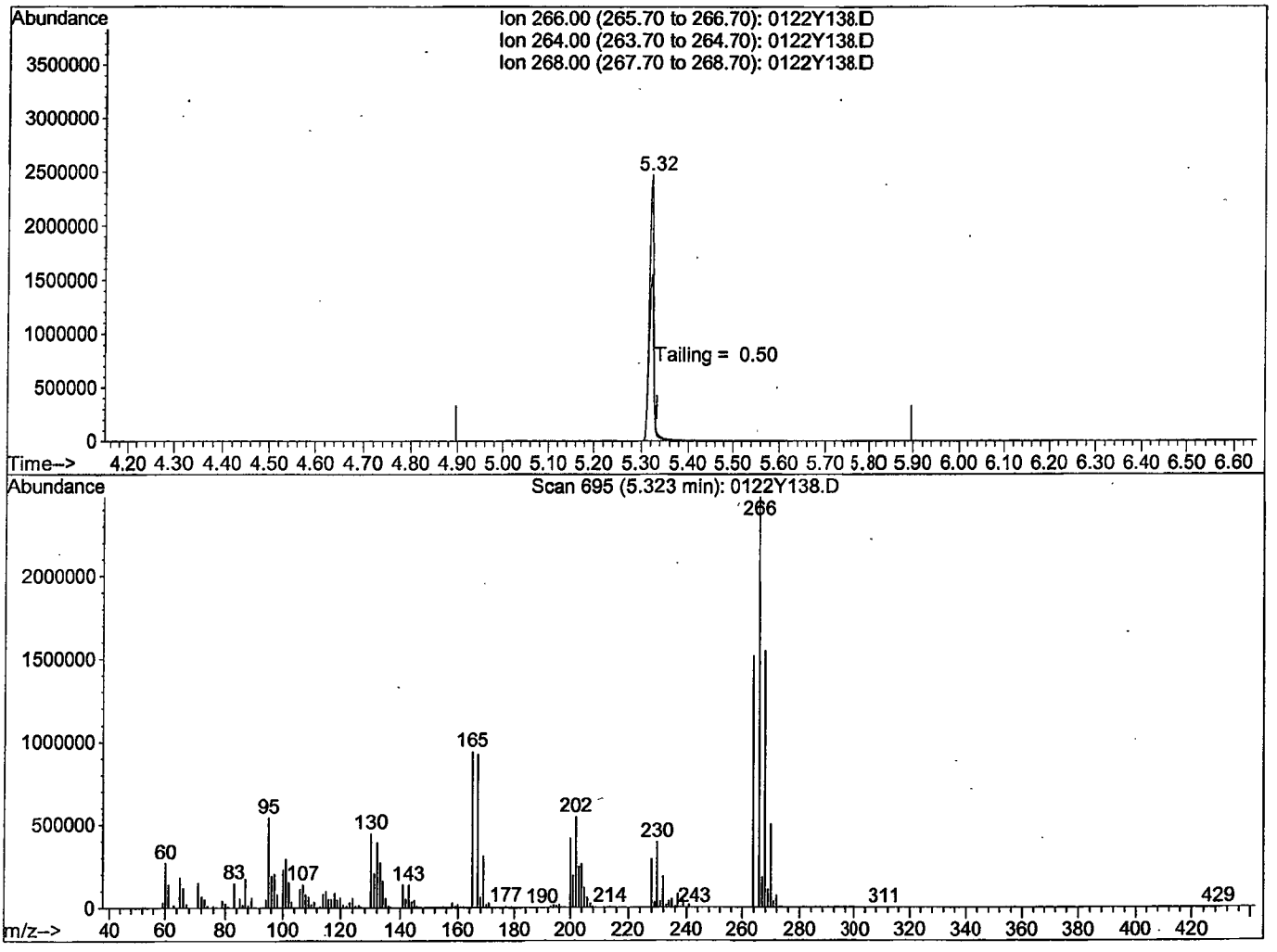
#	Name	Ret Time	Target Response
1)	DDT	6.95	212314000
2)	DDD	6.72	691986
3)	DDE	6.47	554319

Breakdown **0.58**

Quantitation Report

Data File : M:\YODA\DATA\Y200122M\0122Y138.D Vial: 38
Acq On : 1 May 20 9:23 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00
Quant Time: May 1 10:02 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200122M\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 27 10:10:52 2020
Response via : Single Level Calibration



TIC: 0122Y138.D

(5) Pentachlorophenol

5.32min 0.0000

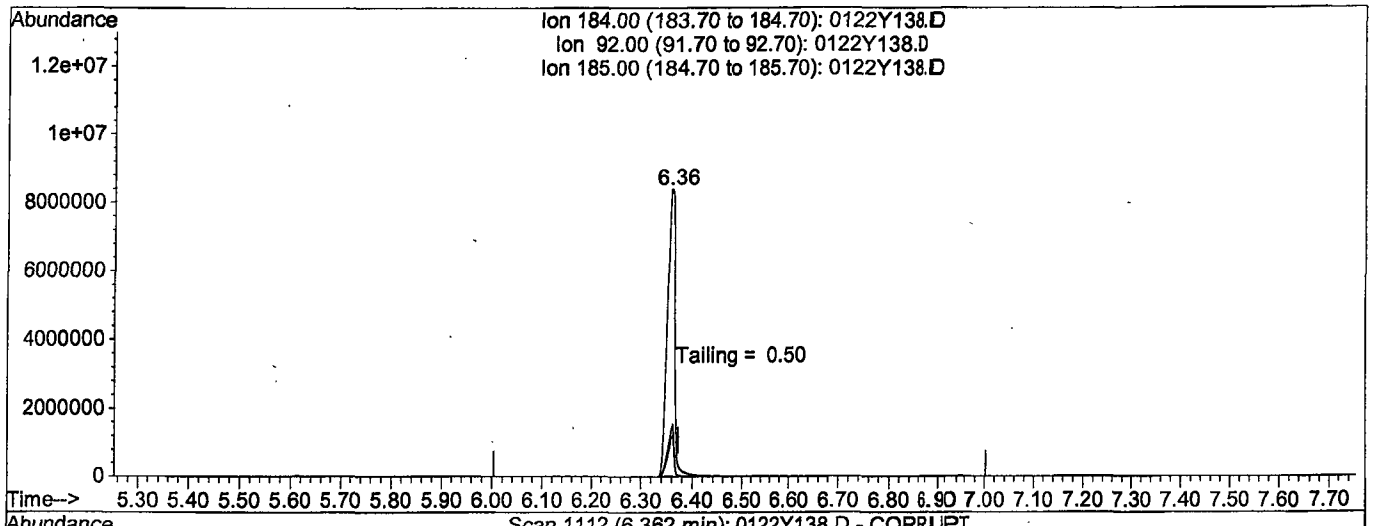
response 16198760

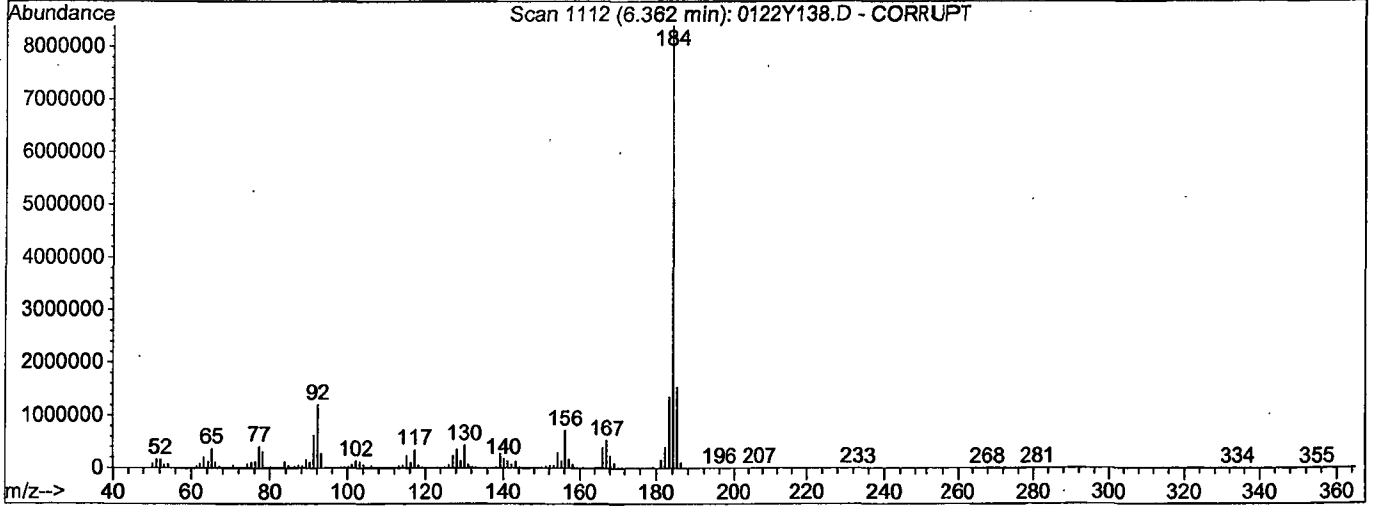
Ion	Exp%	Act%
266.00	100	100
264.00	63.80	61.57
268.00	63.80	63.41
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200122M\0122Y138.D Vial: 38
Acq On : 1 May 20 9:23 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00
Quant Time: May 1 10:02 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200122M\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 27 10:10:52 2020
Response via : Single Level Calibration





TIC: 0122Y138.D

(6) Benzidine

6.36min 0.0000

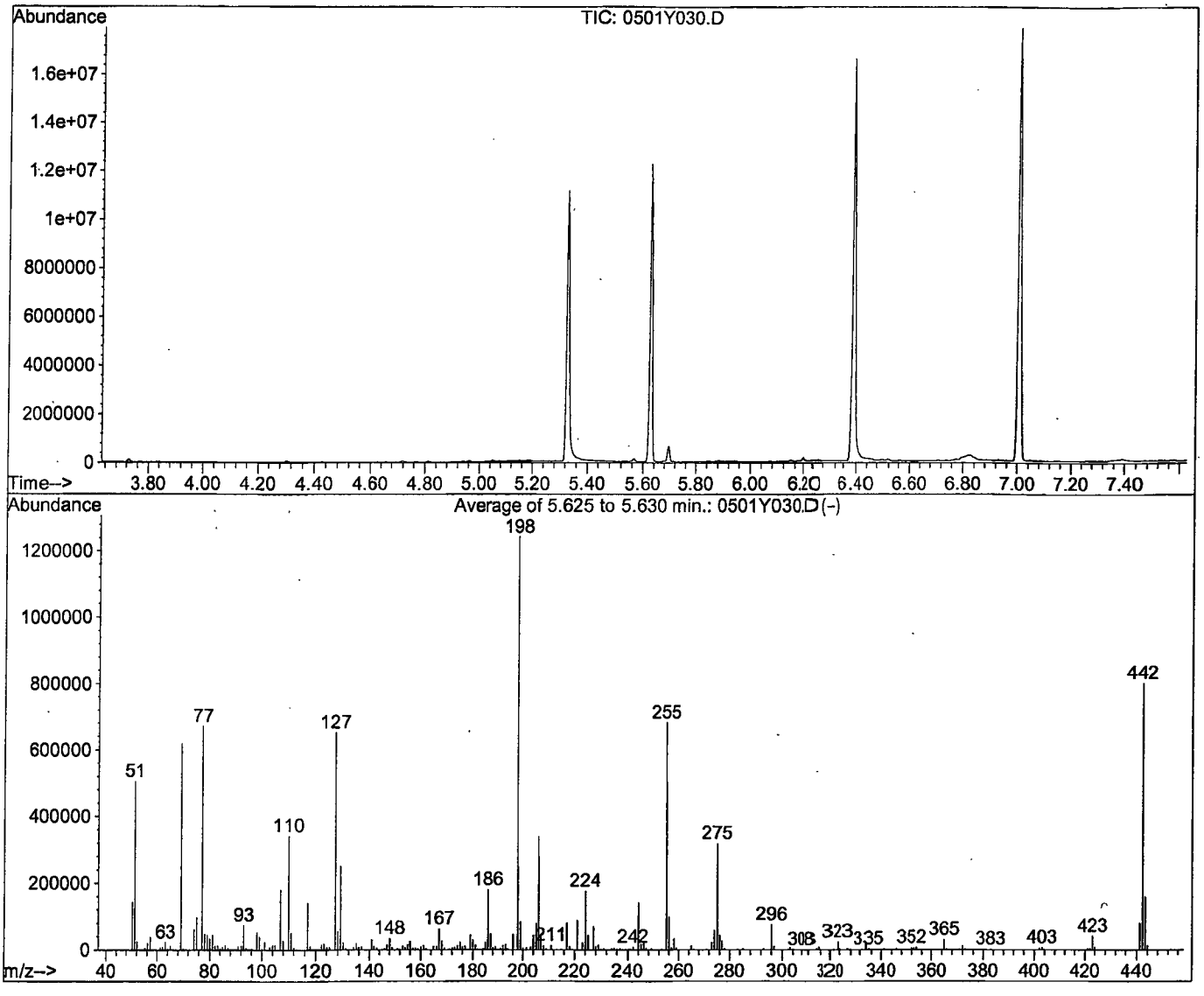
response 85362782

Ion	Exp%	Act%
184.00	100	100
92.00	11.60	11.47
185.00	14.90	15.08
0.00	0.00	0.00

DFTPP

Data File : M:\YODA\DATA\Y200501M\0501Y030.D Vial: 44
Acq On : 4 May 20 14:52 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00

Method : M:\YODA\DATA\Y200501M\YMEE0501.M (RTE Integrator)
Title : EPA 8270C



AutoFind: Scans 816, 817, 818; Background Corrected with Scan 807

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51	198	10	80	40.6	505640	PASS
68	69	0.00	2	0.0	0	PASS
70	69	0.00	2	0.7	4202	PASS
127	198	10	80	52.5	653269	PASS
197	198	0.00	2	0.0	0	PASS
198	198	100	100	100.0	1243904	PASS
199	198	5	9	6.9	85293	PASS
275	198	10	60	25.7	319189	PASS
365	198	1	100	2.6	31835	PASS
441	442	0.01	24	10.1	81517	PASS
442	198	50	500	64.6	803691	PASS
443	442	15	24	19.9	159880	PASS

Data File Name:	**0501Y030.D**
Data File Path:	**M:\YODA\DATA\Y200501M**
Operator:	**MA,SS**
Date Acquired:	**4 May 20 14:52**
Method File:	**DFTPP2.M**
Sample Name:	**SV TUNE 10/01/19**
Vial Number:	**44**
Instrument Name:	**Yoda**

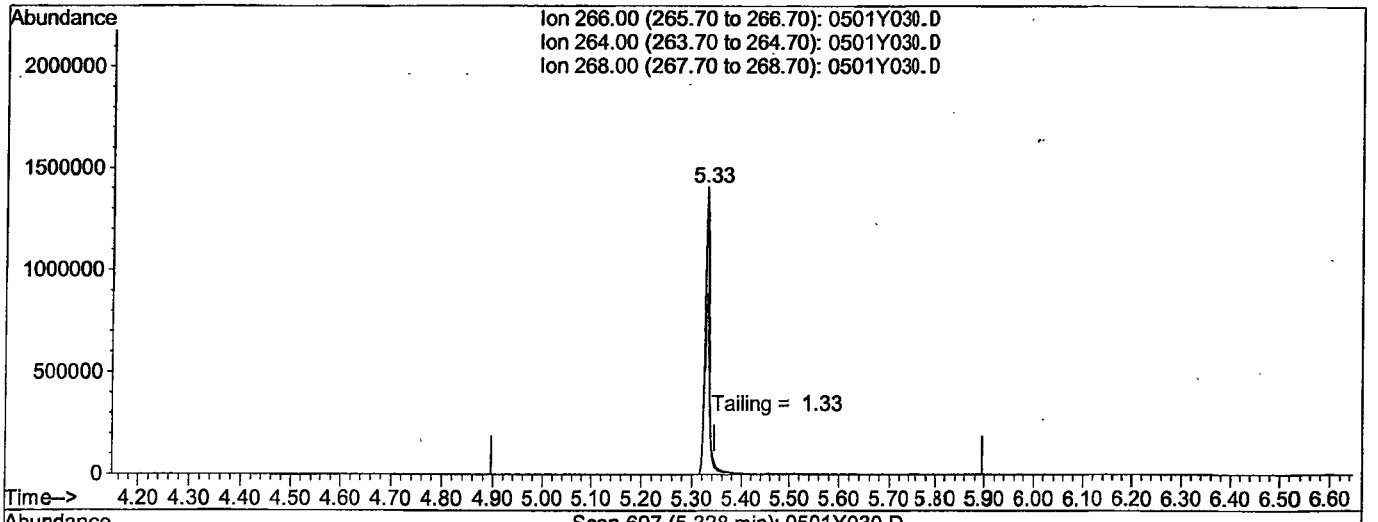
#	Name	Ret Time	Target Response
1)	DDT	6.95	128822000
2)	DDD	6.72	329585
3)	DDE	6.47	140503

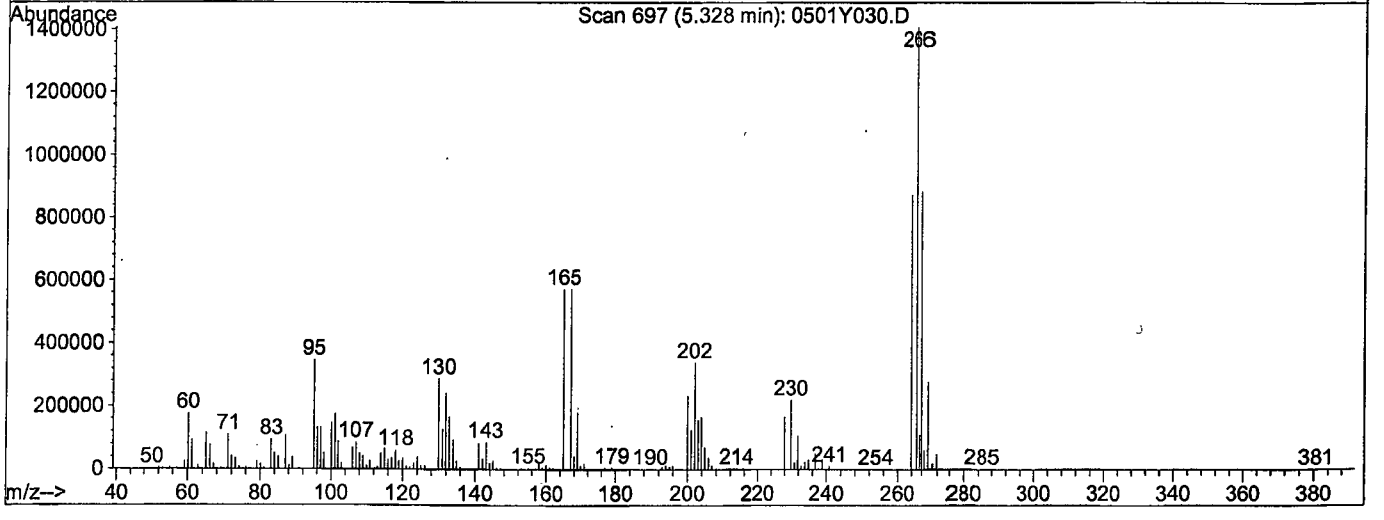
Breakdown **0.36**

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y030.D Vial: 44
Acq On : 4 May 20 14:52 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00
Quant Time: May 5 9:46 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200501M\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 27 10:10:52 2020
Response via : Single Level Calibration





TIC: 0501Y030.D

(5) Pentachlorophenol

5.33min 0.0000 m

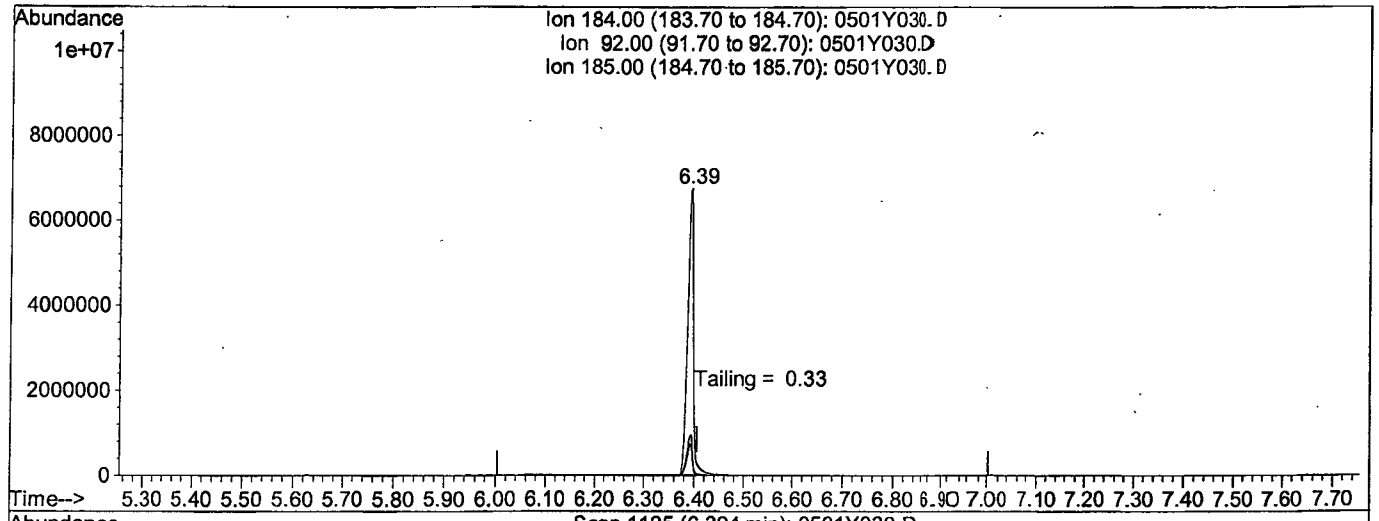
response 9419436

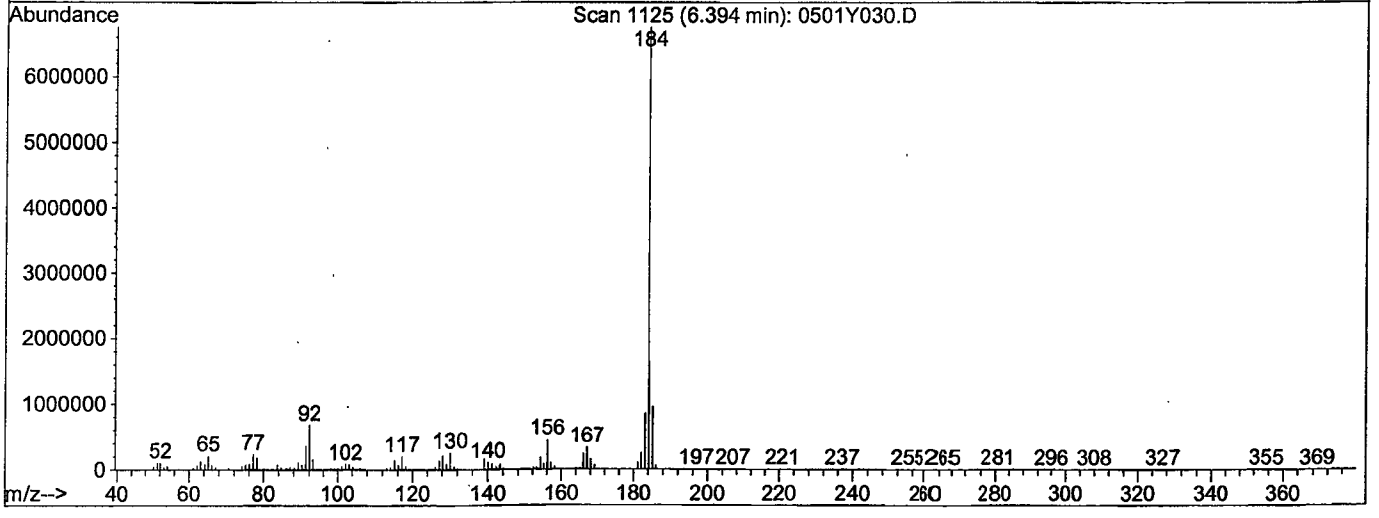
Ion	Exp%	Act%
266.00	100	100
264.00	63.80	59.32
268.00	63.80	62.00
0.00	0.00	0.00

Quantitation Report

Data File : M:\YODA\DATA\Y200501M\0501Y030.D Vial: 44
Acq On : 4 May 20 14:52 Operator: MA,SS
Sample : SV TUNE 10/01/19 Inst : Yoda
Misc : soil Multiplr: 1.00
Quant Time: May 5 9:46 2020 Quant Results File: temp.res

Method : M:\YODA\DATA\Y200501M\DFTPP2.M (Chemstation Integrator)
Title :
Last Update : Mon Apr 27 10:10:52 2020
Response via : Single Level Calibration





TIC: 0501Y030.D

(6) Benzidine

6.39min 0.0000

response 55926364

Ion	Exp%	Act%
184.00	100	100
92.00	11.60	10.06
185.00	14.90	14.16
0.00	0.00	0.00

Name of Final Standard MEE Curve **Prep'd By (Initials)** CD

Prep Date 05/01/20

Exp Date 11/06/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	5 uL	200uL	Methanol 195uL Lot# 235140	50 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	5 uL	100uL	Methanol 95uL Lot# 235140	100 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	10 uL	100uL	Methanol 90uL Lot# 235140	200 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	20 uL	100uL	Methanol 80 uL Lot# 235140	400 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	50 uL	200 uL	Methanol 150 uL Lot# 235140	500 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	30 uL	100uL	Methanol 70 uL Lot# 235140	600 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	40 uL	100uL	Methanol 60 uL Lot# 235140	800 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"
MEE M STD Stock	APPL		2000 ug/mL	11/06/19	11/06/20	50 uL	100uL	Methanol 50uL Lot# 235140	1000 ug/mL
SV Internal Standard	APPL	8270 Internal Standard	2000 ug/mL	03/03/20	03/03/21	2 uL	"	"	"

Name of Final Standard MEE Second Source **Prep'd By (Initials)** MA

Prep Date 05/01/20

Exp Date 11/06/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from container Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
MEE SS	APPL		2000 ug/mL	11/06/19	11/06/20	50 uL	200uL	Methanol 150uL Lot# 235140	500 ug/mL
SV Internal Standard	APPL	8277 Internal Standard	2000 ug/mL	03/03/20	03/03/21	4 uL	"	"	"

Name of Final Standard Diethylene Glycol

Prep'd By (Initials) MA

Prep Date 11/05/19

Exp Date 11/05/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Diethylene glycol methyl ether	AccuStandard	S-72273	2000 ug/mL	218101558-39890	12/01/20	1.0 mL	2 mL	Methanol #208858	1000 ug/mL

Given to Extraction to do **MEE M STD Stock** (used for ICAL) Final concentration 2000ug/L

Name of Final Standard 2MEE Second Source Stock **Prep'd By (Initials)** JP

Prep Date 10/28/19
Exp Date 10/28/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Methoxyethanol-Neat	Chem Service	N-12404-1G	Neat 99.5%	**7079100 - 39417**	**07/31/22**	0.1022g	10 mL	MC #56258	10220 ug/mL

Given to Extraction to do **MEE SS** (used for ICAL SS)
0.097ml were spiked in 500ml of water and extracted on 04/29/19 . Final concentration is 2000ug/L

Name of Final Standard **8270 Internal Standard Ampules (2)** Prep'd By (Initials) **MA**

Prep Date	11/20/19
Exp Date	11/20/20

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or =APPL Prep Date)	Final Standard Conc (range)
Semivolatile Internal Standard	Restek	31206	2000 ug/mL	AO157142-49871,872,873	07/31/25	3mL	3 mL	NA	2000ug/mL

Organic Extraction Worksheet

Method	Solid Phase Extraction of 2MEE in Water	Extraction Set	200504A	Extraction Method	MWE2MEE	Units	mL

Spiked ID 1	Diethylene Glycol 4-29-20 12-1-20		Surrogate ID 1		
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	05/04/20 8:25	
Spiked ID 8			Ext. End Time:	05/04/20 13:40	
			GC Requires Extract By:		

pH1			Water Bath Temp 1 °C	
pH2			Water Bath Temp 2 °C	
pH3			Water Bath Temp 3 °C	

Spiked By: DL **Date** 05/04/20 **Witnessed By:** CFM **Date** 05/04/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200504A Blk				NA	NA equip	500	2	7	05/04/20 8:25	
2	200504A LCS-1		0.040	1	NA	NA equip	500	2	7	05/04/20 8:25	
3	200504A LCSD-1		0.040	1	NA	NA equip	500	2	7	05/04/20 8:25	
4	BA10439	BA10439W14			NA	NA equip	500	2	7	05/04/20 8:25	92025
5	BA10504	BA10504W15			NA	NA equip	500	2	7	05/04/20 8:25	92039
6	BA10505	BA10505W08			NA	NA equip	500	2	7	05/04/20 8:25	92039

Solvent and Lot#	
ENVIRO-CLEAN CARTRIDGES	47266-EY
PH Strip	HC998032
Di Water	5-4-20
Dichloromethane	59239
Methanol	60072

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	CD
Date	5/4/20
Time	2:15
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	05/04/20 2:29:34 PM

Reviewed By: KY **Date** 05/04/20

Injection Log

Directory: M:\YODA\DATA\Y200501M\

Vial	FileName	Multiplier	SampleName	Misc Info	Injected
38	0501Y002.D	1	SV TUNE 10/01/19	soil	1 May 20 9:23
39	0501Y003.D	1	50ug/ml MEE 05/01/20	soil	1 May 20 9:39
40	0501Y004.D	1	100ug/ml MEE 05/01/20	soil	1 May 20 10:03
42	0501Y006.D	1	200ug/ml MEE 05/01/20	soil	1 May 20 10:51
7	0501Y007.D	1	400ug/ml MEE 05/01/20	soil	1 May 20 11:24
8	0501Y008.D	1	500ug/ml MEE 05/01/20	soil	1 May 20 11:48
9	0501Y009.D	1	600ug/ml MEE 05/01/20	soil	1 May 20 12:13
10	0501Y010.D	1	800ug/ml MEE 05/01/20	soil	1 May 20 12:37
11	0501Y011.D	1	1000ug/ml MEE 05/01/20	soil	1 May 20 13:01
13	0501Y013.D	1	SSug/ml MEE 05/01/20	soil	1 May 20 13:50
44	0501Y030.D	1	SV TUNE 10/01/19	soil	4 May 20 14:52
45	0501Y031.D	1	500ug/ml MEE 05/01/20	soil	4 May 20 15:07
32	0501Y032.D	1	200504A BLK 2/500		4 May 20 15:56
33	0501Y033.D	1	200504A LCS-1 2/500		4 May 20 16:20
34	0501Y034.D	1	200504A LCSD-1 2/500		4 May 20 16:44
36	0501Y036.D	1	BA10504W15 2/500		4 May 20 17:33
37	0501Y037.D	1	BA10505W08 2/500		4 May 20 17:56
38	0501Y038.D	1	500ug/ml MEE 05/01/20		4 May 20 18:21

ORGANICS
Calibration Data

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/30/20
Matrix: water Instrument: Max Initials: DG

			0430M18.D	0430M19 D	0430M20.D	0430M21.D	0430M22.D	0430M23.D	0430M24.D	0430M25.D	0430M26.D							
		Compound	0.3	0.5	1	2	5	10	20	40	100		Avg	%RSD	Type	r^2	Q	MRF
1	I	Fluorobenzene (IS)	ISTD															
2	TM	Dichlorodifluoromethane		0.1304	0.1119	0.1064	0.0959	0.1057	0.1063	0.1095	0.1072		0.11	8.9	TM			
3	TML	Freon 114		0.0882	0.0011	0.0715	0.0678	0.0719	0.0726	0.0748	0.0758		0.07	41	TML	1.000		
4	TM**L	Chloromethane		0.1703	0.0945	0.1012	0.0848	0.0915	0.0894	0.0899	0.0840		0.10	28	TM**L	0.999		
5	TM*	Vinyl chloride		0.0966	0.0858	0.0904	0.0794	0.0804	0.0844	0.0862	0.0807		0.09	6.8	TM*			
6	TML	Bromomethane		0.0720	0.0509	0.0632	0.0449	0.0441	0.0453	0.0471	0.0427		0.05	21	TML	0.999		
7	TM	Chloroethane		0.0747	0.0559	0.0468	0.0517	0.0623	0.0523	0.0575	0.0609		0.06	15	TM			
8	TM	Dichlorofluoromethane		0.1771	0.1407	0.1376	0.1331	0.1366	0.1304	0.1355	0.1307		0.14	11	TM			
9	TM	Trichlorofluoromethane		0.1533	0.1162	0.1397	0.1351	0.1371	0.1398	0.1459	0.1389		0.14	7.7	TM			
10	TM	Acrolein		0.0127	0.0112	0.0108	0.0118	0.0110	0.0106	0.0112	0.0104		0.01	6.6	TM			
11	TML	Acetone			0.0924	0.0692	0.0517	0.0425	0.0348	0.0348	0.0273		0.05	46	TML	0.991		
12	TM	Freon-113		0.0326	0.0330	0.0284	0.0256	0.0327	0.0294	0.0291	0.0286		0.03	8.7	TM			
13	TM*	1,1-DCE		0.1404	0.1109	0.1168	0.1153	0.1187	0.1183	0.1190	0.1110		0.12	7.8	TM*			
14	TMQ	t-Butanol	0.0022	0.0019	0.0021	0.0025	0.0027	0.0030	0.0038	0.0052	0.0056		0.00	43	TMQ	0.990		
15	TML	Methyl Acetate		0.0759	0.0588	0.0529	0.0541	0.0517	0.0454	0.0522	0.0498		0.06	17	TML	0.999		
16	TML	Iodomethane		0.0492	0.0386	0.0544	0.0607	0.0792	0.0946	0.1009	0.1084		0.07	36	TML	0.999		
17	TM	Acrylonitrile		0.0314	0.0323	0.0260	0.0220	0.0278	0.0244	0.0282	0.0271		0.03	12	TM			
18	TML	Methylene chloride		0.1322	0.0922	0.0975	0.0841	0.0873	0.0850	0.0848	0.0768		0.09	19	TML	0.998		
19	TM	Carbon disulfide		0.2168	0.1917	0.2165	0.2015	0.1966	0.1988	0.2078	0.1925		0.20	4.9	TM			
20	TML	Methyl t-butyl ether (MtBE)		0.2556	0.1932	0.2074	0.1584	0.1853	0.1627	0.1537	0.1893		0.19	18	TML	0.994		
21	TM	Trans-1,2-DCE		0.0824	0.0974	0.0732	0.0755	0.0886	0.0831	0.0859	0.0815		0.08	9.1	TM			
22	TM	Diisopropyl Ether		0.2433	0.2201	0.2215	0.2133	0.2199	0.2184	0.2247	0.2160		0.22	4.1	TM			
23	TM**	1,1-DCA		0.1240	0.1281	0.1420	0.1297	0.1345	0.1379	0.1361	0.1303		0.13	4.4	TM**			
24	TML	Vinyl Acetate		0.2808	0.1099	0.2171	0.2032	0.2123	0.2116	0.2234	0.1958		0.21	23	TML	0.997		
25	TML	Ethyl tert Butyl Ether		0.1624	0.1310	0.1251	0.1055	0.1269	0.1015	0.0838	0.1071		0.12	20	TML	0.991		
26	TML	MEK (2-Butanone)			0.0485	0.0393	0.0300	0.0276	0.0283	0.0306	0.0316		0.03	22	TML	0.999		
27	TM	Cis-1,2-DCE		0.0955	0.1024	0.1041	0.0958	0.0975	0.0960	0.0951	0.0923		0.10	4.1	TM			
28	TML	2,2-Dichloropropane		0.0340	0.0046	0.0729	0.0663	0.0794	0.0784	0.0812	0.0968		0.06	47	TML	0.996		
29	TM*	Chloroform		0.1946	0.1666	0.1709	0.1498	0.1658	0.1651	0.1659	0.1576		0.17	7.7	TM*			
30	TM	Bromochloromethane		0.0619	0.0538	0.0609	0.0570	0.0576	0.0553	0.0544	0.0520		0.06	6.1	TM			
31	S	Dibromofluoromethane(S)	0.2837	0.2847	0.2530	0.2640	0.2789	0.2822	0.2787	0.2737	0.2577		0.27	4.3	S			
32	TM	1,1,1-TCA		0.1427	0.1444	0.1450	0.1443	0.1463	0.1550	0.1612	0.1490		0.15	4.3	TM			
33	TML	Cyclohexane		0.1049	0.0606	0.0659	0.0534	0.0527	0.0551	0.0597	0.0544		0.06	27	TML	0.998		
34	TM	1,1-Dichloropropene		0.1181	0.1271	0.1166	0.1139	0.1113	0.1092	0.1171	0.1105		0.12	5.0	TM			
35	TM	2,2,4-Trimethylpentane		0.1913	0.1536	0.1416	0.1245	0.1374	0.1292	0.1398	0.1376		0.14	14	TM			

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/30/20
Matrix: water Instrument: Max Initials: DG

		Compound	0.3	0.5	1	2	5	10	20	40	100		Avg	%RSD	Type		Q	MRF
36	S	1,2-DCA-D4(S)	0.3510	0.3396	0.2876	0.3079	0.3314	0.3503	0.3411	0.3491	0.3244		0.33	6.5	S			
37	TM	Carbon Tetrachloride		0.1252	0.1325	0.1291	0.1323	0.1312	0.1351	0.1452	0.1400		0.13	4.7	TM			
38	TMQ	Tert Amyl Methyl Ether		0.1613	0.1272	0.1329	0.0980	0.1093	0.0917	0.0701	0.0955		0.11	26	TMQ	0.996		
39	TM	1,2-DCA		0.1795	0.1399	0.1430	0.1525	0.1528	0.1418	0.1521	0.1424		0.15	8.6	TM			
40	TM	Benzene		0.4412	0.3261	0.3286	0.3224	0.3334	0.3313	0.3324	0.3176		0.34	12	TM			
41	TM	TCE		0.1096	0.1105	0.1132	0.0943	0.1039	0.0953	0.0979	0.0932		0.10	7.9	TM			
42	TM	2-Pentanone		0.0596	0.0574	0.0584	0.0558	0.0566	0.0526	0.0555	0.0584		0.06	3.9	TM			
43	TM*L	1,2-Dichloropropane		0.1148	0.0741	0.0772	0.0657	0.0714	0.0707	0.0739	0.0694		0.08	20	TM*L	0.999		
44	TM	Bromodichloromethane		0.1273	0.1289	0.1318	0.1352	0.1369	0.1311	0.1373	0.1328		0.13	2.7	TM			
45	TM	Methyl Cyclohexane		0.1287	0.1119	0.1056	0.0990	0.1073	0.1069	0.1140	0.1075		0.11	7.9	TM			
46	TM	Dibromomethane		0.0547	0.0548	0.0511	0.0533	0.0518	0.0545	0.0539	0.0528		0.05	2.6	TM			
47	TM	MIBK (methyl isobutyl ketone)													TM			
48	TM	1-Bromo-2-chloroethane		0.0904	0.1023	0.1000	0.1002	0.1035	0.1043	0.1036	0.1023		0.10	4.4	TM			
49	TM	2-Chloroethyl vinyl ether													TM			
50	TM	Cis-1,3-Dichloropropene		0.1061	0.1553	0.1493	0.1289	0.1378	0.1378	0.1491	0.1489		0.14	11	TM			
51	TM*	Toluene		0.4667	0.4382	0.3917	0.3780	0.3888	0.3797	0.3914	0.3824		0.40	8.1	TM*			
52	TM	Trans-1,3-Dichloropropene		0.1051	0.0895	0.1082	0.1057	0.1225	0.1155	0.1276	0.1432		0.11	14	TM			
53	TM	1,1,2-TCA		0.0797	0.0742	0.0660	0.0614	0.0645	0.0642	0.0627	0.0651		0.07	9.4	TM			
54	TML	2-Hexanone			0.0222	0.0514	0.0395	0.0435	0.0431	0.0471	0.0476		0.04	23	TML	1.000		
55	I	Chlorobenzene-D5 (IS)	ISTD															
56	S	Toluene-D8(S)	1.293	1.290	1.126	1.112	1.175	1.221	1.198	1.225	1.092		1.2	6.1	S			
57	TM	1,2-EDB		0.1236	0.1055	0.1146	0.0980	0.1093	0.1010	0.1012	0.0939		0.11	9.1	TM			
58	TML	Tetrachloroethene		0.1283	0.1024	0.0985	0.0829	0.0833	0.0820	0.0845	0.0740		0.09	19	TML	0.997		
59	TML	1-Chlorohexane		0.2206	0.1105	0.1166	0.1204	0.1208	0.1223	0.1289	0.1169		0.13	27	TML	0.998		
60	TM	1,1,1,2-Tetrachloroethane		0.1293	0.1233	0.1182	0.1285	0.1444	0.1405	0.1424	0.1375		0.13	7.2	TM			
61	TM	m&p-Xylene		0.2937	0.2272	0.2391	0.2290	0.2429	0.2241	0.2326	0.2214		0.24	9.8	TM			
62	TM	o-Xylene		0.2910	0.2381	0.2328	0.2262	0.2304	0.2281	0.2361	0.2237		0.24	9.2	TM			
63	TM	Styrene		0.4083	0.3549	0.3821	0.3609	0.3981	0.3911	0.4009	0.3885		0.39	4.9	TM			
64	S	4-Bromofluorobenzene(S)	0.5813	0.5584	0.4666	0.4705	0.4856	0.5114	0.4957	0.5135	0.5017		0.51	7.5	S			
65	TM	1,3-Dichloropropane		0.1761	0.1562	0.1652	0.1607	0.1708	0.1627	0.1655	0.1537		0.16	4.5	TM			
66	TM	Dibromochloromethane		0.1317	0.1289	0.1417	0.1324	0.1463	0.1431	0.1474	0.1428		0.14	5.1	TM			
67	TM**	Chlorobenzene		0.3698	0.3555	0.3590	0.3237	0.3344	0.3325	0.3352	0.3233		0.34	5.1	TM**			
68	TM*	Ethylbenzene		0.6321	0.5513	0.5518	0.4987	0.5536	0.5216	0.5447	0.5087		0.55	7.5	TM*			
69	TM**	Bromoform		0.1232	0.1163	0.1144	0.1225	0.1249	0.1206	0.1312	0.1358		0.12	5.8	TM**			
70	I	1,4-Dichlorobenzene-D (IS)	ISTD															

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/30/20
Matrix: water Instrument: Max Initials: DG

		Compound	0.3	0.5	1	2	5	10	20	40	100		Avg	%RSD	Type		Q	MRF
71	TM	Isopropylbenzene		1.002	0.8411	0.8742	0.8350	0.8791	0.8672	0.8872	0.7842		0.87	7.2	TM			
72	TM**	1,1,2,2-Tetrachloroethane		0.2417	0.1788	0.1703	0.1760	0.1697	0.1689	0.1717	0.1670		0.18	14	TM**			
73	TM	1,2,3-Trichloropropane			0.0757	0.0952	0.0669	0.0771	0.0722	0.0713	0.0717		0.08	12	TM			
74	TML	t-1,4-Dichloro-2-Butene			0.0451	0.0342	0.0200	0.0253	0.0299	0.0316	0.0358		0.03	25	TML	0.997		
75	TM	Bromobenzene		0.2517	0.2857	0.2851	0.2907	0.2990	0.2865	0.2936	0.2677		0.28	5.5	TM			
76	TM	n-Propylbenzene		1.056	0.9059	0.9381	0.8810	0.9207	0.8892	0.9316	0.8350		0.92	7.0	TM			
77	TM	4-Ethyltoluene		0.9320	0.8707	0.8714	0.7978	0.8391	0.8207	0.8721	0.7903		0.85	5.5	TM			
78	TM	2-Chlorotoluene		0.6879	0.6871	0.6872	0.5864	0.6955	0.6871	0.6082	0.6237		0.66	6.7	TM			
79	TM	1,3,5-Trimethylbenzene		0.7780	0.7532	0.7519	0.7710	0.7730	0.7506	0.7670	0.7076		0.76	3.0	TM			
80	TM	4-Chlorotoluene		0.7421	0.7469	0.6961	0.6672	0.7051	0.6910	0.7024	0.6520		0.70	4.7	TM			
81	TM	Tert-Butylbenzene		0.8267	0.7056	0.6693	0.6782	0.7832	0.6798	0.7925	0.6459		0.72	9.4	TM			
82	TM	1,2,4-Trimethylbenzene		0.8657	0.7149	0.7331	0.7116	0.7611	0.7694	0.8341	0.7733		0.77	7.1	TM			
83	TM	Sec-Butylbenzene		0.7996	0.7887	0.7434	0.7627	0.8241	0.8135	0.8762	0.8110		0.80	5.0	TM			
84	TM	p-Isopropyltoluene		0.6977	0.7356	0.6537	0.6894	0.7476	0.7505	0.8267	0.7767		0.73	7.4	TM			
85	TML	Benzyl Chloride		0.1761	0.1179	0.1147	0.1197	0.1328	0.1553	0.1830	0.2350		0.15	27	TML	0.991		
86	TM	1,3-DCB		0.5506	0.4577	0.5359	0.5039	0.5130	0.4953	0.5187	0.4880		0.51	5.7	TM			
87	TM	1,4-DCB		0.6168	0.5282	0.4992	0.5026	0.5088	0.4990	0.5162	0.5029		0.52	7.6	TM			
88	TM	n-Butylbenzene		0.4249	0.3989	0.3941	0.3802	0.4467	0.4711	0.5292	0.5331		0.45	13	TM			
89	TM	1,2-DCB		0.5023	0.5177	0.4602	0.4561	0.4917	0.4773	0.5103	0.4931		0.49	4.6	TM			
90	TM	Hexachloroethane		0.1186	0.1089	0.1170	0.0994	0.1216	0.1268	0.1353	0.1348		0.12	10	TM			
91	TM	1,2-Dibromo-3-chloropropane			0.0439	0.0293	0.0393	0.0414	0.0389	0.0410	0.0378		0.04	12	TM			
92	TML	1,2,4-Trichlorobenzene		0.2183	0.2247	0.2528	0.2160	0.2526	0.2876	0.3106	0.3179		0.26	16	TML	1.000		
93	TM	Hexachlorobutadiene		0.1057	0.1132	0.1072	0.1168	0.1280	0.1391	0.1548	0.1470		0.13	15	TM			
94	TML	Naphthalene		0.4470	0.3234	0.3302	0.3072	0.3793	0.4039	0.4563	0.4779		0.39	17	TML	0.999		
95	TML	1,2,3-Trichlorobenzene		0.1410	0.1979	0.1810	0.1688	0.2061	0.2191	0.2655	0.2693		0.21	22	TML	0.999		
96																		
97																		
98																		
99																		
100																		
101																		
102																		
103																		
104																		
105																		

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M18.D Vial: 15
Acq On : 30 Apr 20 19:46 Operator: LP,DG,CMM
Sample : 0.3ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1854321	25.000	ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1584286	25.000	ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	992003	25.000	ppb		0.00
System Monitoring Compounds							
31) Dibromofluoromethane(S)	5.68	111	105227	5.197	ppb		0.00
Spiked Amount 25.000			Recovery =	20.788%			
36) 1,2-DCA-D4(S)	6.07	65	130162	5.296	ppb		0.00
Spiked Amount 25.000			Recovery =	21.184%			
56) Toluene-D8(S)	8.18	98	409844	5.422	ppb		0.00
Spiked Amount 25.000			Recovery =	21.688%			
64) 4-Bromofluorobenzene(S)	10.81	95	184186	5.706	ppb		0.00
Spiked Amount 25.000			Recovery =	22.824%			
Target Compounds							Qvalue
2) Dichlorodifluoromethane	1.23	85	2265	0.280	ppb	#	74
3) Freon 114	1.33	85	1590	0.791	ppb		73
4) Chloromethane	1.37	50	3358	-0.188	ppb	#	81
5) Vinyl chloride	1.47	62	2121	0.335	ppb	#	57
6) Bromomethane	1.74	94	2297	-0.123	ppb	#	43
7) Chloroethane	1.85	64	3543	0.827	ppb	#	83
8) Dichlorofluoromethane	2.04	67	4287	0.412	ppb		90
9) Trichlorofluoromethane	2.09	101	3186	0.311	ppb		91
10) Acrolein	2.53	56	6520	7.834	ppb		91
11) Acetone	2.72	43	5028	-2.726	ppb		91
12) Freon-113	2.65	101	650	0.293	ppb	#	29
13) 1,1-DCE	2.60	61	2670	0.303	ppb	#	66
14) t-Butanol	3.50	59	1600	-25.000	ppb	#	66
16) Iodomethane	2.78	142	1142	1.831	ppb	#	87
17) Acrylonitrile	3.56	53	512	0.252	ppb	#	53
18) Methylene chloride	3.21	84	3837	-0.424	ppb	#	68
19) Carbon disulfide	2.83	76	5726	0.381	ppb	#	87
20) Methyl t-butyl ether (MtBE	3.65	73	5194	1.441	ppb	#	87
21) Trans-1,2-DCE	3.57	96	1164	0.188	ppb	#	40
23) 1,1-DCA	4.22	63	3713	0.377	ppb	#	81
24) Vinyl Acetate	4.38	43	7466	-0.293	ppb	#	87
25) Ethyl tert Butyl Ether	4.95	59	3507	0.839	ppb	#	79
26) MEK (2-Butanone)	5.14	43	2060	1.393	ppb	#	73
27) Cis-1,2-DCE	5.05	96	2543	0.352	ppb		78
28) 2,2-Dichloropropane	5.05	77	2200	2.186	ppb		96
29) Chloroform	5.50	83	3362	0.271	ppb	#	76
30) Bromochloromethane	5.35	128	1807	0.430	ppb	#	55
32) 1,1,1-TCA	5.68	97	4317	0.392	ppb	#	76
33) Cyclohexane	5.73	41	2299	0.109	ppb	#	14
34) 1,1-Dichloropropene	5.89	75	3384	0.395	ppb		90
35) 2,2,4-Trimethylpentane	6.27	57	4419	0.413	ppb		90
37) Carbon Tetrachloride	5.88	117	3160	0.318	ppb	#	46
38) Tert Amyl Methyl Ether	6.34	73	4557	-2.259	ppb	#	64
39) 1,2-DCA	6.17	62	3373	0.302	ppb		99
40) Benzene	6.13	78	8136	0.321	ppb	#	87
41) TCE	6.87	95	2540	0.335	ppb	#	85
42) 2-Pentanone	7.14	43	36220	8.598	ppb		97
44) Bromodichloromethane	7.43	83	4048	0.411	ppb	#	72
45) Methyl Cyclohexane	7.10	83	2134	0.261	ppb	#	43

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M18.D Vial: 15
Acq On : 30 Apr 20 19:46 Operator: LP,DG,CMM
Sample : 0.3ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
46)	Dibromomethane	7.25	93	1292	0.326	ppb	#	68
48)	1-Bromo-2-chloroethane	7.74	63	2559	0.342	ppb		97
50)	Cis-1,3-Dichloropropene	7.91	75	2950	0.286	ppb	#	82
51)	Toluene	8.25	91	14940	0.501	ppb	#	69
52)	Trans-1,3-Dichloropropene	8.49	75	3428	0.403	ppb	#	62
53)	1,1,2-TCA	8.67	83	1251	0.251	ppb	#	77
54)	2-Hexanone	8.94	43	1843	1.283	ppb	#	44
57)	1,2-EDB	9.15	107	1859	0.277	ppb		89
58)	Tetrachloroethene	8.80	164	2081	-0.827	ppb	#	82
59)	1-Chlorohexane	9.66	91	5611	0.168	ppb	#	60
60)	1,1,1,2-Tetrachloroethane	9.75	131	3322	0.394	ppb	#	71
61)	m&p-Xylene	9.90	106	12660	0.837	ppb		84
62)	o-Xylene	10.28	106	4545	0.301	ppb	#	57
63)	Styrene	10.31	104	6239	0.255	ppb	#	86
65)	1,3-Dichloropropane	8.83	76	3086	0.297	ppb		94
66)	Dibromochloromethane	9.06	129	2649	0.300	ppb	#	64
67)	Chlorobenzene	9.66	112	6592	0.304	ppb		96
68)	Ethylbenzene	9.78	91	12976	0.375	ppb		88
69)	Bromoform	10.47	173	2150	0.274	ppb	#	70
71)	Isopropylbenzene	10.67	105	10677	0.309	ppb	#	78
72)	1,1,2,2-Tetrachloroethane	10.96	83	2799	0.391	ppb	#	58
73)	1,2,3-Trichloropropane	11.00	110	1279	0.426	ppb	#	81
74)	t-1,4-Dichloro-2-Butene	11.03	53	348	2.208	ppb		97
75)	Bromobenzene	10.95	156	3830	0.342	ppb	#	62
76)	n-Propylbenzene	11.08	91	12189	0.334	ppb		87
77)	4-Ethyltoluene	11.20	105	10457	0.310	ppb	#	80
78)	2-Chlorotoluene	11.15	91	10396	0.398	ppb		97
79)	1,3,5-Trimethylbenzene	11.27	105	10008	0.333	ppb		85
80)	4-Chlorotoluene	11.26	91	9723	0.350	ppb		98
81)	Tert-Butylbenzene	11.58	119	7283	0.254	ppb		92
82)	1,2,4-Trimethylbenzene	11.63	105	14165	0.463	ppb	#	76
83)	Sec-Butylbenzene	11.81	105	7748	0.243	ppb		87
84)	p-Isopropyltoluene	11.96	119	8219	0.282	ppb	#	73
85)	Benzyl Chloride	12.14	91	2252	3.227	ppb	#	58
86)	1,3-DCB	11.90	146	6529	0.324	ppb		90
87)	1,4-DCB	11.98	146	6058	0.293	ppb	#	42
88)	n-Butylbenzene	12.36	91	5079	0.286	ppb	#	83
89)	1,2-DCB	12.35	146	6025	0.311	ppb	#	64
90)	Hexachloroethane	12.61	117	927	0.194	ppb	#	71
91)	1,2-Dibromo-3-chloropropan	13.12	75	622	0.404	ppb	#	39
92)	1,2,4-Trichlorobenzene	13.97	180	1136	1.162	ppb	#	68
93)	Hexachlorobutadiene	14.15	225	1370	0.273	ppb		87
94)	Naphthalene	14.20	128	6893	1.710	ppb	#	64
95)	1,2,3-Trichlorobenzene	14.44	180	1588	1.571	ppb	#	73

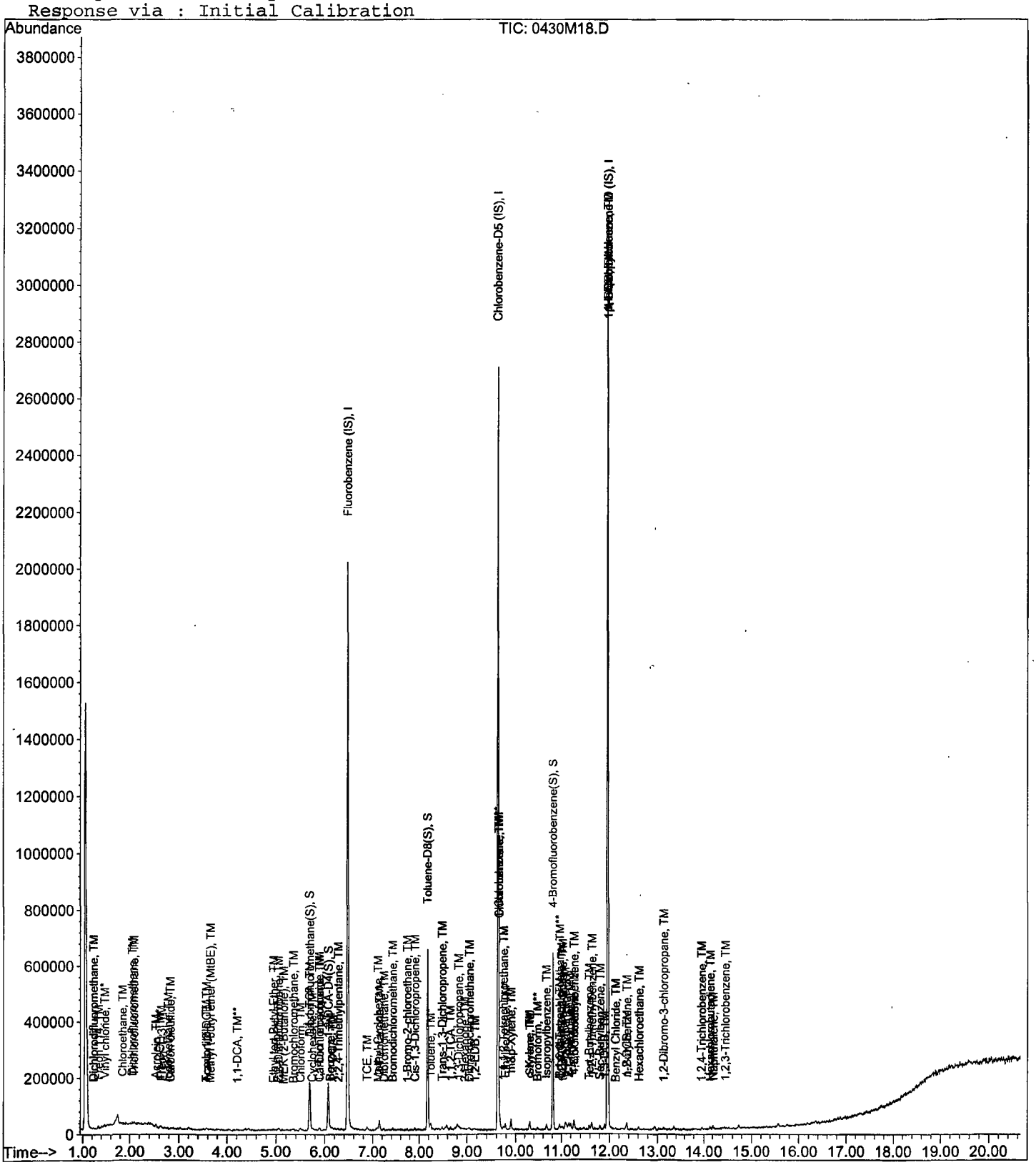
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M18.D Vial: 15
Acq On : 30 Apr 20 19:46 Operator: LP,DG,CMM
Sample : 0.3ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Page 455 of 703

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M19.D Vial: 16
Acq On : 30 Apr 20 20:15 Operator: LP,DG,CMM
Sample : 0.5ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1758160	25.000	ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1490203	25.000	ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	932540	25.000	ppb		0.00
System Monitoring Compounds							
31) Dibromofluoromethane(S)	5.69	111	100124	5.216	ppb		0.00
Spiked Amount 25.000			Recovery =	20.864%			
36) 1,2-DCA-D4(S)	6.07	65	119422	5.124	ppb		0.00
Spiked Amount 25.000			Recovery =	20.496%			
56) Toluene-D8(S)	8.18	98	384554	5.409	ppb		0.00
Spiked Amount 25.000			Recovery =	21.636%			
64) 4-Bromofluorobenzene(S)	10.81	95	166412	5.480	ppb		0.00
Spiked Amount 25.000			Recovery =	21.920%			
Target Compounds							Qvalue
2) Dichlorodifluoromethane	1.23	85	4584	0.597	ppb		83
3) Freon 114	1.34	85	3100	1.088	ppb		78
4) Chloromethane	1.38	50	6651	0.398	ppb	#	75
5) Vinyl chloride	1.47	62	3397	0.565	ppb		99
7) Chloroethane	1.85	64	2626	0.646	ppb		99
8) Dichlorofluoromethane	2.04	67	6226	0.631	ppb	#	71
9) Trichlorofluoromethane	2.09	101	5391	0.554	ppb		75
10) Acrolein	2.53	56	22312	28.274	ppb		91
11) Acetone	2.72	43	6112	-2.010	ppb	#	62
12) Freon-113	2.64	101	1145	0.544	ppb	#	56
13) 1,1-DCE	2.61	61	4936	0.591	ppb	#	84
14) t-Butanol	3.50	59	3352	6.464	ppb	#	83
15) Methyl Acetate	3.12	43	2668	0.599	ppb	#	66
16) Iodomethane	2.77	142	1729	1.915	ppb	#	71
17) Acrylonitrile	3.55	53	1103	0.572	ppb	#	59
18) Methylene chloride	3.21	84	4649	-0.237	ppb		99
19) Carbon disulfide	2.83	76	7625	0.535	ppb		96
20) Methyl t-butyl ether (MtBE	3.65	73	8989	1.751	ppb	#	82
21) Trans-1,2-DCE	3.59	96	2896	0.494	ppb	#	61
22) Diisopropyl Ether	4.43	45	8554	0.548	ppb	#	83
23) 1,1-DCA	4.22	63	4360	0.467	ppb		98
24) Vinyl Acetate	4.42	43	9875	-0.092	ppb	#	99
25) Ethyl tert Butyl Ether	4.96	59	5709	1.162	ppb		93
26) MEK (2-Butanone)	5.15	43	2652	1.708	ppb	#	72
27) Cis-1,2-DCE	5.06	96	3357	0.490	ppb		80
28) 2,2-Dichloropropane	5.04	77	1197	2.056	ppb	#	81
29) Chloroform	5.49	83	6842	0.582	ppb		89
30) Bromochloromethane	5.36	128	2178	0.547	ppb		87
32) 1,1,1-TCA	5.69	97	5017	0.480	ppb	#	86
33) Cyclohexane	5.74	41	3689	0.501	ppb	#	46
34) 1,1-Dichloropropene	5.89	75	4151	0.511	ppb	#	89
35) 2,2,4-Trimethylpentane	6.27	57	6728	0.663	ppb	#	61
37) Carbon Tetrachloride	5.88	117	4403	0.468	ppb		99
38) Tert Amyl Methyl Ether	6.35	73	5673	-1.926	ppb	#	89
39) 1,2-DCA	6.16	62	6313	0.596	ppb	#	78
40) Benzene	6.13	78	15515	0.646	ppb	#	89
41) TCE	6.89	95	3855	0.536	ppb		82
42) 2-Pentanone	7.14	43	104869	26.256	ppb		97
43) 1,2-Dichloropropane	7.12	63	4036	0.466	ppb		98

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M19.D Vial: 16
Acq On : 30 Apr 20 20:15 Operator: LP,DG,CMM
Sample : 0.5ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
44)	Bromodichloromethane	7.43	83	4478	0.480	ppb		88
45)	Methyl Cyclohexane	7.09	83	4527	0.585	ppb	#	73
46)	Dibromomethane	7.25	93	1924	0.513	ppb	#	27
48)	1-Bromo-2-chloroethane	7.74	63	3180	0.448	ppb		96
50)	Cis-1,3-Dichloropropene	7.92	75	3730	0.381	ppb	#	82
51)	Toluene	8.25	91	16411	0.580	ppb		92
52)	Trans-1,3-Dichloropropene	8.48	75	3695	0.458	ppb	#	82
53)	1,1,2-TCA	8.66	83	2801	0.593	ppb		82
54)	2-Hexanone	8.96	43	803	1.003	ppb	#	84
57)	1,2-EDB	9.15	107	3683	0.584	ppb	#	49
58)	Tetrachloroethene	8.80	164	3824	-0.406	ppb	#	68
59)	1-Chlorohexane	9.67	91	6574	0.353	ppb	#	77
60)	1,1,1,2-Tetrachloroethane	9.75	131	3853	0.486	ppb	#	30
61)	m&p-Xylene	9.91	106	17505	1.230	ppb		94
62)	o-Xylene	10.30	106	8673	0.611	ppb		65
63)	Styrene	10.31	104	12170	0.529	ppb		97
65)	1,3-Dichloropropane	8.82	76	5249	0.537	ppb		94
66)	Dibromochloromethane	9.05	129	3925	0.473	ppb		92
67)	Chlorobenzene	9.66	112	11021	0.541	ppb	#	85
68)	Ethylbenzene	9.78	91	18840	0.580	ppb		86
69)	Bromoform	10.47	173	3671	0.498	ppb	#	69
71)	Isopropylbenzene	10.67	105	18688	0.575	ppb	#	82
72)	1,1,2,2-Tetrachloroethane	10.97	83	4507	0.669	ppb	#	55
74)	t-1,4-Dichloro-2-Butene	11.02	53	302	2.189	ppb	#	26
75)	Bromobenzene	10.95	156	4695	0.446	ppb		85
76)	n-Propylbenzene	11.08	91	19695	0.574	ppb		96
77)	4-Ethyltoluene	11.20	105	17383	0.549	ppb		98
78)	2-Chlorotoluene	11.15	91	12829	0.523	ppb		98
79)	1,3,5-Trimethylbenzene	11.26	105	14510	0.514	ppb		94
80)	4-Chlorotoluene	11.26	91	13840	0.530	ppb		97
81)	Tert-Butylbenzene	11.58	119	15418	0.572	ppb		94
82)	1,2,4-Trimethylbenzene	11.63	105	16146	0.562	ppb		95
83)	Sec-Butylbenzene	11.80	105	14913	0.498	ppb		90
84)	p-Isopropyltoluene	11.95	119	13013	0.475	ppb	#	77
85)	Benzyl Chloride	12.13	91	3284	3.360	ppb		97
86)	1,3-DCB	11.90	146	10269	0.542	ppb		95
87)	1,4-DCB	11.99	146	11504	0.591	ppb	#	72
88)	n-Butylbenzene	12.36	91	7924	0.475	ppb	#	88
89)	1,2-DCB	12.35	146	9368	0.514	ppb	#	79
90)	Hexachloroethane	12.61	117	2212	0.493	ppb	#	72
91)	1,2-Dibromo-3-chloropropan	13.11	75	1094	0.756	ppb	#	26
92)	1,2,4-Trichlorobenzene	13.97	180	4072	1.413	ppb		85
93)	Hexachlorobutadiene	14.15	225	1971	0.418	ppb	#	72
94)	Naphthalene	14.20	128	8336	1.814	ppb	#	93
95)	1,2,3-Trichlorobenzene	14.45	180	2630	1.683	ppb		83

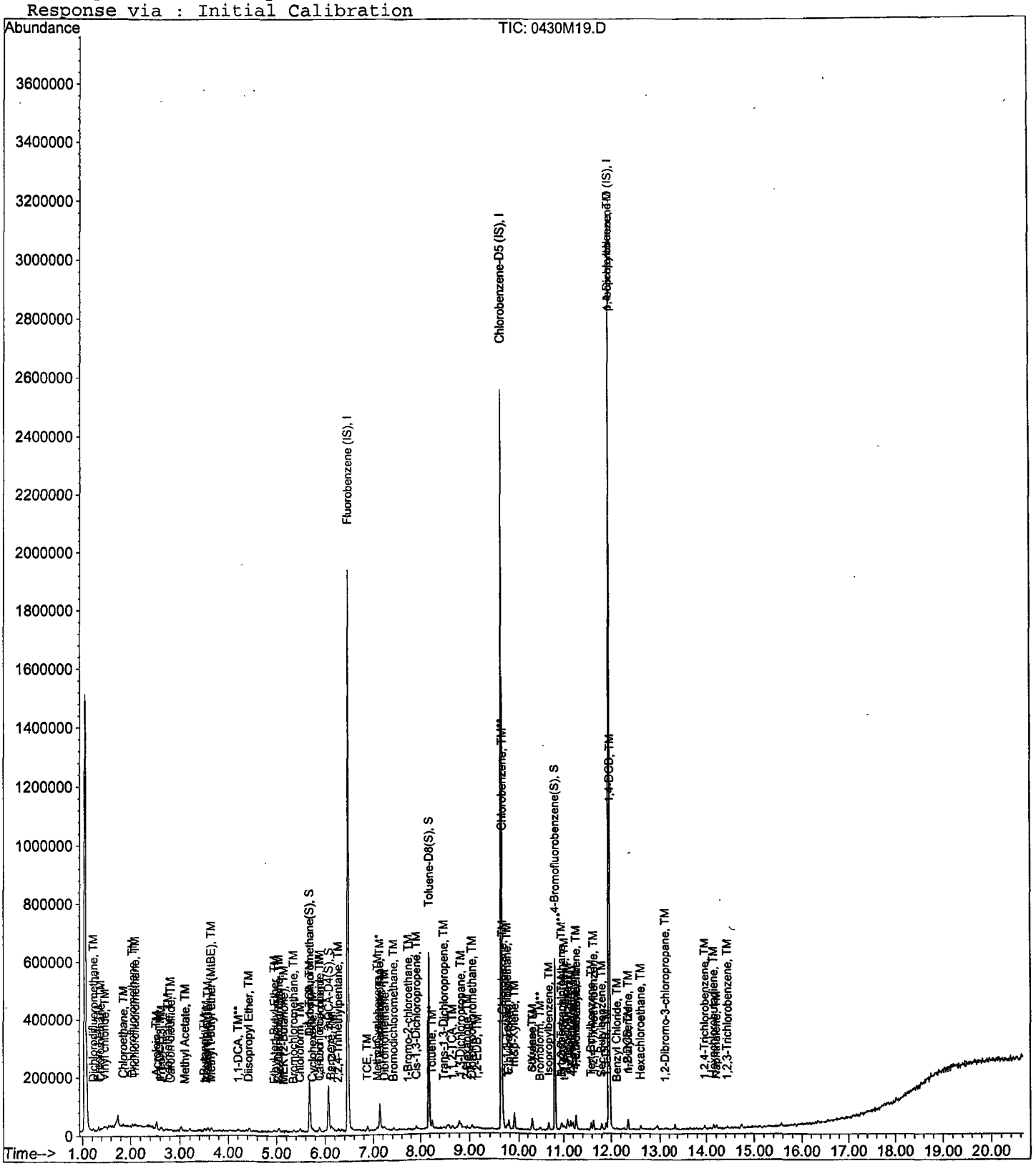
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M19.D Vial: 16
Acq On : 30 Apr 20 20:15 Operator: LP,DG,CMM
Sample : 0.5ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M20.D Vial: 17
Acq On : 30 Apr 20 20:44 Operator: LP,DG,CMM
Sample : 1.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1773357	25.000	ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1505733	25.000	ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	949705	25.000	ppb		0.00
System Monitoring Compounds							
31) Dibromofluoromethane(S)	5.69	111	179438	9.267	ppb		0.00
Spiked Amount 25.000			Recovery =	37.068%			
36) 1,2-DCA-D4(S)	6.07	65	204000	8.679	ppb		0.00
Spiked Amount 25.000			Recovery =	34.716%			
56) Toluene-D8(S)	8.18	98	678315	9.443	ppb		0.00
Spiked Amount 25.000			Recovery =	37.772%			
64) 4-Bromofluorobenzene(S)	10.81	95	281046	9.160	ppb		0.00
Spiked Amount 25.000			Recovery =	36.640%			
Target Compounds							Qvalue
2) Dichlorodifluoromethane	1.23	85	7941	1.026	ppb		88
3) Freon 114	1.43	85	80	0.524	ppb		83
4) Chloromethane	1.38	50	6703	0.397	ppb		83
5) Vinyl chloride	1.47	62	6083	1.003	ppb	#	77
6) Bromomethane	1.74	94	3664	0.360	ppb		82
7) Chloroethane	1.84	64	3963	0.967	ppb	#	76
8) Dichlorofluoromethane	2.04	67	9979	1.003	ppb		91
9) Trichlorofluoromethane	2.09	101	8246	0.841	ppb		98
10) Acrolein	2.53	56	39818	50.026	ppb		99
11) Acetone	2.72	43	6551	-1.806	ppb	#	80
12) Freon-113	2.64	101	2340	1.102	ppb	#	76
13) 1,1-DCE	2.61	61	7870	0.934	ppb		93
14) t-Butanol	3.51	59	7276	59.936	ppb	#	88
15) Methyl Acetate	3.12	43	4174	1.018	ppb		93
16) Iodomethane	2.77	142	2740	2.043	ppb	#	82
17) Acrylonitrile	3.56	53	2294	1.180	ppb	#	67
18) Methylene chloride	3.21	84	6539	0.102	ppb		93
19) Carbon disulfide	2.82	76	13595	0.945	ppb		98
20) Methyl t-butyl ether (MtBE	3.65	73	13705	2.101	ppb	#	91
21) Trans-1,2-DCE	3.57	96	6907	1.167	ppb		78
22) Diisopropyl Ether	4.43	45	15613	0.991	ppb	#	81
23) 1,1-DCA	4.21	63	9088	0.965	ppb	#	85
24) Vinyl Acetate	4.43	43	7798	-0.246	ppb	#	99
25) Ethyl tert Butyl Ether	4.95	59	9293	1.639	ppb		90
26) MEK (2-Butanone)	5.15	43	3438	2.050	ppb	#	78
27) Cis-1,2-DCE	5.06	96	7263	1.052	ppb		91
28) 2,2-Dichloropropane	5.09	77	325	1.927	ppb		98
29) Chloroform	5.49	83	11817	0.997	ppb		91
30) Bromochloromethane	5.35	128	3814	0.950	ppb	#	64
32) 1,1,1-TCA	5.68	97	10245	0.973	ppb	#	89
33) Cyclohexane	5.75	41	4296	0.649	ppb	#	55
34) 1,1-Dichloropropene	5.90	75	9017	1.101	ppb		87
35) 2,2,4-Trimethylpentane	6.27	57	10894	1.064	ppb	#	66
37) Carbon Tetrachloride	5.89	117	9398	0.990	ppb	#	77
38) Tert Amyl Methyl Ether	6.33	73	9021	-1.127	ppb	#	73
39) 1,2-DCA	6.16	62	9923	0.929	ppb		99
40) Benzene	6.13	78	23134	0.955	ppb		95
41) TCE	6.88	95	7837	1.081	ppb		98
42) 2-Pentanone	7.14	43	203424	50.496	ppb		88

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M20.D Vial: 17
Acq On : 30 Apr 20 20:44 Operator: LP,DG,CMM
Sample : 1.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	5257	0.706	ppb		99
44)	Bromodichloromethane	7.43	83	9143	0.972	ppb		80
45)	Methyl Cyclohexane	7.09	83	7939	1.016	ppb		86
46)	Dibromomethane	7.24	93	3885	1.026	ppb		78
48)	1-Bromo-2-chloroethane	7.74	63	7259	1.015	ppb		89
50)	Cis-1,3-Dichloropropene	7.91	75	11013	1.116	ppb	#	81
51)	Toluene	8.25	91	31083	1.090	ppb		87
52)	Trans-1,3-Dichloropropene	8.49	75	6349	0.781	ppb	#	68
53)	1,1,2-TCA	8.66	83	5260	1.103	ppb	#	85
54)	2-Hexanone	8.97	43	1574	1.228	ppb	#	65
57)	1,2-EDB	9.15	107	6354	0.996	ppb		91
58)	Tetrachloroethene	8.81	164	6170	0.109	ppb	#	81
59)	1-Chlorohexane	9.66	91	6657	0.355	ppb		92
60)	1,1,1,2-Tetrachloroethane	9.75	131	7427	0.927	ppb		94
61)	m&p-Xylene	9.91	106	27373	1.904	ppb		96
62)	o-Xylene	10.30	106	14342	0.999	ppb		92
63)	Styrene	10.30	104	21373	0.920	ppb	#	96
65)	1,3-Dichloropropane	8.82	76	9406	0.953	ppb		93
66)	Dibromochloromethane	9.05	129	7766	0.926	ppb		99
67)	Chlorobenzene	9.66	112	21410	1.040	ppb		92
68)	Ethylbenzene	9.78	91	33204	1.011	ppb		86
69)	Bromoform	10.47	173	7004	0.941	ppb		100
71)	Isopropylbenzene	10.67	105	31950	0.965	ppb		96
72)	1,1,2,2-Tetrachloroethane	10.97	83	6792	0.991	ppb		92
73)	1,2,3-Trichloropropane	11.00	110	2875	0.999	ppb		93
74)	t-1,4-Dichloro-2-Butene	11.02	53	1712	3.217	ppb	#	56
75)	Bromobenzene	10.95	156	10854	1.011	ppb		91
76)	n-Propylbenzene	11.08	91	34415	0.985	ppb	#	84
77)	4-Ethyltoluene	11.20	105	33075	1.025	ppb		99
78)	2-Chlorotoluene	11.15	91	26101	1.044	ppb		99
79)	1,3,5-Trimethylbenzene	11.27	105	28612	0.996	ppb		92
80)	4-Chlorotoluene	11.26	91	28373	1.066	ppb	#	81
81)	Tert-Butylbenzene	11.58	119	26805	0.976	ppb		96
82)	1,2,4-Trimethylbenzene	11.81	105	27157	0.928	ppb	#	28
83)	Sec-Butylbenzene	11.81	105	29960	0.983	ppb	#	85
84)	p-Isopropyltoluene	11.96	119	27946	1.001	ppb		94
85)	Benzyl Chloride	12.13	91	4477	3.487	ppb		96
86)	1,3-DCB	11.90	146	17387	0.901	ppb		90
87)	1,4-DCB	11.99	146	20066	1.012	ppb		93
88)	n-Butylbenzene	12.36	91	15153	0.892	ppb		93
89)	1,2-DCB	12.36	146	19666	1.060	ppb	#	93
90)	Hexachloroethane	12.61	117	4135	0.905	ppb		84
91)	1,2-Dibromo-3-chloropropan	13.12	75	1667	1.131	ppb	#	41
92)	1,2,4-Trichlorobenzene	13.96	180	8536	1.774	ppb	#	73
93)	Hexachlorobutadiene	14.15	225	4300	0.895	ppb	#	81
94)	Naphthalene	14.20	128	12287	2.021	ppb	#	88
95)	1,2,3-Trichlorobenzene	14.45	180	7516	2.151	ppb	#	57

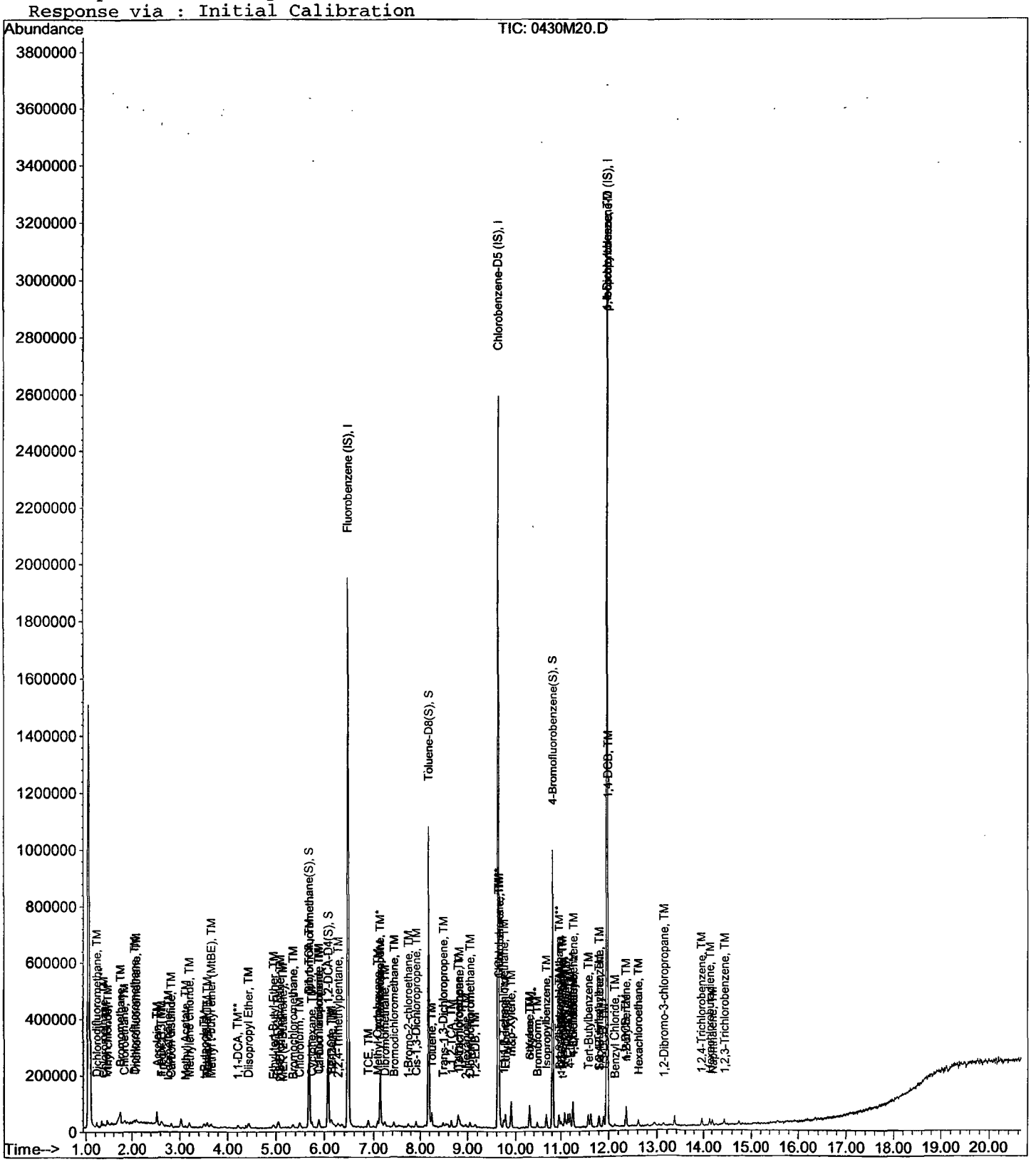
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M20.D Vial: 17
Acq On : 30 Apr 20 20:44 Operator: LP,DG,CMM
Sample : 1.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M21.D Vial: 18
Acq On : 30 Apr 20 21:13 Operator: LP,DG,CMM
Sample : 2.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1674523	25.000	ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1426159	25.000	ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	916370	25.000	ppb		0.00
System Monitoring Compounds							
31) Dibromofluoromethane(S)	5.68	111	176857	9.673	ppb		0.00
Spiked Amount 25.000			Recovery	=	38.692%		
36) 1,2-DCA-D4(S)	6.07	65	206251	9.292	ppb		0.00
Spiked Amount 25.000			Recovery	=	37.168%		
56) Toluene-D8(S)	8.18	98	634610	9.327	ppb		0.00
Spiked Amount 25.000			Recovery	=	37.308%		
64) 4-Bromofluorobenzene(S)	10.81	95	268377	9.235	ppb		0.00
Spiked Amount 25.000			Recovery	=	36.940%		
Target Compounds							Qvalue
2) Dichlorodifluoromethane	1.23	85	14252	1.949	ppb		93
3) Freon 114	1.34	85	9576	2.387	ppb		93
4) Chloromethane	1.37	50	13558	1.680	ppb		94
5) Vinyl chloride	1.47	62	12114	2.116	ppb		92
6) Bromomethane	1.74	94	8464	2.104	ppb		81
7) Chloroethane	1.84	64	6271	1.621	ppb		95
8) Dichlorofluoromethane	2.04	67	18430	1.963	ppb		83
9) Trichlorofluoromethane	2.09	101	18714	2.021	ppb		80
10) Acrolein	2.53	56	54050	71.915	ppb		88
11) Acetone	2.72	43	9264	-0.083	ppb		96
12) Freon-113	2.63	101	3805	1.898	ppb		88
13) 1,1-DCE	2.62	61	15652	1.967	ppb		96
14) t-Butanol	3.51	59	12748	84.543	ppb	#	88
15) Methyl Acetate	3.13	43	7091	1.962	ppb		84
16) Iodomethane	2.77	142	7285	2.685	ppb	#	89
17) Acrylonitrile	3.55	53	3488	1.900	ppb	#	92
18) Methylene chloride	3.20	84	13059	1.436	ppb		96
19) Carbon disulfide	2.82	76	29006	2.136	ppb		93
20) Methyl t-butyl ether (MtBE	3.65	73	27786	3.289	ppb	#	90
21) Trans-1,2-DCE	3.57	96	9805	1.754	ppb		88
22) Diisopropyl Ether	4.42	45	29666	1.994	ppb	#	91
23) 1,1-DCA	4.21	63	19027	2.139	ppb	#	94
24) Vinyl Acetate	4.43	43	29080	1.393	ppb	#	95
25) Ethyl tert Butyl Ether	4.95	59	16755	2.777	ppb	#	83
26) MEK (2-Butanone)	5.15	43	5266	3.006	ppb	#	72
27) Cis-1,2-DCE	5.05	96	13941	2.139	ppb		96
28) 2,2-Dichloropropane	5.04	77	9767	3.389	ppb	#	85
29) Chloroform	5.49	83	22899	2.047	ppb		94
30) Bromochloromethane	5.36	128	8157	2.151	ppb	#	73
32) 1,1,1-TCA	5.68	97	19424	1.953	ppb	#	83
33) Cyclohexane	5.74	41	8828	1.951	ppb	#	70
34) 1,1-Dichloropropene	5.89	75	15617	2.019	ppb		93
35) 2,2,4-Trimethylpentane	6.27	57	18965	1.961	ppb	#	62
37) Carbon Tetrachloride	5.88	117	17288	1.929	ppb		83
38) Tert Amyl Methyl Ether	6.35	73	17801	1.212	ppb	#	82
39) 1,2-DCA	6.16	62	19151	1.900	ppb		95
40) Benzene	6.13	78	44025	1.924	ppb	#	91
41) TCE	6.89	95	15165	2.214	ppb	#	81
42) 2-Pentanone	7.14	43	293482	77.150	ppb		98

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M21.D Vial: 18
Acq On : 30 Apr 20 21:13 Operator: LP,DG,CMM
Sample : 2.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	10347	1.859	ppb	#	93
44)	Bromodichloromethane	7.43	83	17662	1.988	ppb		94
45)	Methyl Cyclohexane	7.09	83	14153	1.919	ppb		80
46)	Dibromomethane	7.24	93	6847	1.916	ppb		85
48)	1-Bromo-2-chloroethane	7.74	63	13398	1.984	ppb		99
50)	Cis-1,3-Dichloropropene	7.91	75	19997	2.145	ppb		93
51)	Toluene	8.25	91	52470	1.948	ppb		89
52)	Trans-1,3-Dichloropropene	8.49	75	14491	1.887	ppb		85
53)	1,1,2-TCA	8.66	83	8842	1.964	ppb		87
54)	2-Hexanone	8.96	43	6889	2.914	ppb		97
57)	1,2-EDB	9.15	107	13075	2.165	ppb		99
58)	Tetrachloroethene	8.80	164	11243	1.381	ppb		93
59)	1-Chlorohexane	9.66	91	13300	1.397	ppb	#	83
60)	1,1,1,2-Tetrachloroethane	9.75	131	13488	1.778	ppb		93
61)	m&p-Xylene	9.90	106	54553	4.006	ppb		82
62)	o-Xylene	10.29	106	26564	1.954	ppb		98
63)	Styrene	10.31	104	43593	1.982	ppb		98
65)	1,3-Dichloropropane	8.83	76	18852	2.017	ppb		91
66)	Dibromochloromethane	9.05	129	16170	2.035	ppb		88
67)	Chlorobenzene	9.66	112	40956	2.101	ppb		100
68)	Ethylbenzene	9.78	91	62960	2.024	ppb		100
69)	Bromoform	10.47	173	13051	1.851	ppb		87
71)	Isopropylbenzene	10.67	105	64090	2.007	ppb		92
72)	1,1,2,2-Tetrachloroethane	10.97	83	12484	1.887	ppb		99
73)	1,2,3-Trichloropropane	11.00	110	6977	2.513	ppb		95
74)	t-1,4-Dichloro-2-Butene	11.03	53	2504	3.863	ppb	#	58
75)	Bromobenzene	10.95	156	20897	2.018	ppb		87
76)	n-Propylbenzene	11.08	91	68774	2.040	ppb		96
77)	4-Ethyltoluene	11.20	105	63879	2.052	ppb		93
78)	2-Chlorotoluene	11.15	91	50375	2.089	ppb		97
79)	1,3,5-Trimethylbenzene	11.26	105	55120	1.988	ppb		97
80)	4-Chlorotoluene	11.26	91	51028	1.988	ppb		89
81)	Tert-Butylbenzene	11.59	119	49066	1.852	ppb		96
82)	1,2,4-Trimethylbenzene	11.63	105	53744	1.903	ppb		98
83)	Sec-Butylbenzene	11.80	105	54500	1.853	ppb		97
84)	p-Isopropyltoluene	11.95	119	47919	1.779	ppb		98
85)	Benzyl Chloride	12.12	91	8409	3.963	ppb		95
86)	1,3-DCB	11.90	146	39288	2.110	ppb		94
87)	1,4-DCB	11.99	146	36599	1.914	ppb		93
88)	n-Butylbenzene	12.36	91	28894	1.762	ppb		95
89)	1,2-DCB	12.35	146	33738	1.884	ppb		91
90)	Hexachloroethane	12.61	117	8574	1.945	ppb		93
91)	1,2-Dibromo-3-chloropropan	13.13	75	2149	1.511	ppb	#	66
92)	1,2,4-Trichlorobenzene	13.96	180	18533	2.651	ppb		89
93)	Hexachlorobutadiene	14.15	225	7858	1.695	ppb		90
94)	Naphthalene	14.20	128	24205	2.722	ppb		99
95)	1,2,3-Trichlorobenzene	14.44	180	13271	2.754	ppb		90

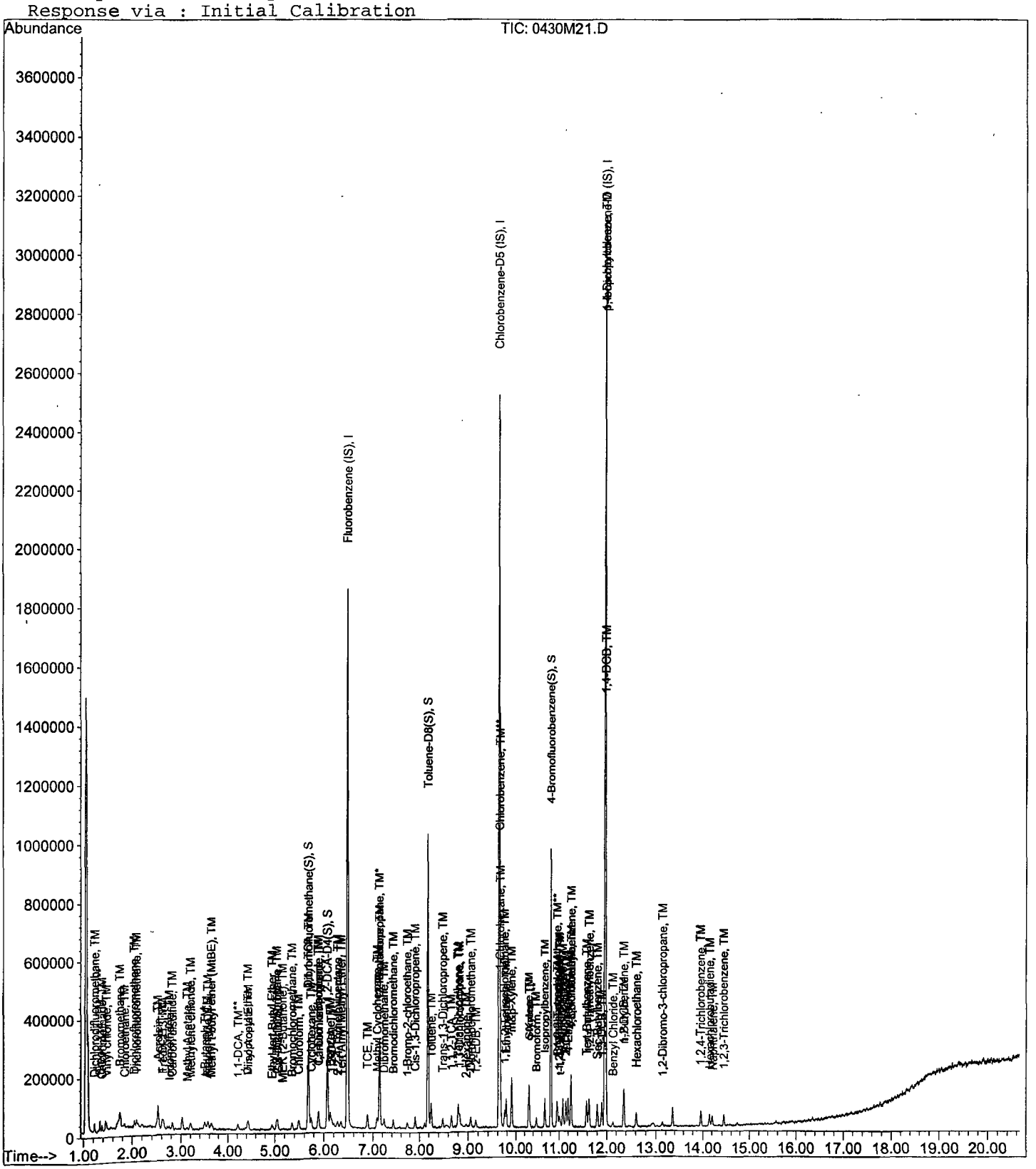
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M21.D Vial: 18
Acq On : 30 Apr 20 21:13 Operator: LP,DG,CMM
Sample : 2.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M22.D Vial: 19
Acq On : 30 Apr 20 21:42 Operator: LP,DG,CMM
Sample : 5.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1692782	25.000	ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1470774	25.000	ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	945304	25.000	ppb		0.00
System Monitoring Compounds							
31) Dibromofluoromethane(S)	5.68	111	472120	25.544	ppb		0.00
Spiked Amount 25.000			Recovery = 102.176%				
36) 1,2-DCA-D4(S)	6.07	65	561019	25.003	ppb		0.00
Spiked Amount 25.000			Recovery = 100.012%				
56) Toluene-D8(S)	8.18	98	1728660	24.636	ppb		0.00
Spiked Amount 25.000			Recovery = 98.544%				
64) 4-Bromofluorobenzene(S)	10.81	95	714241	23.833	ppb		0.00
Spiked Amount 25.000			Recovery = 95.332%				
Target Compounds							Qvalue
2) Dichlorodifluoromethane	1.23	85	32455	4.391	ppb		92
3) Freon 114	1.34	85	22962	4.964	ppb		89
4) Chloromethane	1.37	50	28720	4.316	ppb		97
5) Vinyl chloride	1.47	62	26877	4.644	ppb		96
6) Bromomethane	1.74	94	15194	4.393	ppb		99
7) Chloroethane	1.84	64	17504	4.475	ppb	#	81
8) Dichlorofluoromethane	2.04	67	45045	4.745	ppb		96
9) Trichlorofluoromethane	2.09	101	45728	4.885	ppb		91
10) Acrolein	2.53	56	80152	105.494	ppb		90
11) Acetone	2.72	43	17519	4.429	ppb		98
12) Freon-113	2.63	101	8674	4.280	ppb		89
13) 1,1-DCE	2.61	61	39020	4.851	ppb		99
14) t-Butanol	3.51	59	18008	100.068	ppb		99
15) Methyl Acetate	3.12	43	18301	5.260	ppb		91
16) Iodomethane	2.76	142	20537	4.464	ppb		95
17) Acrylonitrile	3.55	53	7463	4.022	ppb	#	93
18) Methylene chloride	3.20	84	28457	4.361	ppb	#	82
19) Carbon disulfide	2.82	76	68204	4.968	ppb		93
20) Methyl t-butyl ether (MtBE	3.65	73	53612	5.309	ppb		96
21) Trans-1,2-DCE	3.58	96	25564	4.525	ppb		94
22) Diisopropyl Ether	4.43	45	72205	4.800	ppb		95
23) 1,1-DCA	4.21	63	43894	4.881	ppb		97
24) Vinyl Acetate	4.37	43	68797	4.335	ppb	#	78
25) Ethyl tert Butyl Ether	4.95	59	35704	5.426	ppb		95
26) MEK (2-Butanone)	5.14	43	10150	5.266	ppb		99
27) Cis-1,2-DCE	5.04	96	32436	4.922	ppb		87
28) 2,2-Dichloropropane	5.04	77	22437	5.311	ppb	#	88
29) Chloroform	5.49	83	50717	4.484	ppb		79
30) Bromochloromethane	5.35	128	19310	5.038	ppb		92
32) 1,1,1-TCA	5.69	97	48865	4.860	ppb	#	91
33) Cyclohexane	5.74	41	18087	4.425	ppb		73
34) 1,1-Dichloropropene	5.90	75	38568	4.932	ppb		97
35) 2,2,4-Trimethylpentane	6.27	57	42154	4.313	ppb	#	89
37) Carbon Tetrachloride	5.88	117	44784	4.942	ppb		83
38) Tert Amyl Methyl Ether	6.34	73	33185	4.872	ppb	#	87
39) 1,2-DCA	6.16	62	51635	5.067	ppb	#	90
40) Benzene	6.13	78	109153	4.719	ppb		97
41) TCE	6.88	95	31933	4.613	ppb	#	88
42) 2-Pentanone	7.14	43	377791	98.242	ppb		97

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M22.D Vial: 19
Acq On : 30 Apr 20 21:42 Operator: LP,DG,CMM
Sample : 5.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	22248	4.357	ppb		97
44)	Bromodichloromethane	7.43	83	45762	5.094	ppb		100
45)	Methyl Cyclohexane	7.08	83	33505	4.493	ppb		93
46)	Dibromomethane	7.24	93	18032	4.991	ppb		87
48)	1-Bromo-2-chloroethane	7.74	63	33934	4.970	ppb		86
50)	Cis-1,3-Dichloropropene	7.91	75	43643	4.632	ppb		94
51)	Toluene	8.25	91	127981	4.700	ppb		99
52)	Trans-1,3-Dichloropropene	8.49	75	35799	4.611	ppb		94
53)	1,1,2-TCA	8.66	83	20799	4.570	ppb		92
54)	2-Hexanone	8.96	43	13373	4.893	ppb		90
57)	1,2-EDB	9.15	107	28818	4.626	ppb		97
58)	Tetrachloroethene	8.80	164	24376	4.302	ppb		97
59)	1-Chlorohexane	9.67	91	35427	4.533	ppb		85
60)	1,1,1,2-Tetrachloroethane	9.75	131	37790	4.829	ppb		88
61)	m&p-Xylene	9.90	106	134743	9.593	ppb		91
62)	o-Xylene	10.29	106	66538	4.746	ppb		94
63)	Styrene	10.31	104	106169	4.680	ppb		91
65)	1,3-Dichloropropane	8.83	76	47264	4.903	ppb		98
66)	Dibromochloromethane	9.05	129	38951	4.753	ppb		100
67)	Chlorobenzene	9.66	112	95226	4.737	ppb		96
68)	Ethylbenzene	9.78	91	146704	4.573	ppb		87
69)	Bromoform	10.47	173	36034	4.955	ppb		97
71)	Isopropylbenzene	10.67	105	157872	4.792	ppb		93
72)	1,1,2,2-Tetrachloroethane	10.96	83	33277	4.876	ppb		90
73)	1,2,3-Trichloropropane	11.00	110	12652	4.418	ppb		100
74)	t-1,4-Dichloro-2-Butene	11.02	53	3775	4.739	ppb		85
75)	Bromobenzene	10.95	156	54955	5.145	ppb		94
76)	n-Propylbenzene	11.08	91	166555	4.789	ppb		97
77)	4-Ethyltoluene	11.20	105	150839	4.697	ppb		98
78)	2-Chlorotoluene	11.15	91	110857	4.457	ppb		93
79)	1,3,5-Trimethylbenzene	11.26	105	145773	5.096	ppb		94
80)	4-Chlorotoluene	11.26	91	126140	4.763	ppb		100
81)	Tert-Butylbenzene	11.58	119	128223	4.692	ppb		94
82)	1,2,4-Trimethylbenzene	11.80	105	134543	4.619	ppb	#	28
83)	Sec-Butylbenzene	11.80	105	144198	4.753	ppb		95
84)	p-Isopropyltoluene	11.95	119	130329	4.691	ppb		95
85)	Benzyl Chloride	12.13	91	22632	5.536	ppb	#	89
86)	1,3-DCB	11.90	146	95265	4.961	ppb		99
87)	1,4-DCB	11.99	146	95020	4.817	ppb		94
88)	n-Butylbenzene	12.36	91	71889	4.251	ppb		95
89)	1,2-DCB	12.35	146	86237	4.668	ppb		95
90)	Hexachloroethane	12.61	117	18796	4.132	ppb		81
91)	1,2-Dibromo-3-chloropropan	13.12	75	7438	5.070	ppb		89
92)	1,2,4-Trichlorobenzene	13.96	180	40840	4.445	ppb		99
93)	Hexachlorobutadiene	14.15	225	22078	4.617	ppb		91
94)	Naphthalene	14.20	128	58084	4.543	ppb	#	87
95)	1,2,3-Trichlorobenzene	14.45	180	31904	4.525	ppb		90

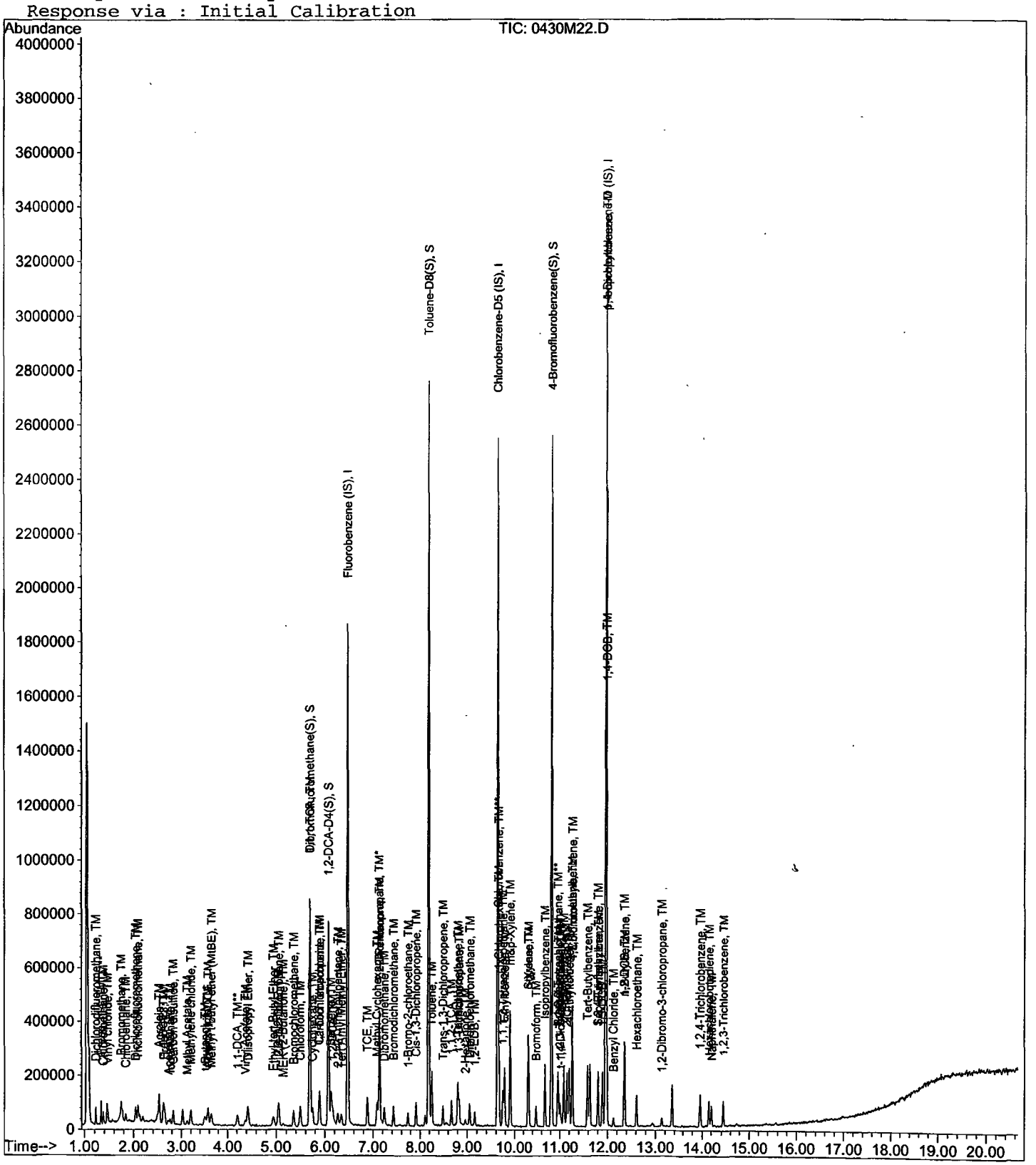
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M22.D Vial: 19
Acq On : 30 Apr 20 21:42 Operator: LP,DG,CMM
Sample : 5.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Page 467 of 703

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M23.D Vial: 20
Acq On : 30 Apr 20 22:11 Operator: LP,DG,CMM
Sample : 10ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1631277	25.000 ppb	0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1391375	25.000 ppb	0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	912008	25.000 ppb	0.00
System Monitoring Compounds					
31) Dibromofluoromethane(S)	5.68	111	460419	25.850 ppb	0.00
Spiked Amount 25.000			Recovery = 103.400%		
36) 1,2-DCA-D4(S)	6.07	65	571363	26.424 ppb	0.00
Spiked Amount 25.000			Recovery = 105.696%		
56) Toluene-D8(S)	8.18	98	1699264	25.599 ppb	0.00
Spiked Amount 25.000			Recovery = 102.396%		
64) 4-Bromofluorobenzene(S)	10.81	95	711502	25.096 ppb	0.00
Spiked Amount 25.000			Recovery = 100.384%		
Target Compounds					Qvalue
2) Dichlorodifluoromethane	1.23	85	68954	9.681 ppb	100
3) Freon 114	1.34	85	46923	9.956 ppb	100
4) Chloromethane	1.37	50	59726	10.154 ppb	100
5) Vinyl chloride	1.47	62	52447	9.403 ppb	100
6) Bromomethane	1.74	94	28784	9.454 ppb	100
7) Chloroethane	1.84	64	40657	10.787 ppb	100
8) Dichlorofluoromethane	2.04	67	89128	9.743 ppb	100
9) Trichlorofluoromethane	2.09	101	89446	9.915 ppb	100
10) Acrolein	2.53	56	89948	122.851 ppb	100
11) Acetone	2.72	43	27740	10.665 ppb	100
12) Freon-113	2.64	101	21344	10.930 ppb	100
13) 1,1-DCE	2.61	61	77467	9.994 ppb	100
14) t-Butanol	3.50	59	24176	117.647 ppb	100
15) Methyl Acetate	3.13	43	33739	10.211 ppb	100
16) Iodomethane	2.77	142	51695	8.936 ppb	100
17) Acrylonitrile	3.56	53	18114	10.131 ppb	100
18) Methylene chloride	3.20	84	56964	10.240 ppb	100
19) Carbon disulfide	2.82	76	128297	9.697 ppb	100
20) Methyl t-butyl ether (MtBE	3.64	73	120891	10.995 ppb	100
21) Trans-1,2-DCE	3.58	96	57786	10.613 ppb	100
22) Diisopropyl Ether	4.43	45	143492	9.900 ppb	100
23) 1,1-DCA	4.21	63	87754	10.125 ppb	100
24) Vinyl Acetate	4.43	43	138525	9.932 ppb	100
25) Ethyl tert Butyl Ether	4.95	59	82810	12.516 ppb	100
26) MEK (2-Butanone)	5.14	43	18031	9.276 ppb	100
27) Cis-1,2-DCE	5.05	96	63627	10.019 ppb	100
28) 2,2-Dichloropropane	5.03	77	51818	10.103 ppb	100
29) Chloroform	5.49	83	108218	9.928 ppb	100
30) Bromochloromethane	5.35	128	37597	10.179 ppb	100
32) 1,1,1-TCA	5.68	97	95468	9.853 ppb	100
33) Cyclohexane	5.74	41	34377	9.172 ppb	100
34) 1,1-Dichloropropene	5.89	75	72643	9.640 ppb	100
35) 2,2,4-Trimethylpentane	6.27	57	89639	9.516 ppb	100
37) Carbon Tetrachloride	5.89	117	85624	9.806 ppb	100
38) Tert Amyl Methyl Ether	6.34	73	71310	14.052 ppb	100
39) 1,2-DCA	6.16	62	99722	10.154 ppb	100
40) Benzene	6.13	78	217572	9.760 ppb	100
41) TCE	6.88	95	67785	10.161 ppb	100
42) 2-Pentanone	7.14	43	461415	124.512 ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M23.D Vial: 20
Acq On : 30 Apr 20 22:11 Operator: LP,DG,CMM
Sample : 10ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	46558	9.882 ppb		100
44)	Bromodichloromethane	7.43	83	89350	10.321 ppb		100
45)	Methyl Cyclohexane	7.09	83	70021	9.745 ppb		100
46)	Dibromomethane	7.24	93	33818	9.713 ppb		100
48)	1-Bromo-2-chloroethane	7.74	63	67566	10.269 ppb		100
50)	Cis-1,3-Dichloropropene	7.91	75	89912	9.902 ppb		100
51)	Toluene	8.25	91	253717	9.669 ppb		100
52)	Trans-1,3-Dichloropropene	8.49	75	79939	10.684 ppb		100
53)	1,1,2-TCA	8.66	83	42118	9.602 ppb		100
54)	2-Hexanone	8.95	43	28373	9.856 ppb		100
57)	1,2-EDB	9.15	107	60818	10.321 ppb		100
58)	Tetrachloroethene	8.80	164	46344	9.926 ppb		100
59)	1-Chlorohexane	9.66	91	67231	9.682 ppb		100
60)	1,1,1,2-Tetrachloroethane	9.75	131	80386	10.859 ppb		100
61)	m&p-Xylene	9.90	106	270342	20.346 ppb		100
62)	o-Xylene	10.29	106	128212	9.667 ppb		100
63)	Styrene	10.31	104	221561	10.324 ppb		100
65)	1,3-Dichloropropane	8.83	76	95070	10.425 ppb		100
66)	Dibromochloromethane	9.05	129	81405	10.501 ppb		100
67)	Chlorobenzene	9.66	112	186116	9.788 ppb		100
68)	Ethylbenzene	9.78	91	308128	10.152 ppb		100
69)	Bromoform	10.47	173	69522	10.106 ppb		100
71)	Isopropylbenzene	10.67	105	320714	10.091 ppb		100
72)	1,1,2,2-Tetrachloroethane	10.97	83	61897	9.401 ppb		100
73)	1,2,3-Trichloropropane	11.00	110	28134	10.184 ppb		100
74)	t-1,4-Dichloro-2-Butene	11.03	53	9241	9.004 ppb		100
75)	Bromobenzene	10.95	156	109068	10.584 ppb		100
76)	n-Propylbenzene	11.08	91	335871	10.011 ppb		100
77)	4-Ethyltoluene	11.20	105	306114	9.881 ppb		100
78)	2-Chlorotoluene	11.15	91	253715	10.572 ppb		100
79)	1,3,5-Trimethylbenzene	11.26	105	281995	10.218 ppb		100
80)	4-Chlorotoluene	11.26	91	257230	10.068 ppb		100
81)	Tert-Butylbenzene	11.58	119	285723	10.838 ppb		100
82)	1,2,4-Trimethylbenzene	11.80	105	283540	10.089 ppb	#	28
83)	Sec-Butylbenzene	11.80	105	300625	10.270 ppb		100
84)	p-Isopropyltoluene	11.95	119	272722	10.175 ppb		100
85)	Benzyl Chloride	12.13	91	48431	8.643 ppb		100
86)	1,3-DCB	11.90	146	187140	10.100 ppb		100
87)	1,4-DCB	11.99	146	185628	9.753 ppb		100
88)	n-Butylbenzene	12.36	91	162968	9.988 ppb		100
89)	1,2-DCB	12.35	146	179364	10.063 ppb		100
90)	Hexachloroethane	12.61	117	44346	10.106 ppb		100
91)	1,2-Dibromo-3-chloropropan	13.12	75	15094	10.665 ppb		100
92)	1,2,4-Trichlorobenzene	13.96	180	92141	8.960 ppb		100
93)	Hexachlorobutadiene	14.15	225	46694	10.121 ppb		100
94)	Naphthalene	14.20	128	138357	9.235 ppb		100
95)	1,2,3-Trichlorobenzene	14.44	180	75187	8.998 ppb		100

(#) = qualifier out of range (m) = manual integration

Quantitation Report

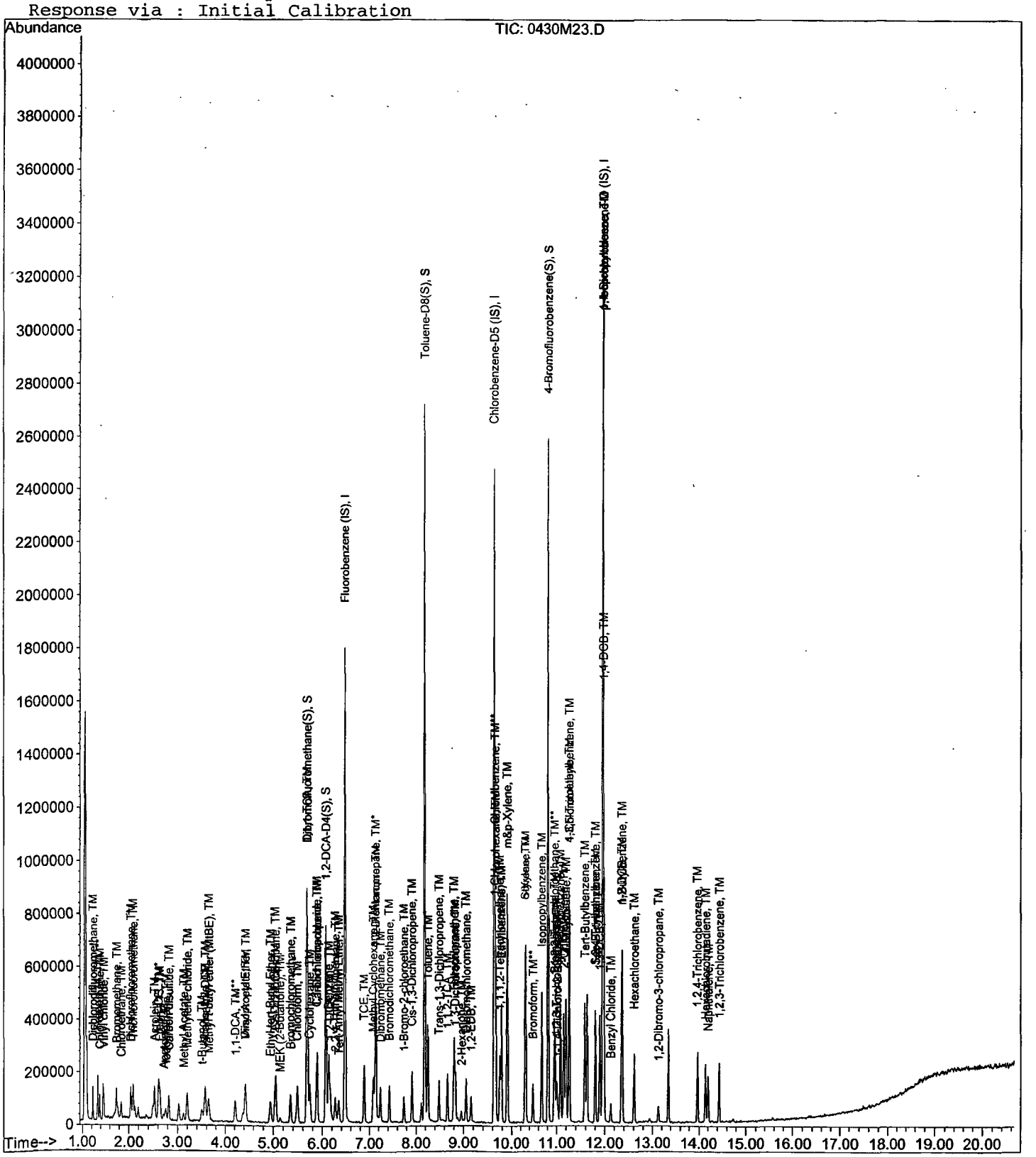
Data File : M:\MAX\DATA\M200430\0430M23.D
Acq On : 30 Apr 20 22:11
Sample : 10ug/L VOC STD 4/30/20
Misc : IS 3/25/20

Vial: 20
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 11:50 2020

Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Page 472 of 703

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M24.D Vial: 21
Acq On : 30 Apr 20 22:40 Operator: LP,DG,CMM
Sample : 20ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1606979	25.000 ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1389499	25.000 ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	919844	25.000 ppb		0.00
System Monitoring Compounds						
31) Dibromofluoromethane(S)	5.68	111	895753	51.053 ppb		0.00
Spiked Amount 25.000			Recovery = 204.212%			
36) 1,2-DCA-D4(S)	6.07	65	1096411	51.473 ppb		0.00
Spiked Amount 25.000			Recovery = 205.892%			
56) Toluene-D8(S)	8.18	98	3329304	50.223 ppb		0.00
Spiked Amount 25.000			Recovery = 200.892%			
64) 4-Bromofluorobenzene(S)	10.81	95	1377460	48.651 ppb		0.00
Spiked Amount 25.000			Recovery = 194.604%			
Target Compounds						Qvalue
2) Dichlorodifluoromethane	1.23	85	136717	19.485 ppb		97
3) Freon 114	1.34	85	93375	19.593 ppb		94
4) Chloromethane	1.37	50	115094	20.556 ppb		94
5) Vinyl chloride	1.47	62	108489	19.745 ppb		97
6) Bromomethane	1.74	94	58264	20.317 ppb		95
7) Chloroethane	1.83	64	67295	18.124 ppb		98
8) Dichlorofluoromethane	2.04	67	167669	18.605 ppb		98
9) Trichlorofluoromethane	2.08	101	179716	20.222 ppb		99
10) Acrolein	2.53	56	102433	142.018 ppb		99
11) Acetone	2.72	43	44701	20.794 ppb		94
12) Freon-113	2.63	101	37808	19.654 ppb		91
13) 1,1-DCE	2.61	61	152058	19.914 ppb		97
14) t-Butanol	3.51	59	36649	144.636 ppb	#	90
15) Methyl Acetate	3.13	43	58326	18.041 ppb		89
16) Iodomethane	2.76	142	121560	18.987 ppb		96
17) Acrylonitrile	3.56	53	31314	17.779 ppb	#	92
18) Methylene chloride	3.20	84	109323	20.987 ppb		97
19) Carbon disulfide	2.82	76	255544	19.606 ppb		97
20) Methyl t-butyl ether (MtBE	3.64	73	209156	18.504 ppb		92
21) Trans-1,2-DCE	3.57	96	106891	19.929 ppb		91
22) Diisopropyl Ether	4.43	45	280820	19.667 ppb		93
23) 1,1-DCA	4.21	63	177306	20.767 ppb		99
24) Vinyl Acetate	4.43	43	271997	20.594 ppb	#	99
25) Ethyl tert Butyl Ether	4.95	59	130481	19.788 ppb		100
26) MEK (2-Butanone)	5.14	43	36376	18.459 ppb	#	84
27) Cis-1,2-DCE	5.05	96	123447	19.732 ppb		84
28) 2,2-Dichloropropane	5.04	77	100738	18.109 ppb		99
29) Chloroform	5.49	83	212201	19.762 ppb		97
30) Bromochloromethane	5.35	128	71075	19.533 ppb		90
32) 1,1,1-TCA	5.68	97	199247	20.875 ppb	#	90
33) Cyclohexane	5.74	41	70859	19.690 ppb		86
34) 1,1-Dichloropropene	5.89	75	140439	18.919 ppb		98
35) 2,2,4-Trimethylpentane	6.27	57	166039	17.893 ppb	#	87
37) Carbon Tetrachloride	5.88	117	173742	20.198 ppb		97
38) Tert Amyl Methyl Ether	6.34	73	117889	24.306 ppb	#	83
39) 1,2-DCA	6.16	62	182301	18.843 ppb		99
40) Benzene	6.13	78	425860	19.392 ppb		97
41) TCE	6.88	95	122536	18.645 ppb	#	90
42) 2-Pentanone	7.14	43	506847	138.840 ppb		100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M24.D Vial: 21
Acq On : 30 Apr 20 22:40 Operator: LP,DG,CMM
Sample : 20ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	90874	19.930	ppb	#	91
44)	Bromodichloromethane	7.43	83	168534	19.763	ppb		94
45)	Methyl Cyclohexane	7.09	83	137433	19.415	ppb		92
46)	Dibromomethane	7.24	93	70017	20.414	ppb		95
48)	1-Bromo-2-chloroethane	7.74	63	134049	20.681	ppb		93
50)	Cis-1,3-Dichloropropene	7.91	75	177195	19.810	ppb		99
51)	Toluene	8.25	91	488117	18.884	ppb		94
52)	Trans-1,3-Dichloropropene	8.49	75	148485	20.144	ppb	#	83
53)	1,1,2-TCA	8.66	83	82474	19.087	ppb		96
54)	2-Hexanone	8.95	43	55416	18.790	ppb		97
57)	1,2-EDB	9.15	107	112245	19.073	ppb		97
58)	Tetrachloroethene	8.80	164	91120	20.772	ppb		96
59)	1-Chlorohexane	9.66	91	135947	20.202	ppb		93
60)	1,1,1,2-Tetrachloroethane	9.75	131	156156	21.123	ppb		85
61)	m&p-Xylene	9.90	106	498175	37.543	ppb		100
62)	o-Xylene	10.29	106	253602	19.147	ppb		100
63)	Styrene	10.31	104	434707	20.283	ppb		98
65)	1,3-Dichloropropane	8.83	76	180876	19.860	ppb		95
66)	Dibromochloromethane	9.05	129	159014	20.539	ppb		94
67)	Chlorobenzene	9.66	112	369553	19.461	ppb		97
68)	Ethylbenzene	9.78	91	579832	19.130	ppb		100
69)	Bromoform	10.47	173	134005	19.506	ppb		99
71)	Isopropylbenzene	10.67	105	638131	19.906	ppb		98
72)	1,1,2,2-Tetrachloroethane	10.97	83	124258	18.711	ppb		91
73)	1,2,3-Trichloropropane	11.00	110	53144	19.073	ppb		90
74)	t-1,4-Dichloro-2-Butene	11.03	53	21990	18.573	ppb		83
75)	Bromobenzene	10.95	156	210822	20.283	ppb		96
76)	n-Propylbenzene	11.08	91	654364	19.338	ppb		97
77)	4-Ethyltoluene	11.20	105	603949	19.328	ppb		97
78)	2-Chlorotoluene	11.15	91	505591	20.888	ppb		98
79)	1,3,5-Trimethylbenzene	11.26	105	552330	19.843	ppb		94
80)	4-Chlorotoluene	11.26	91	508490	19.733	ppb		97
81)	Tert-Butylbenzene	11.58	119	500256	18.814	ppb		95
82)	1,2,4-Trimethylbenzene	11.80	105	566211	19.975	ppb	#	28
83)	Sec-Butylbenzene	11.80	105	598628	20.277	ppb		96
84)	p-Isopropyltoluene	11.95	119	552251	20.429	ppb		97
85)	Benzyl Chloride	12.12	91	114266	16.219	ppb		96
86)	1,3-DCB	11.90	146	364507	19.506	ppb		93
87)	1,4-DCB	11.99	146	367193	19.129	ppb		99
88)	n-Butylbenzene	12.36	91	346640	21.063	ppb		99
89)	1,2-DCB	12.35	146	351250	19.539	ppb		99
90)	Hexachloroethane	12.61	117	93330	21.087	ppb		90
91)	1,2-Dibromo-3-chloropropan	13.12	75	28621	20.050	ppb		89
92)	1,2,4-Trichlorobenzene	13.96	180	211654	19.036	ppb		91
93)	Hexachlorobutadiene	14.15	225	102369	21.999	ppb		93
94)	Naphthalene	14.20	128	297235	18.146	ppb		100
95)	1,2,3-Trichlorobenzene	14.44	180	161247	17.530	ppb		98

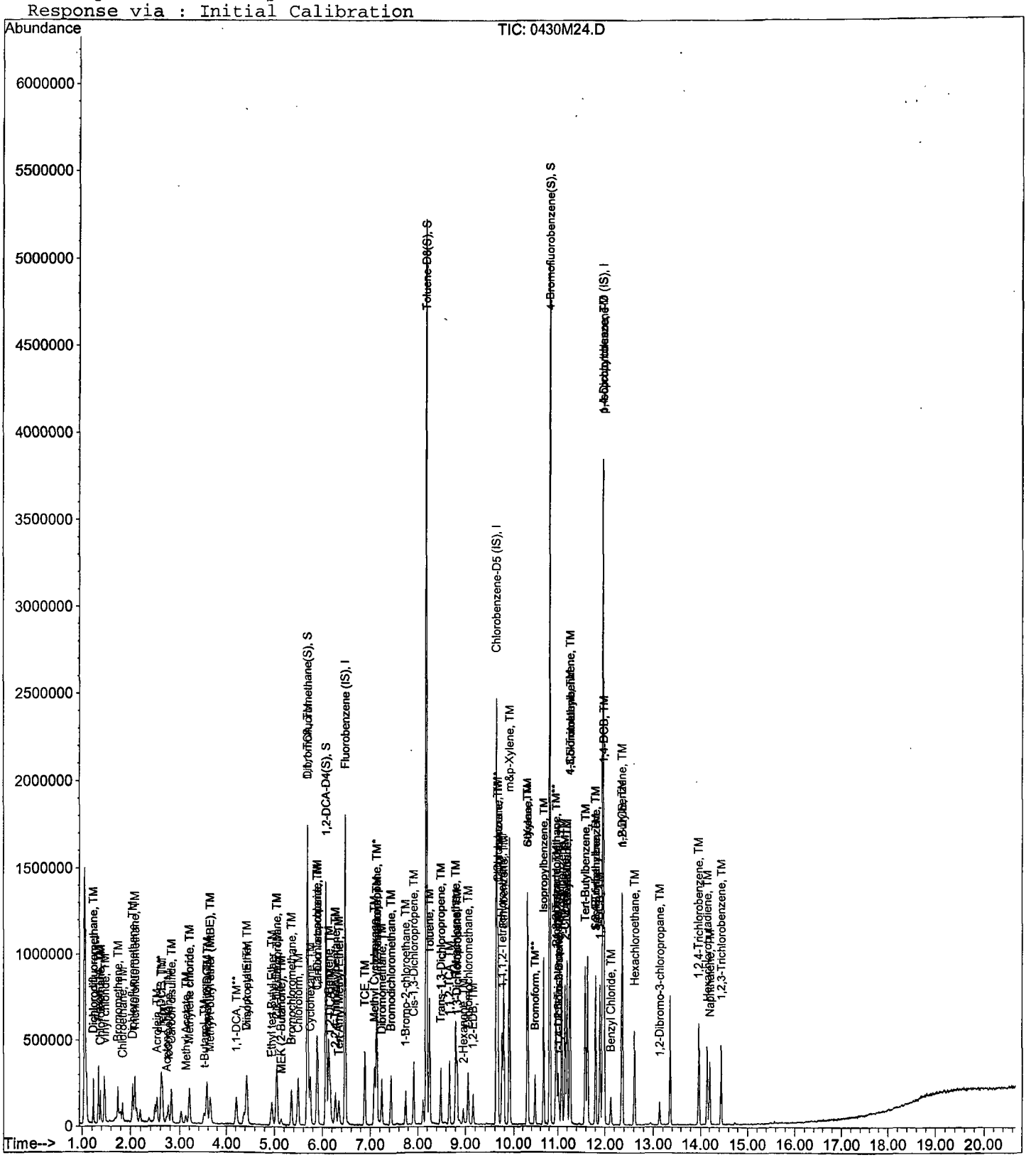
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M24.D Vial: 21
Acq On : 30 Apr 20 22:40 Operator: LP,DG,CMM
Sample : 20ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M25.D Vial: 22
Acq On : 30 Apr 20 23:09 Operator: LP,DG,CMM
Sample : 40ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1511981	25.000 ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1321705	25.000 ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	901374	25.000 ppb		0.00
System Monitoring Compounds						
31) Dibromofluoromethane(S)	5.68	111	827524	50.127 ppb		0.00
Spiked Amount 25.000			Recovery	= 200.508%		
36) 1,2-DCA-D4(S)	6.07	65	1055808	52.681 ppb		0.00
Spiked Amount 25.000			Recovery	= 210.724%		
56) Toluene-D8(S)	8.18	98	3237949	51.350 ppb		0.00
Spiked Amount 25.000			Recovery	= 205.400%		
64) 4-Bromofluorobenzene(S)	10.81	95	1357514	50.406 ppb		0.00
Spiked Amount 25.000			Recovery	= 201.624%		
Target Compounds						Qvalue
2) Dichlorodifluoromethane	1.23	85	264929	40.130 ppb		99
3) Freon 114	1.33	85	181069	39.842 ppb		99
4) Chloromethane	1.37	50	217579	42.035 ppb		92
5) Vinyl chloride	1.47	62	208512	40.333 ppb		91
6) Bromomethane	1.74	94	113864	43.112 ppb		93
7) Chloroethane	1.83	64	139190	39.842 ppb		95
8) Dichlorofluoromethane	2.04	67	327839	38.664 ppb		96
9) Trichlorofluoromethane	2.08	101	352961	42.212 ppb		98
10) Acrolein	2.53	56	119006	175.362 ppb		91
11) Acetone	2.72	43	84159	46.880 ppb		92
12) Freon-113	2.63	101	70472	38.935 ppb		84
13) 1,1-DCE	2.61	61	287795	40.058 ppb		100
14) t-Butanol	3.52	59	55555	181.424 ppb		94
15) Methyl Acetate	3.12	43	126365	41.754 ppb		98
16) Iodomethane	2.76	142	244113	38.609 ppb		99
17) Acrylonitrile	3.56	53	68104	41.096 ppb		97
18) Methylene chloride	3.20	84	205214	42.961 ppb		93
19) Carbon disulfide	2.82	76	502635	40.986 ppb		97
20) Methyl t-butyl ether (MtBE	3.64	73	371876	34.018 ppb		98
21) Trans-1,2-DCE	3.58	96	207834	41.183 ppb		91
22) Diisopropyl Ether	4.43	45	543637	40.465 ppb		97
23) 1,1-DCA	4.21	63	329284	40.991 ppb		96
24) Vinyl Acetate	4.43	43	540542	44.390 ppb	#	99
25) Ethyl tert Butyl Ether	4.95	59	202644	32.411 ppb		98
26) MEK (2-Butanone)	5.14	43	74059	39.345 ppb		92
27) Cis-1,2-DCE	5.05	96	229974	39.070 ppb		87
28) 2,2-Dichloropropane	5.04	77	196320	35.496 ppb	#	87
29) Chloroform	5.49	83	401360	39.727 ppb		97
30) Bromochloromethane	5.35	128	131526	38.417 ppb		92
32) 1,1,1-TCA	5.68	97	389942	43.420 ppb		91
33) Cyclohexane	5.74	41	144539	43.223 ppb		77
34) 1,1-Dichloropropene	5.89	75	283284	40.560 ppb		97
35) 2,2,4-Trimethylpentane	6.27	57	338182	38.734 ppb		93
37) Carbon Tetrachloride	5.88	117	351234	43.398 ppb		96
38) Tert Amyl Methyl Ether	6.34	73	169634	36.456 ppb	#	88
39) 1,2-DCA	6.16	62	367975	40.425 ppb		99
40) Benzene	6.13	78	804241	38.924 ppb		99
41) TCE	6.88	95	236838	38.302 ppb	#	90
42) 2-Pentanone	7.14	43	587867	171.151 ppb		98

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M25.D Vial: 22
Acq On : 30 Apr 20 23:09 Operator: LP,DG,CMM
Sample : 40ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	178763	42.060	ppb		99
44)	Bromodichloromethane	7.43	83	332102	41.390	ppb		91
45)	Methyl Cyclohexane	7.09	83	275820	41.414	ppb		99
46)	Dibromomethane	7.24	93	130320	40.383	ppb		94
48)	1-Bromo-2-chloroethane	7.74	63	250615	41.093	ppb		91
50)	Cis-1,3-Dichloropropene	7.91	75	360799	42.871	ppb		98
51)	Toluene	8.25	91	946934	38.936	ppb		95
52)	Trans-1,3-Dichloropropene	8.49	75	308754	44.519	ppb	#	83
53)	1,1,2-TCA	8.66	83	151773	37.332	ppb		83
54)	2-Hexanone	8.96	43	113867	40.130	ppb		94
57)	1,2-EDB	9.15	107	214113	38.250	ppb		94
58)	Tetrachloroethene	8.80	164	178688	44.171	ppb		96
59)	1-Chlorohexane	9.66	91	272624	43.238	ppb		92
60)	1,1,1,2-Tetrachloroethane	9.75	131	301108	42.819	ppb		85
61)	m&p-Xylene	9.90	106	983843	77.947	ppb		95
62)	o-Xylene	10.29	106	499363	39.635	ppb		96
63)	Styrene	10.31	104	847845	41.589	ppb		96
65)	1,3-Dichloropropane	8.83	76	349943	40.394	ppb		96
66)	Dibromochloromethane	9.05	129	311725	42.330	ppb		100
67)	Chlorobenzene	9.66	112	708772	39.238	ppb		99
68)	Ethylbenzene	9.78	91	1151809	39.951	ppb		98
69)	Bromoform	10.47	173	277521	42.469	ppb		99
71)	Isopropylbenzene	10.67	105	1279560	40.733	ppb		97
72)	1,1,2,2-Tetrachloroethane	10.96	83	247553	38.041	ppb		96
73)	1,2,3-Trichloropropane	11.00	110	102805	37.651	ppb		99
74)	t-1,4-Dichloro-2-Butene	11.02	53	45597	37.110	ppb		81
75)	Bromobenzene	10.95	156	423452	41.576	ppb		95
76)	n-Propylbenzene	11.08	91	1343483	40.516	ppb		98
77)	4-Ethyltoluene	11.20	105	1257726	41.075	ppb		100
78)	2-Chlorotoluene	11.15	91	877078	36.978	ppb		97
79)	1,3,5-Trimethylbenzene	11.26	105	1106154	40.553	ppb		95
80)	4-Chlorotoluene	11.26	91	1012964	40.116	ppb		97
81)	Tert-Butylbenzene	11.58	119	1142988	43.868	ppb		98
82)	1,2,4-Trimethylbenzene	11.80	105	1202947	43.307	ppb	#	28
83)	Sec-Butylbenzene	11.80	105	1263703	43.681	ppb		99
84)	p-Isopropyltoluene	11.95	119	1192221	45.006	ppb		96
85)	Benzyl Chloride	12.12	91	263893	34.176	ppb		96
86)	1,3-DCB	11.90	146	748051	40.851	ppb		95
87)	1,4-DCB	11.99	146	744482	39.578	ppb		99
88)	n-Butylbenzene	12.36	91	763254	47.328	ppb		96
89)	1,2-DCB	12.35	146	735959	41.777	ppb		98
90)	Hexachloroethane	12.61	117	195162	44.999	ppb		93
91)	1,2-Dibromo-3-chloropropan	13.12	75	59085	42.239	ppb		94
92)	1,2,4-Trichlorobenzene	13.96	180	447944	39.870	ppb		97
93)	Hexachlorobutadiene	14.15	225	223246	48.959	ppb		90
94)	Naphthalene	14.20	128	658118	39.301	ppb		96
95)	1,2,3-Trichlorobenzene	14.44	180	382936	40.457	ppb		96

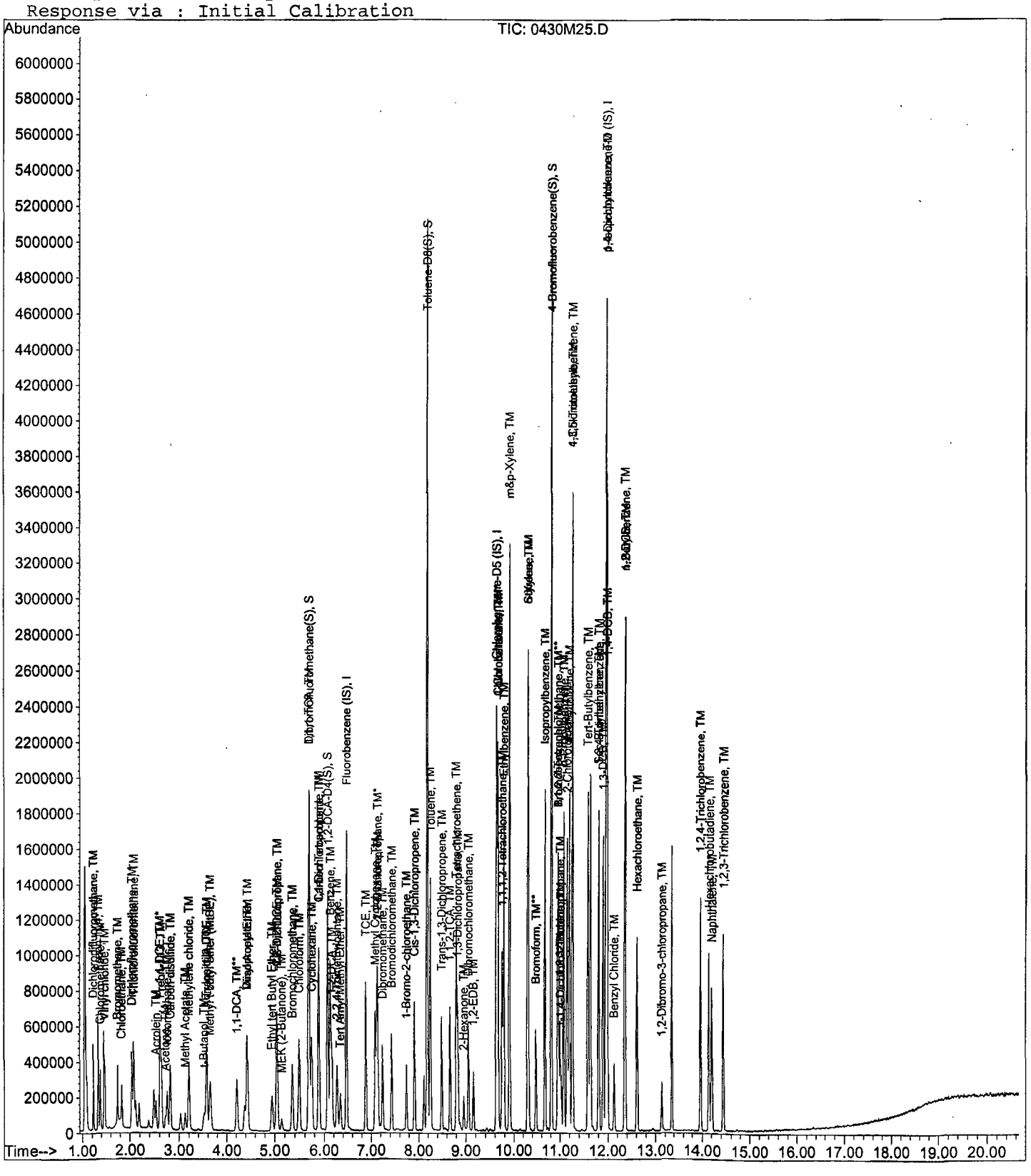
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M25.D Vial: 22
Acq On : 30 Apr 20 23:09 Operator: LP,DG,CMM
Sample : 40ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M26.D Vial: 23
Acq On : 30 Apr 20 23:38 Operator: LP,DG,CMM
Sample : 100ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1507349	25.000 ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1402651	25.000 ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	1033531	25.000 ppb		0.00
System Monitoring Compounds						
31) Dibromofluoromethane(S)	5.68	111	1553513	94.393 ppb		0.00
Spiked Amount 25.000			Recovery	= 377.572%		
36) 1,2-DCA-D4(S)	6.07	65	1955675	97.880 ppb		0.00
Spiked Amount 25.000			Recovery	= 391.520%		
56) Toluene-D8(S)	8.18	98	6129155	91.592 ppb		0.00
Spiked Amount 25.000			Recovery	= 366.368%		
64) 4-Bromofluorobenzene(S)	10.81	95	2815055	98.495 ppb		0.00
Spiked Amount 25.000			Recovery	= 393.980%		
Target Compounds						Qvalue
2) Dichlorodifluoromethane	1.22	85	646105	98.170 ppb		100
3) Freon 114	1.33	85	457274	100.145 ppb		99
4) Chloromethane	1.37	50	506462	99.115 ppb		95
5) Vinyl chloride	1.47	62	486567	94.408 ppb		94
6) Bromomethane	1.74	94	257279	98.784 ppb		96
7) Chloroethane	1.82	64	366928	105.354 ppb		91
8) Dichlorofluoromethane	2.03	67	788109	93.231 ppb		96
9) Trichlorofluoromethane	2.06	101	837779	100.501 ppb		94
10) Acrolein	2.53	56	124897	184.608 ppb		98
11) Acetone	2.73	43	164737	97.121 ppb		88
12) Freon-113	2.62	101	172416	95.550 ppb		85
13) 1,1-DCE	2.60	61	669010	93.405 ppb		98
14) t-Butanol	3.56	59	67192	198.855 ppb	#	91
15) Methyl Acetate	3.13	43	300004	99.656 ppb		99
16) Iodomethane	2.75	142	653718	100.861 ppb		98
17) Acrylonitrile	3.56	53	163690	99.079 ppb		99
18) Methylene chloride	3.19	84	463193	98.650 ppb		85
19) Carbon disulfide	2.81	76	1160834	94.948 ppb		96
20) Methyl t-butyl ether (MtBE	3.65	73	1141601	102.534 ppb		98
21) Trans-1,2-DCE	3.57	96	491379	97.668 ppb		94
22) Diisopropyl Ether	4.44	45	1302069	97.215 ppb		99
23) 1,1-DCA	4.20	63	785484	98.082 ppb		98
24) Vinyl Acetate	4.44	43	1180437	98.193 ppb	#	99
25) Ethyl tert Butyl Ether	4.95	59	645940	102.780 ppb		98
26) MEK (2-Butanone)	5.14	43	190291	100.599 ppb		94
27) Cis-1,2-DCE	5.05	96	556393	94.815 ppb		89
28) 2,2-Dichloropropane	5.04	77	583553	102.109 ppb		96
29) Chloroform	5.49	83	950486	94.370 ppb		95
30) Bromochloromethane	5.35	128	313283	91.787 ppb		90
32) 1,1,1-TCA	5.68	97	898421	100.347 ppb		95
33) Cyclohexane	5.73	41	327732	98.889 ppb		91
34) 1,1-Dichloropropene	5.89	75	666481	95.718 ppb		97
35) 2,2,4-Trimethylpentane	6.27	57	829434	95.293 ppb		97
37) Carbon Tetrachloride	5.88	117	843886	104.590 ppb		93
38) Tert Amyl Methyl Ether	6.34	73	575964	100.258 ppb	#	86
39) 1,2-DCA	6.16	62	858829	94.639 ppb		98
40) Benzene	6.13	78	1914713	92.953 ppb		99
41) TCE	6.88	95	561869	91.146 ppb	#	90
42) 2-Pentanone	7.14	43	704736	205.807 ppb		99

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M26.D Vial: 23
Acq On : 30 Apr 20 23:38 Operator: LP,DG,CMM
Sample : 100ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	418456	99.240	ppb		100
44)	Bromodichloromethane	7.43	83	800589	100.085	ppb		96
45)	Methyl Cyclohexane	7.08	83	648026	97.598	ppb		100
46)	Dibromomethane	7.24	93	318635	99.042	ppb		99
48)	1-Bromo-2-chloroethane	7.74	63	616712	101.433	ppb		92
50)	Cis-1,3-Dichloropropene	7.91	75	897989	107.030	ppb		98
51)	Toluene	8.25	91	2305904	95.106	ppb		96
52)	Trans-1,3-Dichloropropene	8.49	75	863624	124.909	ppb		90
53)	1,1,2-TCA	8.67	83	392399	96.816	ppb		93
54)	2-Hexanone	8.96	43	286711	100.189	ppb		99
57)	1,2-EDB	9.15	107	526913	88.697	ppb		96
58)	Tetrachloroethene	8.80	164	415296	98.245	ppb		96
59)	1-Chlorohexane	9.66	91	655738	98.739	ppb		96
60)	1,1,1,2-Tetrachloroethane	9.75	131	771504	103.381	ppb		82
61)	m&p-Xylene	9.90	106	2483907	185.436	ppb		94
62)	o-Xylene	10.29	106	1254882	93.855	ppb		96
63)	Styrene	10.31	104	2179858	100.758	ppb		97
65)	1,3-Dichloropropane	8.83	76	862300	93.792	ppb		93
66)	Dibromochloromethane	9.05	129	801435	102.549	ppb		99
67)	Chlorobenzene	9.66	112	1814148	94.637	ppb		97
68)	Ethylbenzene	9.78	91	2854271	93.288	ppb		99
69)	Bromoform	10.47	173	761764	109.846	ppb		99
71)	Isopropylbenzene	10.67	105	3241940	90.007	ppb		97
72)	1,1,2,2-Tetrachloroethane	10.97	83	690296	92.513	ppb		92
73)	1,2,3-Trichloropropane	11.00	110	296471	94.696	ppb		100
74)	t-1,4-Dichloro-2-Butene	11.03	53	148062	101.495	ppb		80
75)	Bromobenzene	10.95	156	1106497	94.747	ppb		100
76)	n-Propylbenzene	11.08	91	3452136	90.795	ppb		100
77)	4-Ethyltoluene	11.20	105	3267227	93.058	ppb		100
78)	2-Chlorotoluene	11.15	91	2578500	94.810	ppb		95
79)	1,3,5-Trimethylbenzene	11.26	105	2925209	93.529	ppb		99
80)	4-Chlorotoluene	11.26	91	2695636	93.104	ppb		98
81)	Tert-Butylbenzene	11.58	119	2670306	89.381	ppb		96
82)	1,2,4-Trimethylbenzene	11.80	105	3197051	100.378	ppb	#	28
83)	Sec-Butylbenzene	11.80	105	3352629	101.068	ppb		95
84)	p-Isopropyltoluene	11.95	119	3210852	105.710	ppb		97
85)	Benzyl Chloride	12.13	91	971393	103.116	ppb		97
86)	1,3-DCB	11.90	146	2017434	96.083	ppb		94
87)	1,4-DCB	11.99	146	2078912	96.386	ppb		99
88)	n-Butylbenzene	12.36	91	2203992	119.191	ppb		99
89)	1,2-DCB	12.35	146	2038712	100.931	ppb		97
90)	Hexachloroethane	12.61	117	557220	112.050	ppb		92
91)	1,2-Dibromo-3-chloropropan	13.13	75	156287	97.440	ppb		85
92)	1,2,4-Trichlorobenzene	13.96	180	1314304	100.351	ppb		97
93)	Hexachlorobutadiene	14.15	225	607807	116.250	ppb		91
94)	Naphthalene	14.20	128	1975766	100.718	ppb		96
95)	1,2,3-Trichlorobenzene	14.44	180	1113395	100.403	ppb		97

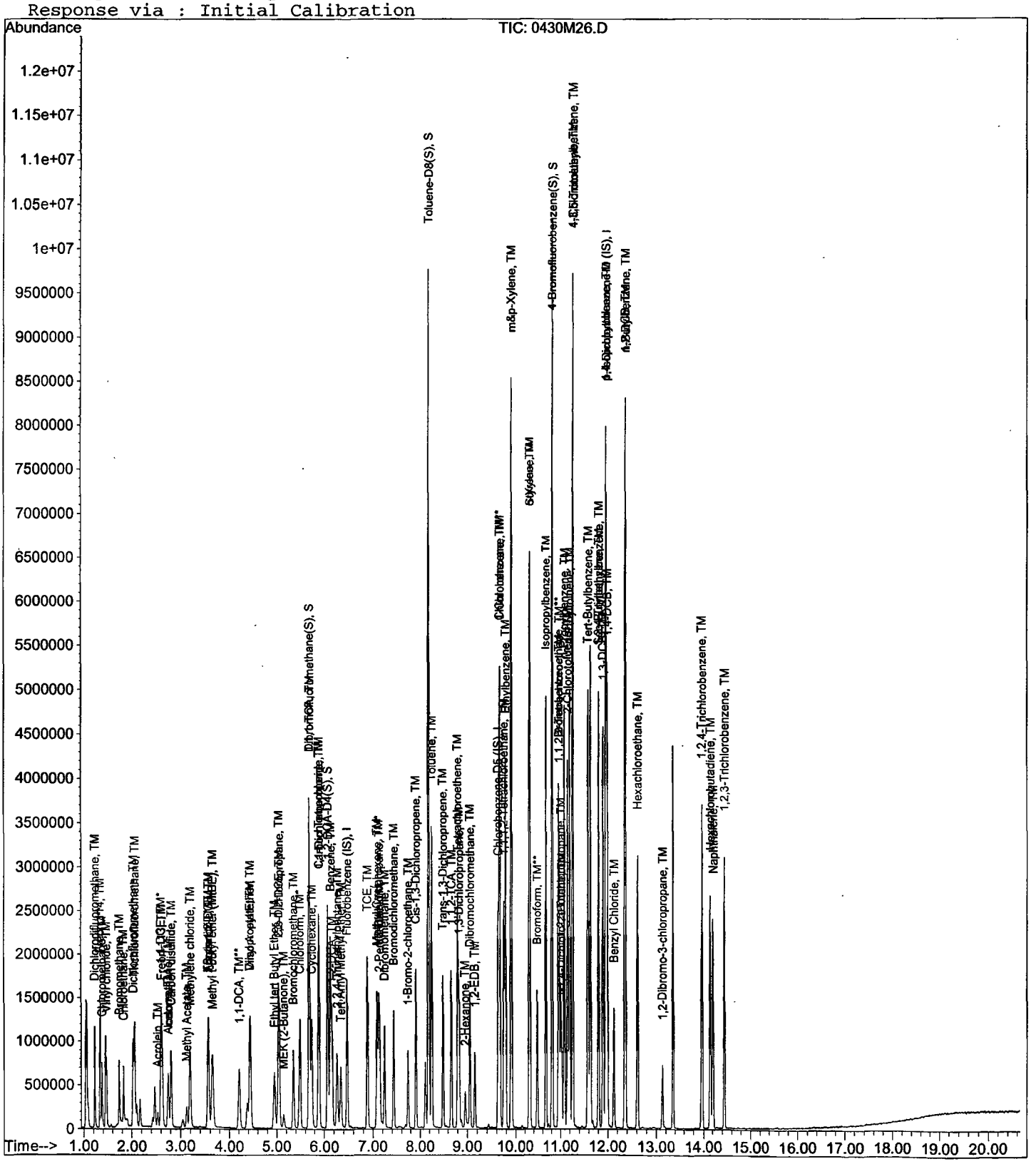
(#) = qualifier out of range (m) = manual integration

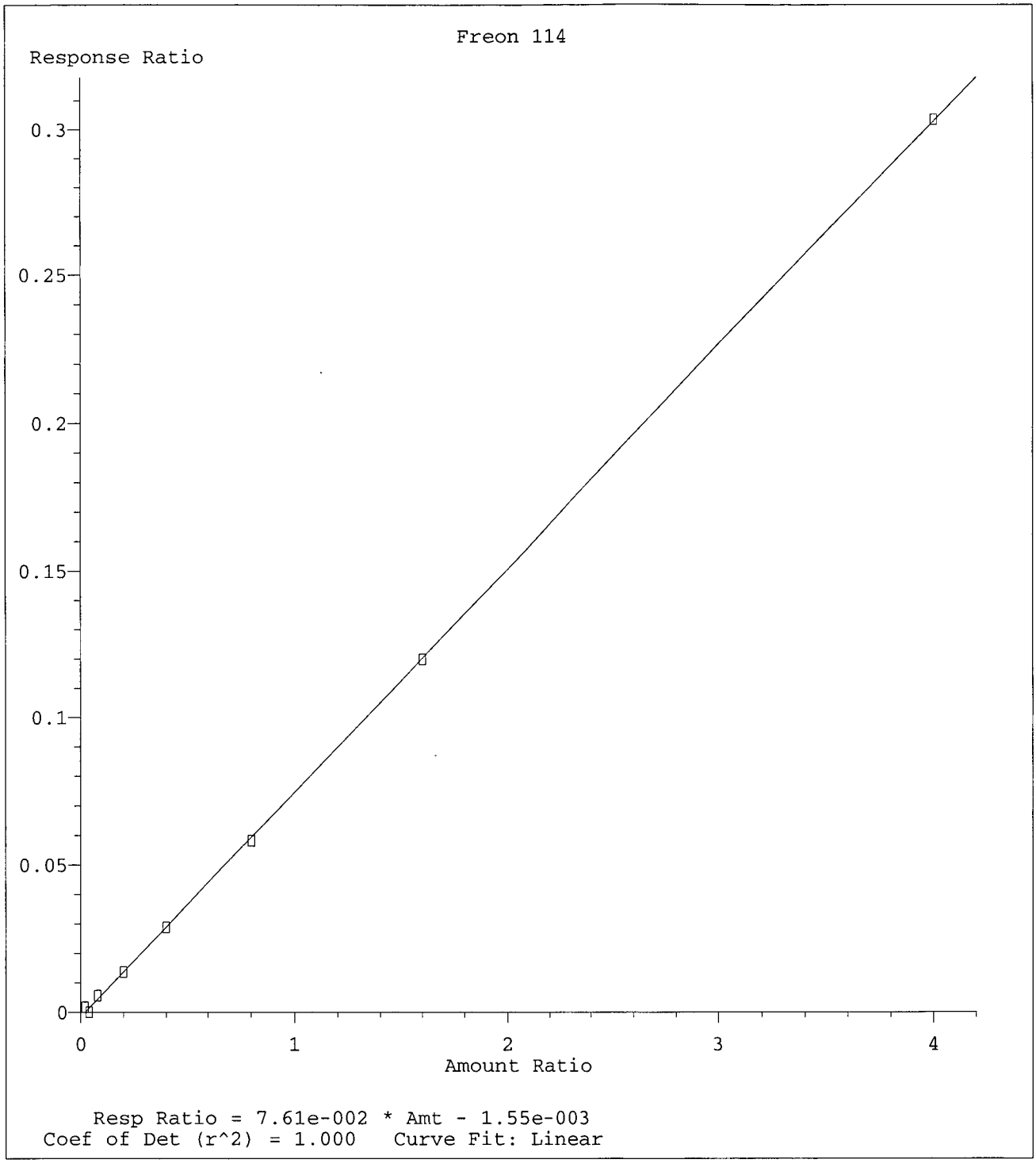
Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M26.D Vial: 23
Acq On : 30 Apr 20 23:38 Operator: LP,DG,CMM
Sample : 100ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

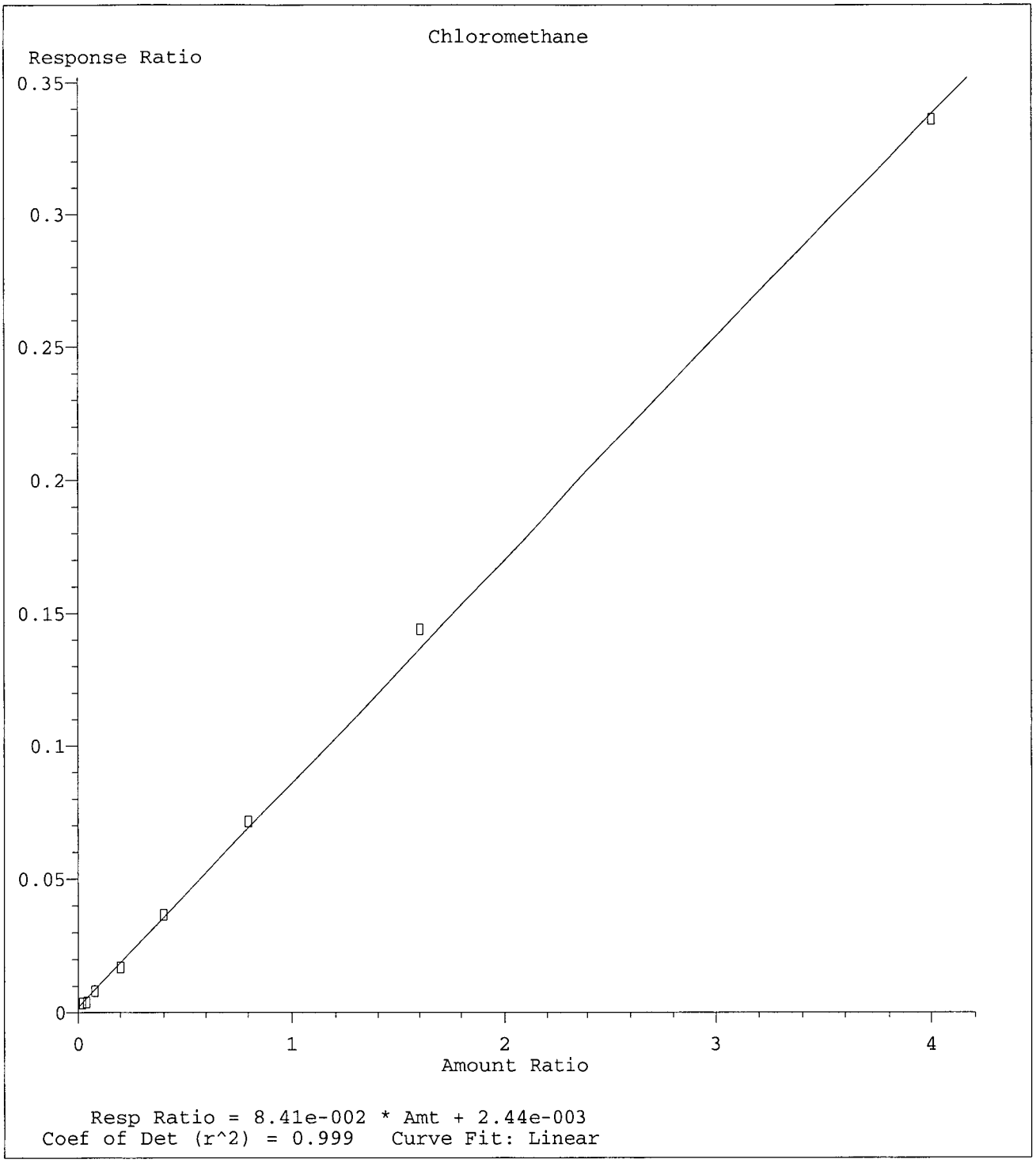
Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration

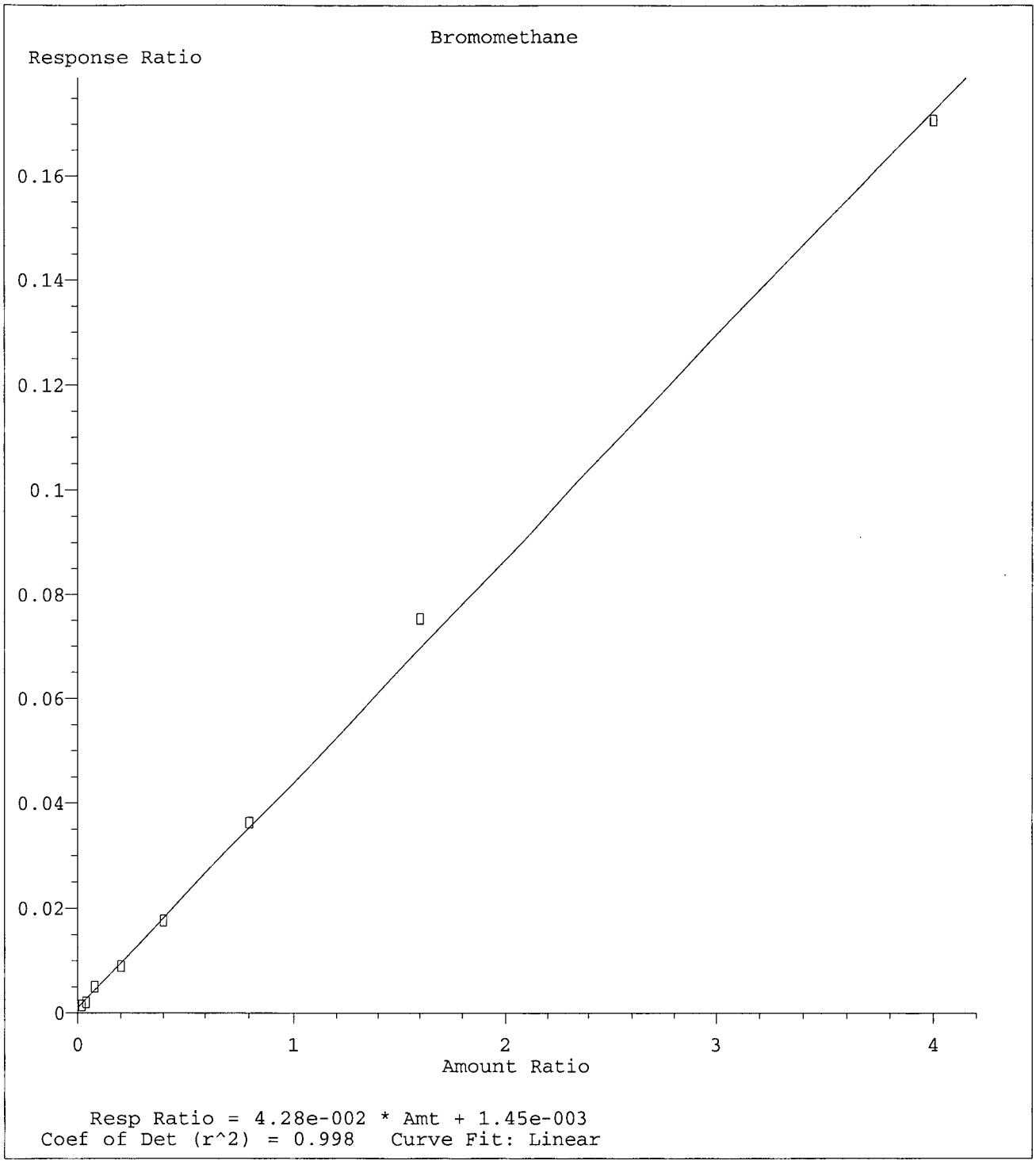




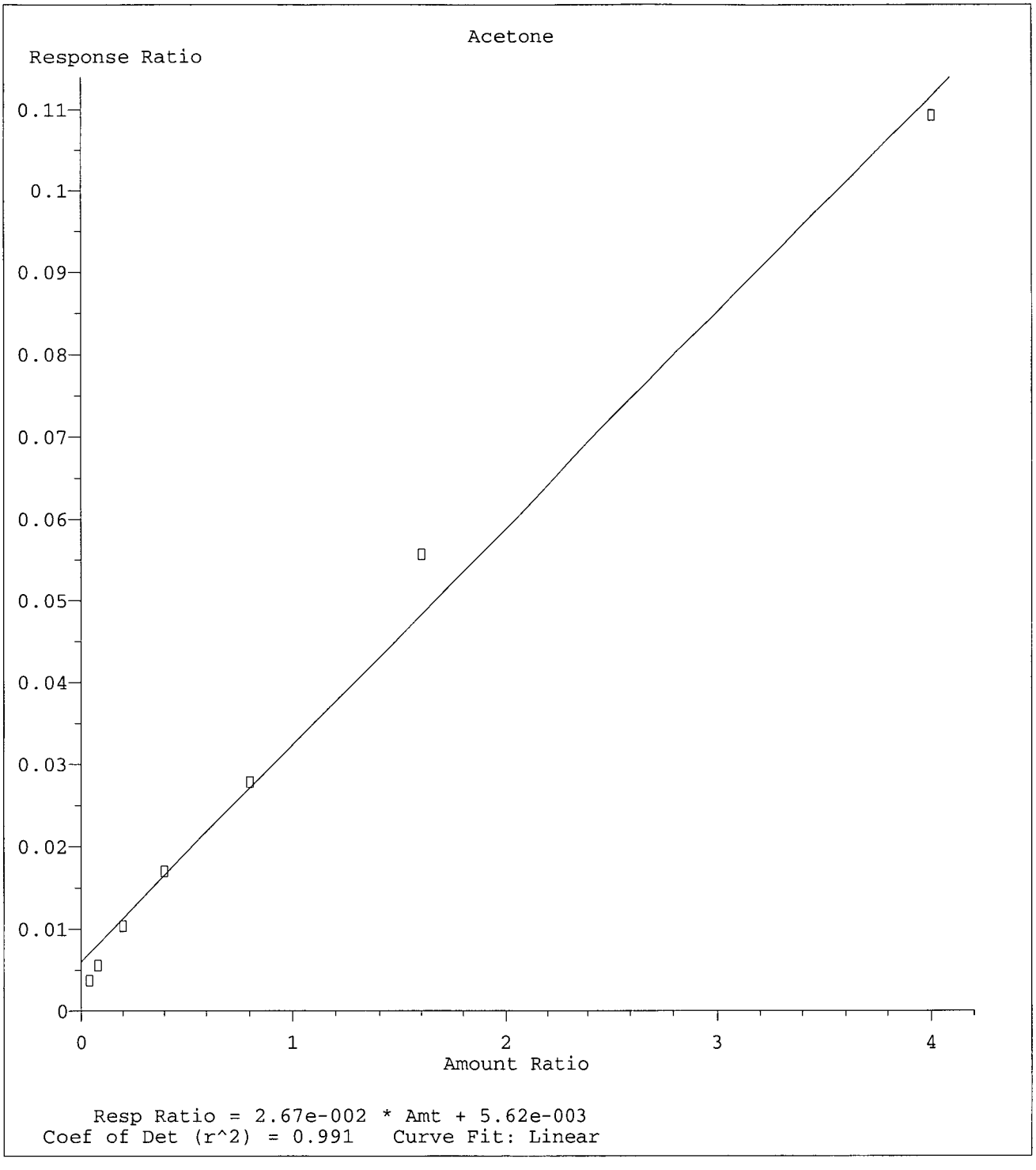
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



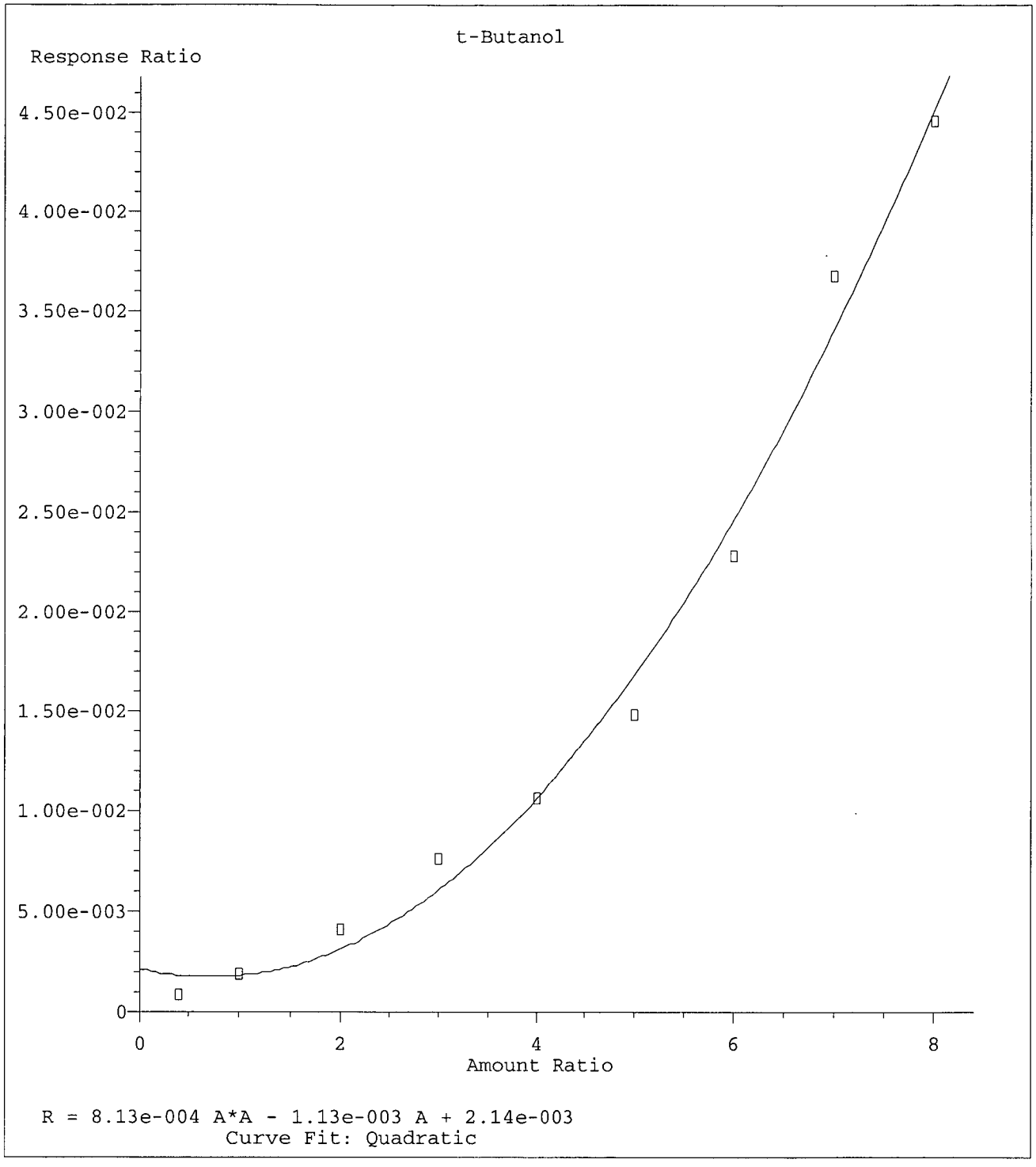
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



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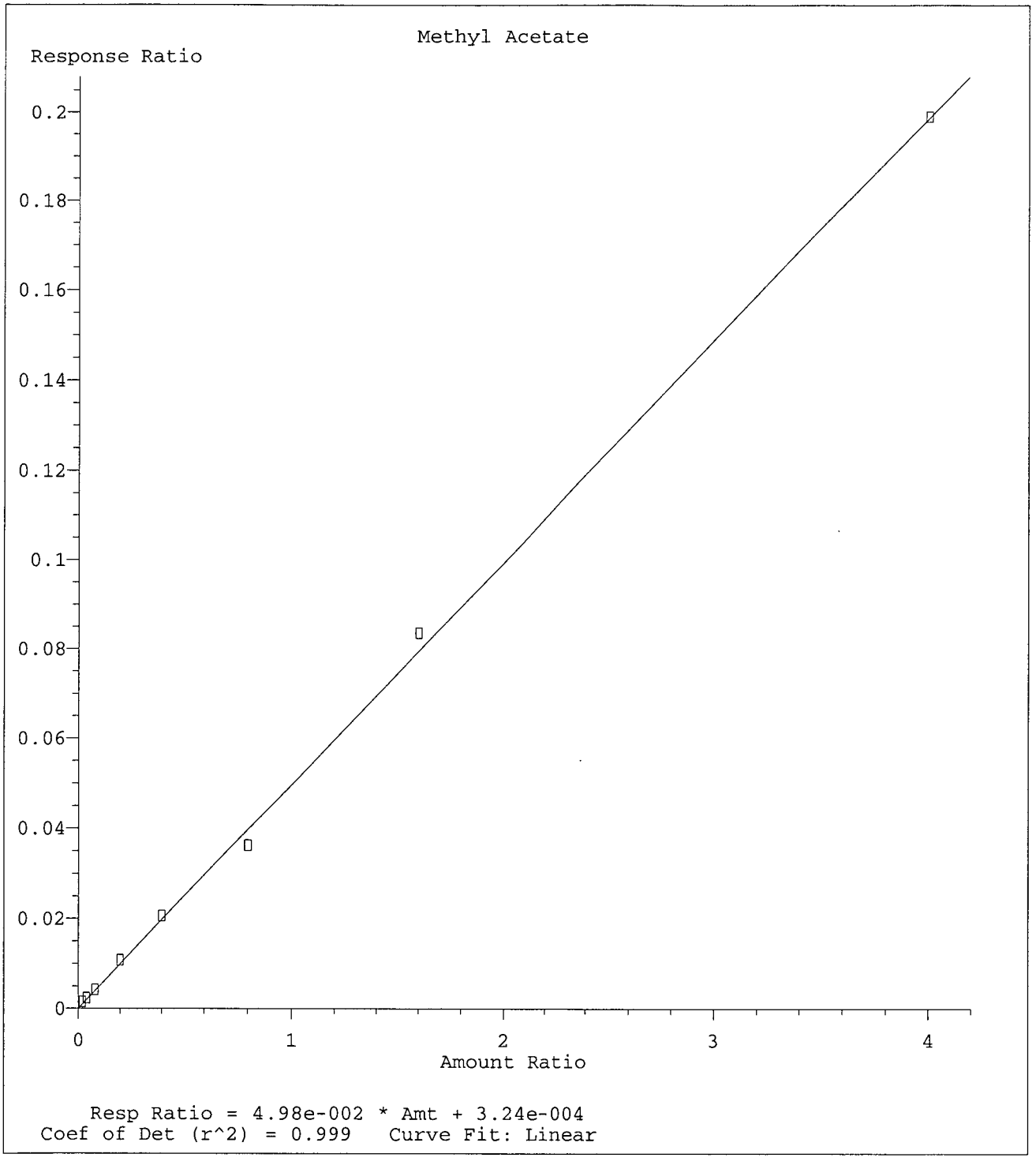
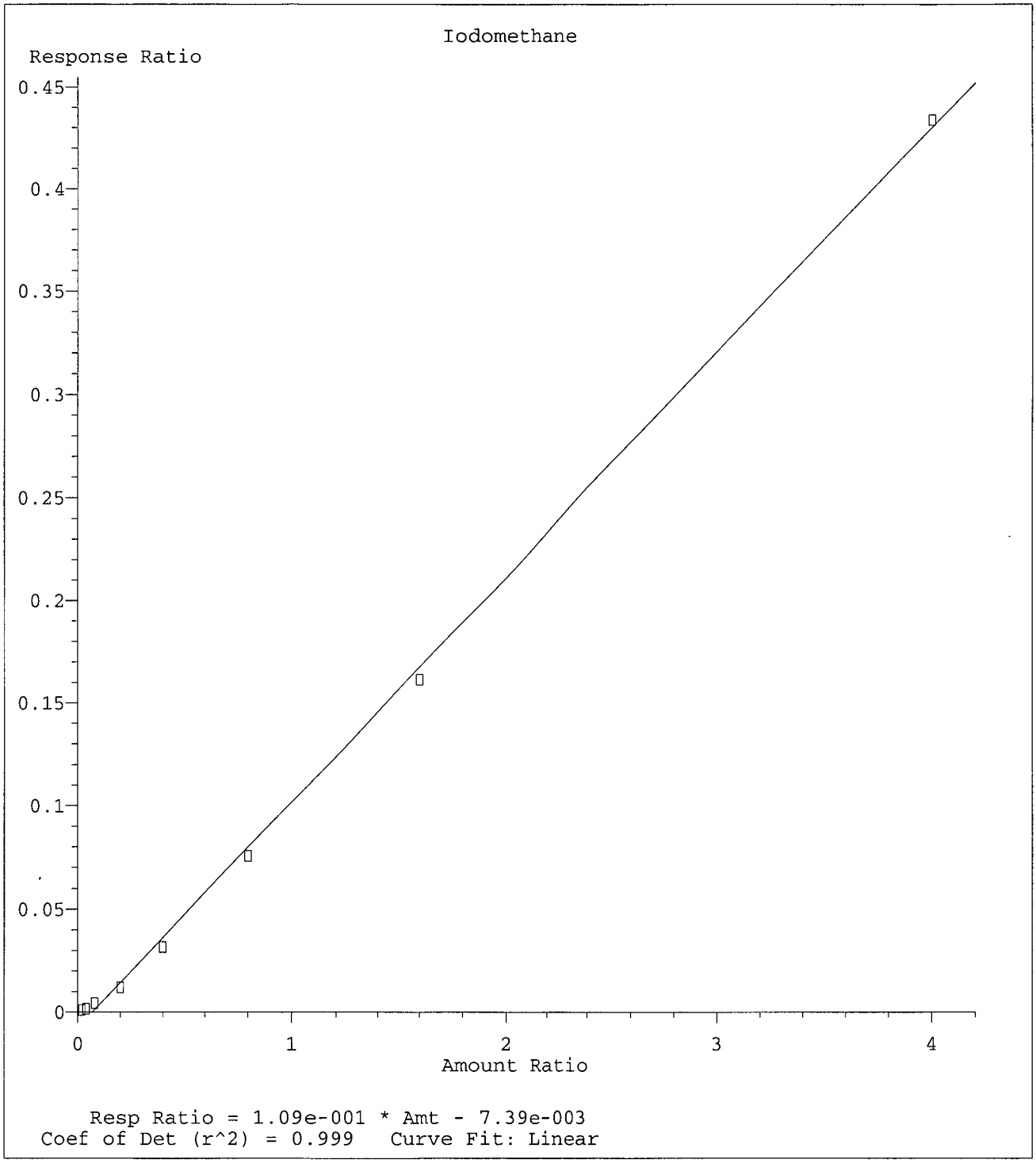
Calibration Table Last Updated: Fri May 01 13:02:52 2020



Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



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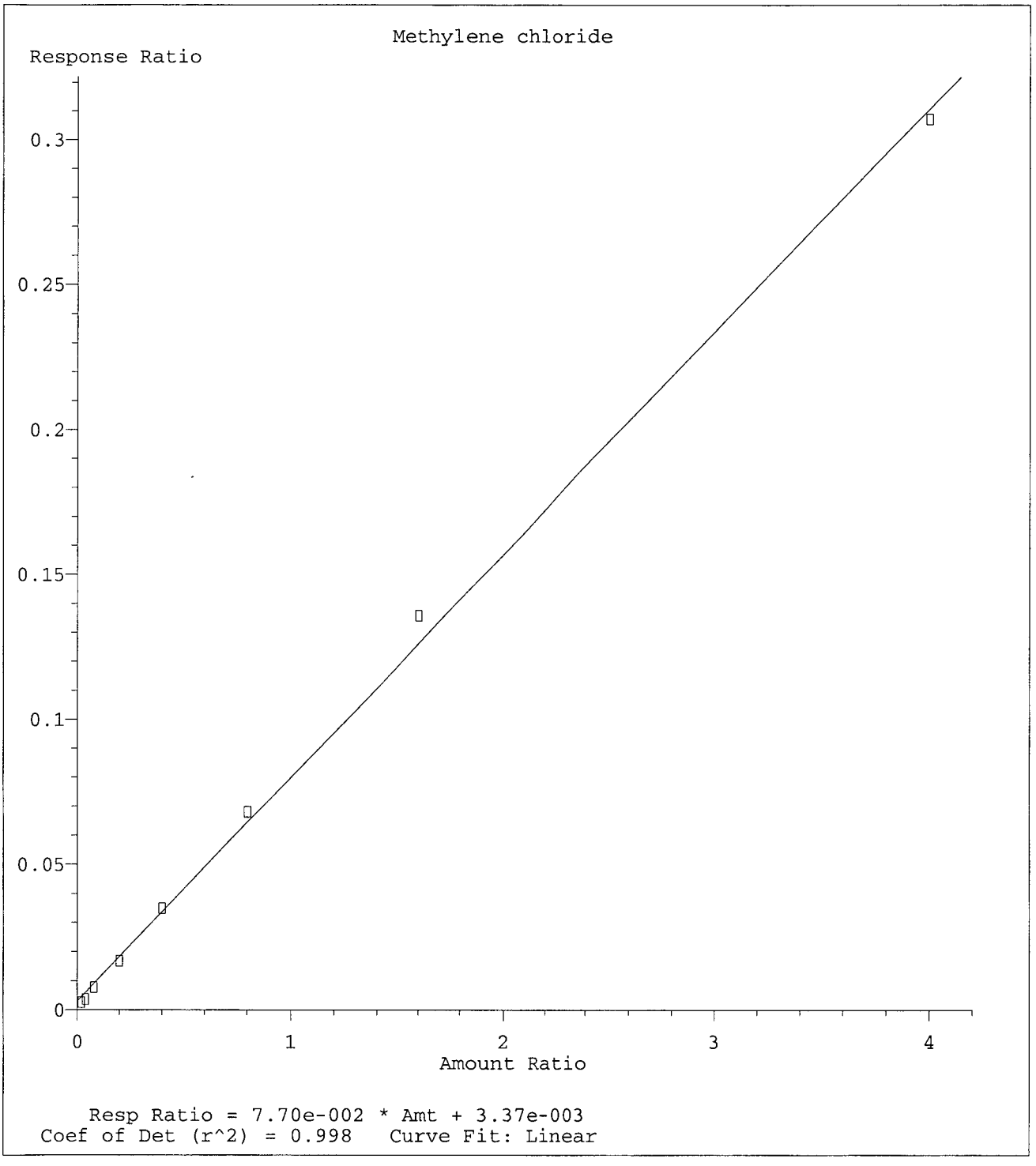
Calibration Table Last Updated: Fri May 01 13:02:52 2020



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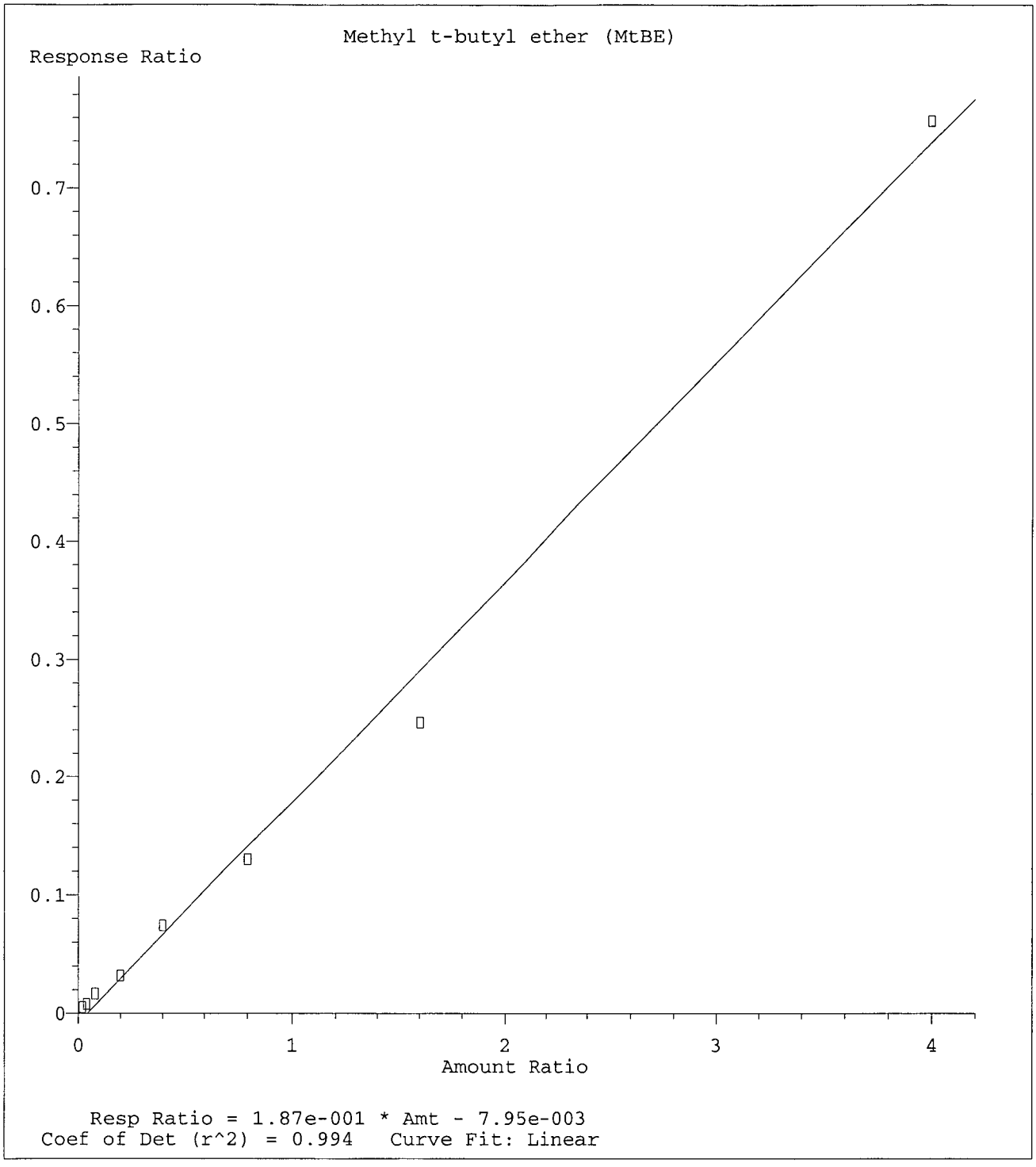
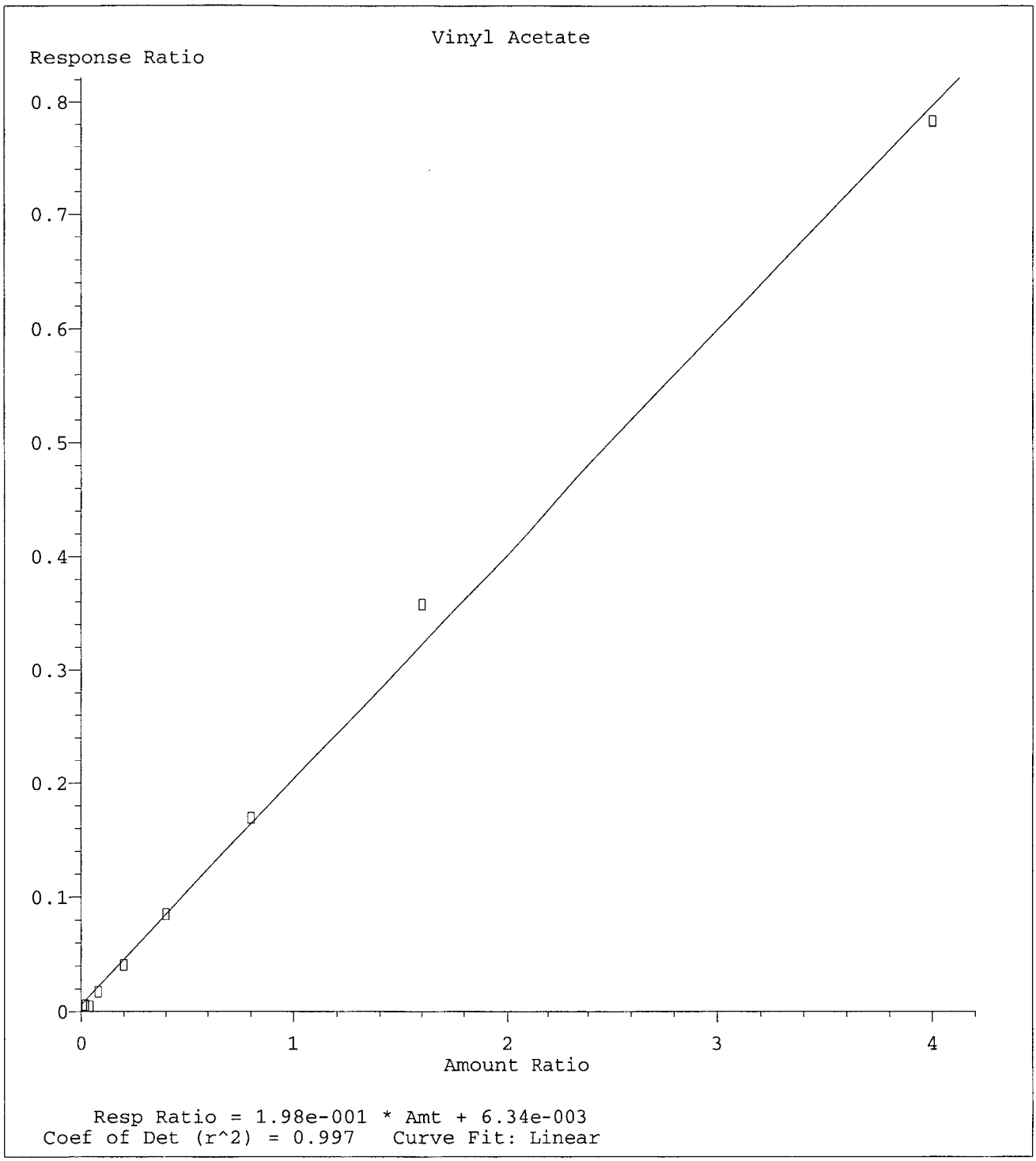
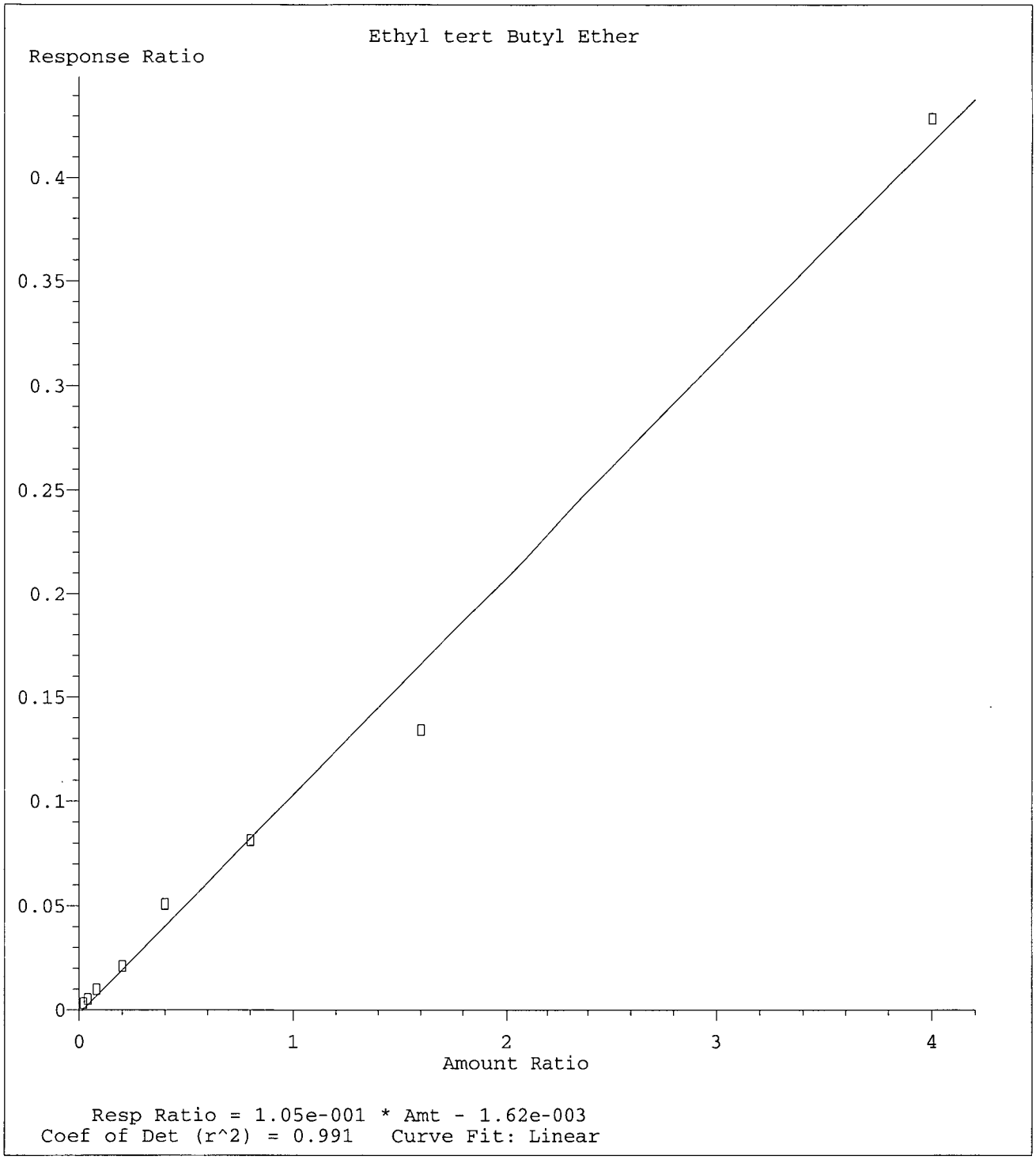
Calibration Table Last Updated: Fri May 01 13:02:52 2020



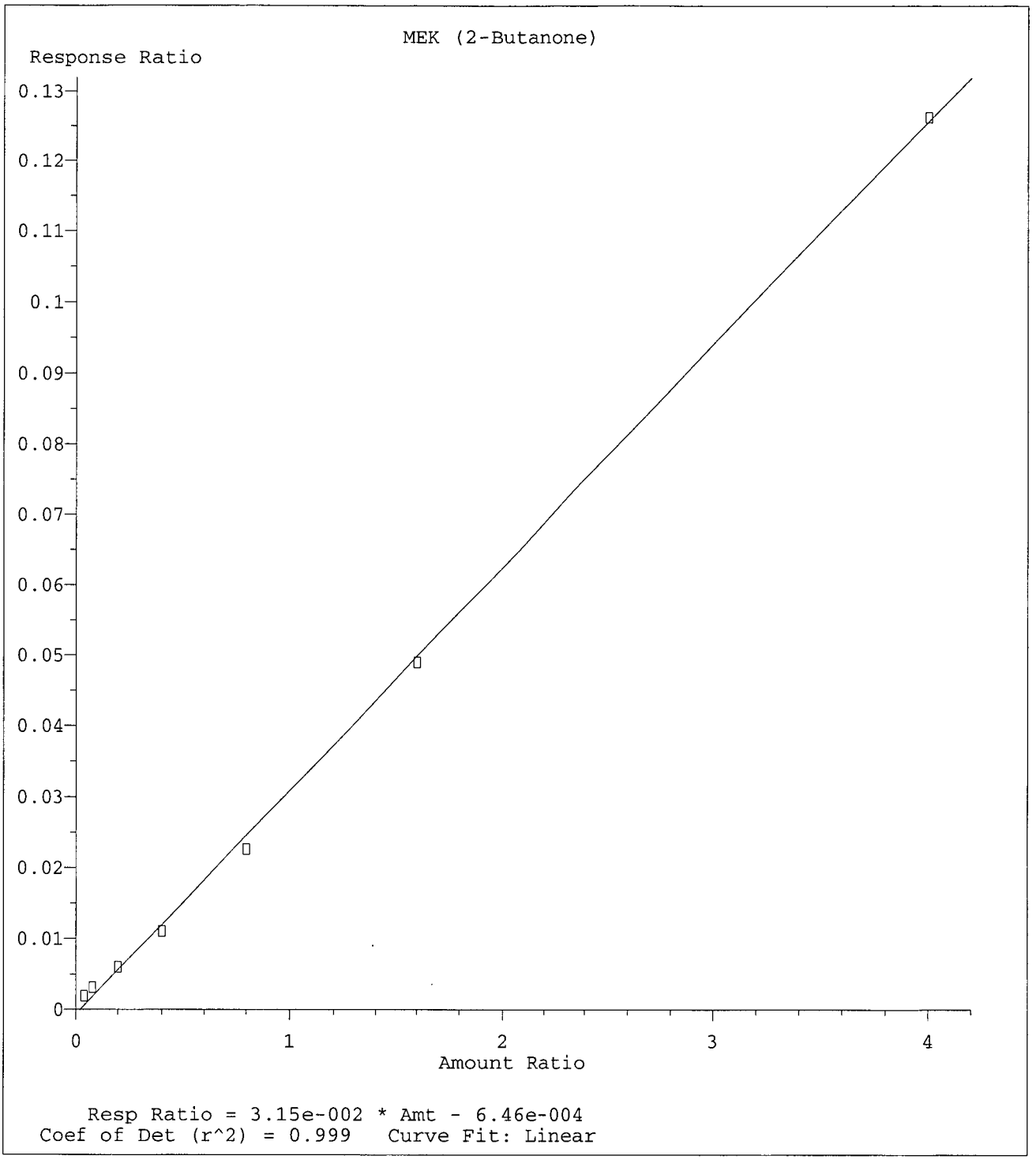
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



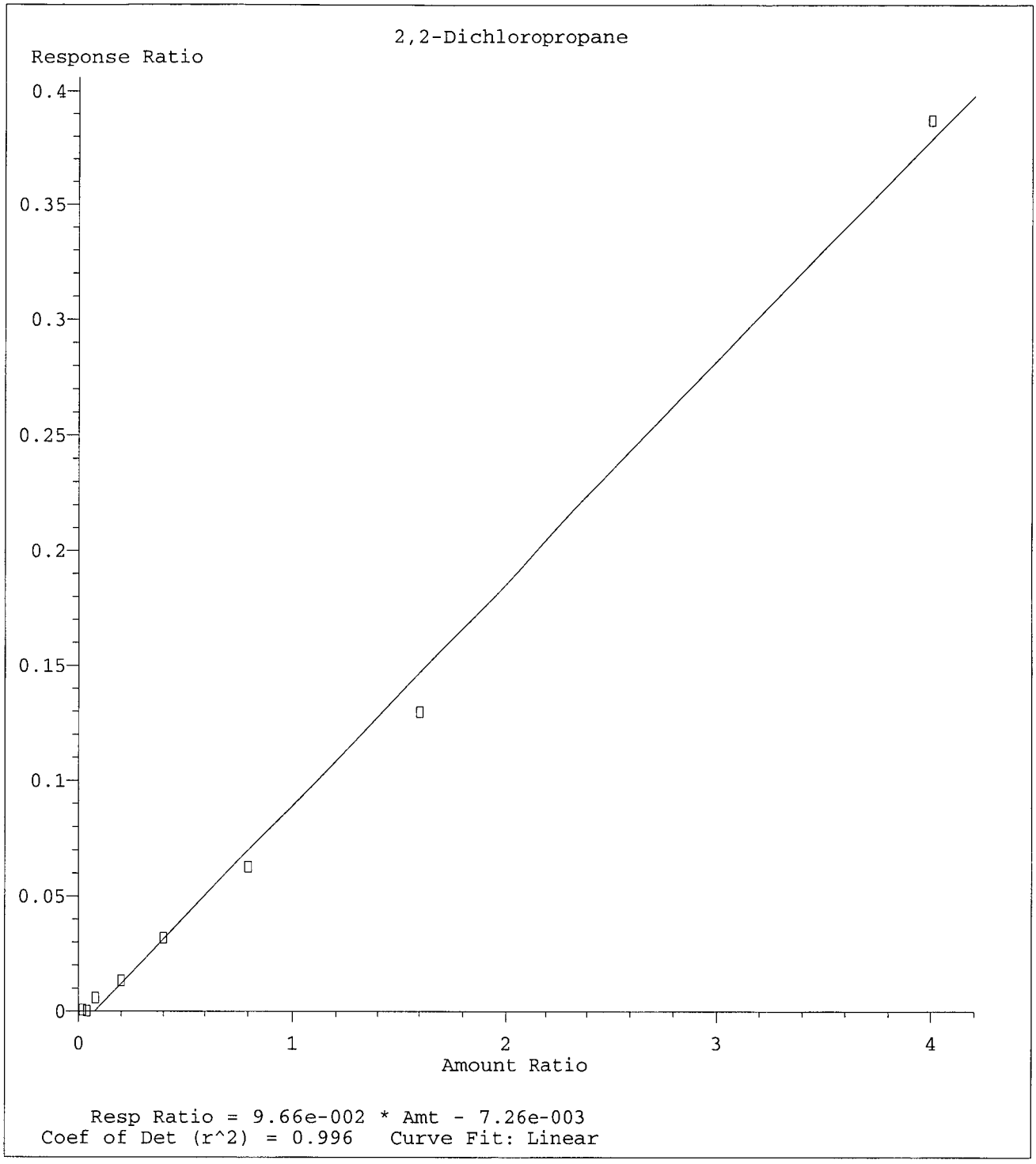
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



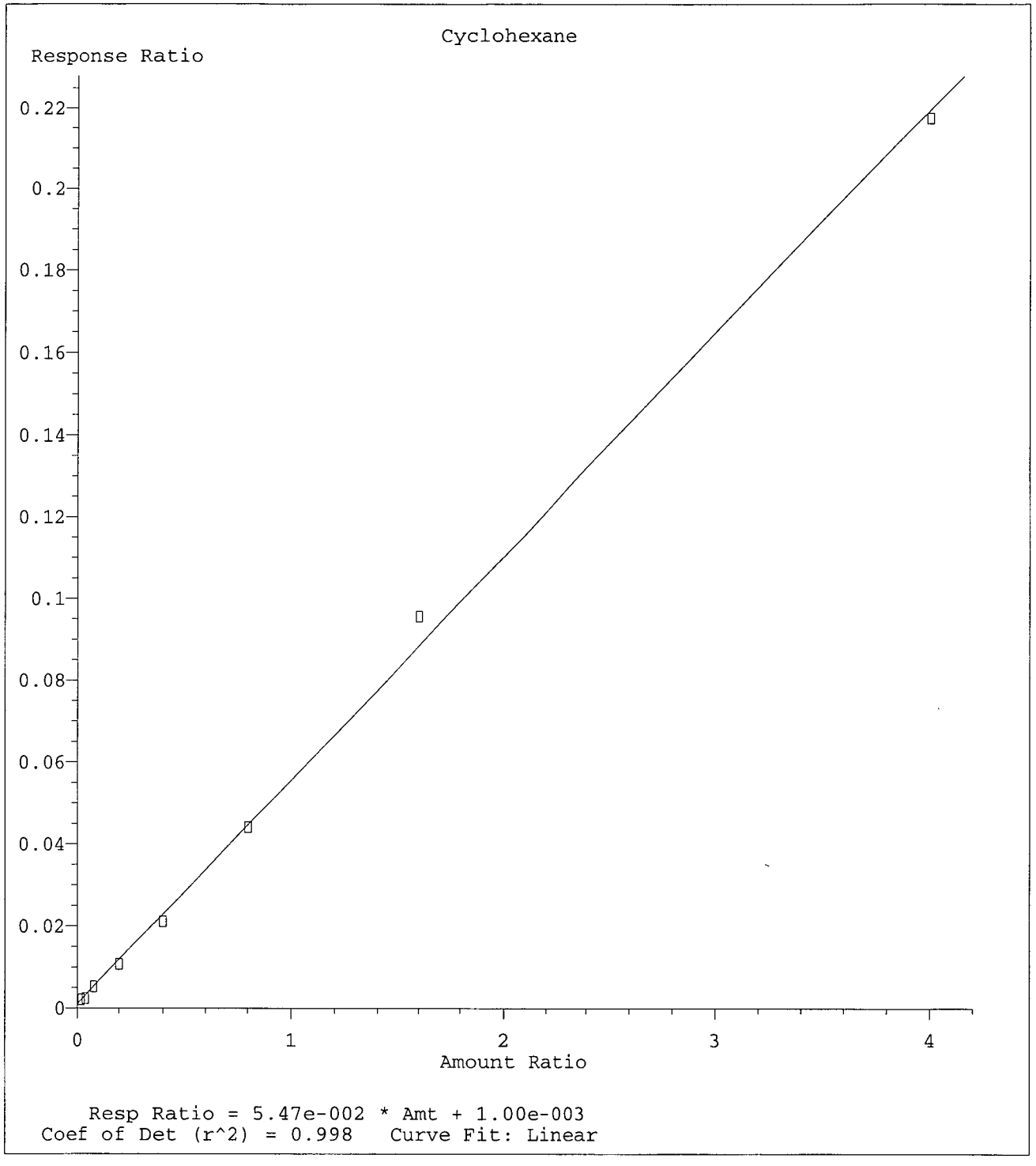
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



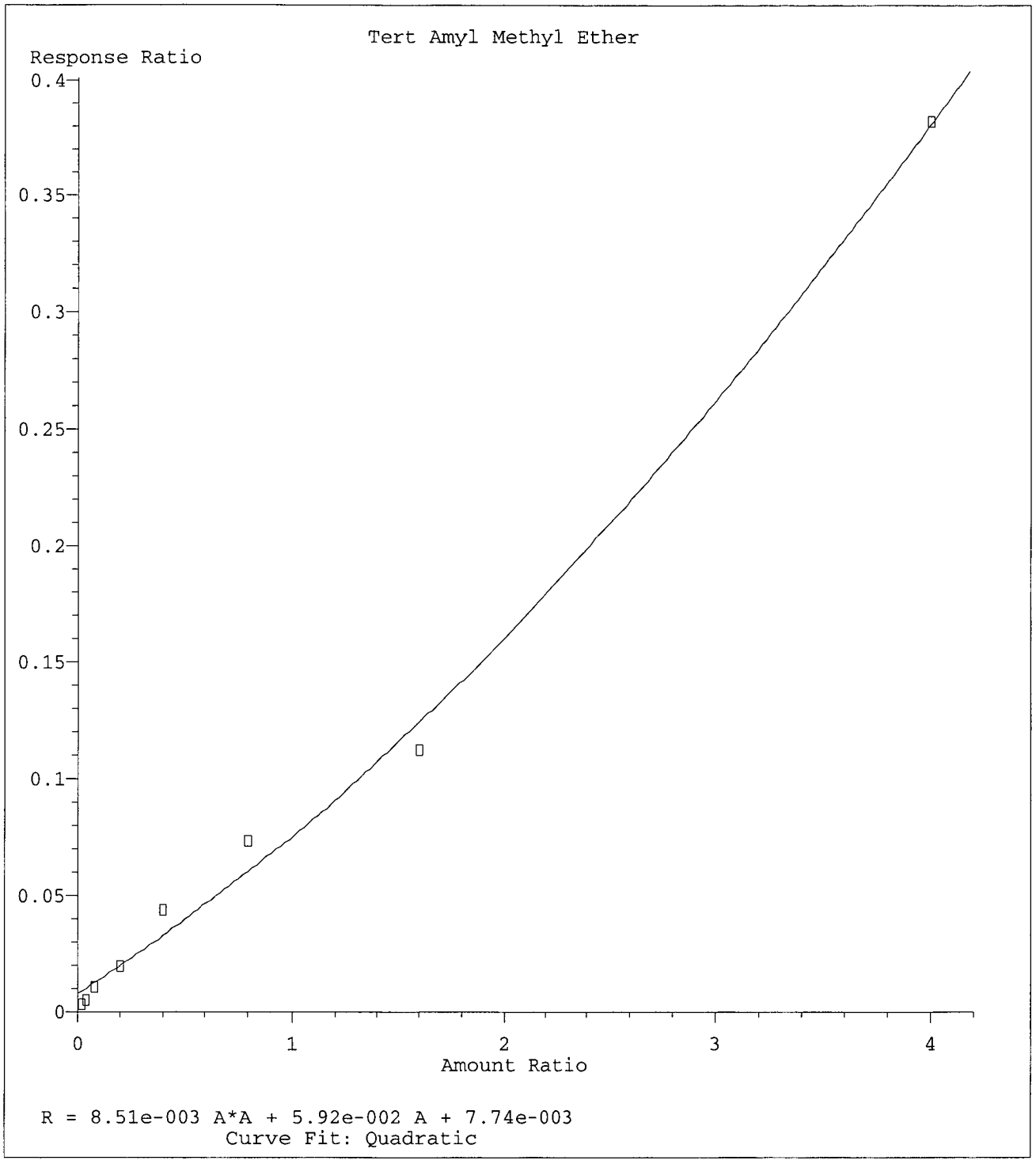
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



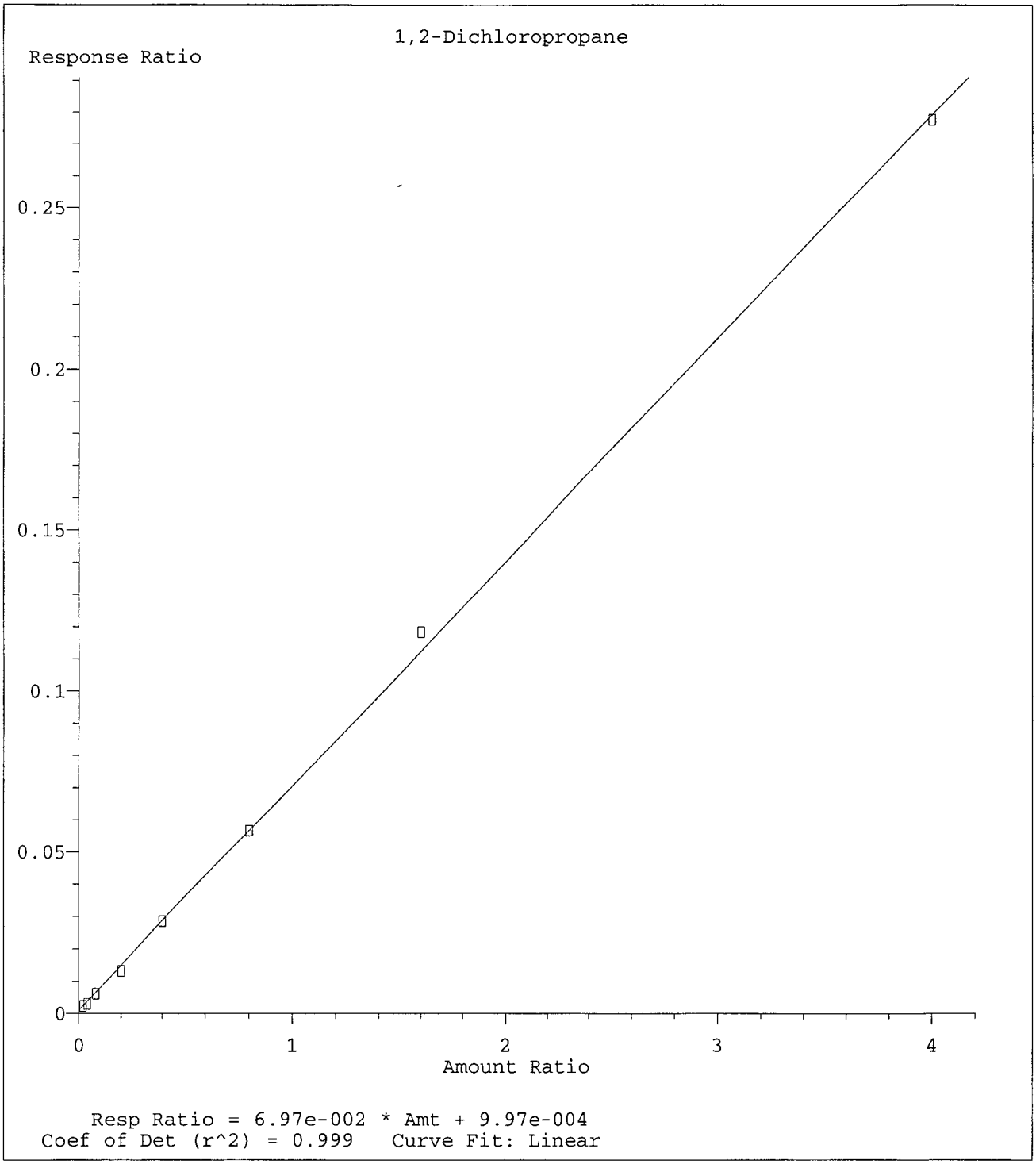
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



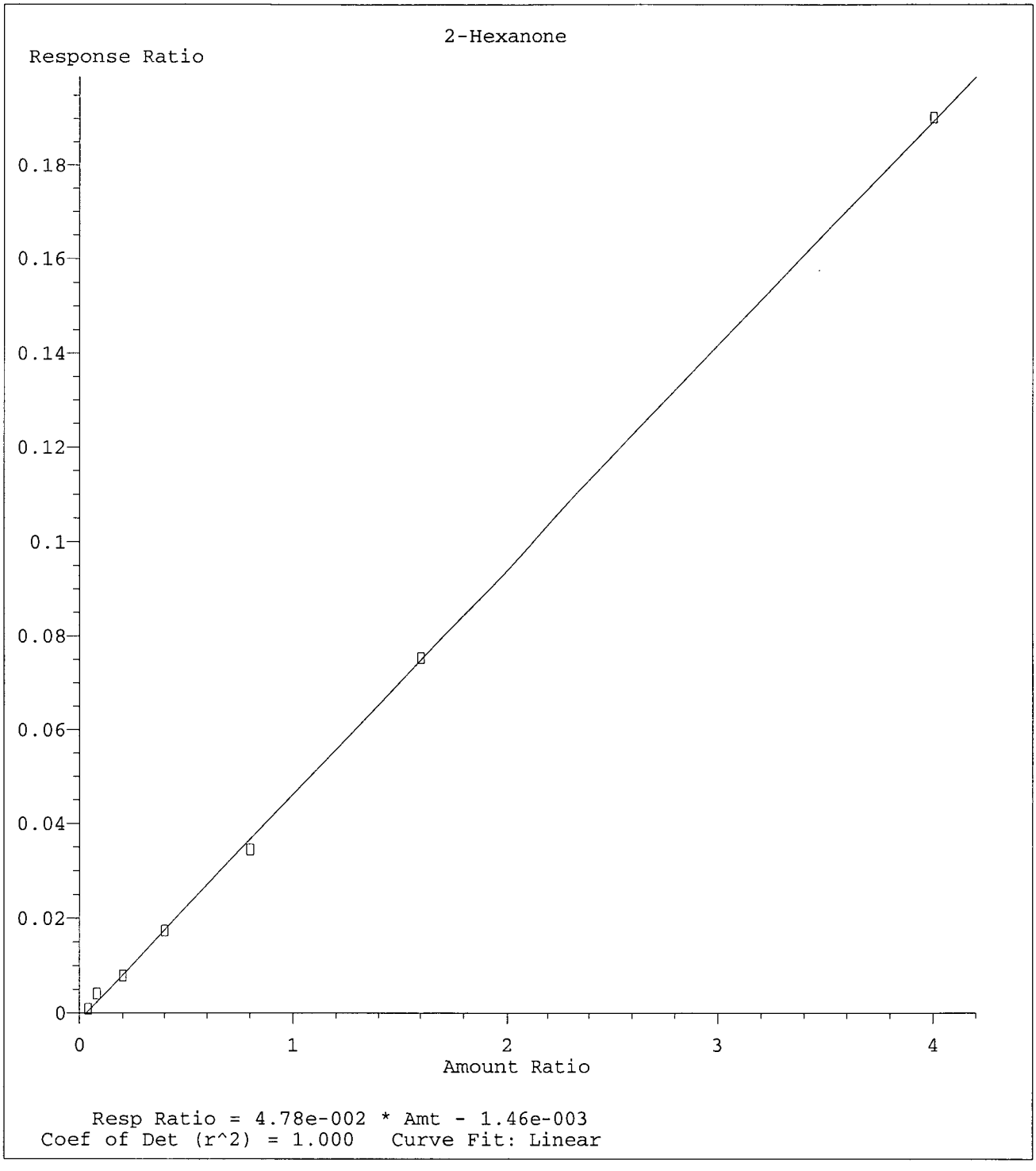
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



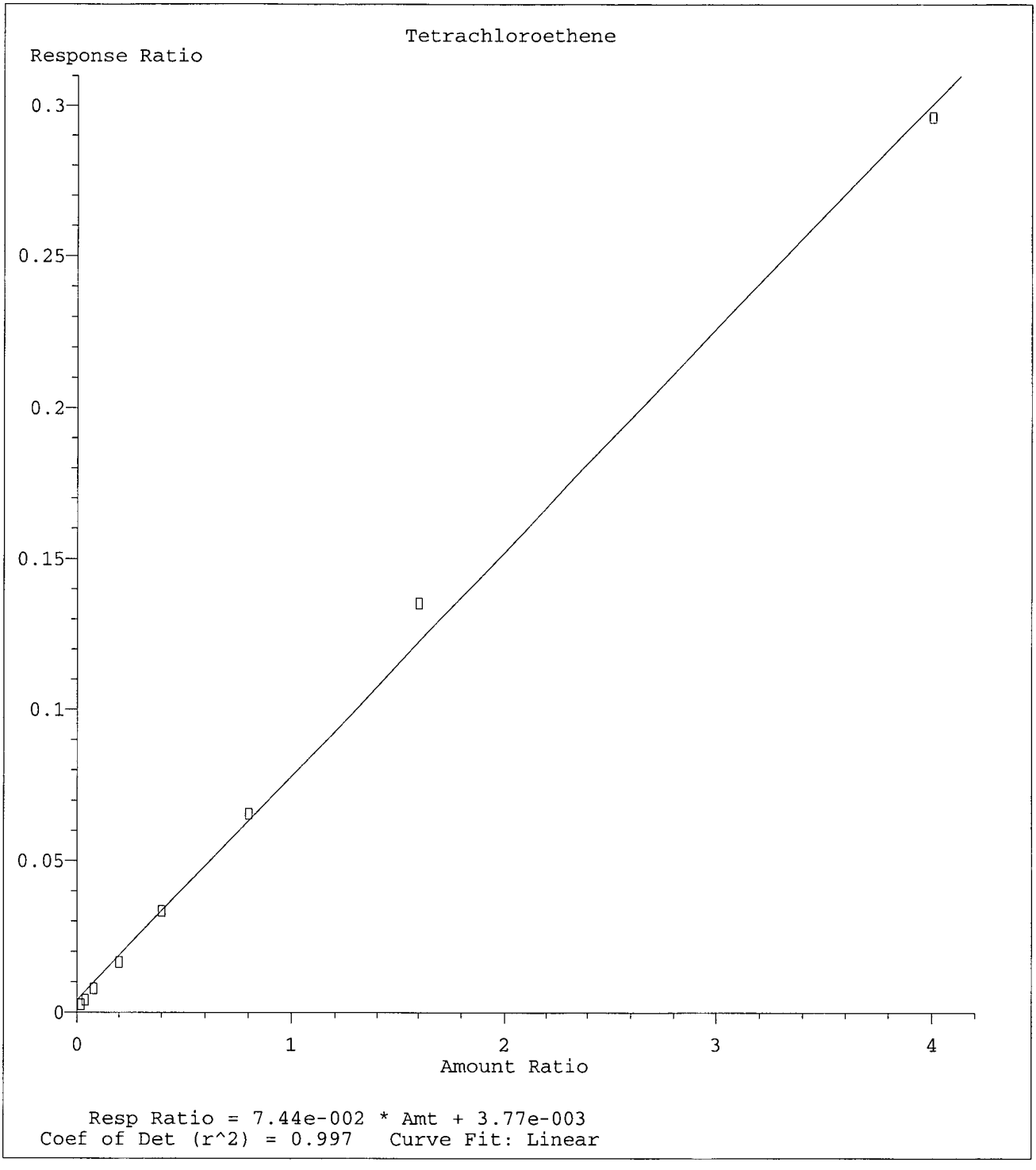
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



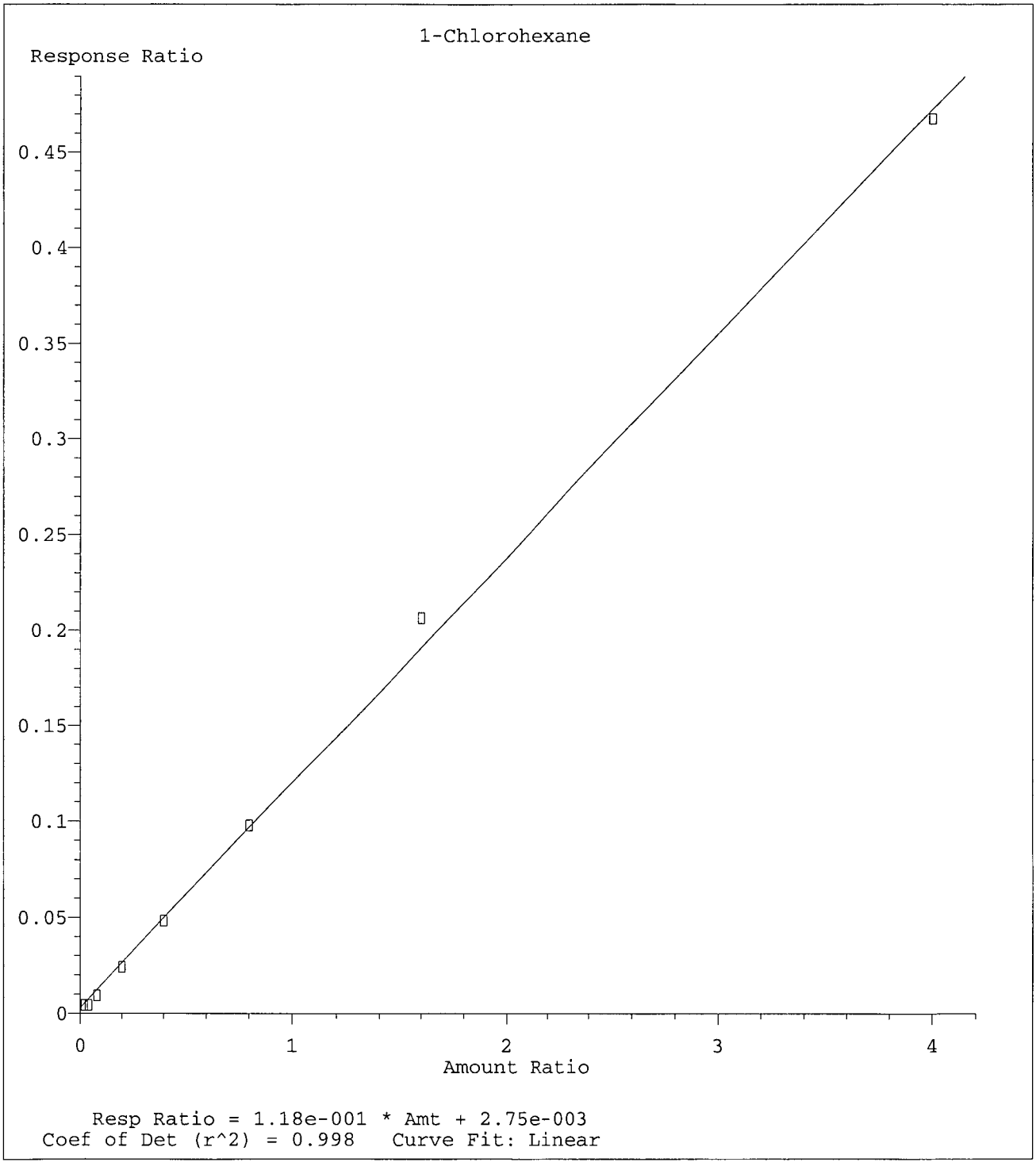
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



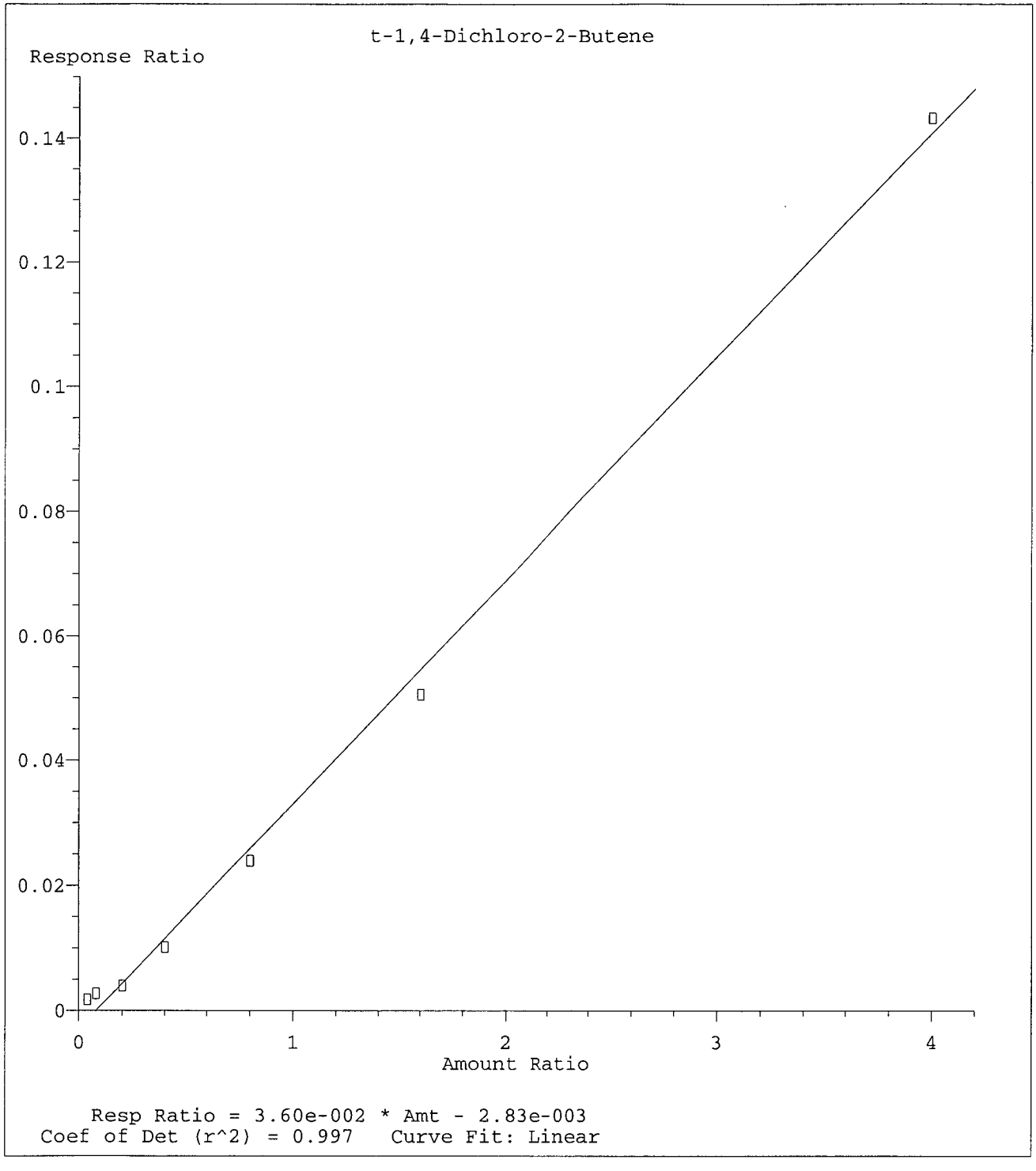
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



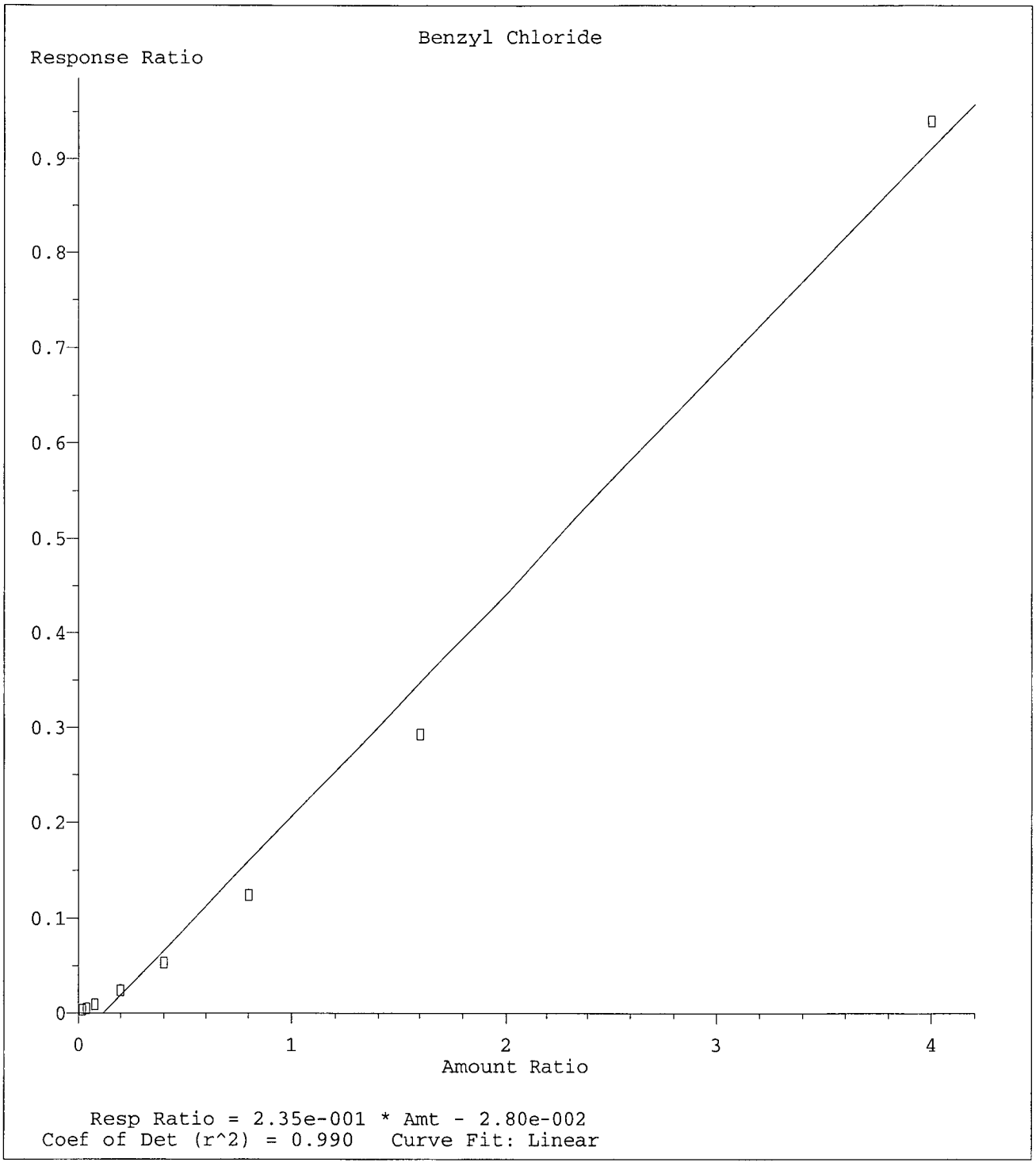
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



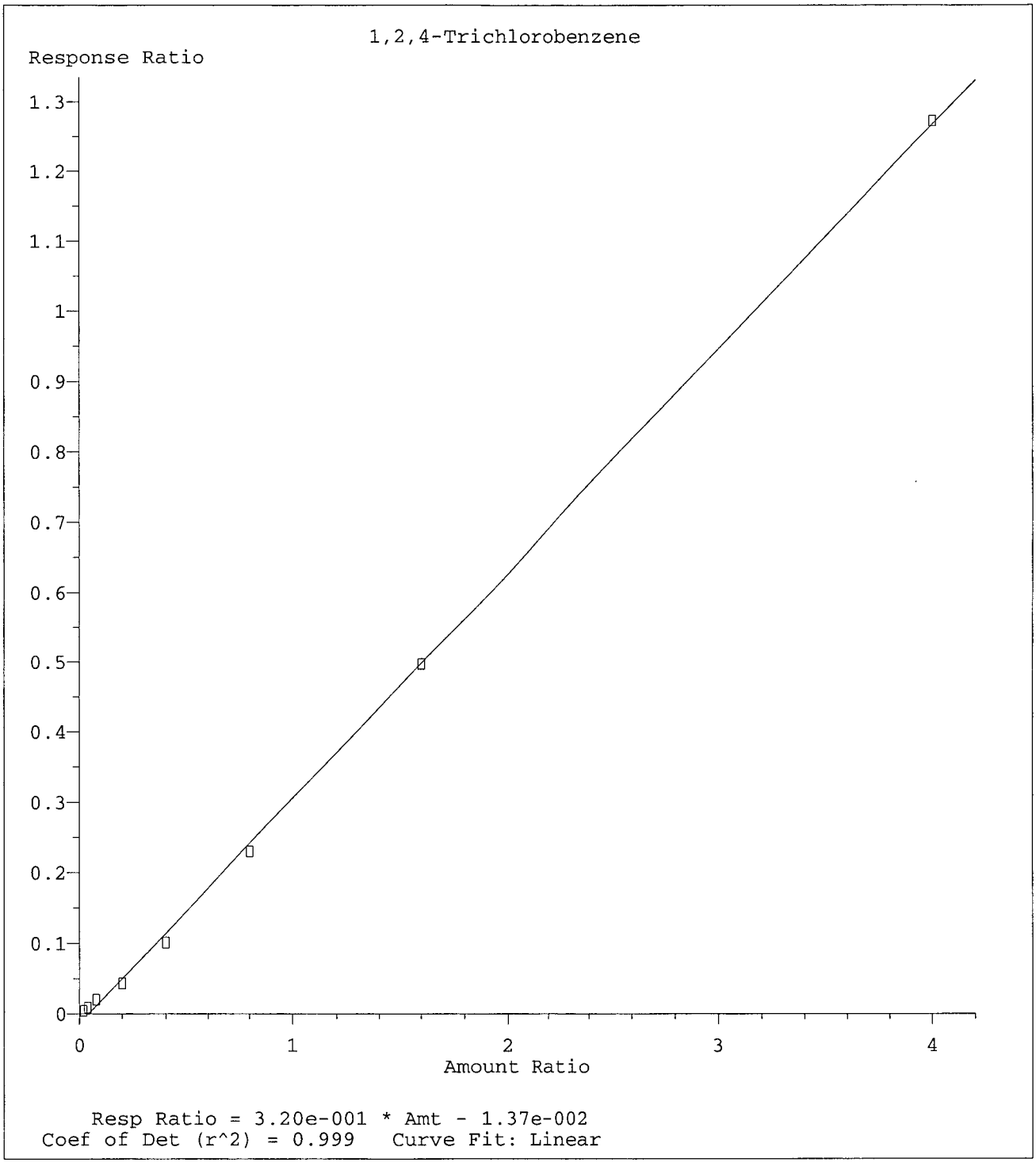
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



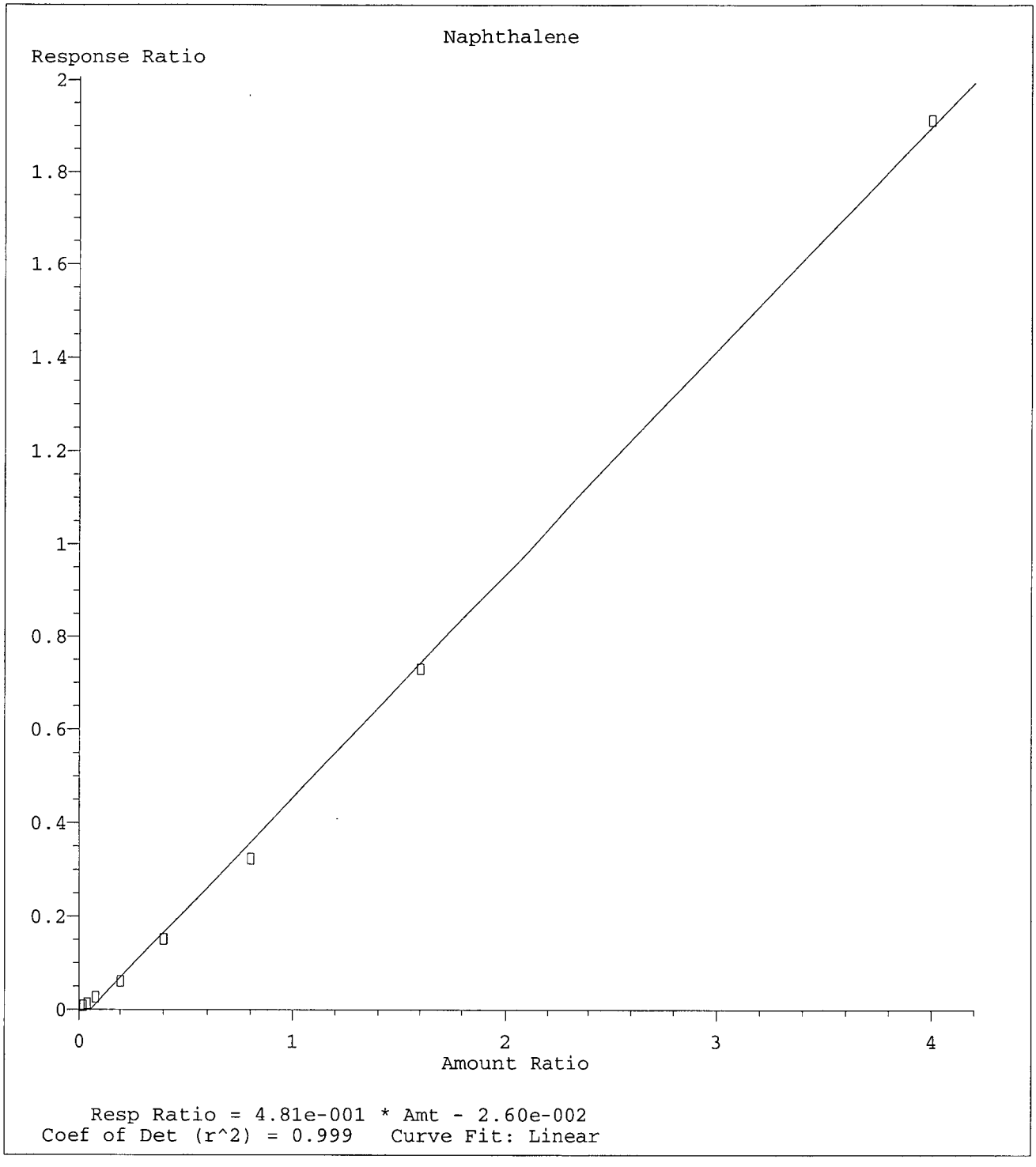
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



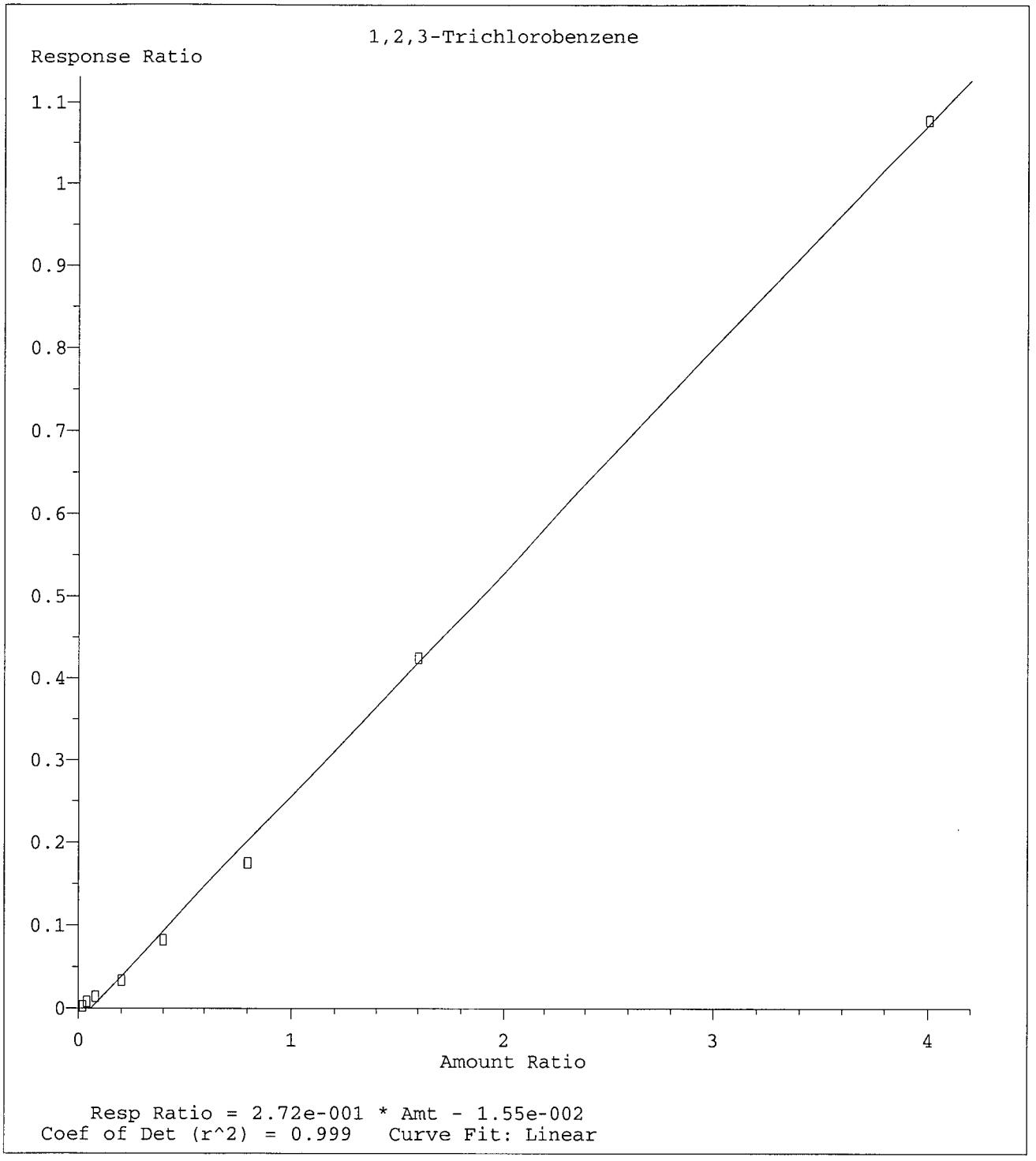
Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020



Method Name: M:\MAX\DATA\M200430\M0430W.M
Calibration Table Last Updated: Fri May 01 13:02:52 2020

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Second Source Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 1 May 20 00:36
Matrix: water Instrument: Max
Initial Cal. Date: 04/30/20
Data File: 0430M28.D

		Compound	MEAN	CCRF	%D		%Drift	
1	TM	Dichlorodifluoromethane	0.1092	0.1046	4.2	TM		
2	TML	Freon 114	0.0655	0.0764	17	TML	5.5	
3	TM**L	Chloromethane	0.1007	0.1011	0.39	TM**L	13	
4	TM*	Vinyl chloride	0.0855	0.0904	5.8	TM*		
5	TML	Bromomethane	0.0513	0.0722	41	TML	60	*NT
6	TM	Chloroethane	0.0578	0.0532	7.8	TM		
7	TM	Dichlorofluoromethane	0.1402	0.1436	2.5	TM		
8	TM	Trichlorofluoromethane	0.1383	0.1451	4.9	TM		
9	TM	Acrolein	0.0112	0.0092	18	TM		
10	TML	Acetone	0.0504	0.0414	18	TML	2.4	
11	TM	Freon-113	0.0299	0.0280	6.5	TM		
12	TM*	1,1-DCE	0.1188	0.1281	7.8	TM*		
13	TMQ	t-Butanol	0.0032	0.0030	7.1	TMQ	5.6	
14	TML	Methyl Acetate	0.0551	0.0518	5.9	TML	2.4	
15	TML	Iodomethane	0.0732	0.0694	5.2	TML	20	
16	TM	Acrylonitrile	0.0274	0.0230	16	TM		
17	TML	Methylene chloride	0.0925	0.0941	1.8	TML	11	
18	TM	Carbon disulfide	0.2028	0.2303	14	TM		
19	TML	Methyl t-butyl ether (MtBE)	0.1882	0.1782	5.3	TML	6.1	
20	TM	Trans-1,2-DCE	0.0834	0.0916	9.8	TM		
21	TM	Diisopropyl Ether	0.2221	0.2299	3.5	TM		
22	TM**	1,1-DCA	0.1328	0.1522	15	TM**		
23	TML	Vinyl Acetate	0.2068	0.2059	0.42	TML	3.9	
24	TML	Ethyl tert Butyl Ether	0.1179	0.1129	4.2	TML	12	
25	TML	MEK (2-Butanone)	0.0337	0.0326	3.2	TML	8.6	
26	TM	Cis-1,2-DCE	0.0973	0.0985	1.2	TM		
27	TML	2,2-Dichloropropane	0.0642	0.0819	28	TML	3.6	
28	TM*	Chloroform	0.1670	0.1742	4.3	TM*		
29	TM	Bromochloromethane	0.0566	0.0552	2.4	TM		
30	TM	1,1,1-TCA	0.1485	0.1600	7.8	TM		
31	TML	Cyclohexane	0.0633	0.0573	9.5	TML	0.19	
32	TM	1,1-Dichloropropene	0.1155	0.1201	4.0	TM		
33	TM	2,2,4-Trimethylpentane	0.1444	0.1370	5.1	TM		
34	TM	Carbon Tetrachloride	0.1338	0.1471	9.9	TM		
35	TMQ	Tert Amyl Methyl Ether	0.1108	0.1062	4.1	TMQ	36	*NT
36	TM	1,2-DCA	0.1505	0.1533	1.9	TM		
37	TM	Benzene	0.3416	0.3283	3.9	TM		
38	TM	TCE	0.1022	0.1014	0.85	TM		
39	TM	2-Pentanone	0.0568	0.0530	6.6	TM		
40	TM*L	1,2-Dichloropropane	0.0771	0.0786	1.9	TM*L	9.2	
		Average			7.9			

VOLATILE ORGANIC ANALYSIS BY EPA METHOD 8260B

Form 7

Second Source Calibration

Lab Name: APPL, Inc. SDG No:

Case No: Date Analyzed: 1 May 20 00:36

Matrix: water Instrument: Max

Cal. Date: 04/30/20

Data File: 0430M28.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	Bromodichloromethane	0.1327	0.1430	7.8	TM	
42	TM	Methyl Cyclohexane	0.1101	0.1104	0.29	TM	
43	TM	Dibromomethane	0.0534	0.0520	2.5	TM	
44	TM	MIBK (methyl isobutyl ketone)	0.0000	0.6444	0.00	TM	
45	TM	1-Bromo-2-chloroethane	0.1008	0.1006	0.21	TM	
46	TM	2-Chloroethyl vinyl ether	0.0000	0.0002	0.00	TM	
47	TM	Cis-1,3-Dichloropropene	0.1392	0.1449	4.2	TM	
48	TM*	Toluene	0.4021	0.4032	0.27	TM*	
49	TM	Trans-1,3-Dichloropropene	0.1147	0.1304	14	TM	
50	TM	1,1,2-TCA	0.0672	0.0644	4.2	TM	
51	TML	2-Hexanone	0.0420	0.0462	9.9	TML	4.2
52	TM	1,2-EDB	0.1059	0.1007	4.9	TM	
53	TML	Tetrachloroethene	0.0920	0.0916	0.42	TML	10
54	TML	1-Chlorohexane	0.1321	0.1281	3.0	TML	3.0
55	TM	1,1,1,2-Tetrachloroethane	0.1330	0.1444	8.5	TM	
56	TM	m&p-Xylene	0.2387	0.2312	3.1	TM	
57	TM	o-Xylene	0.2383	0.2379	0.18	TM	
58	TM	Styrene	0.3856	0.4051	5.1	TM	
59	TM	1,3-Dichloropropane	0.1639	0.1674	2.1	TM	
60	TM	Dibromochloromethane	0.1393	0.1460	4.8	TM	
61	TM**	Chlorobenzene	0.3417	0.3362	1.6	TM**	
62	TM*	Ethylbenzene	0.5453	0.5524	1.3	TM*	
63	TM**	Bromoform	0.1236	0.1265	2.4	TM**	
64	TM	Isopropylbenzene	0.8713	0.8746	0.39	TM	
65	TM**	1,1,2,2-Tetrachloroethane	0.1805	0.1684	6.7	TM**	
66	TM	1,2,3-Trichloropropane	0.0757	0.0842	11	TM	
67	TML	t-1,4-Dichloro-2-Butene	0.0317	0.0299	5.7	TML	2.7
68	TM	Bromobenzene	0.2825	0.2976	5.3	TM	
69	TM	n-Propylbenzene	0.9197	0.9508	3.4	TM	
70	TM	4-Ethyltoluene	0.8493	0.8507	0.17	TM	
71	TM	2-Chlorotoluene	0.6579	0.7281	11	TM	
72	TM	1,3,5-Trimethylbenzene	0.7565	0.8007	5.8	TM	
73	TM	4-Chlorotoluene	0.7003	0.7270	3.8	TM	
74	TM	Tert-Butylbenzene	0.7227	0.6897	4.6	TM	
75	TM	1,2,4-Trimethylbenzene	0.7704	0.8390	8.9	TM	
76	TM	Sec-Butylbenzene	0.8024	0.8050	0.32	TM	
77	TM	p-Isopropyltoluene	0.7347	0.7750	5.5	TM	
78	TML	Benzyl Chloride	0.1543	0.1461	5.3	TML	7.9
79	TM	1,3-DCB	0.5079	0.5218	2.7	TM	
80	TM	1,4-DCB	0.5217	0.5376	3.1	TM	
		Average			4.1		

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 1 May 20 00:36
Instrument: Max
Cal. Date: 04/30/20
Data File: 0430M28.D

		Compound	MEAN	CCRF	%D		%Drift	
81	TM	n-Butylbenzene	0.4473	0.5032	13	TM		
82	TM	1,2-DCB	0.4886	0.5095	4.3	TM		
83	TM	Hexachloroethane	0.1203	0.1260	4.7	TM		
84	TM	1,2-Dibromo-3-chloropropane	0.0388	0.0399	2.9	TM		
85	TML	1,2,4-Trichlorobenzene	0.2601	0.3420	31	TML	18	
86	TM	Hexachlorobutadiene	0.1265	0.1484	17	TM		
87	TML	Naphthalene	0.3907	0.7568	94	TML	71	*NT
88	TML	1,2,3-Trichlorobenzene	0.2061	0.2971	44	TML	23	*NT
89								
90								
91								
92								
93								
94								
95								
96								
97								
98								
99								
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
		Average			26.4			

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M28.D Vial: 25
Acq On : 1 May 20 00:36 Operator: LP,DG,CMM
Sample : (SS)10ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1526581	25.000	ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1320974	25.000	ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	876791	25.000	ppb		0.00
System Monitoring Compounds							
31) Dibromofluoromethane(S)	5.68	111	428627	25.716	ppb		0.00
Spiked Amount 25.000			Recovery = 102.864%				
36) 1,2-DCA-D4(S)	6.07	65	529994	26.192	ppb		0.00
Spiked Amount 25.000			Recovery = 104.768%				
56) Toluene-D8(S)	8.18	98	1583400	25.125	ppb		0.00
Spiked Amount 25.000			Recovery = 100.500%				
64) 4-Bromofluorobenzene(S)	10.81	95	657678	24.434	ppb		0.00
Spiked Amount 25.000			Recovery = 97.736%				
Target Compounds							Qvalue
2) Dichlorodifluoromethane	1.23	85	63875	9.583	ppb		95
3) Freon 114	1.34	85	46670	10.550	ppb		91
4) Chloromethane	1.38	50	61737	11.291	ppb		98
5) Vinyl chloride	1.47	62	55207	10.577	ppb		97
6) Bromomethane	1.74	94	44080	16.009	ppb		96
7) Chloroethane	1.84	64	32516	9.219	ppb	#	75
8) Dichlorofluoromethane	2.04	67	87709	10.245	ppb		97
9) Trichlorofluoromethane	2.09	101	88602	10.495	ppb		98
10) Acrolein	2.53	56	70552	102.968	ppb		91
11) Acetone	2.72	43	25260	10.235	ppb		91
12) Freon-113	2.63	101	17088	9.351	ppb		86
13) 1,1-DCE	2.61	61	78199	10.780	ppb		99
14) t-Butanol	3.51	59	22780	118.037	ppb	#	90
15) Methyl Acetate	3.12	43	31650	10.236	ppb		95
16) Iodomethane	2.76	142	42384	8.039	ppb	#	89
17) Acrylonitrile	3.55	53	14074	8.411	ppb	#	78
18) Methylene chloride	3.20	84	57470	11.125	ppb		96
19) Carbon disulfide	2.82	76	140641	11.359	ppb		95
20) Methyl t-butyl ether (MtBE	3.65	73	108784	10.613	ppb		95
21) Trans-1,2-DCE	3.57	96	55937	10.978	ppb		88
22) Diisopropyl Ether	4.43	45	140405	10.351	ppb	#	90
23) 1,1-DCA	4.21	63	92920	11.457	ppb		96
24) Vinyl Acetate	4.43	43	125726	9.609	ppb	#	99
25) Ethyl tert Butyl Ether	4.94	59	68934	11.176	ppb		92
26) MEK (2-Butanone)	5.14	43	19926	10.861	ppb	#	84
27) Cis-1,2-DCE	5.05	96	60124	10.117	ppb		87
28) 2,2-Dichloropropane	5.04	77	49990	10.357	ppb		94
29) Chloroform	5.49	83	106357	10.427	ppb		93
30) Bromochloromethane	5.35	128	33721	9.755	ppb		89
32) 1,1,1-TCA	5.69	97	97713	10.776	ppb	#	92
33) Cyclohexane	5.74	41	35003	10.019	ppb		86
34) 1,1-Dichloropropene	5.89	75	73363	10.403	ppb		87
35) 2,2,4-Trimethylpentane	6.27	57	83684	9.493	ppb		98
37) Carbon Tetrachloride	5.89	117	89798	10.989	ppb		90
38) Tert Amyl Methyl Ether	6.34	73	64875	13.609	ppb	#	86
39) 1,2-DCA	6.16	62	93615	10.186	ppb		94
40) Benzene	6.13	78	200496	9.611	ppb		98
41) TCE	6.89	95	61901	9.915	ppb	#	88
42) 2-Pentanone	7.14	43	404855	116.742	ppb		100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M28.D Vial: 25
Acq On : 1 May 20 00:36 Operator: LP,DG,CMM
Sample : (SS)10ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 11:50:08 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	47992	10.921	ppb		94
44)	Bromodichloromethane	7.43	83	87331	10.780	ppb		94
45)	Methyl Cyclohexane	7.09	83	67442	10.029	ppb		92
46)	Dibromomethane	7.24	93	31754	9.746	ppb		91
48)	1-Bromo-2-chloroethane	7.74	63	61448	9.979	ppb		98
50)	Cis-1,3-Dichloropropene	7.91	75	88501	10.415	ppb		94
51)	Toluene	8.25	91	246213	10.027	ppb		91
52)	Trans-1,3-Dichloropropene	8.49	75	79602	11.368	ppb		91
53)	1,1,2-TCA	8.67	83	39323	9.580	ppb		89
54)	2-Hexanone	8.96	43	28214	10.425	ppb	#	93
57)	1,2-EDB	9.15	107	53213	9.511	ppb		98
58)	Tetrachloroethene	8.80	164	48400	11.046	ppb		92
59)	1-Chlorohexane	9.66	91	67703	10.305	ppb		92
60)	1,1,1,2-Tetrachloroethane	9.75	131	76283	10.854	ppb		78
61)	m&p-Xylene	9.90	106	244365	19.371	ppb		93
62)	o-Xylene	10.29	106	125697	9.982	ppb		98
63)	Styrene	10.31	104	214063	10.506	ppb		91
65)	1,3-Dichloropropane	8.83	76	88427	10.213	ppb		100
66)	Dibromochloromethane	9.05	129	77135	10.480	ppb		99
67)	Chlorobenzene	9.66	112	177626	9.839	ppb		97
68)	Ethylbenzene	9.78	91	291901	10.130	ppb		99
69)	Bromoform	10.47	173	66857	10.237	ppb		99
71)	Isopropylbenzene	10.67	105	306750	10.039	ppb		99
72)	1,1,2,2-Tetrachloroethane	10.97	83	59061	9.330	ppb		94
73)	1,2,3-Trichloropropane	11.00	110	29534	11.120	ppb		86
74)	t-1,4-Dichloro-2-Butene	11.03	53	10484	10.272	ppb		94
75)	Bromobenzene	10.95	156	104366	10.534	ppb		99
76)	n-Propylbenzene	11.08	91	333467	10.338	ppb		93
77)	4-Ethyltoluene	11.20	105	298353	10.017	ppb		93
78)	2-Chlorotoluene	11.15	91	255358	11.068	ppb		91
79)	1,3,5-Trimethylbenzene	11.26	105	280827	10.584	ppb		99
80)	4-Chlorotoluene	11.26	91	254978	10.381	ppb		97
81)	Tert-Butylbenzene	11.58	119	241887	9.544	ppb		99
82)	1,2,4-Trimethylbenzene	11.63	105	294249	10.890	ppb		98
83)	Sec-Butylbenzene	11.80	105	282313	10.032	ppb		99
84)	p-Isopropyltoluene	11.95	119	271809	10.548	ppb		97
85)	Benzyl Chloride	12.12	91	51234	9.210	ppb		96
86)	1,3-DCB	11.90	146	182998	10.274	ppb		91
87)	1,4-DCB	11.99	146	188559	10.305	ppb		96
88)	n-Butylbenzene	12.36	91	176494	11.251	ppb		97
89)	1,2-DCB	12.35	146	178706	10.429	ppb		99
90)	Hexachloroethane	12.61	117	44175	10.471	ppb		92
91)	1,2-Dibromo-3-chloropropan	13.13	75	13996	10.286	ppb		89
92)	1,2,4-Trichlorobenzene	13.96	180	119942	11.752	ppb		98
93)	Hexachlorobutadiene	14.15	225	52047	11.734	ppb		90
94)	Naphthalene	14.20	128	265412	17.084	ppb		99
95)	1,2,3-Trichlorobenzene	14.44	180	104213	12.344	ppb		96

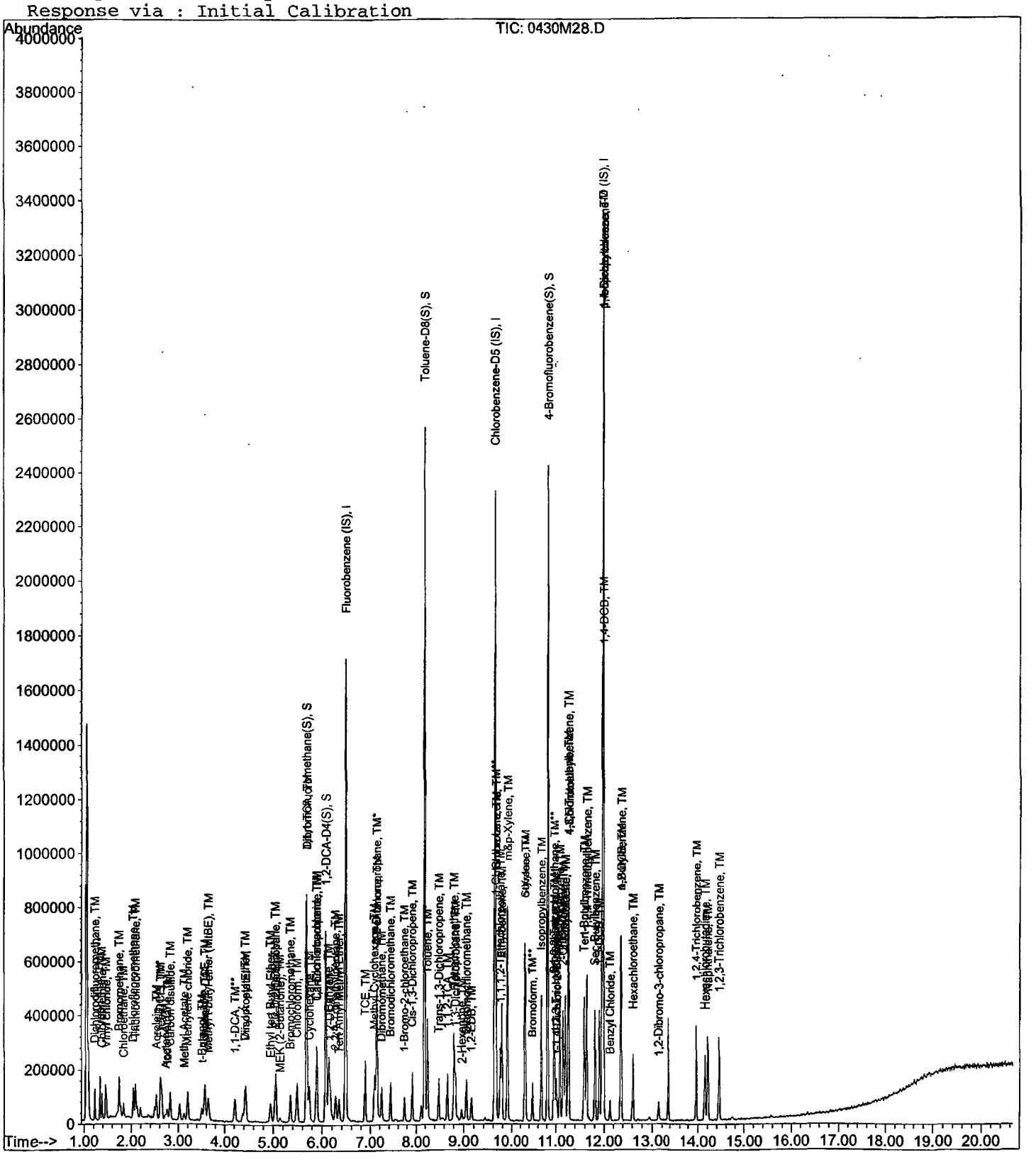
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M28.D Vial: 25
Acq On : 1 May 20 00:36 Operator: LP,DG,CMM
Sample : (SS)10ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 11:50 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Page 502 of 703

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 1 May 20 12:52
Matrix: water Instrument: Max
Initial Cal. Date: 04/30/20
Data File: 0501M05.D

		Compound	MEAN	CCRF	%D		%Drift	
1	I	Fluorobenzene (IS)	ISTD			I		
2	TM	Dichlorodifluoromethane	0.1092	0.1217	11	TM		
3	TML	Freon 114	0.0655	0.0898	37	TML	23	*NT
4	TM**L	Chloromethane	0.1007	0.0839	17	TM**L	7.6	
5	TM*	Vinyl chloride	0.0855	0.0850	0.56	TM*		
6	TML	Bromomethane	0.0513	0.0649	27	TML	43	*NT
7	TM	Chloroethane	0.0578	0.0497	14	TM		
8	TM	Dichlorofluoromethane	0.1402	0.1404	0.13	TM		
9	TM	Trichlorofluoromethane	0.1383	0.1713	24	TM		*NT
10	TM	Acrolein	0.0112	0.0105	6.8	TM		
11	TML	Acetone	0.0504	0.0434	14	TML	9.9	
12	TM	Freon-113	0.0299	0.0319	6.5	TM		
13	TM*	1,1-DCE	0.1188	0.1308	10	TM*		
14	TMQ	t-Butanol	0.0032	0.0032	1.9	TMQ	3.1	
15	TML	Methyl Acetate	0.0551	0.0488	11	TML	3.8	
16	TML	Iodomethane	0.0732	0.0443	39	TML	43	*NT
17	TM	Acrylonitrile	0.0274	0.0288	5.2	TM		
18	TML	Methylene chloride	0.0925	0.0793	14	TML	8.0	
19	TM	Carbon disulfide	0.2028	0.2072	2.2	TM		
20	TML	Methyl t-butyl ether (MtBE)	0.1882	0.1814	3.6	TML	7.9	
21	TM	Trans-1,2-DCE	0.0834	0.0919	10	TM		
22	TM	Diisopropyl Ether	0.2221	0.2109	5.0	TM		
23	TM**	1,1-DCA	0.1328	0.1438	8.3	TM**		
24	TML	Vinyl Acetate	0.2068	0.2446	18	TML	16	
25	TML	Ethyl tert Butyl Ether	0.1179	0.1193	1.2	TML	18	
26	TML	MEK (2-Butanone)	0.0337	0.0296	12	TML	1.2	
27	TM	Cis-1,2-DCE	0.0973	0.0944	3.0	TM		
28	TML	2,2-Dichloropropane	0.0642	0.0925	44	TML	15	
29	TM*	Chloroform	0.1670	0.1730	3.6	TM*		
30	TM	Bromochloromethane	0.0566	0.0604	6.7	TM		
31	S	Dibromofluoromethane(S)	0.2730	0.2743	0.50	S		
32	TM	1,1,1-TCA	0.1485	0.1719	16	TM		
33	TML	Cyclohexane	0.0633	0.0631	0.31	TML	11	
34	TM	1,1-Dichloropropene	0.1155	0.1204	4.2	TM		
35	TM	2,2,4-Trimethylpentane	0.1444	0.1520	5.3	TM		
36	S	1,2-DCA-D4(S)	0.3314	0.3700	12	S		
37	TM	Carbon Tetrachloride	0.1338	0.1632	22	TM		*NT
38	TMQ	Tert Amyl Methyl Ether	0.1108	0.1040	6.1	TMQ	33	*NT
39	TM	1,2-DCA	0.1505	0.1705	13	TM		
40	TM	Benzene	0.3416	0.3437	0.62	TM		
		Average			11.2			

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 1 May 20 12:52
Instrument: Max
Cal. Date: 04/30/20
Data File: 0501M05.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	TCE	0.1022	0.1034	1.2	TM	
42	TM	2-Pentanone	0.0568	0.0526	7.4	TM	
43	TM*L	1,2-Dichloropropane	0.0771	0.0715	7.3	TM*L	0.94
44	TM	Bromodichloromethane	0.1327	0.1488	12	TM	
45	TM	Methyl Cyclohexane	0.1101	0.1222	11	TM	
46	TM	Dibromomethane	0.0534	0.0558	4.5	TM	
47	TM	MIBK (methyl isobutyl ketone)	0.0000	0.6425	0.00	TM	
48	TM	1-Bromo-2-chloroethane	0.1008	0.1005	0.34	TM	
49	TM	2-Chloroethyl vinyl ether	0.0000	0.0002	0.00	TM	
50	TM	Cis-1,3-Dichloropropene	0.1392	0.1446	3.9	TM	
51	TM*	Toluene	0.4021	0.4080	1.5	TM*	
52	TM	Trans-1,3-Dichloropropene	0.1147	0.1278	11	TM	
53	TM	1,1,2-TCA	0.0672	0.0651	3.1	TM	
54	TML	2-Hexanone	0.0420	0.0460	9.4	TML	3.8
55	I	Chlorobenzene-D5 (IS)	ISTD			I	
56	S	Toluene-D8(S)	1.193	1.127	5.5	S	
57	TM	1,2-EDB	0.1059	0.1032	2.6	TM	
58	TML	Tetrachloroethene	0.0920	0.0967	5.2	TML	17
59	TML	1-Chlorohexane	0.1321	0.1345	1.8	TML	8.4
60	TM	1,1,1,2-Tetrachloroethane	0.1330	0.1473	11	TM	
61	TM	m&p-Xylene	0.2387	0.2481	3.9	TM	
62	TM	o-Xylene	0.2383	0.2511	5.4	TM	
63	TM	Styrene	0.3856	0.3986	3.4	TM	
64	S	4-Bromofluorobenzene(S)	0.5094	0.4878	4.2	S	
65	TM	1,3-Dichloropropane	0.1639	0.1682	2.6	TM	
66	TM	Dibromochloromethane	0.1393	0.1579	13	TM	
67	TM**	Chlorobenzene	0.3417	0.3491	2.2	TM**	
68	TM*	Ethylbenzene	0.5453	0.5592	2.5	TM*	
69	TM**	Bromoform	0.1236	0.1347	9.0	TM**	
70	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
71	TM	Isopropylbenzene	0.8713	0.9145	5.0	TM	
72	TM**	1,1,2,2-Tetrachloroethane	0.1805	0.1741	3.5	TM**	
73	TM	1,2,3-Trichloropropane	0.0757	0.0738	2.5	TM	
74	TML	t-1,4-Dichloro-2-Butene	0.0317	0.0308	2.8	TML	5.2
75	TM	Bromobenzene	0.2825	0.2950	4.4	TM	
76	TM	n-Propylbenzene	0.9197	0.8898	3.2	TM	
77	TM	4-Ethyltoluene	0.8493	0.8679	2.2	TM	
78	TM	2-Chlorotoluene	0.6579	0.6871	4.4	TM	
79	TM	1,3,5-Trimethylbenzene	0.7565	0.7780	2.8	TM	
80	TM	4-Chlorotoluene	0.7003	0.7075	1.0	TM	
		Average			4.7		

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 1 May 20 12:52
Instrument: Max
Cal. Date: 04/30/20
Data File: 0501M05.D

		Compound	MEAN	CCRF	%D		%Drift	
81	TM	Tert-Butylbenzene	0.7227	0.7604	5.2	TM		
82	TM	1,2,4-Trimethylbenzene	0.7704	0.7727	0.30	TM		
83	TM	Sec-Butylbenzene	0.8024	0.8162	1.7	TM		
84	TM	p-Isopropyltoluene	0.7347	0.7644	4.0	TM		
85	TML	Benzyl Chloride	0.1543	0.1618	4.9	TML	1.2	
86	TM	1,3-DCB	0.5079	0.5192	2.2	TM		
87	TM	1,4-DCB	0.5217	0.5312	1.8	TM		
88	TM	n-Butylbenzene	0.4473	0.4453	0.44	TM		
89	TM	1,2-DCB	0.4886	0.5039	3.1	TM		
90	TM	Hexachloroethane	0.1203	0.1192	0.91	TM		
91	TM	1,2-Dibromo-3-chloropropane	0.0388	0.0365	5.8	TM		
92	TML	1,2,4-Trichlorobenzene	0.2601	0.2555	1.7	TML	9.5	
93	TM	Hexachlorobutadiene	0.1265	0.1456	15	TM		
94	TML	Naphthalene	0.3907	0.3112	20	TML	22	*NT
95	TML	1,2,3-Trichlorobenzene	0.2061	0.1805	12	TML	19	
96								
97								
98								
99								
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
		Average			5.3			

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M05.D Vial: 2
Acq On : 1 May 20 12:52 Operator: LP,DG,CMM
Sample : 200501A CCV 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1283449	25.000	ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1118462	25.000	ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	767274	25.000	ppb		0.00
System Monitoring Compounds							
31) Dibromofluoromethane(S)	5.68	111	352086	25.125	ppb		0.00
Spiked Amount 25.000			Recovery = 100.500%				
36) 1,2-DCA-D4(S)	6.07	65	474836	27.911	ppb		0.00
Spiked Amount 25.000			Recovery = 111.644%				
56) Toluene-D8(S)	8.18	98	1260550	23.623	ppb		0.00
Spiked Amount 25.000			Recovery = 94.492%				
64) 4-Bromofluorobenzene(S)	10.81	95	545615	23.941	ppb		0.00
Spiked Amount 25.000			Recovery = 95.764%				
Target Compounds							Qvalue
2) Dichlorodifluoromethane	1.23	85	62473	11.148	ppb		99
3) Freon 114	1.33	85	46093	12.304	ppb		95
4) Chloromethane	1.37	50	43064	9.245	ppb		97
5) Vinyl chloride	1.47	62	43636	9.944	ppb		96
6) Bromomethane	1.74	94	33296	14.297	ppb		98
7) Chloroethane	1.84	64	25537	8.611	ppb		98
8) Dichlorofluoromethane	2.04	67	72068	10.013	ppb		92
9) Trichlorofluoromethane	2.08	101	87921	12.387	ppb		96
10) Acrolein	2.52	56	67088	116.461	ppb		91
11) Acetone	2.72	43	22277	10.995	ppb		92
12) Freon-113	2.64	101	16369	10.654	ppb	#	78
13) 1,1-DCE	2.61	61	67170	11.014	ppb		96
14) t-Butanol	3.51	59	20224	121.179	ppb	#	78
15) Methyl Acetate	3.12	43	25042	9.623	ppb		100
16) Iodomethane	2.76	142	22765	5.746	ppb		89
17) Acrylonitrile	3.55	53	14793	10.516	ppb	#	81
18) Methylene chloride	3.20	84	40696	9.197	ppb	#	75
19) Carbon disulfide	2.82	76	106392	10.220	ppb		95
20) Methyl t-butyl ether (MtBE	3.64	73	93151	10.790	ppb		96
21) Trans-1,2-DCE	3.57	96	47162	11.009	ppb		89
22) Diisopropyl Ether	4.43	45	108287	9.495	ppb		96
23) 1,1-DCA	4.20	63	73849	10.830	ppb	#	91
24) Vinyl Acetate	4.36	43	125577	11.566	ppb	#	86
25) Ethyl tert Butyl Ether	4.94	59	61267	11.793	ppb		92
26) MEK (2-Butanone)	5.14	43	15171	9.884	ppb		92
27) Cis-1,2-DCE	5.05	96	48459	9.699	ppb		90
28) 2,2-Dichloropropane	5.04	77	47488	11.459	ppb	#	85
29) Chloroform	5.49	83	88828	10.358	ppb		89
30) Bromochloromethane	5.35	128	31010	10.670	ppb		86
32) 1,1,1-TCA	5.68	97	88265	11.578	ppb		92
33) Cyclohexane	5.73	41	32415	11.083	ppb	#	72
34) 1,1-Dichloropropene	5.89	75	61786	10.421	ppb		97
35) 2,2,4-Trimethylpentane	6.27	57	78016	10.527	ppb		92
37) Carbon Tetrachloride	5.88	117	83785	12.196	ppb		92
38) Tert Amyl Methyl Ether	6.34	73	53400	13.283	ppb	#	79
39) 1,2-DCA	6.16	62	87508	11.325	ppb		96
40) Benzene	6.13	78	176473	10.062	ppb		99
41) TCE	6.88	95	53105	10.117	ppb		95
42) 2-Pentanone	7.13	43	337566	115.778	ppb		97

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M05.D Vial: 2
Acq On : 1 May 20 12:52 Operator: LP,DG,CMM
Sample : 200501A CCV 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	36718	9.906 ppb		99
44)	Bromodichloromethane	7.43	83	76370	11.213 ppb		99
45)	Methyl Cyclohexane	7.08	83	62720	11.094 ppb		96
46)	Dibromomethane	7.24	93	28633	10.453 ppb		93
48)	1-Bromo-2-chloroethane	7.74	63	51594	9.966 ppb		86
50)	Cis-1,3-Dichloropropene	7.91	75	74238	10.392 ppb		91
51)	Toluene	8.24	91	209453	10.146 ppb		94
52)	Trans-1,3-Dichloropropene	8.49	75	65623	11.147 ppb	#	84
53)	1,1,2-TCA	8.67	83	33431	9.687 ppb		90
54)	2-Hexanone	8.96	43	23621	10.384 ppb		97
57)	1,2-EDB	9.15	107	46150	9.742 ppb		94
58)	Tetrachloroethene	8.80	164	43280	11.737 ppb		97
59)	1-Chlorohexane	9.66	91	60159	10.843 ppb		93
60)	1,1,1,2-Tetrachloroethane	9.75	131	65915	11.077 ppb		74
61)	m&p-Xylene	9.90	106	221978	20.783 ppb		97
62)	o-Xylene	10.29	106	112331	10.536 ppb		89
63)	Styrene	10.31	104	178311	10.336 ppb		91
65)	1,3-Dichloropropane	8.83	76	75251	10.265 ppb		89
66)	Dibromochloromethane	9.05	129	70651	11.337 ppb		88
67)	Chlorobenzene	9.66	112	156196	10.219 ppb		95
68)	Ethylbenzene	9.78	91	250169	10.254 ppb		97
69)	Bromoform	10.47	173	60256	10.897 ppb		95
71)	Isopropylbenzene	10.67	105	280679	10.497 ppb		98
72)	1,1,2,2-Tetrachloroethane	10.96	83	53428	9.645 ppb		96
73)	1,2,3-Trichloropropane	11.00	110	22665	9.752 ppb		94
74)	t-1,4-Dichloro-2-Butene	11.02	53	9450	10.521 ppb		81
75)	Bromobenzene	10.95	156	90553	10.445 ppb		98
76)	n-Propylbenzene	11.08	91	273095	9.675 ppb		95
77)	4-Ethyltoluene	11.20	105	266378	10.220 ppb		98
78)	2-Chlorotoluene	11.15	91	210872	10.444 ppb		98
79)	1,3,5-Trimethylbenzene	11.26	105	238783	10.284 ppb		94
80)	4-Chlorotoluene	11.26	91	217138	10.102 ppb		94
81)	Tert-Butylbenzene	11.58	119	233361	10.522 ppb		99
82)	1,2,4-Trimethylbenzene	11.63	105	237148	10.030 ppb		93
83)	Sec-Butylbenzene	11.80	105	250503	10.172 ppb		96
84)	p-Isopropyltoluene	11.95	119	234598	10.404 ppb		92
85)	Benzyl Chloride	12.12	91	49653	9.879 ppb		95
86)	1,3-DCB	11.90	146	159342	10.222 ppb		94
87)	1,4-DCB	11.99	146	163015	10.181 ppb		94
88)	n-Butylbenzene	12.36	91	136667	9.956 ppb		97
89)	1,2-DCB	12.35	146	154637	10.312 ppb		98
90)	Hexachloroethane	12.61	117	36582	9.909 ppb	#	76
91)	1,2-Dibromo-3-chloropropan	13.13	75	11212	9.416 ppb	#	76
92)	1,2,4-Trichlorobenzene	13.96	180	78430	9.052 ppb		85
93)	Hexachlorobutadiene	14.15	225	44673	11.509 ppb		86
94)	Naphthalene	14.20	128	95516	7.820 ppb		97
95)	1,2,3-Trichlorobenzene	14.44	180	55408	8.059 ppb		91

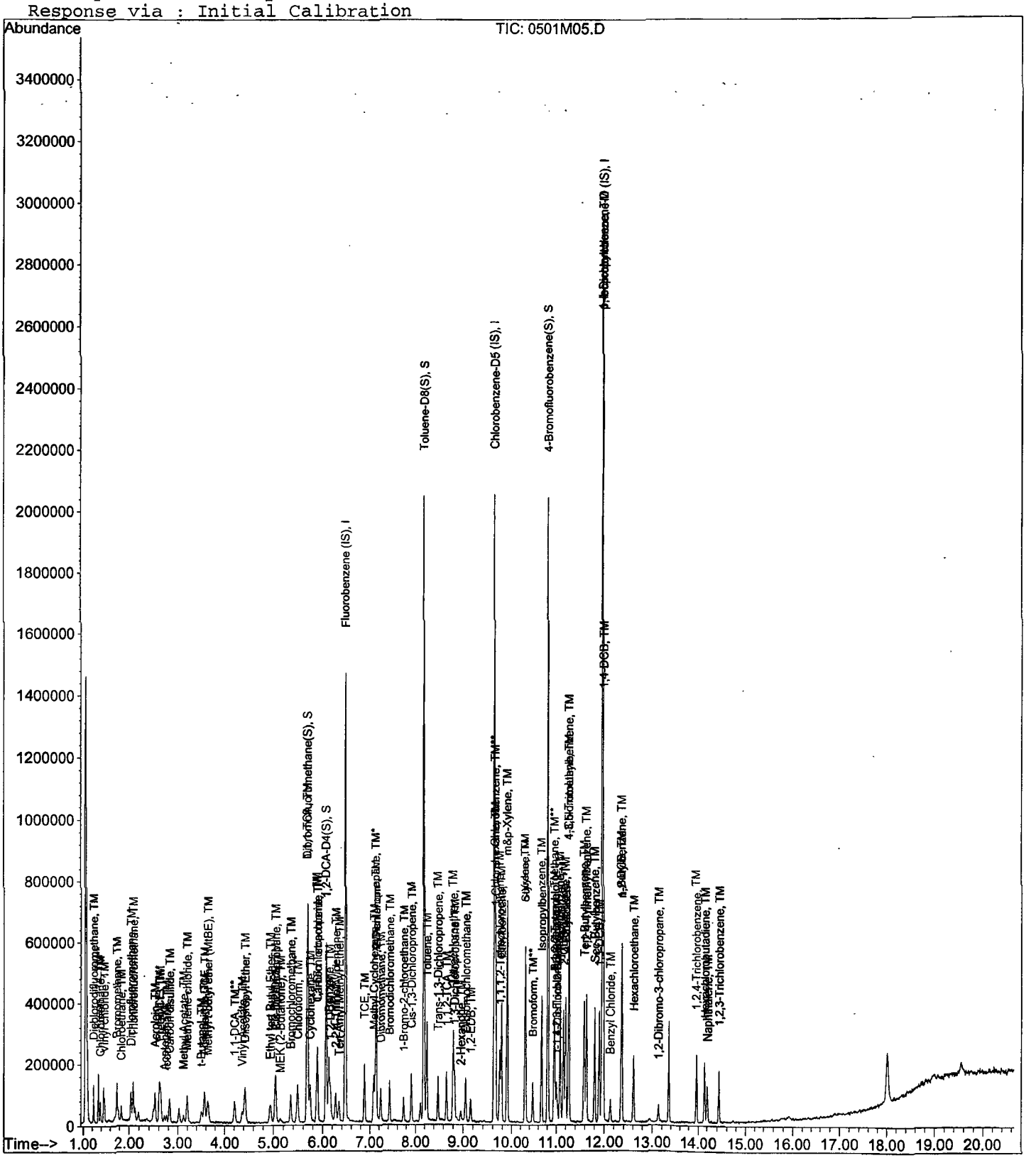
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M05.D Vial: 2
Acq On : 1 May 20 12:52 Operator: LP,DG,CMM
Sample : 200501A CCV 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 1 May 20 18:11
Matrix: water Instrument: Max
Initial Cal. Date: 04/30/20
Data File: 0501M16.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	TM	Dichlorodifluoromethane	0.1092	0.1133	3.8	TM	
3	TML	Freon 114	0.0655	0.0736	12	TML	1.7
4	TM**L	Chloromethane	0.1007	0.0896	11	TM**L	0.80
5	TM*	Vinyl chloride	0.0855	0.0820	4.1	TM*	
6	TML	Bromomethane	0.0513	0.0653	27	TML	44
7	TM	Chloroethane	0.0578	0.0555	3.9	TM	
8	TM	Dichlorofluoromethane	0.1402	0.1368	2.4	TM	
9	TM	Trichlorofluoromethane	0.1383	0.1667	21	TM	
10	TM	Acrolein	0.0112	0.0104	7.2	TM	
11	TML	Acetone	0.0504	0.0385	24	TML	8.4
12	TM	Freon-113	0.0299	0.0301	0.44	TM	
13	TM*	1,1-DCE	0.1188	0.1233	3.8	TM*	
14	TMQ	t-Butanol	0.0032	0.0030	7.0	TMQ	5.5
15	TML	Methyl Acetate	0.0551	0.0464	16	TML	8.5
16	TML	Iodomethane	0.0732	0.0473	35	TML	40
17	TM	Acrylonitrile	0.0274	0.0231	16	TM	
18	TML	Methylene chloride	0.0925	0.0858	7.2	TML	0.45
19	TM	Carbon disulfide	0.2028	0.1914	5.6	TM	
20	TML	Methyl t-butyl ether (MtBE)	0.1882	0.1825	3.0	TML	8.5
21	TM	Trans-1,2-DCE	0.0834	0.0883	5.8	TM	
22	TM	Diisopropyl Ether	0.2221	0.2042	8.1	TM	
23	TM**	1,1-DCA	0.1328	0.1378	3.7	TM**	
24	TML	Vinyl Acetate	0.2068	0.2324	12	TML	9.5
25	TML	Ethyl tert Butyl Ether	0.1179	0.1156	1.9	TML	14
26	TML	MEK (2-Butanone)	0.0337	0.0319	5.3	TML	6.3
27	TM	Cis-1,2-DCE	0.0973	0.1056	8.5	TM	
28	TML	2,2-Dichloropropane	0.0642	0.0854	33	TML	7.3
29	TM*	Chloroform	0.1670	0.1772	6.1	TM*	
30	TM	Bromochloromethane	0.0566	0.0571	0.86	TM	
31	S	Dibromofluoromethane(S)	0.2730	0.2698	1.1	S	
32	TM	1,1,1-TCA	0.1485	0.1843	24	TM	
33	TML	Cyclohexane	0.0633	0.0542	14	TML	5.5
34	TM	1,1-Dichloropropene	0.1155	0.1190	3.0	TM	
35	TM	2,2,4-Trimethylpentane	0.1444	0.1281	11	TM	
36	S	1,2-DCA-D4(S)	0.3314	0.3623	9.3	S	
37	TM	Carbon Tetrachloride	0.1338	0.1594	19	TM	
38	TMQ	Tert Amyl Methyl Ether	0.1108	0.1110	0.21	TMQ	43
39	TM	1,2-DCA	0.1505	0.1775	18	TM	
40	TM	Benzene	0.3416	0.3347	2.0	TM	
		Average			10.2		

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 1 May 20 18:11
Instrument: Max
Cal. Date: 04/30/20
Data File: 0501M16.D

		Compound	MEAN	CCRF	%D		%Drift
41	TM	TCE	0.1022	0.0934	8.7	TM	
42	TM	2-Pentanone	0.0568	0.0518	8.7	TM	
43	TM*L	1,2-Dichloropropane	0.0771	0.0739	4.2	TM*L	2.5
44	TM	Bromodichloromethane	0.1327	0.1462	10	TM	
45	TM	Methyl Cyclohexane	0.1101	0.1040	5.5	TM	
46	TM	Dibromomethane	0.0534	0.0586	9.8	TM	
47	TM	MIBK (methyl isobutyl ketone)	0.0000	0.6284	0.00	TM	
48	TM	1-Bromo-2-chloroethane	0.1008	0.0958	5.0	TM	
49	TM	2-Chloroethyl vinyl ether	0.0000	0.0001	0.00	TM	
50	TM	Cis-1,3-Dichloropropene	0.1392	0.1401	0.69	TM	
51	TM*	Toluene	0.4021	0.4093	1.8	TM*	
52	TM	Trans-1,3-Dichloropropene	0.1147	0.1256	9.5	TM	
53	TM	1,1,2-TCA	0.0672	0.0683	1.6	TM	
54	TML	2-Hexanone	0.0420	0.0349	17	TML	19
55	I	Chlorobenzene-D5 (IS)	ISTD			I	
56	S	Toluene-D8(S)	1.193	1.108	7.1	S	
57	TM	1,2-EDB	0.1059	0.1071	1.2	TM	
58	TML	Tetrachloroethene	0.0920	0.0861	6.4	TML	3.1
59	TML	1-Chlorohexane	0.1321	0.1261	4.6	TML	1.3
60	TM	1,1,1,2-Tetrachloroethane	0.1330	0.1424	7.1	TM	
61	TM	m&p-Xylene	0.2387	0.2369	0.77	TM	
62	TM	o-Xylene	0.2383	0.2256	5.3	TM	
63	TM	Styrene	0.3856	0.3967	2.9	TM	
64	S	4-Bromofluorobenzene(S)	0.5094	0.4772	6.3	S	
65	TM	1,3-Dichloropropane	0.1639	0.1584	3.3	TM	
66	TM	Dibromochloromethane	0.1393	0.1471	5.6	TM	
67	TM**	Chlorobenzene	0.3417	0.3493	2.2	TM**	
68	TM*	Ethylbenzene	0.5453	0.5311	2.6	TM*	
69	TM**	Bromoform	0.1236	0.1332	7.8	TM**	
70	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
71	TM	Isopropylbenzene	0.8713	0.8628	0.97	TM	
72	TM**	1,1,2,2-Tetrachloroethane	0.1805	0.1739	3.7	TM**	
73	TM	1,2,3-Trichloropropane	0.0757	0.0818	8.0	TM	
74	TML	t-1,4-Dichloro-2-Butene	0.0317	0.0274	14	TML	4.2
75	TM	Bromobenzene	0.2825	0.3063	8.4	TM	
76	TM	n-Propylbenzene	0.9197	0.8694	5.5	TM	
77	TM	4-Ethyltoluene	0.8493	0.8289	2.4	TM	
78	TM	2-Chlorotoluene	0.6579	0.6586	0.12	TM	
79	TM	1,3,5-Trimethylbenzene	0.7565	0.7454	1.5	TM	
80	TM	4-Chlorotoluene	0.7003	0.6995	0.12	TM	
		Average			5.0		

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Date Analyzed: 1 May 20 18:11
Matrix: water Instrument: Max
Cal. Date: 04/30/20
Data File: 0501M16.D

		Compound	MEAN	CCRF	%D		%Drift
81	TM	Tert-Butylbenzene	0.7227	0.6885	4.7	TM	
82	TM	1,2,4-Trimethylbenzene	0.7704	0.7623	1.1	TM	
83	TM	Sec-Butylbenzene	0.8024	0.7626	5.0	TM	
84	TM	p-Isopropyltoluene	0.7347	0.7523	2.4	TM	
85	TML	Benzyl Chloride	0.1543	0.1587	2.9	TML	2.5
86	TM	1,3-DCB	0.5079	0.5021	1.1	TM	
87	TM	1,4-DCB	0.5217	0.4960	4.9	TM	
88	TM	n-Butylbenzene	0.4473	0.4206	6.0	TM	
89	TM	1,2-DCB	0.4886	0.4760	2.6	TM	
90	TM	Hexachloroethane	0.1203	0.1190	1.1	TM	
91	TM	1,2-Dibromo-3-chloropropane	0.0388	0.0404	4.2	TM	
92	TML	1,2,4-Trichlorobenzene	0.2601	0.2491	4.2	TML	11
93	TM	Hexachlorobutadiene	0.1265	0.1357	7.3	TM	
94	TML	Naphthalene	0.3907	0.2889	26	TML	26
95	TML	1,2,3-Trichlorobenzene	0.2061	0.1763	14	TML	21
96							
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
		Average			5.8		

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M16.D Vial: 13
Acq On : 1 May 20 18:11 Operator: LP,DG,CMM
Sample : Ending CCV 10ug/L 5/1/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1197191	25.000 ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1068265	25.000 ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	727933	25.000 ppb		0.00
System Monitoring Compounds						
31) Dibromofluoromethane(S)	5.68	111	323040	24.713 ppb		0.00
Spiked Amount 25.000			Recovery =	98.852%		
36) 1,2-DCA-D4(S)	6.07	65	433743	27.333 ppb		0.00
Spiked Amount 25.000			Recovery =	109.332%		
56) Toluene-D8(S)	8.18	98	1184096	23.233 ppb		0.00
Spiked Amount 25.000			Recovery =	92.932%		
64) 4-Bromofluorobenzene(S)	10.81	95	509741	23.418 ppb		0.00
Spiked Amount 25.000			Recovery =	93.672%		
Target Compounds						Qvalue
2) Dichlorodifluoromethane	1.23	85	54255	10.379 ppb		99
3) Freon 114	1.34	85	35224	10.172 ppb		97
4) Chloromethane	1.37	50	42891	9.920 ppb		92
5) Vinyl chloride	1.47	62	39255	9.590 ppb		89
6) Bromomethane	1.74	94	31264	14.397 ppb		94
7) Chloroethane	1.84	64	26587	9.611 ppb		92
8) Dichlorofluoromethane	2.04	67	65500	9.756 ppb		97
9) Trichlorofluoromethane	2.09	101	79834	12.058 ppb		89
10) Acrolein	2.53	56	62311	115.962 ppb		96
11) Acetone	2.71	43	18441	9.164 ppb		93
12) Freon-113	2.64	101	14394	10.044 ppb	#	79
13) 1,1-DCE	2.61	61	59068	10.383 ppb		93
14) t-Butanol	3.51	59	17883	118.095 ppb		94
15) Methyl Acetate	3.12	43	22225	9.148 ppb		99
16) Iodomethane	2.76	142	22671	6.020 ppb		97
17) Acrylonitrile	3.55	53	11070	8.436 ppb	#	53
18) Methylene chloride	3.20	84	41087	10.045 ppb		85
19) Carbon disulfide	2.82	76	91662	9.440 ppb		98
20) Methyl t-butyl ether (MtBE	3.65	73	87414	10.848 ppb	#	90
21) Trans-1,2-DCE	3.58	96	42287	10.583 ppb		85
22) Diisopropyl Ether	4.43	45	97795	9.193 ppb		96
23) 1,1-DCA	4.21	63	65965	10.371 ppb	#	95
24) Vinyl Acetate	4.37	43	111293	10.949 ppb	#	76
25) Ethyl tert Butyl Ether	4.95	59	55367	11.437 ppb		100
26) MEK (2-Butanone)	5.14	43	15276	10.629 ppb	#	78
27) Cis-1,2-DCE	5.05	96	50574	10.851 ppb		88
28) 2,2-Dichloropropane	5.04	77	40909	10.726 ppb		99
29) Chloroform	5.49	83	84861	10.608 ppb		95
30) Bromochloromethane	5.35	128	27341	10.086 ppb		88
32) 1,1,1-TCA	5.68	97	88265	12.413 ppb	#	84
33) Cyclohexane	5.74	41	25946	9.445 ppb		88
34) 1,1-Dichloropropene	5.89	75	56982	10.304 ppb		95
35) 2,2,4-Trimethylpentane	6.27	57	61341	8.873 ppb		90
37) Carbon Tetrachloride	5.88	117	76325	11.910 ppb		99
38) Tert Amyl Methyl Ether	6.34	73	53152	14.300 ppb	#	88
39) 1,2-DCA	6.16	62	85000	11.793 ppb		100
40) Benzene	6.13	78	160301	9.798 ppb		98
41) TCE	6.88	95	44706	9.131 ppb		94
42) 2-Pentanone	7.14	43	310260	114.080 ppb		99

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M16.D Vial: 13
Acq On : 1 May 20 18:11 Operator: LP,DG,CMM
Sample : Ending CCV 10ug/L 5/1/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	35396	10.250	ppb		98
44)	Bromodichloromethane	7.43	83	69997	11.018	ppb		99
45)	Methyl Cyclohexane	7.08	83	49809	9.445	ppb		95
46)	Dibromomethane	7.24	93	28051	10.978	ppb		94
48)	1-Bromo-2-chloroethane	7.74	63	45866	9.498	ppb		97
50)	Cis-1,3-Dichloropropene	7.91	75	67096	10.069	ppb		97
51)	Toluene	8.25	91	195994	10.178	ppb		97
52)	Trans-1,3-Dichloropropene	8.49	75	60124	10.949	ppb	#	84
53)	1,1,2-TCA	8.66	83	32696	10.157	ppb		92
54)	2-Hexanone	8.96	43	16730	8.069	ppb	#	83
57)	1,2-EDB	9.15	107	45769	10.116	ppb		95
58)	Tetrachloroethene	8.80	164	36808	10.312	ppb		92
59)	1-Chlorohexane	9.66	91	53879	10.131	ppb		97
60)	1,1,1,2-Tetrachloroethane	9.75	131	60859	10.708	ppb		88
61)	m&p-Xylene	9.90	106	202459	19.846	ppb		99
62)	o-Xylene	10.29	106	96418	9.468	ppb		100
63)	Styrene	10.31	104	169500	10.287	ppb		94
65)	1,3-Dichloropropane	8.83	76	67696	9.668	ppb	#	82
66)	Dibromochloromethane	9.05	129	62847	10.559	ppb		99
67)	Chlorobenzene	9.66	112	149242	10.222	ppb		96
68)	Ethylbenzene	9.78	91	226961	9.740	ppb		91
69)	Bromoform	10.47	173	56928	10.779	ppb		96
71)	Isopropylbenzene	10.67	105	251229	9.903	ppb		95
72)	1,1,2,2-Tetrachloroethane	10.97	83	50634	9.635	ppb		96
73)	1,2,3-Trichloropropane	11.00	110	23805	10.796	ppb		91
74)	t-1,4-Dichloro-2-Butene	11.02	53	7979	9.580	ppb	#	33
75)	Bromobenzene	10.95	156	89178	10.842	ppb		98
76)	n-Propylbenzene	11.08	91	253155	9.454	ppb		100
77)	4-Ethyltoluene	11.20	105	241362	9.761	ppb		99
78)	2-Chlorotoluene	11.15	91	191775	10.012	ppb		98
79)	1,3,5-Trimethylbenzene	11.26	105	217036	9.853	ppb		95
80)	4-Chlorotoluene	11.26	91	203677	9.988	ppb		97
81)	Tert-Butylbenzene	11.58	119	200479	9.528	ppb		97
82)	1,2,4-Trimethylbenzene	11.63	105	221954	9.894	ppb		94
83)	Sec-Butylbenzene	11.80	105	222040	9.504	ppb		98
84)	p-Isopropyltoluene	11.95	119	219058	10.240	ppb		97
85)	Benzyl Chloride	12.12	91	46218	9.749	ppb	#	95
86)	1,3-DCB	11.90	146	146190	9.885	ppb		90
87)	1,4-DCB	11.99	146	144425	9.507	ppb		94
88)	n-Butylbenzene	12.36	91	122471	9.404	ppb		99
89)	1,2-DCB	12.35	146	138605	9.743	ppb		93
90)	Hexachloroethane	12.60	117	34642	9.891	ppb		90
91)	1,2-Dibromo-3-chloropropan	13.12	75	11776	10.424	ppb		90
92)	1,2,4-Trichlorobenzene	13.96	180	72538	8.852	ppb		82
93)	Hexachlorobutadiene	14.15	225	39523	10.733	ppb		87
94)	Naphthalene	14.20	128	84108	7.355	ppb	#	92
95)	1,2,3-Trichlorobenzene	14.44	180	51321	7.901	ppb		94

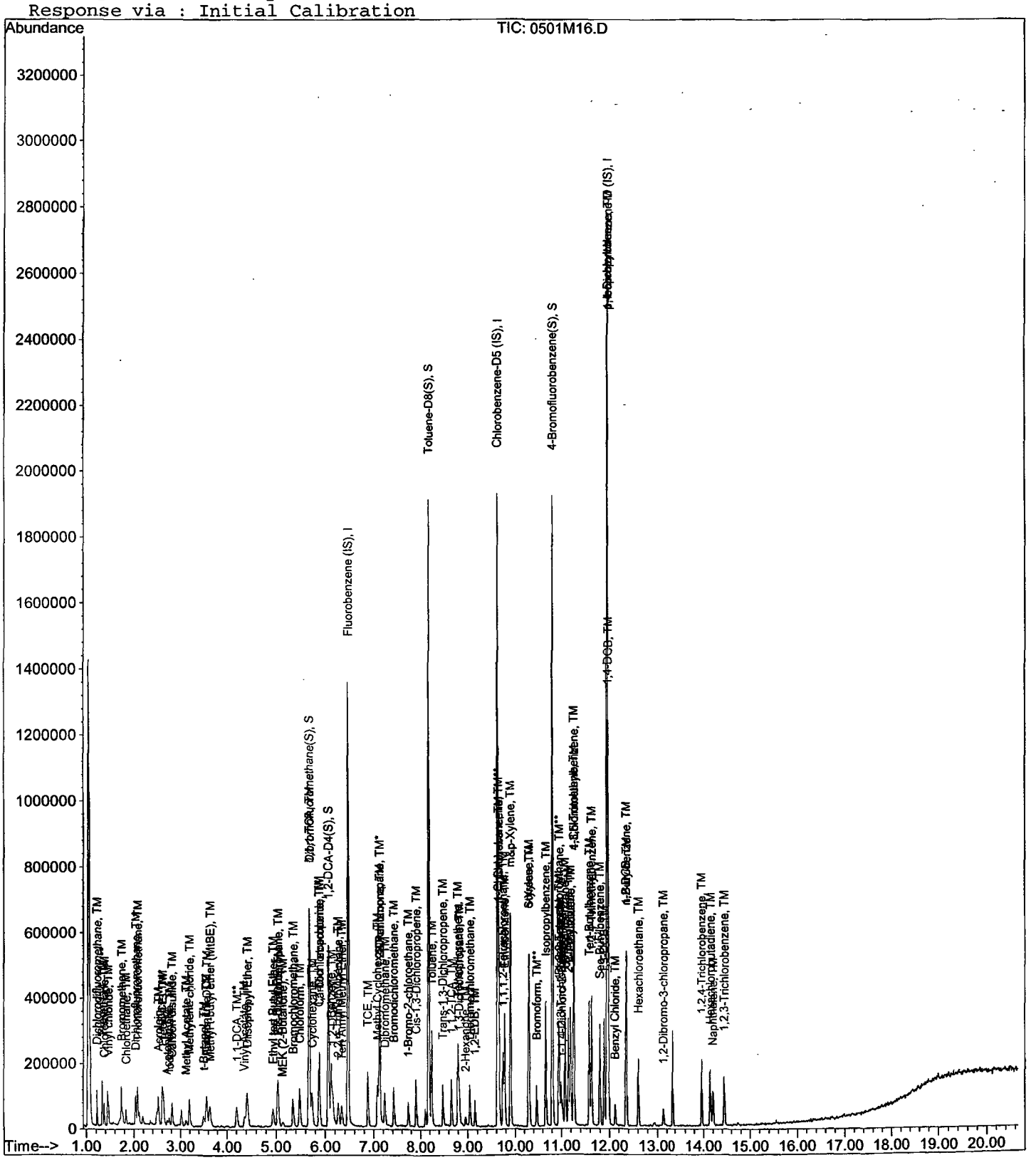
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M16.D Vial: 13
Acq On : 1 May 20 18:11 Operator: LP,DG,CMM
Sample : Ending CCV 10ug/L 5/1/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M12.D Vial: 9
Acq On : 1 May 20 16:15 Operator: LP,DG,CMM
Sample : BA10503W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:27 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1250763	25.000 ppb	0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1099445	25.000 ppb	0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	733427	25.000 ppb	0.00
System Monitoring Compounds					
31) Dibromofluoromethane(S)	5.68	111	337368	24.704 ppb	0.00
Spiked Amount 25.000			Recovery =	98.816%	
36) 1,2-DCA-D4(S)	6.07	65	436203	26.310 ppb	0.00
Spiked Amount 25.000			Recovery =	105.240%	
56) Toluene-D8(S)	8.18	98	1217639	23.214 ppb	0.00
Spiked Amount 25.000			Recovery =	92.856%	
64) 4-Bromofluorobenzene(S)	10.81	95	513969	22.942 ppb	0.00
Spiked Amount 25.000			Recovery =	91.768%	

Target Compounds Qvalue

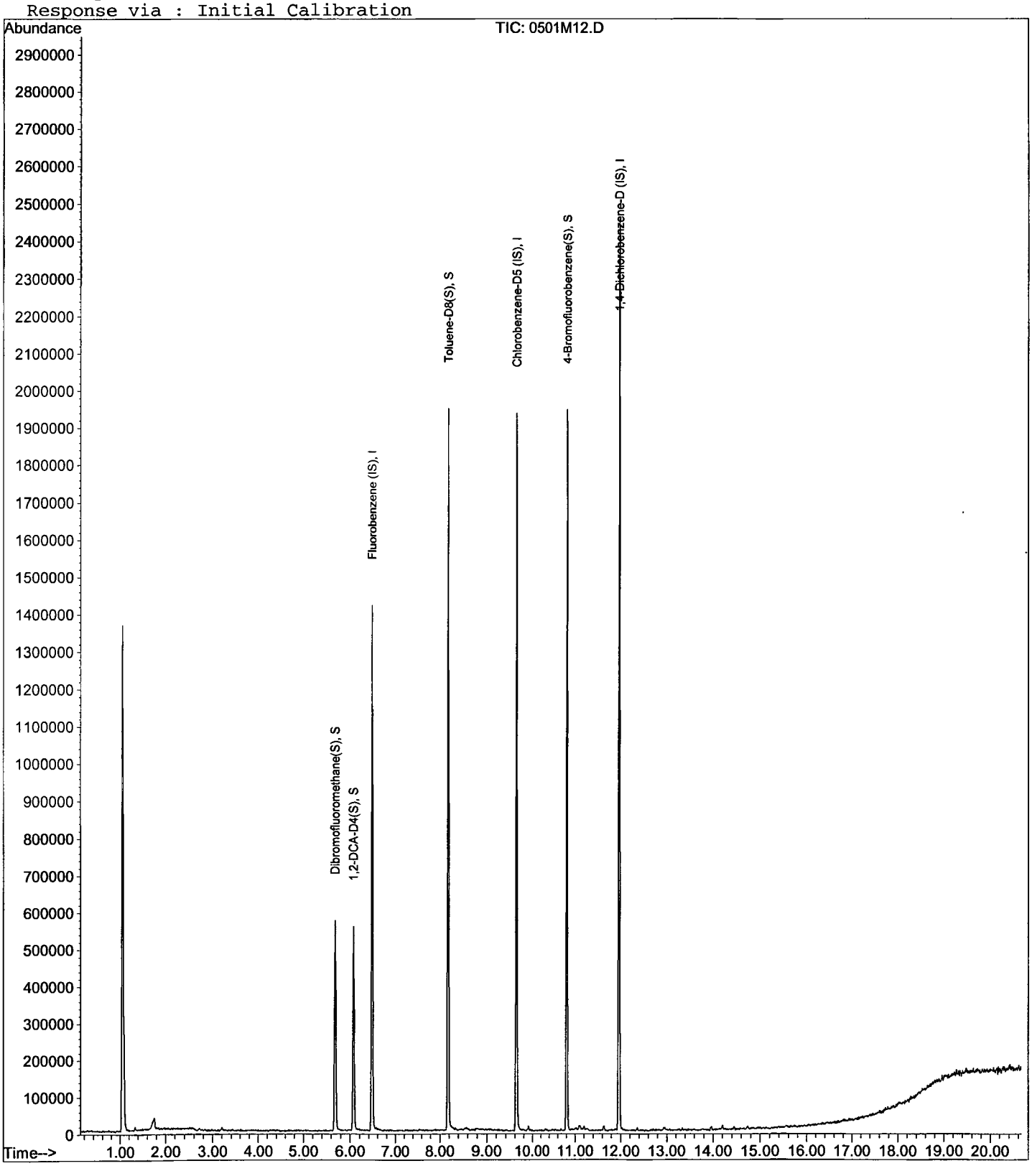
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M12.D Vial: 9
Acq On : 1 May 20 16:15 Operator: LP,DG,CMM
Sample : BA10503W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:27 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M13.D Vial: 10
Acq On : 1 May 20 16:44 Operator: LP,DG,CMM
Sample : BA10504W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:28 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1225634	25.000 ppb	0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1089669	25.000 ppb	0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	715154	25.000 ppb	0.00
System Monitoring Compounds					
31) Dibromofluoromethane(S)	5.68	111	339974	25.405 ppb	0.00
Spiked Amount 25.000			Recovery = 101.620%		
36) 1,2-DCA-D4(S)	6.07	65	442623	27.245 ppb	0.00
Spiked Amount 25.000			Recovery = 108.980%		
56) Toluene-D8(S)	8.18	98	1216421	23.399 ppb	0.00
Spiked Amount 25.000			Recovery = 93.596%		
64) 4-Bromofluorobenzene(S)	10.81	95	510963	23.013 ppb	0.00
Spiked Amount 25.000			Recovery = 92.052%		

Target Compounds Qvalue

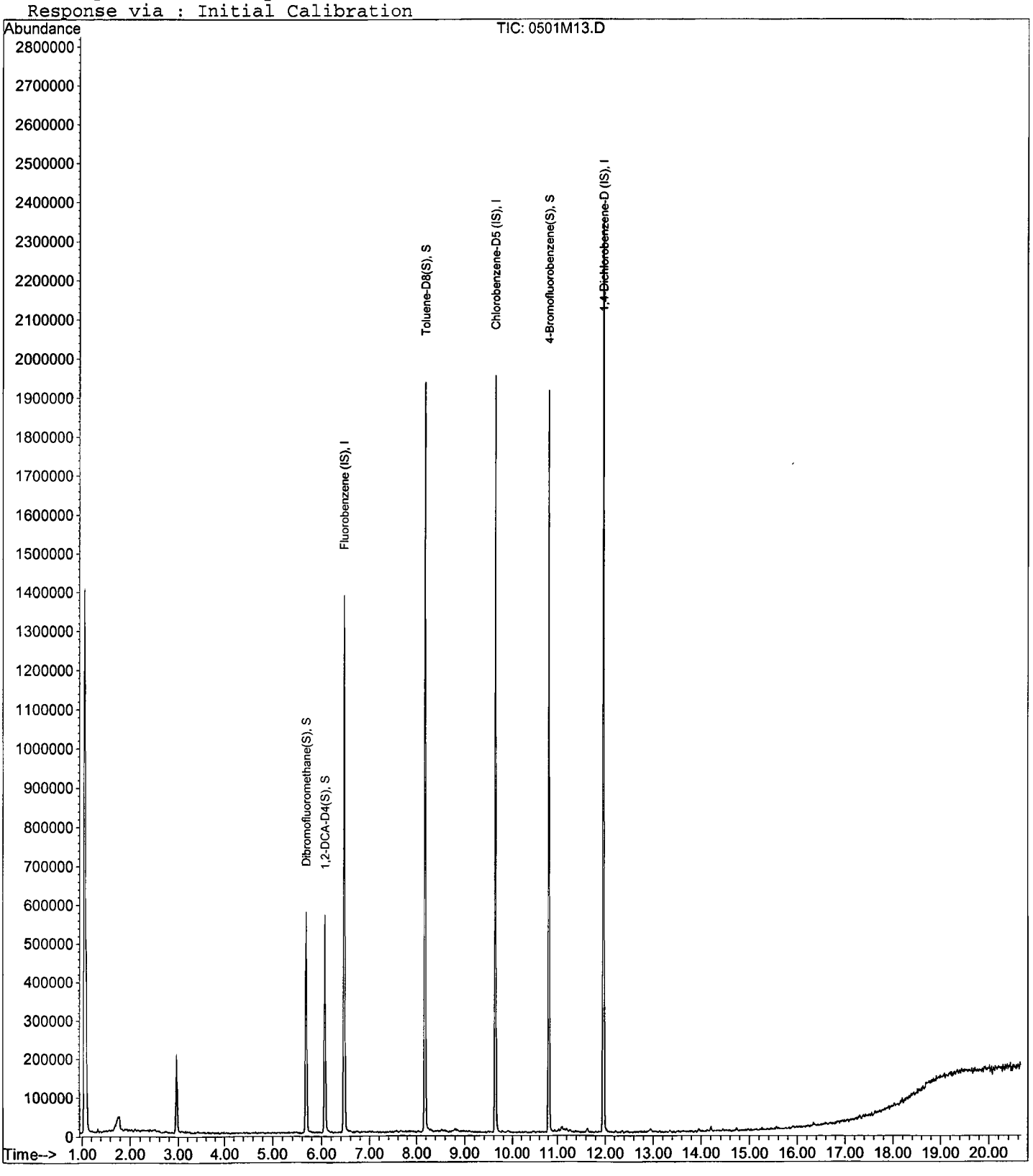
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M13.D Vial: 10
Acq On : 1 May 20 16:44 Operator: LP,DG,CMM
Sample : BA10504W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:28 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M14.D Vial: 11
Acq On : 1 May 20 17:13 Operator: LP,DG,CMM
Sample : BA10505W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:28 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1217216	25.000 ppb	0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1078879	25.000 ppb	0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	718215	25.000 ppb	0.00
System Monitoring Compounds					
31) Dibromofluoromethane(S)	5.68	111	332664	25.031 ppb	0.00
Spiked Amount 25.000			Recovery = 100.124%		
36) 1,2-DCA-D4(S)	6.07	65	434998	26.961 ppb	0.00
Spiked Amount 25.000			Recovery = 107.844%		
56) Toluene-D8(S)	8.18	98	1173053	22.790 ppb	0.00
Spiked Amount 25.000			Recovery = 91.160%		
64) 4-Bromofluorobenzene(S)	10.81	95	509322	23.168 ppb	0.00
Spiked Amount 25.000			Recovery = 92.672%		

Target Compounds Qvalue

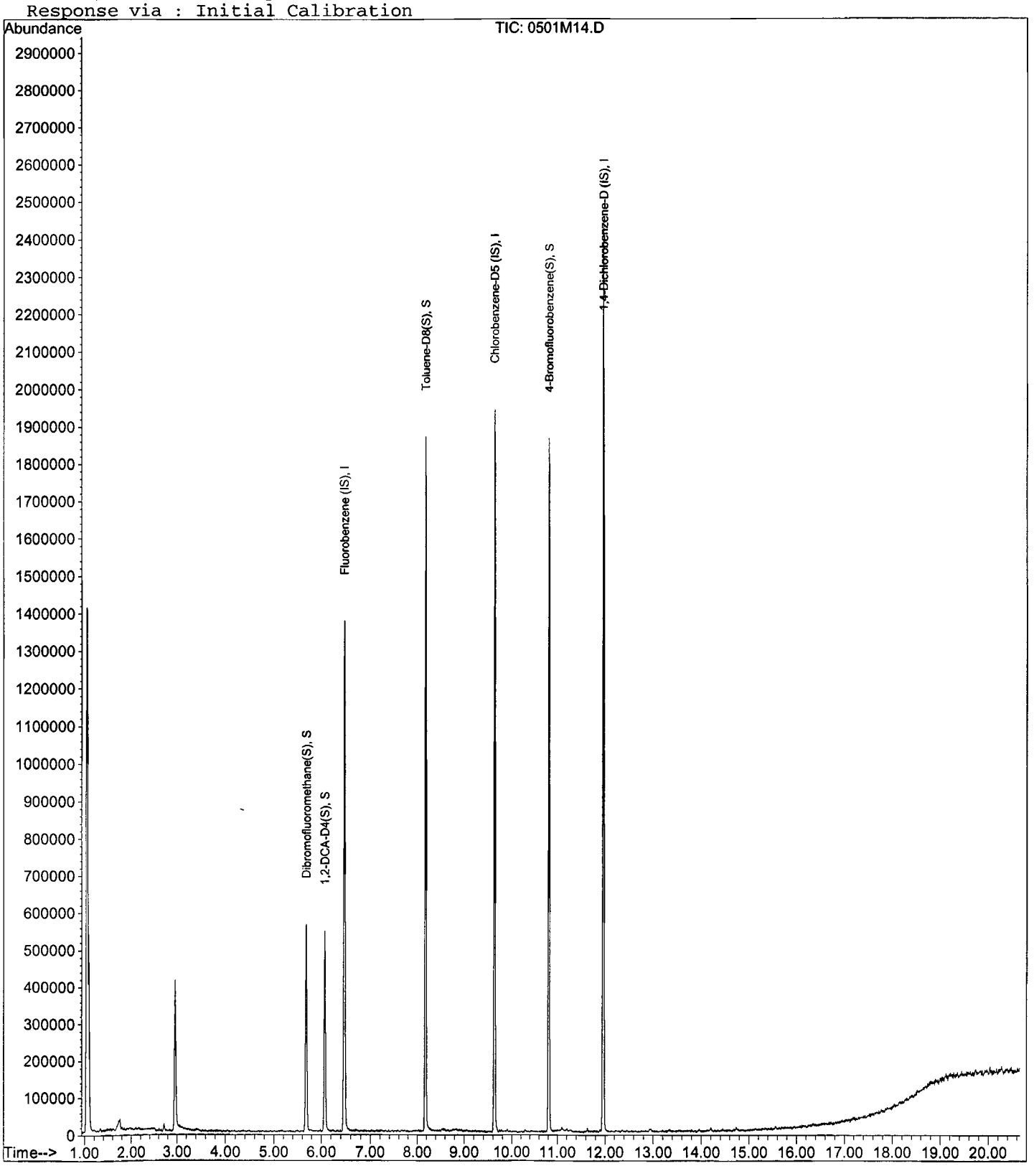
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M14.D Vial: 11
Acq On : 1 May 20 17:13 Operator: LP,DG,CMM
Sample : BA10505W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:28 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M11.D Vial: 8
Acq On : 1 May 20 15:46 Operator: LP,DG,CMM
Sample : 200501A BLK Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:26 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1176498	25.000 ppb	0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1042330	25.000 ppb	0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	680373	25.000 ppb	0.00
System Monitoring Compounds					
31) Dibromofluoromethane(S)	5.68	111	352064	27.408 ppb	0.00
Spiked Amount 25.000			Recovery	= 109.632%	
36) 1,2-DCA-D4(S)	6.07	65	455270	29.194 ppb	0.00
Spiked Amount 25.000			Recovery	= 116.776%	
56) Toluene-D8(S)	8.18	98	1232067	24.776 ppb	0.00
Spiked Amount 25.000			Recovery	= 99.104%	
64) 4-Bromofluorobenzene(S)	10.81	95	524244	24.683 ppb	0.00
Spiked Amount 25.000			Recovery	= 98.732%	

Target Compounds Qvalue

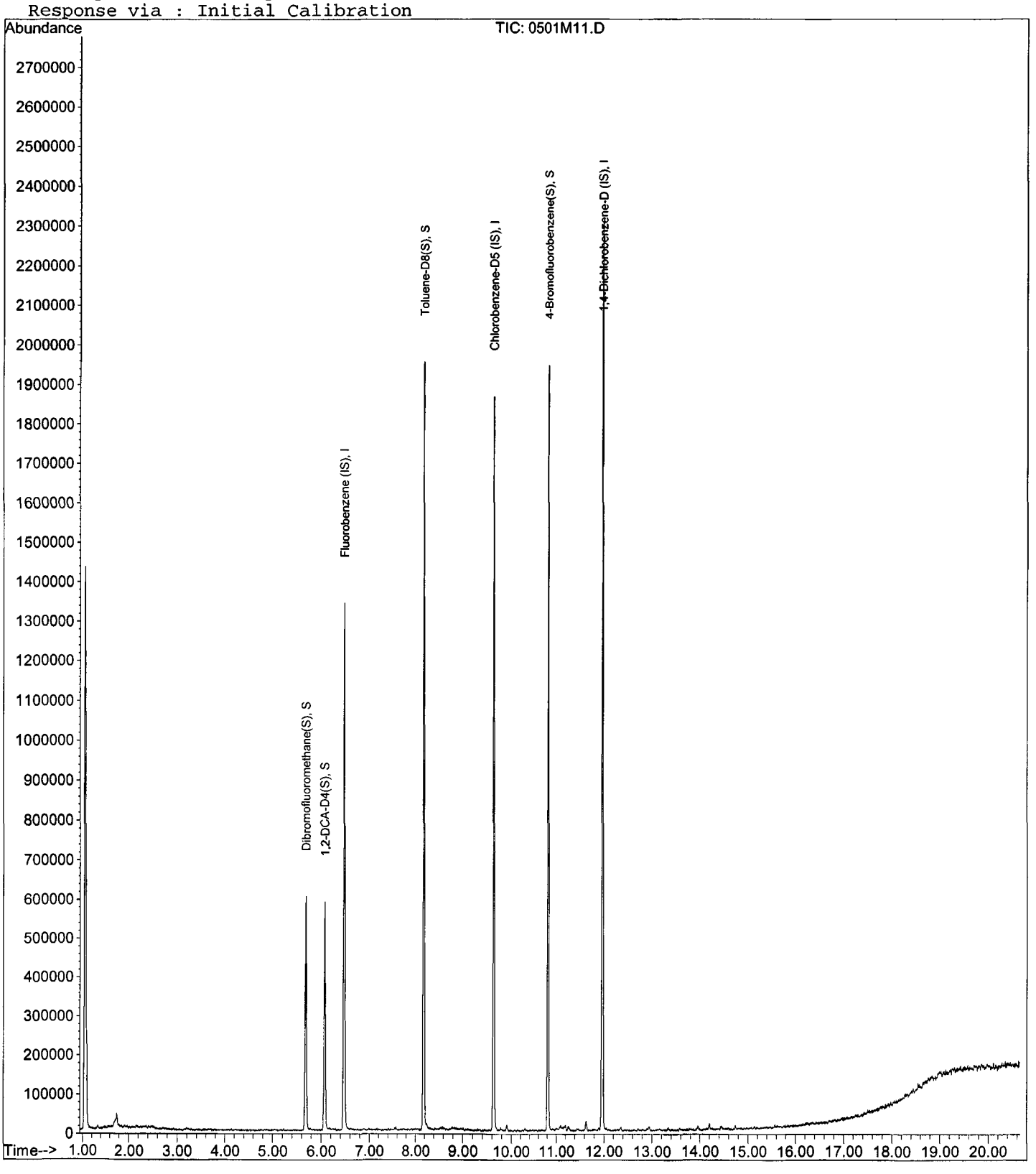
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M11.D Vial: 8
Acq On : 1 May 20 15:46 Operator: LP,DG,CMM
Sample : 200501A BLK Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:26 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M06.D Vial: 3
Acq On : 1 May 20 13:21 Operator: LP,DG,CMM
Sample : 200501A LCS 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1235562	25.000 ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1104828	25.000 ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	754196	25.000 ppb		0.00
System Monitoring Compounds						
31) Dibromofluoromethane(S)	5.68	111	352019	26.094 ppb		0.00
Spiked Amount 25.000			Recovery = 104.376%			
36) 1,2-DCA-D4(S)	6.07	65	459740	28.071 ppb		0.00
Spiked Amount 25.000			Recovery = 112.284%			
56) Toluene-D8(S)	8.18	98	1255766	23.824 ppb		0.00
Spiked Amount 25.000			Recovery = 95.296%			
64) 4-Bromofluorobenzene(S)	10.81	95	538323	23.912 ppb		0.00
Spiked Amount 25.000			Recovery = 95.648%			
Target Compounds						Qvalue
2) Dichlorodifluoromethane	1.23	85	63902	11.845 ppb		98
3) Freon 114	1.34	85	44962	12.461 ppb		99
4) Chloromethane	1.37	50	43512	9.739 ppb		90
5) Vinyl chloride	1.47	62	41804	9.895 ppb		96
6) Bromomethane	1.74	94	31552	14.060 ppb		91
7) Chloroethane	1.83	64	23744	8.317 ppb		87
8) Dichlorofluoromethane	2.04	67	67059	9.678 ppb		99
9) Trichlorofluoromethane	2.08	101	83477	12.217 ppb		96
10) Acrolein	2.53	56	68680	123.845 ppb		93
11) Acetone	2.72	43	18650	8.875 ppb		93
12) Freon-113	2.63	101	18216	12.316 ppb		92
13) 1,1-DCE	2.61	61	60136	10.243 ppb		99
14) t-Butanol	3.51	59	22312	129.377 ppb	#	88
15) Methyl Acetate	3.12	43	25318	10.115 ppb		97
16) Iodomethane	2.76	142	29029	7.062 ppb		98
17) Acrylonitrile	3.55	53	10418	7.693 ppb		91
18) Methylene chloride	3.20	84	45414	10.836 ppb	#	84
19) Carbon disulfide	2.82	76	105606	10.538 ppb		97
20) Methyl t-butyl ether (MtBE	3.65	73	98351	11.730 ppb	#	88
21) Trans-1,2-DCE	3.57	96	39241	9.515 ppb		94
22) Diisopropyl Ether	4.43	45	102414	9.328 ppb	#	87
23) 1,1-DCA	4.22	63	65560	9.987 ppb		98
24) Vinyl Acetate	4.43	43	122963	11.778 ppb	#	99
25) Ethyl tert Butyl Ether	4.94	59	61937	12.364 ppb		94
26) MEK (2-Butanone)	5.14	43	16767	11.271 ppb	#	57
27) Cis-1,2-DCE	5.05	96	49480	10.287 ppb		89
28) 2,2-Dichloropropane	5.04	77	47880	11.912 ppb		100
29) Chloroform	5.49	83	86403	10.466 ppb		91
30) Bromochloromethane	5.35	128	26520	9.479 ppb		87
32) 1,1,1-TCA	5.68	97	88343	12.038 ppb	#	88
33) Cyclohexane	5.74	41	27961	9.883 ppb		83
34) 1,1-Dichloropropene	5.89	75	58235	10.203 ppb		93
35) 2,2,4-Trimethylpentane	6.27	57	75109	10.527 ppb		98
37) Carbon Tetrachloride	5.88	117	82741	12.511 ppb		84
38) Tert Amyl Methyl Ether	6.34	73	56884	14.893 ppb	#	86
39) 1,2-DCA	6.16	62	78961	10.615 ppb		94
40) Benzene	6.13	78	166324	9.851 ppb		98
41) TCE	6.88	95	45609	9.026 ppb	#	79
42) 2-Pentanone	7.14	43	340312	121.244 ppb		97

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M06.D Vial: 3
Acq On : 1 May 20 13:21 Operator: LP,DG,CMM
Sample : 200501A LCS 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	36355	10.199	ppb		99
44)	Bromodichloromethane	7.43	83	69955	10.669	ppb		90
45)	Methyl Cyclohexane	7.08	83	55729	10.240	ppb		86
46)	Dibromomethane	7.24	93	28610	10.849	ppb		91
48)	1-Bromo-2-chloroethane	7.74	63	50913	10.216	ppb		99
50)	Cis-1,3-Dichloropropene	7.91	75	73414	10.675	ppb		95
51)	Toluene	8.24	91	202212	10.175	ppb		92
52)	Trans-1,3-Dichloropropene	8.49	75	65642	11.582	ppb		86
53)	1,1,2-TCA	8.66	83	31693	9.540	ppb		91
54)	2-Hexanone	8.96	43	24611	11.176	ppb	#	95
57)	1,2-EDB	9.15	107	46913	10.026	ppb		99
58)	Tetrachloroethene	8.80	164	44264	12.197	ppb		87
59)	1-Chlorohexane	9.66	91	55546	10.097	ppb		89
60)	1,1,1,2-Tetrachloroethane	9.75	131	63158	10.744	ppb		84
61)	m&p-Xylene	9.90	106	214339	20.315	ppb		97
62)	o-Xylene	10.29	106	105149	9.984	ppb		93
63)	Styrene	10.31	104	180202	10.575	ppb		94
65)	1,3-Dichloropropane	8.83	76	69073	9.538	ppb		93
66)	Dibromochloromethane	9.05	129	65028	10.564	ppb		98
67)	Chlorobenzene	9.66	112	152895	10.126	ppb		99
68)	Ethylbenzene	9.78	91	246507	10.229	ppb		94
69)	Bromoform	10.47	173	60046	10.993	ppb		98
71)	Isopropylbenzene	10.67	105	266002	10.120	ppb		98
72)	1,1,2,2-Tetrachloroethane	10.96	83	51335	9.428	ppb		91
73)	1,2,3-Trichloropropane	11.00	110	23754	10.397	ppb		91
74)	t-1,4-Dichloro-2-Butene	11.03	53	8389	9.692	ppb	#	40
75)	Bromobenzene	10.95	156	92520	10.857	ppb		93
76)	n-Propylbenzene	11.08	91	267686	9.648	ppb		98
77)	4-Ethyltoluene	11.20	105	265099	10.347	ppb		97
78)	2-Chlorotoluene	11.15	91	210916	10.628	ppb		95
79)	1,3,5-Trimethylbenzene	11.26	105	236635	10.368	ppb		98
80)	4-Chlorotoluene	11.26	91	222006	10.508	ppb		99
81)	Tert-Butylbenzene	11.58	119	228496	10.481	ppb		96
82)	1,2,4-Trimethylbenzene	11.80	105	248060	10.673	ppb	#	28
83)	Sec-Butylbenzene	11.80	105	262905	10.861	ppb		96
84)	p-Isopropyltoluene	11.95	119	239999	10.828	ppb		100
85)	Benzyl Chloride	12.12	91	52832	10.448	ppb		98
86)	1,3-DCB	11.90	146	154133	10.060	ppb		98
87)	1,4-DCB	11.99	146	157121	9.983	ppb		96
88)	n-Butylbenzene	12.36	91	143816	10.658	ppb		94
89)	1,2-DCB	12.35	146	153505	10.414	ppb		95
90)	Hexachloroethane	12.61	117	35868	9.884	ppb		92
91)	1,2-Dibromo-3-chloropropan	13.12	75	12868	10.994	ppb	#	77
92)	1,2,4-Trichlorobenzene	13.96	180	89750	10.363	ppb		98
93)	Hexachlorobutadiene	14.15	225	46611	12.217	ppb		93
94)	Naphthalene	14.20	128	131443	10.408	ppb	#	94
95)	1,2,3-Trichlorobenzene	14.44	180	73812	10.416	ppb		94

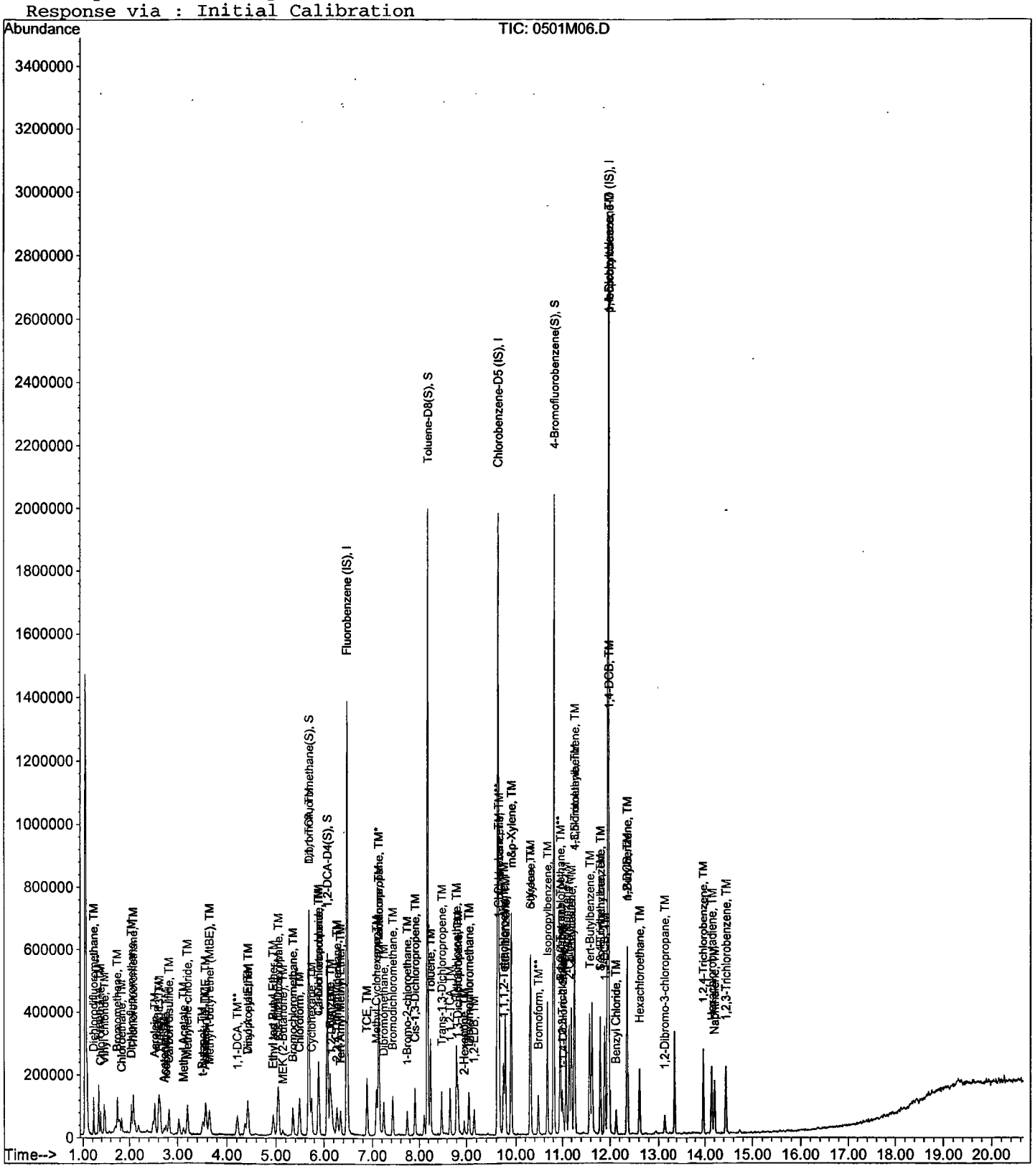
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M06.D Vial: 3
Acq On : 1 May 20 13:21 Operator: LP,DG,CMM
Sample : 200501A LCS 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Page 533 of 703

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M07.D Vial: 4
Acq On : 1 May 20 13:50 Operator: LP,DG,CMM
Sample : 200501A LCSD 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1206776	25.000	ppb		0.00
55) Chlorobenzene-D5 (IS)	9.63	117	1063668	25.000	ppb		0.00
70) 1,4-Dichlorobenzene-D (IS)	11.96	152	722715	25.000	ppb		0.00
System Monitoring Compounds							
31) Dibromofluoromethane(S)	5.68	111	345860	26.249	ppb		0.00
Spiked Amount 25.000			Recovery = 104.996%				
36) 1,2-DCA-D4(S)	6.07	65	450484	28.162	ppb		0.00
Spiked Amount 25.000			Recovery = 112.648%				
56) Toluene-D8(S)	8.18	98	1248027	24.594	ppb		0.00
Spiked Amount 25.000			Recovery = 98.376%				
64) 4-Bromofluorobenzene(S)	10.81	95	529028	24.409	ppb		0.00
Spiked Amount 25.000			Recovery = 97.636%				
Target Compounds							Qvalue
2) Dichlorodifluoromethane	1.23	85	65485	12.428	ppb		95
3) Freon 114	1.33	85	45357	12.854	ppb		95
4) Chloromethane	1.37	50	42348	9.702	ppb		95
5) Vinyl chloride	1.47	62	40082	9.714	ppb		93
6) Bromomethane	1.74	94	31760	14.516	ppb		92
7) Chloroethane	1.84	64	27761	9.956	ppb		99
8) Dichlorofluoromethane	2.04	67	68956	10.189	ppb		91
9) Trichlorofluoromethane	2.08	101	84331	12.636	ppb		92
10) Acrolein	2.53	56	70830	130.769	ppb		87
11) Acetone	2.72	43	21391	11.340	ppb		96
12) Freon-113	2.63	101	17168	11.884	ppb		85
13) 1,1-DCE	2.61	61	61997	10.812	ppb		95
14) t-Butanol	3.50	59	24112	135.792	ppb	#	90
15) Methyl Acetate	3.12	43	20993	8.562	ppb		93
16) Iodomethane	2.77	142	36190	8.547	ppb		99
17) Acrylonitrile	3.56	53	13504	10.210	ppb	#	80
18) Methylene chloride	3.20	84	43049	10.484	ppb		91
19) Carbon disulfide	2.82	76	110376	11.277	ppb		93
20) Methyl t-butyl ether (MtBE	3.65	73	90428	11.105	ppb		99
21) Trans-1,2-DCE	3.57	96	45477	11.291	ppb		86
22) Diisopropyl Ether	4.43	45	99590	9.288	ppb		90
23) 1,1-DCA	4.21	63	68254	10.645	ppb		91
24) Vinyl Acetate	4.37	43	123470	12.131	ppb	#	77
25) Ethyl tert Butyl Ether	4.94	59	58451	11.960	ppb	#	87
26) MEK (2-Butanone)	5.14	43	15379	10.616	ppb		99
27) Cis-1,2-DCE	5.04	96	51443	10.950	ppb		89
28) 2,2-Dichloropropane	5.04	77	49311	12.458	ppb		93
29) Chloroform	5.49	83	90292	11.198	ppb		97
30) Bromochloromethane	5.35	128	31002	11.345	ppb		80
32) 1,1,1-TCA	5.68	97	88871	12.399	ppb		89
33) Cyclohexane	5.74	41	32985	12.032	ppb		64
34) 1,1-Dichloropropene	5.89	75	65081	11.675	ppb		96
35) 2,2,4-Trimethylpentane	6.27	57	74757	10.728	ppb	#	78
37) Carbon Tetrachloride	5.88	117	83616	12.944	ppb		95
38) Tert Amyl Methyl Ether	6.33	73	52259	13.903	ppb	#	88
39) 1,2-DCA	6.16	62	81874	11.269	ppb		100
40) Benzene	6.13	78	170098	10.314	ppb		96
41) TCE	6.88	95	50975	10.329	ppb		93
42) 2-Pentanone	7.14	43	341536	124.583	ppb		97

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M07.D Vial: 4
Acq On : 1 May 20 13:50 Operator: LP,DG,CMM
Sample : 200501A LCSD 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Quant Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
43)	1,2-Dichloropropane	7.12	63	37177	10.695	ppb		99
44)	Bromodichloromethane	7.43	83	77949	12.172	ppb		99
45)	Methyl Cyclohexane	7.09	83	56859	10.696	ppb		82
46)	Dibromomethane	7.24	93	30738	11.934	ppb		87
48)	1-Bromo-2-chloroethane	7.74	63	47558	9.770	ppb		97
50)	Cis-1,3-Dichloropropene	7.91	75	74993	11.165	ppb		96
51)	Toluene	8.24	91	203721	10.495	ppb		99
52)	Trans-1,3-Dichloropropene	8.49	75	65489	11.831	ppb		89
53)	1,1,2-TCA	8.66	83	31894	9.829	ppb		91
54)	2-Hexanone	8.96	43	22578	10.544	ppb	#	85
57)	1,2-EDB	9.15	107	49588	11.008	ppb		97
58)	Tetrachloroethene	8.80	164	43728	12.549	ppb		94
59)	1-Chlorohexane	9.66	91	58123	11.025	ppb		99
60)	1,1,1,2-Tetrachloroethane	9.75	131	67806	11.982	ppb		86
61)	m&p-Xylene	9.90	106	214038	21.071	ppb		99
62)	o-Xylene	10.29	106	107905	10.642	ppb		91
63)	Styrene	10.31	104	181467	11.061	ppb		95
65)	1,3-Dichloropropane	8.83	76	75169	10.782	ppb		96
66)	Dibromochloromethane	9.05	129	66757	11.264	ppb		94
67)	Chlorobenzene	9.66	112	154129	10.603	ppb		97
68)	Ethylbenzene	9.78	91	244586	10.542	ppb		99
69)	Bromoform	10.47	173	60037	11.416	ppb		97
71)	Isopropylbenzene	10.67	105	264516	10.502	ppb		98
72)	1,1,2,2-Tetrachloroethane	10.97	83	50600	9.698	ppb		99
73)	1,2,3-Trichloropropane	11.00	110	23293	10.640	ppb		92
74)	t-1,4-Dichloro-2-Butene	11.02	53	8042	9.695	ppb		80
75)	Bromobenzene	10.95	156	91367	11.188	ppb		94
76)	n-Propylbenzene	11.08	91	276966	10.417	ppb		97
77)	4-Ethyltoluene	11.20	105	267487	10.895	ppb		96
78)	2-Chlorotoluene	11.15	91	184205	9.686	ppb		95
79)	1,3,5-Trimethylbenzene	11.26	105	236999	10.837	ppb		98
80)	4-Chlorotoluene	11.26	91	222710	11.000	ppb		97
81)	Tert-Butylbenzene	11.58	119	242869	11.625	ppb		96
82)	1,2,4-Trimethylbenzene	11.63	105	245454	11.021	ppb		96
83)	Sec-Butylbenzene	11.80	105	253493	10.928	ppb		96
84)	p-Isopropyltoluene	11.95	119	246078	11.586	ppb		97
85)	Benzyl Chloride	12.12	91	50556	10.438	ppb		94
86)	1,3-DCB	11.90	146	169099	11.517	ppb		94
87)	1,4-DCB	11.98	146	162624	10.782	ppb		97
88)	n-Butylbenzene	12.36	91	144574	11.181	ppb		96
89)	1,2-DCB	12.35	146	161064	11.403	ppb		97
90)	Hexachloroethane	12.61	117	37967	10.918	ppb		91
91)	1,2-Dibromo-3-chloropropan	13.12	75	12303	10.969	ppb		92
92)	1,2,4-Trichlorobenzene	13.96	180	91897	10.999	ppb		99
93)	Hexachlorobutadiene	14.15	225	48992	13.400	ppb		94
94)	Naphthalene	14.20	128	139416	11.376	ppb		96
95)	1,2,3-Trichlorobenzene	14.44	180	69800	10.297	ppb		96

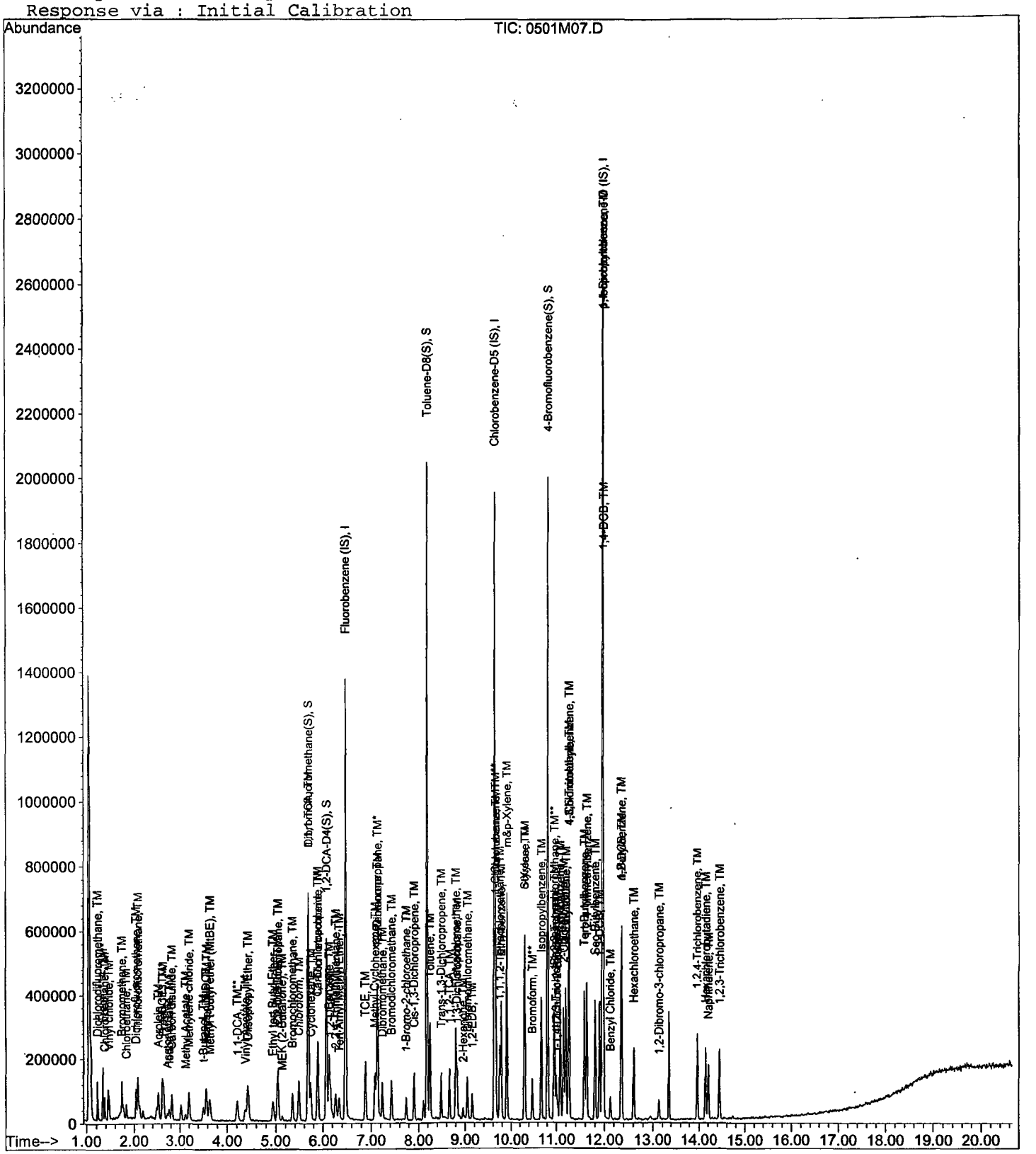
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M07.D Vial: 4
Acq On : 1 May 20 13:50 Operator: LP,DG,CMM
Sample : 200501A LCSD 10ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:21 2020 Quant Results File: M0430W.RES

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration

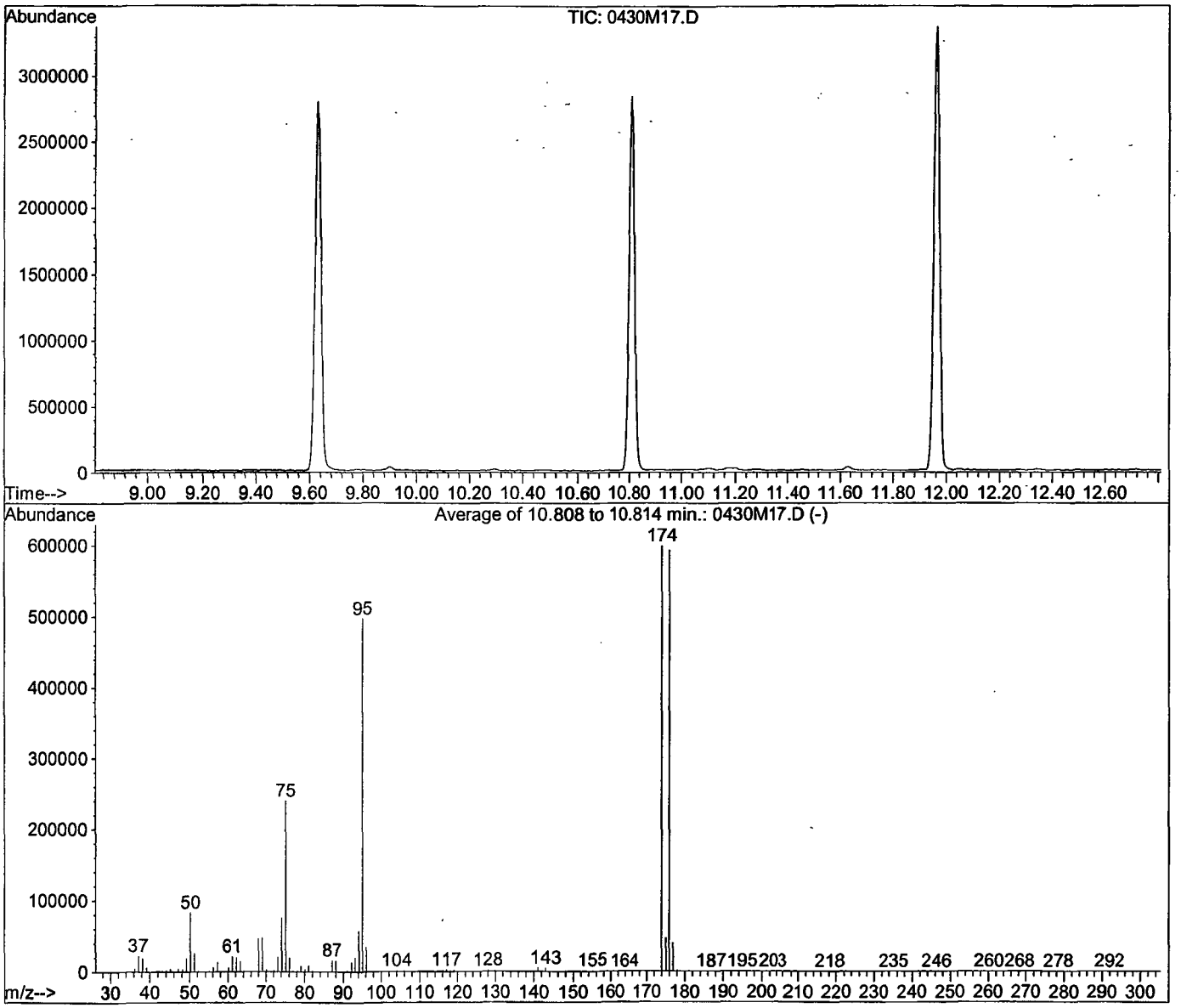


Page 536 of 703

Data File : M:\MAX\DATA\M200430\0430M17.D
Acq On : 30 Apr 20 19:17
Sample : 25ug/L BFB STD 3/25/20
Misc : IS 3/25/20

Vial: 14
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B



AutoFind: Scans 3075, 3076, 3077; Background Corrected with Scan 3059

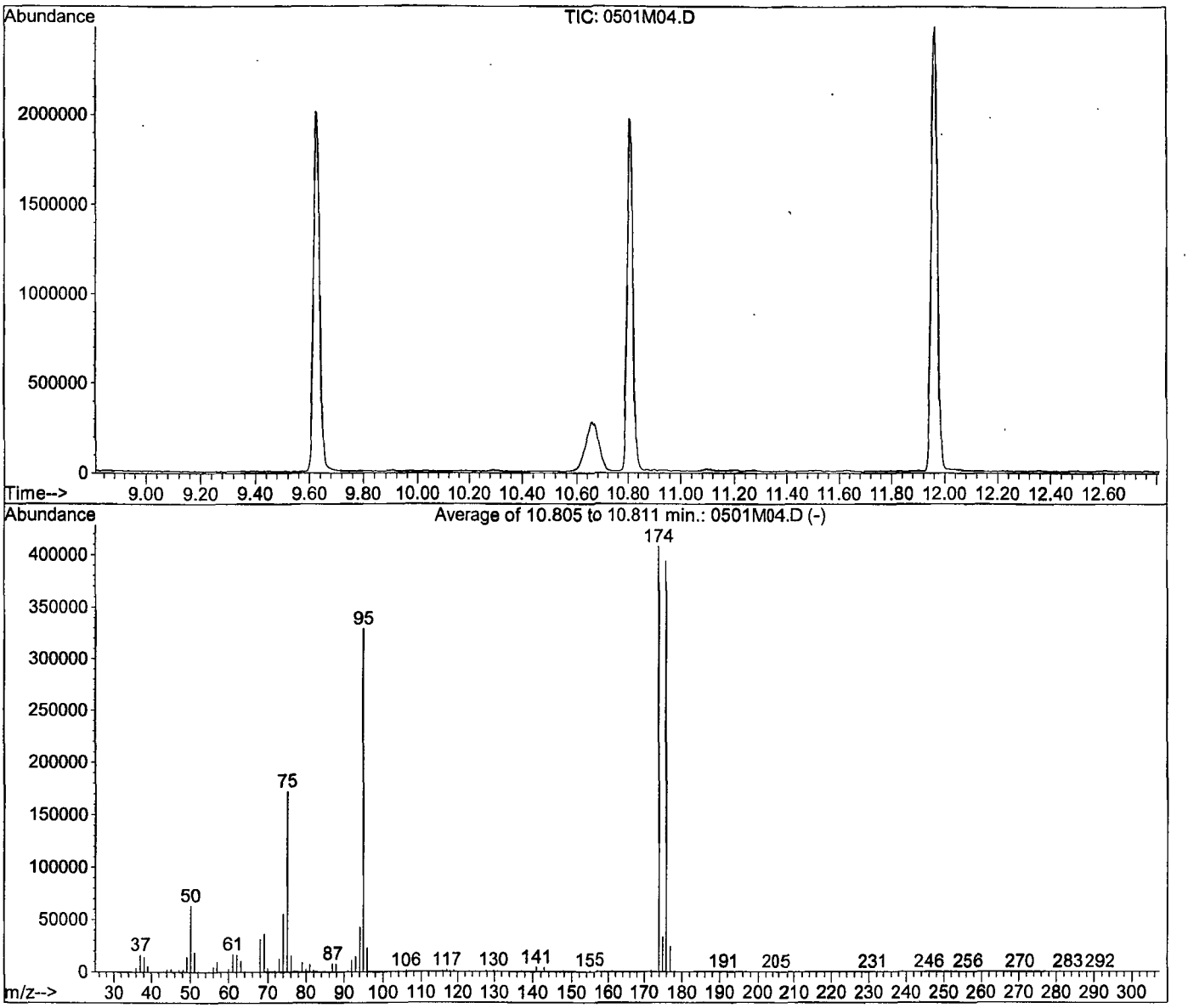
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	16.7	82769	PASS
75	95	30	60	48.3	239893	PASS
95	95	100	200	100.0	496555	PASS
96	95	5	9	6.8	33933	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	200	120.7	599189	PASS
175	174	5	9	7.8	46763	PASS
176	174	95	101	99.0	593109	PASS
177	176	5	9	6.7	40000	PASS

BFB

Data File : M:\MAX\DATA\M200430\0501M04.D
Acq On : 1 May 20 12:23
Sample : 25ug/L BFB STD 3/25/20
Misc : IS 3/25/20

Vial: 1
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Method : M:\MAX\DATA\M200430\M0430W.M (RTE Integrator)
Title : METHOD 8260B



AutoFind: Scans 3074, 3075, 3076; Background Corrected with Scan 3059

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	19.2	63272	PASS
75	95	30	60	52.3	172352	PASS
95	95	100	200	100.0	329472	PASS
96	95	5	9	6.9	22896	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	200	123.8	407808	PASS
175	174	5	9	8.2	33251	PASS
176	174	95	101	96.6	393984	PASS
177	176	5	9	6.1	24061	PASS

Max 8260 Standard Prep

Max 8260 Water Calibration Curve

Prepared By (Initials): CH

0.3ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	Various	0.3ug/L	5	Prepared 04/30/20	06/29/20	N/A	3uL	50mL	P&T Water	0.3
VOA STD. 12	Phenova		5	Prepared 04/30/20	06/29/20	N/A	3uL			0.3
VOA STD. 1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	5uL			5
VOA STD. TBA	Phenova		5	Prepared 03/24/20	05/20/20	N/A	2uL			10

0.5ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	Various	0.5ug/L	5	Prepared 04/30/20	06/29/20	N/A	5uL	50mL	P&T Water	0.5
VOA STD. 12	Phenova		5	Prepared 04/30/20	06/29/20	N/A	5uL			0.5
VOA STD. 1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	10uL			10
VOA STD. TBA	Phenova		250	Prepared 04/30/20	05/20/20	N/A	5uL			25

1.0ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	Various	1.0ug/L	5	Prepared 04/30/20	06/29/20	N/A	10uL	50mL	P&T Water	1
VOA STD. 12	Phenova		5	Prepared 04/30/20	06/29/20	N/A	10uL			1
VOA STD. 1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	20uL			20
VOA STD. TBA	Phenova		250	Prepared 04/30/20	05/20/20	N/A	10uL			50

2.0ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 9	Various	2.0ug/L	5	Prepared 04/30/20	06/29/20	N/A	20uL	50mL	P&T Water	2
VOA STD. 12	Phenova		5	Prepared 04/30/20	06/29/20	N/A	20uL			2
VOA STD.1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	30uL			30
VOA STD. TBA	Phenova		250	Prepared 04/30/20	05/20/20	N/A	15uL			75

5ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	5ug/L	50	Prepared 04/30/20	06/29/20	N/A	5uL	50mL	P&T Water	5
VOA STD. 8	Phenova		50	Prepared 04/30/20	05/20/20	N/A	5uL			5
VOA STD. 2	Phenova		50	Prepared 04/30/20	06/29/20	N/A	5uL			5
VOA STD. 1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	40uL			40
VOA STD. TBA	Phenova		250	Prepared 04/30/20	05/20/20	N/A	20uL			100

10ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	10ug/L	50	Prepared 04/30/20	06/29/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova		50	Prepared 04/30/20	05/20/20	N/A	10uL			10
VOA STD. 2	Phenova		50	Prepared 04/30/20	06/29/20	N/A	10uL			10
VOA STD. 1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	50uL			50
VOA STD. TBA	Phenova		250	Prepared 04/30/20	05/20/20	N/A	25uL			125

20ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	20ug/L	50	Prepared 04/30/20	06/29/20	N/A	20uL	50mL	P&T Water	20
VOA STD. 8	Phenova		50	Prepared 04/30/20	05/20/20	N/A	20uL			20
VOA STD. 2	Phenova		50	Prepared 04/30/20	06/29/20	N/A	20uL			20
VOA STD. 1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	60uL			60
VOA STD. TBA	Phenova		250	Prepared 04/30/20	05/20/20	N/A	30uL			150

40ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	40ug/L	50	Prepared 04/30/20	06/29/20	N/A	40uL	50mL	P&T Water	40
VOA STD. 8	Phenova		50	Prepared 04/30/20	05/20/20	N/A	40uL			40
VOA STD. 2	Phenova		50	Prepared 04/30/20	06/29/20	N/A	40uL			40
VOA STD. 1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	80uL			80
VOA STD. TBA	Phenova		250	Prepared 04/30/20	05/20/20	N/A	35uL			175

100ug/L

Prepared: 04/30/20

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	100ug/L	50	Prepared 04/30/20	06/29/20	N/A	100uL	50mL	P&T Water	100
VOA STD. 8	Phenova		50	Prepared 04/30/20	05/20/20	N/A	100uL			100
VOA STD. 2	Phenova		50	Prepared 04/30/20	06/29/20	N/A	100uL			100
VOA STD. 1	Absolute		50	Prepared 04/30/20	06/29/20	N/A	100uL			100
VOA STD. TBA	Phenova		250	Prepared 04/30/20	05/20/20	N/A	40uL			200

Max 8260 Water Second Source (SS)

Prepared: 04/30/20

Prepared By (Initials): CH

Expires: 05/30/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 3	Phenova	8260 Water SS	50	Prepared 04/30/20	06/29/20	N/A	10uL	50mL	P&T Water	10
VOA STD. Gases	Phenova	8260 Water SS	50	Prepared 04/30/20	06/29/20	N/A	10uL			10
VOA STD. 6	Various	8260 Water SS	50	Prepared 04/30/20	05/06/20	N/A	10uL			10
VOA STD. 2-CEVE	Absolute	8260 Water SS	50	Prepared 04/30/20	06/29/20	N/A	50uL			50
VOA STD. 0	Absolute	8260 Water SS	50	Prepared 04/30/20	06/29/20	N/A	100uL			100
Voa STD. TBA	Various	8260 Water SS	250	Prepared 04/30/20	05/06/20	N/A	25uL			250

8260 Water Continuing Calibrations (CCV)/ Lab Control Spikes (LCS)

Prepared: 04/30/20

Prepared By (Initials): CH

Expires: 05/01/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	CCV/ LCS	50	Prepared 04/30/20	06/29/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	CCV/ LCS	50	Prepared 04/30/20	05/20/20	N/A	10uL			10
VOA STD. 2	Phenova	CCV/ LCS	50	Prepared 04/30/20	06/29/20	N/A	10uL			10
VOA STD. 1	Absolute	CCV/ LCS	50	Prepared 04/30/20	06/29/20	N/A	50uL			50
VOA STD. TBA	Phenova	CCV/ LCS	250	Prepared 04/30/20	05/20/20	N/A	25uL			125

LCS (X4 Ketones)

Prepared: 04/30/20

Prepared By (Initials): CH

Expires: 05/01/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA STD. 7	Various	LCS X4 Ketones	50	Prepared 04/30/20	06/29/20	N/A	10uL	50mL	P&T Water	10
VOA STD. 8	Phenova	LCS X4 Ketones	50	Prepared 04/30/20	05/20/20	N/A	10uL			10
VOA STD. 2	Phenova	LCS X4 Ketones	50	Prepared 04/30/20	06/29/20	N/A	40uL			40
VOA STD. 1	Absolute	LCS X4 Ketones	50	Prepared 04/30/20	06/29/20	N/A	50uL			50
VOA STD. TBA	Phenova	LCS X4 Ketones	250	Prepared 04/30/20	05/20/20	N/A	25uL			125

Max 8260 Surrogate

Prepared: 03/25/20
Expires: 09/12/20
Methanol Lot No: 58243

Prepared By (Initials): DG

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
8260 Surrogate Solution	O2SI	120002-01	2,000	348756-39339	09/12/20	02/10/22	375uL	15mL	Methanol	50

Max 8260 Internal Standard

Prepared: 03/25/20
Expires: 11/11/20
Methanol Lot No: 58243

Prepared By (Initials): DG

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr.)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Internal Standard Solution	Phenova	ALO-101215	2,500	CL12444-40616	11/11/20	04/30/23	300uL	15mL	Methanol	50

Primary Standards

VOA STD 7

Prepared: 04/30/20 A
Expires: 06/29/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Gasses STD	Phenova	ALO-101206	2,000	CL14053-49895	04/30/21	10/31/24	100uL	4mL	Methanol	50
Hexachloroethane	Absolute	70199	1,000	091818-49910	04/30/21	09/18/23	200uL			50
Benzyl Chloride	Accusta	M-8010-01	1,000	011320-49978	04/30/21	01/13/21	200uL			50

VOA STD 8

Prepared: 04/30/20 B
Expires: 05/20/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Additions STD	Phenova	ALO-130175	2,000	CL12744-50146	04/30/21	08/31/21	100uL	4mL	Methanol	50
502.2 Cal. Std.	Phenova	ALO-101200	2,000	CL14379-49944	04/30/21	10/31/24	100uL			50
Vinyl Acetate	Phenova	ALO-101228	2,000	CL15238-50131	04/30/21	05/20/20	100uL			50

VOA STD TBA

Prepared: 04/30/20 C
Expires: 05/20/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOC Mix	Phenova	ALO-130176	2,000	CL12929-49791	04/30/21	11/30/20	500uL	4mL	Methanol	250
Acrolein	Phenova	ALO-130549	10,000	CL15242-50132	04/30/21	05/20/20	100uL			250

VOA STD 1

Prepared: 04/30/20 D
Expires: 06/29/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE	Absolute	82408	2,000	011320-49914	04/14/21	01/13/23	50	2mL	Methanol	50

VOA STD 2

Prepared: 04/30/20 E
Expires: 06/29/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Std.	Phenova	AL0-109211	2,000	CL12730-49962	04/30/21	08/31/28	100	4mL	Methanol	50

VOA STD 9

Prepared: 04/30/20 F
Expires: 06/29/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 7		VOA STD. 9	50	Prepared 04/30/20	04/30/21	N/A	200uL	2mL	Methanol	5
VOA STD. 8			50	Prepared 04/30/20	04/30/21	N/A	200uL			5

VOA STD. 10

Prepared: 04/30/20 G
Expires: 06/29/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 1		VOA STD. 10	50	Prepared 04/30/20	04/30/21	N/A	200uL	2mL	Methanol	5

VOA STD. 12

Prepared: 04/30/20 H
Expires: 06/29/20
Prepared By (Initials): CH
Methanol Lot No. DW117-US-0095

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA STD. 2		VOA STD. 12	50	Prepared 04/30/20	04/30/21	N/A	200uL	2mL	Methanol	5

Second Source (SS) Standards

VOA STD. 3

Prepared: 04/30/20 I
Expires: 06/29/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Ketones Standard	Phenova	ALO-101211	2,000	**CL13994-49967**	**04/30/21**	**08/31/29**	50uL	2mL	Methanol	50

VOA STD. Gases

Prepared: 04/30/20 J
Expires: 06/29/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
8260 Gases (SS)	Phenova	ALO-101206	2,000	**CL14504-49900**	**04/30/21**	**10/31/24**	50uL	2mL	Methanol	50

VOA STD. 6

Prepared: 04/30/20 K
Expires: 05/06/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
502.2 Calibration STD. (54-compounds)	Phenova	ALO-101200	2,000	**CL14381-49948**	**04/30/21**	**10/31/24**	50uL	2mL	Methanol	50
Vinyl Acetate	Phenova	ALO-101228	2,000	**CL15169-50084**	**04/14/21**	**05/06/20**	50uL			50
Hexachloroethane	Accustan	AS-E0011	1,000	**219061767-49990**	**04/30/21**	**06/28/29**	100uL			50
Benzyl Chloride	Accustan	M-8010-01	200	**219041664-49933**	**04/14/21**	**12/25/21**	500uL			50

VOA STD. TBA

Prepared: 04/30/20 L
Expires: 05/06/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Custom VOA Mix (4-3)	Phenova	ALO-130176	2,000	**CL12734-49953**	**04/30/21**	**08/31/20**	250uL	2mL	Methanol	250
Acrolein	Phenova	ALO-101224	10,000	**CL15174-50085**	**04/14/21**	**05/06/20**	50uL			250

VOA STD. 0

Prepared: 04/30/20 M
Expires: 06/29/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Addition STD.	Phenova	ALO-130175	2,000	**CL14058-49973**	**04/30/21**	**08/31/21**	50uL	2mL	Methanol	50

VOA STD. 2-CEVE

Prepared: 04/30/20 N
Expires: 06/29/20
Methanol Lot No. DW117-US-0095

Prepared By (Initials): CH

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
2-CEVE (SS)	Absolute	82408	2,000	**121119-49915**	**04/14/21**	**12/11/22**	50uL	2mL	Methanol	50

Injection Log

Directory: M:\MAX\DATA\M200430\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	14	0430M17.D	1	25ug/L BFB STD 3/25/20	IS 3/25/20	30 Apr 20 19:17
2	15	0430M18.D	1	0.3ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 19:46
3	16	0430M19.D	1	0.5ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 20:15
4	17	0430M20.D	1	1.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 20:44
5	18	0430M21.D	1	2.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 21:13
6	19	0430M22.D	1	5.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 21:42
7	20	0430M23.D	1	10ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 22:11
8	21	0430M24.D	1	20ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 22:40
9	22	0430M25.D	1	40ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 23:09
10	23	0430M26.D	1	100ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 23:38
11	25	0430M28.D	1	(SS)10ug/L VOC STD 4/30/20	IS 3/25/20	1 May 20 00:36
12	1	0501M04.D	1	25ug/L BFB STD 3/25/20	IS 3/25/20	1 May 20 12:23
13	2	0501M05.D	1	200501A CCV 10ug/L	IS 3/25/20	1 May 20 12:52
14	3	0501M06.D	1	200501A LCS 10ug/L	IS 3/25/20	1 May 20 13:21
15	4	0501M07.D	1	200501A LCSD 10ug/L	IS 3/25/20	1 May 20 13:50
16	8	0501M11.D	1	200501A BLK	IS 3/25/20	1 May 20 15:46
17	9	0501M12.D	1	BA10503W01	IS 3/25/20	1 May 20 16:15
18	10	0501M13.D	1	BA10504W01	IS 3/25/20	1 May 20 16:44
19	11	0501M14.D	1	BA10505W01	IS 3/25/20	1 May 20 17:13
20	13	0501M16.D	1	Ending CCV 10ug/L 5/1/20	IS 3/25/20	1 May 20 18:11

Injection Log

Directory: M:\MAX\DATA\M200430\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	14	0430M17.D	1	25ug/L BFB STD 3/25/20	IS 3/25/20	30 Apr 20 19:17
2	15	0430M18.D	1	0.3ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 19:46
3	16	0430M19.D	1	0.5ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 20:15
4	17	0430M20.D	1	1.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 20:44
5	18	0430M21.D	1	2.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 21:13
6	19	0430M22.D	1	5.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 21:42
7	20	0430M23.D	1	10ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 22:11
8	21	0430M24.D	1	20ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 22:40
9	22	0430M25.D	1	40ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 23:09
10	23	0430M26.D	1	100ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 23:38
11	25	0430M28.D	1	(SS)10ug/L VOC STD 4/30/20	IS 3/25/20	1 May 20 00:36
12	1	0501M04.D	1	25ug/L BFB STD 3/25/20	IS 3/25/20	1 May 20 12:23
13	2	0501M05.D	1	200501A CCV 10ug/L	IS 3/25/20	1 May 20 12:52
14	3	0501M06.D	1	200501A LCS 10ug/L	IS 3/25/20	1 May 20 13:21
15	4	0501M07.D	1	200501A LCSD 10ug/L	IS 3/25/20	1 May 20 13:50
16	8	0501M11.D	1	200501A BLK	IS 3/25/20	1 May 20 15:46
17	9	0501M12.D	1	BA10503W01	IS 3/25/20	1 May 20 16:15
18	10	0501M13.D	1	BA10504W01	IS 3/25/20	1 May 20 16:44
19	11	0501M14.D	1	BA10505W01	IS 3/25/20	1 May 20 17:13
20	13	0501M16.D	1	Ending CCV 10ug/L 5/1/20	IS 3/25/20	1 May 20 18:11

ORGANICS
Calibration Data

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/30/20
Matrix: water Instrument: Max Initials: DG

		Compound	0430M07.D	0430M08.D	0430M09.D	0430M10.D	0430M13.D	0430M14.D	0430M15.D				Avg	%RSD	Type	r^2	Q	MRF
1	I	Fluorobenzene (IS)																
2	TMHBL	Gasoline C6-C10	14.6	5.968	3.224	1.325	0.8402	0.7200	0.6577				3.9	130	TMHBL	1.000		
3	TMHB	Chlorobenzene-D5 (IS)																
4	TMHB	1,4-Dichlorobenzene (IS)																
5																		
6																		
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Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0430M07.D Vial: 6
Acq On : 30 Apr 20 14:36 Operator: LP,DG,CMM
Sample : 20ug/L GAS STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 13:18 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:17:05 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	2317424	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1735207m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	2051226m	25.000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	26992822m	34.601	ppb	100

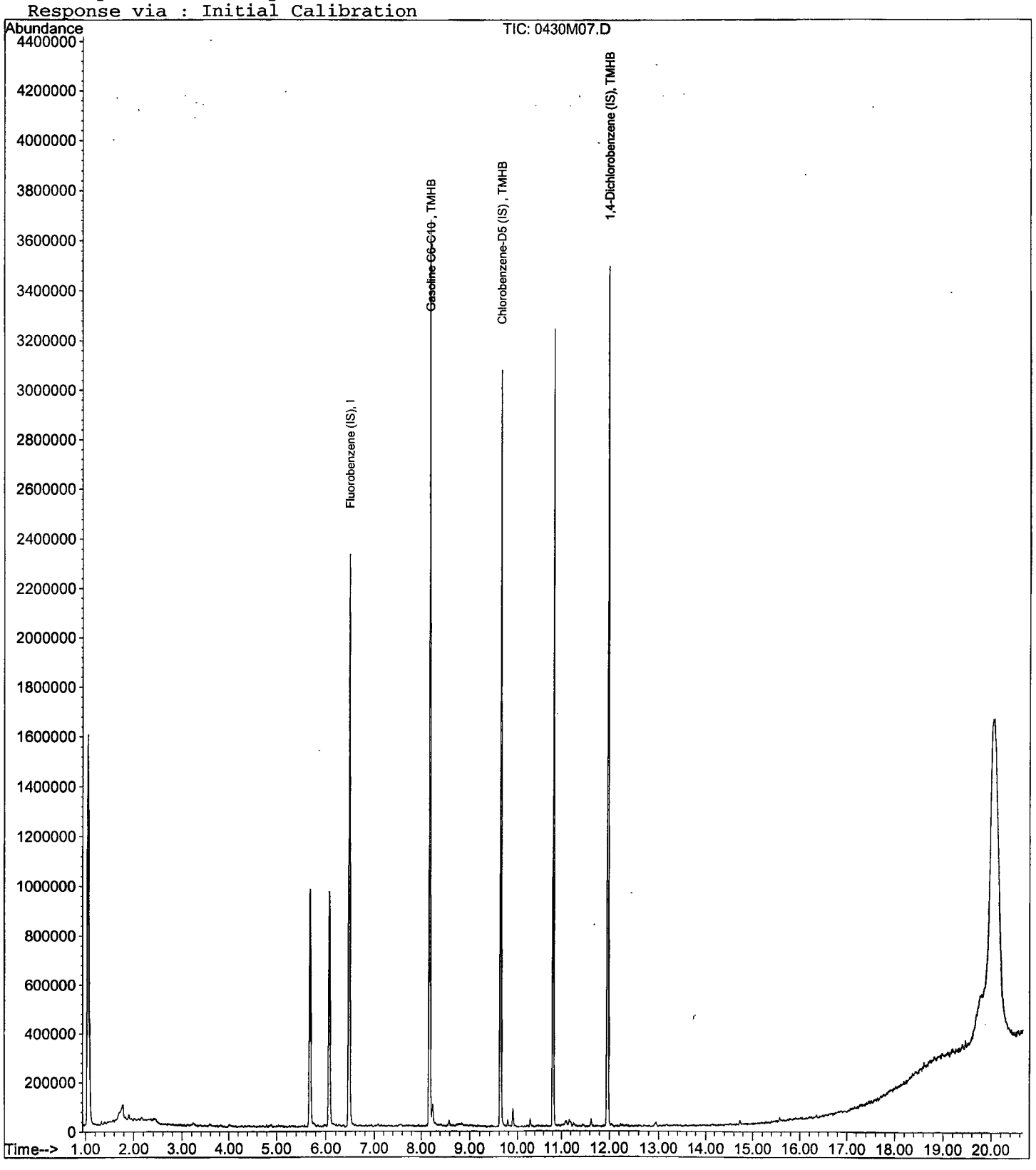
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M07.D Vial: 6
Acq On : 30 Apr 20 14:36 Operator: LP,DG,CMM
Sample : 20ug/L GAS STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 13:18 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0430M08.D Vial: 7
Acq On : 30 Apr 20 15:05 Operator: LP,DG,CMM
Sample : 50ug/L GAS STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 13:18 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:17:05 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	2255531	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1800648m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1943298m	25.000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	26920219m	53.219	ppb	100

(#) = qualifier out of range (m) = manual integration

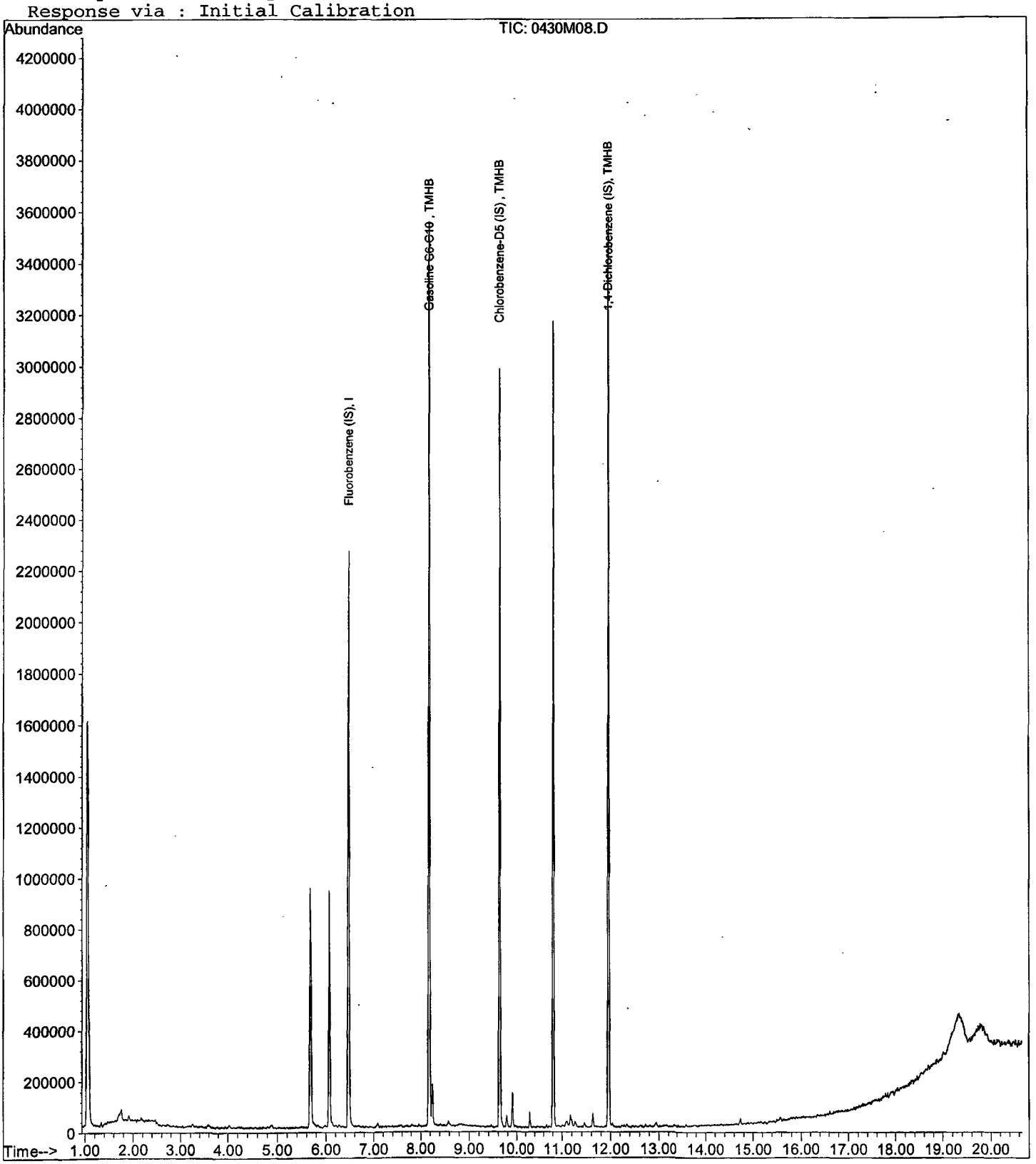
Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M08.D
Acq On : 30 Apr 20 15:05
Sample : 50ug/L GAS STD 4/30/20
Misc : IS 3/25/20

Vial: 7
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 13:18 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0430M09.D Vial: 8
Acq On : 30 Apr 20 15:34 Operator: LP,DG,CMM
Sample : 100ug/L GAS STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 13:19 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:17:05 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	2271048	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1850679m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	2097350m	25.000	ppb	0.00

System Monitoring Compounds

Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	29286922m	115.441	ppb	100

(#) = qualifier out of range (m) = manual integration

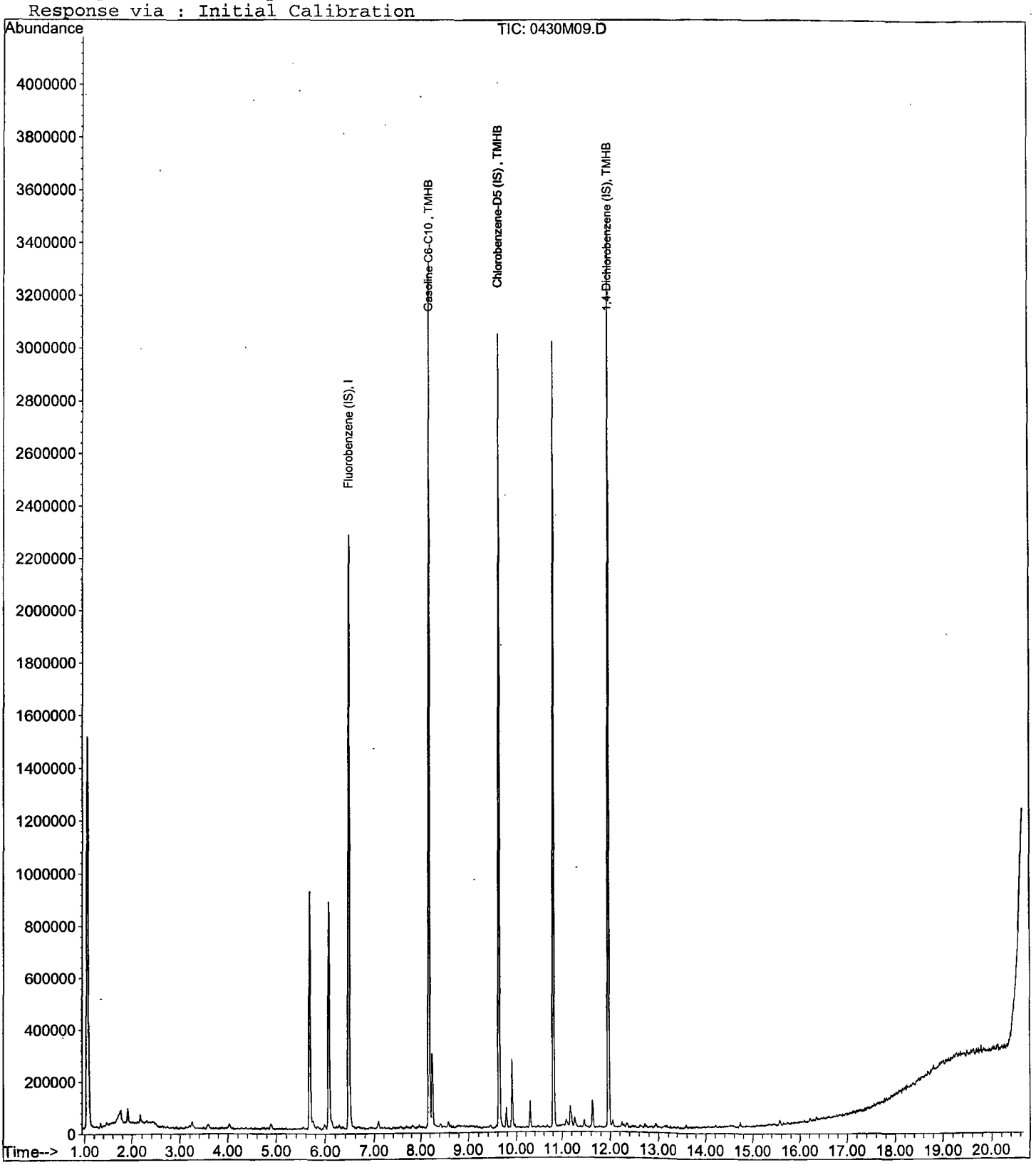
Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M09.D
Acq On : 30 Apr 20 15:34
Sample : 100ug/L GAS STD 4/30/20
Misc : IS 3/25/20

Vial: 8
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 13:19 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0430M10.D Vial: 9
Acq On : 30 Apr 20 16:03 Operator: LP,DG,CMM
Sample : 300ug/L GAS STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 13:19 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:17:05 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	2152248	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1959088m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	2168368m	25.000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	34220765m	310.043	ppb	100

(#) = qualifier out of range (m) = manual integration

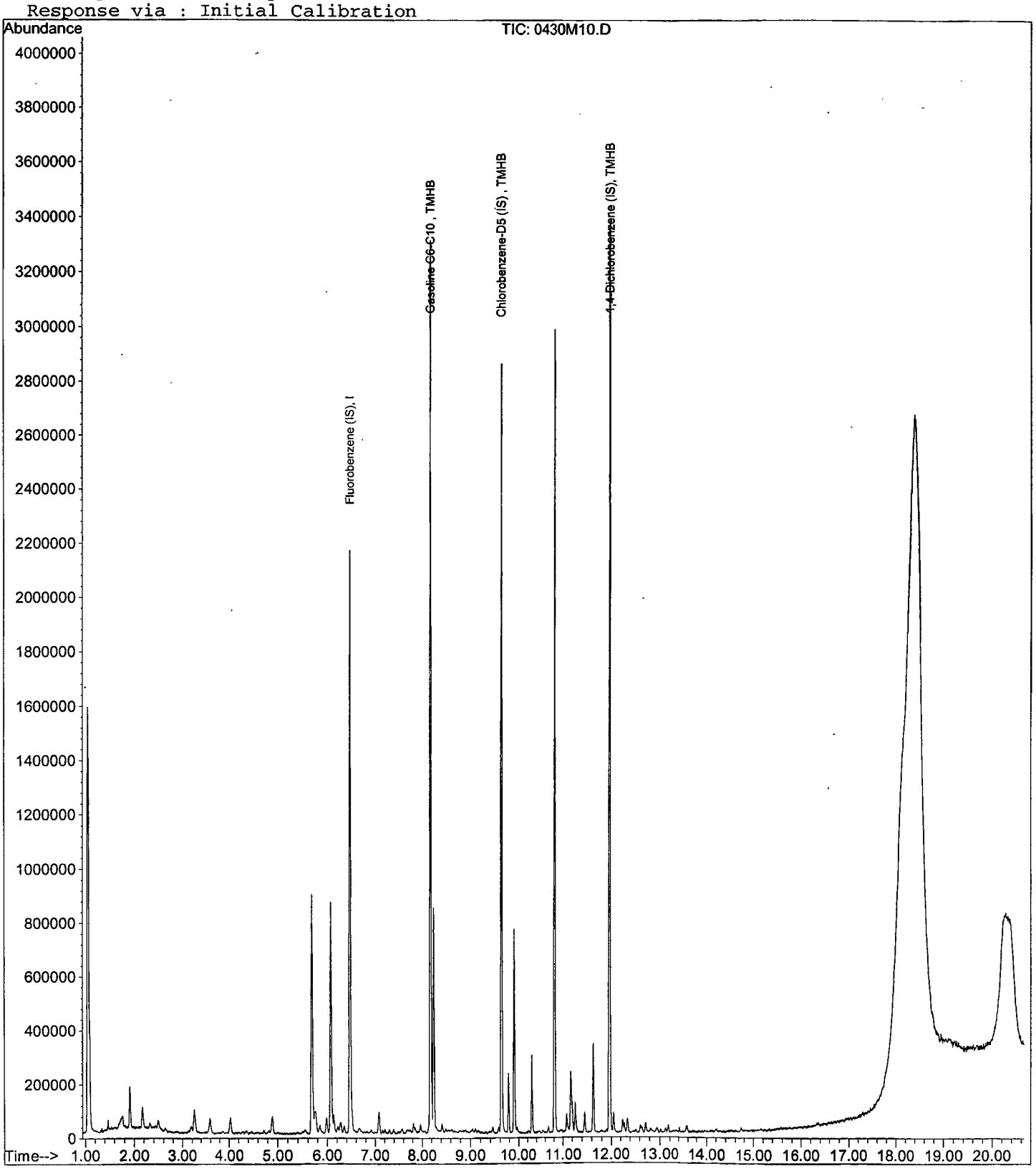
Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M10.D
Acq On : 30 Apr 20 16:03
Sample : 300ug/L GAS STD 4/30/20
Misc : IS 3/25/20

Vial: 9
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 13:19 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0430M13.D Vial: 10
Acq On : 30 Apr 20 17:21 Operator: LP,DG,CMM
Sample : 600ug/L GAS STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 13:20 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:17:05 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	2280570	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	2644017m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	2590049m	25.000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	45986172m	586.269	ppb	100

(#) = qualifier out of range (m) = manual integration

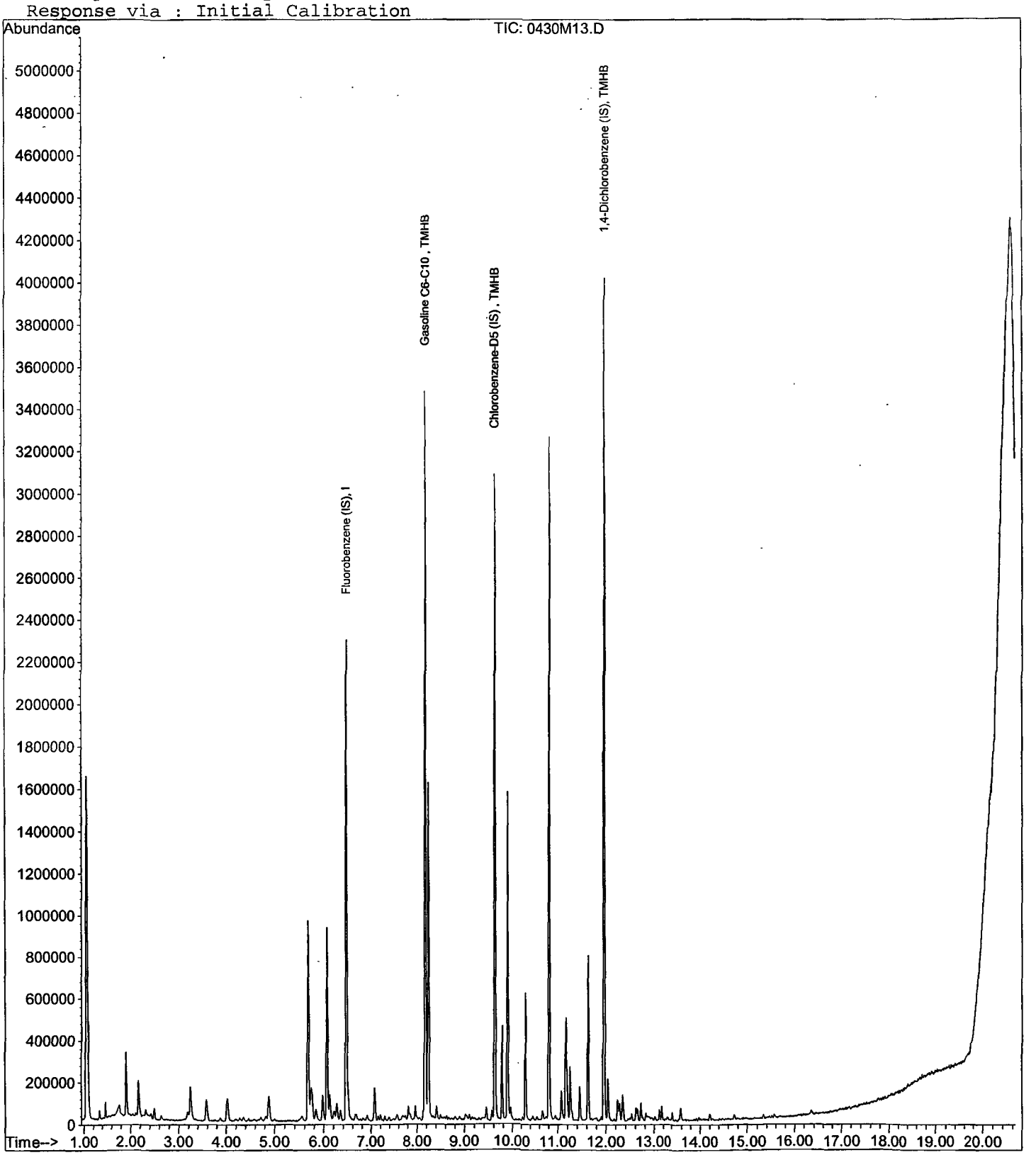
Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M13.D
Acq On : 30 Apr 20 17:21
Sample : 600ug/L GAS STD 4/30/20
Misc : IS 3/25/20

Vial: 10
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 13:20 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0430M14.D Vial: 11
Acq On : 30 Apr 20 17:50 Operator: LP,DG,CMM
Sample : 800ug/L GAS STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 13:21 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:17:05 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	2173353	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	2684928m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	2336394m	25.000	ppb	0.00

System Monitoring Compounds

Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	50073818m	772.535	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report

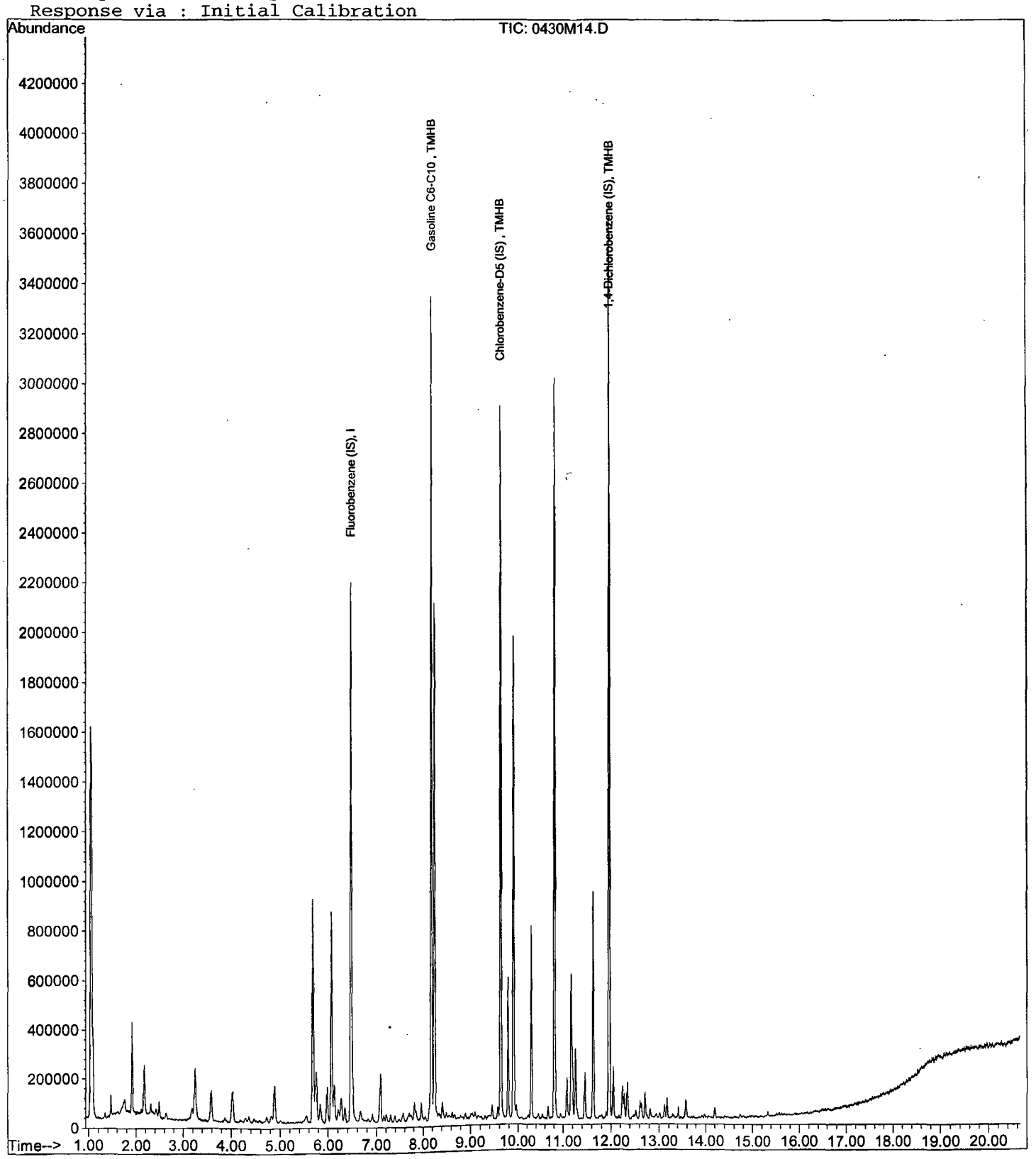
Data File : M:\MAX\DATA\M200430\0430M14.D
Acq On : 30 Apr 20 17:50
Sample : 800ug/L GAS STD 4/30/20
Misc : IS 3/25/20

Vial: 11
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 13:21 2020

Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0430M15.D
Acq On : 30 Apr 20 18:19
Sample : 1000ug/L GAS STD 4/30/20
Misc : IS 3/25/20

Vial: 12
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 13:22 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:17:05 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	2161332	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	3037353m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	2509557m	25.000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	56861380m	984.262	ppb	100

(#) = qualifier out of range (m) = manual integration

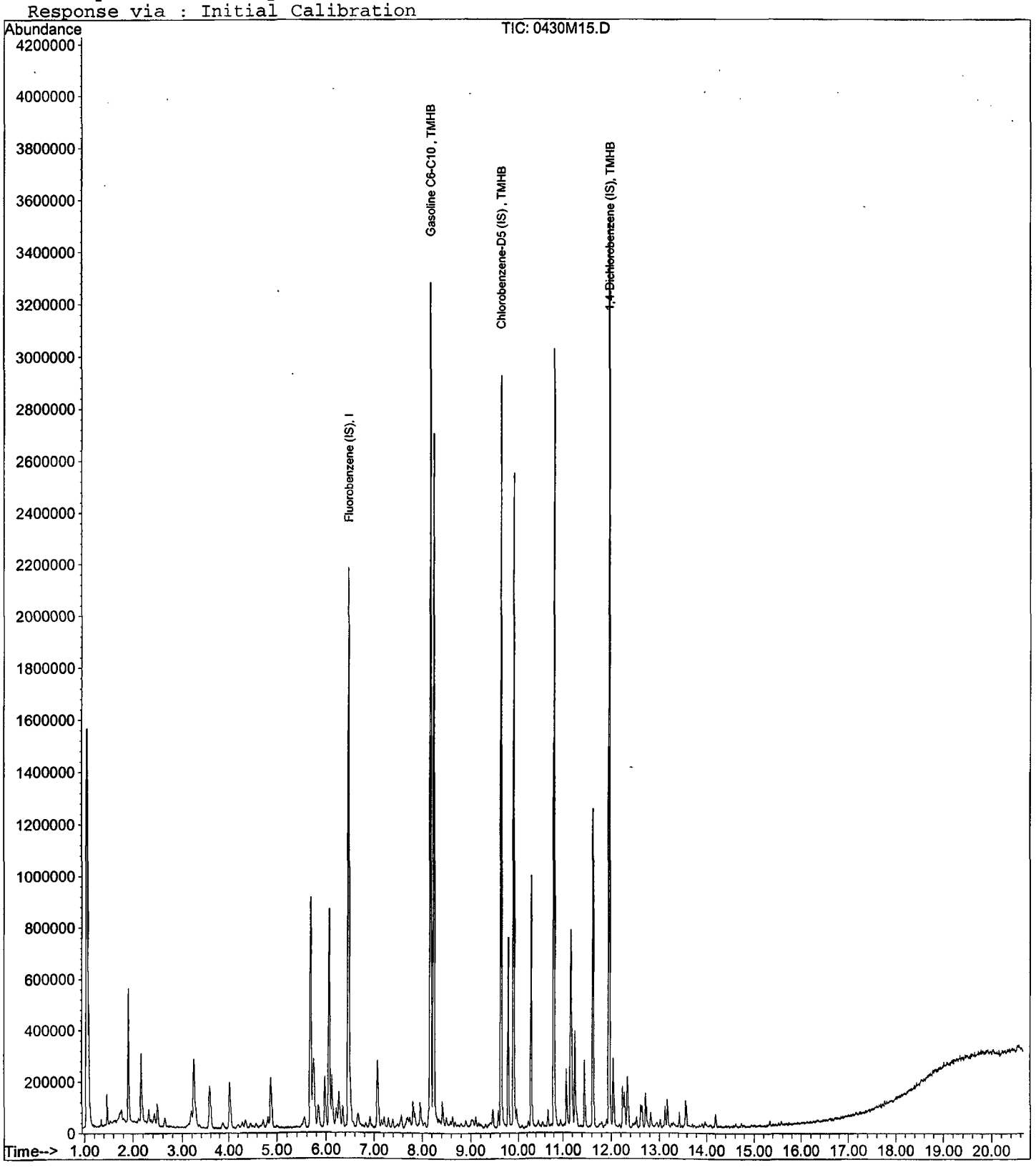
Quantitation Report

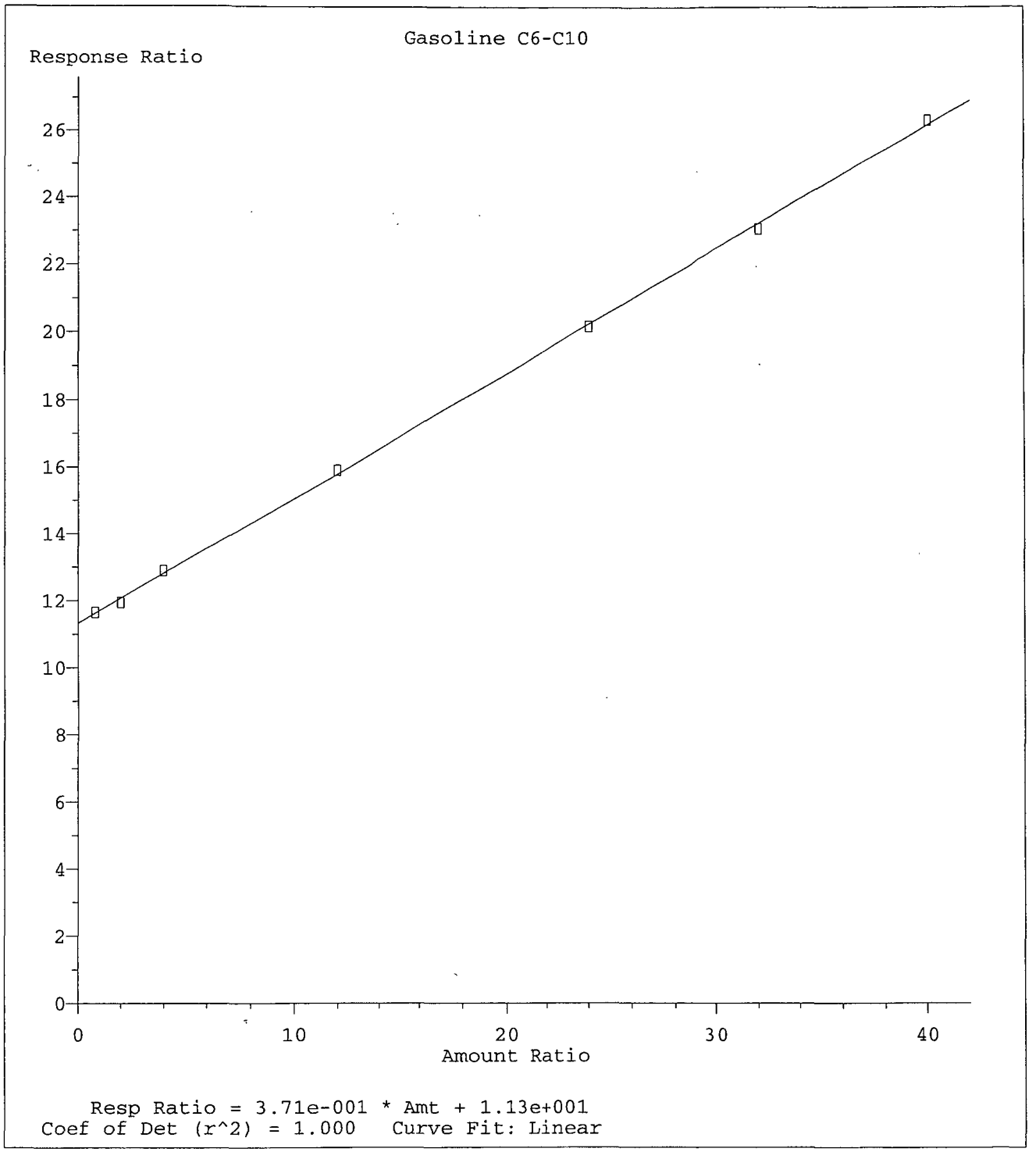
Data File : M:\MAX\DATA\M200430\0430M15.D
Acq On : 30 Apr 20 18:19
Sample : 1000ug/L GAS STD 4/30/20
Misc : IS 3/25/20

Vial: 12
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 13:22 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration





Method Name: M:\MAX\DATA\M200430\MGAS0430.M
Calibration Table Last Updated: Fri May 01 13:22:09 2020

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 04/30/20
Instrument: Max
Initial Cal. Date: 04/30/20
Data File: 0430M16.D

		Compound	MEAN	CCRF	%D		%Drift
1	TMHB	Gasoline C6-C10	3.899	1.336	66	TMHBL	5.6
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
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34							
35							
36							
37							
38							
39							
40							
		Average			66.0		

Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0430M16.D Vial: 13
Acq On : 30 Apr 20 18:48 Operator: LP,DG,CMM
Sample : (SS)300ug/L GAS STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 13:24 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	2153215	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	2063079m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	2083415m	25.000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	34513262m	316.769	ppb	100

(#) = qualifier out of range (m) = manual integration

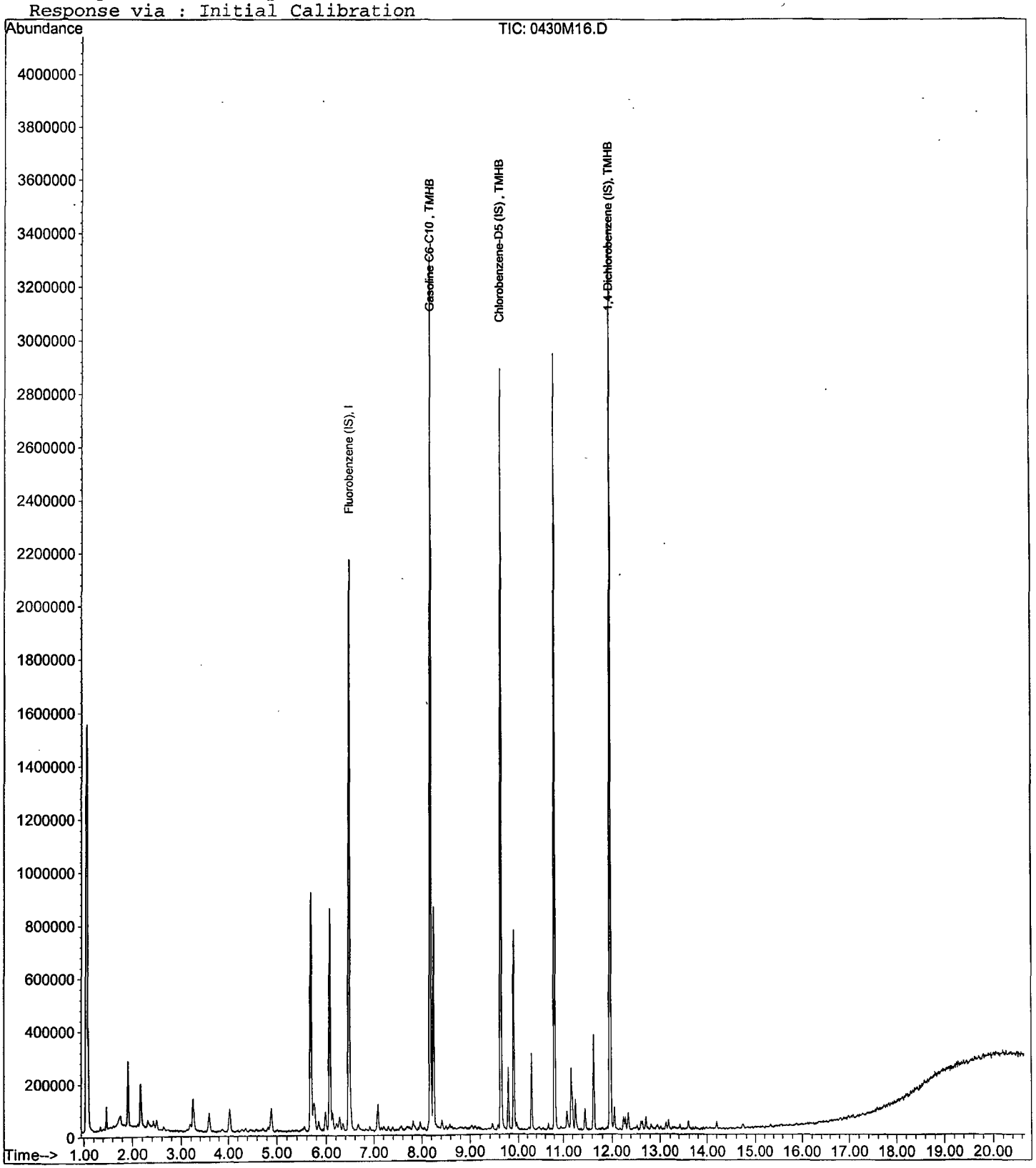
Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M16.D
Acq On : 30 Apr 20 18:48
Sample : (SS)300ug/L GAS STD 4/30/20
Misc : IS 3/25/20

Vial: 13
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 1 13:24 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 04/30/20
Matrix: water Instrument: Max Initials: DG

		Compound	0430M18.D 0.3	0430M19.D 0.5	0430M20.D 1	0430M21.D 2	0430M22.D 5	0430M23 D 10	0430M24 D 20	0430M25.D 40	0430M26.D 100		Avg	%RSD	Type	r^2	Q	MRF
1	I	Fluorobenzene (IS)	ISTD															
2	S	Dibromofluoromethane(S)	0.2837	0.2847	0.2530	0.2640	0.2789	0.2822	0.2787	0.2737	0.2577		0.27	4.3	S			
3	S	1,2-DCA-D4(S)	0.3510	0.3396	0.2876	0.3079	0.3314	0.3503	0.3411	0.3491	0.3244		0.33	6.5	S			
4	I	Chlorobenzene-D5 (IS)	ISTD															
5	S	Toluene-D8(S)	1.293	1.290	1.126	1.112	1.175	1.221	1.198	1.225	1.092		1.2	6.1	S			
6	S	4-Bromofluorobenzene(S)	0.5813	0.5584	0.4666	0.4705	0.4856	0.5114	0.4957	0.5135	0.5017		0.51	7.5	S			
7	I	1,4-Dichlorobenzene-D (IS)	ISTD															
8																		
9																		
10																		
11																		
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13																		
14																		
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Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M18.D Vial: 15
Acq On : 30 Apr 20 19:46 Operator: LP,DG,CMM
Sample : 0.3ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1854321	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1584286	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	992003	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.68	111	105227	5.197	ppb	0.00
Spiked Amount 25.000			Recovery =	20.788%		
3) 1,2-DCA-D4(S)	6.07	65	130162	5.296	ppb	0.00
Spiked Amount 25.000			Recovery =	21.184%		
5) Toluene-D8(S)	8.18	98	409844	5.422	ppb	0.00
Spiked Amount 25.000			Recovery =	21.688%		
6) 4-Bromofluorobenzene(S)	10.81	95	184186	5.706	ppb	0.00
Spiked Amount 25.000			Recovery =	22.824%		

Target Compounds Qvalue

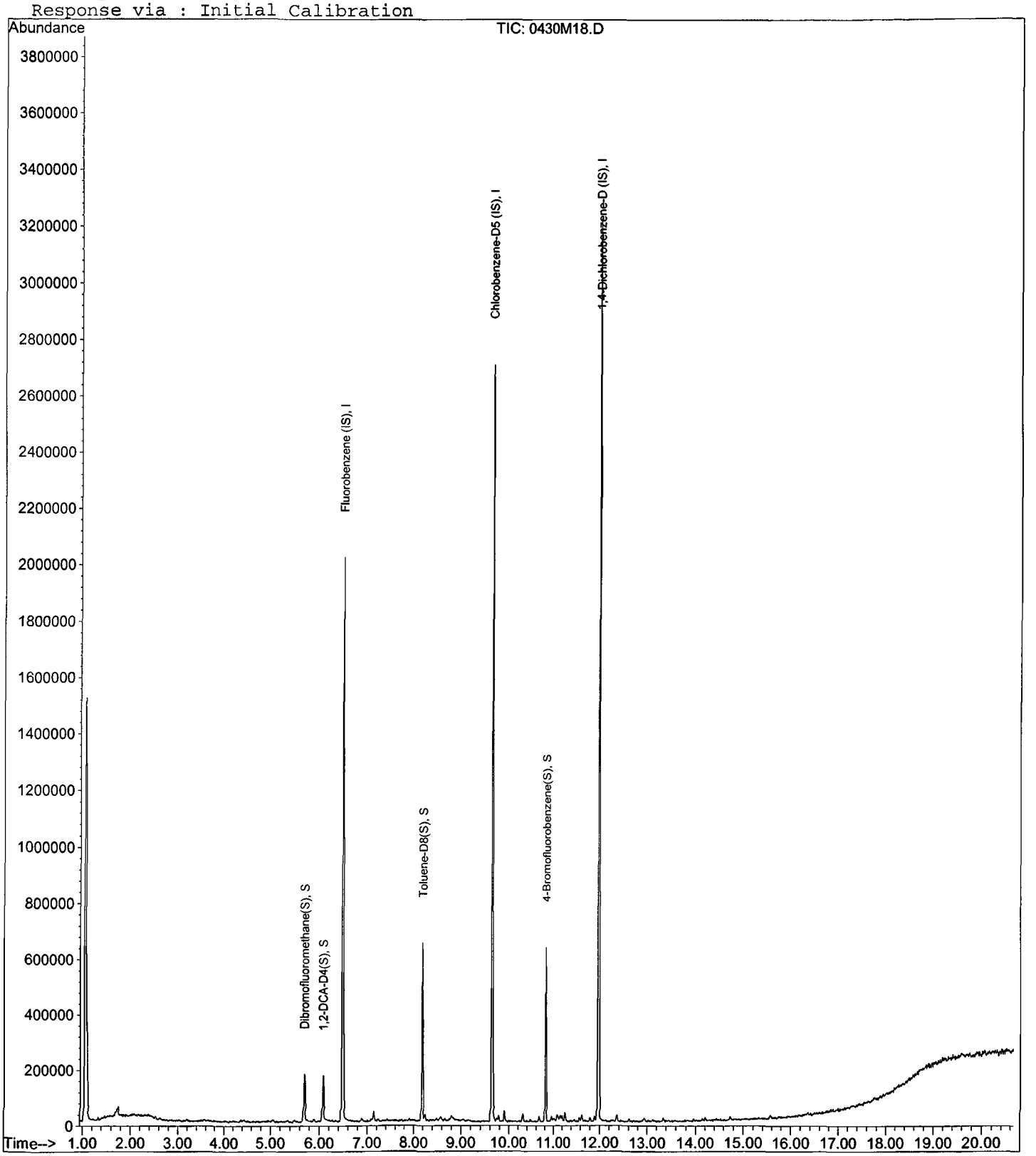
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M18.D Vial: 15
Acq On : 30 Apr 20 19:46 Operator: LP,DG,CMM
Sample : 0.3ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M19.D Vial: 16
Acq On : 30 Apr 20 20:15 Operator: LP,DG,CMM
Sample : 0.5ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1758160	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1490203	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	932540	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.69	111	100124	5.216	ppb	0.00
Spiked Amount 25.000			Recovery =	20.864%		
3) 1,2-DCA-D4(S)	6.07	65	119422	5.124	ppb	0.00
Spiked Amount 25.000			Recovery =	20.496%		
5) Toluene-D8(S)	8.18	98	384554	5.409	ppb	0.00
Spiked Amount 25.000			Recovery =	21.636%		
6) 4-Bromofluorobenzene(S)	10.81	95	166412	5.480	ppb	0.00
Spiked Amount 25.000			Recovery =	21.920%		

Target Compounds Qvalue

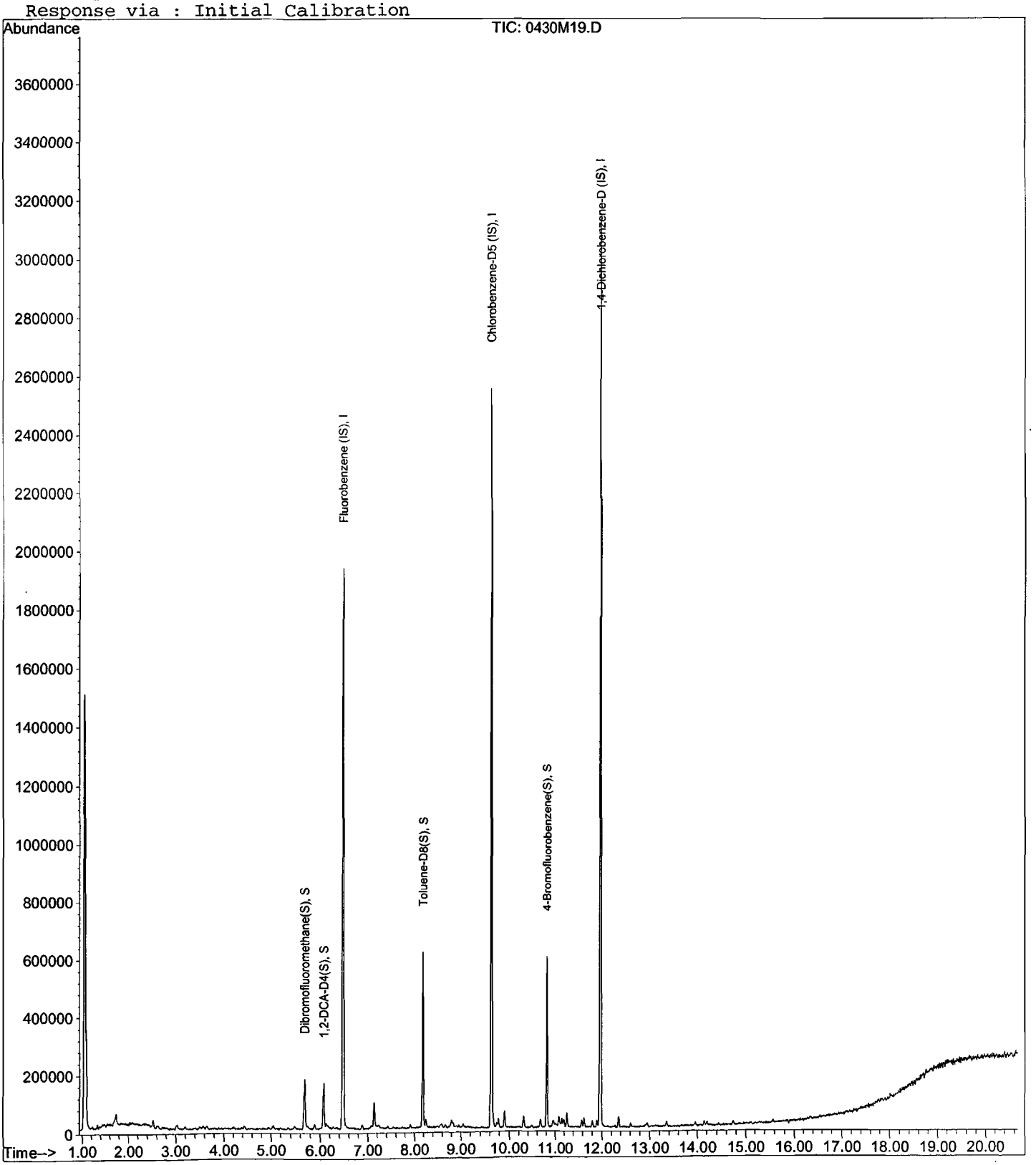
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M19.D Vial: 16
Acq On : 30 Apr 20 20:15 Operator: LP,DG,CMM
Sample : 0.5ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M20.D Vial: 17
Acq On : 30 Apr 20 20:44 Operator: LP,DG,CMM
Sample : 1.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1773357	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1505733	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	949705	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.69	111	179438	9.267	ppb	0.00
Spiked Amount 25.000			Recovery =	37.068%		
3) 1,2-DCA-D4(S)	6.07	65	204000	8.679	ppb	0.00
Spiked Amount 25.000			Recovery =	34.716%		
5) Toluene-D8(S)	8.18	98	678315	9.443	ppb	0.00
Spiked Amount 25.000			Recovery =	37.772%		
6) 4-Bromofluorobenzene(S)	10.81	95	281046	9.160	ppb	0.00
Spiked Amount 25.000			Recovery =	36.640%		

Target Compounds Qvalue

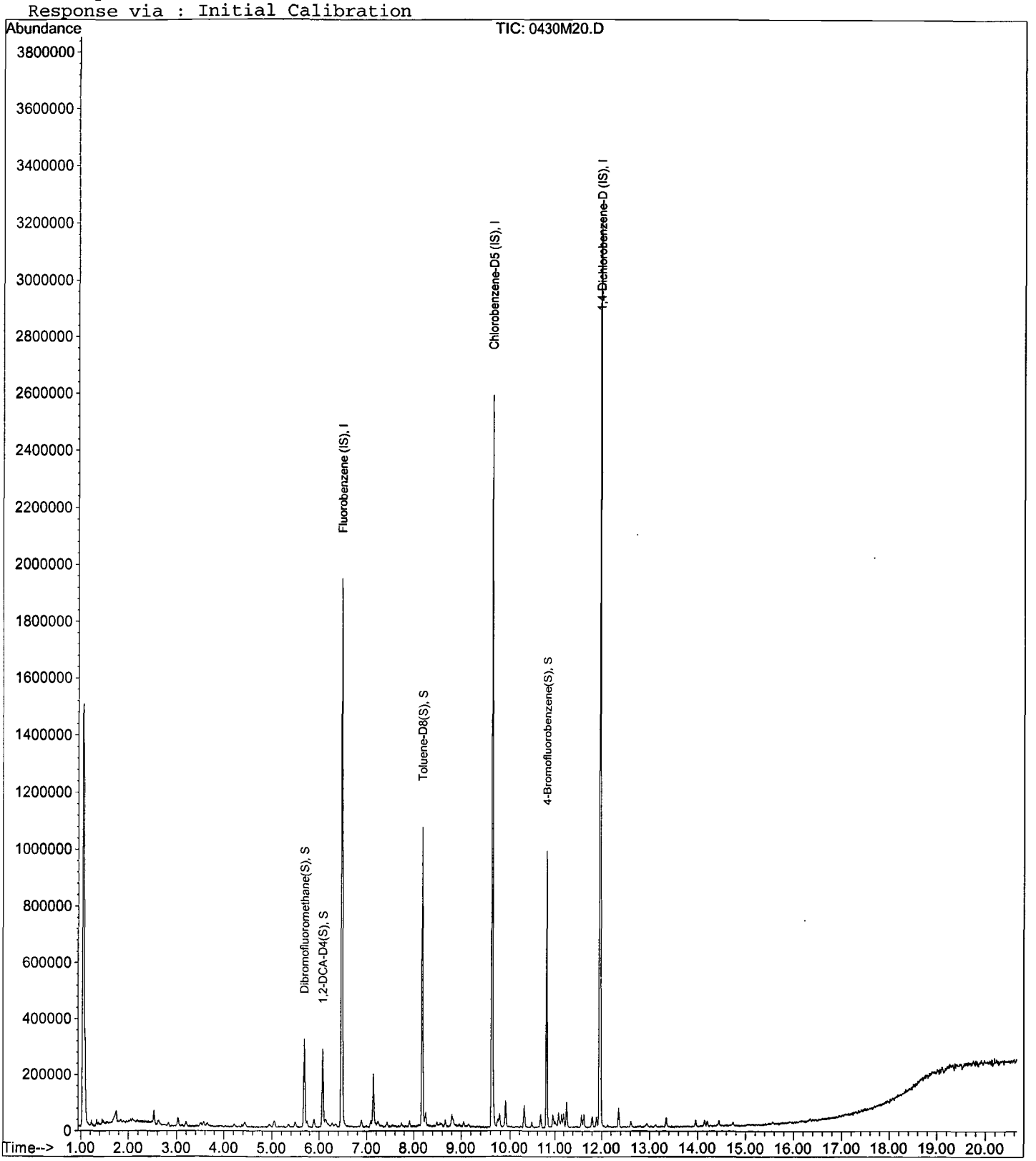
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M20.D Vial: 17
Acq On : 30 Apr 20 20:44 Operator: LP,DG,CMM
Sample : 1.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M21.D Vial: 18
Acq On : 30 Apr 20 21:13 Operator: LP,DG,CMM
Sample : 2.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1674523	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1426159	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	916370	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.68	111	176857	9.673	ppb	0.00
Spiked Amount 25.000			Recovery =	38.692%		
3) 1,2-DCA-D4(S)	6.07	65	206251	9.292	ppb	0.00
Spiked Amount 25.000			Recovery =	37.168%		
5) Toluene-D8(S)	8.18	98	634610	9.327	ppb	0.00
Spiked Amount 25.000			Recovery =	37.308%		
6) 4-Bromofluorobenzene(S)	10.81	95	268377	9.235	ppb	0.00
Spiked Amount 25.000			Recovery =	36.940%		
Target Compounds						Qvalue

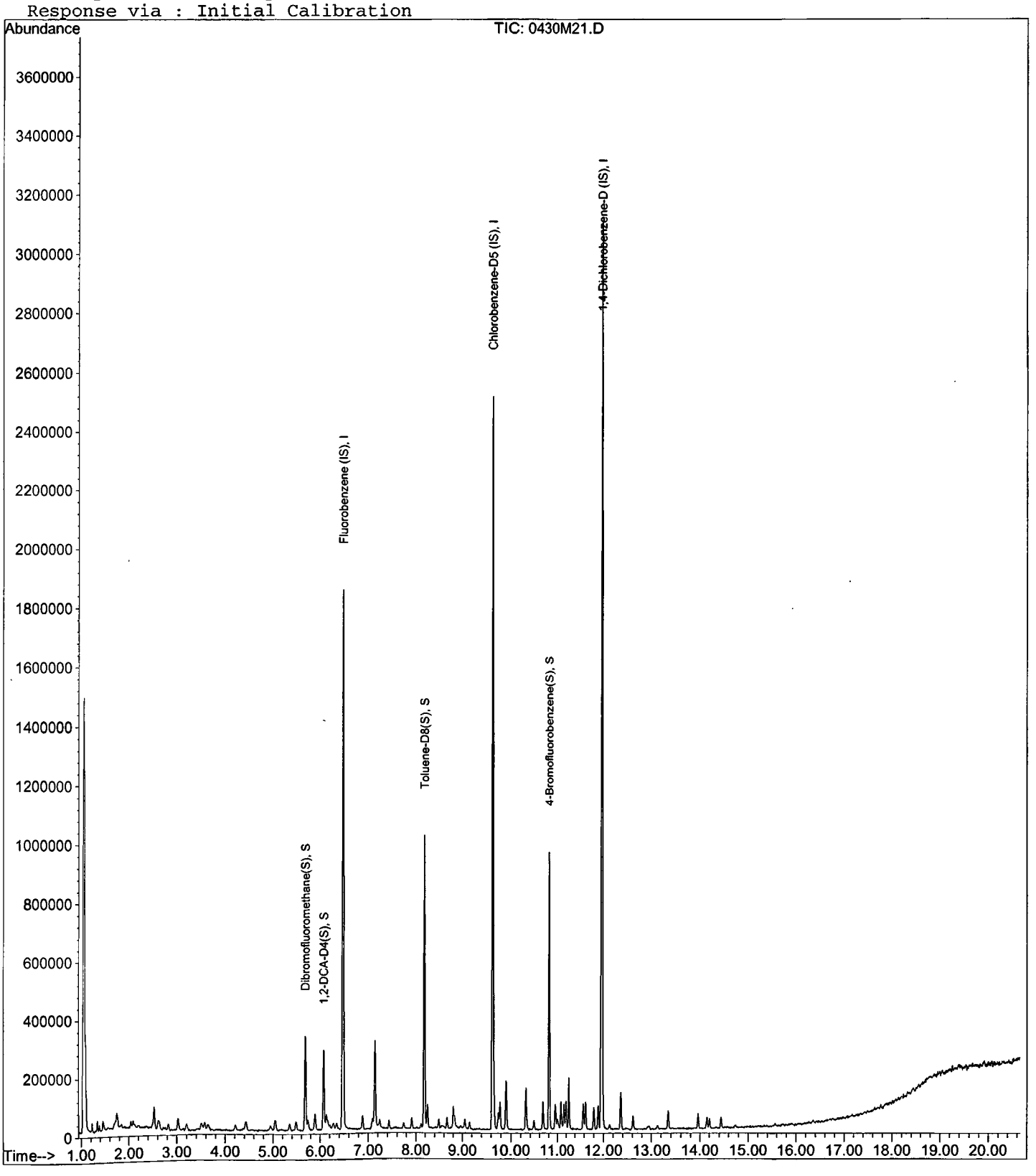
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M21.D Vial: 18
Acq On : 30 Apr 20 21:13 Operator: LP,DG,CMM
Sample : 2.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M22.D Vial: 19
Acq On : 30 Apr 20 21:42 Operator: LP,DG,CMM
Sample : 5.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1692782	25.000 ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1470774	25.000 ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	945304	25.000 ppb	0.00
System Monitoring Compounds					
2) Dibromofluoromethane(S)	5.68	111	472120	25.544 ppb	0.00
Spiked Amount 25.000			Recovery	= 102.176%	
3) 1,2-DCA-D4(S)	6.07	65	561019	25.003 ppb	0.00
Spiked Amount 25.000			Recovery	= 100.012%	
5) Toluene-D8(S)	8.18	98	1728660	24.636 ppb	0.00
Spiked Amount 25.000			Recovery	= 98.544%	
6) 4-Bromofluorobenzene(S)	10.81	95	714241	23.833 ppb	0.00
Spiked Amount 25.000			Recovery	= 95.332%	

Target Compounds Qvalue

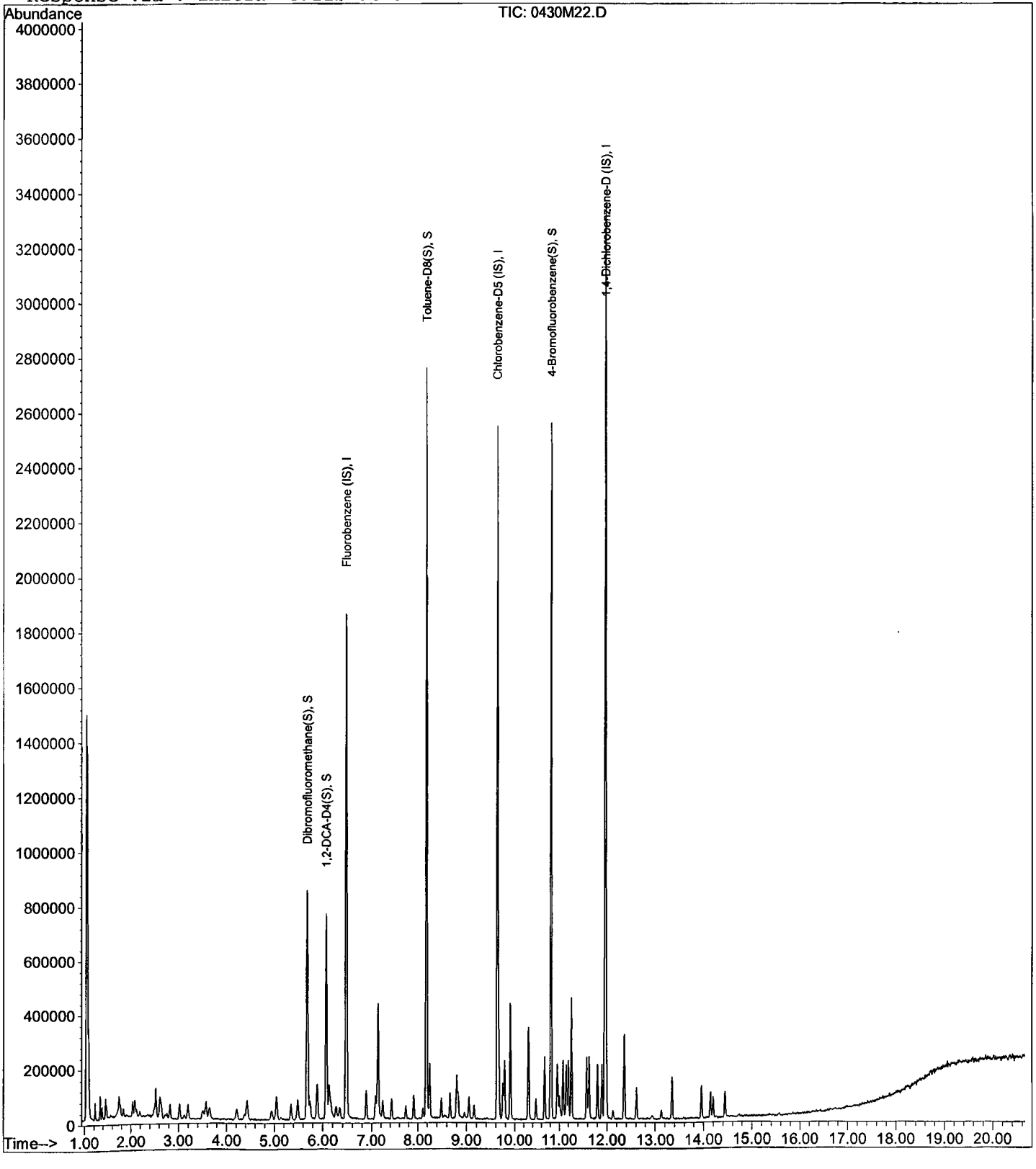
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M22.D Vial: 19
Acq On : 30 Apr 20 21:42 Operator: LP,DG,CMM
Sample : 5.0ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M23.D Vial: 20
Acq On : 30 Apr 20 22:11 Operator: LP,DG,CMM
Sample : 10ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1631277	25.000 ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1391375	25.000 ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	912008	25.000 ppb	0.00
System Monitoring Compounds					
2) Dibromofluoromethane(S)	5.68	111	460419	25.850 ppb	0.00
Spiked Amount 25.000			Recovery	= 103.400%	
3) 1,2-DCA-D4(S)	6.07	65	571363	26.424 ppb	0.00
Spiked Amount 25.000			Recovery	= 105.696%	
5) Toluene-D8(S)	8.18	98	1699264	25.599 ppb	0.00
Spiked Amount 25.000			Recovery	= 102.396%	
6) 4-Bromofluorobenzene(S)	10.81	95	711502	25.096 ppb	0.00
Spiked Amount 25.000			Recovery	= 100.384%	

Target Compounds Qvalue

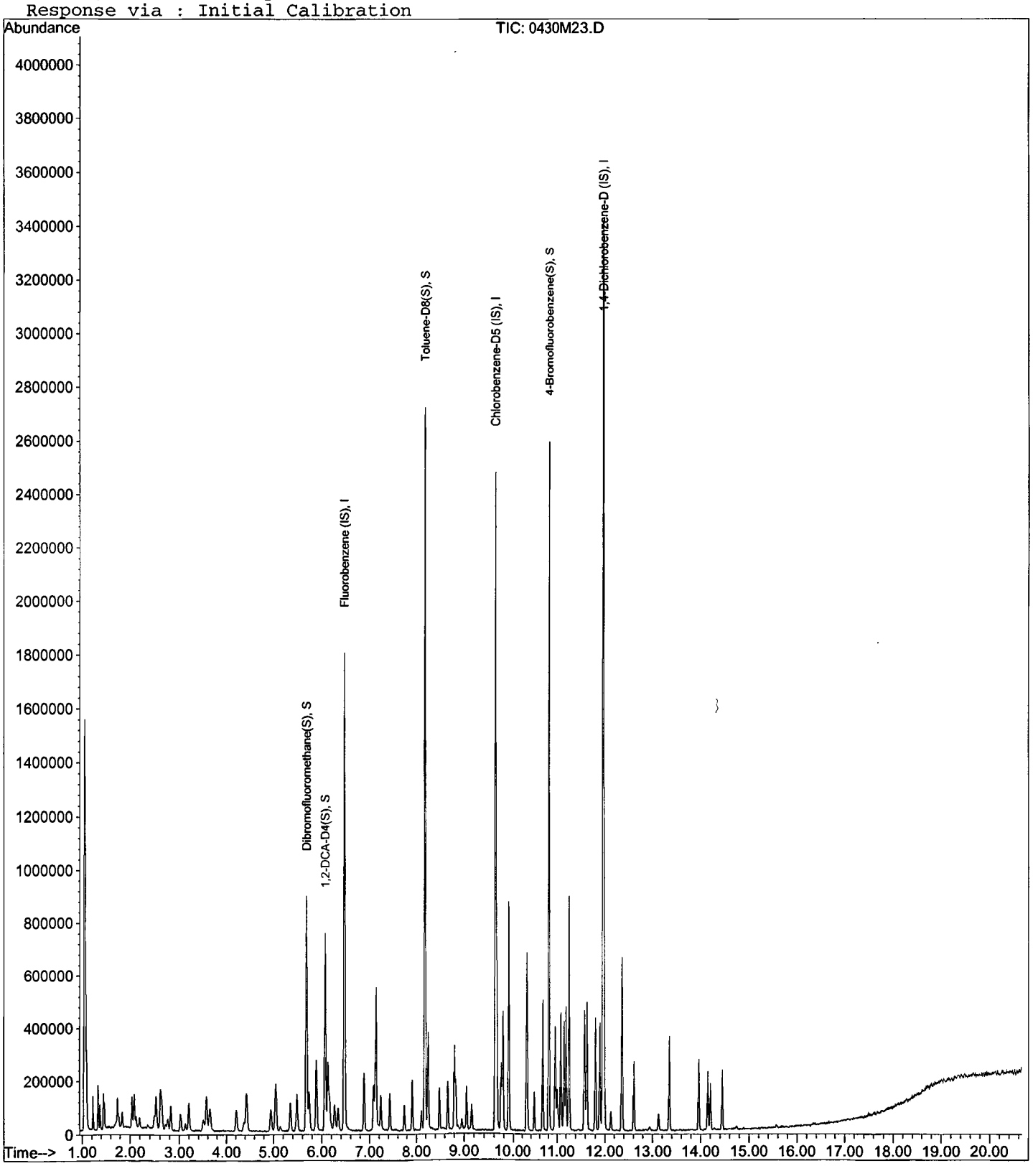
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M23.D Vial: 20
Acq On : 30 Apr 20 22:11 Operator: LP,DG,CMM
Sample : 10ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M24.D Vial: 21
Acq On : 30 Apr 20 22:40 Operator: LP,DG,CMM
Sample : 20ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1606979	25.000 ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1389499	25.000 ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	919844	25.000 ppb	0.00
System Monitoring Compounds					
2) Dibromofluoromethane(S)	5.68	111	895753	51.053 ppb	0.00
Spiked Amount 25.000			Recovery	= 204.212%	
3) 1,2-DCA-D4(S)	6.07	65	1096411	51.473 ppb	0.00
Spiked Amount 25.000			Recovery	= 205.892%	
5) Toluene-D8(S)	8.18	98	3329304	50.223 ppb	0.00
Spiked Amount 25.000			Recovery	= 200.892%	
6) 4-Bromofluorobenzene(S)	10.81	95	1377460	48.651 ppb	0.00
Spiked Amount 25.000			Recovery	= 194.604%	

Target Compounds Qvalue

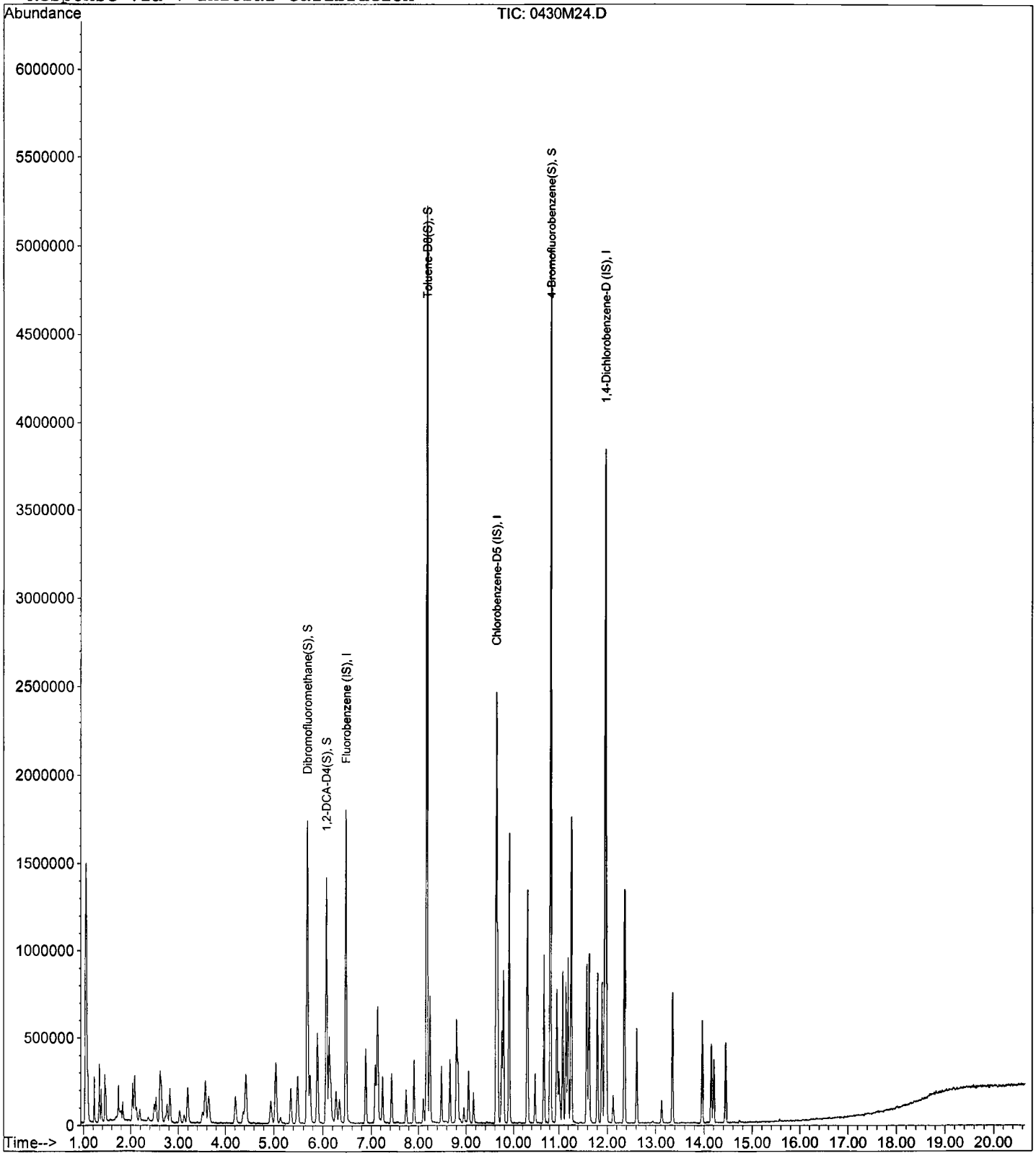
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M24.D Vial: 21
Acq On : 30 Apr 20 22:40 Operator: LP,DG,CMM
Sample : 20ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M25.D Vial: 22
Acq On : 30 Apr 20 23:09 Operator: LP,DG,CMM
Sample : 40ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1511981	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1321705	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	901374	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.68	111	827524	50.127	ppb	0.00
Spiked Amount 25.000			Recovery = 200.508%			
3) 1,2-DCA-D4(S)	6.07	65	1055808	52.681	ppb	0.00
Spiked Amount 25.000			Recovery = 210.724%			
5) Toluene-D8(S)	8.18	98	3237949	51.350	ppb	0.00
Spiked Amount 25.000			Recovery = 205.400%			
6) 4-Bromofluorobenzene(S)	10.81	95	1357514	50.406	ppb	0.00
Spiked Amount 25.000			Recovery = 201.624%			

Target Compounds Qvalue

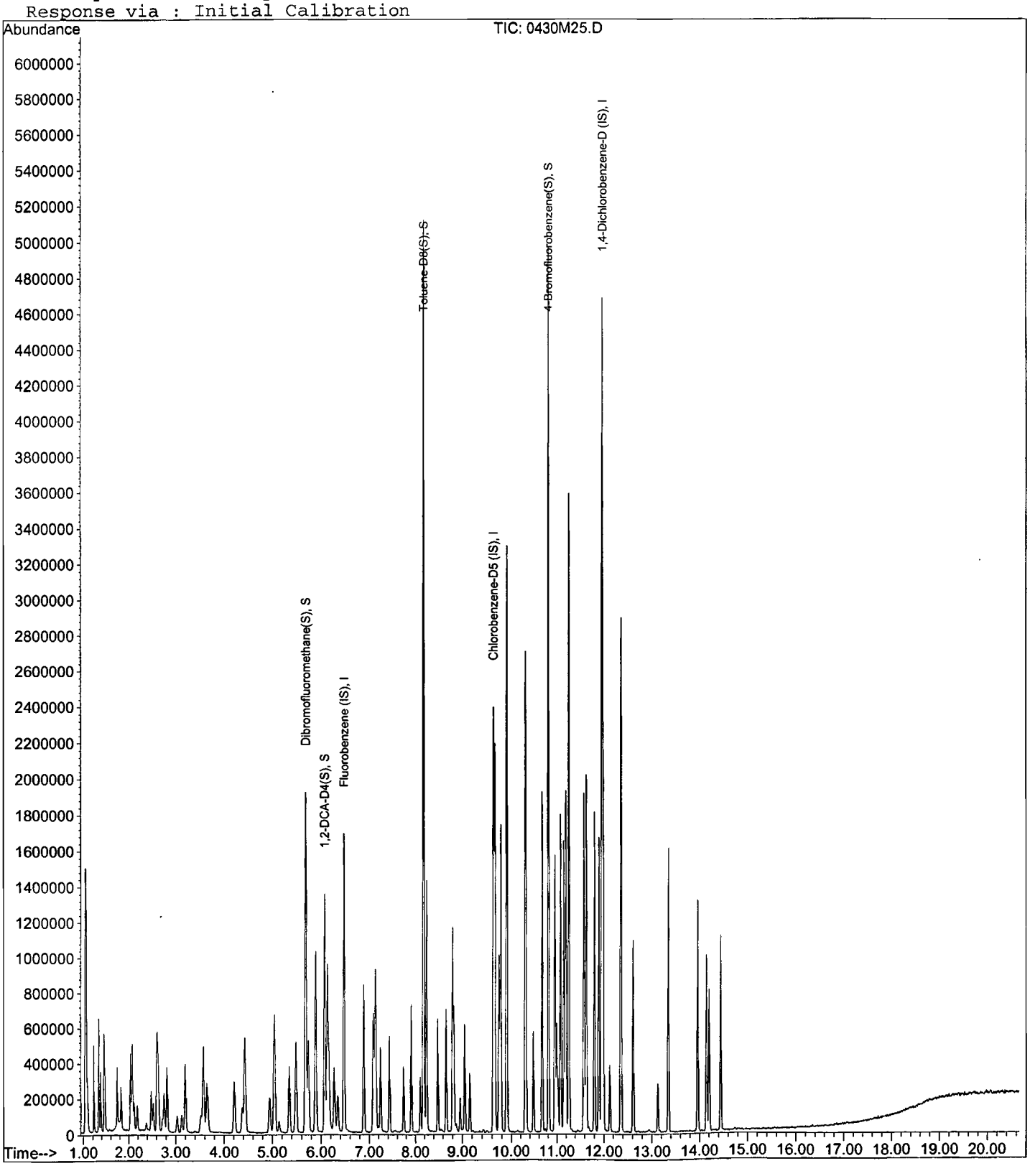
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M25.D Vial: 22
Acq On : 30 Apr 20 23:09 Operator: LP,DG,CMM
Sample : 40ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0430M26.D Vial: 23
Acq On : 30 Apr 20 23:38 Operator: LP,DG,CMM
Sample : 100ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1507349	25.000 ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1402651	25.000 ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	1033531	25.000 ppb	0.00
System Monitoring Compounds					
2) Dibromofluoromethane(S)	5.68	111	1553513	94.393 ppb	0.00
Spiked Amount 25.000			Recovery = 377.572%		
3) 1,2-DCA-D4(S)	6.07	65	1955675	97.880 ppb	0.00
Spiked Amount 25.000			Recovery = 391.520%		
5) Toluene-D8(S)	8.18	98	6129155	91.592 ppb	0.00
Spiked Amount 25.000			Recovery = 366.368%		
6) 4-Bromofluorobenzene(S)	10.81	95	2815055	98.495 ppb	0.00
Spiked Amount 25.000			Recovery = 393.980%		

Target Compounds Qvalue

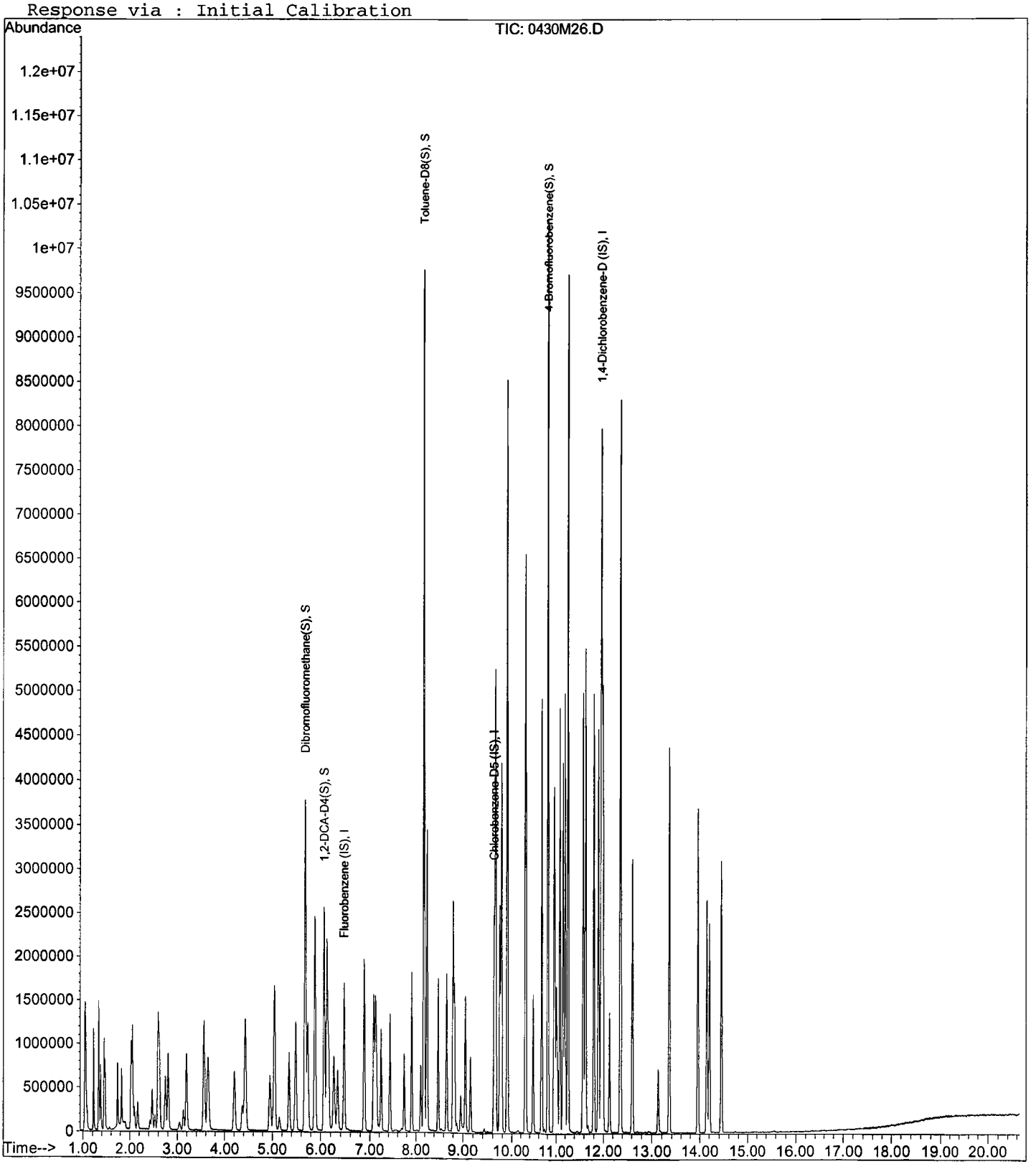
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0430M26.D Vial: 23
Acq On : 30 Apr 20 23:38 Operator: LP,DG,CMM
Sample : 100ug/L VOC STD 4/30/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:06 2020 Quant Results File: SUR430W.RES

Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 1 May 20 14:19
Instrument: Max
Initial Cal. Date: 04/30/20
Data File: 0501M08.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	TMHB	Gasoline C6-C10	3.899	1.318	66	TMHBL	0.94
3	TMHB	Chlorobenzene-D5 (IS)	ISTD			TMHB	
4	TMHB	1,4-Dichlorobenzene (IS)	ISTD			TMHB	
5							
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40							
		Average			66.0		

Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M08.D Vial: 5
Acq On : 1 May 20 14:19 Operator: LP,DG,CMM
Sample : 200501A CCV 300ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 14:48 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	1411023	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1393430m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1592376m	25.000	ppb	0.00

System Monitoring Compounds

Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	22324904m	302.833	ppb	100

(#) = qualifier out of range (m) = manual integration
0501M08.D MGAS0430.M Mon May 04 15:54:26 2020

VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 1 May 20 14:19
Instrument: Max
Initial Cal. Date: 04/30/20
Data File: 0501M08.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	S	Dibromofluoromethane(S)	0.2730	0.2891	5.9	S	
3	S	1,2-DCA-D4(S)	0.3314	0.3709	12	S	
4	I	Chlorobenzene-D5 (IS)	ISTD			I	
5	S	Toluene-D8(S)	1.193	1.136	4.7	S	
6	S	4-Bromofluorobenzene(S)	0.5094	0.4759	6.6	S	
7	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
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40							
		Average			7.3		

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M08.D Vial: 5
Acq On : 1 May 20 14:19 Operator: LP,DG,CMM
Sample : 200501A CCV 300ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:36 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1248216	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1108881	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	746432	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.68	111	360918	26.482	ppb	0.00
Spiked Amount 25.000			Recovery =	105.928%		
3) 1,2-DCA-D4(S)	6.07	65	462909	27.978	ppb	0.00
Spiked Amount 25.000			Recovery =	111.912%		
5) Toluene-D8(S)	8.18	98	1260077	23.819	ppb	0.00
Spiked Amount 25.000			Recovery =	95.276%		
6) 4-Bromofluorobenzene(S)	10.81	95	527750	23.357	ppb	0.00
Spiked Amount 25.000			Recovery =	93.428%		

Target Compounds Qvalue

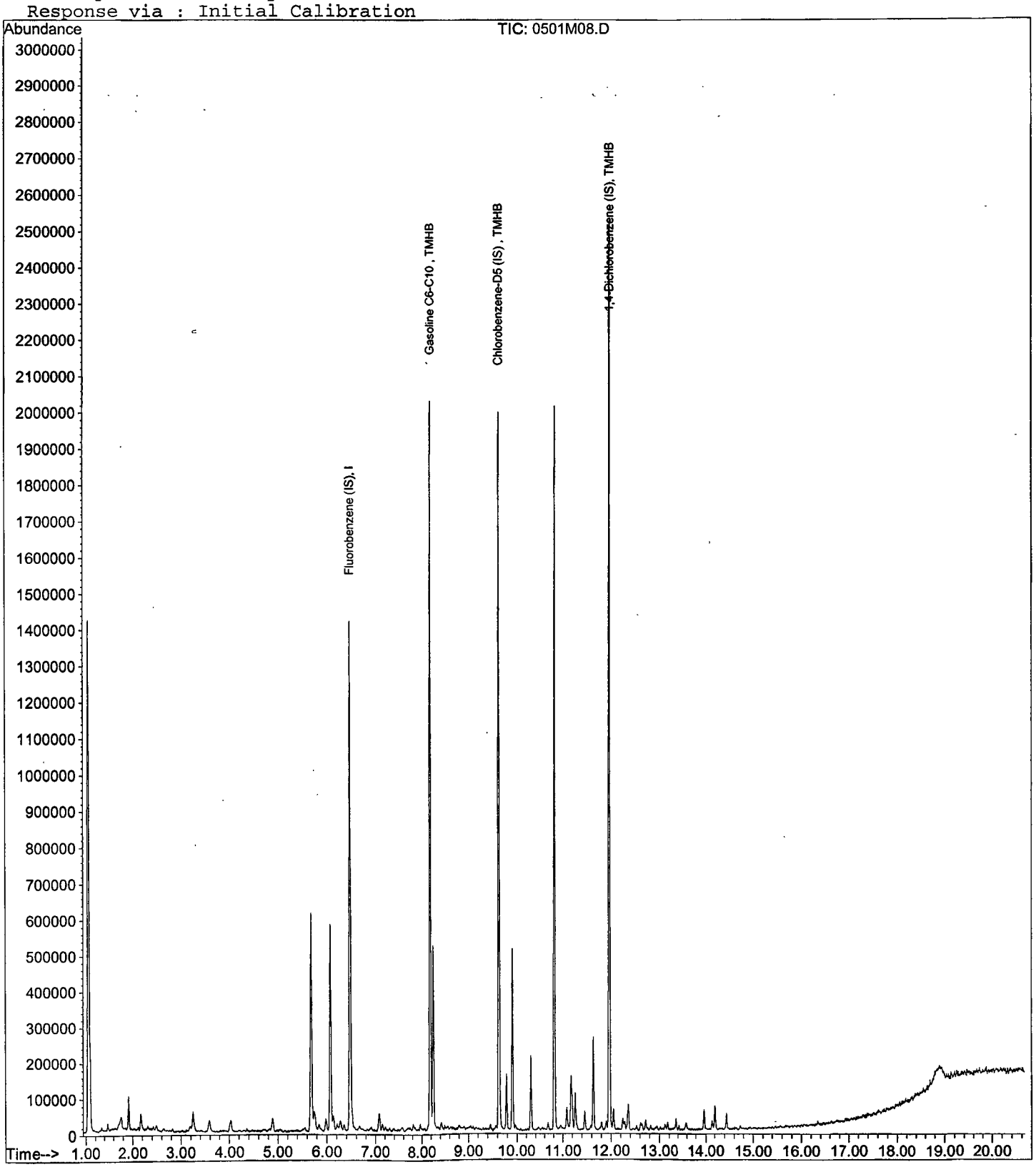
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M08.D Vial: 5
Acq On : 1 May 20 14:19 Operator: LP,DG,CMM
Sample : 200501A CCV 300ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 1 14:48 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



VOLATILE ORGANIC ANALYSIS BY
EPA METHOD 8260B

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 1 May 20 18:40
Instrument: Max
Initial Cal. Date: 04/30/20
Data File: 0501M17.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	S	Dibromofluoromethane(S)	0.2730	0.2941	7.7	S	
3	S	1,2-DCA-D4(S)	0.3314	0.3706	12	S	
4	I	Chlorobenzene-D5 (IS)	ISTD			I	
5	S	Toluene-D8(S)	1.193	1.114	6.6	S	
6	S	4-Bromofluorobenzene(S)	0.5094	0.4834	5.1	S	
7	I	1,4-Dichlorobenzene-D (IS)	ISTD			I	
8							
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40							
		Average			7.9		

Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M17.D Vial: 14
Acq On : 1 May 20 18:40 Operator: LP,DG,CMM
Sample : Ending CCV 300ug/L 5/1/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:34 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	1307844	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1362189m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1515728m	25.000	ppb	0.00

System Monitoring Compounds

Target Compounds						Qvalue
2) Gasoline C6-C10	10.81	TIC	20886221m	312.812	ppb	100

(#) = qualifier out of range (m) = manual integration

VOLATILE ORGANIC ANALYSIS
VOLATILE ORGANIC COMPOUNDS

Form 7

Ending Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix: water

SDG No:
Date Analyzed: 1 May 20 18:40
Instrument: Max
Initial Cal. Date: 04/30/20
Data File: 0501M17.D

		Compound	MEAN	CCRF	%D		%Drift
1	I	Fluorobenzene (IS)	ISTD			I	
2	TMHB	Gasoline C6-C10	3.899	1.331	66	TMHBL	4.3
3	TMHB	Chlorobenzene-D5 (IS)	ISTD			TMHB	
4	TMHB	1,4-Dichlorobenzene (IS)	ISTD			TMHB	
5							
6							
7							
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40							
		Average			66.0		

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M17.D Vial: 14
Acq On : 1 May 20 18:40 Operator: LP,DG,CMM
Sample : Ending CCV 300ug/L 5/1/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:36 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1166628	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1057637	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	708022	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.68	111	343051	26.932	ppb	0.00
Spiked Amount 25.000			Recovery = 107.728%			
3) 1,2-DCA-D4(S)	6.07	65	432339	27.958	ppb	0.00
Spiked Amount 25.000			Recovery = 111.832%			
5) Toluene-D8(S)	8.18	98	1177970	23.345	ppb	0.00
Spiked Amount 25.000			Recovery = 93.380%			
6) 4-Bromofluorobenzene(S)	10.81	95	511252	23.723	ppb	0.00
Spiked Amount 25.000			Recovery = 94.892%			

Target Compounds Qvalue

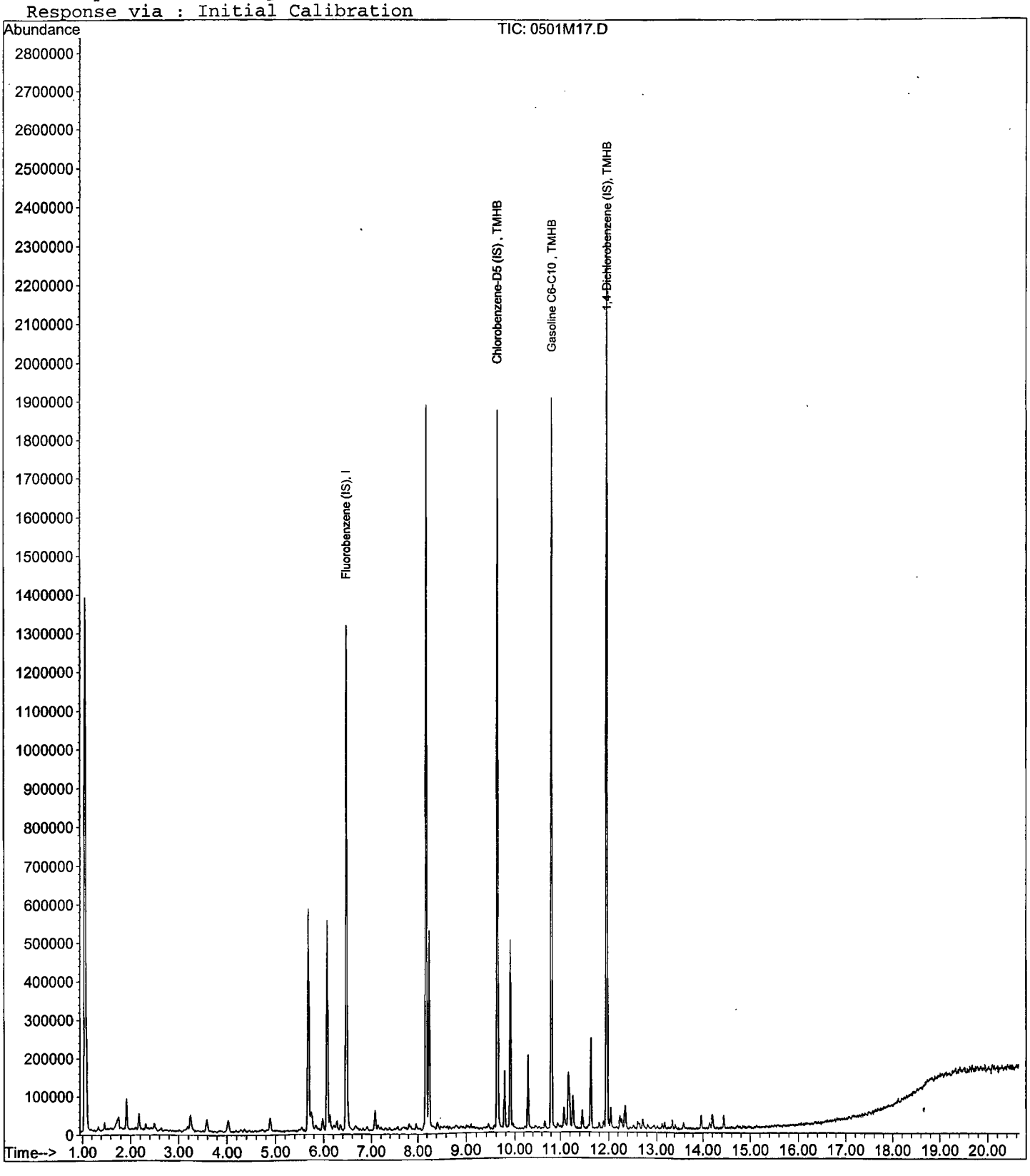
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M17.D Vial: 14
Acq On : 1 May 20 18:40 Operator: LP,DG,CMM
Sample : Ending CCV 300ug/L 5/1/20 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:34 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M12.D Vial: 9
Acq On : 1 May 20 16:15 Operator: LP,DG,CMM
Sample : BA10503W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:35 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	1414711	25.000 ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1179758m	25.000 ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1432693m	25.000 ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M12.D Vial: 9
Acq On : 1 May 20 16:15 Operator: LP,DG,CMM
Sample : BA10503W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:36 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1250763	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1099445	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	733427	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.68	111	337368	24.704	ppb	0.00
Spiked Amount 25.000			Recovery =	98.816%		
3) 1,2-DCA-D4(S)	6.07	65	436203	26.310	ppb	0.00
Spiked Amount 25.000			Recovery =	105.240%		
5) Toluene-D8(S)	8.18	98	1217639	23.214	ppb	0.00
Spiked Amount 25.000			Recovery =	92.856%		
6) 4-Bromofluorobenzene(S)	10.81	95	513969	22.942	ppb	0.00
Spiked Amount 25.000			Recovery =	91.768%		

Target Compounds Qvalue

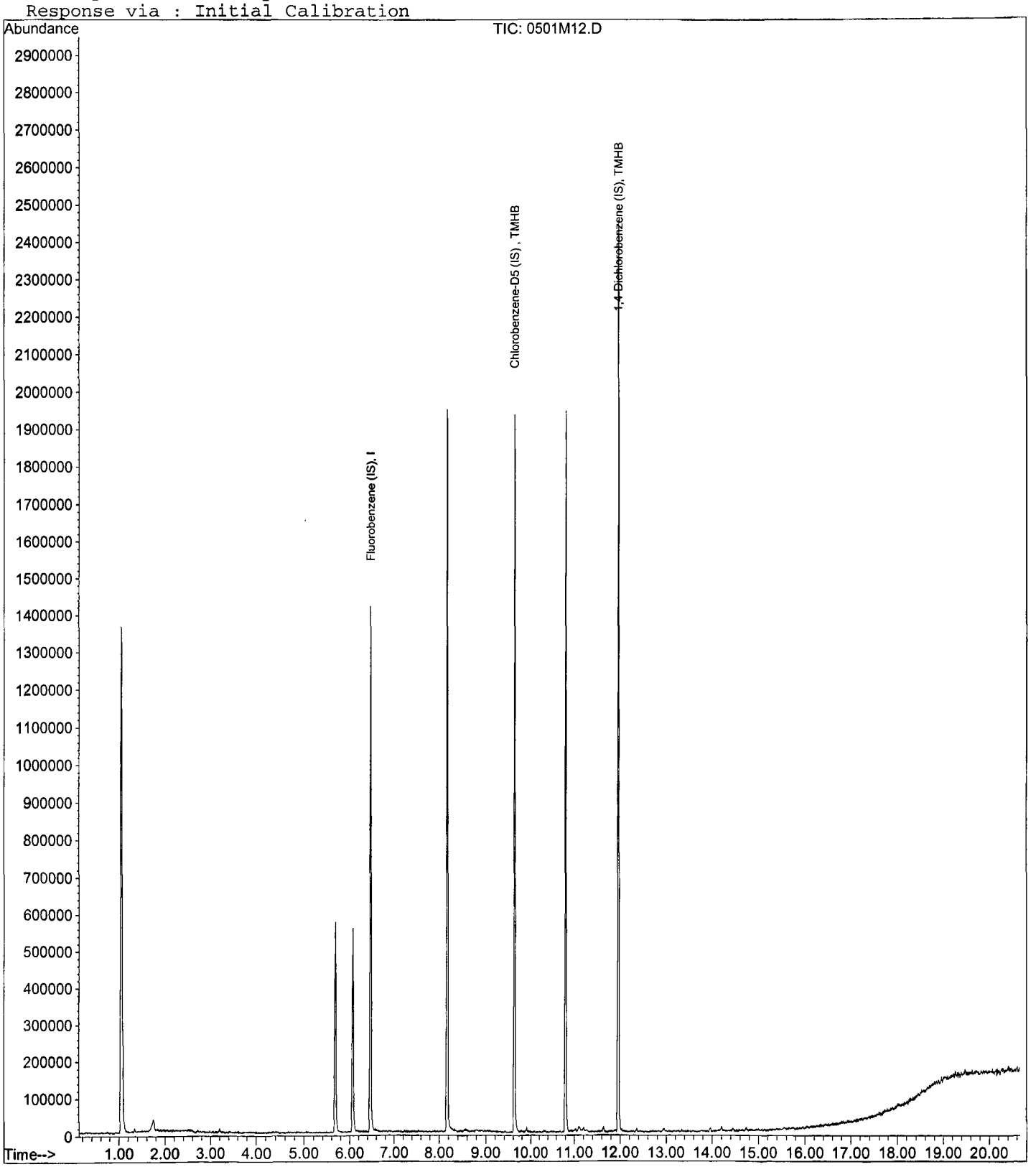
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M12.D Vial: 9
Acq On : 1 May 20 16:15 Operator: LP,DG,CMM
Sample : BA10503W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:35 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M13.D Vial: 10
Acq On : 1 May 20 16:44 Operator: LP,DG,CMM
Sample : BA10504W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:35 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	1382294	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1117716m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1446104m	25.000	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M13.D Vial: 10
Acq On : 1 May 20 16:44 Operator: LP,DG,CMM
Sample : BA10504W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:36 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1225634	25.000 ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1089669	25.000 ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	715154	25.000 ppb	0.00
System Monitoring Compounds					
2) Dibromofluoromethane(S)	5.68	111	339974	25.405 ppb	0.00
Spiked Amount 25.000			Recovery	= 101.620%	
3) 1,2-DCA-D4(S)	6.07	65	442623	27.245 ppb	0.00
Spiked Amount 25.000			Recovery	= 108.980%	
5) Toluene-D8(S)	8.18	98	1216421	23.399 ppb	0.00
Spiked Amount 25.000			Recovery	= 93.596%	
6) 4-Bromofluorobenzene(S)	10.81	95	510963	23.013 ppb	0.00
Spiked Amount 25.000			Recovery	= 92.052%	

Target Compounds Qvalue

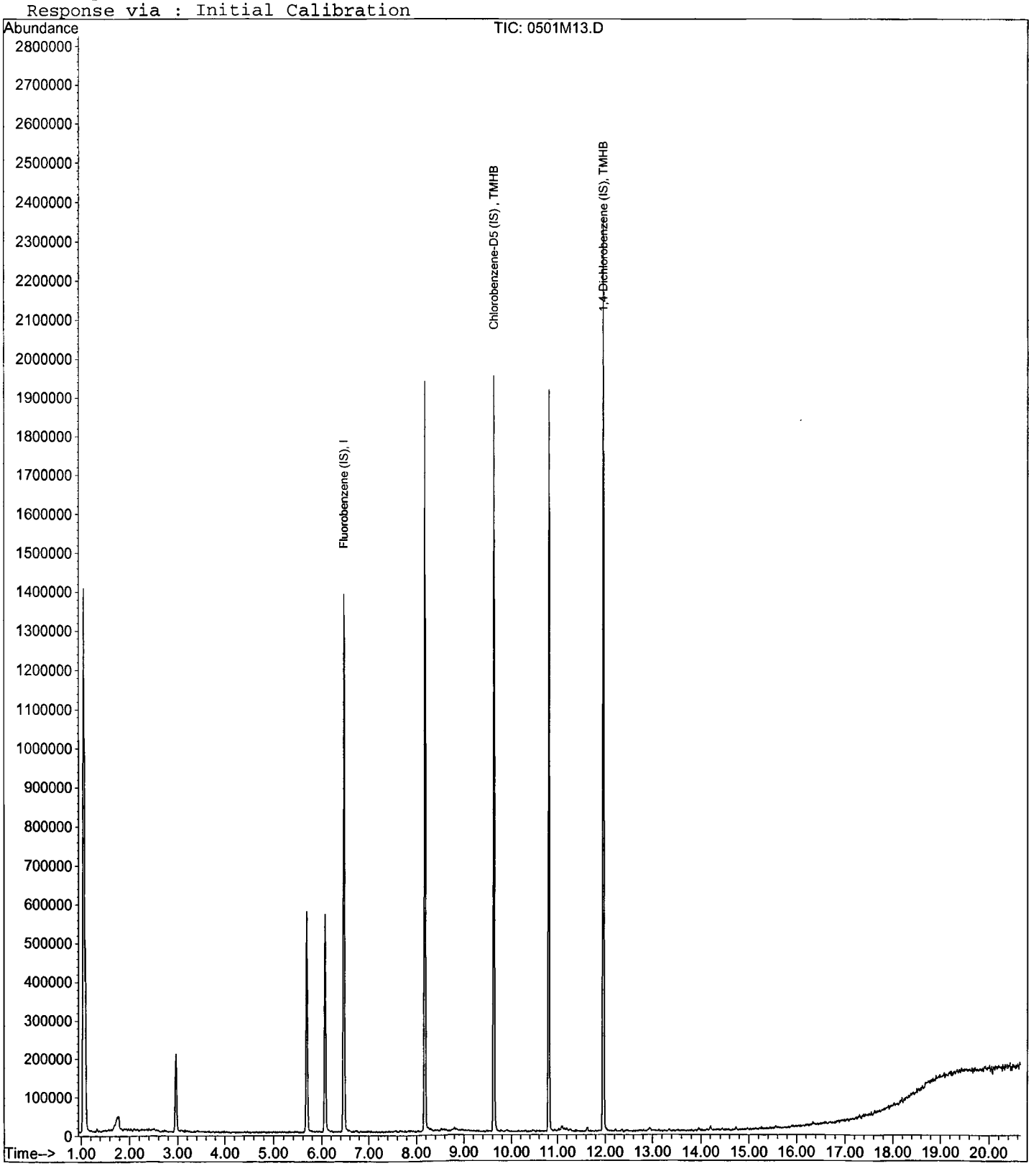
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M13.D Vial: 10
Acq On : 1 May 20 16:44 Operator: LP,DG,CMM
Sample : BA10504W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:35 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M14.D Vial: 11
Acq On : 1 May 20 17:13 Operator: LP,DG,CMM
Sample : BA10505W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:35 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	1371289	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1101355m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1369684m	25.000	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M14.D Vial: 11
Acq On : 1 May 20 17:13 Operator: LP,DG,CMM
Sample : BA10505W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:36 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1217216	25.000 ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1078879	25.000 ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	718215	25.000 ppb	0.00
System Monitoring Compounds					
2) Dibromofluoromethane(S)	5.68	111	332664	25.031 ppb	0.00
Spiked Amount 25.000			Recovery = 100.124%		
3) 1,2-DCA-D4(S)	6.07	65	434998	26.961 ppb	0.00
Spiked Amount 25.000			Recovery = 107.844%		
5) Toluene-D8(S)	8.18	98	1173053	22.790 ppb	0.00
Spiked Amount 25.000			Recovery = 91.160%		
6) 4-Bromofluorobenzene(S)	10.81	95	509322	23.168 ppb	0.00
Spiked Amount 25.000			Recovery = 92.672%		

Target Compounds Qvalue

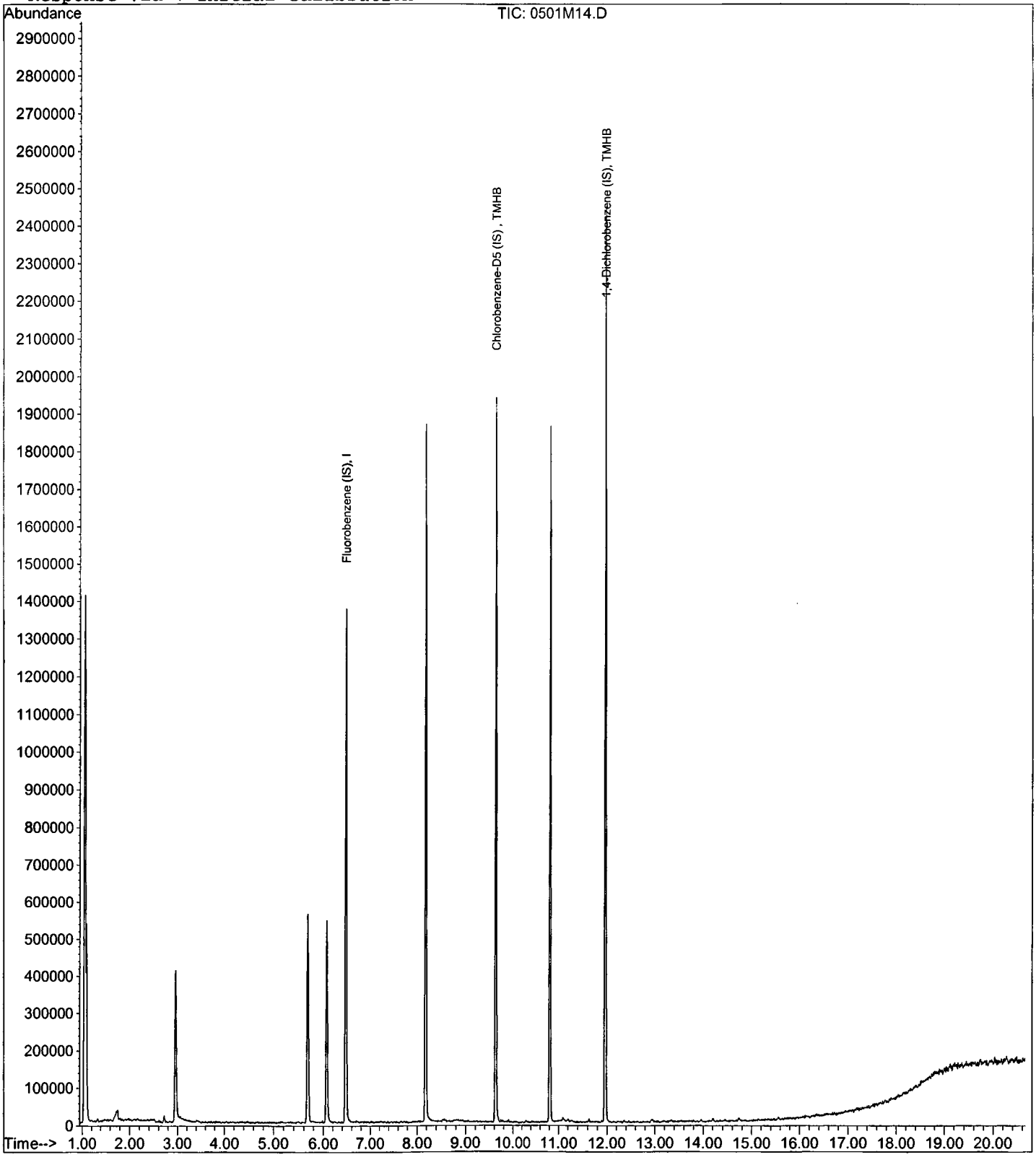
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M14.D Vial: 11
Acq On : 1 May 20 17:13 Operator: LP,DG,CMM
Sample : BA10505W01 Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:35 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M11.D Vial: 8
Acq On : 1 May 20 15:46 Operator: LP,DG,CMM
Sample : 200501A BLK Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:35 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	1338332	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1091585m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1311929m	25.000	ppb	0.00

System Monitoring Compounds

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M11.D Vial: 8
Acq On : 1 May 20 15:46 Operator: LP,DG,CMM
Sample : 200501A BLK Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:36 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1176498	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1042330	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	680373	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.68	111	352064	27.408	ppb	0.00
Spiked Amount 25.000			Recovery =	109.632%		
3) 1,2-DCA-D4(S)	6.07	65	455270	29.194	ppb	0.00
Spiked Amount 25.000			Recovery =	116.776%		
5) Toluene-D8(S)	8.18	98	1232067	24.776	ppb	0.00
Spiked Amount 25.000			Recovery =	99.104%		
6) 4-Bromofluorobenzene(S)	10.81	95	524244	24.683	ppb	0.00
Spiked Amount 25.000			Recovery =	98.732%		

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report

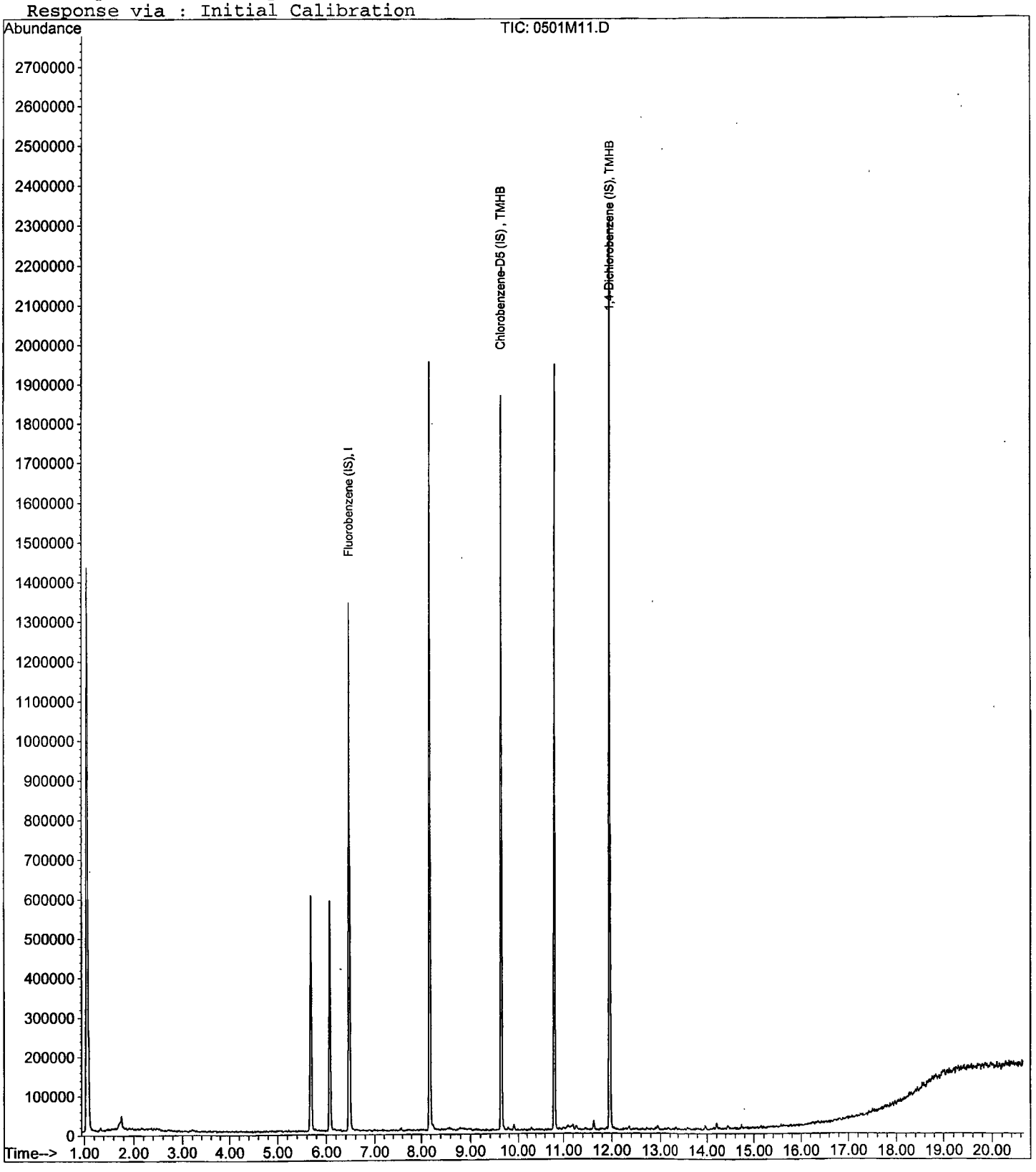
Data File : M:\MAX\DATA\M200430\0501M11.D
Acq On : 1 May 20 15:46
Sample : 200501A BLK
Misc : IS 3/25/20

Vial: 8
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 4 15:35 2020

Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Page 609 of 703

Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M09.D
Acq On : 1 May 20 14:48
Sample : 200501A LCS 300ug/L
Misc : IS 3/25/20

Vial: 6
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 4 15:33 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	1345238	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1339987m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1512264m	25.000	ppb	0.00
System Monitoring Compounds						
Target Compounds						Qvalue
2) Gasoline C6-C10	8.18	TIC	21357472m	306.508	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M09.D Vial: 6
Acq On : 1 May 20 14:48 Operator: LP,DG,CMM
Sample : 200501A LCS 300ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:36 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1219079	25.000 ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1083292	25.000 ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	717260	25.000 ppb	0.00
System Monitoring Compounds					
2) Dibromofluoromethane(S)	5.69	111	352270	26.466 ppb	0.00
Spiked Amount 25.000			Recovery	= 105.864%	
3) 1,2-DCA-D4(S)	6.07	65	447403	27.687 ppb	0.00
Spiked Amount 25.000			Recovery	= 110.748%	
5) Toluene-D8(S)	8.18	98	1256640	24.315 ppb	0.00
Spiked Amount 25.000			Recovery	= 97.260%	
6) 4-Bromofluorobenzene(S)	10.81	95	533513	24.170 ppb	0.00
Spiked Amount 25.000			Recovery	= 96.680%	

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

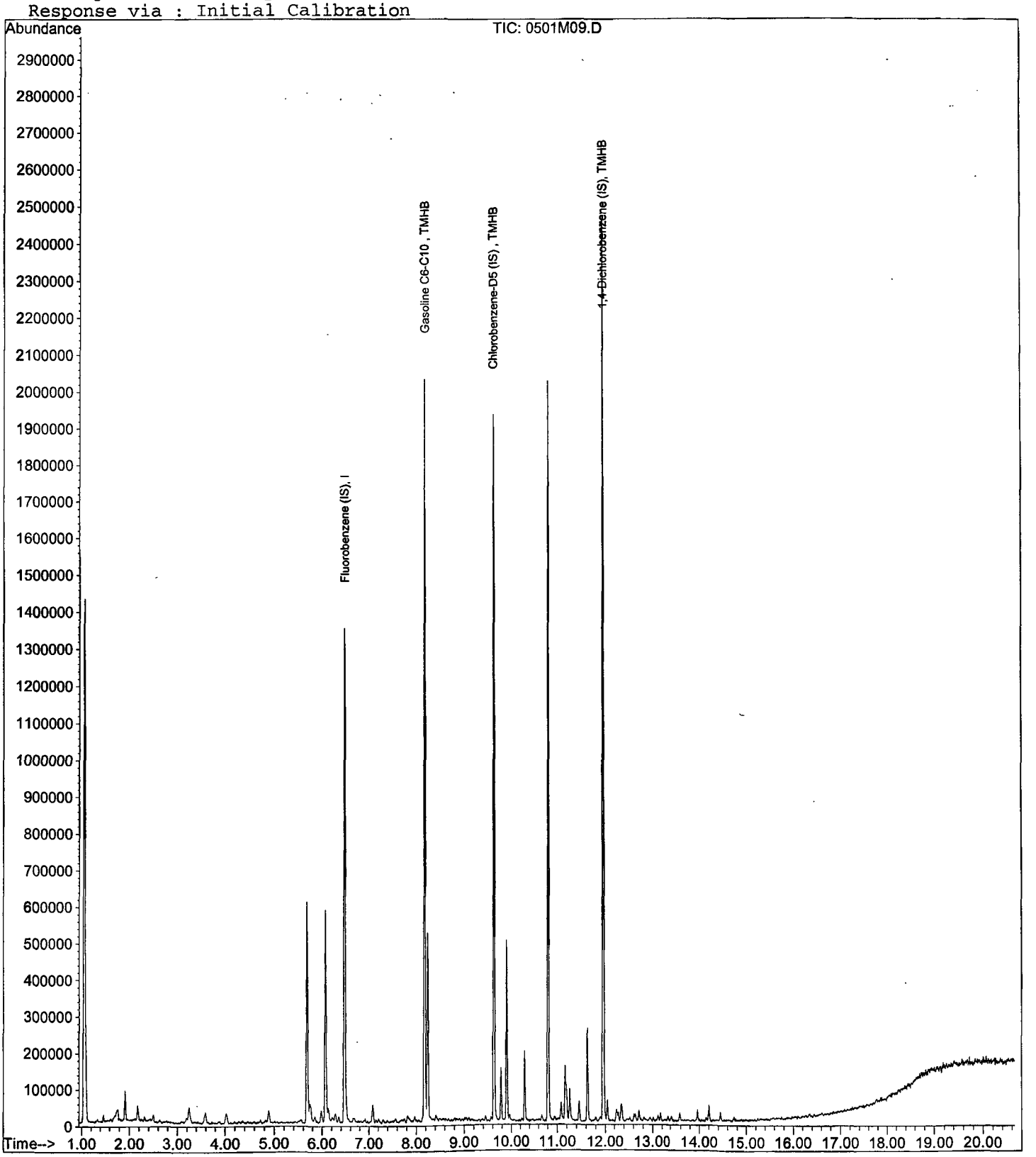
Quantitation Report

Data File : M:\MAX\DATA\M200430\0501M09.D
Acq On : 1 May 20 14:48
Sample : 200501A LCS 300ug/L
Misc : IS 3/25/20

Vial: 6
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 4 15:33 2020 Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : M:\MAX\DATA\M200430\0501M10.D Vial: 7
Acq On : 1 May 20 15:17 Operator: LP,DG,CMM
Sample : 200501A LCSD 300ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:33 2020 Quant Results File: MGAS0430.RES

Quant Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	TIC	1396539	25.000	ppb	0.00
3) Chlorobenzene-D5 (IS)	9.63	TIC	1363083m	25.000	ppb	0.00
4) 1,4-Dichlorobenzene (IS)	11.96	TIC	1538258m	25.000	ppb	0.00

System Monitoring Compounds

Target Compounds						Qvalue
2) Gasoline C6-C10	10.81	TIC	22207876m	308.241	ppb	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (Not Reviewed)

Data File : M:\MAX\DATA\M200430\0501M10.D Vial: 7
Acq On : 1 May 20 15:17 Operator: LP,DG,CMM
Sample : 200501A LCSD 300ug/L Inst : Max
Misc : IS 3/25/20 Multiplr: 1.00

Quant Time: May 4 15:36 2020 Quant Results File: SUR430W.RES

Quant Method : M:\MAX\DATA\M200430\SUR430W.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:02:52 2020
Response via : Initial Calibration
DataAcq Meth : M8260

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene (IS)	6.47	96	1243720	25.000	ppb	0.00
4) Chlorobenzene-D5 (IS)	9.63	117	1116339	25.000	ppb	0.00
7) 1,4-Dichlorobenzene-D (IS)	11.96	152	748377	25.000	ppb	0.00
System Monitoring Compounds						
2) Dibromofluoromethane(S)	5.68	111	351472	25.883	ppb	0.00
Spiked Amount 25.000			Recovery = 103.532%			
3) 1,2-DCA-D4(S)	6.07	65	443069	26.876	ppb	0.00
Spiked Amount 25.000			Recovery = 107.504%			
5) Toluene-D8(S)	8.18	98	1251833	23.505	ppb	0.00
Spiked Amount 25.000			Recovery = 94.020%			
6) 4-Bromofluorobenzene(S)	10.81	95	538117	23.657	ppb	0.00
Spiked Amount 25.000			Recovery = 94.628%			

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Quantitation Report

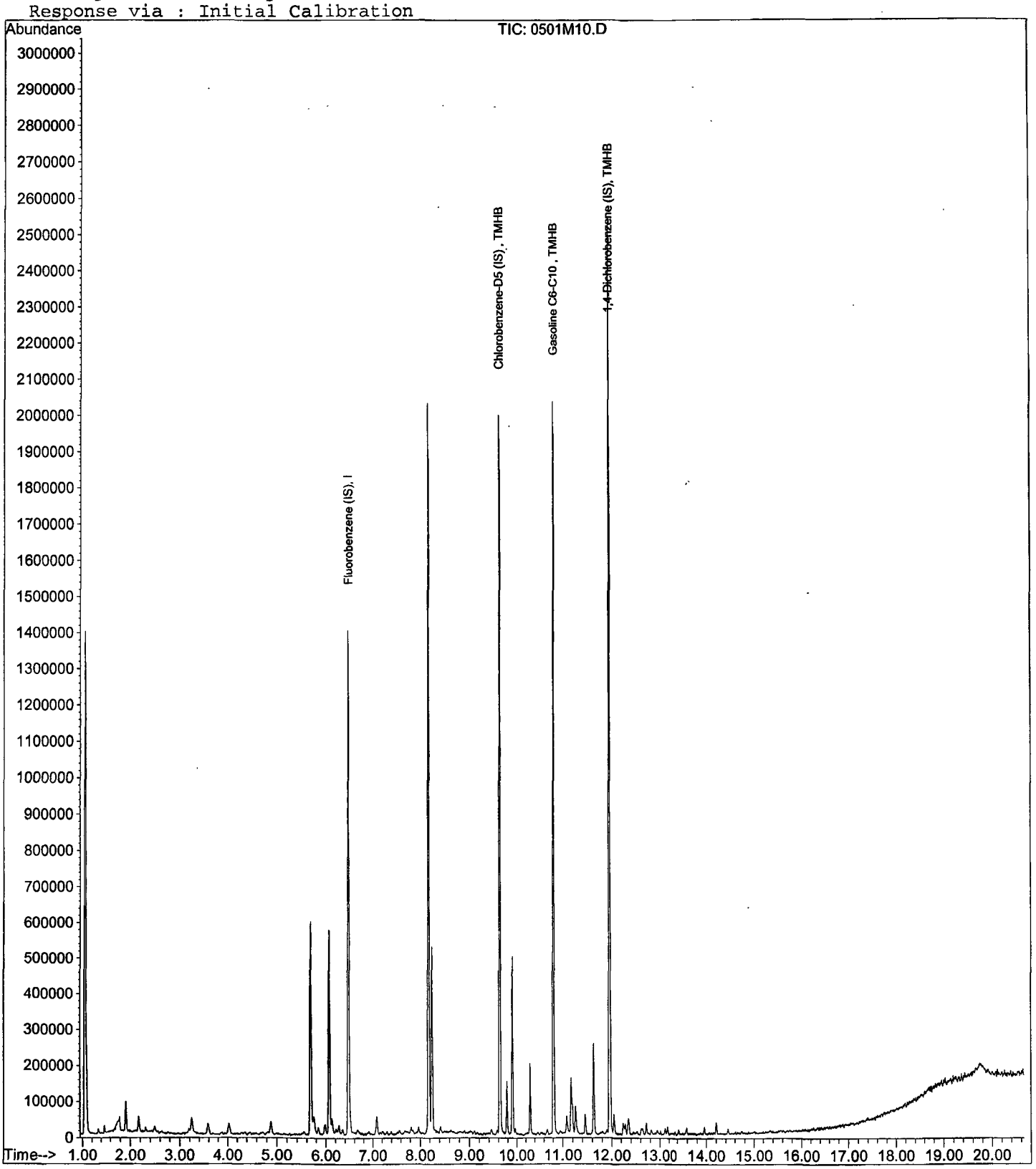
Data File : M:\MAX\DATA\M200430\0501M10.D
Acq On : 1 May 20 15:17
Sample : 200501A LCSD 300ug/L
Misc : IS 3/25/20

Vial: 7
Operator: LP,DG,CMM
Inst : Max
Multiplr: 1.00

Quant Time: May 4 15:33 2020

Quant Results File: MGAS0430.RES

Method : M:\MAX\DATA\M200430\MGAS0430.M (RTE Integrator)
Title : METHOD 8260B
Last Update : Fri May 01 13:22:09 2020
Response via : Initial Calibration



Max Gas Standard Prep

Gas Primary Working Standard

Prepared: 03/13/20 **Prepared By (Initials):** CH

Expires: 01/06/21

Methanol Lot No. 58019-00962

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
50,000ug/mL Gas STD	Restek	30205	50,000	A0132443-39859	01/06/21	12/31/24	80uL	2mL	Methanol	2,000

Gas Second Source (SS) Working Standard

Prepared: 03/13/20 **Prepared By (Initials):** CH

Expires: 07/16/20

Methanol Lot No. 58019-00962

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
Gasoline (5,000ppm)	O2SI	020246-06	5,000	CL11750-40999	07/16/20	02/28/27	800uL	2mL	Methanol	2,000

Max Gas Calibration Curve

Prepared: 04/30/20 **Prepared By (Initials):** DG

Expires: 06/29/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
VOA Gasses Standards	Phenova	20ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	1uL	100mL	P&T Water	20
VOA Gasses Standards	Phenova	50ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	2.5uL	100mL	P&T Water	50
VOA Gasses Standards	Phenova	100ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	5uL	100mL	P&T Water	100
VOA Gasses Standards	Phenova	300ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	15uL	100mL	P&T Water	300
VOA Gasses Standards	Phenova	600ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	30uL	100mL	P&T Water	600
VOA Gasses Standards	Phenova	800ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	40uL	100mL	P&T Water	800
VOA Gasses Standards	Phenova	1,000ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	50uL	100mL	P&T Water	1,000

Max Gas Second Source

Prepared: 04/30/20 **Prepared By (Initials):** DG

Expires: 06/29/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. (ug/mL)	Reference To APPL Prep Date	Exp. Date	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/L)
50,000ug/mL Gas STD	Phenova	SS 300ug/L	2,000	Prepared 03/13/20	07/16/20	N/A	15uL	100mL	P&T Water	300

Max Gas Continuing Calibrations/Lab Control Spikes

Prepared: 04/30/20 **Prepared By (Initials):** DG

Expires: 05/01/20

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier P/N#	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date (1 yr)	Exp. Date (Manufacturers)	Aliquot From Stock	Final Volume	Solvent	Final Standard Conc. (ug/mL)
VOA Gasses Standards	Phenova	300ug/L	2,000	Prepared 03/13/20	01/06/21	N/A	15uL	100mL	P&T Water	300

Injection Log

Directory: M:\MAX\DATA\M200430\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	6	0430M07.D	1	20ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 14:36
2	7	0430M08.D	1	50ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 15:05
3	8	0430M09.D	1	100ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 15:34
4	9	0430M10.D	1	300ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 16:03
5	10	0430M13.D	1	600ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 17:21
6	11	0430M14.D	1	800ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 17:50
7	12	0430M15.D	1	1000ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 18:19
8	13	0430M16.D	1	(SS)300ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 18:48
9	15	0430M18.D	1	0.3ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 19:46
10	16	0430M19.D	1	0.5ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 20:15
11	17	0430M20.D	1	1.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 20:44
12	18	0430M21.D	1	2.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 21:13
13	19	0430M22.D	1	5.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 21:42
14	20	0430M23.D	1	10ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 22:11
15	21	0430M24.D	1	20ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 22:40
16	22	0430M25.D	1	40ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 23:09
17	23	0430M26.D	1	100ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 23:38
18	5	0501M08.D	1	200501A CCV 300ug/L	IS 3/25/20	1 May 20 14:19
19	6	0501M09.D	1	200501A LCS 300ug/L	IS 3/25/20	1 May 20 14:48
20	7	0501M10.D	1	200501A LCSD 300ug/L	IS 3/25/20	1 May 20 15:17
21	8	0501M11.D	1	200501A BLK	IS 3/25/20	1 May 20 15:46
22	9	0501M12.D	1	BA10503W01	IS 3/25/20	1 May 20 16:15
23	10	0501M13.D	1	BA10504W01	IS 3/25/20	1 May 20 16:44
24	11	0501M14.D	1	BA10505W01	IS 3/25/20	1 May 20 17:13
25	14	0501M17.D	1	Ending CCV 300ug/L 5/1/20	IS 3/25/20	1 May 20 18:40

Injection Log

Directory: M:\MAX\DATA\M200430\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	6	0430M07.D	1	20ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 14:36
2	7	0430M08.D	1	50ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 15:05
3	8	0430M09.D	1	100ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 15:34
4	9	0430M10.D	1	300ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 16:03
5	10	0430M13.D	1	600ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 17:21
6	11	0430M14.D	1	800ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 17:50
7	12	0430M15.D	1	1000ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 18:19
8	13	0430M16.D	1	(SS)300ug/L GAS STD 4/30/20	IS 3/25/20	30 Apr 20 18:48
9	15	0430M18.D	1	0.3ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 19:46
10	16	0430M19.D	1	0.5ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 20:15
11	17	0430M20.D	1	1.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 20:44
12	18	0430M21.D	1	2.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 21:13
13	19	0430M22.D	1	5.0ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 21:42
14	20	0430M23.D	1	10ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 22:11
15	21	0430M24.D	1	20ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 22:40
16	22	0430M25.D	1	40ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 23:09
17	23	0430M26.D	1	100ug/L VOC STD 4/30/20	IS 3/25/20	30 Apr 20 23:38
18	5	0501M08.D	1	200501A CCV 300ug/L	IS 3/25/20	1 May 20 14:19
19	6	0501M09.D	1	200501A LCS 300ug/L	IS 3/25/20	1 May 20 14:48
20	7	0501M10.D	1	200501A LCSD 300ug/L	IS 3/25/20	1 May 20 15:17
21	8	0501M11.D	1	200501A BLK	IS 3/25/20	1 May 20 15:46
22	9	0501M12.D	1	BA10503W01	IS 3/25/20	1 May 20 16:15
23	10	0501M13.D	1	BA10504W01	IS 3/25/20	1 May 20 16:44
24	11	0501M14.D	1	BA10505W01	IS 3/25/20	1 May 20 17:13
25	14	0501M17.D	1	Ending CCV 300ug/L 5/1/20	IS 3/25/20	1 May 20 18:40

ORGANICS
Calibration Data

RSK 175

Form 6
Initial Calibration

Lab Name: APPL, Inc. SDG No:
Case No: Initial Cal. Date: 03/11/20
Matrix: Instrument: 7890
Initials:

0311R03 D 0311R04.D 0311R07 D 0311R08 D 0311R09 D 0311R11.D 0311R13.D

		Compound	1	2	3	4	5	6	7				Avg	%RSD	Type	r^2	Q
1	ATML	Methane	29734	15773	13580	17096	20094	18490	14651				18488	29	ATM	0.995	
2	ATML	Ethane	23899	13476	11688	13961	16062	14509	11867				15066	28	ATM	0.996	
3	ATML	Ethene	18360	10463	8970	10401	12628	10583	9230				11519	28	ATM	0.998	
4																	
5																	
6																	
7																	
8																	
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33																	
34																	
35																	

2.435739

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R03.D Vial: 3
Acq On : 11 Mar 20 13:00 Operator: GA
Sample : RSK Std 1 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

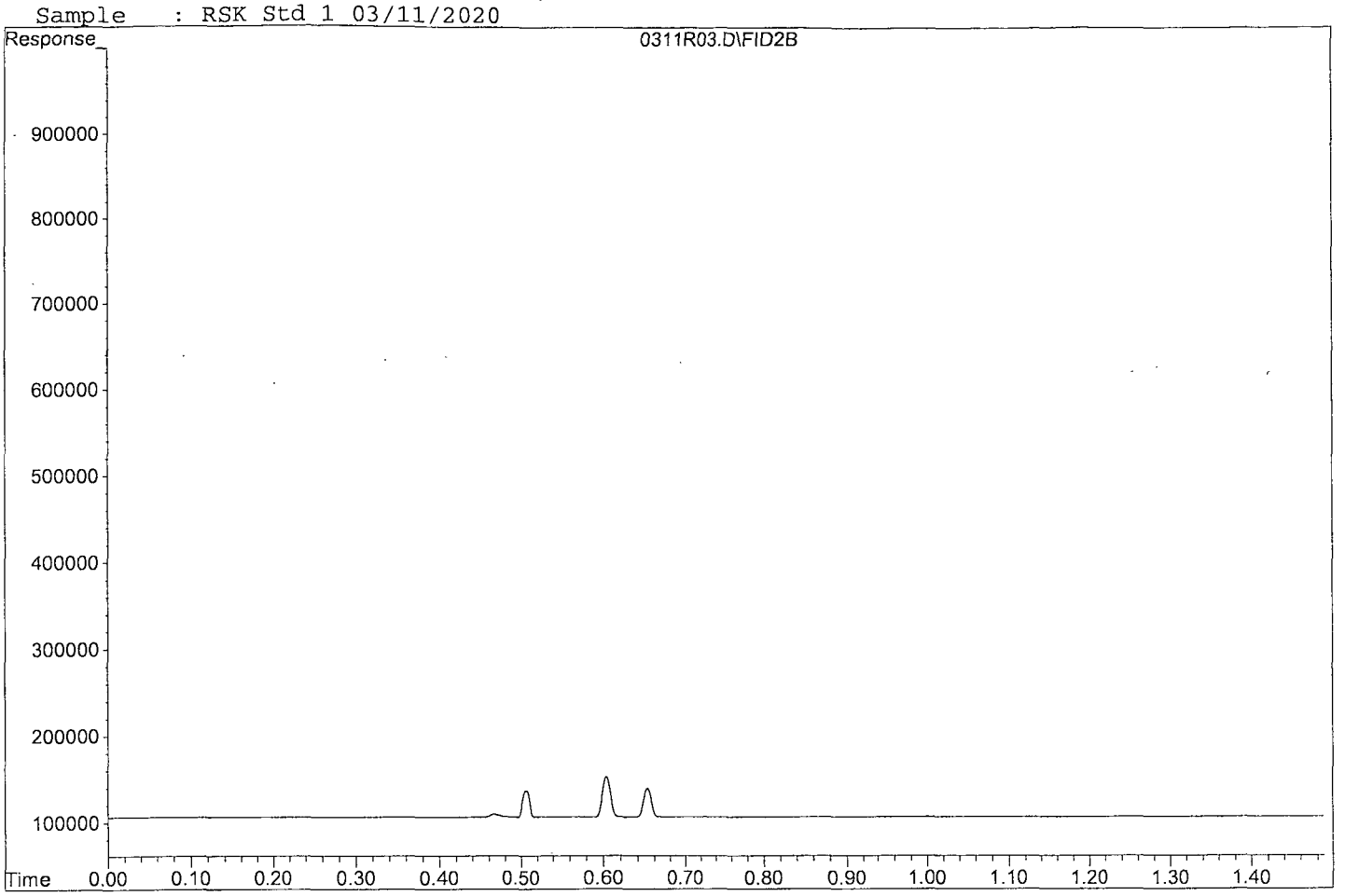
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.51	30923	N.D.	ppb
2) ATM Ethane	0.60	46722	N.D.	ppb
3) ATM Ethene	0.65	33507	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R03.D
Sample : RSK Std 1 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R04.D Vial: 4
Acq On : 11 Mar 20 13:03 Operator: GA
Sample : RSK Std 2 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

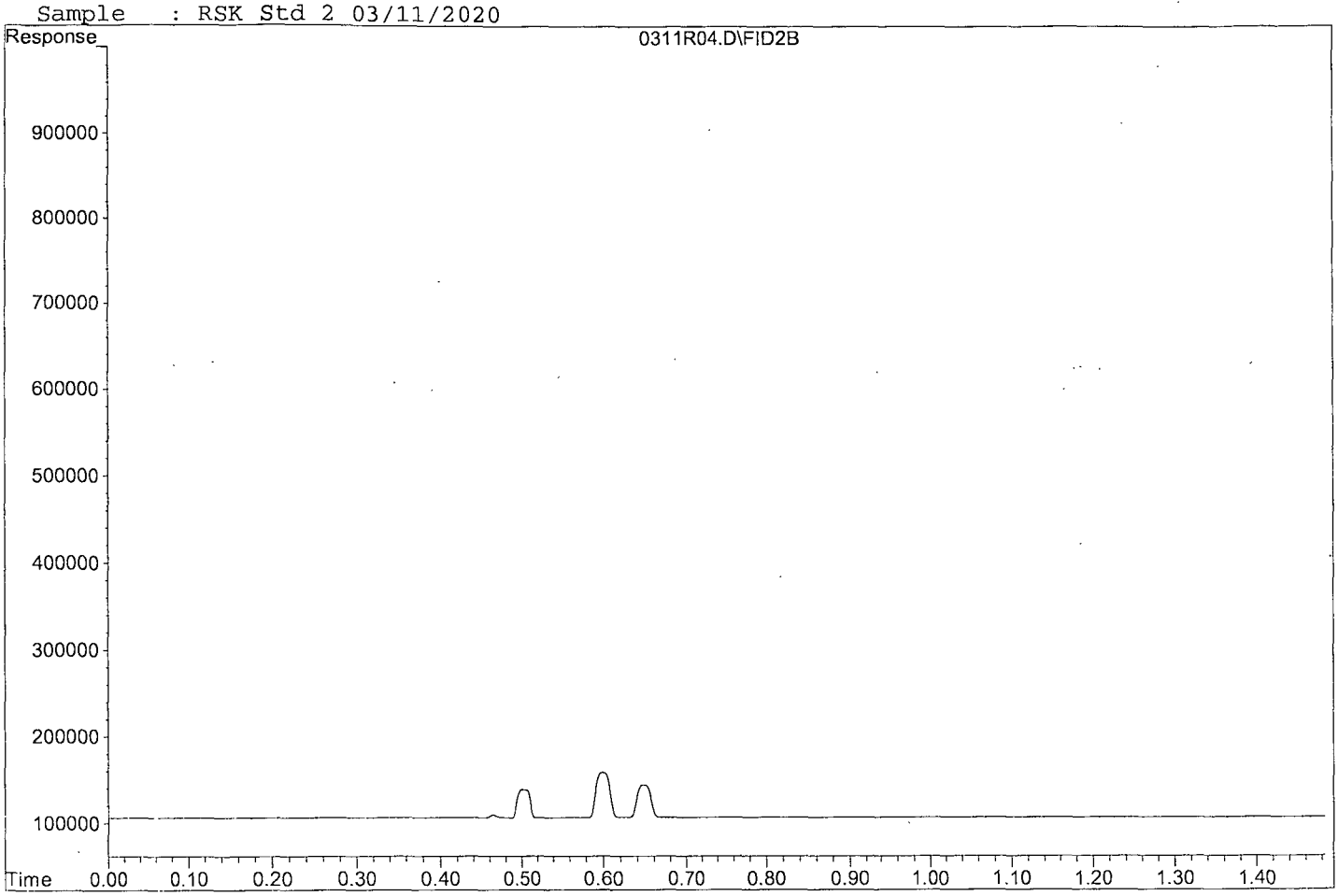
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.50	32807	N.D.	ppb
2) ATM Ethane	0.60	52625	N.D.	ppb
3) ATM Ethene	0.65	38189	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R04.D
Sample : RSK Std 2 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R07.D Vial: 7
Acq On : 11 Mar 20 13:12 Operator: GA
Sample : RSK Std 3 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

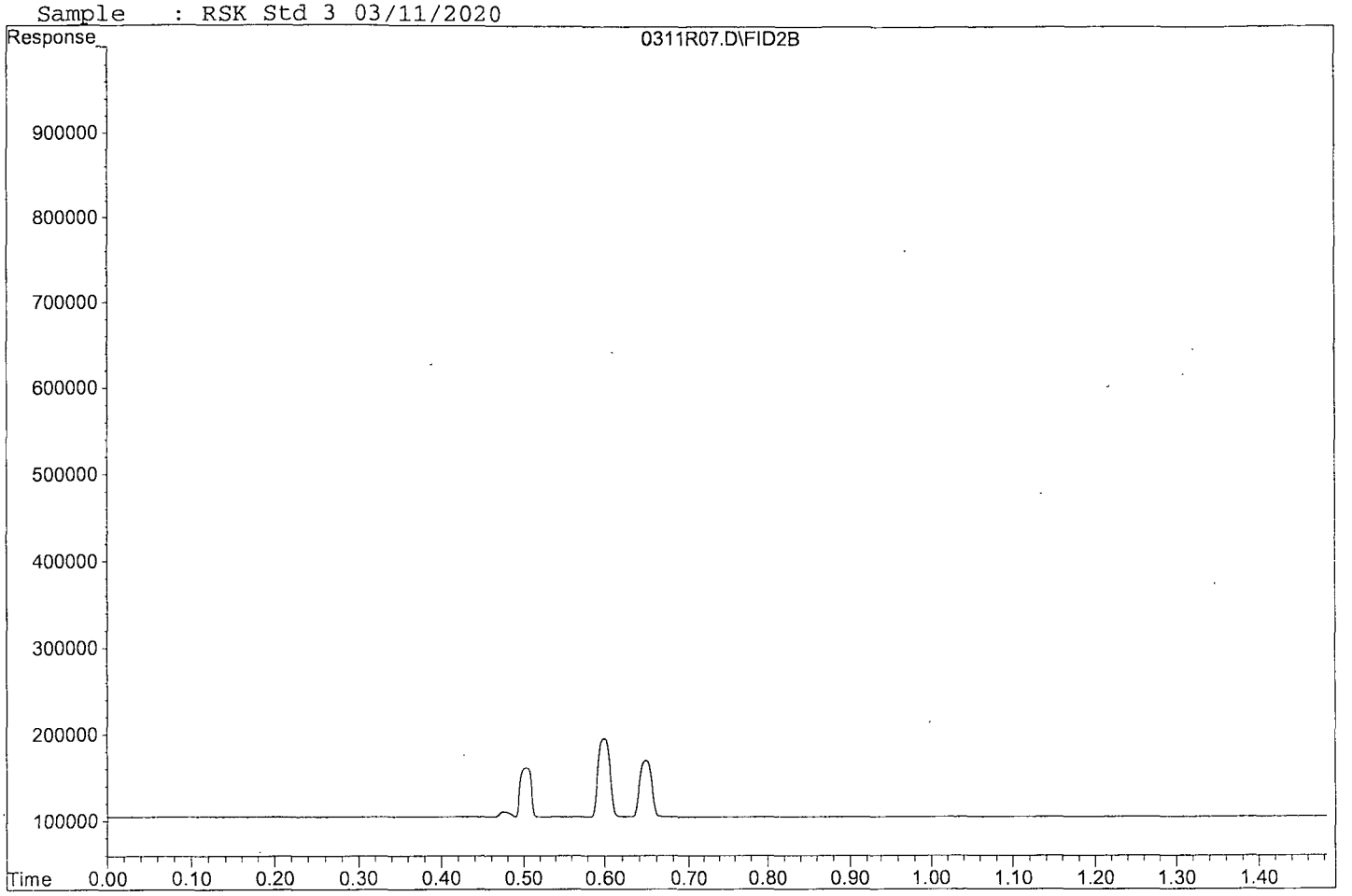
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
Target Compounds				
1) ATM Methane	0.50	56629	N.D.	ppb
2) ATM Ethane	0.60	91168	N.D.	ppb
3) ATM Ethene	0.65	65481	N.D.	ppb

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R07.D
Sample : RSK Std 3 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R08.D Vial: 8
Acq On : 11 Mar 20 13:15 Operator: GA
Sample : RSK Std 4 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 17 11:28 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Mar 17 11:20:36 2020
Response via : Multiple Level Calibration

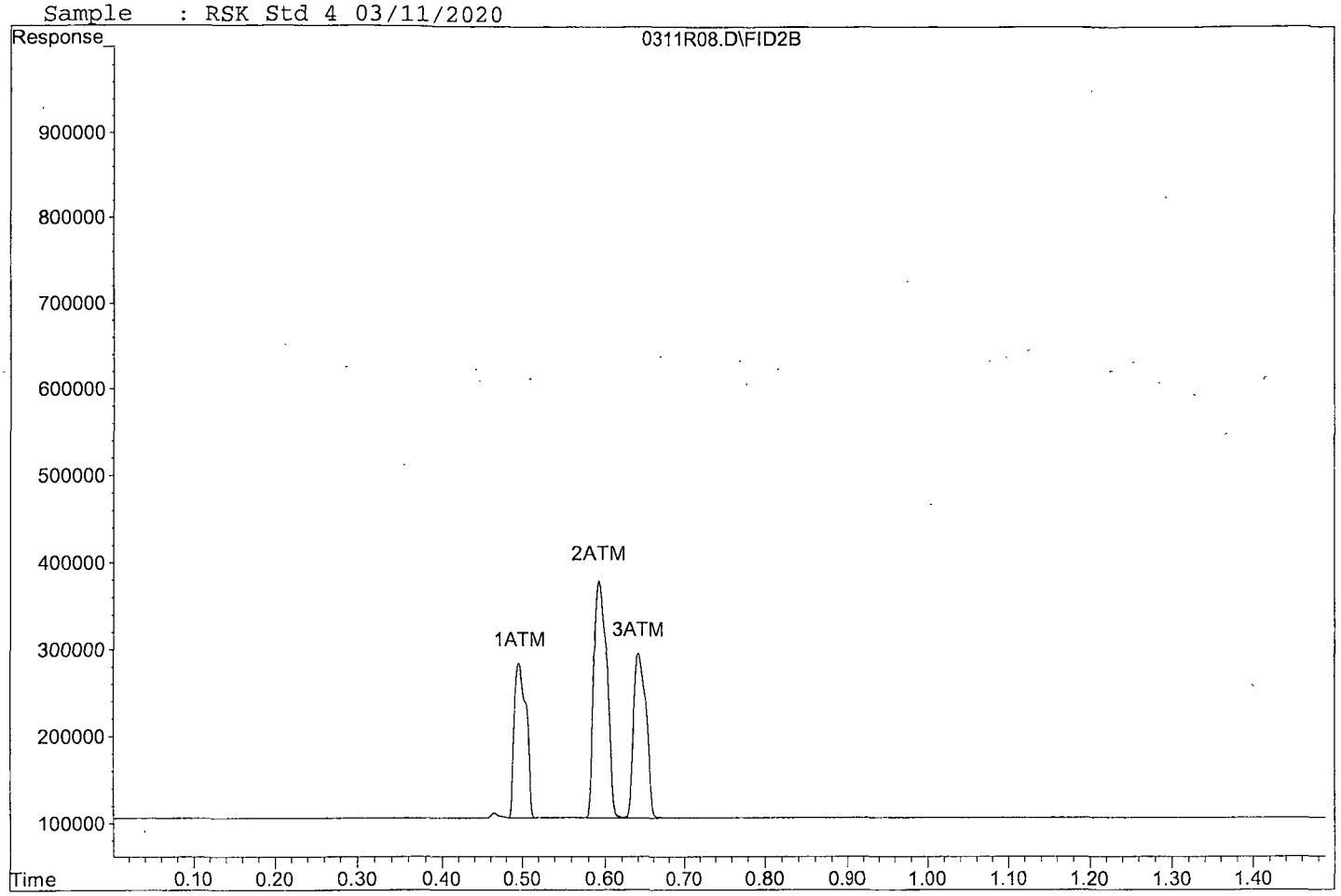
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	178225	11.047 ppb
2) ATM Ethane	0.59	272861	23.257 ppb
3) ATM Ethene	0.64	189615	23.557 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R08.D
Sample : RSK Std 4 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R09.D Vial: 9
Acq On : 11 Mar 20 13:17 Operator: GA
Sample : RSK Std 5 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

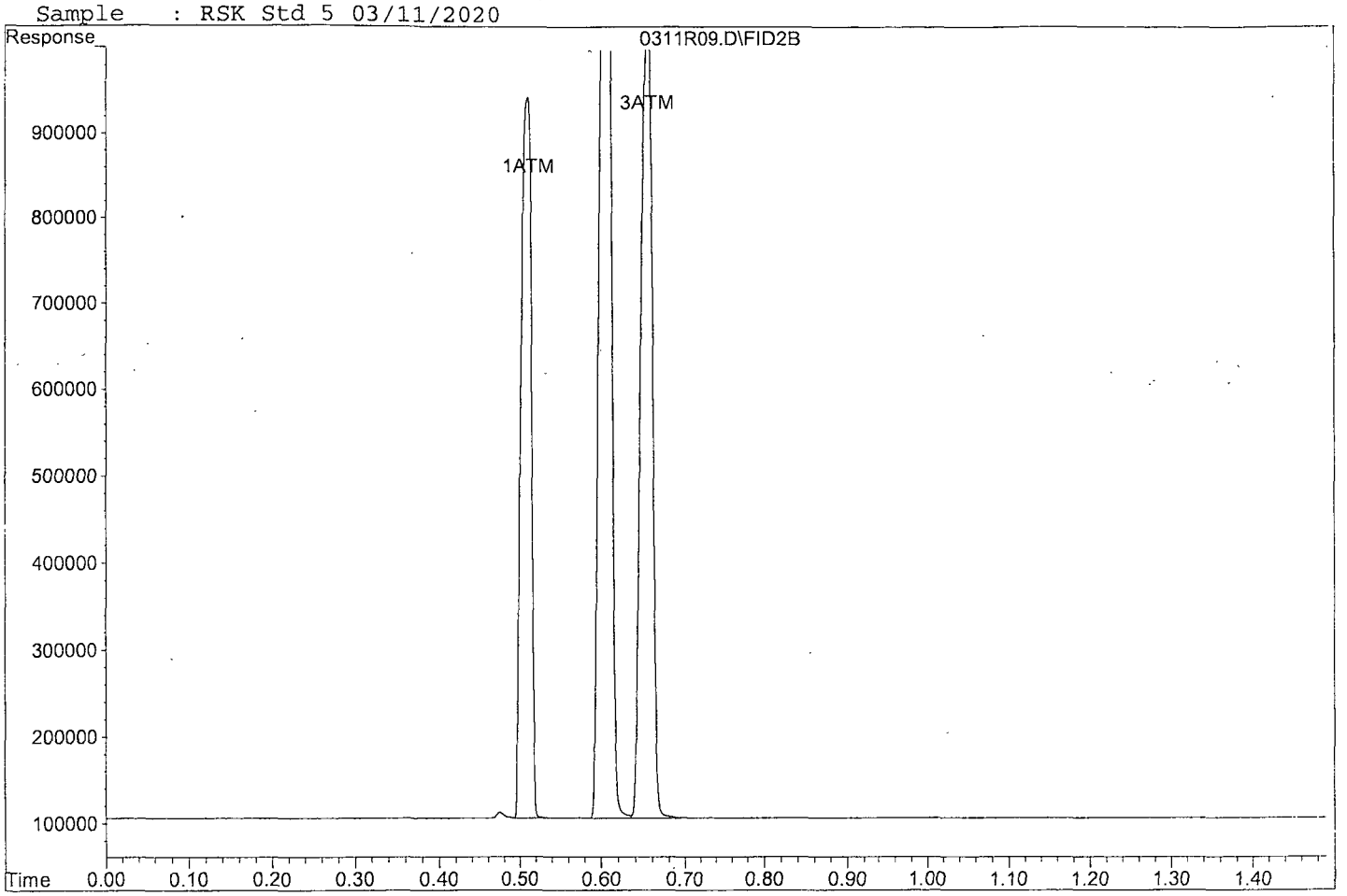
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.51	837925	101.270 ppb
2) ATM Ethane	0.61	1255676	189.317 ppb
3) ATM Ethene	0.66	920839	182.581 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R09.D
Sample : RSK Std 5 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R11.D Vial: 11
Acq On : 11 Mar 20 13:22 Operator: GA
Sample : RSK Std 6 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:42 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

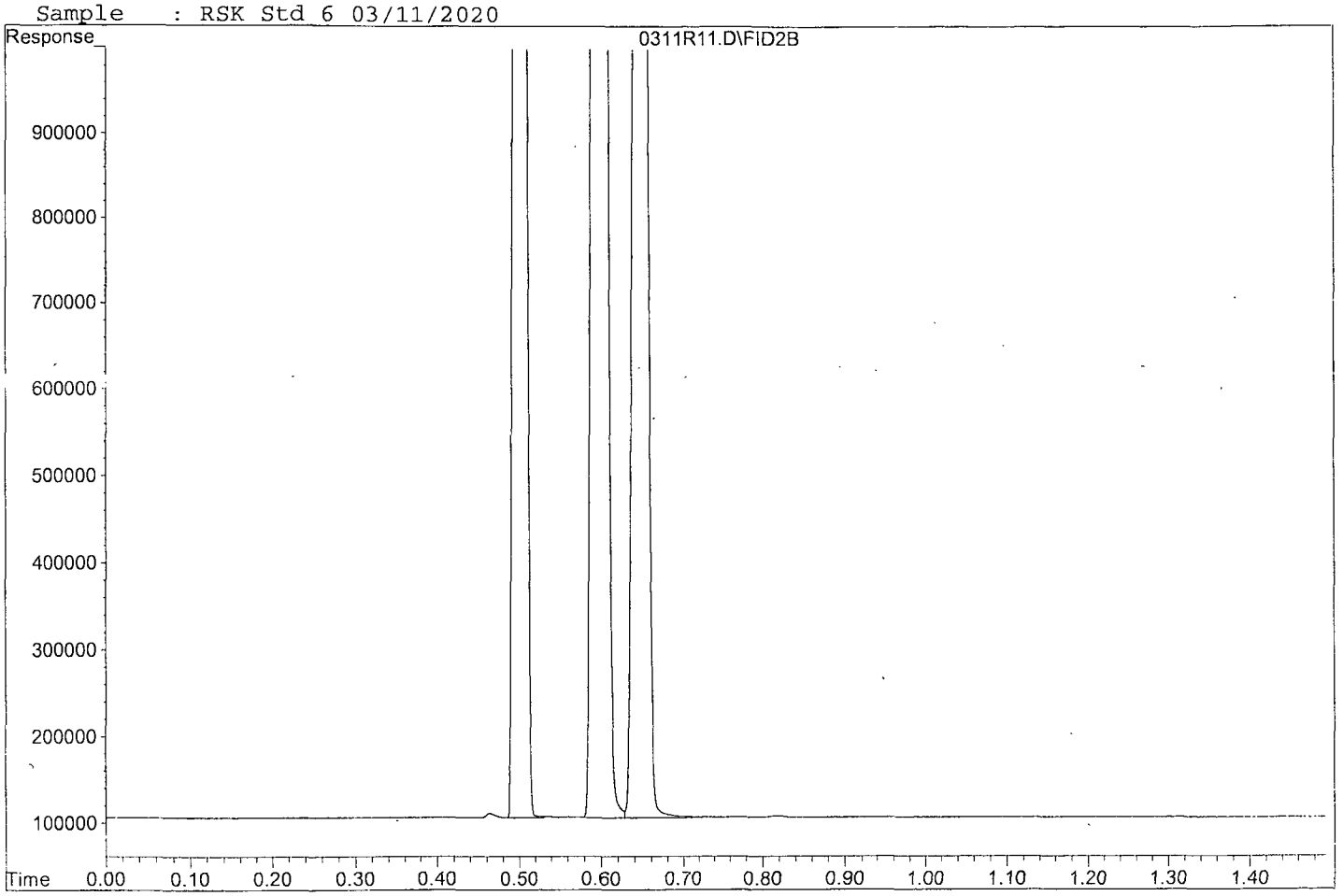
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	1927571	250.295 ppb
2) ATM Ethane	0.60	2835810	456.301 ppb
3) ATM Ethene	0.65	1929291	401.895 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R11.D
Sample : RSK Std 6 03/11/2020



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R13.D Vial: 13
Acq On : 11 Mar 20 13:28 Operator: GA
Sample : RSK Std 7 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 17 11:30 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Mar 17 11:20:36 2020
Response via : Multiple Level Calibration

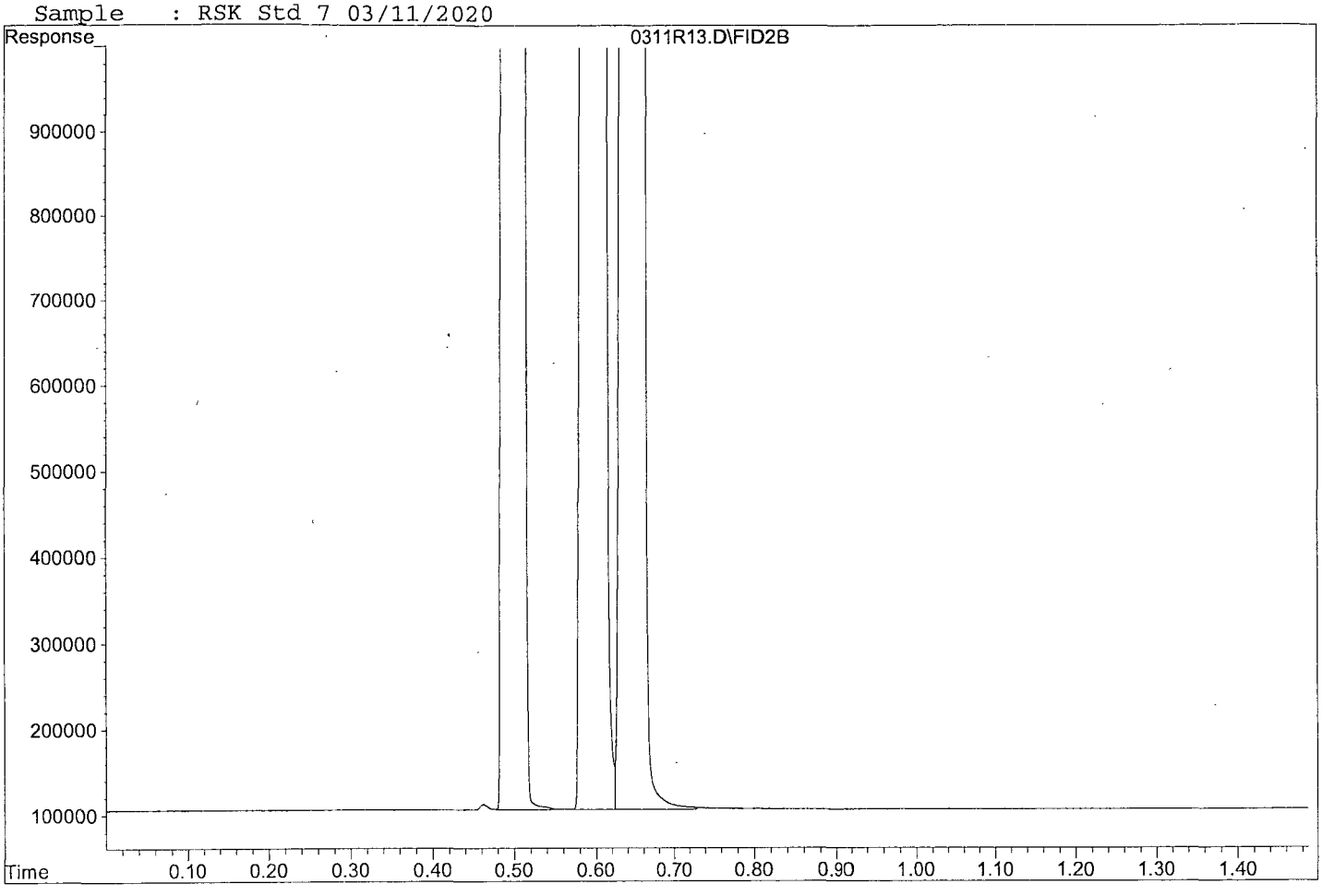
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

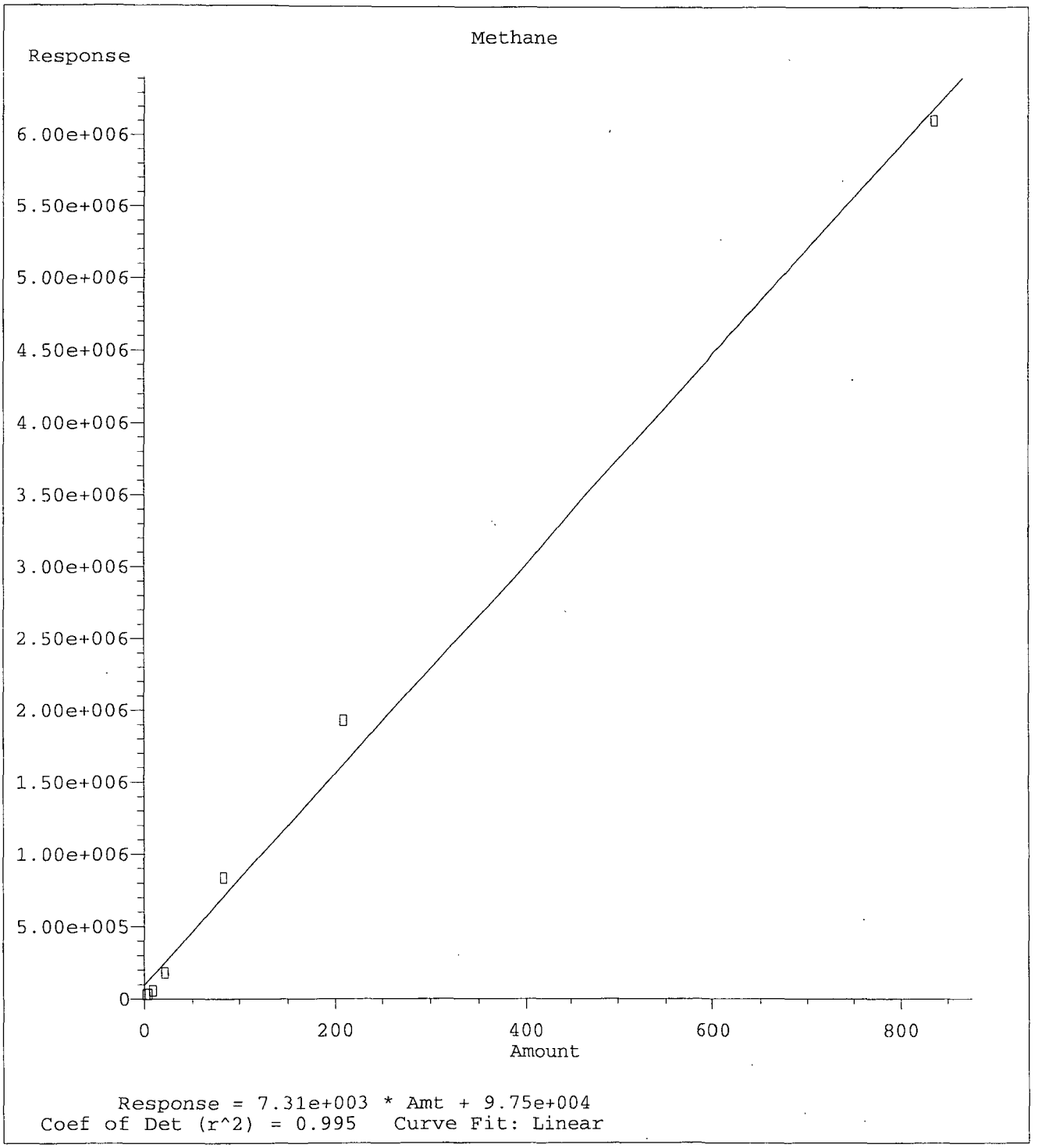
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	6109561	822.241 ppb
2) ATM Ethane	0.60	9277052	1544.634 ppb
3) ATM Ethene	0.64	6730405	1446.024 ppb

Target Compounds

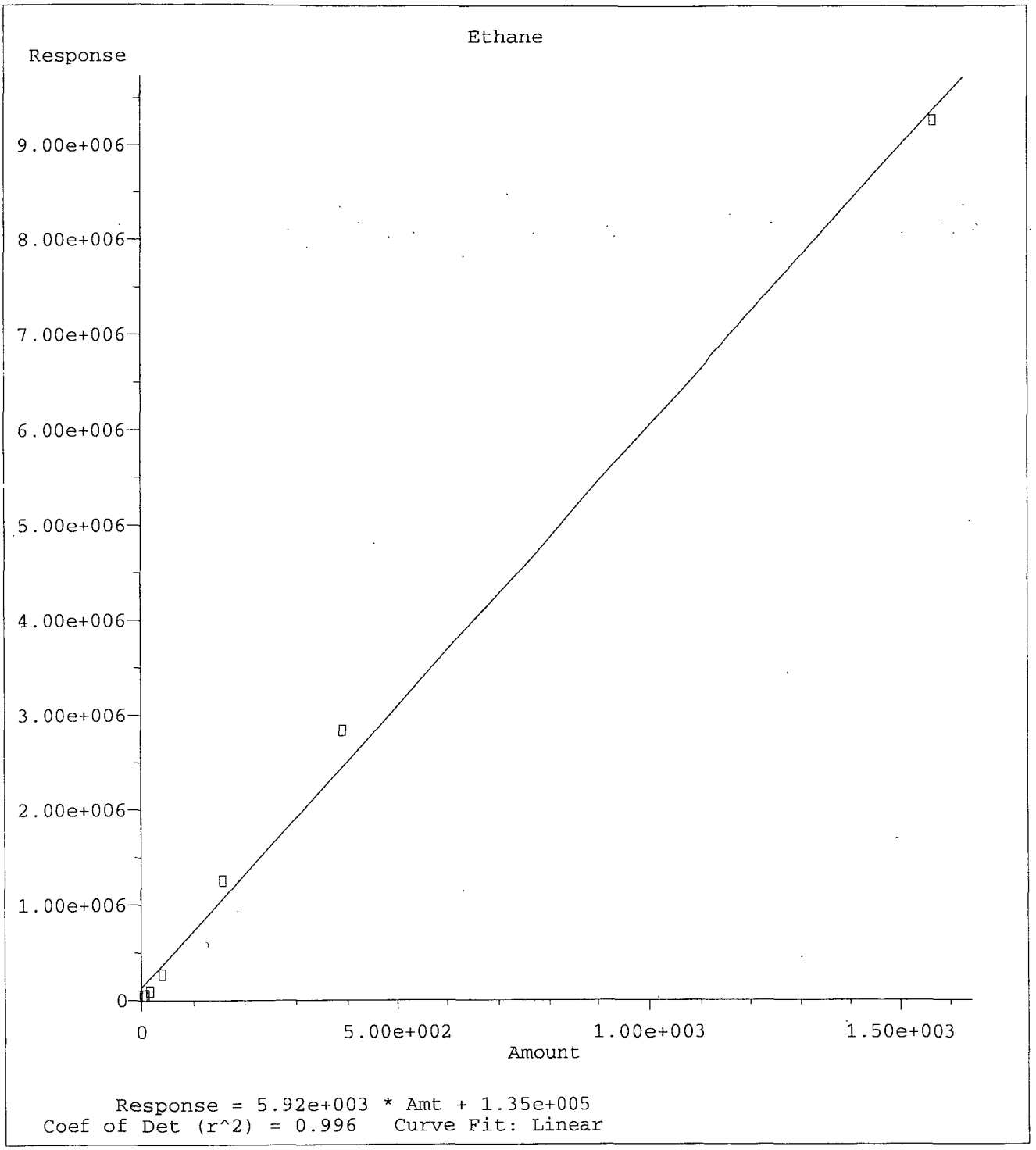
(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0311R13.D
Sample : RSK Std 7 03/11/2020

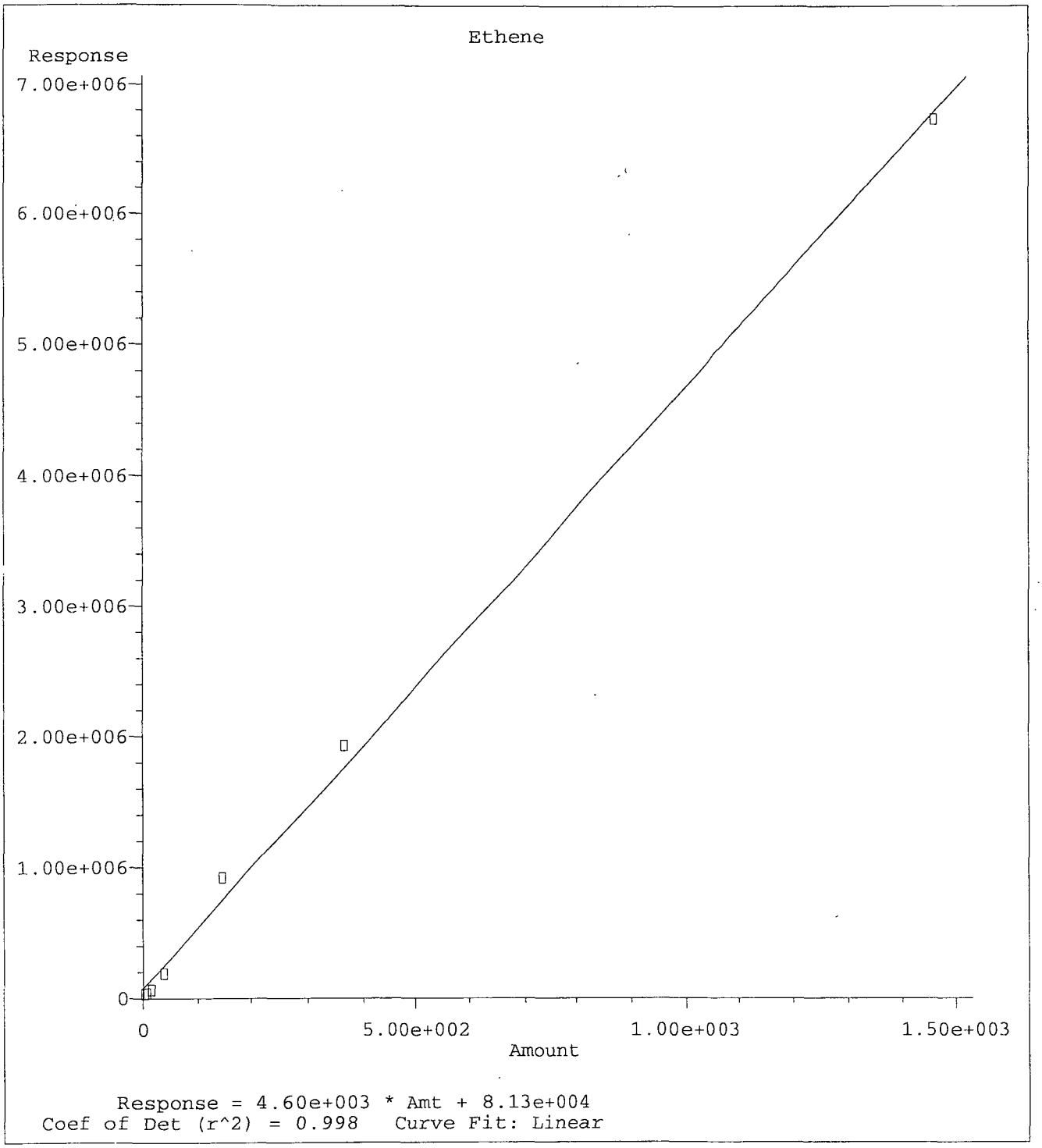




Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020



Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020



Method Name: G:\ROCKY\DATA\200311RS\RSK0311.M
Calibration Table Last Updated: Wed Mar 11 13:35:17 2020

Form 7

Second Source Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 03/11/20
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0311R15.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	16733	9.5	ATML	1.6
2	ATML	Ethane	15066	13396	11	ATML	1.4
3	ATML	Ethene	11519	10439	9.4	ATML	1.4
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
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35							
36							
37							
38							
39							
40							
		Average			10.0		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0311R15.D Vial: 15
Acq On : 11 Mar 20 13:38 Operator: GA
Sample : RSK SS Std 5 03/11/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Mar 11 13:40 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Wed Mar 11 13:35:17 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

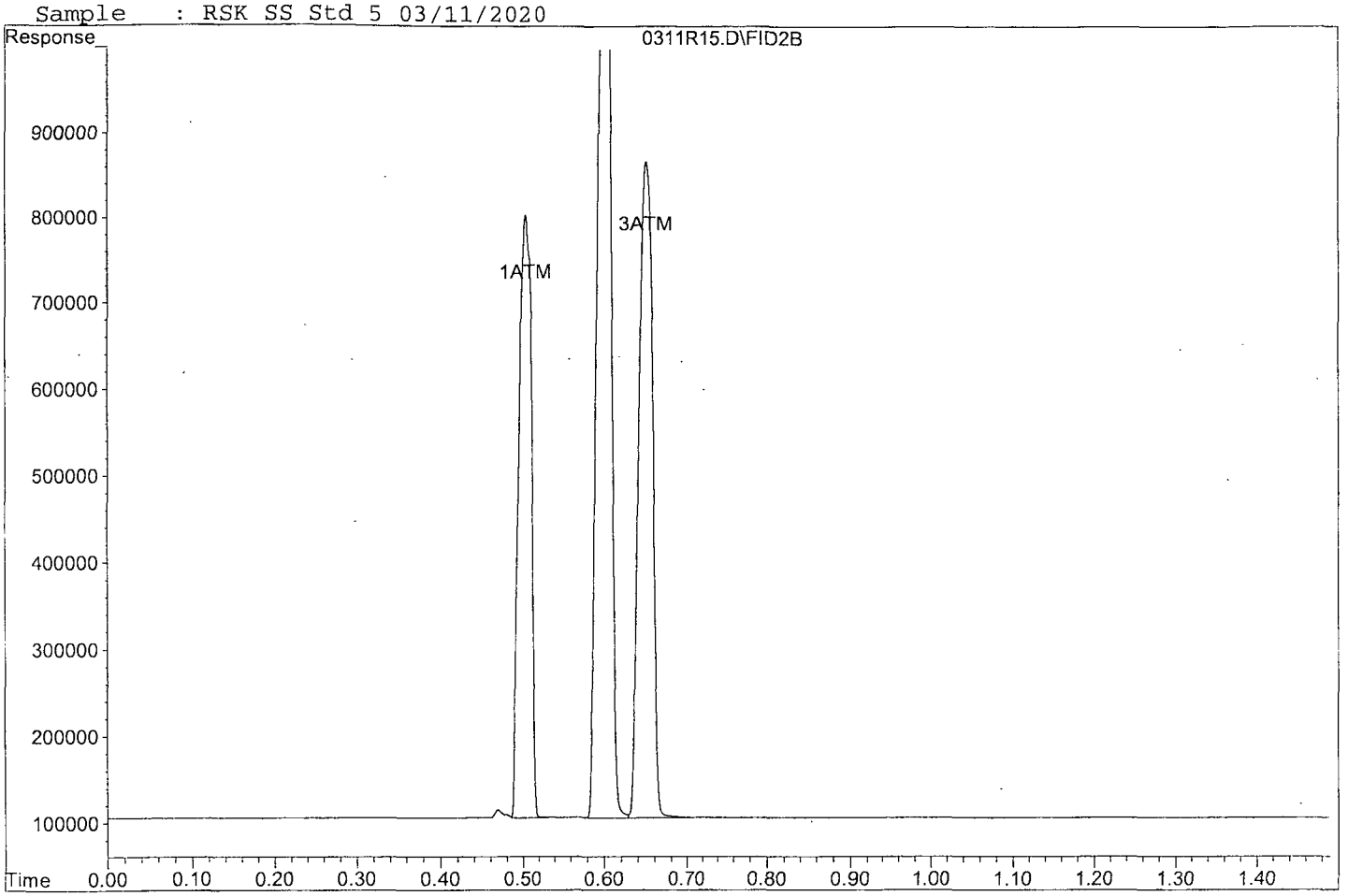
Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	697755	82.100 ppb
2) ATM Ethane	0.60	1047226	154.096 ppb
3) ATM Ethene	0.65	761233	147.870 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0311R15.D
Sample : RSK SS Std 5 03/11/2020



RSK 175

Form 7

Continuing Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 5 May 20 11:28
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0505R01.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	15290	17	ATML	11
2	ATML	Ethane	15066	13892	7.8	ATML	2.7
3	ATML	Ethene	11519	10360	10	ATML	0.53
4							
5							
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30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			11.6		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R01.D Vial: 1
Acq On : 5 May 20 11:28 Operator: GA; CMM
Sample : 200505A CCV/LCS RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 11:31 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

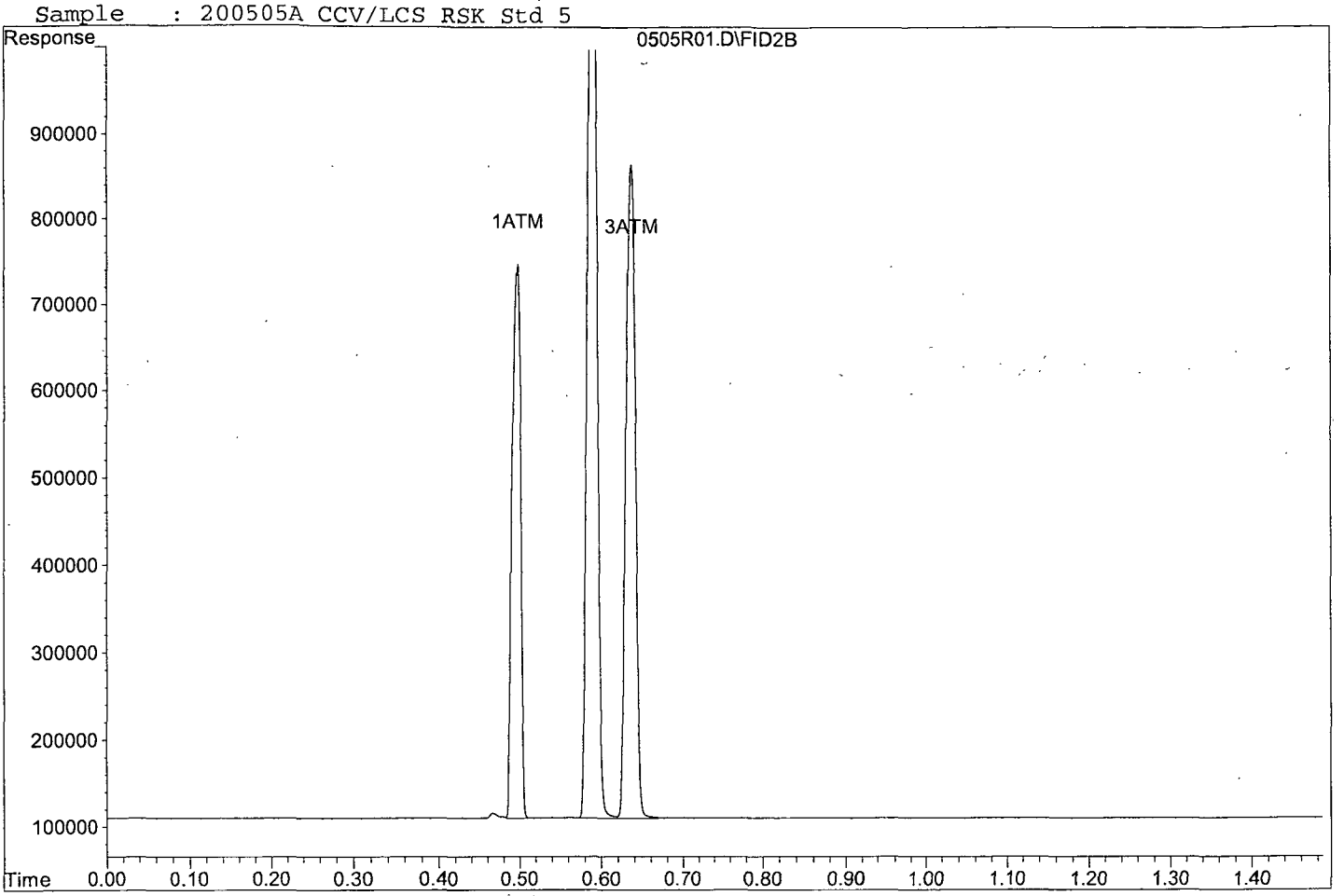
Compound	R.T.	Response	Conc	Units
Target Compounds				
1) ATM Methane	0.50	637603	73.873	ppb
2) ATM Ethane	0.59	1085970	160.643	ppb
3) ATM Ethene	0.64	755466	146.616	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0505R01.D
Sample : 200505A CCV/LCS RSK Std 5



Form 7

Ending Calibration

Lab Name: APPL, Inc.
Case No:
Matrix:

SDG No:
Date Analyzed: 5 May 20 12:12
Instrument: 7890
Initial Cal. Date: 03/11/20
Data File: 0505R11.D

		Compound	MEAN	CCRF	%D		%Drift
1	ATML	Methane	18488	14757	20	ATML	15
2	ATML	Ethane	15066	13211	12	ATML	3.0
3	ATML	Ethene	11519	9700	16	ATML	6.6
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
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31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
		Average			16.0		

Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R11.D Vial: 11
Acq On : 5 May 20 12:12 Operator: GA; CMM
Sample : Ending CCV RSK Std 5 05/05/2020 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 12:14 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

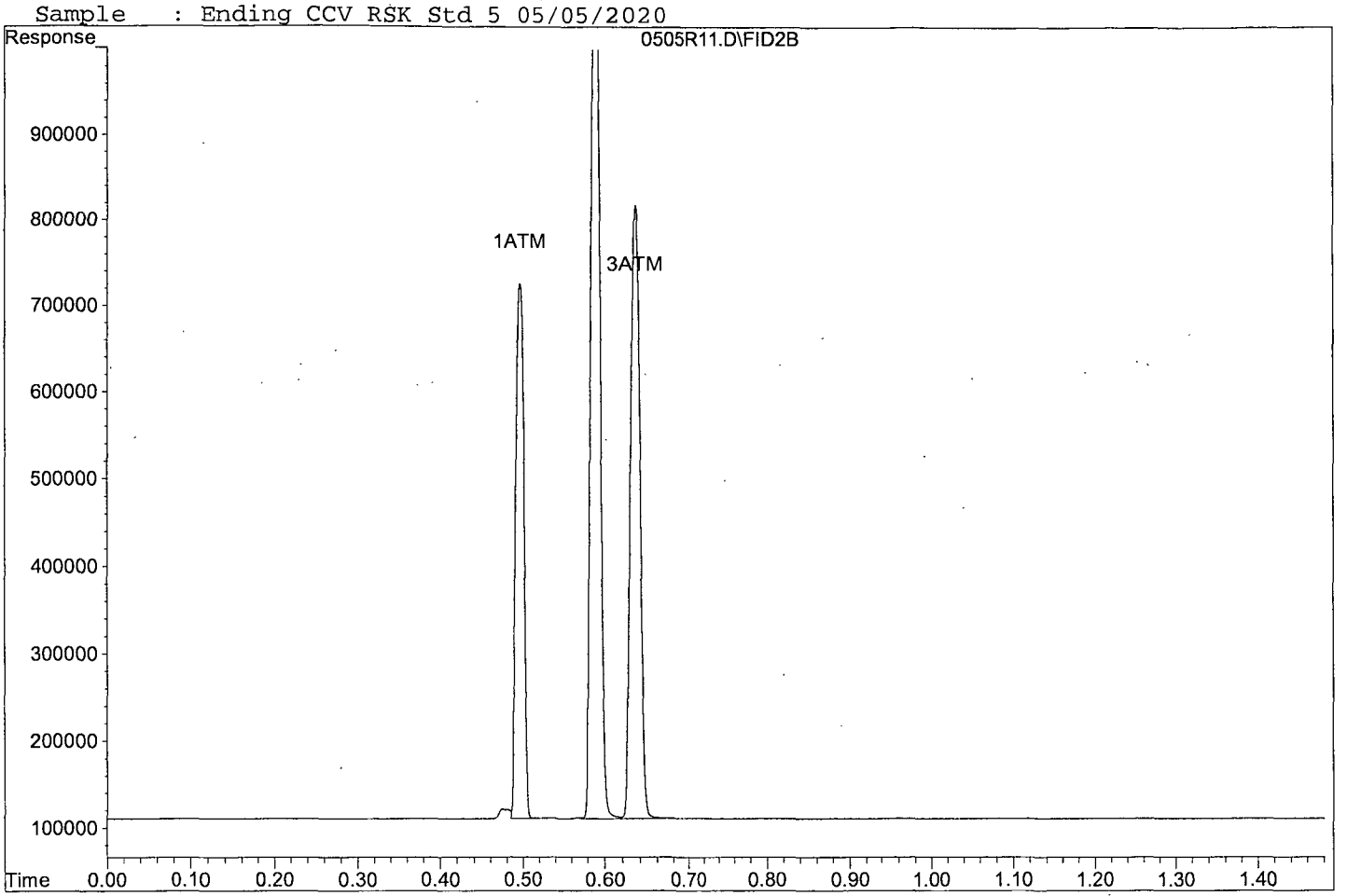
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	615378	70.834 ppb
2) ATM Ethane	0.59	1032758	151.652 ppb
3) ATM Ethene	0.64	707313	136.144 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0505R11.D
Sample : Ending CCV RSK Std 5 05/05/2020



ORGANICS
Raw Data

Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R08.D
Acq On : 5 May 20 12:04
Sample : BA10503W02
Misc :
IntFile : autoint1.e
Quant Time: May 5 12:08 2020 Quant Results File: RSK0311.RES

Vial: 8
Operator: GA; CMM
Inst : 7890
Multiplr: 1.00

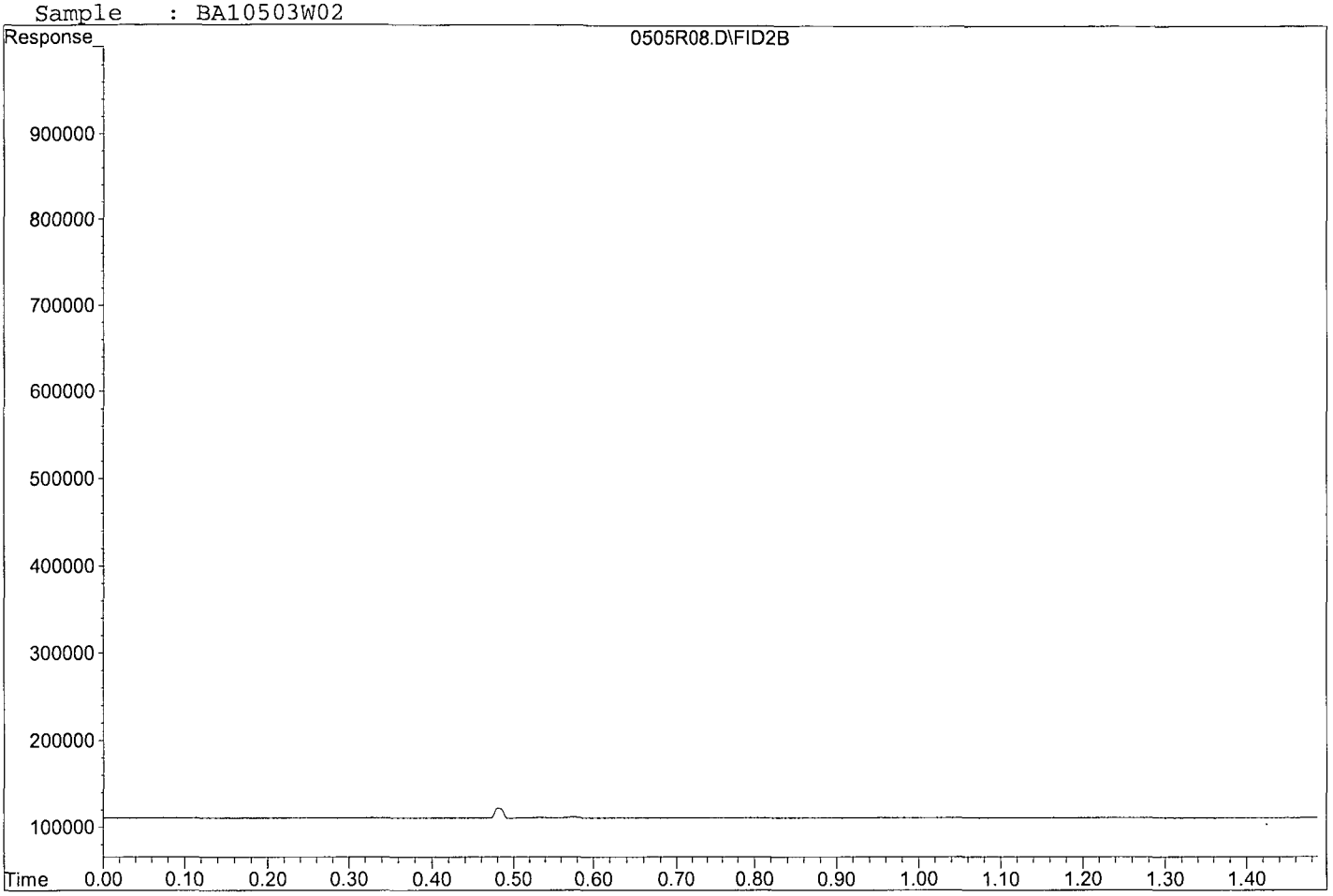
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0505R08.D
Sample : BA10503W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R09.D Vial: 9
Acq On : 5 May 20 12:07 Operator: GA; CMM
Sample : BA10504W02 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 12:09 2020 Quant Results File: RSK0311.RES

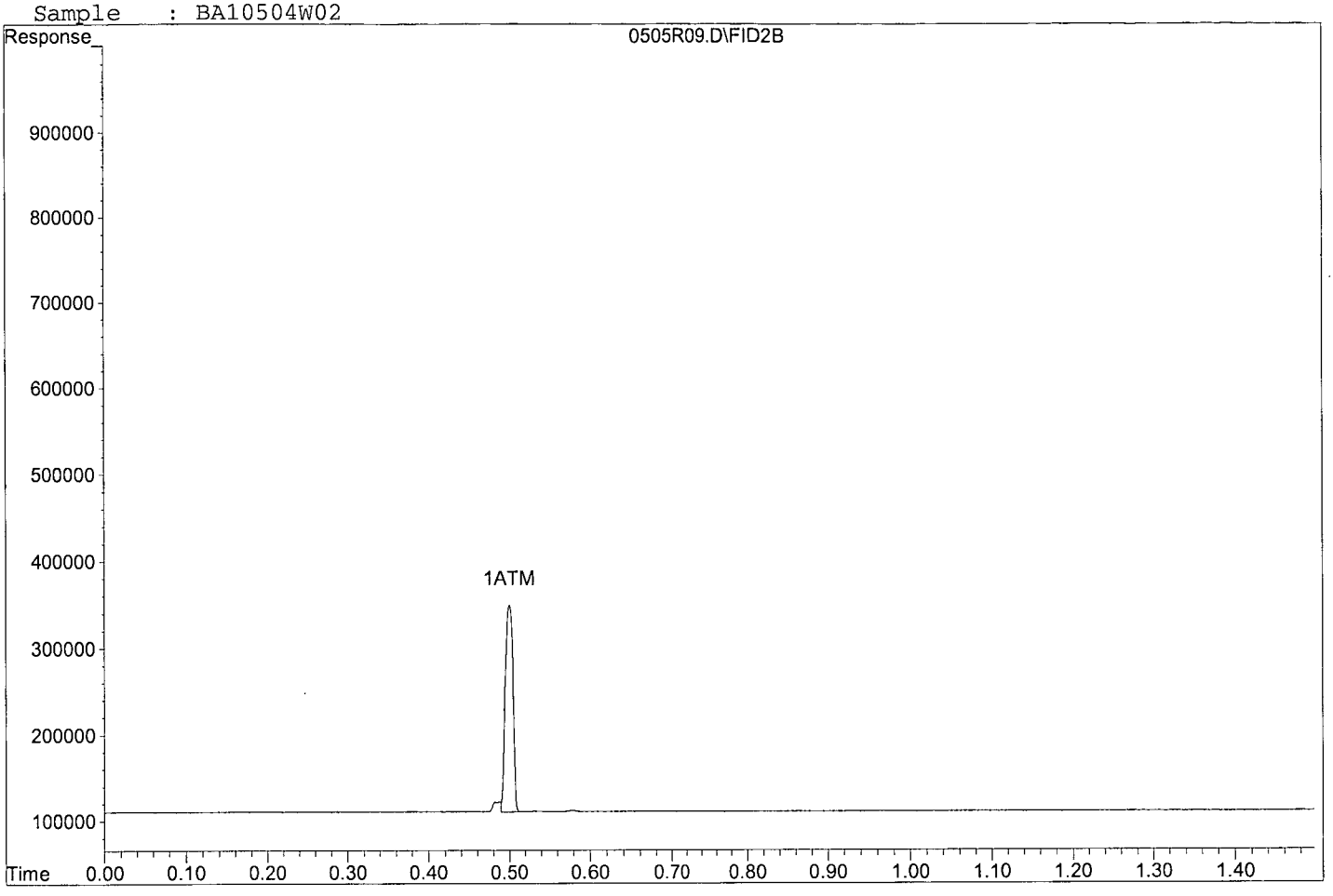
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
1) ATM Methane	0.50	239140	19.378	ppb	
Target Compounds					
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0505R09.D
Sample : BA10504W02



Quantitation Report (QT Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R05.D Vial: 5
Acq On : 5 May 20 11:52 Operator: GA; CMM
Sample : 200505A Blk Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 11:59 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

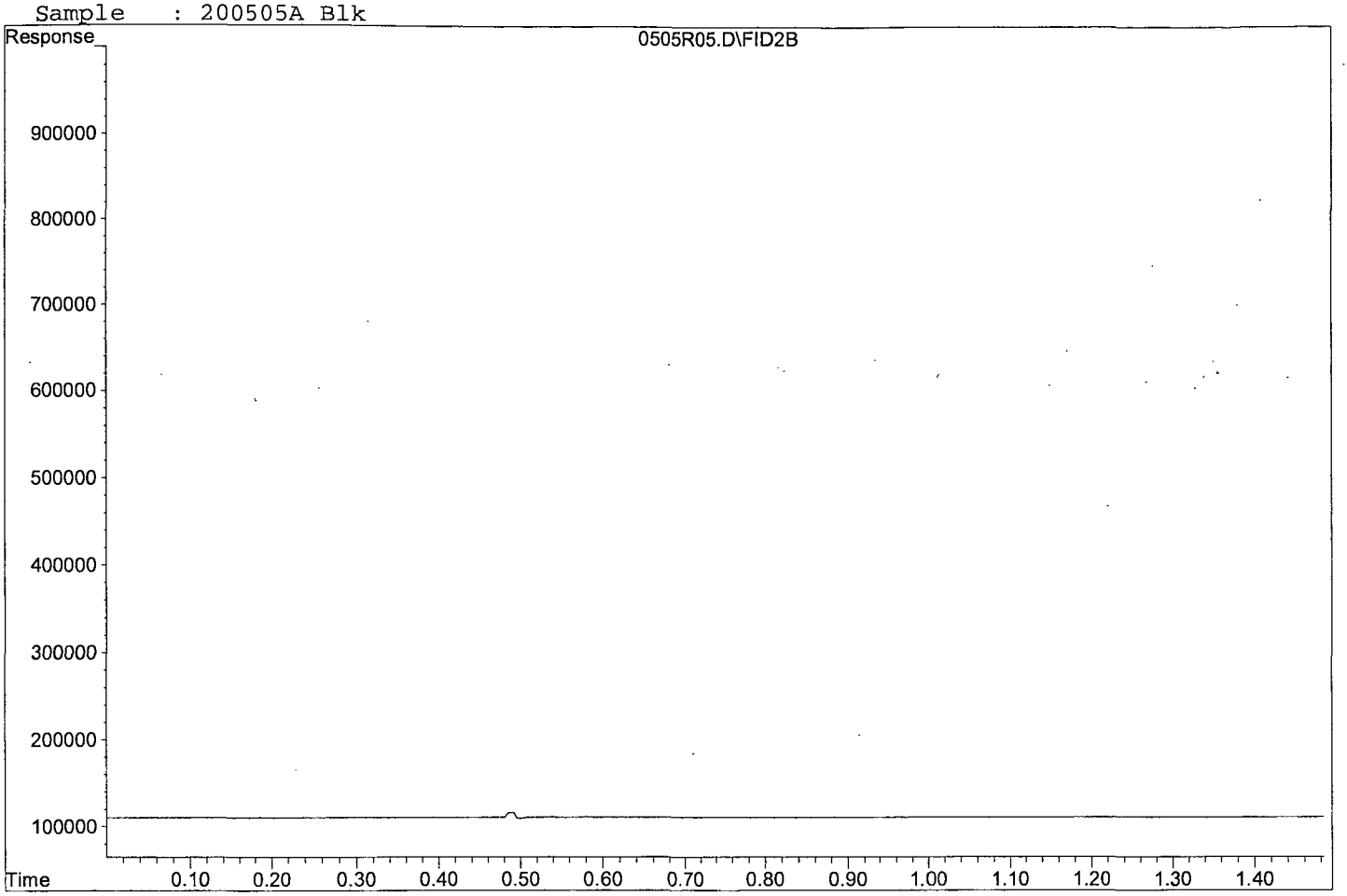
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units	
Target Compounds					
Target Compounds					
1) ATM Methane	0.00	0	N.D.	ppb	d
2) ATM Ethane	0.00	0	N.D.	ppb	d
3) ATM Ethene	0.00	0	N.D.	ppb	d

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\ROCKY\DATA\200311RS\0505R05.D
Sample : 200505A Blk



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R01.D Vial: 1
Acq On : 5 May 20 11:28 Operator: GA; CMM
Sample : 200505A CCV/LCS RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 11:31 2020 Quant Results File: RSK0311.RES

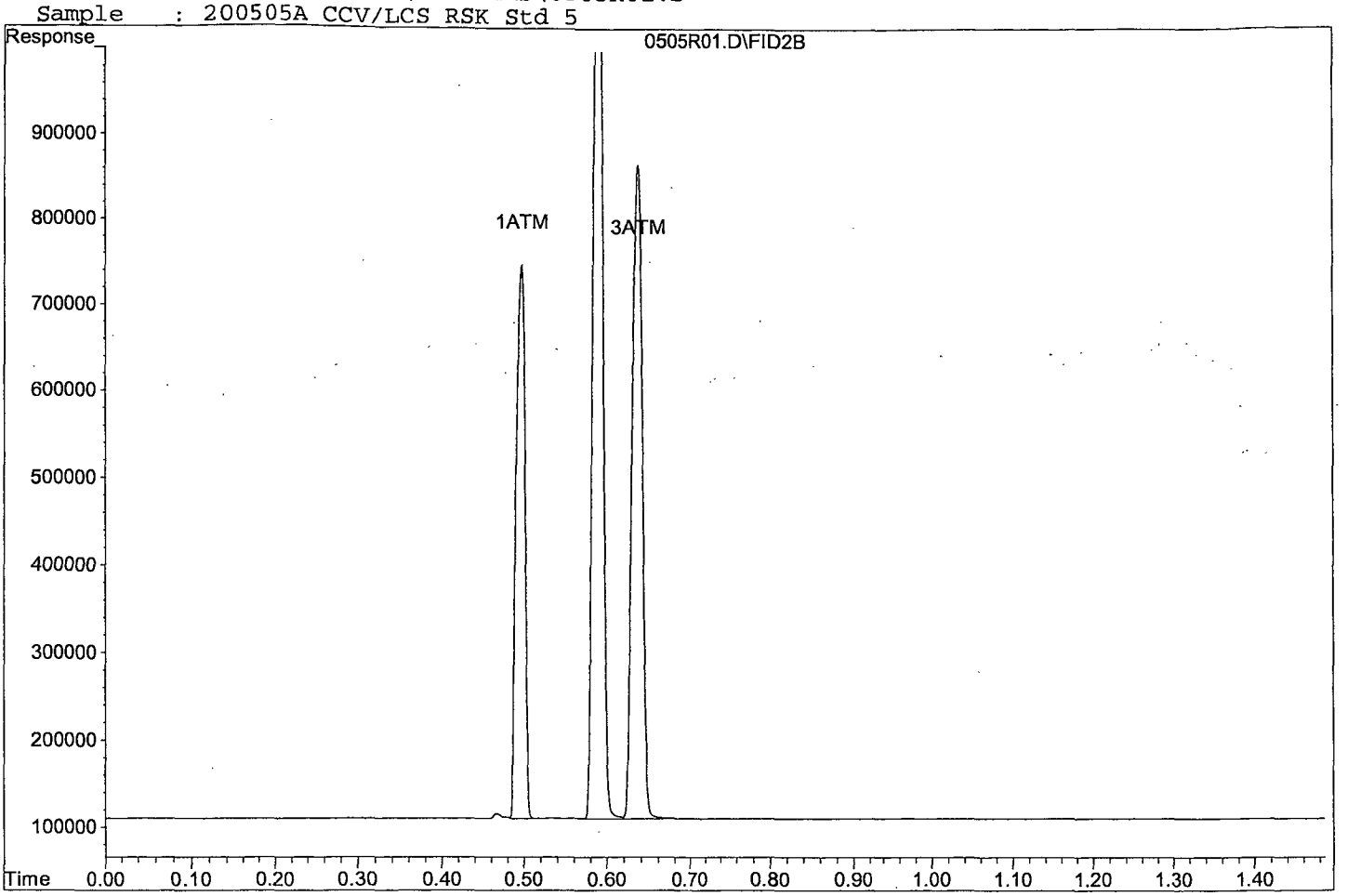
Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc Units
Target Compounds			
1) ATM Methane	0.50	637603	73.873 ppb
2) ATM Ethane	0.59	1085970	160.643 ppb
3) ATM Ethene	0.64	755466	146.616 ppb

Target Compounds

Data File: G:\ROCKY\DATA\200311RS\0505R01.D
Sample : 200505A CCV/LCS RSK Std 5



Quantitation Report (Not Reviewed)

Data File : G:\ROCKY\DATA\200311RS\0505R03.D Vial: 3
Acq On : 5 May 20 11:46 Operator: GA; CMM
Sample : 200505A LCSD RSK Std 5 Inst : 7890
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: May 5 11:49 2020 Quant Results File: RSK0311.RES

Method : G:\ROCKY\DATA\200311RS\RSK0311.M (Chemstation Integrator)
Title : RSK 175
Last Update : Tue Apr 28 12:29:37 2020
Response via : Multiple Level Calibration

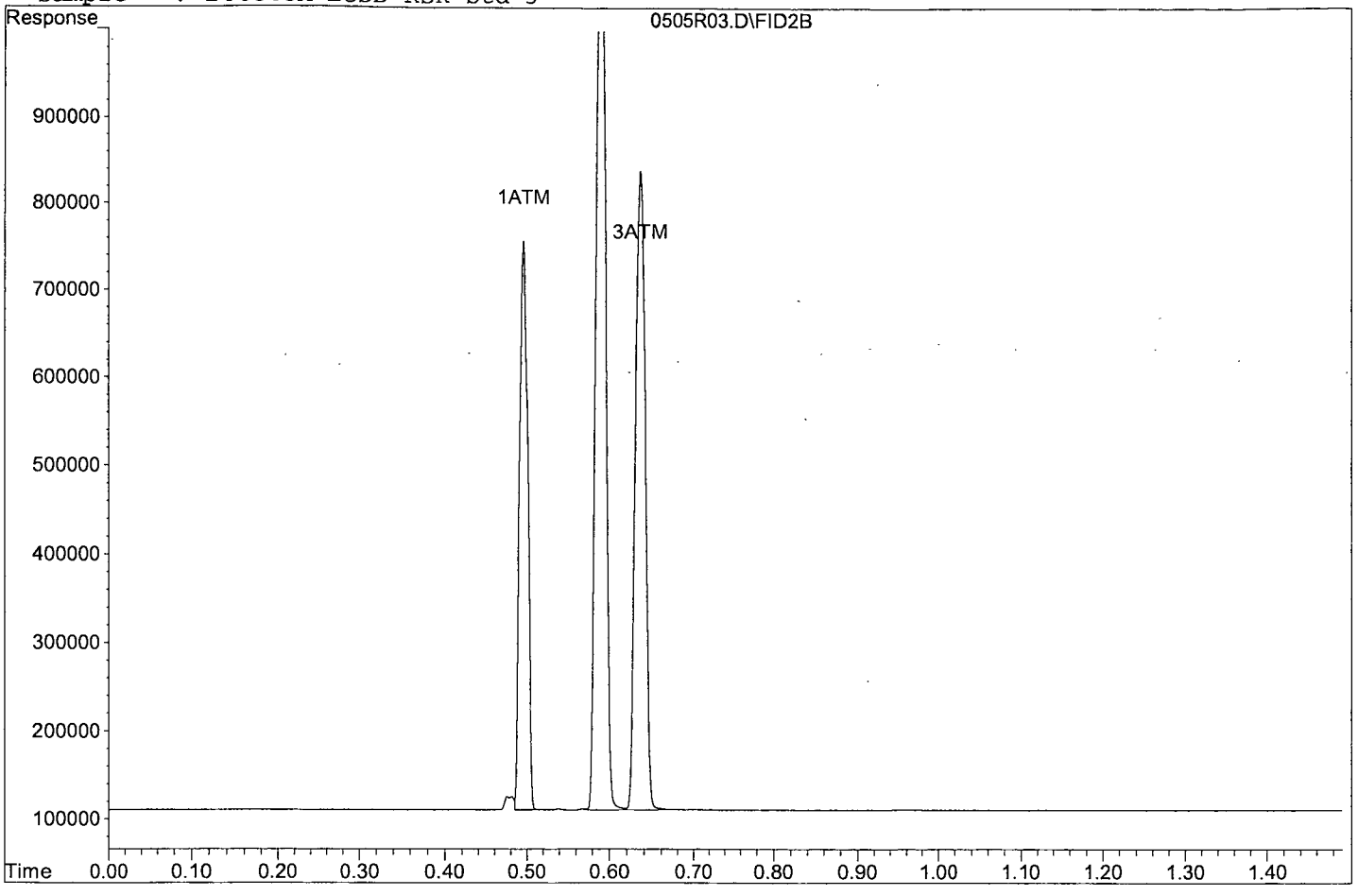
Volume Inj. : 0.500 mL
Signal Phase : CARBOPACK
Signal Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) ATM Methane	0.50	644612	74.832	ppb
2) ATM Ethane	0.59	1059347	156.144	ppb
3) ATM Ethene	0.64	727278	140.486	ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\ROCKY\DATA\200311RS\0505R03.D
Sample : 200505A LCSD RSK Std 5



Primary Stock Source

10,000ppmV **Manufacture Expiration:** 09/21/21

RSK Gas Mix (Scott Specialty Gas) CAT#X04NI97CP140001 LOT#160-401558175-1

1% Gas Concentration Moles = 10,000ppmV Methane, Ethane, Ethene

RSK Calibration Curve (prepared in 1.0 L Tedlar Bags at room temp) **05/11/20** **03/11/20**

Analyte	Conc Std 1 (1/2 = LOD) (ug/L)	Conc Std 2 (LOQ Chk) (ug/L)	Conc Std 3 (ug/L)	Conc Std 4 (ug/L)	Conc Std 5 (ug/L)	Conc Std 6 (ug/L)	Conc Std 7 (ug/L)
Methane (MW 16.04)	2.08	4.16	8.34	20.85	83.40	208.5	834.0
Ethane (MW 30.07)	3.91	7.81	15.6	39.09	156.35	390.9	1563.5
Ethene (MW 28.05)	3.65	7.30	14.6	36.46	145.84	364.6	1458.4
Stock Source	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1	160-401558175-1
Stock Conc (ppmv)	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV	10,000 ppmV
Stock Aliquot (mL)	0.010	0.020	0.040	0.100	0.400	1.00	4.00
Final Volume P&T Water	32 mL	32 mL	32 mL	32 mL	32 mL	32 mL	32 mL

Second Source Stock Standard 10,000ppmV **Manufacturer Exp date 9-21-2021**

RSK Gas Mix (Scott Specialty Gas) Cat.# 23452, Lot # 160-401303032-1-39774

1% Gas Concentration Moles = 10,000ppmV Methane, Ethane, Ethene

Second Source **Expires 03/12/2020** **CMM 03/11/2020**

Spike 0.400mL of 10,000ppmV into 32mL DI water, with 8mL Nitrogen headspace

final conc: 83.40ug/L Methane, 156.35ug/L Ethane, and 145.84ug/L Ethene

CCV/LCS/LCSD **CMM 05/05/20**

Spike 0.400mL of 10,000ppmV into 32mL DI water, with 8mL Nitrogen headspace

final conc: 83.40ug/L Methane, 156.35ug/L Ethane, and 145.84ug/L Ethene

Injection Log

Directory: G:\ROCKY\DATA\200311RS\

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	3	0311R03.D	1	RSK Std 1 03/11/2020		11 Mar 20 13:00
2	4	0311R04.D	1	RSK Std 2 03/11/2020		11 Mar 20 13:03
3	7	0311R07.D	1	RSK Std 3 03/11/2020		11 Mar 20 13:12
4	8	0311R08.D	1	RSK Std 4 03/11/2020		11 Mar 20 13:15
5	9	0311R09.D	1	RSK Std 5 03/11/2020		11 Mar 20 13:17
6	11	0311R11.D	1	RSK Std 6 03/11/2020		11 Mar 20 13:22
7	13	0311R13.D	1	RSK Std 7 03/11/2020		11 Mar 20 13:28
8	15	0311R15.D	1	RSK SS Std 5 03/11/2020		11 Mar 20 13:38
9	1	0505R01.D	1	200505A CCV/LCS RSK Std 5		5 May 20 11:28
10	3	0505R03.D	1	200505A LCSD RSK Std 5		5 May 20 11:46
11	5	0505R05.D	1	200505A Blk		5 May 20 11:52
14	8	0505R08.D	1	BA10503W02		5 May 20 12:04
15	9	0505R09.D	1	BA10504W02		5 May 20 12:07
16	11	0505R11.D	1	Ending CCV RSK Std 5 05/05/2020		5 May 20 12:12

INORGANIC ANALYSIS
Calibration Data

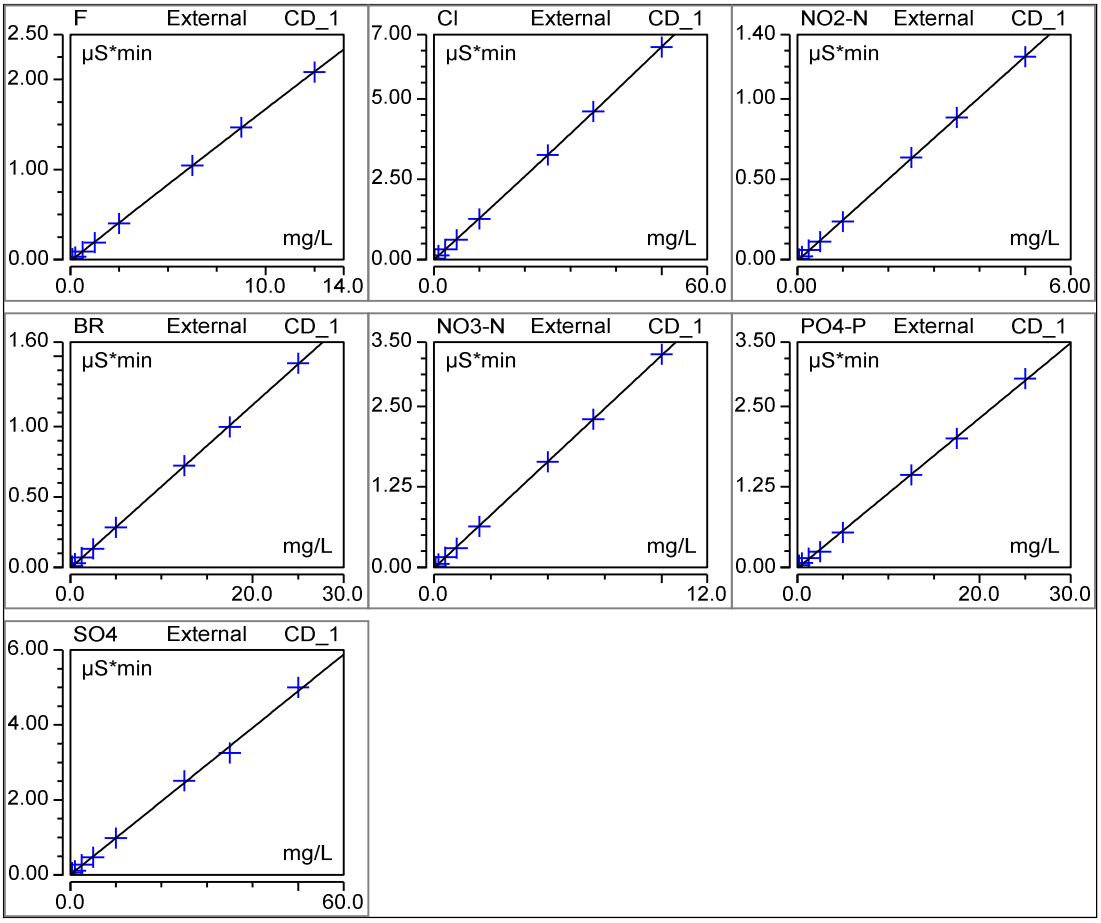
Calibration Batch Report

Sequence:	**200326**	*Injection Volume:*	**25.00**
Instrument Method:	**Anions IM**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:22**	*Run Time:*	**14**

Calibration Summary

Peak Name	Eval.Type	Cal.Type	Points	Offset (C0)	Slope (C1)	Curve (C2)	Coeff.Det. %
F	Area	Quad, WithOffset	8.000	-0.016	0.171	0.000	99.9922
Cl	Area	Quad, WithOffset	8.000	-0.007	0.128	0.000	99.9957
NO2-N	Area	Lin, WithOffset	8.000	-0.009	0.255	0.000	99.9838
BR	Area	Lin, WithOffset	8.000	-0.006	0.058	0.000	99.9872
NO3-N	Area	Lin, WithOffset, 1/A	8.000	-0.014	0.331	0.000	99.9739
PO4-P	Area	Lin, WithOffset	8.000	-0.016	0.117	0.000	99.9396
SO4	Area	Lin, WithOffset	8.000	0.006	0.098	0.000	99.7903

Injection Name	Amount mg/L CD_1 F	Amount mg/L CD_1 Cl	Amount mg/L CD_1 NO2-N	Amount mg/L CD_1 BR	Amount mg/L CD_1 NO3-N	Amount mg/L CD_1 PO4-P	Amount mg/L CD_1 SO4
Cal 1	0.157	0.3163	0.0511	0.2474	0.0796	0.4282	0.6148
Cal 2	0.273	1.0789	0.1153	0.5781	0.2054	0.7072	1.0626
Cal 3	0.611	2.5316	0.2592	1.2595	0.5238	1.1933	2.7192
Cal 4	1.187	4.8096	0.4672	2.4043	0.9297	2.1420	4.7385
Cal 5	2.371	9.8094	0.9573	4.9426	1.9148	4.5306	9.9082
Cal 6	6.245	25.0387	2.4641	12.3303	4.9622	12.0807	25.4677
Cal 7	8.827	34.9499	3.4985	17.2085	6.9204	17.1012	35.1265
Cal 8 2020.03.25	12.582	49.9317	4.9740	25.1090	9.9430	25.1800	50.7694



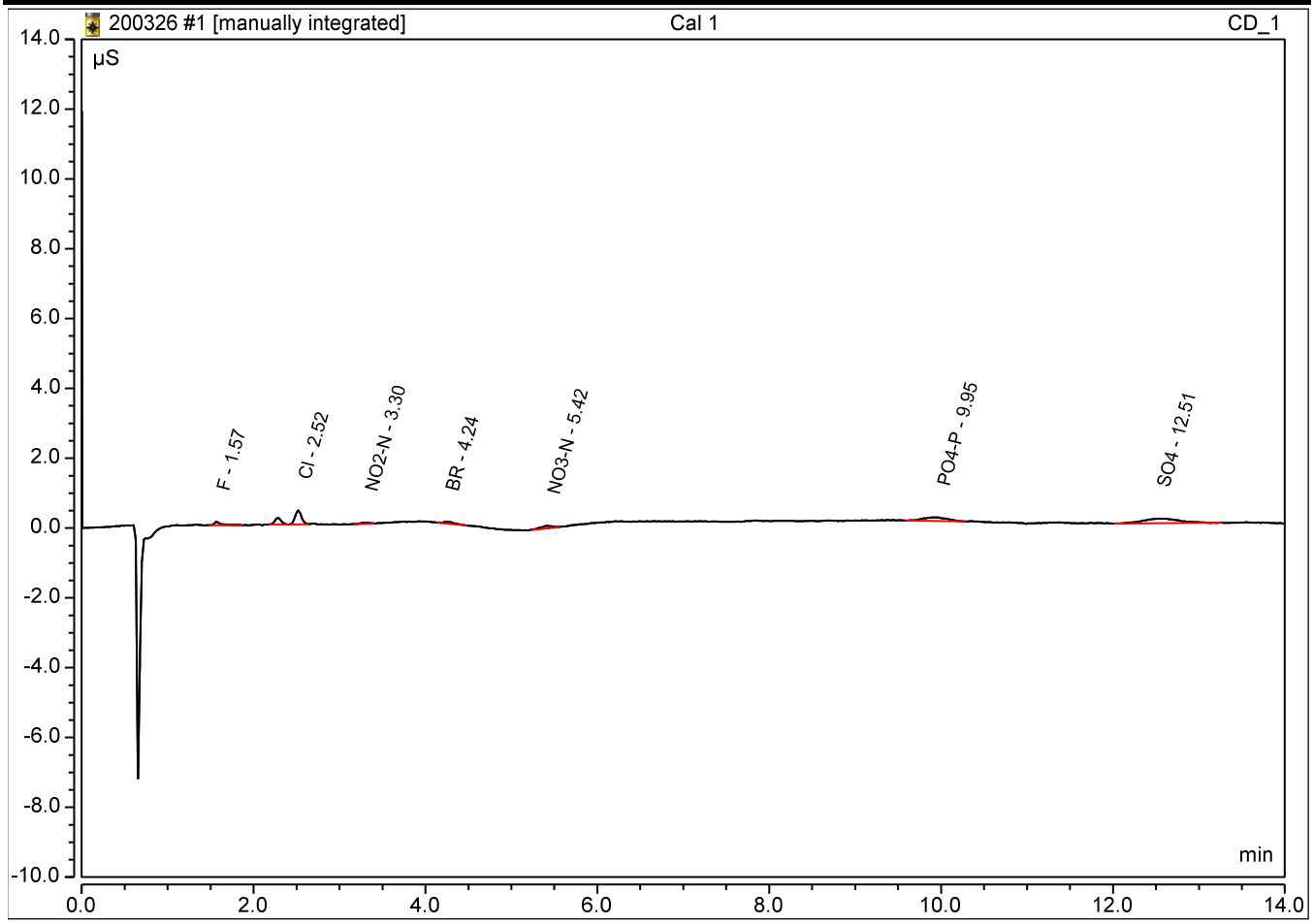
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:28**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.011	0.098	0.16	0.1	157.2%
3	2.52	**Cl**	BMB	0.034	0.405	0.32	0.2	158.1%
4	3.30	**NO2-N**	BMB	0.005	0.038	0.05	0.04	127.7%
5	4.24	**BR**	BMB	0.009	0.050	0.25	0.2	123.7%
6	5.42	**NO3-N**	BMB	0.012	0.074	0.08	0.08	99.5%
7	9.95	**PO4-P**	BMB*	0.034	0.107	0.43	0.2	214.1%
8	12.51	**SO4**	BMB*	0.067	0.137	0.61	0.4	153.7%

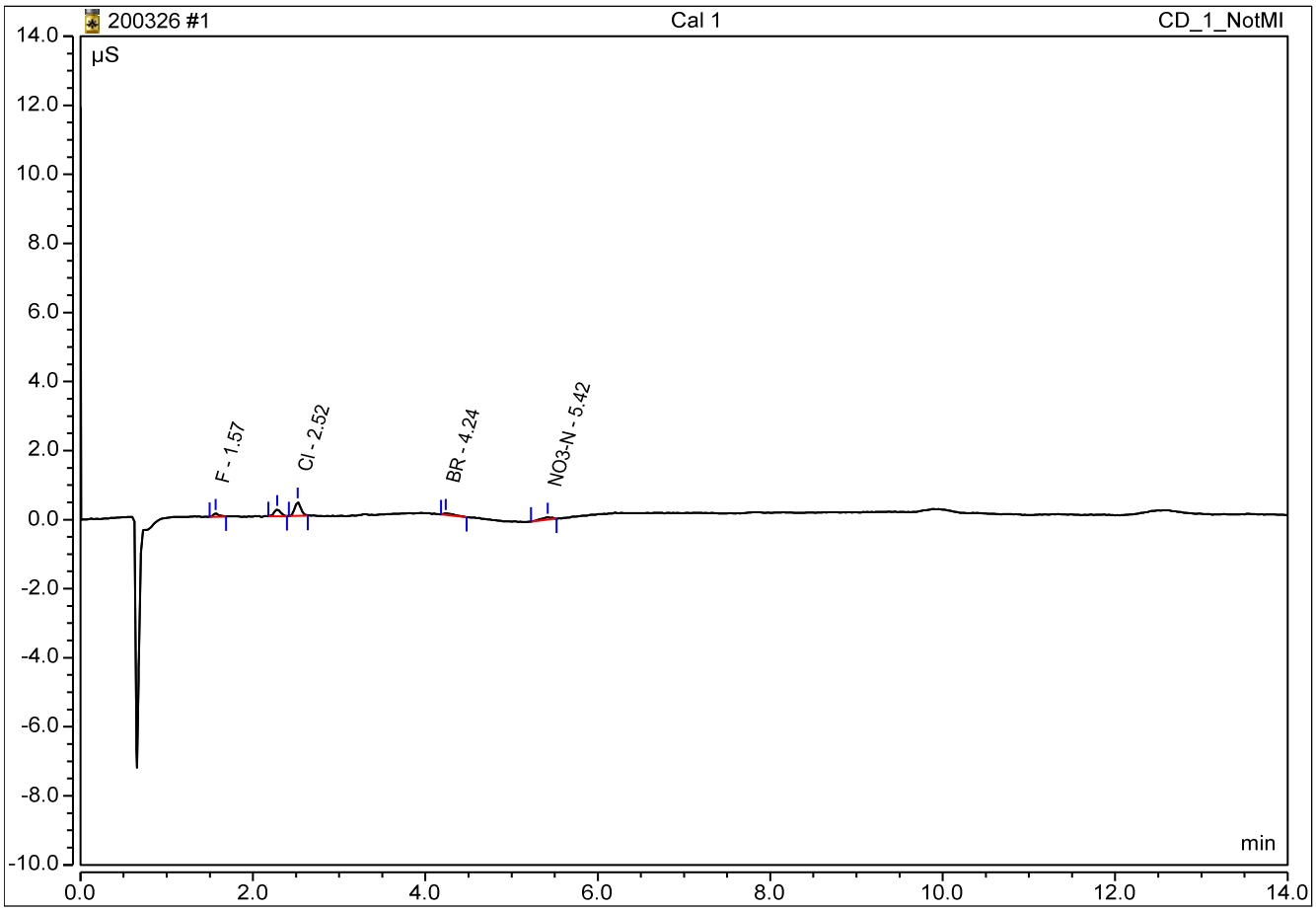


GA MI 1 2020.03.26

Not Manipulated Peak Integration Report

Sample Name:	**Cal 1**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:28**	*Run Time:*	**14.00**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	1.57	**F**	BMB	0.007	0.093	0.1305
3	2.52	**Cl**	BMB	0.034	0.405	0.3164
4	n.a.	**NO2-N**	BMB	n.a.	n.a.	n.a.
5	4.24	**BR**	BMB	0.006	0.041	0.2065
6	5.42	**NO3-N**	BMB	0.010	0.068	0.0644
7	n.a.	**PO4-P**	BMB*	n.a.	n.a.	n.a.
8	n.a.	**SO4**	BMB*	n.a.	n.a.	n.a.

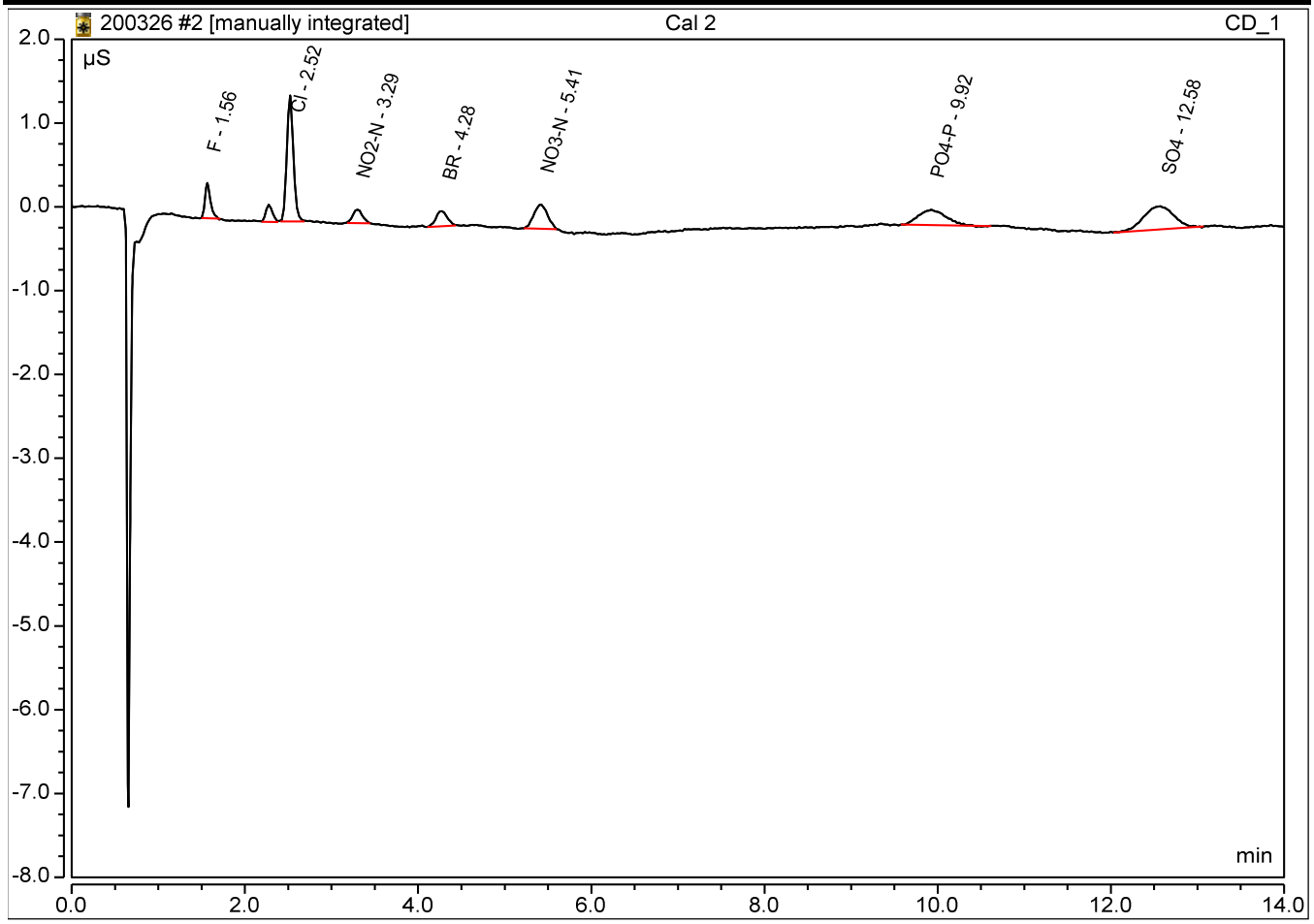


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:44**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.56	**F**	BMB*	0.030	0.420	0.27	0.25	109.1%
3	2.52	**Cl**	BMB	0.132	1.502	1.08	1	107.9%
4	3.29	**NO2-N**	BMB	0.021	0.165	0.12	0.1	115.3%
5	4.28	**BR**	BMB	0.028	0.182	0.58	0.5	115.6%
6	5.41	**NO3-N**	BMB	0.054	0.288	0.21	0.2	102.7%
7	9.92	**PO4-P**	BMB*	0.067	0.192	0.71	0.5	141.4%
8	12.58	**SO4**	BMB*	0.110	0.278	1.06	1	106.3%

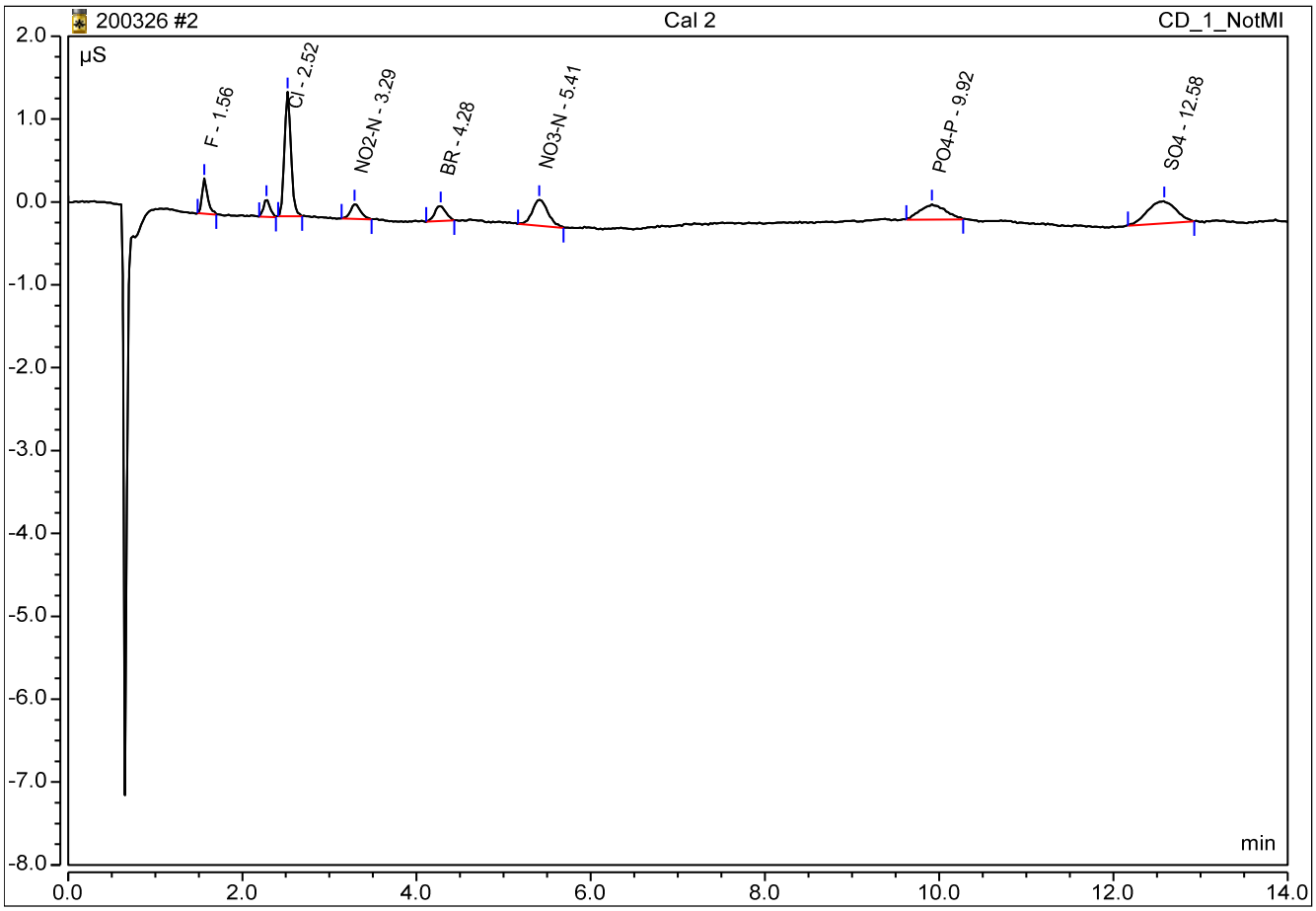


GA MI 1 2020.03.26

Not Manipulated Peak Integration Report

Sample Name:	**Cal 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 13:44**	*Run Time:*	**14.00**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	1.56	**F**	BMB*	0.032	0.425	0.2765
3	2.52	**Cl**	BMB	0.132	1.502	1.0796
4	3.29	**NO2-N**	BMB	0.025	0.176	0.1249
5	4.28	**BR**	BMB	0.027	0.180	0.5628
6	5.41	**NO3-N**	BMB	0.067	0.315	0.2352
7	9.92	**PO4-P**	BMB*	0.061	0.185	0.6914
8	12.58	**SO4**	BMB*	0.103	0.270	1.0287

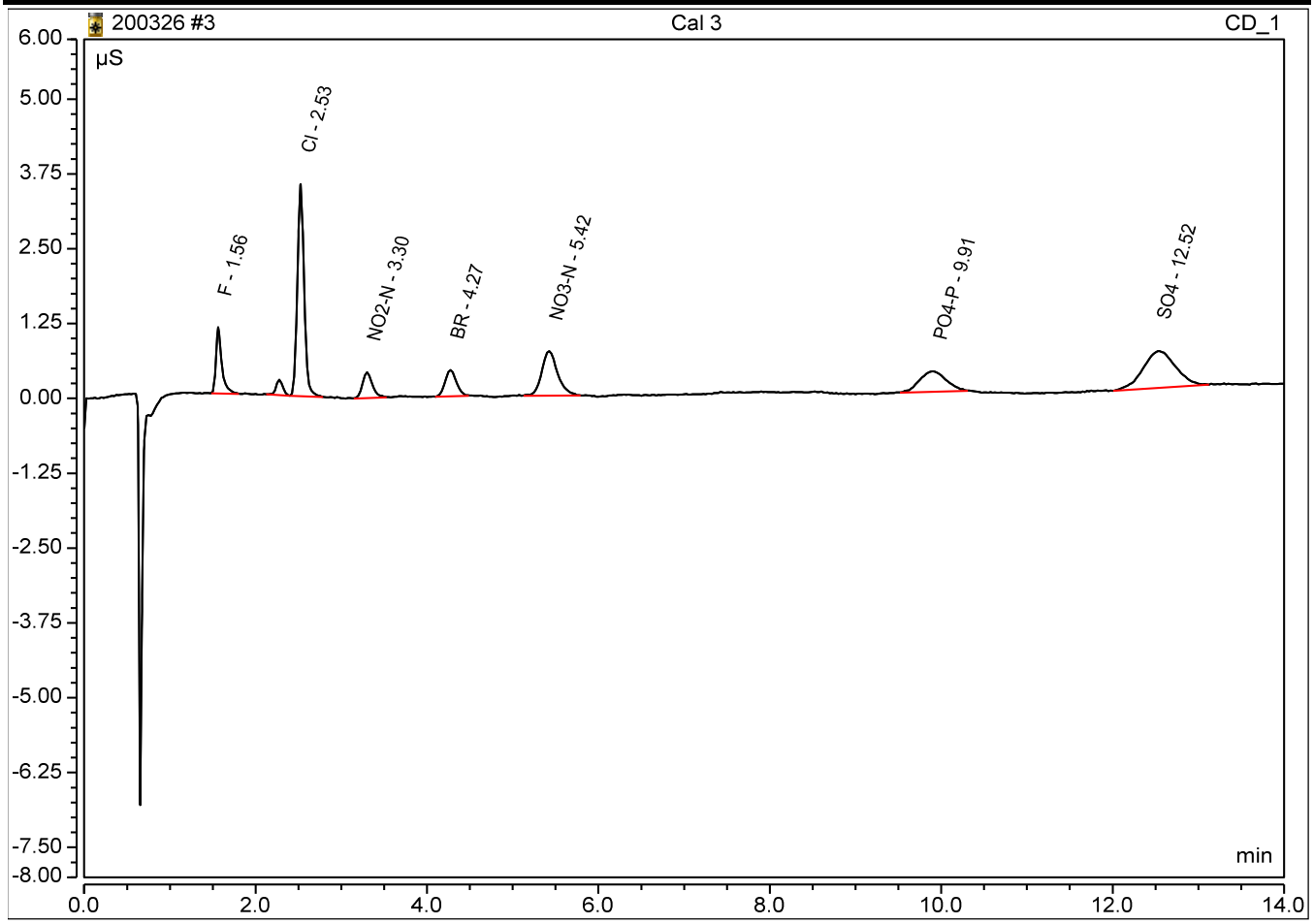


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:01**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.56	**F**	BMB	0.088	1.107	0.61	0.625	97.8%
3	2.53	**Cl**	BMB	0.319	3.543	2.53	2.5	101.3%
4	3.30	**NO2-N**	BMB	0.057	0.430	0.26	0.25	103.7%
5	4.27	**BR**	BMB	0.067	0.442	1.26	1.25	100.8%
6	5.42	**NO3-N**	BMB	0.159	0.742	0.52	0.5	104.8%
7	9.91	**PO4-P**	BMB	0.124	0.343	1.19	1.25	95.5%
8	12.52	**SO4**	BMB	0.273	0.621	2.72	2.5	108.8%

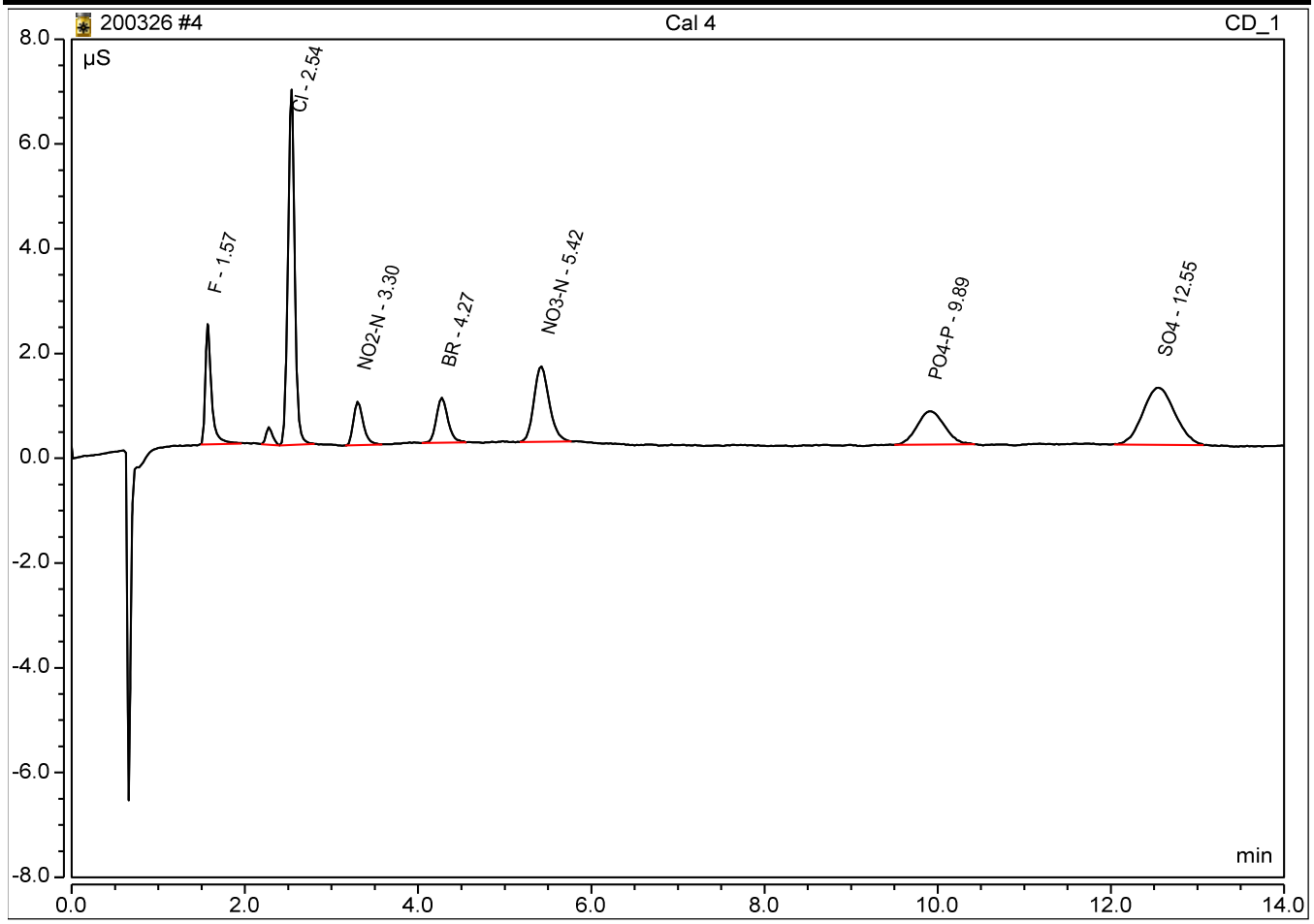


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 4**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:17**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.186	2.294	1.19	1.25	94.9%
3	2.54	**Cl**	BMB	0.612	6.787	4.81	5	96.2%
4	3.30	**NO2-N**	BMB	0.110	0.831	0.47	0.5	93.4%
5	4.27	**BR**	BMB	0.134	0.859	2.40	2.5	96.2%
6	5.42	**NO3-N**	BMB	0.293	1.442	0.93	1	93.0%
7	9.89	**PO4-P**	BMB	0.234	0.639	2.14	2.5	85.7%
8	12.55	**SO4**	BMB	0.470	1.092	4.74	5	94.8%



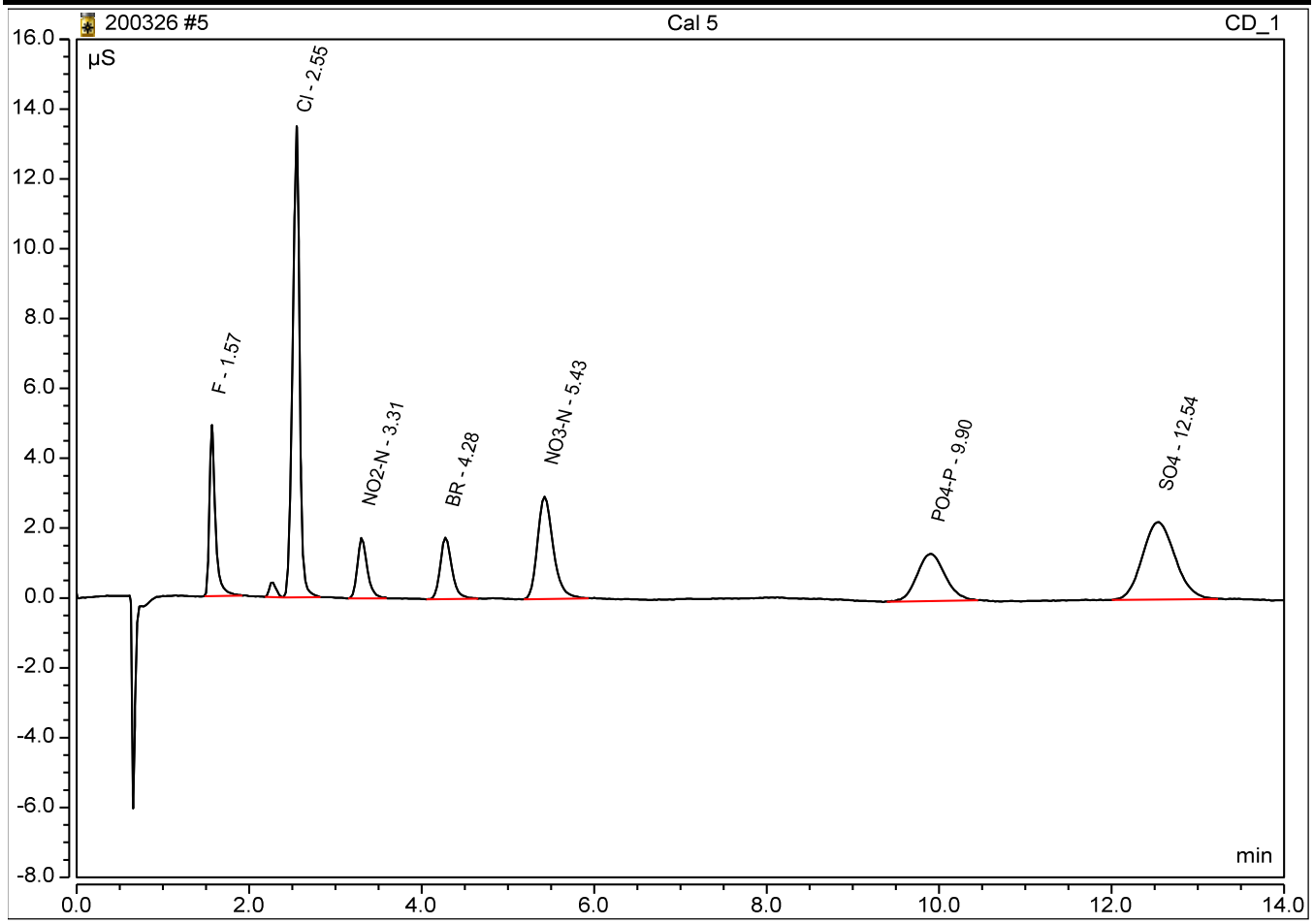
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:33**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.388	4.897	2.37	2.5	94.8%
3	2.55	**Cl**	BMB	1.260	13.489	9.81	10	98.1%
4	3.31	**NO2-N**	BMB	0.235	1.743	0.96	1	95.7%
5	4.28	**BR**	BMB	0.281	1.762	4.94	5	98.9%
6	5.43	**NO3-N**	BMB	0.619	2.936	1.91	2	95.7%
7	9.90	**PO4-P**	BMB	0.513	1.360	4.53	5	90.6%
8	12.54	**SO4**	BMB	0.977	2.218	9.91	10	99.1%



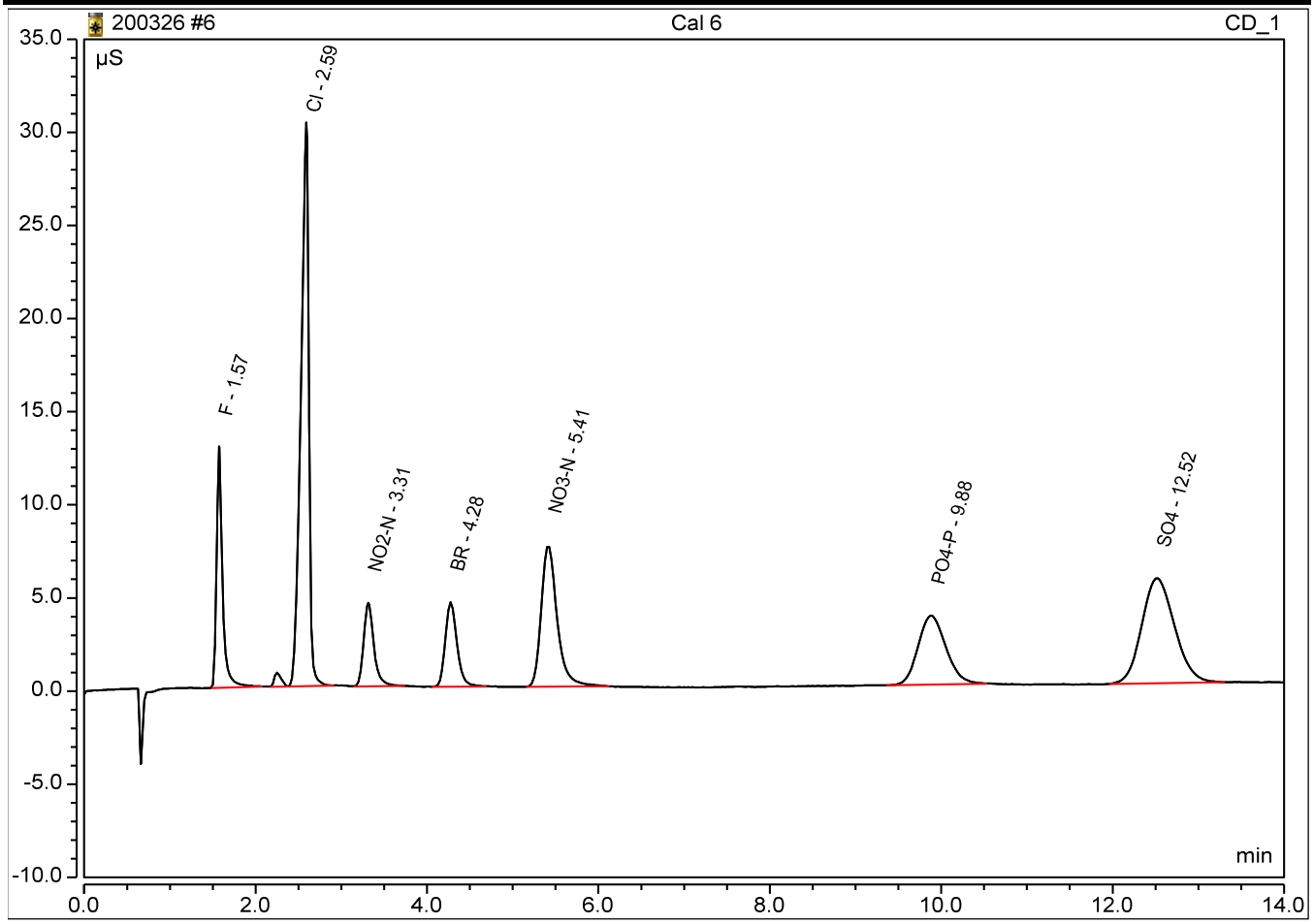
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 6**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 14:50**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	1.043	12.959	6.25	6.25	99.9%
3	2.59	**Cl**	BMB	3.257	30.258	25.04	25	100.2%
4	3.31	**NO2-N**	BMB	0.619	4.484	2.46	2.5	98.6%
5	4.28	**BR**	BMB	0.709	4.535	12.33	12.5	98.6%
6	5.41	**NO3-N**	BMB	1.628	7.608	4.96	5	99.2%
7	9.88	**PO4-P**	BMB	1.395	3.711	12.08	12.5	96.6%
8	12.52	**SO4**	BMB	2.500	5.638	25.47	25	101.9%

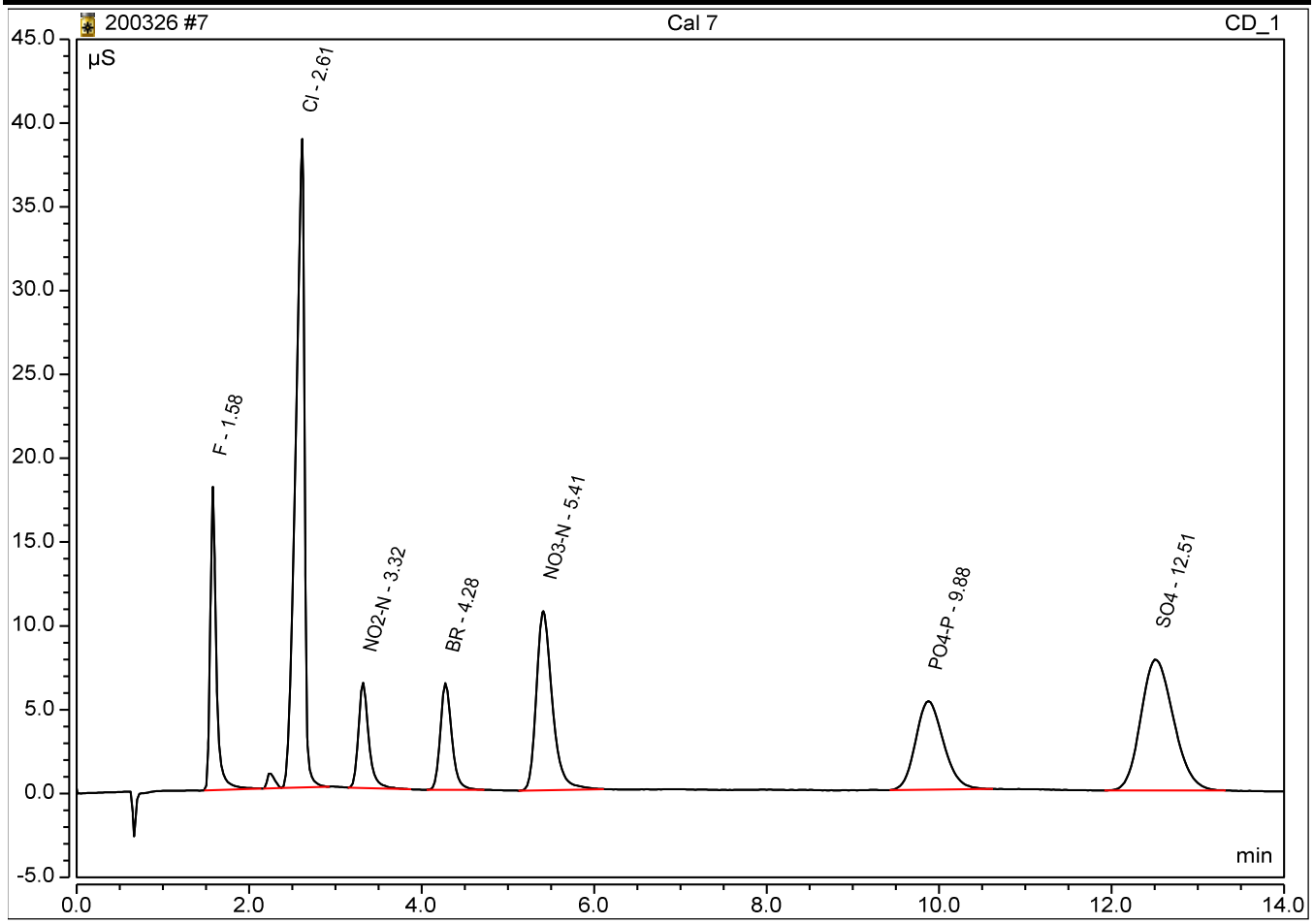


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 7**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:06**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.58	**F**	BMB	1.476	18.100	8.83	8.75	100.9%
3	2.61	**Cl**	BMB	4.578	38.681	34.95	35	99.9%
4	3.32	**NO2-N**	BMB	0.882	6.277	3.50	3.5	100.0%
5	4.28	**BR**	BMB	0.992	6.366	17.21	17.5	98.3%
6	5.41	**NO3-N**	BMB	2.276	10.681	6.92	7	98.9%
7	9.88	**PO4-P**	BMB	1.981	5.287	17.10	17.5	97.7%
8	12.51	**SO4**	BMB	3.446	7.825	35.13	35	100.4%

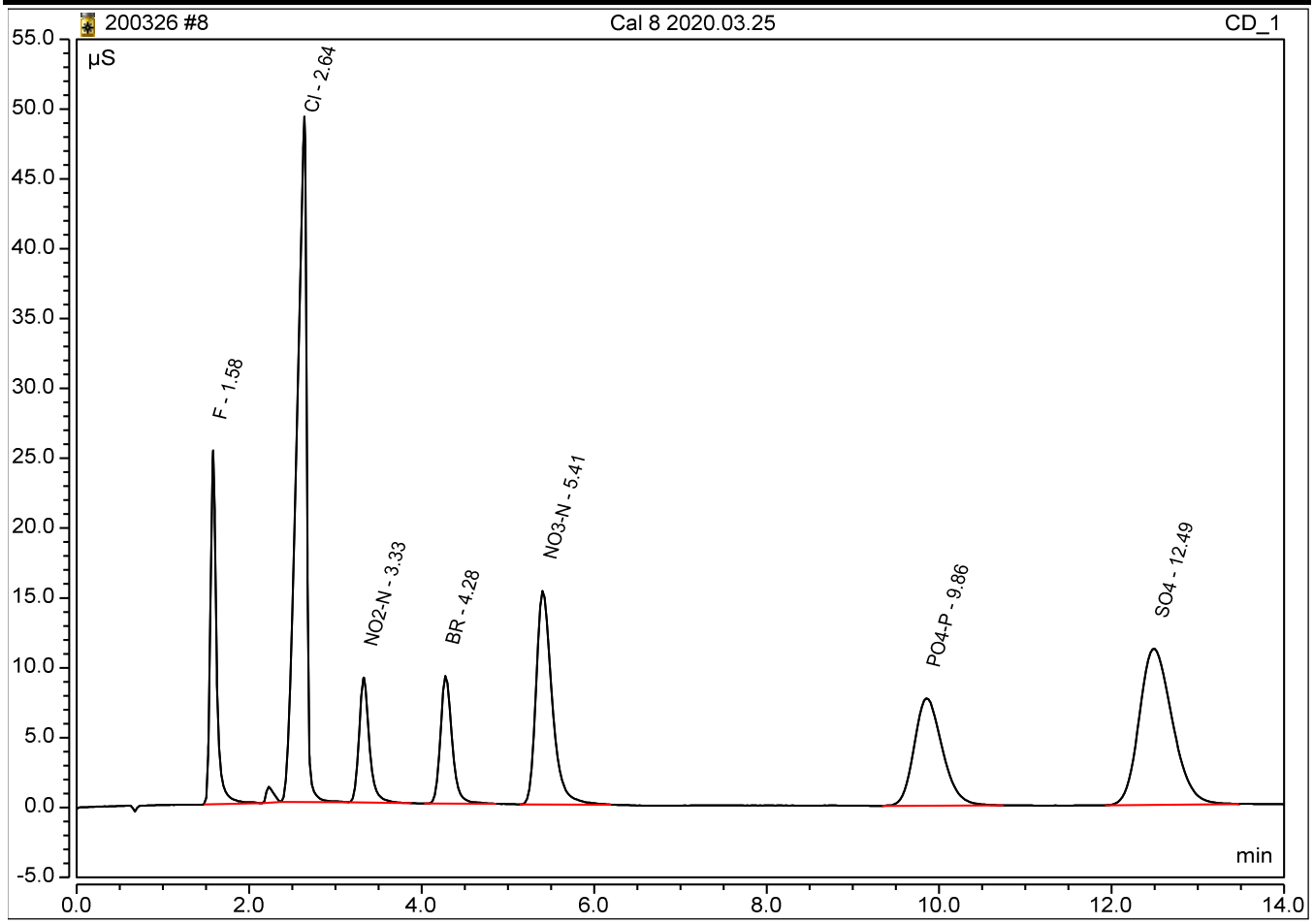


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**Cal 8 2020.03.25**	*Inj. Vol.:*	**25uL**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:22**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.58	**F**	BMB	2.100	25.328	12.58	12.5	100.7%
3	2.64	**Cl**	BMB	6.606	49.067	49.93	50	99.9%
4	3.33	**NO2-N**	BMB	1.257	8.938	4.97	5	99.5%
5	4.28	**BR**	BMB	1.450	9.175	25.11	25	100.4%
6	5.41	**NO3-N**	BMB	3.277	15.327	9.94	10	99.4%
7	9.86	**PO4-P**	BMB	2.924	7.700	25.18	25	100.7%
8	12.49	**SO4**	BMB	4.978	11.186	50.77	50	101.5%



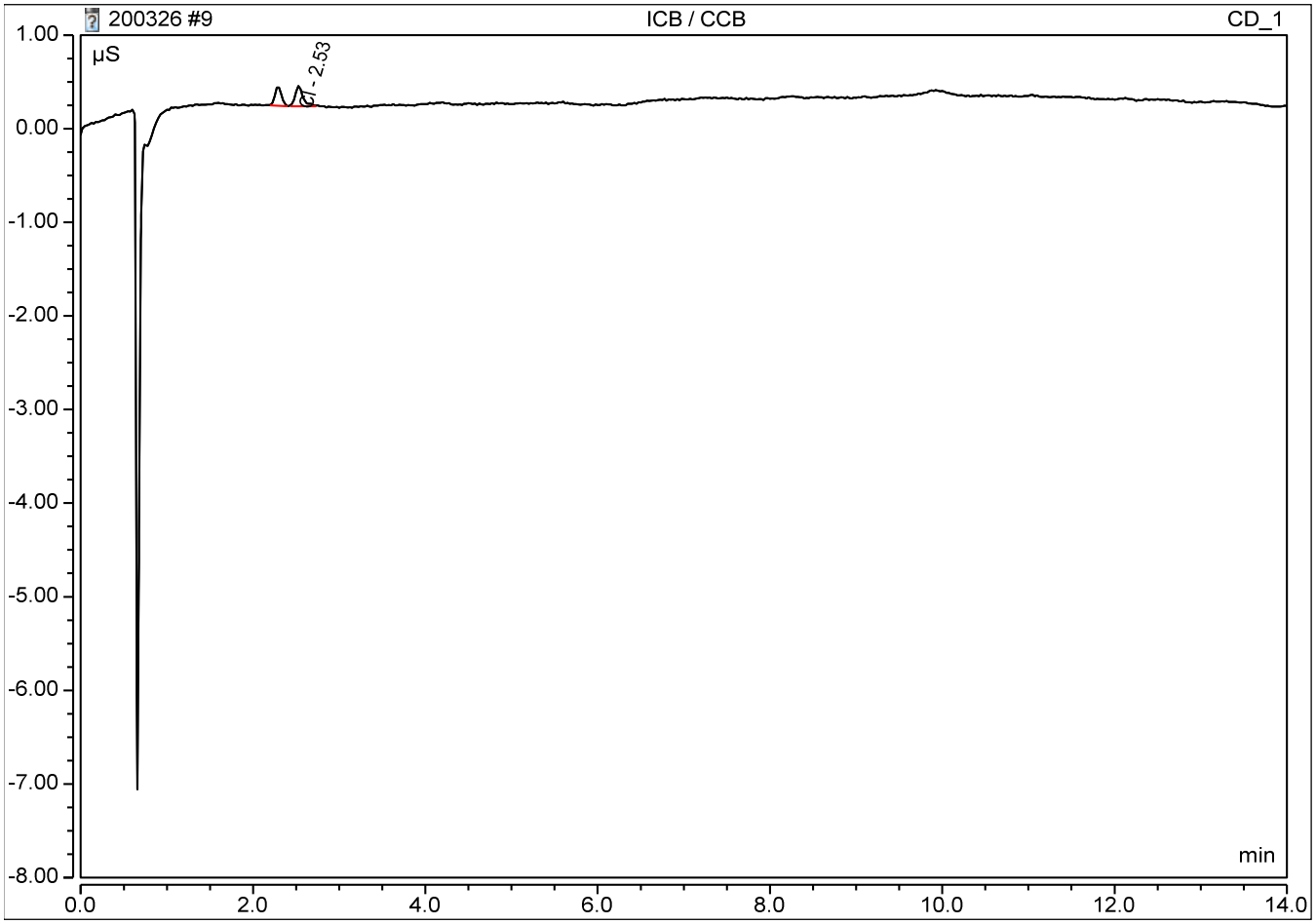
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**ICB / CCB**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:39**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.53	**Cl**	BMB	0.022	0.219	0.22		

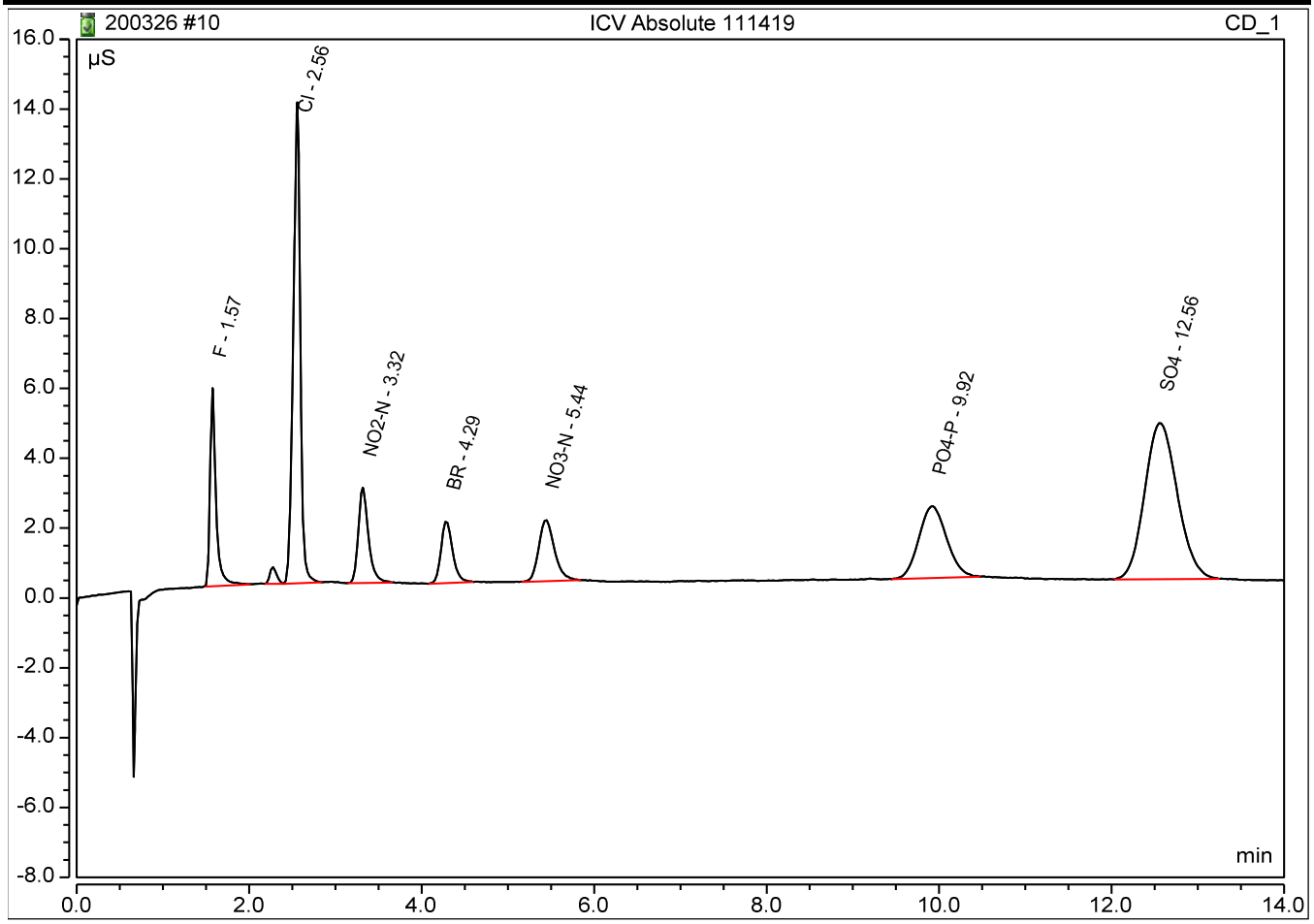


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200326

Peak Integration Report

Sample Name:	**ICV Absolute 111419**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**26-Mar-2020 / 15:55**	*Run Time:*	**14.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.57	**F**	BMB	0.452	5.670	2.75	2.5	110.0%
3	2.56	**Cl**	BMB	1.301	13.777	10.13	10	101.3%
4	3.32	**NO2-N**	BMB	0.377	2.729	1.51	1.522334	99.4%
5	4.29	**BR**	BMB	0.279	1.779	4.91	5	98.3%
6	5.44	**NO3-N**	BMB	0.370	1.758	1.16	1.129525	102.7%
7	9.92	**PO4-P**	BMB	0.771	2.060	6.74	6.522	103.3%
8	12.56	**SO4**	BMB	1.968	4.481	20.04	20	100.2%



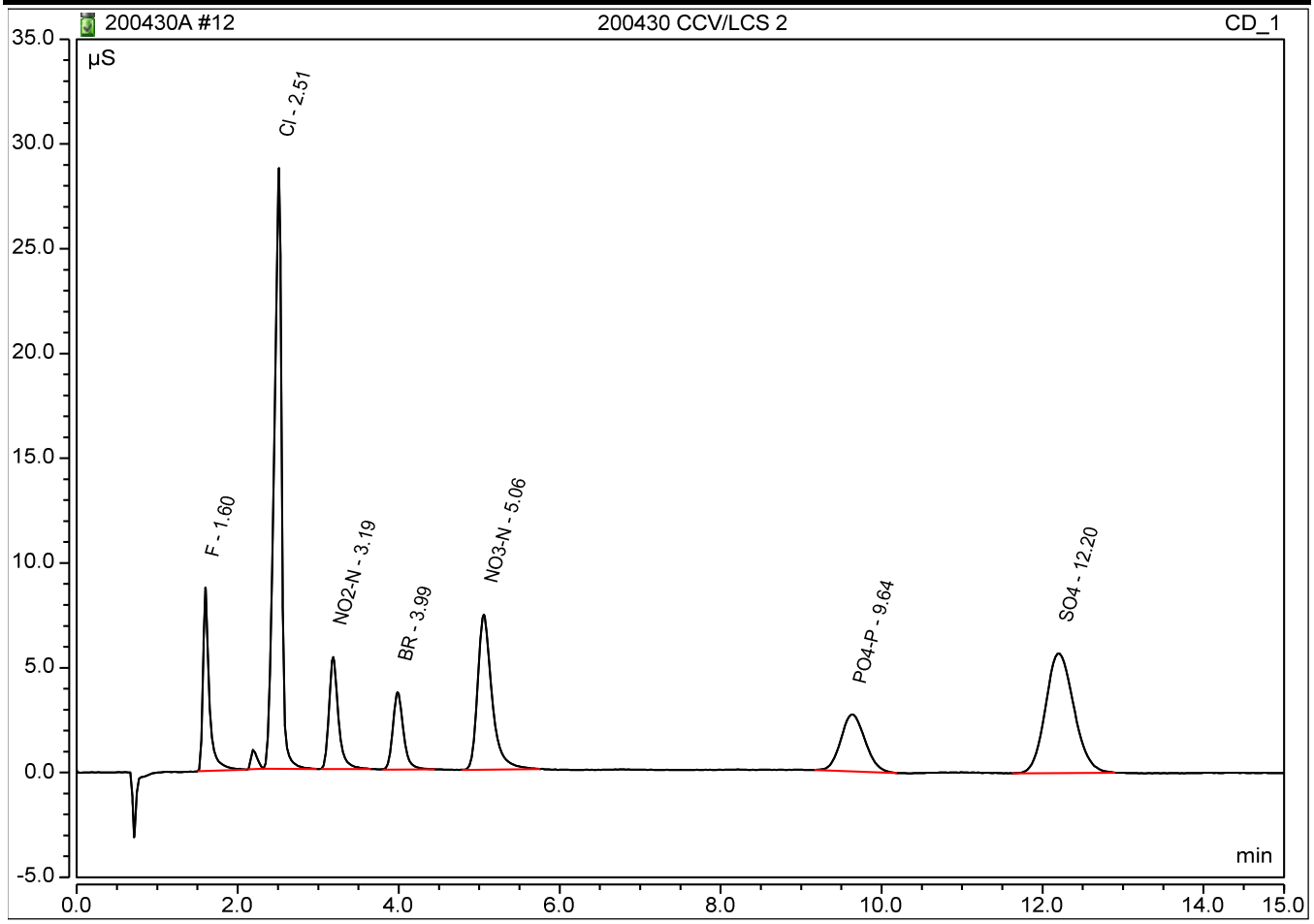
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200430A

Peak Integration Report

Sample Name:	**200430 CCV/LCS 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**30-Apr-2020 / 16:15**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	**F**	BMB	0.804	8.750	4.83	5	96.5%
3	2.51	**Cl**	BMB	3.156	28.675	24.27	25	97.1%
4	3.19	**NO2-N**	BMB	0.731	5.350	2.90	3.04	95.5%
5	3.99	**BR**	BMB	0.558	3.694	9.73	10	97.3%
6	5.06	**NO3-N**	BMB	1.544	7.411	4.71	5	94.1%
7	9.64	**PO4-P**	BMB	0.952	2.718	8.29	10	82.9%
8	12.20	**SO4**	BMB	2.344	5.730	23.87	25	95.5%

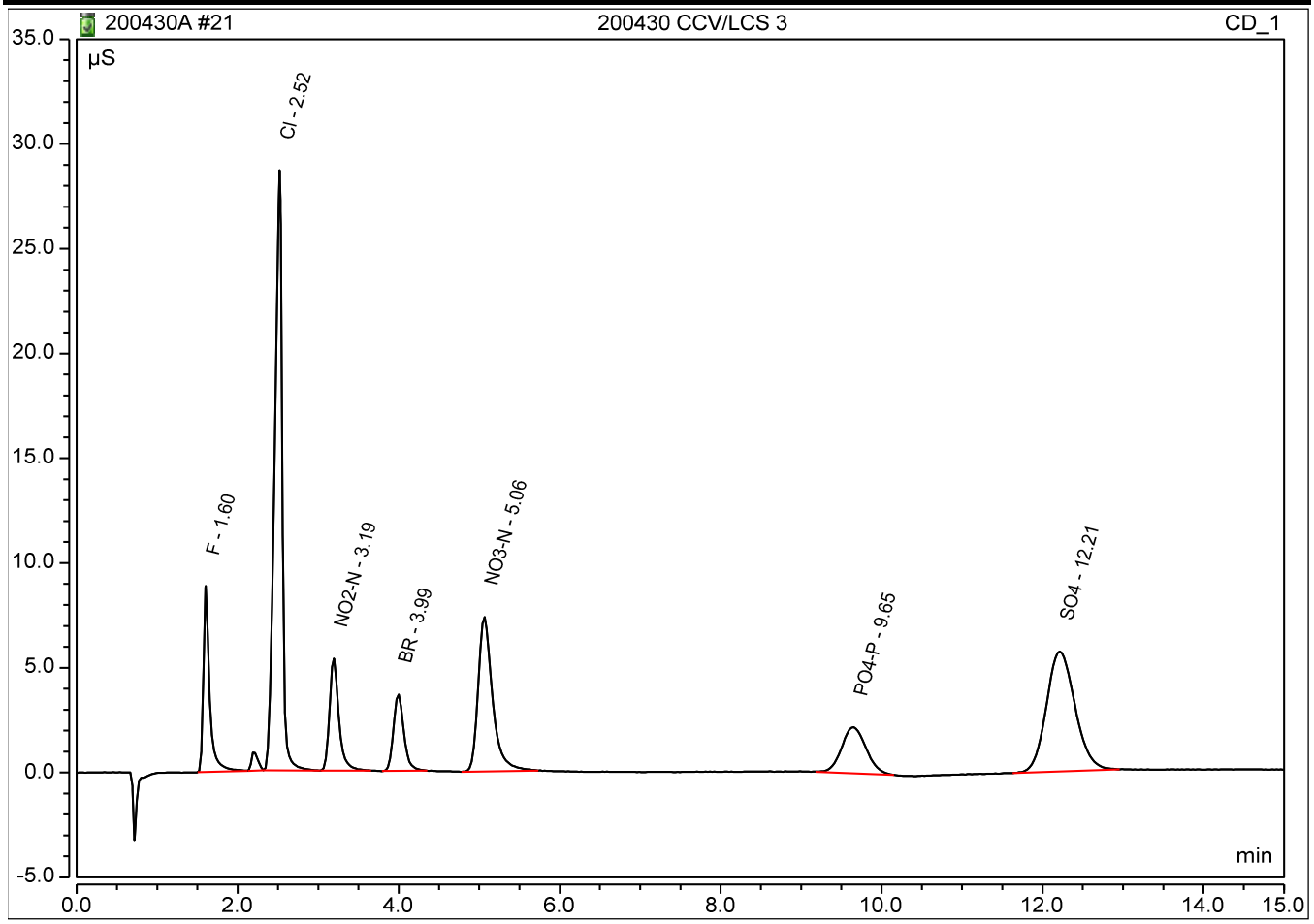


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200430A

Peak Integration Report

Sample Name:	**200430 CCV/LCS 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**30-Apr-2020 / 18:52**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.60	**F**	BMB	0.809	8.877	4.86	5	97.1%
3	2.52	**Cl**	BMB	3.165	28.642	24.34	25	97.4%
4	3.19	**NO2-N**	BMB	0.732	5.354	2.91	3.04	95.7%
5	3.99	**BR**	BMB	0.544	3.671	9.49	10	94.9%
6	5.06	**NO3-N**	BMB	1.542	7.395	4.70	5	94.0%
7	9.65	**PO4-P**	BMB	0.779	2.203	6.80	10	68.0%
8	12.21	**SO4**	BMB	2.360	5.720	24.04	25	96.1%



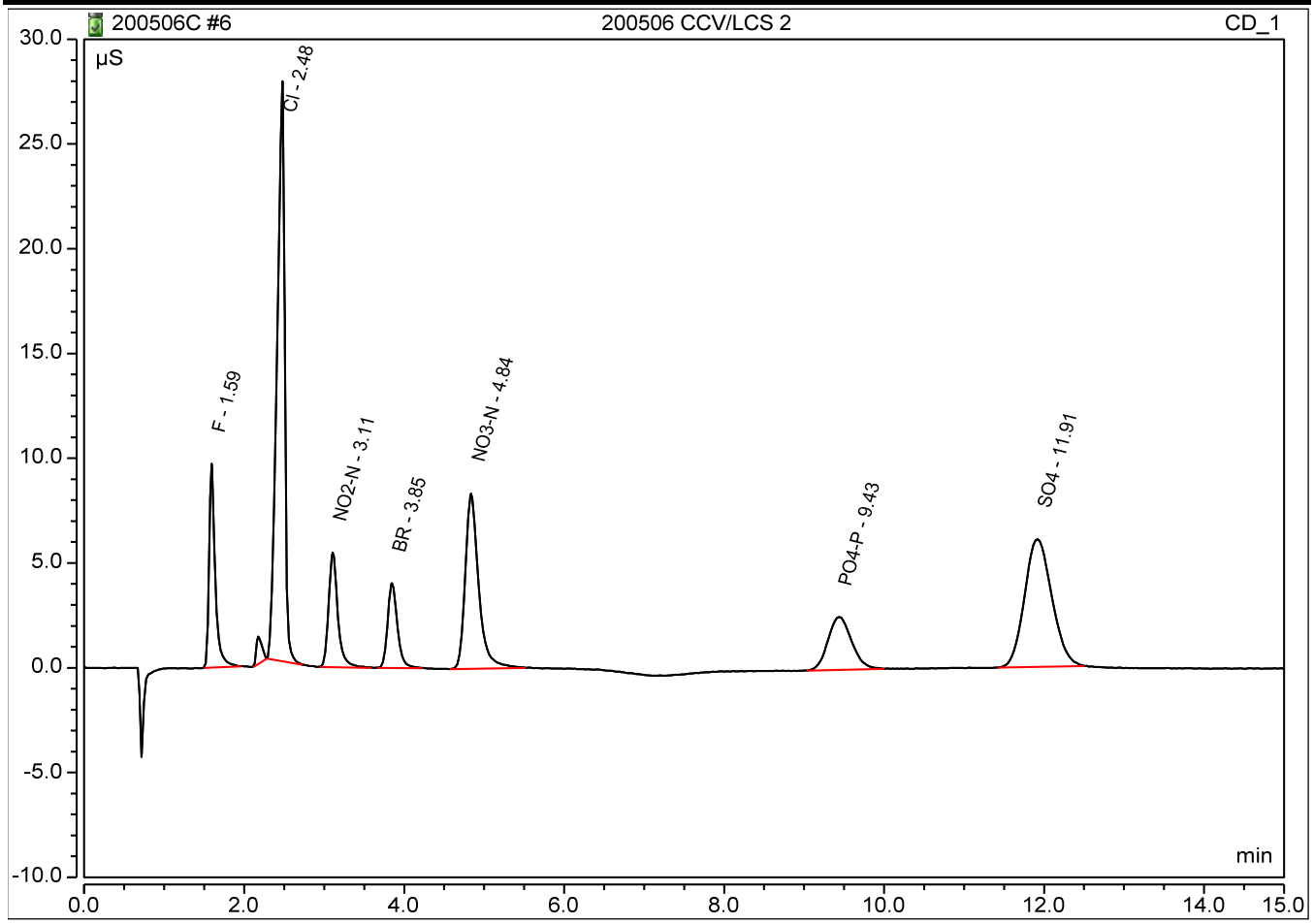
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200506C

Peak Integration Report

Sample Name:	**200506 CCV/LCS 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 11:21**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.845	9.736	5.07	5	101.4%
3	2.48	**Cl**	BMB	3.090	27.690	23.77	25	95.1%
4	3.11	**NO2-N**	BMB	0.728	5.472	2.89	3.04	95.2%
5	3.85	**BR**	BMB	0.574	4.040	10.00	10	100.0%
6	4.84	**NO3-N**	BMB	1.627	8.365	4.96	5	99.2%
7	9.43	**PO4-P**	BMB	0.870	2.535	7.59	10	75.9%
8	11.91	**SO4**	BMB	2.418	6.112	24.63	25	98.5%



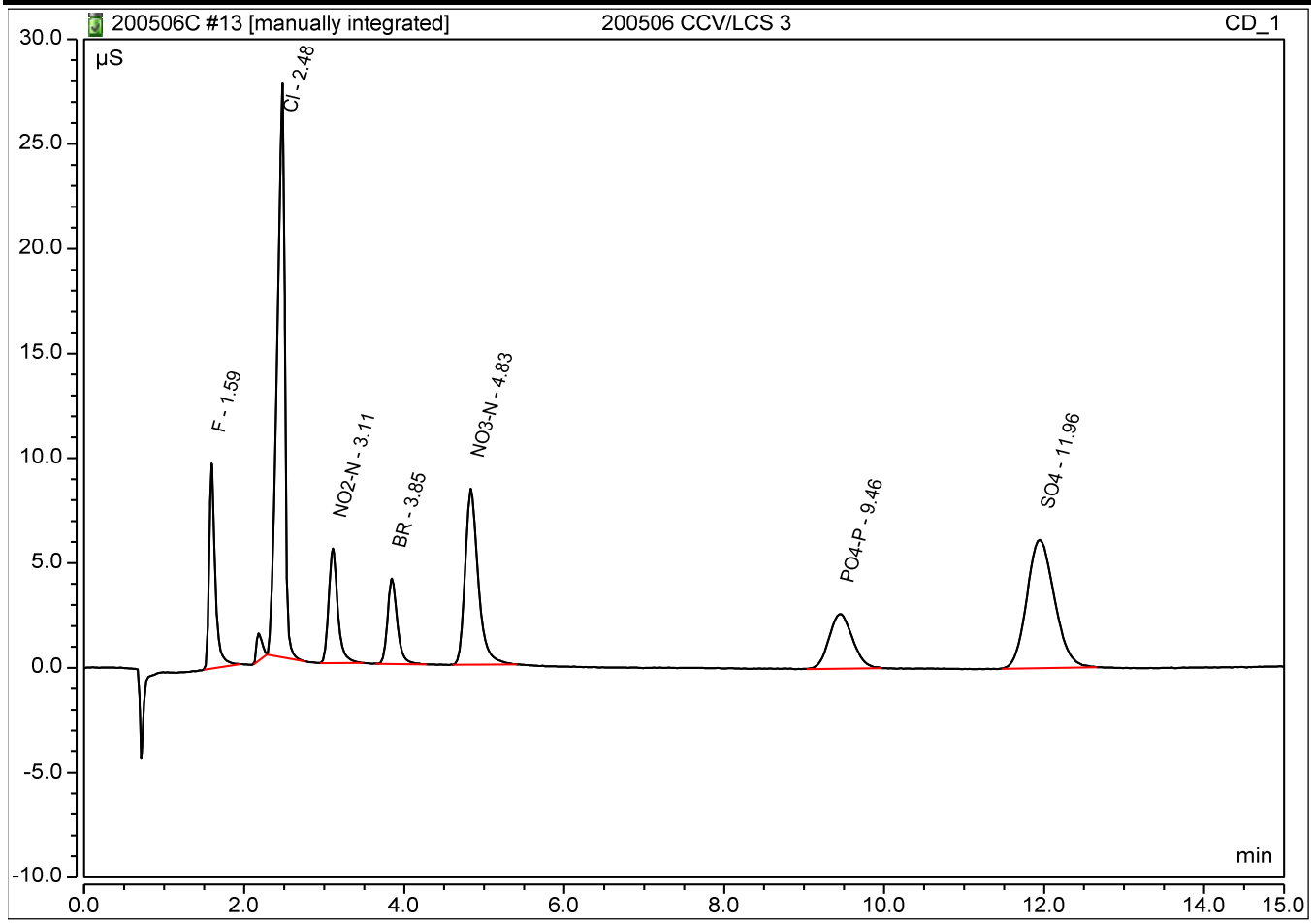
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200506C

Peak Integration Report

Sample Name:	**200506 CCV/LCS 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 16:27**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB*	0.844	9.793	5.07	5	101.3%
3	2.48	**Cl**	BMB	3.078	27.405	23.69	25	94.7%
4	3.11	**NO2-N**	BMB	0.717	5.468	2.85	3.04	93.8%
5	3.85	**BR**	BMB	0.582	4.077	10.14	10	101.4%
6	4.83	**NO3-N**	BMB	1.601	8.405	4.88	5	97.6%
7	9.46	**PO4-P**	BMB	0.893	2.621	7.78	10	77.8%
8	11.96	**SO4**	BMB	2.455	6.134	25.01	25	100.0%



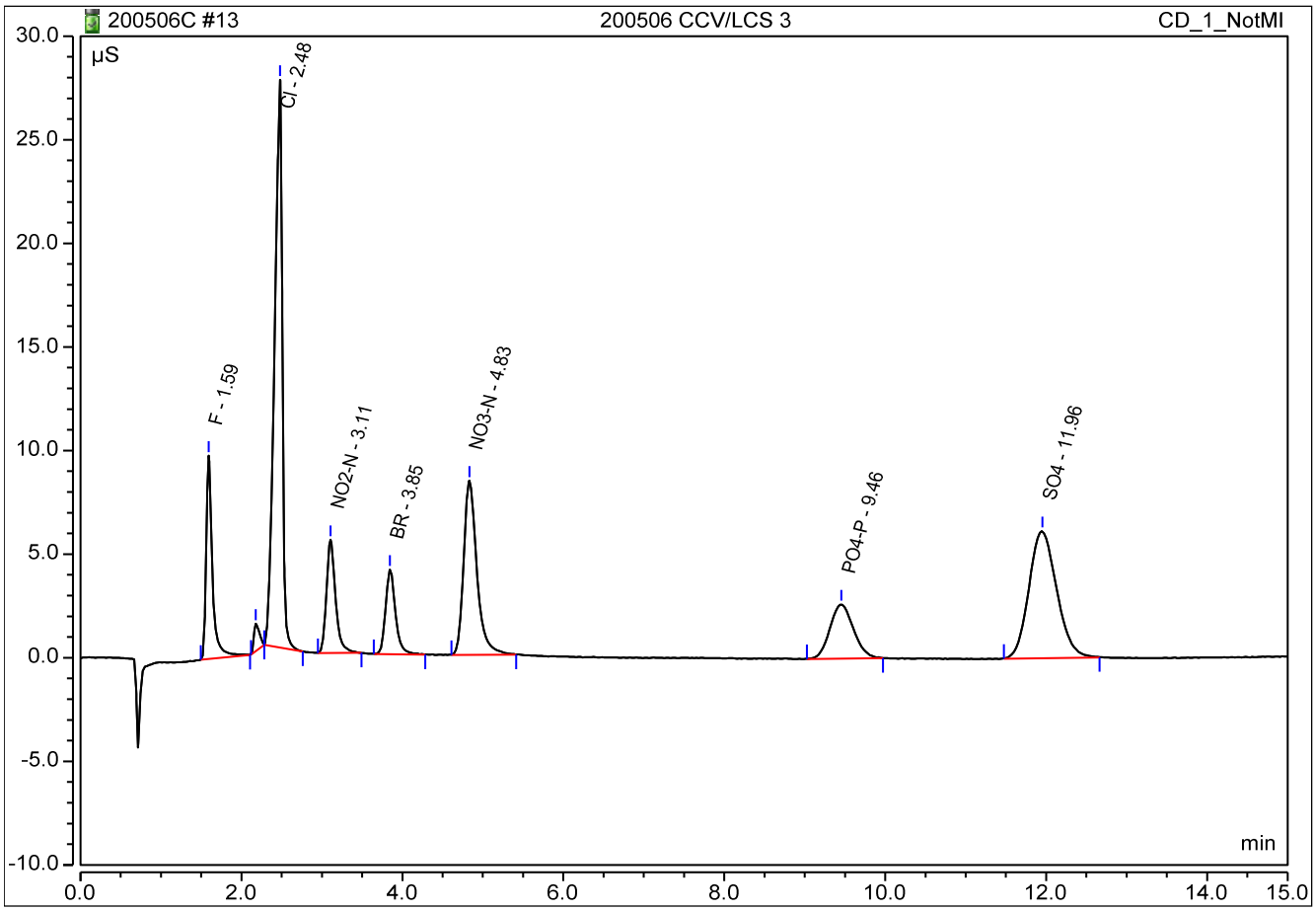
MI 1 F GA 5/6/20

Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Not Manipulated Peak Integration Report

Sample Name:	**200506 CCV/LCS 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 16:27**	*Run Time:*	**15.00**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	1.59	**F**	BMB*	0.872	9.811	5.2005
3	2.48	**Cl**	BMB	3.078	27.405	24.0534
4	3.11	**NO2-N**	BMB	0.717	5.468	2.8495
5	3.85	**BR**	BMB	0.582	4.077	10.1372
6	4.83	**NO3-N**	BMB	1.601	8.405	4.8785
7	9.46	**PO4-P**	BMB	0.893	2.621	7.8026
8	11.96	**SO4**	BMB	2.455	6.134	25.0225

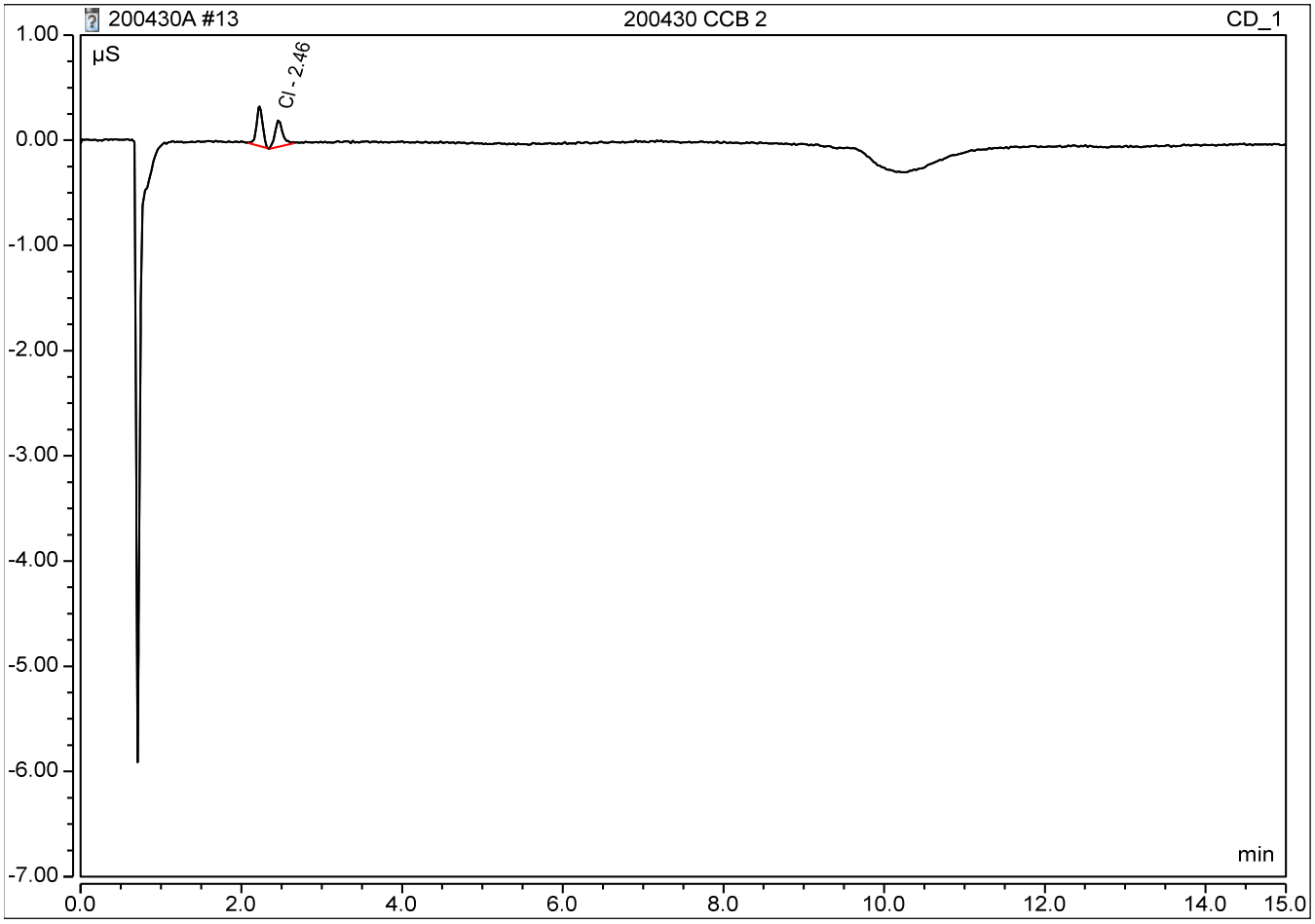


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200430A

Peak Integration Report

Sample Name:	**200430 CCB 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**30-Apr-2020 / 16:33**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.46	**Cl**	BMB	0.028	0.258	0.27		

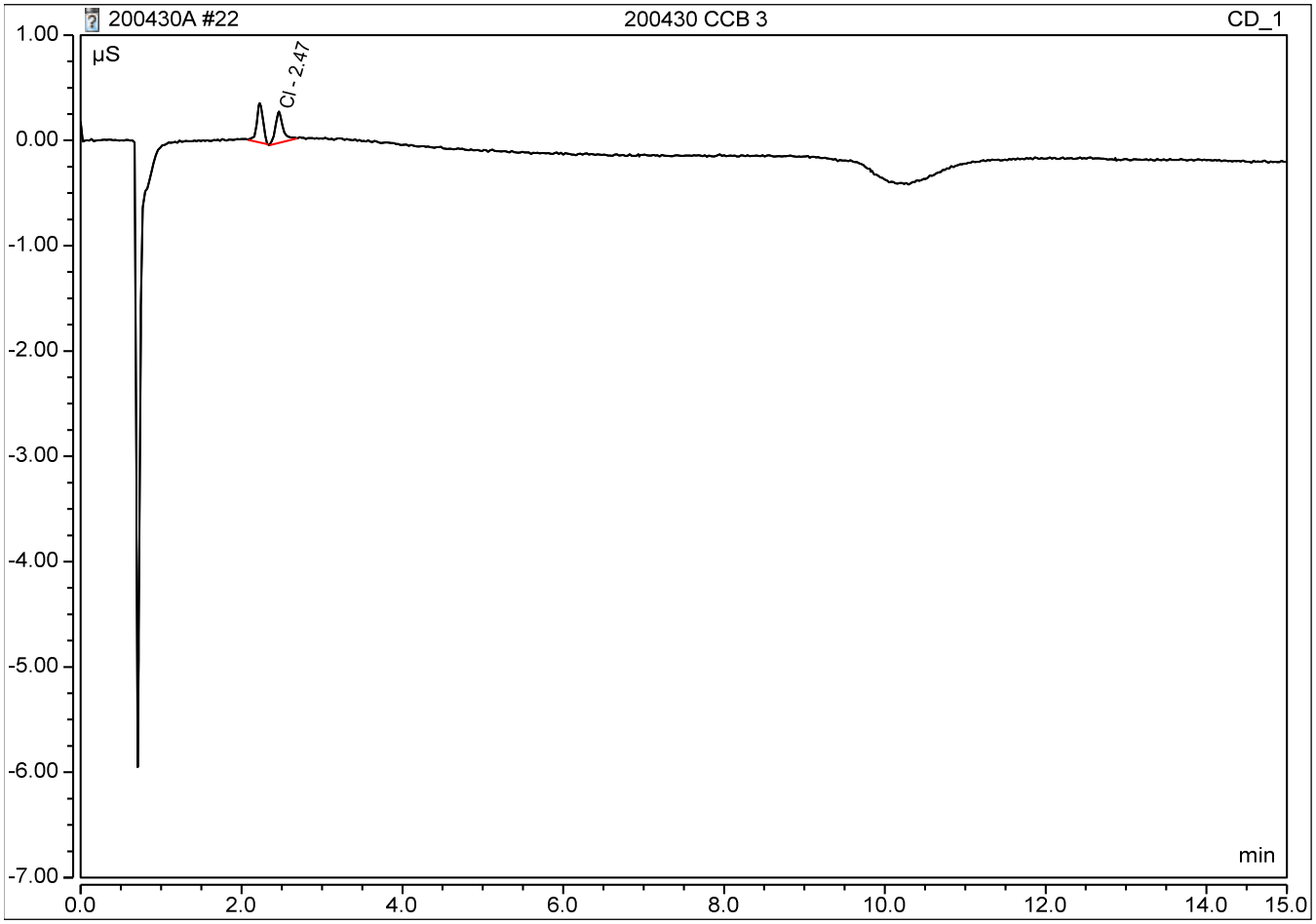


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200430A

Peak Integration Report

Sample Name:	**200430 CCB 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**30-Apr-2020 / 19:09**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.47	**Cl**	BMB	0.033	0.297	0.31		



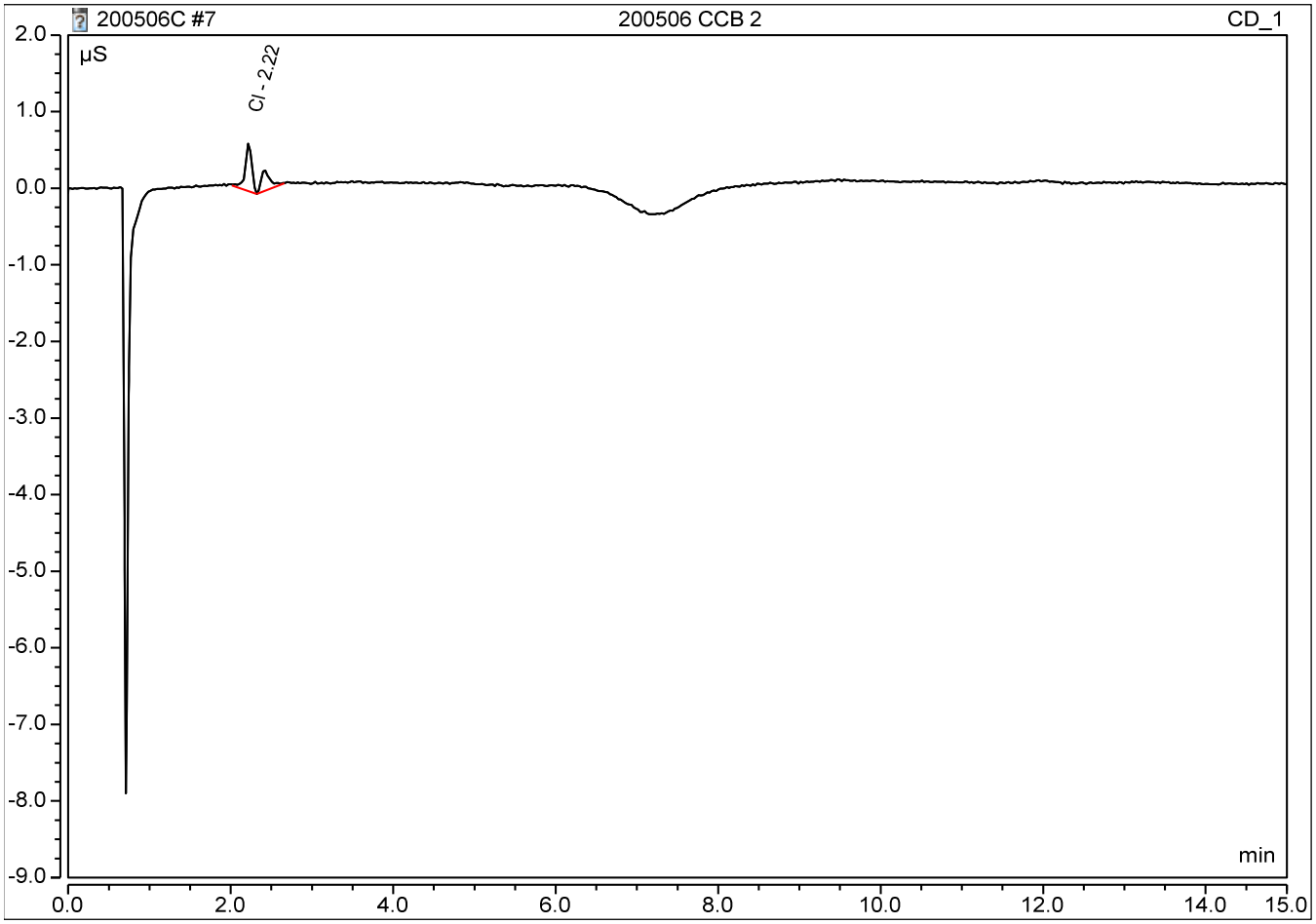
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200506C

Peak Integration Report

Sample Name:	**200506 CCB 2**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 11:38**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	2.22	**Cl**	BMB	0.059	0.617	0.51		



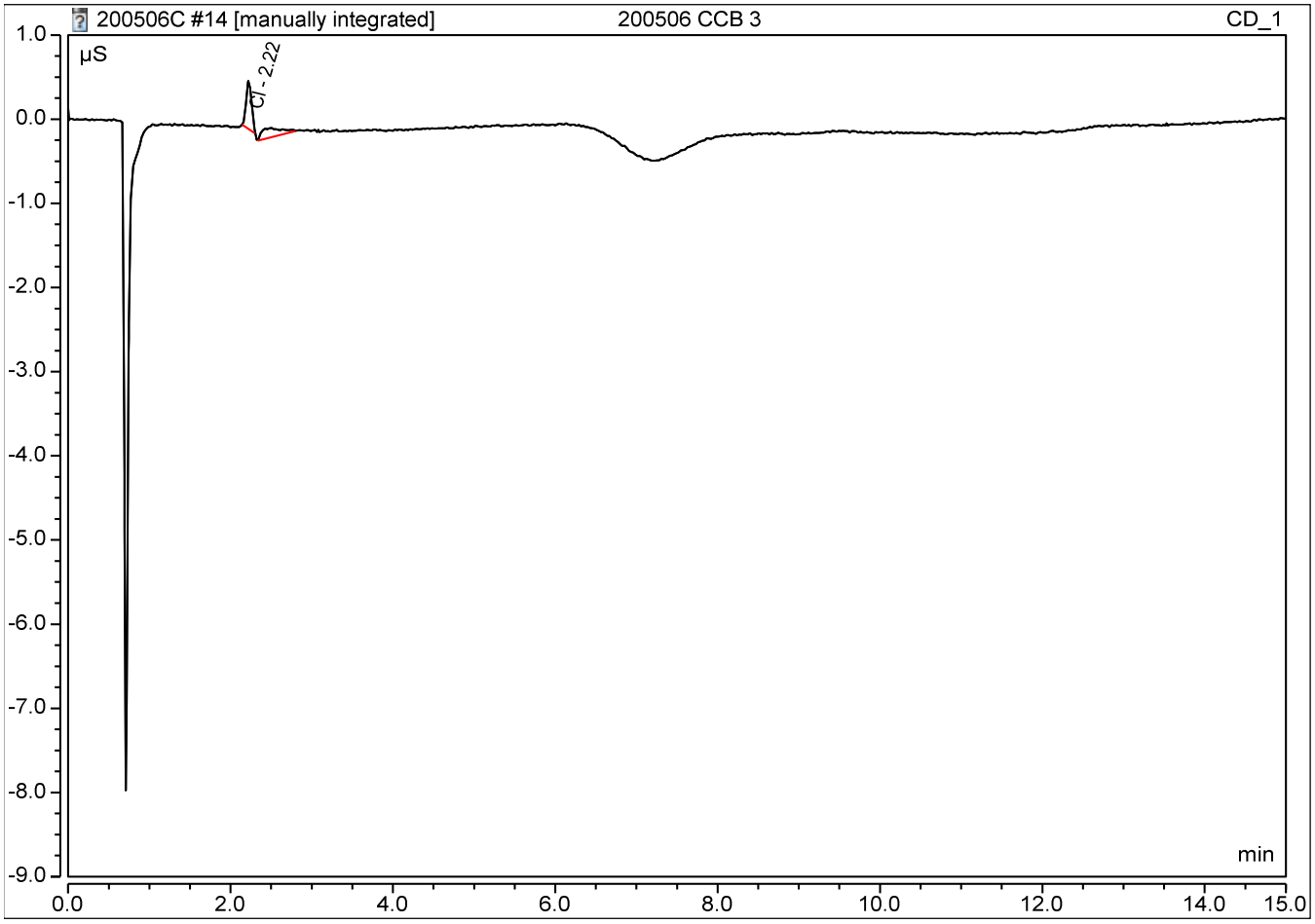
Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200506C

Peak Integration Report

Sample Name:	**200506 CCB 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 16:45**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	2.22	**Cl**	BMB*	0.044	0.571	0.40		

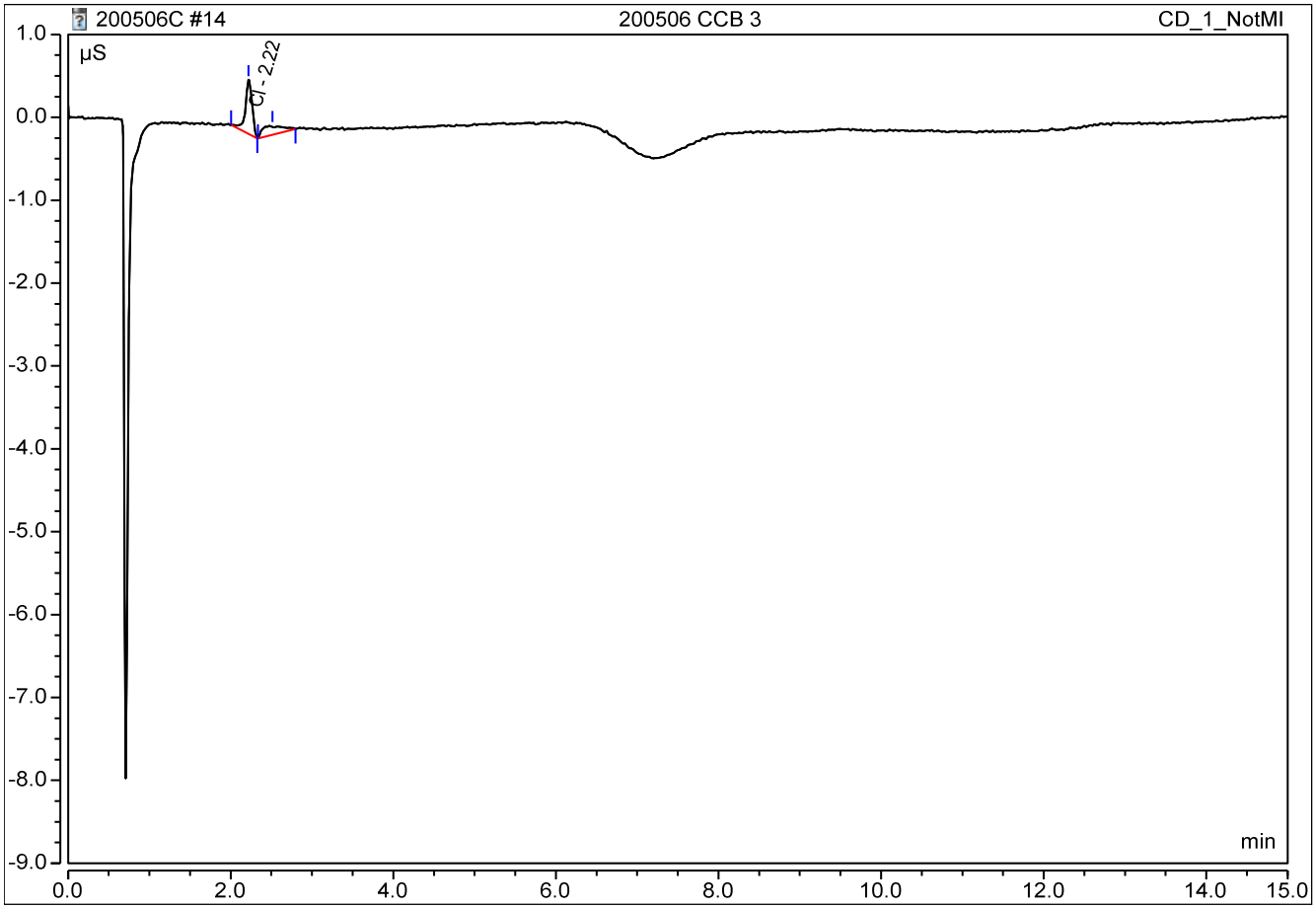


MI 2 CL GA 5/6/20

Not Manipulated Peak Integration Report

Sample Name:	**200506 CCB 3**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 16:45**	*Run Time:*	**15.00**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Ammount mg/L
1	2.22	Cl	BMB*	0.063	0.655	0.5461



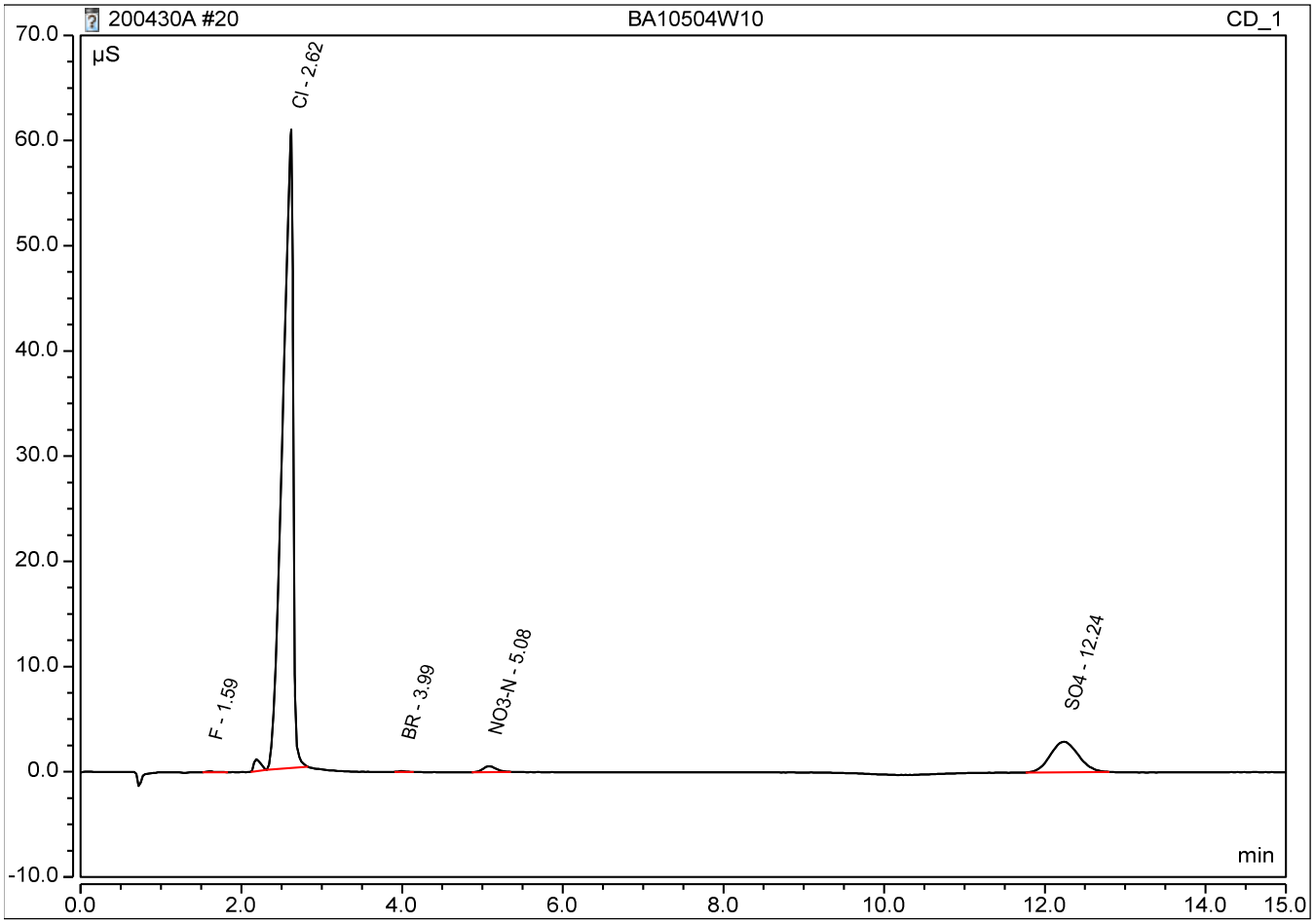
INORGANIC ANALYSIS
Raw Data

Logged on User: GA
Instrument: Charlie System_1
Sequence: 200430A

Peak Integration Report

Sample Name:	**BA10504W10**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**30-Apr-2020 / 18:34**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
1	1.59	**F**	BMB	0.011	0.114	0.16		
3	2.62	**Cl**	BMB	9.152	60.678	68.36		
4	3.99	**BR**	BMB	0.010	0.083	0.27		
5	5.08	**NO3-N**	BMB	0.108	0.565	0.37		
6	12.24	**SO4**	BMB	1.178	2.907	11.96		

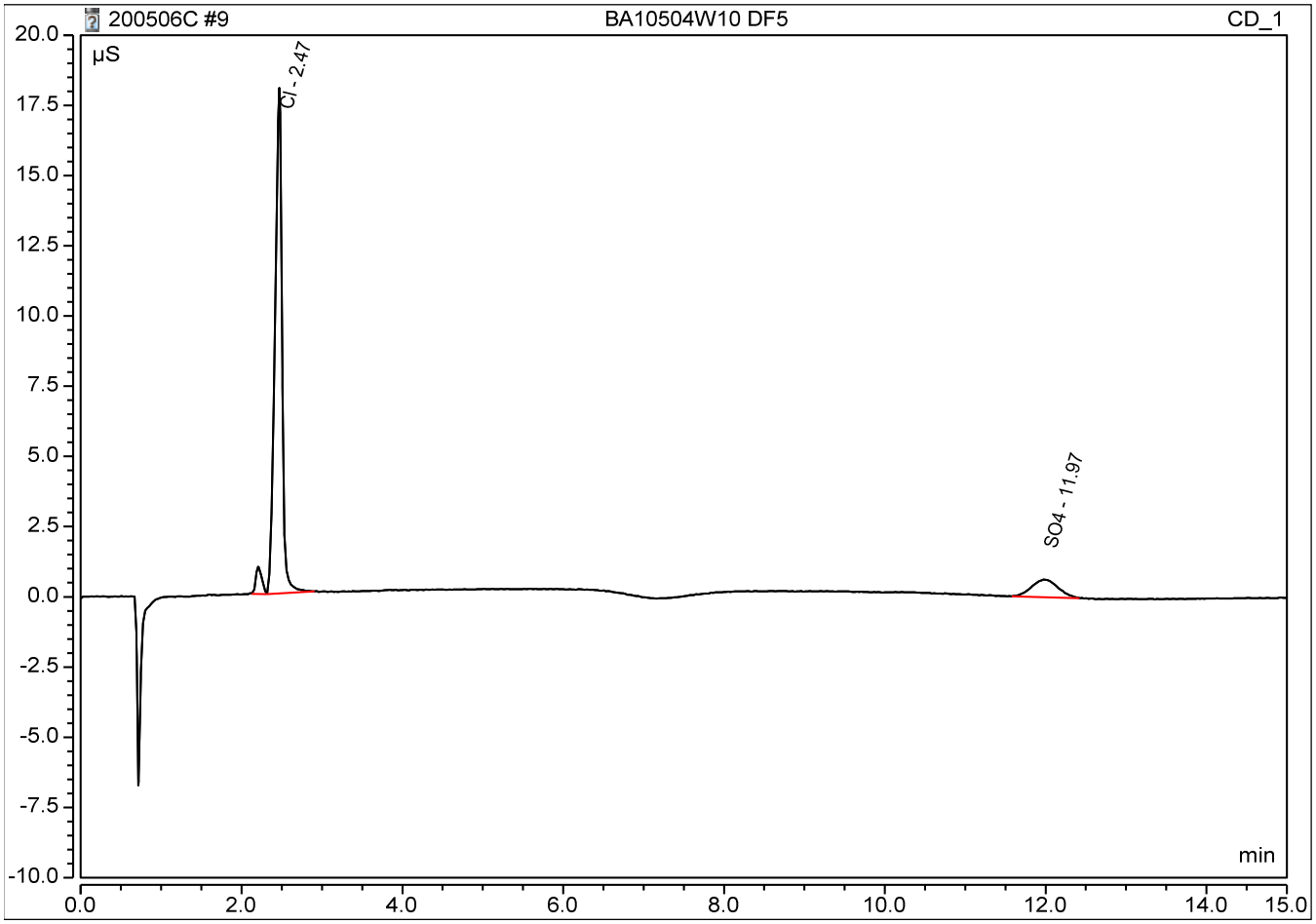


Logged on User: GA
Instrument: Charlie System_1
Sequence: 200506C

Peak Integration Report

Sample Name:	**BA10504W10 DF5**	*Inj. Vol.:*	**25uL**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.00**
Program:	**Anion APM 2020.03.26**	*Operator:*	**chemist_wetlab**
Inj. Date / Time:	**06-May-2020 / 15:12**	*Run Time:*	**15.00**

No.	Time (min) min	Peak Name	Peak Type	Area (µS*min) µS*min	Height (µS) µS	Amount mg/L	Spike Level mg/L	Recovery
2	2.47	**Cl**	BMB	1.818	18.007	70.50		
3	11.97	**SO4**	BMB	0.243	0.630	12.08		



Chromeleon (c) Dionex 1996-2009
Version 7.2.4.8340

Anion Chromatography Working Standard

Prep Date: 03/25/20

Exp Date: 03/26/20

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Ion Chromatography Standard Fluoride 1000 µg/mL in H2O	o2si	O2SI-062002-01-01	1000	**687393-38-40744**	**10/30/20**	312.5 µL	25 mL	Millipore Water	12.5
Ion Chromatography Standard Nitrite 1000 µg/mL in H2O	Inorganic Ventures	ICCL1	1000	**P2-CL675597-41353**	**01/15/23**	411 µL	25 mL	Millipore Water	5 as NO2-N
Ion Chromatography Standard Chloride 5000 µg/mL in H2O	Inorganic Ventures	ICNO21	1000	**N2-NOX672889-49601**	**01/30/23**	1250 µL	25 mL	Millipore Water	50
Ortho-Phosphate as P Standard	Agilent	ICC-005A	1000	**G34-CP-3323-49590**	**05/31/25**	625 µL	25 mL	Millipore Water	25
Ion Chromatography Standard Nitrate as N 1000 µg/mL in H2O	Inorganic Ventures	P2-NOX675324	1000	**P2-NOX675324-49391**	**02/14/23**	250 µL	25 mL	Millipore Water	10
Bromide Standard	CPI international	4400-IC8M	1000	**1011817-12-49602**	**06/04/21**	625 µL	25 mL	Millipore Water	25
Sulfate Standard	Inorganic Ventures	ICS041	1000	**P2-SOX677315**	**04/03/23**	1250 µL	25 mL	Millipore Water	50

Anion Chromatography Calibration Curve

Prep Date: 03/25/20

Exp Date: 03/26/20

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	APPL Mix Name	Conc. Range (ug/mL)	Reference To APPL Prep Date	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc. Range (µg/mL)
Anion Chromatography Working Standard	Varies	ICal1	5.0-50.0	Prepared 03/25/20	03/26/20	4 µL	1000 µL	Millipore Water	0.04-0.40
Anion Chromatography Working Standard	Varies	ICal2	5.0-50.0	Prepared 03/25/20	03/26/20	20 µL	1000 µL	Millipore Water	0.1-1.0
Anion Chromatography Working Standard	Varies	ICal3	5.0-50.0	Prepared 03/25/20	03/26/20	50 µL	1000 µL	Millipore Water	0.25-2.5
Anion Chromatography Working Standard	Varies	ICal4	5.0-50.0	Prepared 03/25/20	03/26/20	100 µL	1000 µL	Millipore Water	0.5-5.0
Anion Chromatography Working Standard	Varies	ICal5	5.0-50.0	Prepared 03/25/20	03/26/20	200 µL	1000 µL	Millipore Water	1.0-10.0
Anion Chromatography Working Standard	Varies	ICal6	5.0-50.0	Prepared 03/25/20	03/26/20	500 µL	1000 µL	Millipore Water	2.5-25.0
Anion Chromatography Working Standard	Varies	ICal7	5.0-50.0	Prepared 03/25/20	03/26/20	700 µL	1000 µL	Millipore Water	3.5-35.0
Anion Chromatography Working Standard	Varies	ICal8	5.0-50.0	Prepared 03/25/20	03/26/20	1000 µL	1000 µL	Millipore Water	5.0-50.0

Anion Chromatography ICV Absolute COA 49866

Prep Date: See injection Log

Exp Date: 24 hours after prep

Prep'd By (Initials): Absolute

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. Range (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Flouride	Absolute	50021	2.5	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	2.5
Nitrite	Absolute	50021	1.522334	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.522334
Chloride	Absolute	50021	1.522334	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.522334
O-Phosphate as P	Absolute	50021	6.522	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	6.522
Nitrate as N	Absolute	50021	1.129525	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	1.129525
Ion Chromatography Standard Bromide, 1000 µg/mL in H2O	Absolute	50021	5	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	5
Sulfate	Absolute	50021	20	**111419-49866**	**11/14/21**	1000 µL	1000 µL	N / A	20

Anion Chromatography CCV / LCS

Prep Date: See injection Log

Exp Date: 24 hours after prep

Prep'd By (Initials): GA

Initial Standard Information						Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Supplier Part No.	Conc. (ug/mL)	Lot Number - QA Number	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
Ion Chromatography Standard Fluoride 1000 µg/mL in H2O	o2si	O2SI-062002-01-01	1000	**687393-38-40744**	**10/30/20**	125 µL	25 mL	Millipore Water	5
Ion Chromatography Standard Nitrite 1000 µg/mL in H2O	Inorganic Ventures	ICCL1	1000	**P2-CL675597-41353**	**01/15/23**	250 µL	25 mL	Millipore Water	10
Ion Chromatography Standard Chloride 5000 µg/mL in H2O	Inorganic Ventures	ICNO21	1000	**N2-NOX672889-49601**	**01/30/23**	125 µL	25 mL	Millipore Water	25
Ortho-Phosphate as P Standard	Agilent	ICC-005A	1000	**G34-CP-3323-49590**	**05/31/25**	250 µL	25 mL	Millipore Water	10
Ion Chromatography Standard Nitrate as N 1000 µg/mL in H2O	Inorganic Ventures	P2-NOX675324	1000	**P2-NOX675324-49391**	**02/14/23**	125 µL	25 mL	Millipore Water	5
Bromide Standard	CPI international	4400-IC8M	1000	**1011817-12-49602**	**06/04/21**	250 µL	25 mL	Millipore Water	10
Sulfate Standard	Inorganic Ventures	ICS041	1000	**P2-SOX677315**	**04/03/23**	625 µL	25 mL	Millipore Water	25

Method 300 and 9056 Injection Log

No.	Position	Injection Description	Inject Time		Type	Comment
1	RA1	Cal 1	26/Mar/2020	13:28	Calibration Standard	
2	RA2	Cal 2	26/Mar/2020	13:44	Calibration Standard	
3	RA3	Cal 3	26/Mar/2020	14:01	Calibration Standard	MDL 1
4	RA4	Cal 4	26/Mar/2020	14:17	Calibration Standard	
5	RA5	Cal 5	26/Mar/2020	14:33	Calibration Standard	
6	RA6	Cal 6	26/Mar/2020	14:50	Calibration Standard	
7	RA7	Cal 7	26/Mar/2020	15:06	Calibration Standard	
8	RA8	Cal 8 2020.03.25	26/Mar/2020	15:22	Calibration Standard	
9	R1	ICB / CCB	26/Mar/2020	15:39	Unknown	
10	RB1	ICV Absolute 111419	26/Mar/2020	15:55	Check Standard	
11	RB2	BA09192W01	26/Mar/2020	16:18	Unknown	
12	RB3	BA09197W07	26/Mar/2020	16:35	Unknown	
13	RB4	BA09203W13	26/Mar/2020	16:51	Unknown	
14	RB5	BA09227W13	26/Mar/2020	17:08	Unknown	
15	RB6	BA08726W07	26/Mar/2020	17:24	Unknown	
16	RB7	BA08727W07	26/Mar/2020	17:40	Unknown	
17	RB8	BA08728W07	26/Mar/2020	17:57	Unknown	
18	RC1	BA08729W07	26/Mar/2020	18:13	Unknown	
19	RC2	BA08730W07	26/Mar/2020	18:30	Unknown	
20	RC3	BA08731W07	26/Mar/2020	18:46	Unknown	
21	R2	200326 CCV/LCS 1	26/Mar/2020	19:02	Check Standard	
22	R1	200326 CCB 1	26/Mar/2020	19:19	Unknown	
23	RC4	BA08735W07	26/Mar/2020	19:35	Unknown	
24	RC5	BA08540W07 DF5	26/Mar/2020	19:52	Unknown	
25	RC6	BA08540W07 DF10	26/Mar/2020	20:08	Unknown	
26	RC7	BA08548W14 DF5	26/Mar/2020	20:24	Unknown	
27	RC8	BA08548W14 DUP DF5	26/Mar/2020	20:41	Unknown	
28	RD1	BA08548W14 MS DF5	26/Mar/2020	20:57	Unknown	
29	RD2	BA08746W14	26/Mar/2020	21:13	Unknown	
30	RD3	BA08747W07	26/Mar/2020	21:30	Unknown	
31	RD4	BA08748W07	26/Mar/2020	21:46	Unknown	
32	RD5	BA08749W07	26/Mar/2020	22:03	Unknown	
33	RD6	BA08750W14	26/Mar/2020	22:19	Unknown	
34	RD7	BA08750W14 MS	26/Mar/2020	22:35	Unknown	
35	RD8	BA08750W14 MSD	26/Mar/2020	22:52	Unknown	
36	RE1	BA08751W07	26/Mar/2020	23:08	Unknown	
37	R2	200326 CCV/LCS 2	26/Mar/2020	23:24	Check Standard	
38	R1	200326 CCB 2	26/Mar/2020	23:41	Unknown	
39	RE2	BA08752W07	26/Mar/2020	23:57	Unknown	
40	RE3	BA08753W07	27/Mar/2020	00:14	Unknown	
41	RE4	BA08754W07	27/Mar/2020	00:30	Unknown	
42	RE5	BA08755W07	27/Mar/2020	00:46	Unknown	
43	RE6	BA08756W07	27/Mar/2020	01:03	Unknown	
44	RE7	BA08757W07	27/Mar/2020	01:19	Unknown	
45	RE8	BA08758W14	27/Mar/2020	01:35	Unknown	
46	BA1	BA08759W07	27/Mar/2020	01:52	Unknown	
47	BA2	BA08760W07	27/Mar/2020	02:08	Unknown	
48	BA3	BA08765W07	27/Mar/2020	02:25	Unknown	
49	R2	200326 CCV/LCS 3	27/Mar/2020	02:41	Check Standard	
50	R1	200326 CCB 3	27/Mar/2020	02:57	Unknown	
51	RA3	MDL 2	27/Mar/2020	03:14	Unknown	
52	RA3	MDL 3	27/Mar/2020	03:30	Unknown	
53	R1	MDL BLK 1	27/Mar/2020	03:47	Unknown	
54	R1	MDL BLK 2	27/Mar/2020	04:03	Unknown	
55	R1	MDL BLK 3	27/Mar/2020	04:19	Unknown	
56	BA4	BLK Nitro AR	27/Mar/2020	04:36	Unknown	
57	BA5	DOC 1 Nitro AR	27/Mar/2020	04:52	Unknown	
58	BA6	DOC 2 Nitro AR	27/Mar/2020	05:09	Unknown	
59	BA7	DOC 3 Nitro AR	n.a.		Unknown	
60	BA8	DOC 4 Nitro AR	n.a.		Unknown	
61	R2	200326 CCV/LCS 4	n.a.		Check Standard	
62	R1	200326 CCB 4	n.a.		Unknown	

Method 300 and 9056 Injection Log

No.	Position	Injection Description	Inject Time		Type	Comment
1	R2	200430 CCV/LCS 1	30/Apr/2020	12:47	Check Standard	
2	R1	200430 CCB 1	30/Apr/2020	13:21	Unknown	
3	BA1	BA10470W01	30/Apr/2020	13:39	Unknown	
4	BA2	BA10471W01	30/Apr/2020	13:56	Unknown	
5	BA3	BA10472W01	30/Apr/2020	14:14	Unknown	
6	BA4	BA10473W01	30/Apr/2020	14:31	Unknown	
7	BA5	BA10474W01	30/Apr/2020	14:48	Unknown	
8	BA6	BA10475W01	30/Apr/2020	15:06	Unknown	
9	BA7	BA10476W01	30/Apr/2020	15:23	Unknown	
10	BA8	BA10477W01	30/Apr/2020	15:41	Unknown	
11	BB1	BA10478W01	30/Apr/2020	15:58	Unknown	
12	R2	200430 CCV/LCS 2	30/Apr/2020	16:15	Check Standard	
13	R1	200430 CCB 2	30/Apr/2020	16:33	Unknown	
14	BB2	BA10506W13	30/Apr/2020	16:50	Unknown	
15	BB3	BA10507W12	30/Apr/2020	17:08	Unknown	
16	BB4	BA10508W38	30/Apr/2020	17:25	Unknown	
17	BB5	BA10509W12	30/Apr/2020	17:42	Unknown	
18	BB6	BA10474W01 DF5	30/Apr/2020	18:00	Unknown	
19	BB7	BA10476W01 DF5	30/Apr/2020	18:17	Unknown	
20	BB8	BA10504W10	30/Apr/2020	18:34	Unknown	
21	R2	200430 CCV/LCS 3	30/Apr/2020	18:52	Check Standard	
22	R1	200430 CCB 3	30/Apr/2020	19:09	Unknown	
23	R2	stop	30/Apr/2020	19:24	Unknown	

Method 300 and 9056 Injection Log

No.	Position	Injection Description	Inject Time		Type	Comment
1	R2	200506 CCV/LCS 1	06/May/2020	09:00	Check Standard	
2	R1	200506 CCB 1	06/May/2020	09:18	Unknown	
3	BD4	BA10754	06/May/2020	10:28	Unknown	
4	BD5	BA10755	06/May/2020	10:46	Unknown	
5	BD6	BA10756	06/May/2020	11:03	Unknown	
6	R2	200506 CCV/LCS 2	06/May/2020	11:21	Check Standard	
7	R1	200506 CCB 2	06/May/2020	11:38	Unknown	
8	RE6	BA10548W01 DF10	06/May/2020	14:54	Unknown	
9	RE1	BA10504W10 DF5	06/May/2020	15:12	Unknown	
10	BE7	BA10158W11 MS DF5	06/May/2020	15:29	Unknown	
11	BE8	BA10158W11 MSD DF5	06/May/2020	15:46	Unknown	
12	RD4	BA10476W01 DF10	06/May/2020	16:04	Unknown	
13	R2	200506 CCV/LCS 3	06/May/2020	16:27	Check Standard	
14	R1	200506 CCB 3	06/May/2020	16:45	Unknown	
15	RD5	BA10506W13 DF5	06/May/2020	17:02	Unknown	
16	RD6	BA10507W12 DF5	06/May/2020	17:19	Unknown	
17	GC7	BA10719W01 DF5 DUP	06/May/2020	17:37	Unknown	
18	RD7	BA10508W38 DF5	06/May/2020	17:54	Unknown	
19	RD8	BA10509W12 DF5	06/May/2020	18:12	Unknown	
20	RE2	BA10549W01 DF5	06/May/2020	18:29	Unknown	
21	RE3	BA10550W01 DF5	06/May/2020	18:46	Unknown	
22	RE4	BA10551W01 DF5	06/May/2020	19:04	Unknown	
23	R2	200506 CCV/LCS 4	06/May/2020	19:21	Check Standard	
24	R1	200506 CCB 4	06/May/2020	19:39	Unknown	
25	RE5	BA10552W01 DF5	06/May/2020	19:56	Unknown	
26	RE7	BA10588W01 DF5	06/May/2020	20:13	Unknown	
27	RE8	BA10589W01 DF5	06/May/2020	20:31	Unknown	
28	BA1	BA10590W01 DF5	06/May/2020	20:48	Unknown	
29	BA2	BA10591W01 DF5	06/May/2020	21:06	Unknown	
30	BA3	BA10592W01 DF5	06/May/2020	21:23	Unknown	
31	BA4	BA10593W01 DF10	06/May/2020	21:40	Unknown	
32	BA5	BA10595W01 DF5	06/May/2020	21:58	Unknown	
33	BA6	BA10596W01 DF10	06/May/2020	22:15	Unknown	
34	BA7	BA10597W01 DF5	06/May/2020	22:33	Unknown	
35	R2	200506 CCV/LCS 5	06/May/2020	22:50	Check Standard	
36	R1	200506 CCB 5	06/May/2020	23:07	Unknown	
37	BA8	BA10598W01 DF5	06/May/2020	23:25	Unknown	
38	BB1	BA10599W01 DF5	06/May/2020	23:42	Unknown	
39	BB2	BA10600W01 DF5	07/May/2020	00:00	Unknown	
40	BB3	BA10601W01 DF5	07/May/2020	00:17	Unknown	
41	BB4	BA10602W01 DF5	07/May/2020	00:34	Unknown	
42	BB5	BA10603W01 DF5	07/May/2020	00:52	Unknown	
43	BB6	BA10604W01 DF5	07/May/2020	01:09	Unknown	
44	BB7	BA10605W01 DF5	07/May/2020	01:26	Unknown	
45	BB8	BA10606W01 DF5	07/May/2020	01:44	Unknown	
46	R2	200506 CCV/LCS 6	07/May/2020	02:01	Check Standard	
47	R1	200506 CCB 6	07/May/2020	02:19	Unknown	
48	BD1	BA10609W01 DF10	07/May/2020	02:36	Unknown	
49	BD2	BA10610W01 DF20	07/May/2020	02:53	Unknown	
50	BD3	BA10611W01 DF10	07/May/2020	03:11	Unknown	
51	GC8	BA10757W05	07/May/2020	03:28	Unknown	
52	R2	200506 CCV/LCS 7	07/May/2020	03:46	Check Standard	
53	R1	200506 CCB 7	07/May/2020	04:03	Unknown	

INORGANIC ANALYSIS
Calibration and Raw Data

A.P.P.L. INC.
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: A.P.P.L. INC. Contract: AECOM
ARF No: 92039 SDG: 92039
Initial Calibration Source: CPI
Continuing Calibration Source: Environmental Express
Analysis Date: 05/01/20

Analyte	Calibration Verification									M
	True CCV1	Found 11:43	%R(1)	True CCV1	Found 11:49	%R(1)	True	Found	%R(1)	
TOXN	3	2.9484	98.3	3	2.965	98.8				

(1) Control Limits: 90-110

ILM02.0

A.P.P.L. INC.
3
BLANKS

Lab Name: A.P.P.L. INC. Contract: AECOM

ARF No.: 92039 SDG: 92039

Preparation Blank Matrix (soil/water): water

Preparation Blank Concentration Units (ug/L or mg/kg): mg/L

Analyte	Calibration Blanks										M
	ICB 05/01/20 11:26	C	CCB 05/01/20 11:44	C	CCB 05/01/20 11:50	C		C		C	
TOXN	.100	U	.100	U	.100	U					

AQ2 Tray Report

Serial Number:	190170
Software Version:	2.1.0
Report Requested By:	Kyle S
Date & Time:	2020-05-01 12:33:07
Tray Number:	2
Tray Name:	200501A NO2 NO3 TOXN

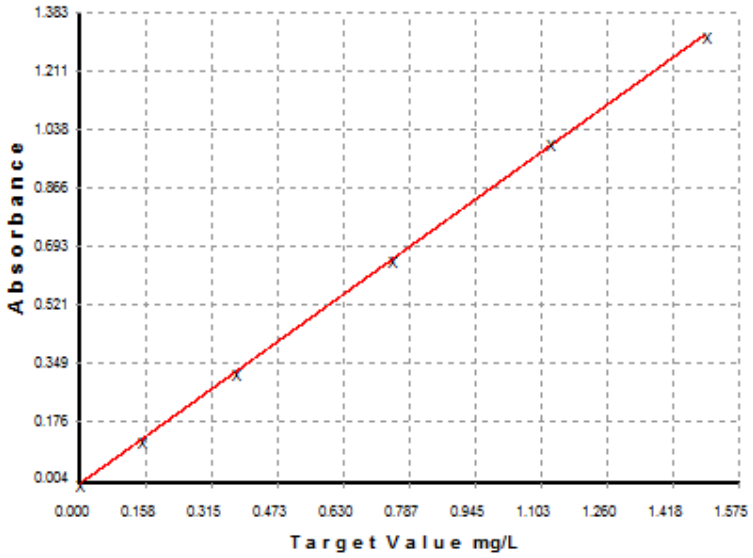
Nitrite-N

Calibration Chart

Type	Absorbance	Calc mg/L	Target mg/L	% Error
S1	0.0038	0.0034	0.0000	
S90	0.1304	0.1471	0.1500	-1.95
S91	0.3288	0.3724	0.3750	-0.71
S92	0.6590	0.7473	0.7500	-0.36
S93	1.0009	1.1354	1.1250	0.93
S94	1.3172	1.4945	1.5000	-0.37
S0	0.0123	0.0130	0.0000	

Polynomial Order:	1
Correlation Coefficient:	0.9999
Carryover(%):	0.6
Calibration equation:	y = bx + a
y =:	Concentration mg/L
x =:	Measured absorbance
a =:	-9.635769E-004
b =:	1.135361E+000
Date & Time:	2020-05-01 10:15:45

Calibration Graph



Test Results

Cup	Type	ID	Result	Units	QC Pro	Raw Data	Auto Dil.	Man Dil.	User	Time/Date
	S1	Standard 1	0.0038			0.003825			KS	2020-05-01 10:08:04
	S90	Standard 90	0.1304			0.130389			KS	2020-05-01 10:09:21
	S91	Standard 91	0.3288			0.328807			KS	2020-05-01 10:10:39
	S92	Standard 92	0.6590			0.659032			KS	2020-05-01 10:11:56
	S93	Standard 93	1.0009			1.000891			KS	2020-05-01 10:13:11
	S94	Standard 94	1.3172			1.317179			KS	2020-05-01 10:14:27
	S0	Standard 0	0.0123			0.012290			KS	2020-05-01 10:15:45
	CCV	CCV .75	0.7457	mg/L		0.657625			KS	2020-05-01 10:17:02
	CCB	CCB	0.0077	mg/L		0.007672			KS	2020-05-01 10:18:19
3	U1	ICV NO2	0.7172	mg/L		0.632561			KS	2020-05-01 10:19:36
4	U2	ICV NO3 TOXN	0.0088	mg/L		0.008579			KS	2020-05-01 10:20:54
5	U3	ICB NO2 NO3 TOXN	0.0023ELL	mg/L		0.002916			KS	2020-05-01 10:22:11
6	U4	200501A Blk NO2 NO3 TOXN	0.0019ELL	mg/L		0.002517			KS	2020-05-01 10:23:29
7	U5	200501A LCS NO2	0.7348	mg/L		0.648007			KS	2020-05-01 10:24:47
8	U6	200501A LCSD NO2	0.7373	mg/L		0.650212			KS	2020-05-01 10:26:05
9	U7	200501A LCS NO3 TOXN	0.0078	mg/L		0.007697			KS	2020-05-01 10:27:23
10	U8	200501A LCSD NO3 TOXN	0.0039	mg/L		0.004250			KS	2020-05-01 10:28:42
11	U9	1 ppm NO2	0.9992	mg/L		0.880937			KS	2020-05-01 10:30:00
12	U10	1 ppm NO3	0.0095	mg/L		0.009248			KS	2020-05-01 10:31:19
	CCV	CCV .75	0.7511	mg/L		0.662372			KS	2020-05-01 10:32:37
	CCB	CCB	0.0082	mg/L		0.008100			KS	2020-05-01 10:33:56
13	U11	BA10508W34 MS	0.7487	mg/L		0.660275			KS	2020-05-01 10:35:13
14	U12	BA10508W34 MSD	0.7559	mg/L		0.666655			KS	2020-05-01 10:36:32
15	U13	BA10506W12	0.0111	mg/L		0.010652			KS	2020-05-01 10:39:12

16	U14	BA10507W12	0.0253	mg/L	0.023122	KS	2020-05-01 10:41:32
17	U15	BA10508W34	0.0098	mg/L	0.009501	KS	2020-05-01 10:43:56
18	U16	BA10509W12	0.0106	mg/L	0.010222	KS	2020-05-01 10:46:20
19	U17	BA10439W11 Thing 1 pH 6.48	0.0028ELL	mg/L	0.003352	KS	2020-05-01 10:48:45
20	U18	BA10504W11 Thing 1 pH 6.26	0.0048	mg/L	0.005112	KS	2020-05-01 10:51:08
	CCV	CCV .75	0.7535	mg/L	0.664480	KS	2020-05-01 10:53:27
	CCB	CCB	0.0066	mg/L	0.006679	KS	2020-05-01 10:55:47

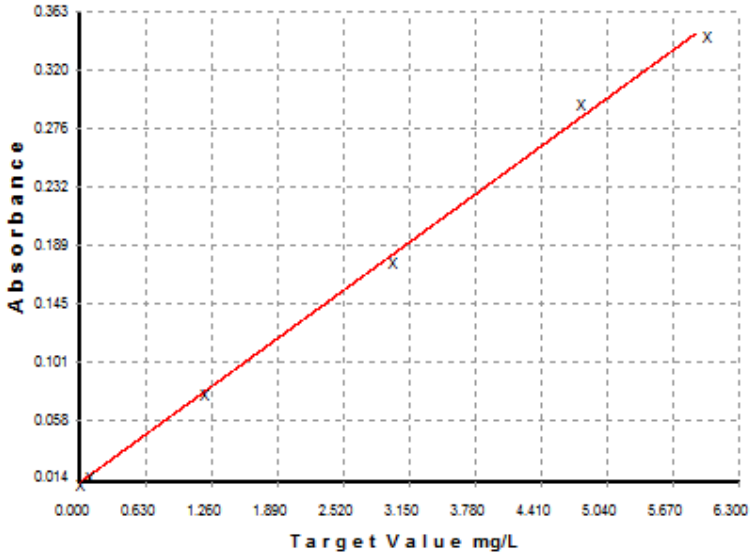
TOXN

Calibration Chart

Type	Absorbance	Calc mg/L	Target mg/L	% Error
S1	0.0139	0.0159	0.0000	
S90	0.0184	0.0955	0.1000	-4.49
S91	0.0800	1.1847	1.2000	-1.27
S92	0.1784	2.9250	3.0000	-2.50
S93	0.2953	4.9912	4.8000	3.98
S94	0.3460	5.8877	6.0000	-1.87
S0	0.0143	0.0227	0.0000	

Polynomial Order:	1
Correlation Coefficient:	0.9991
Carryover(%):	0.1
Calibration equation:	y = bx + a
y =:	Concentration mg/L
x =:	Measured absorbance
a =:	-2.293231E-001
b =:	1.767836E+001
Date & Time:	2020-05-01 11:14:44

Calibration Graph



Test Results

Cup	Type	ID	Result	Units	QC Pro	Raw Data	Auto Dil.	Man Dil.	User	Time/Date
	S1	Standard 1	0.0139			0.013870			KS	2020-05-01 11:00:58
	S90	Standard 90	0.0184			0.018375			KS	2020-05-01 11:03:16
	S91	Standard 91	0.0800			0.079988			KS	2020-05-01 11:05:33
	S92	Standard 92	0.1784			0.178428			KS	2020-05-01 11:07:51
	S93	Standard 93	0.2953			0.295306			KS	2020-05-01 11:10:09
	S94	Standard 94	0.3460			0.346016			KS	2020-05-01 11:12:27
	S0	Standard 0	0.0143			0.014254			KS	2020-05-01 11:14:44
	CCV	CCV	2.9365	mg/L		0.179082			KS	2020-05-01 11:19:09
	CCB	CCB	0.0193	mg/L		0.014062			KS	2020-05-01 11:21:27
4	U2	ICV NO3 TOXN	2.8911	mg/L		0.176512			KS	2020-05-01 11:23:45
5	U3	ICB NO2 NO3 TOXN	0.0245	mg/L		0.014356			KS	2020-05-01 11:26:03
6	U4	200501A Blk NO2 NO3 TOXN	0.0177	mg/L		0.013973			KS	2020-05-01 11:28:23
9	U7	200501A LCS NO3 TOXN	3.0493	mg/L		0.185459			KS	2020-05-01 11:30:41
10	U8	200501A LCSD NO3 TOXN	3.0590	mg/L		0.186009			KS	2020-05-01 11:32:59
12	U10	1 ppm NO3	1.0171	mg/L		0.070504			KS	2020-05-01 11:35:17
13	U11	BA10508W34 MS	15.2158	mg/L		0.099042	x10.0000		KS	2020-05-01 12:16:27
13	U11	BA10508W34 MS	15.5207	mg/L		0.890921			KS	2020-05-01 11:37:35
14	U12	BA10508W34 MSD	15.6067	mg/L		0.101253	x10.0000		KS	2020-05-01 12:17:23
14	U12	BA10508W34 MSD	15.3326	mg/L		0.880280			KS	2020-05-01 11:39:54
15	U13	BA10506W12	10.0423	mg/L		0.069777	x10.0000		KS	2020-05-01 12:18:19
15	U13	BA10506W12	10.5096	mg/L		0.607460			KS	2020-05-01 11:42:13
16	U14	BA10507W12	10.1142	mg/L		0.070184	x10.0000		KS	2020-05-01 12:19:15
16	U14	BA10507W12	10.6318	mg/L		0.614376			KS	2020-05-01 11:42:53
	CCV	CCV	2.9484	mg/L		0.179754			KS	2020-05-01 11:43:58
	CCB	CCB	0.0168	mg/L		0.013922			KS	2020-05-01 11:44:54
17	U15	BA10508W34	11.4385	mg/L		0.077675	x10.0000		KS	2020-05-01 12:20:11
17	U15	BA10508W34	11.7899	mg/L		0.679883			KS	2020-05-01 11:45:51
18	U16	BA10509W12	11.6243	mg/L		0.078726	x10.0000		KS	2020-05-01 12:21:07
18	U16	BA10509W12	12.0020	mg/L		0.691881			KS	2020-05-01 11:46:47
19	U17	BA10439W11 Thing 1 pH 6.48	0.4955	mg/L		0.041000			KS	2020-05-01 11:47:43
20	U18	BA10504W11 Thing 1 pH 6.26	0.4085	mg/L		0.036081			KS	2020-05-01 11:48:39
	CCV	CCV	2.9650	mg/L		0.180691			KS	2020-05-01 11:49:36
	CCB	CCB	0.0242	mg/L		0.014343			KS	2020-05-01 11:50:32
	CCV	CCV	2.9395	mg/L		0.179250				2020-05-01 12:14:43
	CCB	CCB	0.0179	mg/L		0.013985				2020-05-01 12:15:22
	CCV	CCV	2.9398	mg/L		0.179268				2020-05-01 12:22:03
	CCB	CCB	0.0152	mg/L		0.013832				2020-05-01 12:23:00

Nitrate-N

Test Results

Cup	Type	ID	Result	Units	QC Pro	Raw Data	Auto Dil.	Man Dil.	User	Time/Date
4	U2	ICV NO3 TOXN	2.8823	mg/L		0.000000			KS	2020-05-01 11:23:45
4	U2	ICV NO3 TOXN				0.000000			KS	2020-05-01 11:23:45
5	U3	ICB NO2 NO3 TOXN	0.0221	mg/L		0.000000			KS	2020-05-01 11:26:03
5	U3	ICB NO2 NO3 TOXN				0.000000			KS	2020-05-01 11:26:03
6	U4	200501A Blk NO2 NO3 TOXN	0.0158	mg/L		0.000000			KS	2020-05-01 11:28:23
6	U4	200501A Blk NO2 NO3 TOXN				0.000000			KS	2020-05-01 11:28:23
9	U7	200501A LCS NO3 TOXN	3.0415	mg/L		0.000000			KS	2020-05-01 11:30:41
9	U7	200501A LCS NO3 TOXN				0.000000			KS	2020-05-01 11:30:41
10	U8	200501A LCSD NO3 TOXN	3.0552	mg/L		0.000000			KS	2020-05-01 11:32:59
10	U8	200501A LCSD NO3 TOXN				0.000000			KS	2020-05-01 11:32:59
12	U10	1 ppm NO3	1.0075	mg/L		0.000000			KS	2020-05-01 11:35:17
12	U10	1 ppm NO3				0.000000			KS	2020-05-01 11:35:17
13	U11	BA10508W34 MS	14.4671	mg/L		0.000000			KS	2020-05-01 12:16:27
13	U11	BA10508W34 MS				0.000000			KS	2020-05-01 12:16:27
14	U12	BA10508W34 MSD	14.8508	mg/L		0.000000			KS	2020-05-01 12:17:23
14	U12	BA10508W34 MSD				0.000000			KS	2020-05-01 12:17:23
15	U13	BA10506W12	10.0311	mg/L		0.000000			KS	2020-05-01 12:18:19
15	U13	BA10506W12				0.000000			KS	2020-05-01 12:18:19
16	U14	BA10507W12	10.0889	mg/L		0.000000			KS	2020-05-01 12:19:15
16	U14	BA10507W12				0.000000			KS	2020-05-01 12:19:15
17	U15	BA10508W34	11.4287	mg/L		0.000000			KS	2020-05-01 12:20:11
17	U15	BA10508W34				0.000000			KS	2020-05-01 12:20:11
18	U16	BA10509W12	11.6137	mg/L		0.000000			KS	2020-05-01 12:21:07
18	U16	BA10509W12				0.000000			KS	2020-05-01 12:21:07
19	U17	BA10439W11 Thing 1 pH 6.48	0.4926	mg/L		0.000000			KS	2020-05-01 11:47:43
19	U17	BA10439W11 Thing 1 pH 6.48				0.000000			KS	2020-05-01 11:47:43
20	U18	BA10504W11 Thing 1 pH 6.26	0.4037	mg/L		0.000000			KS	2020-05-01 11:48:39
20	U18	BA10504W11 Thing 1 pH 6.26				0.000000			KS	2020-05-01 11:48:39

Nitrite

High Point @ 1.5 mg/L
0.2463 mL NO2 Inorganic Ventures lot N2-NOX672889-40759 exp: 05/01/20
50 mL DI Water

CCV @ 0.75 mg/L
0.1232 mL NO2 Inorganic Ventures lot N2-NOX672889-40759 exp: 05/01/20
50 mL DI Water

ICV/LCS @ 0.73 mg/L
0.120 mL NO2 Inorganic Ventures lot M2-NOX660562-40468 exp: 08/25/21
50 mL DI Water

1 mg/L NO2
400 uL of High point and 200 uL of DI made directly into a sample cup

Prep 05/01/20
Exp 05/08/20
KS

Nitrate/TOXN

High Point @ 6 mg/L
0.300 mL NO3 O2Si lot 880117-4-39577 exp: 2/21/20
50 mL DI Water

CCV @ 3.0 mg/L
0.150 mL NO3 O2Si lot 880117-4-39577 exp: 2/21/20
50 mL DI Water

ICV/LCS @ 3.0 mg/L
0.150 mL NO3 Inorganic Ventures lot P2-NOX675324-49391 exp: 02/14/23
50 mL DI Water

1 mg/L NO3
100 uL of High point and 500 uLof DI made directly into a sample cup

MS @ 0.73 mg/L NO2 and 2.5 mg/L NO3
0.120 mL NO2 Inorganic Ventures lot M2-NOX660562-40468 exp: 08/25/21and
0.125 mL NO3 Inorganic Ventures lot P2-NOX675324-49391 exp: 02/14/23
Final volume 50 mL of sample

Prep 05/01/20
Exp 05/08/20
KS

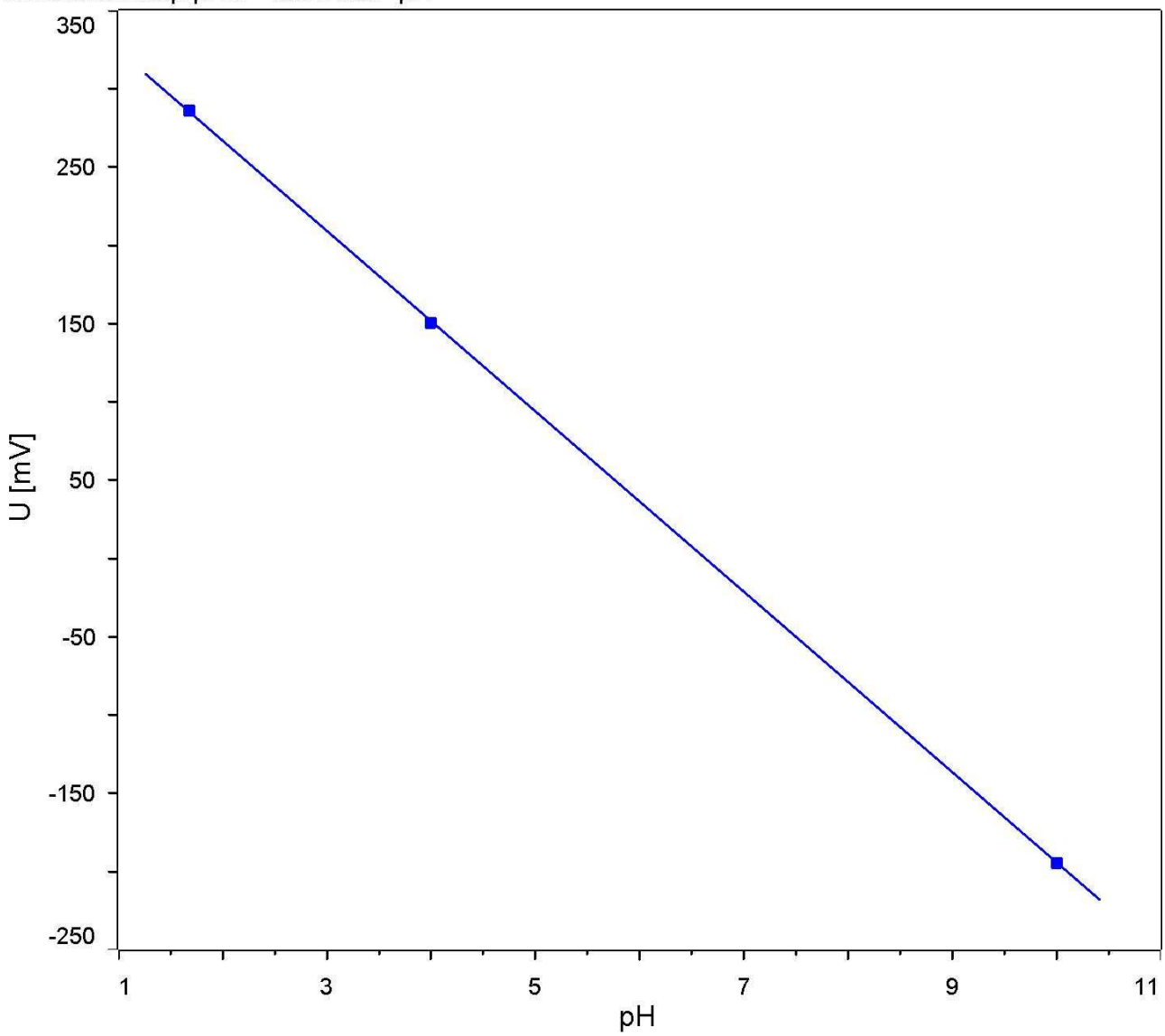
Timao Calibration Curve

2020-05-04 13:32:21

Calculations

Buffer 7	7.05	
Formula	'MEAS pH.EME'	
MEAS pH.EME	7.0487	
Slope	98.30	
Formula	'Calibration loop pH.SLO'	
Calibration loop pH.SLO	98.3	
pH(as)	6.63	
Formula	'Calibration loop pH.ENP'	
Calibration loop pH.ENP	6.626	
Res19	22.4	°C
Formula	'CAL MEAS pH.ETE'	
CAL MEAS pH.ETE	22.4408	

Calibration loop pH.1 - CAL LOOP pH



Metrohm 814/809 Titrando Data

Sample ID	Analysis Date/Time	Method	Titration Volume (to 8.3)	Titration Volume (total)	OH	CO3	HCO3	Total Alk	Unit	Sample Vol	N	Batch	Initials
200504A LCSD	2020-05-04 20:00:33 UTC-7	Alkalinity	0.240	6.838	0.00	18.91	250.51	269.42	mg/L	25 mL	0.0197	200504A	AR
200504A LCS	2020-05-04 19:49:59 UTC-7	Alkalinity	0.302	6.966	0.00	23.80	250.66	274.46	mg/L	25 mL	0.0197	200504A	AR
BA10504W10	2020-05-04 18:05:06 UTC-7	Alkalinity	0.000	2.370	0.00	0.00	93.38	93.38	mg/L	25 mL	0.0197	200504A	AR
200504A BLK	2020-05-04 16:51:28 UTC-7	Alkalinity	0.000	0.088	0.00	0.00	3.47	3.47	mg/L	25 mL	0.0197	200504A	AR

Tiamo Alkalinity Standard Prep

Prep Date:

Exp Date:

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Unit	Conc	Lot Number - QA Number	Prep/Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc
Sulfuric Acid (H2SO4)	J.T.Baker	NA	NA	167828	NA	NA	PURCHASED	NA	NA	NA
0.10N Sulfuric Acid (H2SO4)	J.T.Baker	Normality	0.1N	167828	05/24/19	05/24/20	3ml	1L	DI	0.10N
0.02N Sulfuric Acid (H2SO4)	J.T.Baker	Normality	0.02N	167828	05/24/19	05/24/20	200mL	1L	DI	0.02N
Inorganic Spike(NaHCO3)	BDH	NA	NA	1575C510	10/18/18	08/14/20	PURCHASED	NA	NA	NA
Inorganic Spike Solution	BDH	Milligrams/Liters	250mg/L	1575C510	01/30/20	07/30/20	3.5g	500mL	DI	250mg/L
Standarizing Solution(NaCO3)	J.T.Baker	Normality	1N	178494	07/25/17	07/25/19	PURCHASED	NA	NA	NA

Tiamo Electroconductivity Standard Prep

Prep Date:

Exp Date:

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Units	Conc	Lot Number	Prep/Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc. Range (µg/mL)
EC Spike(KCl)	Mallinckrodt AR	Na	NA	6858 KHMV	NA	NA	PURCHASED	NA	NA	NA
EC Spike Solution	Mallinckrodt AR	Moles/Conductivity	0.01M	6858 KHMV	11/26/18	11/26/19	0.7456g	1L	DI	1412umos
EC Daily LCS Solution	Mallinckrodt AR	Moles/Conductivity	0.0070824M	6858 KHMV	06/06/19	6/6/20	0.5280g	1L	DI	1000umos
Storage Solution EC Probe	APPL	NA	NA	NA	NA	NA	NA	NA	DI	NA

Tiamo pH Buffer Reference Standards

Prep Date: Daily

Exp Date: Daily

Prep'd By (Initials): AR

Initial Standard Information							Final Standard Information			
Name of Initial Standard (QAU Label)	Supplier	Units	pH	Lot Number - QA Number	Opened	Exp. Date	Aliquot from Stock	Final Volume	Solvent	Final Standard Conc (µg/mL)
pH 1.68 Buffer	ORION	pH Units	1.68	WX1-40709	04/22/19	01/01/21	NA	NA	NA	NA
pH 4.00 Buffer	RICCA	pH Units	4	1807191-39782	04/22/19	01/01/21	NA	NA	NA	NA
pH 10.01 Buffer	VWR	pH Units	10.01	0903980-40707	04/22/19	08/27/19	NA	NA	NA	NA
pH 7.00 Buffer	Ricca	pH Units	7	1805M17 - 39765	10/11/18	05/01/20	NA	NA	NA	NA

Ferrous Iron — Rev 2, 04-05-19

Method SM3500Fe | Units mg/L | Instrument: Genisis Spectrometer
Analyte Fe2+ | QCG: 200501 | Wavelength: 510 nm
Analyist fjr | Final Volume: 50mL | Units: mg/L

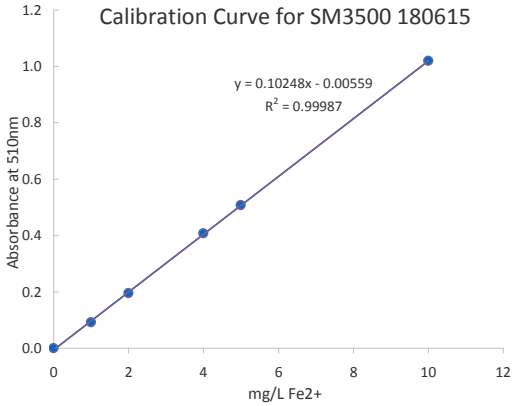
Date	Time	Appl ID	[Fe2+]	Absorbance	% Recovery
06/28/19	12:48	ICB	0.00	0.000	
06/28/19	12:49	Ical 1	1.00	0.092	95.2%
06/28/19	12:50	Ical 2	2.00	0.195	97.9%
06/28/19	12:51	Ical 3	4.00	0.408	100.9%
06/28/19	12:51	Ical 4	5.00	0.507	100.0%
06/28/19	12:52	Ical 5	10.00	1.019	100.0%
06/28/19	13:08	ICV	3.00	0.326	107.9%
06/28/19	12:53	ICB	0.00	0.002	

Slope	0.102479592
Intercept	-0.005591837
Coefficient of Determination	0.999872044

Algortithm Check:	Appl ID	Absorbance	Result
	LCS 200501	0.301	2.99

Result = (Absorbance-Raw Blk-Intercept)/ Slope

Test:	FJR	05/01/20	2.99



Date	Time	Appl ID	DF	Raw Result	SubSample Amount	Raw BLK	Calc Conc	Result	QC True	% Recovery
05/01/20	20:30	CCV 4.0 200501	1	0.405	25mL		4.01	4.01	4.00	100.2%
05/01/20	20:31	CCB 200501	1	0.000	25mL		0.05	0.05		
05/01/20	20:32	LCS 200501	1	0.301	25mL		2.99	2.99	3.00	99.7%
05/01/20	20:33	LCSD 200501	1	0.301	25mL		2.99	2.99	3.00	99.7%
05/01/20										
05/01/20	20:35	BA10439W12	1	0.005	25mL		0.10	0.10		
05/01/20	20:36	BA10504W12	1	0.010	25mL		0.15	0.15		
05/01/20	20:37	BA10504W12 MS	1	0.310	25mL		3.08	3.08		
05/01/20	20:38	BA10504W12 MSD	1	0.310	25mL		3.08	3.08		
05/01/20	20:39	CCV 4.0 200501	1	0.406	25mL		4.02	4.02	4.00	100.4%
05/01/20	20:40	CCB 200501	1	0.001	25mL		0.06	0.06		

Standard Prep

	Ferrous Iron Standards		Prep'd By (Initials)		FJR		
Prep Date	06/28/18						
Exp Date	06/28/19						
Stock Label	Supplier	Batch Number	Exp Date	Aliquot from Stock	Final Volume	Solvent	Ferrous Iron Concentration
Ferrous Ammonium Sulfate	J.T.Baker	0000184592	08/21/20	0.351	250mL	5ml H2SO4 (0000167828) Diluted with water	200ug/L
Ferrous Sulfate	Mallinckrodt	Lot 5056 KDRX	NA	0.250	250mL	5ml H2SO4 (0000167828) Diluted with water	200ug/L
Ferrous Iron CCV/LCS/MS/ICV			Prep'd By (Initials)		FJR		
Prep Date	See Injection Log						
Exp Date	24 Hours						
Initial Standard Information	Supplier	Batch Number	Exp Date	Final Standard Information			
Ferrous Iron CCV	J.T.Baker	0000184592	06/14/19	500uL	25mL	Deionized water	4mg/L
Ferrous Iron ICV/LCS	Mallinckrodt	Lot 5056 KDRX	06/14/19	375uL	25mL	Deionized water	3mg/L
	Ferrous Iron Calibration Curve		Prep'd By (Initials)		FJR		
Prep Date	06/28/18						
Exp Date	06/28/19						
Final Standard Information							
Point Label	Supplier	Batch Number	Exp Date	Aliquot from Stock (mL)	Final Volume	Solvent	Ferrous Iron Concentration
CCB	J.T.Baker	0000184592	06/14/19	0	25mL	Deionized water	0mg/L
Ical 1	J.T.Baker	0000184592	06/14/19	0.125	25mL	Deionized water	1mg/L
Ical 2	J.T.Baker	0000184592	06/14/19	0.25	25mL	Deionized water	2mg/L
Ical 3	J.T.Baker	0000184592	06/14/19	0.5	25mL	Deionized water	4mg/L
Ical 4	J.T.Baker	0000184592	06/14/19	0.625	25mL	Deionized water	5mg/L
Ical 5	J.T.Baker	0000184592	06/14/19	1.25	25mL	Deionized water	10mg/L
ICV	Mallinckrodt	Lot 5056 KDRX	06/14/19	0.375	25mL	Deionized water	3mg/L

Reagent Prep

Reagent	Chemical Lot #	Chemical	Chemical Expiration Date	Amount	Date Prep
Colorizer	0747C107	1,10-phenanthroline	na	1.008	03/12/20
		10% HCL conc	na	enough to dissolve	03/12/20
Buffer	Z28B018	Ammonia Acetate	na	248	01/03/20
	2018071399	Glacial Acetic Acid	06/27/20	700mL	

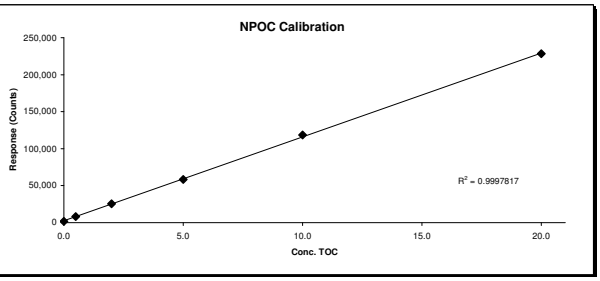
TOTAL ORGANIC CARBON

Method: WetChem | Units mg/L | Instrument: Tic Toc

Analyte: TOC | QCG: 200501A

Analyist: AAR | Final Volume: 40mL

Date	Time	Appl ID	[TOC]	Raw	% Recovery
01/15/20	13:42	QC blank	0.00	1639	
01/15/20	14:25	Ical 1	0.50	8021	
01/15/20	15:01	Ical 2	2.00	25461	
01/15/20	15:37	Ical 3	5.00	58252	
01/15/20	16:13	Ical 4	10.00	118315	
01/15/20	16:49	Ical 5	20.00	228427	
01/16/20	15:11	ICB	0.08	906	
01/16/20	14:33	ICV	5.20	59018	104.0%



Date	Time	Appl ID	DF	Raw Result	SubSample Amount	Filter Blank Subtract	Calc Conc	Result	Range (mg/L)	QC True	% Recovery
2020-05-01	05:28 PM	QCB	1	2011	40mL	0.000	0	0.00	0.00		
2020-05-01	06:07 PM	CCV / 200501A LCS	1	59453	40mL	0.000	5.061	5.06	0.23	5.00	101.2%
2020-05-01	06:46 PM	CCB	1	1356	40mL	0.000	0	0.00	0.00		
2020-05-01	07:25 PM	BA10439W08	1	111960	40mL	0.000	9.834	9.83	1.04		
2020-05-01	08:03 PM	BA10504W09	1	10152	40mL	0.000	0.865	0.87	0.08		
2020-05-01	08:41 PM	BA10506W10	1	8920	40mL	0.000	0.756	0.76	0.05		
2020-05-01	09:17 PM	BA10507W07	1	9500	40mL	0.000	0.807	0.81	0.06		
2020-05-01	09:54 PM	BA10508W16	1	9984	40mL	0.000	0.85	0.85	0.02		
2020-05-01	10:31 PM	BA10508W16 DUP	1	9517	40mL	0.000	0.809	0.81	0.34		
2020-05-01	11:08 PM	BA10508W27 MS	1	63256	40mL	0.000	5.543	5.54	0.01		
2020-05-01	11:46 PM	BA10508W27 MSD	1	60611	40mL	0.000	5.309	5.31	0.90		
2020-05-02	12:24 AM	BA10509W09	1	10160	40mL	0.000	0.865	0.87	0.05		
2020-05-02	01:01 AM	CCV / 200501A LCSD	1	59984	40mL	0.000	5.108	5.11	0.03	5.00	102.2%
2020-05-02	01:41 AM	CCB	1	1457	40mL	0.000	0	0.00	0.00		

Name of Final Standard TOC Calibration Curve — **Prep'd By (Initials)** AR

Prep Date 01/15/20

Exp Date 01/15/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	20 uL	40 mL	DI Water	0.5 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	100 uL	40 mL	DI Water	2 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	250 uL	40 mL	DI Water	5 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	500 uL	40 mL	DI Water	10 ppm
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	1000 uL	40 mL	DI Water	20 ppm

Name of Final Standard ICV (TOC) — **Prep'd By (Initials)** HH

Prep Date 01/15/20

Exp Date 01/15/21

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
1000 PPM ICV TOC Intermediate	APPL Inc.	Prep: 2/11/19	1000 mg/L	Prep: 2/11/19	01/15/21	500 uL	40mL	DI Water	10 ppm

Name of Final Standard CCV (TOC) — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	Agilent	IQC-1 06-5	1000 mg/L	CS-5157-40233	11/30/20	200 uL	40 mL	DI Water	5 ppm

Name of Final Standard TOC_LCS/LCSD — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	ULTRA Scientific	IQC-106-5	1000 mg/L	CR-0328-37639	02/28/19	200 uL	40 mL	DI Water	5 ppm

Name of Final Standard TOC_MS/MSD — **Prep'd By (Initials)** AR

Prep Date See Data

Exp Date 1 year

Initial Standard Information						Final Standard Information			
Name of Initial Standard (from contianer Label)	Supplier	Supplier P/N# (or APPL Mix Name)	Conc.(range)	Lot # with QA # (or reference to APPL prep date)	Exp Date	Aliquot from Stock	Final Volume	Final Solvent + Lot# (or APPL Prep Date)	Final Standard Conc (range)
Total Organic Carbon (TOC) Standard	ULTRA Scientific	IQC-106-5	1000 mg/L	CR-0328-37639	02/28/19	200 uL	40 mL	sample	5 ppm

Appendix C.2:
Data Validation Reports

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LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

April 27, 2020

SUBJECT: Revised Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Pascua

Enclosed are the final validation reports for the fractions listed below. This SDG was received on April 3, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #47711:

SDG #	Fraction
91638	Volatiles, Phenol, Polynuclear Aromatic Hydrocarbons, 2-(2-Methoxyethoxy)-ethanol, Metals, Wet Chemistry, Gasoline Range Organics, Total Petroleum Hydrocarbons as Extractables, Ethylene Dibromide, Methane

The data validation was performed under Level C & D validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 02, January 2017
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 01, April 2017
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, September 2017
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, June 2018
- Project Procedures Manual U.S. Naval Facilities Engineering Command Environmental Restoration Program, NAVFAC Pacific; DON 2015

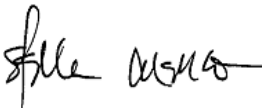
LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017

- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,



Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

1,191 pages-DL

Attachment 1

LDC #47711 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

EDD 90/10 C/D

LDC	SDG#	DATE REC'D	(2) DATE DUE	BTEX & 1,2-DCA (8260B)		Phenol (8270D)		(3) PAHs (8270D -SIM)		2,2-MEE (8270D-M)		(5) Metals (6010C)		GRO (8260B)		TPH-E (8015B)		SGCU TPH-E (8015B)		EDB (8011)		Methane (175)											
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91638	04/03/20	04/17/20	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0										
A	91638	04/03/20	04/17/20	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0										
Total	J/SC			2	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	0	0	14

LDC #47711 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

EDD 90/10 C/D

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		Br,Cl,F SO_4NO_3 (300.0)		NO_3/ NO_2-N (353.2)		Fe II (3500-Fe B)		Silica (4500 -Si D)		D.Silica (4500 -Si D)		DOC (9060A)		TOC (9060A)															
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91638	04/03/20	04/17/20	1	0	1	0	1	0	1	0	1	0	1	0	2	0	1	0														
Total	J/SC			1	0	1	0	1	0	1	0	1	0	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9

Shaded cells indicate Level D validation (all other cells are Level C validation). These sample counts do not include MS/MSD, and DUPs

L:\AECOM\Red Hill\47711ST-18F0126.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Volatiles

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1028	BA08340	Water	03/09/20
ERH1029**	BA08341**	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) which are Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and 1,2-Dichloroethane by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1028 was identified as a trip blank. No contaminants were found.

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A1a
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: FT

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)
BTEX + DCA

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration pending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1, EB = ERH1035 (91505)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XIII.	Target compound identification	A	Not reviewed for Level C validation
XIV.	System performance	A	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; ND = No compounds detected; D = Duplicate; SB=Source blank
N = Not provided/applicable; R = Rinsate; TB = Trip blank; OTHER:
SW = See worksheet; FB = Field blank; EB = Equipment blank

**Indicates sample underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1028 TB	BA08340	Water	03/09/20
2	ERH1029**	BA08341**	Water	03/09/20
3	#2MS	-341 MS	↓	↓
4	#2 MSD	-341 MSD		
5				
6				
7				
8				

Notes:

	200313 BL						

LDC #: 47711A1a

VALIDATION FINDINGS CHECKLIST

Reviewer: FQ
2nd Reviewer: M

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were all percent relative standard deviations (%RSD) ≤ 15% and relative response factors (RRF) ≥ 0.05?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
Were all percent differences (%D) ≤ 50% for closing calibration verifications?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 47711A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: M

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF ug/L (5.0 std)	Recalc RRF ug/L (5.0 std)	Reported Average RRF (initial)	Recalc Average RRF (initial)	Reported %RSD	Recalc %RSD
1	ICAL	3/12/20	V (1st internal standard)	1.468	1.468	1.638	1.638	9.3	9.3
			EE (2nd internal standard)	1.542	1.542	1.726	1.726	8.2	1.9
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV-L39457	3/14/20	V (1st internal standard)	1.638	1.565	1.565	4.5	4.5
			EE (2nd internal standard)	1.726	1.611	1.611	6.6	6.6
			(3rd internal standard)					
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A1a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	25.0	26.24	105	105	0
1,2-Dichloroethane-d4	↓	25.08	100	100	↓
Toluene-d8		25.80	103	103	
Bromofluorobenzene		24.12	96.5	96.5	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 47711A1a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 3 + 4

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene											
Trichloroethene											
Benzene	10.0	10.0	ND	9.81	8.98	98.1	98.1	89.8	89.8	8.8	8.8
Toluene	↓	↓	↓	10.0	9.42	100	100	94.2	94.2	6.0	6.0
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A1a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: 200313BL LCSD

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene										
Trichloroethene										
Benzene	10.0	10.0	9.83	9.31	98.3	98.3	93.1	93.1	5.4	5.4
Toluene	↓	↓	10.1	9.56	101	101	95.6	95.6	5.5	5.5
Chlorobenzene										

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: JV

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 200313BL LCS V

Conc. = $\frac{(224951)(35.0)}{(349376)(1.638)}$

9.827 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ng/L)	Qualification
	LCS	V	9.83	9.827	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Phenol

Validation Level: Level D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1029	BA08341	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level D data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria.

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A2a
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level D

Date: 4/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: AC

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration | ending CCV	A	CCV ≤ 20|50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1035 (91585)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1029	BA08341	Water	03/09/20
2	#1 MS	-341MS	↓	↓
3	#1 MSD	-341MSD		
4				
5				
6				
7				
8				
9				

Notes:

	200312A-Blank						

LDC #: 47711A2a

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: EV
2nd Reviewer: AC

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check (Not required)				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 15% and relative response factors (RRF) ≥ 0.05?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
Were all percent differences (%D) ≤ 50% for closing calibration verifications?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent differences (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			

Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 10 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Did compound quantitation limits meet QAPP limits?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 47711 A2a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported RRF (40 std)	Recalculated RRF (40 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	12/19/19	Phenol (1st IS)	2.040	2.040	2.204	2.204	1.7	1.7
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						
2			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						
3			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711 A2a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: A

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ccv 0207226	3/17/20	Phenol (1st IS)	2.204	2.410	2.410	9.3	9.3
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
2			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A2a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	125.0	85.53428	68.4	68.4	0
2-Fluorobiphenyl	↓	86.37124	69.1	69.1	↓
Terphenyl-d14	↓	114.78404	91.8	91.8	↓
Phenol-d6	250.0	159.17516	63.7	63.7	↓
2-Fluorophenol	↓	146.00937	58.4	58.4	↓
2,4,6-Tribromophenol	↓	206.50411	82.6	82.6	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 47711 A2a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: A

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 2 + 3

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
Phenol	62.5	62.5	ND	39.8	40.6	63.7	63.7	65.0	65.0	2.0	2.0
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711 A2a

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 200312A LCS

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	62.5	NA	43.7	NA	69.9	69.9				
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711 A2a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 200312ALCS: Pheno 1

Conc. = $\frac{(402338)(40.0)(1)(1000)}{(208647)(2.204)(800)}$

=

43.7 ng/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ng/L)	Qualification
	LCS	A	~~62.5~~ 43.7	43.7	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1029	BA08341	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level D data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria.

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A2b
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level D

Date: 4/17/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration pending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1035 (91585)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1029	BA08341	Water	03/09/20
2	#1MS	-34MS	↓	↓
3	#1MSD	-34MSD		
4				
5				
6				
7				
8				
9				

Notes:

	200312A - Blank					

LDC #: 47711 A2b

VALIDATION FINDINGS CHECKLIST

Reviewer: FF
2nd Reviewer: AK

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check (Not required)				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 15% and relative response factors (RRF) ≥ 0.05?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
Were all percent differences (%D) ≤ 50% for closing calibration verifications?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent differences (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10 percent, was a reanalysis performed to confirm %R?				
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			

Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 10 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Did compound quantitation limits meet QAPP limits?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 47711A26

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported RRF (5 std)	Recalculated RRF (5 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	2/4/20	S (1st IS)	1.129	1.129	1.062	1.062	6.9	6.9
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						
2			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						
3			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: AK

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV 0204L282 .308	3/16/20	S (1st IS)	1.062	1.008	1.008	5.0	5.0
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
2			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A26

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ W-d10	6.250	5.86896	93.9	93.9	0
2-Fluorobiphenyl YY-d10	↓	6.30313	101	101	0
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 47711A2b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 2 1 3

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											
S	6.25	6.25	ND	5.12	5.46	81.9	81.9	87.4	87.4	6.4	6.4

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A2b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: AY

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 200312A LCS

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										
S	6.25	NA	5.26	NA	84.2	84.2	NA			

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A2b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 200312A LCS : S

Conc. = $\frac{161053\ (2.5)(1)}{90182\ (1.062)\ (800)}$

=

5.26 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	S	5.26	5.26	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1029	BA08341	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level D data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgment, no data were qualified since the MS/MSD percent recoveries and LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

MS/MSD ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
ERH1029MS/MSD (ERH1029)	2-(2-Methoxyethoxy)-ethanol	25.1 (≤20)	NA	-

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria.

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A2c
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level D

Date: 4/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: RC

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%D ≤ 15 ICV ≤ 20
IV.	Continuing calibration pending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB: ERH1035 (91585)
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1029	BA08341	Water	03/09/20
2	#1 MS	-341 MS	↓	↓
3	#1 MSD	-341 MSD	↓	↓
4				
5				
6				
7				
8				
9				

Notes:

	200313A						

LDC #: 47711A2C

VALIDATION FINDINGS CHECKLIST

Reviewer: EZ
2nd Reviewer: M

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check (Not required)				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 15% and relative response factors (RRF) ≥ 0.05?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
Were all percent differences (%D) ≤ 50% for closing calibration verifications?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent differences (%R) within QC limits?			✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			

Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 10 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Did compound quantitation limits meet QAPP limits?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 47711A2C

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	all	Surrogates were not added to all samples as required by the method. Using professional judgment, no data were qualified. Although the MS/MSD percent RPD was outside criteria, the MS/MSD percent recovery were within QC limits. The LCS/LCSD percent recovery and percent RPD were also within the limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.		Text
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
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			( )	
			( )	
			( )	

LDC #: 47711A2C

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

(Q) FT

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	2, 3	*	( )	( )	25.1 (20)	1	J/UJ/A ND (E)
			( )	( )	( )		
			( )	( )			
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
		* 2-(2-Methoxyethoxy)-Ethanol	( )				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 47711A2C

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported RRF (400 ug/L std)	Recalculated RRF (400 ug/L std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	1/22/20	2-(2-MEE) (1st IS)	0.2203	0.2203	0.2349	0.2349	14	14
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						
2			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						
3			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A2c

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: AK

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	2CV 0122Y076	3/16/20	2-(2 MEE) (1st IS)	0.2349	0.2429	0.2429	3.4	3.4
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
2			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A2C

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: A

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 2 & 3

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											
2-(2-MEE)	80.0	80.0	ND	44.6	57.4	55.8	55.8	71.8	71.8	25.1	25.1

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A2C

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 200313A LCS ND

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										
*	80	80	60.6	75.8	54.5	54.5	68.1	68.1	10.6	10.6

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

* 2-(2-Methoxyethoxy)-Ethanol

LDC #: 47711A2C

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 200313A LCS : 2-(2-MEE)

Conc. = $\frac{(51887)(40.0)(2)}{(145789)(0.2349)(1)}$

=

60.6 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	2-(2-MEE)	60.6	60.6	

LDC Report# 47711A4b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Metals

Validation Level: Level D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1029	BA08341	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Calcium, Magnesium, Manganese, Potassium, and Sodium by Environmental Protection Agency (EPA) SW 846 Method 6010C

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Serial Dilution

Serial dilution was not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A4b
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level D

Date: 4/13/20
Page: 1 of 1
Reviewer: ATV
2nd Reviewer: JV

METHOD: Metals (EPA SW 846 Method 6010C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Instrument Calibration	A	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	A	
V.	Field Blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	(2,3)
VII.	Duplicate sample analysis	N	
VIII.	Serial Dilution	N	
IX.	Laboratory control samples	A	LCS/LCSD
X.	Field Duplicates	N	
XI.	Sample Result Verification	A	
XII.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1029	BA08341	Water	03/09/20
2	↓ MS	↓ MS	↓	↓
3	↓ MSD	↓ MSD	↓	↓
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 47711A4b

VALIDATION FINDINGS CHECKLIST

Reviewer: ATV
2nd Reviewer: ac

Method: Metals (EPA SW 846 Method 6010/6020/7000)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?			✓	
Were %RSD of isotopes in the tuning solution ≤5%?			✓	
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were the low standard checks within 70-130% 80-120%	✓			
Were all initial calibration correlation coefficients within limits as specified by the method?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?			✓	
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?		✓		
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 47711A4b

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: ATV
2nd reviewer: QC

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	W	Al, Sb, As, Ba, Be, Cd, (Ca) Cr, Co, Cu, Fe, Pb, (Mg) (Mn) Hg, Ni, (K) Se, Ag, (Na) Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
2,3	W	Al, Sb, As, Ba, Be, Cd, (Ca) Cr, Co, Cu, Fe, Pb, (Mg) (Mn) Hg, Ni, (K) Se, Ag, (Na) Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Comments: Mercury by CVAA if performed

LDC #: 47711A4b

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: ATV
2nd Reviewer: AC

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
LLICV	ICP (Low Level calibration) 3/18 @ 10:34	K	497.81	500	100	100	Y
	ICP/MS (Low Level calibration)						\
ICV	ICP (Initial calibration) 3/18 @ 10:25	Mg	12428.28	12500	99.4	99.4	Y
	ICP/MS (Initial calibration)						
	CVAA (Initial calibration)						
CCV	ICP (Continuing calibration) 3/18 @ 12:25	Na	12947.68	12500	104	104	Y
	ICP/MS (Continuing calibration)						
	CVAA (Continuing calibration)						

ICP-MS TUNE	Calculation	Mass	Actual (Mean Counts / Axis)	Required (Counts / Axis)	Recalculated %RSD	Acceptable (Y/N)
	Mass Axis			± 0.1 AMU	NA	
	%RSD			≤ 5% RSD		

Comments:

LDC #: 47111A46

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: ATL
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

%D = |I-SDR| / I x 100 Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (mg/L) (units)	True / D / SDR (mg/L) (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check 3/18 @ 11:10	Mg	101705.49	100 000	102	102	Y
LCS	Laboratory control sample 3/18 @ 11:23	Mn	251.05	250	100	100	Y
2	Matrix spike 3/18 @ 11:46	K	(SSR-SR) 5540	5000	111	111	Y
2/3	Duplicate 3/18 @ 11:50	K	7155	7540	5,2	5,3	Y
	Post digestion spike						
	ICP serial dilution						

Comments: _____

LDC #: 47111A4b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: AR
2nd reviewer: AV

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
(Y) N N/A Are all detection limits below the CRDL?

Detected analyte results for Ca were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation: #1

$2118.76 \times 5 = 10593.8$
≈ 10600

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
	1	Ca (3/18 @ 11:32)	10600	10600	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Wet Chemistry

Validation Level: Level D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1029	BA08341	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20
ERH1029DUP	BA08341DUP	Water	03/09/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Bromide, Chloride, Fluoride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Dissolved Organic Carbon by EPA SW 846 Method 9060A
Dissolved Silica and Silica by Standard Method 4500-Si D
Ferrous Iron by Standard Method 3500-Fe B
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Total Organic Carbon by EPA SW 846 Method 9060A

All sample results were subjected to Level D data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ERH1029	Nitrate	125.02 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Chloride	0.16 mg/L	1.0 mg/L	All samples in SDG 91638
ICB/CCB	Chloride	0.16 mg/L	1.0 mg/L	All samples in SDG 91638
PB (prep blank)	Alkalinity, total Alkalinity, bicarbonate	1.9 mg/L 1.9 mg/L	2.0 mg/L 2.0 mg/L	All samples in SDG 91638

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were qualified as estimated in one sample.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 91638

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1029	Nitrate	J (all detects)	P	Technical holding times (H)

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A6
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level D

Date: 4/13/20
Page: 1 of 1
Reviewer: ATV
2nd Reviewer: ND

METHOD: (Analyte) Alkalinity (SM 2320B), Bromide, Chloride, Fluoride, Nitrate-~~N~~, Sulfate (EPA Method 300.0), Nitrate/Nitrite-N (EPA Method 353.2), Ferrous Iron (SM 3500- Fe B), DOC (EPA SW846 Method 9060A), Dissolved Silica (SM 4500-Si D), Silica (SM 4500-Si D), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	(3,4)
VII.	Duplicate sample analysis	A	5
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	A	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1029	BA08341	Water	03/09/20
2	~~ERH1029RE~~	~~BA08341RE~~	Water	03/09/20
3	MS	MS	↓	↓
4	MSD	MSD	↓	↓
5	↓ DUP	↓ DUP	↓	↓
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 47711A6

VALIDATION FINDINGS CHECKLIST

Reviewer: ATV
2nd Reviewer: MZ

Method: Inorganics (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		✓		
II. Calibration				
Were all instruments calibrated daily, each set-up time?		✓		
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)	✓			
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 47711AG

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATL
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS (Cl) (F) (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (Br) (NO3/NO2-N) (BiO2) (DisSiO2)
1	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (DOC) (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
3,4	pH TDS (Cl) (F) (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Br) (NO3/NO2-N) (Fe2+) (DOC)
5	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (DOC)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 47111A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: ATL
2nd reviewer: JE

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria? Code: H

Method:	NO_3 (EPA 300.0)						
Parameters:	water						
Technical holding time:	48 hrs.						
Sample ID	**Sampling date**	**Analysis date**	**Total Time**	**Qualifier**	**Analysis date**	**Total Time**	**Qualifier**
1	8:45 → 11:45 03/09/20	16:46 03/14/20	125.02 hrs	J/R/P(detect)			

LDC #: 47711A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer: AC

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All **Code: B**

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ									
Cl	0.16		0.80	1.0									
Cl		0.16	0.80	1.0									
Alkalinity Total	1.9		9.5	2.0									
Alkalinity Bicarbonate	1.9		9.5	2.0									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 47711A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: ATL
2nd Reviewer: [illegible]

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Br⁻ was recalculated. Calibration date: 03/12/20

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Br⁻	s1	0.2	0.003	*0.99953*	*0.99952*	Y
		s2	0.5	0.018			
		s3	1.25	0.044			
		s4	5	0.178			
		s5	12.5	0.456			
		s6	25	0.954			
CCV Calibration verification	TOC	FOUND	TRUE				Y
CCV (3/13 @ 13:16) Calibration verification	NO_3/NO_2-N	3.1066	3.000		104	104	Y
CCV (3/18 @ 14:53) Calibration verification	SiO_2	3.91	4.00		97.7	97.7	Y

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: ATL
2nd Reviewer: AC

METHOD: Inorganics, Method See cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units) mg/L	True / D (units) mg/L	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Alkalinity	245.38	239	103	103	Y
3	Matrix spike sample	Fe^{2+}	(SSR-SR) 2.96	3.00	98.7	98.5	Y
5	Duplicate sample	DOC	0.757	0.734	3.1	2.7	Y

Comments: _____

LDC #: 47711A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: ATL
2nd reviewer: X

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?
(Y) N N/A Are all detection limits below the CRQL?

Compound (analyte) results for Dissolved SiO2 reported with a positive detect were recalculated and verified using the following equation:

Concentration =

$$\frac{Abs - 0.00145}{0.02574} \times 5$$

Recalculation: #1

$$\frac{0.260 - 0.00145}{0.02574} \times 5 = 50.2234 \simeq 50.2$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	1	Cl- (03/14 @ 17:16)	46.6	46.7	Y
	1	NO3/NO2-N	0.43	0.43	|
	1	Alkalinity total	73.3	73.3	|
	1	SiO2	49.3	49.3	|
	1	Dissolved SiO2	50.2	50.2	|
	1	Fe 2+	ND	ND	|
	1	DOC	0.72	0.73	|
	1	TOC	5.4		↓

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C & D

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1028	BA08340	Water	03/09/20
ERH1029**	BA08341**	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1028 was identified as a trip blank. No contaminants were found.

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
ERH1029MS/MSD (ERH1029**)	Gasoline range organics	130 (78-122)	129 (78-122)	NA	-

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A7
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: AC

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	r² ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = ERH1035 (91585)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS/P
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XIII.	Target compound identification	A	Not reviewed for Level C validation
XIV.	System performance	A	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates sample underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1028 TB	BA08340	Water	03/09/20
2	ERH1029**	BA08341**	Water	03/09/20
3	#2 MS	-341 MS	↓	↓
4	#2 MSD	-341 MSD	↓	↓
5				
6				
7				
8				

Notes:

	200313 BL						

LDC #: 47711A7

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer:

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of $\geq$ 0.990?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 30%/15% and relative response factors (RRF) $\geq$ 0.05?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) $\leq$ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?			✓	
Were all percent differences (%D) $\leq$ 20% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 47711A7

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer: AC

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

(9)

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	3,4	gasoline	130 (78-122)	129 (78-122)	( )	2	Jdet/A ND
		Range Organics	( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC#: 47711A7
SDG#: pw cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: EV
2nd Reviewer: AK

Method: Gasoline (EPA SW 846 Method 8260B)

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
3/13/2020	GCMS Loki	GRO	1	14.91073836	0.8
			2	15.5635805	2.0
			3	17.31875488	4.0
			4	24.12950374	12.0
			5	35.9773767	24.0
			6	42.51063938	32.0
			7	51.39877156	40.0

Regression Output		*Reported*
Constant	*13.646811*	*NR*
Std Err of Y Est		
R Squared	*0.998598*	*NR*
Degrees of Freedom		
X Coefficient(s)	*0.925799*	*NR*
Std Err of Coef.		
Correlation Coefficient	*0.999299*	
Coefficient of Determination (r^2)	*0.998598*	*NR*

LDC #: 477117

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV 0313I42	3/14/20	gasoline (1st internal standard)	300	289.21	289.21	3.6	3.6
			C_6-C_{10} (2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A7

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene	25.0	24.12	96.5	96.5	0

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 47711A7

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = | MSC - MSC | * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 344

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
GRO 1,1-Dichloroethene	300	300	ND	389	388	130	130	129	129	0.26	0.26
Trichloroethene											
Benzene											
Toluene											
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A7

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: 200313BL LCS ID

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
GRO 1,1-Dichloroethene	300	300	315	306	105		102		2.9	
Trichloroethene										
Benzene										
Toluene										
Chlorobenzene										

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A7

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: M

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 200313BL LCS: (GRO)

Conc. = $\frac{\left(\frac{18124394}{716342} - 13.646811\right)(25)}{0.925799}$

= 314.71 ng/L

#	Sample ID	Compound	Reported Concentration (ug/L	Calculated Concentration (ug/L)	Qualification
	LCS	GRO	315	314.71	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1029	BA08341	Water	03/09/20
ERH1029(SGCU)	BA08341(SGCU)	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20
ERH1029(SGCU)MS	BA08341(SGCU)MS	Water	03/09/20
ERH1029(SGCU)MSD	BA08341(SGCU)MSD	Water	03/09/20

Samples ending in "SGCU" underwent Silica Gel cleanup

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level D data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as a rinsate. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria.

XI. Target Compound Identifications

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A8
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level D

Date: 4/17/20
Page: 1 of 1
Reviewer: EZ
2nd Reviewer: AC

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB= ERH1035 (91585)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	A	
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Sample appended with "SGCU" underwent Silica Gel Clean Up

	Client ID	Lab ID	Matrix	Date
1	ERH1029	BA08341	Water	03/09/20
2	ERH1029(SGCU)	BA08341(SGCU)	Water	03/09/20
3	#1 MS	- 341MS	↓	↓
4	#1 MSD	- 341MSD		
5	#2 MS	- 341(SGCU)MS	↓	↓
6	#2 MSD	- 341(SGCU)MSD		
7				
8				
9				
10				
11				

Notes:

-	200312A - Blank						
-	200312A1 - Blank		SGC				

LDC #: 47711A8

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: MC

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed per analytical or extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 47711A0

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: M

METHOD: GC ✓ HPLC ____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (250 std)	Recalculated CF (250 std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL	3/10/20	Diesel (C10-C20)	1956346	1956346	1917612	1917612	14	14
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A8

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: A

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	ccv 312152	3/16/20	Diesel C10-C24	1917610	2261300	2261300	18	18
2	ccv 317008	3/17/20	↓	↓	2167310	2167310	13	13
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A8

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
octacosane		75.0	~~109.00~~ 81.793 F7	109	109	0
o-Terphenyl		75.0	67.406	89.9	90	0

Sample ID: ___

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 47711 A8

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SC = Sample concentration; SA = Spike added

MS = Matrix spike; MSD = Matrix spike duplicate

MS/MSD samples: 3 4

Compound	Spike Added (ug/L)		Sample Conc. (ug/L)	Spike Sample Concentration (ug/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
Diesel C_{10}-C_{24}	1250	1250	220	1460	1540	99.2	99.2	106	106	5.3	5.3

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A8

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration; SA = Spike added
LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 200312A-LCS

Compound	Spike Added (ug/L)		Spike Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
Diesel C10-C24	1250	NA	1320	NA	106	106	NA			

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A8

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: AC

METHOD: GC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #1, Diesel (C_{10}-C_{24})

Conc. = $\frac{34321598 \text{ (Z) (1000)}}{19176 \text{ 12 (2)(800)}}$

=

223.73 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	#1	Diesel (C_{10}-C_{24})	220	223.73	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Ethylene Dibromide

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1029**	BA08341**	Water	03/09/20
ERH1028	BA08340	Water	03/09/20
ERH1029MS	BA08341MS	Water	03/09/20
ERH1029MSD	BA08341MSD	Water	03/09/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Ethylene Dibromide by Environmental Protection Agency (EPA) SW 846 Method 8011

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1028 was identified as a trip blank. No contaminants were found.

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XI. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A10
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level D C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: A

METHOD: GC Ethylene Dibromide (EPA SW846 Method 8011)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	Initial calibration/ICV	A /A	%D %RSD / ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB= ERH1035 (91585)
VI.	Surrogate spikes	A	TB = 2
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	A	
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Level IV

	Client ID	Lab ID	Matrix	Date
1	ERH1029 **	BA08341 **	Water	03/09/20
2	ERH1028 TB	BA08340	↓	↓
3	#1 MS	- 341 MS	↓	↓
4	#1 MSD	- 341 MSD		
5				
6				
7				
8				
9				
10				
11				
12				

Notes:

	200316A - Blank						

LDC #: 47711A10

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: [illegible]

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed per analytical or extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 47711A10

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: GC ✓ HPLC ____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (ug/L std)	Recalculated CF (ug/L std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL	3/16/20	EDB DB-XLB	388534	388534	3825387	3825387	8.7	8.7
			DB-35MS	816946	816946	837934	837934	8.2	8.2
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711 A10

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	ICV 0228164	3/16/20	EDB DB-35MS	837934	843785	843785	0.70	0.70
			DB-XLB	3825387	3656580	3656580	4.4	4.4
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711 A10

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
1,3- Dibromopropane	DB-35MS	0.344	0.307	89.2	89.2	0

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 47711 A10

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: AC

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added

MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 3 4

Compound	Spike Added (ug/L)		Sample Conc. (ug/L)	Spike Sample Concentration (ug/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
EDB	0.250	0.250	ND	0.234	0.237	93.6	93.6	94.8	94.8	1.3	1.3

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A0

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: / GC ___ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 200316A LCS ID

Compound	Spike Added (ug/L)		Spike Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
EDB	0.250	0.250	0.238	0.237	95.2	95.2	94.8	94.8	0.42	0.42

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A10

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: F7
2nd reviewer: ND

METHOD: GC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 200316A LCS EDB

Conc. = $\frac{399960}{837934 \quad (2)}$

=

0.2386 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	EDB	0.238	0.2386	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 20, 2020

Parameters: Methane

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91638

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1028	BA08340	Water	03/09/20
ERH1029**	BA08341**	Water	03/09/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

Retention time windows were established as required by the method for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

Retention times in the calibration standards were within the established retention time windows for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1028 was identified as a trip blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

X. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 91638

No Sample Data Qualified in this SDG

LDC #: 47711A51
SDG #: 91638
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 8/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: KC

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	r² ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB = 1
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
X.	Target compound identification	A	Not reviewed for Level C validation
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates sample underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1028	BA08340	Water	03/09/20
2	ERH1029**	BA08341**	Water	03/09/20
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Notes:

	200317A						

LDC #: 47711A51

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: [illegible]

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?			✓	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per analytical or extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC#: 47711A51
SDG#: see cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: EV
2nd Reviewer: AC

Method: RSK 175

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
3/11/2020	Ints 7890	Methane	1	30923	2.080
			2	32807	4.160
			3	56629	8.340
			4	178225	20.850
			5	837925	83.400
			6	1927571	208.500
			7	6109561	834.000

Regression Output		*Reported*
Constant	*97452.177422*	*97500.00*
Std Err of Y Est		
R Squared	*0.994991*	*0.995000*
Degrees of Freedom		
X Coefficient(s)	*7311.854303*	*7310.00*
Std Err of Coef.		
Correlation Coefficient	*0.997492*	
Coefficient of Determination (r^2)	*0.994991*	*0.995000*

LDC #: 4771|A5|

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV 031780 1	3/17/20	Methane	83.40	88.180	88.180	5.7	5.7
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711 A5)

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 200317A LCS ID

Compound		Spike Added (ug/L)		Spike Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
		LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline	(8015)										
Diesel	(8015)										
Benzene	(8021B)										
Methane	(RSK-175)	83.4	83.4	88.2	87.1	106	106	104	104	1.3	1.3
2,4-D	(8151)										
Dinoseb	(8151)										
Naphthalene	(8310)										
Anthracene	(8310)										
HMX	(8330)										
2,4,6-Trinitrotoluene	(8330)										
Phorate	(8141A)										
Malathion	(8141A)										
Formaldehyde	(8315A)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 47711A5)

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: EJ
2nd reviewer: [illegible]

METHOD: GC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 200317A, LCS Methane

Conc. = $\frac{(742212 \cdot 7.31 \times 10^3)}{(9.75 \times 10^4)}$ #7

= $\frac{742212 - 9.75 \times 10^4}{7.31 \times 10^3}$

= 88.196 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Qualification
	LCS	Methane	88.2	88.196	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **2320B**													
ERH1029	BA08341	1	ALKALINITY, TOTAL (AS CACO3)	3/9/2020 8:45:00 AM	3/18/2020 4:04:00 PM	D	73.3	MG_L		2.0	1.70		
ERH1029	BA08341	1	BICARBONATE	3/9/2020 8:45:00 AM	3/18/2020 4:04:00 PM	D	73.3	MG_L		2.0	1.70		
ERH1029	BA08341	1	CARBONATE (AS CO3)	3/9/2020 8:45:00 AM	3/18/2020 4:04:00 PM	D	1.70	MG_L	U	2.0	1.70	U	
METHOD: **300.0**													
ERH1029	BA08341	1	BROMIDE	3/9/2020 8:45:00 AM	3/14/2020 4:46:00 PM	D	0.33	MG_L	J	0.5	0.16	J	
ERH1029	BA08341	10	CHLORIDE (AS CL)	3/9/2020 8:45:00 AM	3/14/2020 5:16:00 PM	D	46.6	MG_L	D	10.0	2.00		
ERH1029	BA08341	1	FLUORIDE	3/9/2020 8:45:00 AM	3/14/2020 4:46:00 PM	D	0.19	MG_L		0.1	0.09		
ERH1029	BA08341	1	NITRATE AS NO3 (ANION)	3/9/2020 8:45:00 AM	3/14/2020 4:46:00 PM	D	1.8	MG_L		0.5	0.18	J	h
ERH1029	BA08341	10	SULFATE (AS SO4)	3/9/2020 8:45:00 AM	3/14/2020 5:16:00 PM	D	11.3	MG_L	D	10.0	2.00		
METHOD: **3500-FE-B**													
ERH1029	BA08341	1	Iron, Ion (Fe2+)	3/9/2020 8:45:00 AM	3/12/2020 3:30:00 PM	D	0.32	MG_L	U	1.0	0.32	U	
METHOD: **353.2**													
ERH1029	BA08341	1	NITROGEN, NITRATE-NITRITE	3/9/2020 8:45:00 AM	3/13/2020 1:14:00 PM	D	0.43	MG_L		0.10	0.090		
METHOD: **4500-SIO2-C**													
ERH1029	BA08341	1	SILICA	3/9/2020 8:45:00 AM	3/18/2020 2:51:00 PM	D	49.3	MG_L		1.0	0.80		
ERH1029	BA08341	1	SILICA	3/9/2020 8:45:00 AM	3/18/2020 2:51:00 PM	D	50.2	MG_L		1.0	0.80		
METHOD: **6010C**													
ERH1029	BA08341	1	CALCIUM	3/9/2020 8:45:00 AM	3/18/2020 11:32:00 AM	D	10600	UG_L		1000	75.0		
ERH1029	BA08341	1	MAGNESIUM	3/9/2020 8:45:00 AM	3/18/2020 11:32:00 AM	D	11800	UG_L		500	30.0		
ERH1029	BA08341	1	MANGANESE	3/9/2020 8:45:00 AM	3/18/2020 11:32:00 AM	D	4.8	UG_L	J	10.0	4.00	J	
ERH1029	BA08341	1	POTASSIUM	3/9/2020 8:45:00 AM	3/18/2020 11:32:00 AM	D	2000	UG_L	J	3000	500.0	J	
ERH1029	BA08341	1	SODIUM	3/9/2020 8:45:00 AM	3/18/2020 11:32:00 AM	D	40700	UG_L		5000	500.0		
METHOD: **8011**													
ERH1028	BA08340	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/9/2020 7:55:00 AM	3/16/2020 5:03:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1029	BA08341	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/9/2020 8:45:00 AM	3/16/2020 5:24:00 PM	D	0.019	UG_L	U	0.02	0.019	U	
METHOD: **8015B_E**													
ERH1029	BA08341	1	C10-C24 DIESEL RANGE ORG SILICA GEL CLEAN UP	3/9/2020 8:45:00 AM	3/17/2020 11:52:00 AM	D	300.0	UG_L	U	320	300.0	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8015B_E**													
ERH1029	BA08341	1	C10-C24 DIESEL RANGE ORGANICS	3/9/2020 8:45:00 AM	3/16/2020 4:46:00 PM	D	220	UG_L	J	320	300.0	J	
ERH1029	BA08341	1	C24-C40 OIL RANGE ORGANICS SILICA GEL CLEAN	3/9/2020 8:45:00 AM	3/17/2020 11:52:00 AM	D	300.0	UG_L	U	320	300.0	U	
ERH1029	BA08341	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	3/9/2020 8:45:00 AM	3/16/2020 4:46:00 PM	D	240	UG_L	JT4I	320	300.0	J	
METHOD: **8260B**													
ERH1028	BA08340	1	1,2-DICHLOROETHANE	3/9/2020 7:55:00 AM	3/14/2020 6:55:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1028	BA08340	1	BENZENE	3/9/2020 7:55:00 AM	3/14/2020 6:55:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1028	BA08340	1	ETHYLBENZENE	3/9/2020 7:55:00 AM	3/14/2020 6:55:00 AM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1028	BA08340	1	PETROLEUM HYDROCARBONS C6-C10	3/9/2020 7:55:00 AM	3/14/2020 6:54:00 AM	C	18.0	UG_L	U	20	18.0	U	
ERH1028	BA08340	1	TOLUENE	3/9/2020 7:55:00 AM	3/14/2020 6:55:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1028	BA08340	1	Xylenes	3/9/2020 7:55:00 AM	3/14/2020 6:55:00 AM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1029	BA08341	1	1,2-DICHLOROETHANE	3/9/2020 8:45:00 AM	3/14/2020 7:24:00 AM	D	0.30	UG_L	U	1.0	0.30	U	
ERH1029	BA08341	1	BENZENE	3/9/2020 8:45:00 AM	3/14/2020 7:24:00 AM	D	0.30	UG_L	U	1.0	0.30	U	
ERH1029	BA08341	1	ETHYLBENZENE	3/9/2020 8:45:00 AM	3/14/2020 7:24:00 AM	D	0.50	UG_L	U	1.0	0.50	U	
ERH1029	BA08341	1	PETROLEUM HYDROCARBONS C6-C10	3/9/2020 8:45:00 AM	3/14/2020 7:23:00 AM	D	18.0	UG_L	U	20	18.0	U	
ERH1029	BA08341	1	TOLUENE	3/9/2020 8:45:00 AM	3/14/2020 7:24:00 AM	D	0.30	UG_L	U	1.0	0.30	U	
ERH1029	BA08341	1	Xylenes	3/9/2020 8:45:00 AM	3/14/2020 7:24:00 AM	D	0.30	UG_L	U	2.0	0.30	U	
METHOD: **8270D**													
ERH1029	BA08341	1	2-(2-METHOXY ETHOXY)-ETHANOL	3/9/2020 8:45:00 AM	3/16/2020 11:43:00 AM	D	80.0	UG_L	U	100	80.0	U	
ERH1029	BA08341	1	PHENOL	3/9/2020 8:45:00 AM	3/17/2020 10:58:00 AM	D	4.00	UG_L	U	5.0	4.00	U	
METHOD: **8270DSIM**													
ERH1029	BA08341	1	1-METHYLNAPHTHALENE	3/9/2020 8:45:00 AM	3/16/2020 4:52:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
ERH1029	BA08341	1	2-METHYLNAPHTHALENE	3/9/2020 8:45:00 AM	3/16/2020 4:52:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
ERH1029	BA08341	1	NAPHTHALENE	3/9/2020 8:45:00 AM	3/16/2020 4:52:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
METHOD: **9060A**													
ERH1029	BA08341	1	DISSOLVED ORGANIC CARBON	3/9/2020 8:45:00 AM	3/19/2020 10:12:00 PM	D	0.72	MG_L	J	0.93	0.350	J	
ERH1029	BA08341	1	TOTAL ORGANIC CARBON	3/9/2020 8:45:00 AM	3/13/2020 1:33:00 AM	D	5.4	MG_L		0.93	0.350		
METHOD: **RSK175**													
ERH1028	BA08340	1	METHANE	3/9/2020 7:55:00 AM	3/17/2020 10:25:00 AM	C	1.00	UG_L	U	5.0	1.00	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **RSK175**													
ERH1029	BA08341	1	METHANE	3/9/2020 8:45:00 AM	3/17/2020 10:27:00 AM	D	1.00	UG_L	U	5.0	1.00	U	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

April 27, 2020

SUBJECT: Revised Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Pascua

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on April 7, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #47741:

SDG #	Fraction
91607, 91653	Volatiles, Phenol, Polynuclear Aromatic Hydrocarbons, 2-(2-Methoxyethoxy)-ethanol, Metals, Wet Chemistry, Gasoline Range Organics, Total Petroleum Hydrocarbons as Extractables, Ethylene Dibromide, Methane

The data validation was performed under Level C validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 02, January 2017
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 01, April 2017
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, September 2017
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, June 2018
- Project Procedures Manual U.S. Naval Facilities Engineering Command Environmental Restoration Program, NAVFAC Pacific; DON 2015

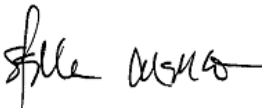
LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017

- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,



Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

112 pages-DL

Attachment 1

EDD 90/10 C/D

LDC #47741 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	BTEX & 1,2-DCA (8260B)		Phenol + TICs (8270D)		(3) PAHs (8270D -SIM)		2,2-MEE (8270D-M)		(5) Metals (6010C)		GRO (8260B)		TPH-E (8015B)		SGCU TPH-E (8015B)		EDB (8011)		Methane (175)											
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91607	04/07/20	04/21/20	2	0	1	0	1	0	1	0	1	0	2	0	1	0	-	-	2	0	2	0										
B	91653	04/07/20	04/21/20	3	0	3	0	2	0	2	0	1	0	3	0	2	0	2	0	3	0	2	0										
Total	J/SC			5	0	4	0	3	0	3	0	2	0	5	0	3	0	2	0	5	0	4	0	0	0	0	0	0	0	0	0	0	36

EDD 90/10 C/D

LDC #47741 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		Br,Cl,F SO_4NO_3 (300.0)		NO_3/ NO_2-N (353.2)		Fe II (3500-Fe B)		Silica (4500 -Si D)		D.Silica (4500 -Si D)		DOC (9060A)		TOC (9060A)															
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91607	04/07/20	04/21/20	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0														
B	91653	04/07/20	04/21/20	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0														
Total	J/SC			2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16

Shaded cells indicate Level D validation (all other cells are Level C validation). These sample counts do not include MS/MSD, and DUPs

L:\AECOM\Red Hill\47741ST-18F0126.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1026	BA08033	Water	03/05/20
ERH1027	BA08034	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) which are Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and 1,2-Dichloroethane by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
03/11/20	1,2-Dichloroethane	25	All samples in SDG 91607	UJ (all non-detects)	A

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1026 was identified as a trip blank. No contaminants were found.

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
ERH1026	1,2-Dichloroethane-d4 Toluene-d8	123 (81-118) 88.4 (89-112)	All compounds	UJ (all non-detects)	A
ERH1027	1,2-Dichloroethane-d4	127 (81-118)	All compounds	UJ (all non-detects)	A

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to continuing calibration %D and surrogate %R, data were qualified as estimated in two samples.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 91607

Sample	Compound	Flag	A or P	Reason (Code)
ERH1026 ERH1027	1,2-Dichloroethane	UJ (all non-detects)	A	Continuing calibration (%D) (C)
ERH1026 ERH1027	All compounds	UJ (all non-detects)	A	Surrogates (%R) (S)

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A1a
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: JD

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)
BTEX + 1,2-DCA

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration pending	SW	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = ERH1035 (91585)
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	client
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1026	BA08033	Water	03/05/20
2	ERH1027	BA08034	Water	03/05/20
3				
4				
5				
6				
7				
8				
9				

Notes:

	200311AT						

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 47741A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ? (c)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	3/11/20	CCV-0311I09	L	25		All	J/UJ/A ND

CONCAL.wpd

LDC #: 47741A1a

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: FT
2nd Reviewer: AK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". (S)

Y N N/A Were all surrogate %R within QC limits?

Y N N/A If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R out of outside of criteria?

#	Sample ID	Surrogate	%Recovery (Limits)	Qualifications
	1	DCE	123 (81-118)	J/nJ/A ND
		Tol	88.4 (89-112)	↓
			( )	
	2	DCE	127 (81-118)	J/nJ/A ND
			( )	
			( )	
	200311AT-Blank	DCE	125 (81-118)	J/nJ/P ND
		TOL	87.5 (89-112)	↓
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	

SMC1 (TOL) = Toluene-d8
SMC2 (BFB) = Bromofluorobenzene
SMC3 (DCE) = 1,2-Dichloroethane-d4
SMC4 (DFM) = Dibromofluoromethane

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Phenol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1027	BA08034	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A2a
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration | ending CCV	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1035 (91585
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1027	BA08034	Water	03/05/20
2				
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Notes:

	200310A - BLK						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1027	BA08034	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A2b
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: JC

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1035 (91585)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1027	BA08034	Water	03/05/20
2				
3				
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6				
7				
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9				

Notes:

	200310A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1027	BA08034	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgement, no data were qualified since the LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
200310A-LCS/LCSD (All samples in SDG 91607)	2-(2-Methoxyethoxy)-ethanol	25.8 (≤20)	UJ (all non-detects)	P

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII.

Due to LCS/LCSD RPD, data were qualified as estimated in one sample.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 91607

Sample	Compound	Flag	A or P	Reason (Code)
ERH1027	2-(2-Methoxyethoxy)-ethanol	UJ (all non-detects)	P	Laboratory control samples (RPD) (L)

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A2c
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: F
2nd Reviewer: M

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /Δ	
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration/ICV	Δ/Δ	RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration | ending	Δ	CCV ≤ 20/50
V.	Laboratory Blanks	Δ	
VI.	Field blanks	ND	EB = ERH1035 (91585)
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	SW	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	Δ	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	Δ	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1027	BA08034	Water	03/05/20
2				
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Notes:

	200310Δ						

LDC #: 47741A2C

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	all	Surrogates were not added to all samples as required by the method. Using professional judgment, no data were qualified. Although the LCS/LCSD percent RPD was outside criteria, the percent recovery were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.		Text
			( )	
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			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5 (2FP) = 2-Fluorophenol

LDC #: 47741A2C

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

(L)

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	260310A LCS ID	*	( )	( )	25.8 (20)	All	J/UJ/P ND
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
		* 2-(2-Methoxyethoxy)-Ethanol	( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Metals

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1027	BA08034	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Calcium, Magnesium, Manganese, Potassium, and Sodium by Environmental Protection Agency (EPA) SW 846 Method 6010C

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Serial Dilution

Serial dilution was not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Sample Result Verification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A4b
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/16/20
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: M

METHOD: Metals (EPA SW 846 Method 6010C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Instrument Calibration	A	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	A	
V.	Field Blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	C.S
VII.	Duplicate sample analysis	N	
VIII.	Serial Dilution	N	
IX.	Laboratory control samples	A	LCS/LCSD
X.	Field Duplicates	N	
XI.	Sample Result Verification	N	
XII	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1027	BA08034	Water	03/05/20
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 47741A4b

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Reviewer: ATL
2nd reviewer: YE

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	W	Al, Sb, As, Ba, Be, Cd, (Ca), Cr, Co, Cu, Fe, Pb, (Mg), (Mn), Hg, Ni, (K), Se, Ag, (Na), Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Comments: Mercury by CVAA if performed

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Wet Chemistry

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1027	BA08034	Water	03/05/20
ERH1027MS	BA08034MS	Water	03/05/20
ERH1027MSD	BA08034MSD	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Bromide, Chloride, Fluoride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Dissolved Organic Carbon and Total Organic Carbon by EPA SW 846 Method 9060A
Ferrous Iron by Standard Method 3500-Fe B
Dissolved Silica and Silica by Standard Method 4500-Si D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Chloride Alkalinity bicarbonate Alkalinity total	0.43 mg/L 1.9 mg/L 1.9 mg/L	1.0 mg/L 2.0 mg/L 2.0 mg/L	All samples in SDG 91607
ICB/CCB	Chloride Nitrate	0.43 mg/L 0.31 mg/L	1.0 mg/L 0.50 mg/L	All samples in SDG 91607

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For ERH1027MS/MSD, no data were qualified for dissolved silica percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
LCSD (All samples in SDG 91607)	Alkalinity total	-	111 (90-110)	J (all detects)	A
LCSD (All samples in SDG 91607)	Dissolved organic carbon	-	88.8 (90-110)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to LCS/LCSD %R, data were qualified as estimated in one sample.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 91607

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1027	Alkalinity total Dissolved organic carbon	J (all detects) J (all detects)	A	Laboratory control samples (%R) (L)

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A6
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/16/20
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: [illegible]

METHOD: (Analyte) Alkalinity (SM 2320B), Bromide, Chloride, Fluoride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrate/Nitrite-N (EPA Method 353.2), DOC (EPA SW846 Method 9060A), Ferrous Iron (SM 3500- Fe B), Silica (SM 4500-Si D), Dissolved Silica (SM 4500-Si D), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	(3,4): Dis SiO2 > 4X
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	SW	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	~~ERH1026~~	~~BA08033~~	Water	03/05/20
2	ERH1027	BA08034	Water	03/05/20
3	ERH1027MS	BA08034MS	Water	03/05/20
4	ERH1027MSD	BA08034MSD	Water	03/05/20
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 47741A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATL
2nd reviewer: RC

All circled methods are applicable to each sample.

Sample ID	Parameter
2	pH TDS (Cl) (F) (NO_3) NO_2 (SO_4) O-PO_4 (Alk) CN NH_3 TKN (TOC) Cr6+ ClO_4 (Br) (NO_3/NO_2-N) (SiO_2) (Dis SiO_2)
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 (Fe^{2+}) (DOC)
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
3,4	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 (SiO_2) (Dis SiO_2) (Fe^{2+})
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 47741A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer: AK

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All **Code: B**

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ									
Cl		0.43	2.15	1.0									
Cl	0.43		2.15	1.0									
NO3		0.31	1.55	0.50									
Alkallinity Bicarbonate	1.9		9.5	2.0									
Alkalinity Total	1.9		9.5	2.0									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 47741A6

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS/LCSD ID	Matrix	Analyte	LCS %R (limits)	LCSD %R (limits)	RPD (limits)	Associated Samples	Qualifications Code: L
	LCSD	W	Alkalinity Total		111 (90-110)		all	Jdet/A (detect)
	LCSD	W	DOC		88.8 (90-110)		all	J/UJ/A (detect)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1026	BA08033	Water	03/05/20
ERH1027	BA08034	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1026 was identified as a trip blank. No contaminants were found.

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A7
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: JC

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	r² IW ≤ 20
IV.	Continuing calibration	A	CW ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = ERH1035 (91585)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1026	BA08033	Water	03/05/20
2	ERH1027	BA08034	Water	03/05/20
3				
4				
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8				
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Notes:

	200311AT						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1027	BA08034	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A8
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: KT
2nd Reviewer: KC

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	Initial calibration/ICV	A/A	%RSD/ICV ≤ 20 CCV ≤ 20
III.	Continuing calibration	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB= ERH1035 (91585)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	cs
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1027	BA08034	Water	03/05/20
2				
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10				
11				
12				

Notes:

	200.7/10A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Ethylene Dibromide

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1026	BA08033	Water	03/05/20
ERH1027	BA08034	Water	03/05/20

Introduction

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The analyses were performed by the following method:

Ethylene Dibromide by Environmental Protection Agency (EPA) SW 846 Method 8011

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A10
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: FT

METHOD: GC Ethylene Dibromide (EPA SW846 Method 8011)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD/ICV ≤ 20 CW ≤ 20
III.	Continuing calibration	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB= ERH1035 (9158S)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1026	BA08033	Water	03/05/20
2	ERH1027	BA08034	Water	03/05/20
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Notes:

	200309A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Methane

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91607

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1026	BA08033	Water	03/05/20
ERH1027	BA08034	Water	03/05/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1026 was identified as a trip blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

Raw data were not reviewed for Level C validation.

X. Target Compound Identification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 91607

No Sample Data Qualified in this SDG

LDC #: 47741A51
SDG #: 91607
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: KT
2nd Reviewer: JL

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	RSD ≤ 20 ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB = 1
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCSID
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	N	
X.	Target compound identification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1026 TB	BA08033	Water	03/05/20
2	ERH1027	BA08034	Water	03/05/20
3				
4				
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8				
9				
10				
11				
12				
13				

Notes:

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **2320B**													
ERH1027	BA08034	1	ALKALINITY, TOTAL (AS CACO3)	3/5/2020 9:00:00 AM	3/9/2020 6:00:00 PM	C	81.5	MG_L		2.0	1.70	J	l
ERH1027	BA08034	1	BICARBONATE	3/5/2020 9:00:00 AM	3/9/2020 6:00:00 PM	C	81.5	MG_L		2.0	1.70		
ERH1027	BA08034	1	CARBONATE (AS CO3)	3/5/2020 9:00:00 AM	3/9/2020 6:00:00 PM	C	1.70	MG_L	U	2.0	1.70	U	
METHOD: **300.0**													
ERH1027	BA08034	1	BROMIDE	3/5/2020 9:00:00 AM	3/6/2020 10:03:00 PM	C	0.22	MG_L	J	0.5	0.16	J	
ERH1027	BA08034	1	CHLORIDE (AS CL)	3/5/2020 9:00:00 AM	3/6/2020 10:03:00 PM	C	47.5	MG_L		1.0	0.20		
ERH1027	BA08034	1	FLUORIDE	3/5/2020 9:00:00 AM	3/6/2020 10:03:00 PM	C	0.25	MG_L		0.1	0.09		
ERH1027	BA08034	1	NITRATE AS NO3 (ANION)	3/5/2020 9:00:00 AM	3/6/2020 10:03:00 PM	C	1.8	MG_L		0.5	0.18		
ERH1027	BA08034	1	SULFATE (AS SO4)	3/5/2020 9:00:00 AM	3/6/2020 10:03:00 PM	C	7.5	MG_L		1.0	0.20		
METHOD: **3500-FE-B**													
ERH1027	BA08034	1	Iron, Ion (Fe2+)	3/5/2020 9:00:00 AM	3/9/2020 4:58:00 PM	C	0.32	MG_L	U	1.0	0.32	U	
METHOD: **353.2**													
ERH1027	BA08034	1	NITROGEN, NITRATE-NITRITE	3/5/2020 9:00:00 AM	3/10/2020 12:16:00 PM	C	0.42	MG_L		0.10	0.090		
METHOD: **4500-SIO2-C**													
ERH1027	BA08034	5	SILICA	3/5/2020 9:00:00 AM	3/9/2020 3:12:00 PM	C	46.5	MG_L		5.0	4.00		
ERH1027	BA08034	5	SILICA	3/5/2020 9:00:00 AM	3/9/2020 3:10:00 PM	C	51.1	MG_L		5.0	4.00		
METHOD: **6010C**													
ERH1027	BA08034	1	CALCIUM	3/5/2020 9:00:00 AM	3/13/2020 12:51:00 PM	C	11400	UG_L		1000	75.0		
ERH1027	BA08034	1	MAGNESIUM	3/5/2020 9:00:00 AM	3/13/2020 12:51:00 PM	C	12100	UG_L		500	30.0		
ERH1027	BA08034	1	MANGANESE	3/5/2020 9:00:00 AM	3/13/2020 12:51:00 PM	C	1.4	UG_L	J	10.0	4.00	J	
ERH1027	BA08034	1	POTASSIUM	3/5/2020 9:00:00 AM	3/13/2020 12:51:00 PM	C	1960	UG_L	J	3000	500.0	J	
ERH1027	BA08034	1	SODIUM	3/5/2020 9:00:00 AM	3/13/2020 12:51:00 PM	C	33900	UG_L		5000	500.0		
METHOD: **8011**													
ERH1026	BA08033	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/5/2020 8:15:00 AM	3/10/2020 12:13:00 AM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1027	BA08034	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/5/2020 9:00:00 AM	3/10/2020 12:33:00 AM	C	0.019	UG_L	U	0.02	0.019	U	
METHOD: **8015B_E**													
ERH1027	BA08034	1	C10-C24 DIESEL RANGE ORGANICS	3/5/2020 9:00:00 AM	3/12/2020 10:29:00 AM	C	300.0	UG_L	U	320	300.0	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8015B_E**													
ERH1027	BA08034	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	3/5/2020 9:00:00 AM	3/12/2020 10:29:00 AM	C	300.0	UG_L	U	320	300.0	U	
METHOD: **8260B**													
ERH1026	BA08033	1	1,2-DICHLOROETHANE	3/5/2020 8:15:00 AM	3/11/2020 5:23:00 PM	C	0.30	UG_L	U	1.0	0.30	UJ	c,s
ERH1026	BA08033	1	BENZENE	3/5/2020 8:15:00 AM	3/11/2020 5:23:00 PM	C	0.30	UG_L	U	1.0	0.30	UJ	s
ERH1026	BA08033	1	ETHYLBENZENE	3/5/2020 8:15:00 AM	3/11/2020 5:23:00 PM	C	0.50	UG_L	U	1.0	0.50	UJ	s
ERH1026	BA08033	1	PETROLEUM HYDROCARBONS C6-C10	3/5/2020 8:15:00 AM	3/11/2020 5:22:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1026	BA08033	1	TOLUENE	3/5/2020 8:15:00 AM	3/11/2020 5:23:00 PM	C	0.30	UG_L	U	1.0	0.30	UJ	s
ERH1026	BA08033	1	Xylenes	3/5/2020 8:15:00 AM	3/11/2020 5:23:00 PM	C	0.30	UG_L	U	2.0	0.30	UJ	s
ERH1027	BA08034	1	1,2-DICHLOROETHANE	3/5/2020 9:00:00 AM	3/11/2020 5:51:00 PM	C	0.30	UG_L	U	1.0	0.30	UJ	c,s
ERH1027	BA08034	1	BENZENE	3/5/2020 9:00:00 AM	3/11/2020 5:51:00 PM	C	0.30	UG_L	U	1.0	0.30	UJ	s
ERH1027	BA08034	1	ETHYLBENZENE	3/5/2020 9:00:00 AM	3/11/2020 5:51:00 PM	C	0.50	UG_L	U	1.0	0.50	UJ	s
ERH1027	BA08034	1	PETROLEUM HYDROCARBONS C6-C10	3/5/2020 9:00:00 AM	3/11/2020 5:50:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1027	BA08034	1	TOLUENE	3/5/2020 9:00:00 AM	3/11/2020 5:51:00 PM	C	0.30	UG_L	U	1.0	0.30	UJ	s
ERH1027	BA08034	1	Xylenes	3/5/2020 9:00:00 AM	3/11/2020 5:51:00 PM	C	0.30	UG_L	U	2.0	0.30	UJ	s
METHOD: **8270D**													
ERH1027	BA08034	1	2-(2-METHOXY ETHOXY)-ETHANOL	3/5/2020 9:00:00 AM	3/11/2020 4:10:00 PM	C	80.0	UG_L	U	100	80.0	UJ	l
ERH1027	BA08034	1	PHENOL	3/5/2020 9:00:00 AM	3/12/2020 5:55:00 PM	C	4.00	UG_L	U	5.0	4.00	U	
METHOD: **8270DSIM**													
ERH1027	BA08034	1	1-METHYLNAPHTHALENE	3/5/2020 9:00:00 AM	3/13/2020 11:41:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1027	BA08034	1	2-METHYLNAPHTHALENE	3/5/2020 9:00:00 AM	3/13/2020 11:41:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1027	BA08034	1	NAPHTHALENE	3/5/2020 9:00:00 AM	3/13/2020 11:41:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
METHOD: **9060A**													
ERH1027	BA08034	1	DISSOLVED ORGANIC CARBON	3/5/2020 9:00:00 AM	3/11/2020 10:52:00 PM	C	0.40	MG_L	J	0.93	0.350	J	l
ERH1027	BA08034	1	TOTAL ORGANIC CARBON	3/5/2020 9:00:00 AM	3/13/2020 12:55:00 AM	C	18.5	MG_L		0.93	0.350		
METHOD: **RSK175**													
ERH1026	BA08033	1	METHANE	3/5/2020 8:15:00 AM	3/10/2020 12:51:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1027	BA08034	1	METHANE	3/5/2020 9:00:00 AM	3/10/2020 12:55:00 PM	C	1.00	UG_L	U	5.0	1.00	U	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1030	BA08369	Water	03/10/20
ERH1031	BA08370	Water	03/10/20
ERH1032	BA08371	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) which are Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and 1,2-Dichloroethane by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1030 was identified as a trip blank. No contaminants were found.

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples ERH1031 and ERH1032 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B1a
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)
BTEX + 1,2 DCA

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15% ICV ≤ 20
IV.	Continuing calibration / ending CCV	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = ERH1035 (91585)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	ND	D = 2, 3
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID		Lab ID	Matrix	Date
1	ERH1030	TB	BA08369	Water	03/10/20
2	ERH1031MW	D	BA08370MW	Water	03/10/20
3	ERH1032	D	BA08371	Water	03/10/20
4					
5					
6					
7					
8					
9					

Notes:

	200313BL						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 27, 2020

Parameters: Phenol & Tentatively Identified Compounds

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1031	BA08370	Water	03/10/20
ERH1032	BA08371	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol & Tentatively Identified Compounds (TICs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Tentatively Identified Compounds (Retention Time in Minutes)	Concentration	Associated Samples
200312A-Blk	03/12/20	Benzene, methyl (2.08) Hexadecanoic acid (11.18)	520.5 ug/L 8.9 ug/L	All samples in SDG 91653

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated laboratory blanks

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples ERH1031 and ERH1032 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol & Tentatively Identified Compounds - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol & Tentatively Identified Compounds - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol & Tentatively Identified Compounds - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B2a
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: [illegible]

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A, A	RSD ≤ 15 ICV ≤ 70
IV.	Continuing calibration | ending	A	CCV ≤ 20 | 50
V.	Laboratory Blanks	SW	
VI.	Field blanks	ND	EB = ERH1035 (91585)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D = 1, 2
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1031W D	BA08370W	Water	03/10/20
2	ERH1032 D	BA08371	Water	03/10/20
3				
4				
5				
6				
7				
8				
9				

Notes:

	20031ZA						

LDC #: 47741B2a

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 3/12/20 **Blank analysis date:** 3/17/20
Conc. units: ug/L Associated Samples: All (ND)

Compound	Blank ID								
	200312A-BLK								
TIC Benzene, methyl	520.5 (2.08)								
Hexadecanoic acid	8.9 (11.18)								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1031	BA08370	Water	03/10/20
ERH1032	BA08371	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples ERH1031 and ERH1032 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B2b
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)
TTT, W, S only

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration pending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1035 (91585)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D = 1,2
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1031W D	BA08370W	Water	03/10/20
2	ERH1032 D	BA08371	Water	03/10/20
3				
4				
5				
6				
7				
8				
9				

Notes:

	200312A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1031	BA08370	Water	03/10/20
ERH1032	BA08371	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgement, no data were qualified since the LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples ERH1031 and ERH1032 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B2c
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration pending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1035 (91585)
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS/LCSD
X.	Field duplicates	ND	D = 1,2
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1031	BA08370	Water	03/10/20
2	ERH1032	BA08371	Water	03/10/20
3				
4				
5				
6				
7				
8				
9				

Notes:

	200313A						

LDC #: 47741B2C

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	all	Surrogates were not added to all samples as required by the method. Using professional judgment, no data were qualified. The LCS/LCSD percent recovery and percent RPD were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.		Text
			( )	
			( )	
			( )	
			( )	
			( )	
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			( )	
			( )	
			( )	
			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5 (2FP) = 2-Fluorophenol

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Metals

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1031	BA08370	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Calcium, Magnesium, Manganese, Potassium, and Sodium by Environmental Protection Agency (EPA) SW 846 Method 6010C

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Serial Dilution

Serial dilution was not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Sample Result Verification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B4b
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level ⊠C

Date: 4/17/20
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: YC

METHOD: Metals (EPA SW 846 Method 6010C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Instrument Calibration	A	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	A	
V.	Field Blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	C,S
VII.	Duplicate sample analysis	N	
VIII.	Serial Dilution	N	
IX.	Laboratory control samples	A	LCS/LCSD
X.	Field Duplicates	N	
XI.	Sample Result Verification	N	
XII	Overall Assessment of Data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1031	BA08370	Water	03/10/20
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 47741B46

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Reviewer: ATV
2nd reviewer: M

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	W	Al, Sb, As, Ba, Be, Cd, (Ca) Cr, Co, Cu, Fe, Pb, (Mg) (Mn) Hg, Ni, (K) Se, Ag, (Na) Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Comments: Mercury by CVAA if performed

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Wet Chemistry

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1031	BA08370	Water	03/10/20
ERH1031DL	BA08370DL	Water	03/10/20
ERH1031MS	BA08370MS	Water	03/10/20
ERH1031MSD	BA08370MSD	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Bromide, Chloride, Fluoride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Dissolved Organic Carbon and Total Organic Carbon by EPA SW 846 Method 9060A
Ferrous Iron by Standard Method 3500-Fe B
Dissolved Silica and Silica by Standard Method 4500-Si D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ERH1031	Nitrate	70.97 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Alkalinity bicarbonate Alkalinity total	1.9 mg/L 1.9 mg/L	2.0 mg/L 2.0 mg/L	All samples in SDG 91653

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Reason	Flag	A or P
ERH1031	Fluoride	Result from diluted analysis was more usable.	R	A

Due to technical holding time, data were qualified as estimated in one sample.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 91653

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1031	Nitrate	J (all detects)	P	Technical holding times (H)
ERH1031	Fluoride	R	A	Overall assessment of data (D)

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B6
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 4/17/20
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: AL

METHOD: (Analyte) Alkalinity (SM 2320B), Bromide, Chloride, Fluoride, Nitrate, Sulfate (EPA Method 300.0), Nitrate/Nitrite-N (EPA Method 353.2), DOC (EPA SW846 Method 9060A), Ferrous Iron (SM 3500- Fe B), Silica (SM 4500-Si D), Dissolved Silica (SM 4500-Si D), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	(3,4)
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1031	BA08370	Water	03/10/20
2	ERH1031DL	BA08370DL	Water	03/10/20
3	ERH1031MS	BA08370MS	Water	03/10/20
4	ERH1031MSD	BA08370MSD	Water	03/10/20
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 47741B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATL
2nd reviewer: VC

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS ~~Cl~~ (F) (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (Br) (NO3/NO2-N) (SiO2) (Dis SiO2) (Fe2+)
2	pH TDS (Cl) (F) NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
1	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (DOC)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
3,4	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 47741B6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: ATL
2nd reviewer: AL

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria? Code: H

Method:	NO3 (EPA 300.0)			
Parameters:	water			
Technical holding time:	48 hrs			
Sample ID	Sampling date	Analysis date	Total time	Qualifier
1	03/10/20 @ 8:30 -11:30	03/13/20 @ 10:28	70.97 hrs	J/UJ/P (detect)

LDC #: 47741B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All **Code: B**

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ									
Alkallinity Bicarbonate	1.9		9.5	2.0									
Alkalinity Total	1.9		9.5	2.0									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 47741B6

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: ATL
2nd Reviewer: AR

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
	3/13/20	1	F was analyzed 2X D more usable	1	R/A (detect) code: D

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1030	BA08369	Water	03/10/20
ERH1031	BA08370	Water	03/10/20
ERH1032	BA08371	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1030 was identified as a trip blank. No contaminants were found.

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples ERH1031 and ERH1032 were identified as field duplicates. No results were detected in any of the samples.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B7
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: MC

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	r² ICV≤20
IV.	Continuing calibration	A	CCV≤20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH 1035 (91585) TB = 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	ND	D = 2, 3
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1030	BA08369	Water	03/10/20
2	ERH1031	BA08370	Water	03/10/20
3	ERH1032	BA08371	Water	03/10/20
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Notes:

	200313BL						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 27, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1031	BA08370	Water	03/10/20
ERH1032	BA08371	Water	03/10/20
ERH1031(SGCU)	BA08370(SGCU)	Water	03/10/20
ERH1032(SGCU)	BA08371(SGCU)	Water	03/10/20

Samples appended with "SGCU" underwent Silica Gel cleanup

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples ERH1031 and ERH1032 and samples ERH1031(SGCU) and ERH1032(SGCU) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1031	ERH1032	
Diesel (C10-C24)	240J	200J	18 (≤50)
Oil (C24-C40)	240J	170J	24 (≤50)

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B8
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A/A	RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = ERH1095 (91585) 35
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	D= 1,2 *3,4
X.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XI.	Target compound identification	N	Not reviewed for Level C validation
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation / Samples appended with "SGCU" underwent Silica Gel Clean Up

	Client ID	Lab ID	Matrix	Date
1	ERH1031	BA08370	Water	03/10/20
2	ERH1032	BA08371	Water	03/10/20
3	ERH1031(SGCU)	BA08370(SGCU)	Water	03/10/20
4	ERH1032(SGCU)	BA08371(SGCU)	Water	03/10/20
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9				
10				
11				

Notes:

	200312A						

LDC #: 47741B8

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: FT
2nd reviewer:

METHOD: ✓ **GC** __ **HPLC**

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		%RPD Limit (≤ 50%)	Qualification (Parent only)
	1	2		
Diesel (C_{10}-C_{24})	240 J	200 J	18	
Oil (C_{24}-C_{40})	240 J	170 J	24	

Compound	Concentration ( )		%RPD Limit (≤ %)	Qualification (Parent only)

Compound	Concentration ( )		%RPD Limit (≤ %))	Qualification (Parent only)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Ethylene Dibromide

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1030	BA08369	Water	03/10/20
ERH1031	BA08370	Water	03/10/20
ERH1032	BA08371	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Ethylene Dibromide by Environmental Protection Agency (EPA) SW 846 Method 8011

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1030 was identified as a trip blank. No contaminants were found.

Sample ERH1035 (from SDG 91585) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples ERH1031 and ERH1032 were identified as field duplicates. No results were detected in any of the samples.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B10
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/~~D~~

Date: 4/17/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Ethylene Dibromide (EPA SW846 Method 8011)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	RSD / ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB = 1 EB= ERH1035 (91585)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	cs
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	ND	D= 2,3
X.	Compound quantitation RL/LOQ/LODs	~~A~~ N	Not reviewed for Level C validation
XI.	Target compound identification	N	Not reviewed for Level C validation
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1030 TB	BA08369	Water	03/10/20
2	ERH1031	BA08370**	Water	03/10/20
3	ERH1032	BA08371	Water	03/10/20
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Notes:

	200316A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Methane

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91653

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1030	BA08369	Water	03/10/20
ERH1031	BA08370	Water	03/10/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1030 was identified as a trip blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

Raw data were not reviewed for Level C validation.

X. Target Compound Identification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 91653

No Sample Data Qualified in this SDG

LDC #: 47741B51
SDG #: 91653
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/17/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: FT

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A A	
II.	Initial calibration/ICV	A/A	r² ICV ≤ 20
III.	Continuing calibration	A	CW ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB = 1
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS ID
VIII.	Field duplicates N	~~ND~~	~~D = 1,2~~ FT
IX.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
X.	Target compound identification	N	Not reviewed for Level C validation
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1030	BA08369	Water	03/10/20
2	ERH1031	BA08370	Water	03/10/20
3				
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13				

Notes:

	200317A						

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **2320B**													
ERH1031	BA08370	1	ALKALINITY, TOTAL (AS CACO3)	3/10/2020 8:30:00 AM	3/18/2020 9:11:00 PM	C	90.3	MG_L		2.0	1.70		
ERH1031	BA08370	1	BICARBONATE	3/10/2020 8:30:00 AM	3/18/2020 9:11:00 PM	C	84.8	MG_L		2.0	1.70		
ERH1031	BA08370	1	CARBONATE (AS CO3)	3/10/2020 8:30:00 AM	3/18/2020 9:11:00 PM	C	5.5	MG_L		2.0	1.70		
METHOD: **300.0**													
ERH1031	BA08370	1	BROMIDE	3/10/2020 8:30:00 AM	3/13/2020 10:28:00 AM	C	0.40	MG_L	J	0.5	0.16	J	
ERH1031	BA08370	5	CHLORIDE (AS CL)	3/10/2020 8:30:00 AM	3/13/2020 5:24:00 PM	C	65.8	MG_L	D	5.0	1.00		
ERH1031	BA08370	1	FLUORIDE	3/10/2020 8:30:00 AM	3/13/2020 10:28:00 AM	C	0.26	MG_L		0.1	0.09	R	d
ERH1031	BA08370	5	FLUORIDE	3/10/2020 8:30:00 AM	3/13/2020 5:24:00 PM	C	0.87	MG_L	D	0.5	0.45		
ERH1031	BA08370	1	NITRATE AS NO3 (ANION)	3/10/2020 8:30:00 AM	3/13/2020 10:28:00 AM	C	0.40	MG_L	J	0.5	0.18	J	h
ERH1031	BA08370	1	SULFATE (AS SO4)	3/10/2020 8:30:00 AM	3/13/2020 10:28:00 AM	C	11.7	MG_L		1.0	0.20		
METHOD: **3500-FE-B**													
ERH1031	BA08370	1	Iron, Ion (Fe2+)	3/10/2020 8:30:00 AM	3/13/2020 8:13:00 PM	C	0.32	MG_L	U	1.0	0.32	U	
METHOD: **353.2**													
ERH1031	BA08370	1	NITROGEN, NITRATE-NITRITE	3/10/2020 8:30:00 AM	3/13/2020 1:15:00 PM	C	0.048	MG_L	J	0.10	0.090	J	
METHOD: **4500-SIO2-C**													
ERH1031	BA08370	1	SILICA	3/10/2020 8:30:00 AM	3/18/2020 2:52:00 PM	C	9.0	MG_L		1.0	0.80		
ERH1031	BA08370	1	SILICA	3/10/2020 8:30:00 AM	3/18/2020 2:52:00 PM	C	9.0	MG_L		1.0	0.80		
METHOD: **6010C**													
ERH1031	BA08370	1	CALCIUM	3/10/2020 8:30:00 AM	3/18/2020 11:54:00 AM	C	21900	UG_L		1000	75.0		
ERH1031	BA08370	1	MAGNESIUM	3/10/2020 8:30:00 AM	3/18/2020 11:54:00 AM	C	14900	UG_L		500	30.0		
ERH1031	BA08370	1	MANGANESE	3/10/2020 8:30:00 AM	3/18/2020 11:54:00 AM	C	117	UG_L		10.0	4.00		
ERH1031	BA08370	1	POTASSIUM	3/10/2020 8:30:00 AM	3/18/2020 11:54:00 AM	C	3380	UG_L		3000	500.0		
ERH1031	BA08370	1	SODIUM	3/10/2020 8:30:00 AM	3/18/2020 11:54:00 AM	C	47500	UG_L		5000	500.0		
METHOD: **8011**													
ERH1030	BA08369	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/10/2020 7:50:00 AM	3/16/2020 6:24:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1031	BA08370	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/10/2020 8:30:00 AM	3/16/2020 6:44:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1032	BA08371	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/10/2020 8:30:00 AM	3/16/2020 7:04:00 PM	C	0.019	UG_L	U	0.02	0.019	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8015B_E**													
ERH1031	BA08370	1	C10-C24 DIESEL RANGE ORG SILICA GEL CLEAN UP	3/10/2020 8:30:00 AM	3/17/2020 1:45:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1031	BA08370	1	C10-C24 DIESEL RANGE ORGANICS	3/10/2020 8:30:00 AM	3/16/2020 5:08:00 PM	C	240	UG_L	JT4I	320	300.0	J	
ERH1031	BA08370	1	C24-C40 OIL RANGE ORGANICS SILICA GEL CLEAN	3/10/2020 8:30:00 AM	3/17/2020 1:45:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1031	BA08370	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	3/10/2020 8:30:00 AM	3/16/2020 5:08:00 PM	C	240	UG_L	J	320	300.0	J	
ERH1032	BA08371	1	C10-C24 DIESEL RANGE ORG SILICA GEL CLEAN UP	3/10/2020 8:30:00 AM	3/17/2020 2:07:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1032	BA08371	1	C10-C24 DIESEL RANGE ORGANICS	3/10/2020 8:30:00 AM	3/16/2020 5:31:00 PM	C	200	UG_L	JT4I	320	300.0	J	
ERH1032	BA08371	1	C24-C40 OIL RANGE ORGANICS SILICA GEL CLEAN	3/10/2020 8:30:00 AM	3/17/2020 2:07:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1032	BA08371	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	3/10/2020 8:30:00 AM	3/16/2020 5:31:00 PM	C	170	UG_L	J	320	300.0	J	
METHOD: **8260B**													
ERH1030	BA08369	1	1,2-DICHLOROETHANE	3/10/2020 7:50:00 AM	3/14/2020 7:52:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1030	BA08369	1	BENZENE	3/10/2020 7:50:00 AM	3/14/2020 7:52:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1030	BA08369	1	ETHYLBENZENE	3/10/2020 7:50:00 AM	3/14/2020 7:52:00 AM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1030	BA08369	1	PETROLEUM HYDROCARBONS C6-C10	3/10/2020 7:50:00 AM	3/14/2020 7:51:00 AM	C	18.0	UG_L	U	20	18.0	U	
ERH1030	BA08369	1	TOLUENE	3/10/2020 7:50:00 AM	3/14/2020 7:52:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1030	BA08369	1	Xylenes	3/10/2020 7:50:00 AM	3/14/2020 7:52:00 AM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1031	BA08370	1	1,2-DICHLOROETHANE	3/10/2020 8:30:00 AM	3/14/2020 8:21:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1031	BA08370	1	BENZENE	3/10/2020 8:30:00 AM	3/14/2020 8:21:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1031	BA08370	1	ETHYLBENZENE	3/10/2020 8:30:00 AM	3/14/2020 8:21:00 AM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1031	BA08370	1	PETROLEUM HYDROCARBONS C6-C10	3/10/2020 8:30:00 AM	3/14/2020 8:20:00 AM	C	18.0	UG_L	U	20	18.0	U	
ERH1031	BA08370	1	TOLUENE	3/10/2020 8:30:00 AM	3/14/2020 8:21:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1031	BA08370	1	Xylenes	3/10/2020 8:30:00 AM	3/14/2020 8:21:00 AM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1032	BA08371	1	1,2-DICHLOROETHANE	3/10/2020 8:30:00 AM	3/14/2020 8:49:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1032	BA08371	1	BENZENE	3/10/2020 8:30:00 AM	3/14/2020 8:49:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1032	BA08371	1	ETHYLBENZENE	3/10/2020 8:30:00 AM	3/14/2020 8:49:00 AM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1032	BA08371	1	PETROLEUM HYDROCARBONS C6-C10	3/10/2020 8:30:00 AM	3/14/2020 8:48:00 AM	C	18.0	UG_L	U	20	18.0	U	
ERH1032	BA08371	1	TOLUENE	3/10/2020 8:30:00 AM	3/14/2020 8:49:00 AM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1032	BA08371	1	Xylenes	3/10/2020 8:30:00 AM	3/14/2020 8:49:00 AM	C	0.30	UG_L	U	2.0	0.30	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8270D**													
ERH1031	BA08370	1	2-(2-METHOXY ETHOXY)-ETHANOL	3/10/2020 8:30:00 AM	3/16/2020 12:07:00 PM	C	80.0	UG_L	U	100	80.0	U	
ERH1031	BA08370	1	2-ETHYL-1-HEXANOL	3/10/2020 8:30:00 AM	3/17/2020 12:13:00 PM	C	6.5	UG_L	T	0	0		
ERH1031	BA08370	1	CIS-1-BUTYL-2-METHYLCYCLOPROPANE	3/10/2020 8:30:00 AM	3/17/2020 12:13:00 PM	C	99	UG_L	T	0	0		
ERH1031	BA08370	1	PHENOL	3/10/2020 8:30:00 AM	3/17/2020 12:13:00 PM	C	4.00	UG_L	U	5.0	4.00	U	
ERH1032	BA08371	1	2-(2-METHOXY ETHOXY)-ETHANOL	3/10/2020 8:30:00 AM	3/16/2020 12:30:00 PM	C	80.0	UG_L	U	100	80.0	U	
ERH1032	BA08371	1	2-ETHYL-1-HEXANOL	3/10/2020 8:30:00 AM	3/17/2020 12:40:00 PM	C	13	UG_L	T	0	0		
ERH1032	BA08371	1	CIS-1-BUTYL-2-METHYLCYCLOPROPANE	3/10/2020 8:30:00 AM	3/17/2020 12:40:00 PM	C	100	UG_L	T	0	0		
ERH1032	BA08371	1	OCTADECANOIC ACID	3/10/2020 8:30:00 AM	3/17/2020 12:40:00 PM	C	6.0	UG_L	T	0	0		
ERH1032	BA08371	1	PHENOL	3/10/2020 8:30:00 AM	3/17/2020 12:40:00 PM	C	4.00	UG_L	U	5.0	4.00	U	
METHOD: **8270DSIM**													
ERH1031	BA08370	1	1-METHYLNAPHTHALENE	3/10/2020 8:30:00 AM	3/16/2020 5:14:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1031	BA08370	1	2-METHYLNAPHTHALENE	3/10/2020 8:30:00 AM	3/16/2020 5:14:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1031	BA08370	1	NAPHTHALENE	3/10/2020 8:30:00 AM	3/16/2020 5:14:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1032	BA08371	1	1-METHYLNAPHTHALENE	3/10/2020 8:30:00 AM	3/16/2020 5:36:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1032	BA08371	1	2-METHYLNAPHTHALENE	3/10/2020 8:30:00 AM	3/16/2020 5:36:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1032	BA08371	1	NAPHTHALENE	3/10/2020 8:30:00 AM	3/16/2020 5:36:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
METHOD: **9060A**													
ERH1031	BA08370	1	DISSOLVED ORGANIC CARBON	3/10/2020 8:30:00 AM	3/20/2020 12:04:00 AM	C	0.36	MG_L	J	0.93	0.350	J	
ERH1031	BA08370	4	TOTAL ORGANIC CARBON	3/10/2020 8:30:00 AM	3/20/2020 3:16:00 AM	C	29.7	MG_L		3.72	1.400		
METHOD: **RSK175**													
ERH1030	BA08369	1	METHANE	3/10/2020 7:50:00 AM	3/17/2020 10:30:00 AM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1031	BA08370	1	METHANE	3/10/2020 8:30:00 AM	3/17/2020 10:32:00 AM	C	20	UG_L		5.0	1.00		

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

April 27, 2020

SUBJECT: Revised Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Pascua

Enclosed are the final validation reports for the fractions listed below. This SDG was received on April 7, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #47757:

SDG #	Fraction
91585	Volatiles, Phenol, Polynuclear Aromatic Hydrocarbons, 2-(2-Methoxyethoxy)-ethanol, Metals, Wet Chemistry, Gasoline Range Organics, Total Petroleum Hydrocarbons as Extractables, Ethylene Dibromide, Methane

The data validation was performed under Level C validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 02, January 2017
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 01, April 2017
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, September 2017
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, June 2018
- Project Procedures Manual U.S. Naval Facilities Engineering Command Environmental Restoration Program, NAVFAC Pacific; DON 2015

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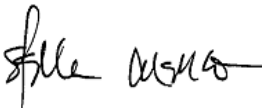
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017

- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,



Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

150 pages-DL

Attachment 1

EDD 90/10 C/D

LDC #47757 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	BTEX & 1,2-DCA (8260B)		Phenol (8270D)		(3) PAHs (8270D -SIM)		2,2-MEE (8270D-M)		(5) Metals (6010C)		GRO (8260B)		TPH-E (8015B)		EDB (8011)		Methane (175)											
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91585	04/07/20	04/21/20	7	0	4	0	4	0	4	0	2	0	7	0	4	0	7	0	4	0												
Total	J/SC			7	0	4	0	4	0	4	0	2	0	7	0	4	0	7	0	4	0	0	0	0	0	0	0	0	0	0	0	0	43

EDD 90/10 C/D

LDC #47757 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Alk (2320B)		Br,Cl,F SO_4NO_3 (300.0)		NO_3/ NO_2-N (353.2)		Fe II (3500-Fe B)		Silica (4500 -Si D)		D.Silica (4500 -Si D)		DOC (9060A)		TOC (9060A)													
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91585	04/07/20	04/21/20	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0														
Total	J/SC			2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16

Shaded cells indicate Level D validation (all other cells are Level C validation). These sample counts do not include MS/MSD, and DUPs

L:\AECOM\Red Hill\47757ST-18F0126.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1022	BA07941	Water	03/03/20
ERH1023	BA07942	Water	03/03/20
ERH1024	BA07943	Water	03/04/20
ERH1025	BA07944	Water	03/04/20
ERH1033	BA07945	Water	03/04/20
ERH1034	BA07946	Water	03/04/20
ERH1035	BA07947	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) which are Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and 1,2-Dichloroethane by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples ERH1022, ERH1024, and ERH1033 were identified as trip blanks. No contaminants were found.

Sample ERH1035 was identified as an equipment blank. No contaminants were found.

Sample ERH1034 was identified as a field blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A1a
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/16/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: FC

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)
BTEX + 12 OCA

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration | ending CCV	A	CCV ≤ 20|50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1, 3, 5 FB = 6 EB = 7
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS|D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID		Lab ID	Matrix	Date
1	ERH1022	TB	BA07941	Water	03/03/20
2	ERH1023 W		BA07942 W	Water	03/03/20
3	ERH1024	TB	BA07943	Water	03/04/20
4	ERH1025		BA07944	Water	03/04/20
5	ERH1033	TB	BA07945	Water	03/04/20
6	ERH1034	FB	BA07946	Water	03/04/20
7	ERH1035	EB	BA07947	Water	03/04/20
8					

Notes:

	200305BT - Blank						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Phenol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1023	BA07942	Water	03/03/20
ERH1025	BA07944	Water	03/04/20
ERH1034	BA07946	Water	03/04/20
ERH1035	BA07947	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 was identified as an equipment blank. No contaminants were found.

Sample ERH1034 was identified as a field blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A2a
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/16/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration ending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB=3 EB=4
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CD
IX.	Laboratory control samples	A	LCSID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1023W	BA07942W	Water	03/03/20
2	ERH1025	BA07944	Water	03/04/20
3	ERH1034 FB	BA07946	Water	03/04/20
4	ERH1035 EB	BA07947	Water	03/04/20
5				
6				
7				
8				

Notes:

	200306A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1023	BA07942	Water	03/03/20
ERH1025	BA07944	Water	03/04/20
ERH1034	BA07946	Water	03/04/20
ERH1035	BA07947	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 was identified as an equipment blank. No contaminants were found.

Sample ERH1034 was identified as a field blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A2b
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/16/20
Page: 1 of 1
Reviewer: ET
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration pending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB = 3 EB = ERH1035 (#4)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1023W	BA07942**	Water	03/03/20
2	ERH1025	BA07944	Water	03/04/20
3	ERH1034 FB	BA07946	Water	03/04/20
4	ERH1035 EB	BA07947	Water	03/04/20
5				
6				
7				
8				

Notes:

2003064

W, TTT, S

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1023	BA07942	Water	03/03/20
ERH1025	BA07944	Water	03/04/20
ERH1034	BA07946	Water	03/04/20
ERH1035	BA07947	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1035 was identified as an equipment blank. No contaminants were found.

Sample ERH1034 was identified as a field blank. No contaminants were found.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgement, no data were qualified since the LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
200310A-LCS/LCSD (All samples in SDG 91585)	2-(2-Methoxyethoxy)-ethanol	25.8 (≤20)	UJ (all non-detects)	P

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII.

Due to LCS/LCSD RPD, data were qualified as estimated in four samples.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 91585

Sample	Compound	Flag	A or P	Reason (Code)
ERH1023 ERH1025 ERH1034 ERH1035	2-(2-Methoxyethoxy)-ethanol	UJ (all non-detects)	P	Laboratory control samples (RPD) (L)

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A2c
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/Ø

Date: 4/16/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: JC

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration pending CCV	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB=3 EB=4
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1023W	BA07942**	Water	03/03/20
2	ERH1025	BA07944	Water	03/04/20
3	ERH1034 FB	BA07946	Water	03/04/20
4	ERH1035 EB	BA07947	Water	03/04/20
5				
6				
7				
8				

Notes:

	200310A						

LDC #: 47757A2C

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: FT
2nd Reviewer: DC

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	all	Surrogates were not added to all samples as required by the method. Using professional judgment, no data were qualified. Although the LCS/LCSD percent RPD is outside the limit, the percent recovery were within the limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.		Text
			( )	
			( )	
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			( )	
			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5 (2FP) = 2-Fluorophenol

LDC #: 47757A2C
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: EJ
2nd Reviewer: MC

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		200310A	*	( )	( )	25.8 20)	All	J/UJ/P ND (L)
		LCS ID		( )	( )	( )		
				( )	( )	( )	— — —	—
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		* 2-(2-Methoxyethoxy)-Ethanol		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Metals

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1023	BA07942	Water	03/03/20
ERH1025	BA07944	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Calcium, Magnesium, Manganese, Potassium, and Sodium by Environmental Protection Agency (EPA) SW 846 Method 6010C

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Serial Dilution

Serial dilution was not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Sample Result Verification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Metals - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A4b
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C~~X~~

Date: 4/16/20
Page: 1 of 1
Reviewer: ATV
2nd Reviewer: VV

METHOD: Metals (EPA SW 846 Method 6010C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Instrument Calibration	A	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	A	
V.	Field Blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	C,S
VII.	Duplicate sample analysis	N	
VIII.	Serial Dilution	N	
IX.	Laboratory control samples	A	LCS/LCSD
X.	Field Duplicates	N	
XI.	Sample Result Verification	N	~~Not reviewed for Level C validation.~~
XII	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1023**	BA07942**	Water	03/03/20
2	ERH1025	BA07944	Water	03/04/20
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

10/30

Notes:

LDC #: 47757A4b

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Reviewer: ATV
2nd reviewer: A

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1,2	W	Al, Sb, As, Ba, Be, Cd, (Ca) Cr, Co, Cu, Fe, Pb, (Mg) (Mn) Hg, Ni, (K) Se, Ag, (Na) Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Comments: Mercury by CVAA if performed

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Wet Chemistry

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1023	BA07942	Water	03/03/20
ERH1025	BA07944	Water	03/04/20
ERH1023MS	BA07942MS	Water	03/03/20
ERH1023MSD	BA07942MSD	Water	03/03/20
ERH1025MS	BA07944MS	Water	03/04/20
ERH1025MSD	BA07944MSD	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Bromide, Chloride, Fluoride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Dissolved Organic Carbon and Total Organic Carbon by EPA SW 846 Method 9060A
Ferrous Iron by Standard Method 3500-Fe B
Dissolved Silica and Silica by Standard Method 4500-Si D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ERH1023	Nitrate	51.78 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
03/07/20	CCV (18:52)	Total organic carbon	80.9 (90-110)	All samples in SDG 91585	J (all detects)	P
03/07/20	CCV (23:26)	Total organic carbon	86.5 (90-110)	All samples in SDG 91585	J (all detects)	P

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Alkalinity bicarbonate Alkalinity total	1.9 mg/L 1.9 mg/L	2.0 mg/L 2.0 mg/L	All samples in SDG 91585
ICB/CCB	Chloride Nitrate	0.43 mg/L 0.31 mg/L	1.0 mg/L 0.50 mg/L	All samples in SDG 91585

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
ERH1023	Nitrate	1.30 mg/L	1.30U mg/L
ERH1025	Nitrate	1.50 mg/L	1.50U mg/L

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
ERH1023MS/MSD (ERH1023)	Nitrate/Nitrite as N	-	111 (90-110)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
LCSD (All samples in SDG 91585)	Alkalinity total	-	111 (90-110)	J (all detects)	A
LCSD (All samples in SDG 91585)	Dissolved organic carbon	-	88.8 (90-110)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, continuing calibration %R, MS/MSD %R, and LCS/LCSD %R, data were qualified as estimated in two samples.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 91585

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1023	Nitrate	J (all detects)	P	Technical holding times (H)
ERH1023 ERH1025	Total organic carbon	J (all detects)	P	Continuing calibration (%R) (R)
ERH1023	Nitrate/Nitrite as N	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (Q)
ERH1023 ERH1025	Alkalinity total Dissolved organic carbon	J (all detects) J (all detects)	A	Laboratory control samples (%R) (L)

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 91585

Sample	Analyte	Modified Final Concentration	A or P	Code
ERH1023	Nitrate	1.30U mg/L	A	B
ERH1025	Nitrate	1.50U mg/L	A	B

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A6
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/~~X~~

Date: 4/16/20
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: AL

METHOD: (Analyte) Alkalinity (SM 2320B), Bromide, Chloride, Fluoride, Nitrate-~~X~~, Sulfate (EPA Method 300.0), Nitrate/Nitrite-N (EPA Method 353.2), DOC (EPA SW846 Method 9060A), Ferrous Iron (SM 3500- Fe B), Silica (SM 4500-Si D), Dissolved Silica (SM 4500-Si D), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	~~A~~ /SW	
II	Initial calibration	~~A~~	
III.	Calibration verification	SW	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	(3,4), (5,6) From SDG # 91607 (ERH 1027 MS/MSD)
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	SW	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	~~Not reviewed for Level C validation~~
XI.	Overall assessment of data	~~A~~	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1023**	BA07942**	Water	03/03/20 10:30
2	ERH1025	BA07944	Water	03/04/20
3	ERH1023MS	BA07942MS	Water	03/03/20
4	ERH1023MSD	BA07942MSD	Water	03/03/20
5	ERH1025MS	BA07944MS	Water	03/04/20
6	ERH1025MSD	BA07944MSD	Water	03/04/20
7				
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13				
14				

Notes:

LDC #: 47757AG

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATL
2nd reviewer: M

All circled methods are applicable to each sample.

Sample ID	Parameter
1,2	pH TDS (Cl) (F) (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (Br) (NO3/NO2-N) (SiO2) (Dis SiO2) (Fe2+)
1,2	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (DOC)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
3,4	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (NO3/NO2-N)
5,6	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 47757A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: ATL
2nd reviewer: AC

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria? Code: H

Method:	NO3 (EPA 300.0)			
Parameters:	water			
Technical holding time:	48 hrs			
Sample ID	Sampling date	Analysis date	Total time	Qualifier
1	03/03/20 @ 10:30 -13:30	03/05/20 @ 17:17	51.78 hrs	J/UJ/P (detect)

LDC #: 47757A6

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% ?
Y N N/A Are all correlation coefficients ≥0.995 ?

LEVEL IV/D ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications Code: R
	03/07/20	CCV (18:52)	TOC	80.9 (90-110)	all	J/UJ/P (all detect)
		CCV (23:26)	TOC	86.5 (90-110)	all	J/UJ/P (all detect)

Comments:

LDC #: 47757A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All **Code: B**

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		LOQ	1	2							
Cl		0.43	2.15	1.0									
NO3		0.31	1.55	0.50	1.30	1.50							
Alkallinity Bicarbonate	1.9		9.5	2.0									
Alkalinity Total	1.9		9.5	2.0									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 47757A6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125~~ lab limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	3/4	W	NO3/NO2-N		111 (90-110)		1	Jdet/A (detect) Code: Q

Comments:

LDC #: 47757A6

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS/LCSD ID	Matrix	Analyte	LCS %R (limits)	LCSD %R (limits)	RPD (limits)	Associated Samples	Qualifications Code: L
	LCSD	W	Alkalinity Total		111 (90-110)		all	Jdet/A (detect)
	LCSD	W	DOC		88.8 (90-110)		all	J/UJ/A (detect)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1022	BA07941	Water	03/03/20
ERH1023	BA07942	Water	03/03/20
ERH1024	BA07943	Water	03/04/20
ERH1025	BA07944	Water	03/04/20
ERH1033	BA07945	Water	03/04/20
ERH1034	BA07946	Water	03/04/20
ERH1035	BA07947	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1022, ERH1024, and ERH1033 were identified as trip blanks. No contaminants were found.

Sample ERH1035 was identified as an equipment blank. No contaminants were found.

Sample ERH1034 was identified as a field blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A7
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 04/16/20
Page: 1 of
Reviewer: EF
2nd Reviewer: RC

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	r² ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB=1, 3, 5 FB=6 EB=7
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification	N	Not reviewed for Level C validation
XIV.	System performance	N	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID		Lab ID	Matrix	Date
1	ERH1022	TB	BA07941	Water	03/03/20
2	ERH1023		BA07942**	Water	03/03/20
3	ERH1024	TB	BA07943	Water	03/04/20
4	ERH1025		BA07944	Water	03/04/20
5	ERH1033	TB	BA07945	Water	03/04/20
6	ERH1034	FB	BA07946	Water	03/04/20
7	ERH1035	EB	BA07947	Water	03/04/20
8					

Notes:

	200305 BT1						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1023	BA07942	Water	03/03/20
ERH1025	BA07944	Water	03/04/20
ERH1034	BA07946	Water	03/04/20
ERH1035	BA07947	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1035 was identified as an equipment blank. No contaminants were found.

Sample ERH1034 was identified as a field blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A8
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/16/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: N

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	FB = 3 EB = 4
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XI.	Target compound identification	N	Not reviewed for Level C validation
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1023W	BA07942**	Water	03/03/20
2	ERH1025	BA07944	Water	03/04/20
3	ERH1034 FB	BA07946	Water	03/04/20
4	ERH1035 EB	BA07947	Water	03/04/20
5				
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11				

Notes:

	200306A - BLK						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Ethylene Dibromide

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1022	BA07941	Water	03/03/20
ERH1023	BA07942	Water	03/03/20
ERH1024	BA07943	Water	03/04/20
ERH1025	BA07944	Water	03/04/20
ERH1033	BA07945	Water	03/04/20
ERH1034	BA07946	Water	03/04/20
ERH1035	BA07947	Water	03/04/20

Introduction

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The analyses were performed by the following method:

Ethylene Dibromide by Environmental Protection Agency (EPA) SW 846 Method 8011

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1022, ERH1024, and ERH1033 were identified as trip blanks. No contaminants were found.

Sample ERH1035 was identified as an equipment blank. No contaminants were found.

Sample ERH1034 was identified as a field blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A10
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/16/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: MC

METHOD: GC Ethylene Dibromide (EPA SW846 Method 8011)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	Initial calibration/ICV	A/A	RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB=1,3,5 FB=6 EB=7
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XI.	Target compound identification	N	Not reviewed for Level C validation
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID		Lab ID	Matrix	Date
1	ERH1022	TB	BA07941	Water	03/03/20
2	ERH1023**		BA07942**	Water	03/03/20
3	ERH1024	TB	BA07943	Water	03/04/20
4	ERH1025		BA07944	Water	03/04/20
5	ERH1033	TB	BA07945	Water	03/04/20
6	ERH1034	FB	BA07946	Water	03/04/20
7	ERH1035	EB	BA07947	Water	03/04/20
8					
9					
10					
11					

Notes:

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 21, 2020

Parameters: Methane

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91585

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1022	BA07941	Water	03/03/20
ERH1023	BA07942	Water	03/04/20
ERH1024	BA07943	Water	03/04/20
ERH1025	BA07944	Water	03/04/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1022 and ERH1024 were identified as trip blanks. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

Raw data were not reviewed for Level C validation.

X. Target Compound Identification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 91585

No Sample Data Qualified in this SDG

LDC #: 47757A51
SDG #: 91585
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 4/16/20
Page: 1 of 1
Reviewer: AF-7
2nd Reviewer: AC

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB = 1.3
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
X.	Target compound identification	A	Not reviewed for Level C validation
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1022 TB	BA07941	Water	03/03/20
2	ERH1023	BA07942	Water	03/04/20
3	ERH1024 FB TB	BA07943	Water	03/04/20
4	ERH1025 EB	BA07944	Water	03/04/20
5				
6				
7				
8				
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10				
11				
12				

Notes:

	200309A						

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **2320B**													
ERH1023	BA07942	1	ALKALINITY, TOTAL (AS CACO3)	3/3/2020 10:30:00 AM	3/9/2020 4:59:00 PM	C	51.8	MG_L		2.0	1.70	J	l
ERH1023	BA07942	1	BICARBONATE	3/3/2020 10:30:00 AM	3/9/2020 4:59:00 PM	C	51.8	MG_L		2.0	1.70		
ERH1023	BA07942	1	CARBONATE (AS CO3)	3/3/2020 10:30:00 AM	3/9/2020 4:59:00 PM	C	1.70	MG_L	U	2.0	1.70	U	
ERH1025	BA07944	1	ALKALINITY, TOTAL (AS CACO3)	3/4/2020 10:15:00 AM	3/9/2020 5:22:00 PM	C	70.7	MG_L		2.0	1.70	J	l
ERH1025	BA07944	1	BICARBONATE	3/4/2020 10:15:00 AM	3/9/2020 5:22:00 PM	C	70.7	MG_L		2.0	1.70		
ERH1025	BA07944	1	CARBONATE (AS CO3)	3/4/2020 10:15:00 AM	3/9/2020 5:22:00 PM	C	1.70	MG_L	U	2.0	1.70	U	
METHOD: **300.0**													
ERH1023	BA07942	1	BROMIDE	3/3/2020 10:30:00 AM	3/5/2020 5:17:00 PM	C	0.21	MG_L	J	0.5	0.16	J	
ERH1023	BA07942	1	CHLORIDE (AS CL)	3/3/2020 10:30:00 AM	3/5/2020 5:17:00 PM	C	41.8	MG_L		1.0	0.20		
ERH1023	BA07942	1	FLUORIDE	3/3/2020 10:30:00 AM	3/5/2020 5:17:00 PM	C	0.09	MG_L	U	0.1	0.09	U	
ERH1023	BA07942	1	NITRATE AS NO3 (ANION)	3/3/2020 10:30:00 AM	3/5/2020 5:17:00 PM	C		MG_L		0.5	1.3	UJ	h,b
ERH1023	BA07942	1	SULFATE (AS SO4)	3/3/2020 10:30:00 AM	3/5/2020 5:17:00 PM	C	6.4	MG_L		1.0	0.20		
ERH1025	BA07944	1	BROMIDE	3/4/2020 10:15:00 AM	3/5/2020 5:43:00 PM	C	0.19	MG_L	J	0.5	0.16	J	
ERH1025	BA07944	1	CHLORIDE (AS CL)	3/4/2020 10:15:00 AM	3/5/2020 5:43:00 PM	C	26.5	MG_L		1.0	0.20		
ERH1025	BA07944	1	FLUORIDE	3/4/2020 10:15:00 AM	3/5/2020 5:43:00 PM	C	0.09	MG_L	U	0.1	0.09	U	
ERH1025	BA07944	1	NITRATE AS NO3 (ANION)	3/4/2020 10:15:00 AM	3/5/2020 5:43:00 PM	C		MG_L		0.5	1.5	U	b
ERH1025	BA07944	1	SULFATE (AS SO4)	3/4/2020 10:15:00 AM	3/5/2020 5:43:00 PM	C	5.5	MG_L		1.0	0.20		
METHOD: **3500-FE-B**													
ERH1023	BA07942	1	Iron, Ion (Fe2+)	3/3/2020 10:30:00 AM	3/5/2020 1:21:00 PM	C	0.32	MG_L	U	1.0	0.32	U	
ERH1025	BA07944	1	Iron, Ion (Fe2+)	3/4/2020 10:15:00 AM	3/5/2020 1:22:00 PM	C	0.32	MG_L	U	1.0	0.32	U	
METHOD: **353.2**													
ERH1023	BA07942	1	NITROGEN, NITRATE-NITRITE	3/3/2020 10:30:00 AM	3/6/2020 10:52:00 AM	C	0.31	MG_L		0.10	0.090	J	q
ERH1025	BA07944	1	NITROGEN, NITRATE-NITRITE	3/4/2020 10:15:00 AM	3/6/2020 10:53:00 AM	C	0.36	MG_L		0.10	0.090		
METHOD: **4500-SIO2-C**													
ERH1023	BA07942	5	SILICA	3/3/2020 10:30:00 AM	3/9/2020 3:09:00 PM	C	40.4	MG_L		5.0	4.00		
ERH1023	BA07942	5	SILICA	3/3/2020 10:30:00 AM	3/9/2020 3:11:00 PM	C	41.6	MG_L		5.0	4.00		

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **4500-SIO2-C**													
ERH1025	BA07944	5	SILICA	3/4/2020 10:15:00 AM	3/9/2020 3:12:00 PM	C	42.9	MG_L		5.0	4.00		
ERH1025	BA07944	5	SILICA	3/4/2020 10:15:00 AM	3/9/2020 3:09:00 PM	C	47.9	MG_L		5.0	4.00		
METHOD: **6010C**													
ERH1023	BA07942	1	CALCIUM	3/3/2020 10:30:00 AM	3/12/2020 3:43:00 PM	C	12100	UG_L		1000	75.0		
ERH1023	BA07942	1	MAGNESIUM	3/3/2020 10:30:00 AM	3/12/2020 3:43:00 PM	C	9320	UG_L		500	30.0		
ERH1023	BA07942	1	MANGANESE	3/3/2020 10:30:00 AM	3/12/2020 3:43:00 PM	C	2.6	UG_L	J	10.0	4.00	J	
ERH1023	BA07942	1	POTASSIUM	3/3/2020 10:30:00 AM	3/12/2020 3:43:00 PM	C	1870	UG_L	J	3000	500.0	J	
ERH1023	BA07942	1	SODIUM	3/3/2020 10:30:00 AM	3/12/2020 3:43:00 PM	C	21600	UG_L		5000	500.0		
ERH1025	BA07944	1	CALCIUM	3/4/2020 10:15:00 AM	3/12/2020 3:47:00 PM	C	10300	UG_L		1000	75.0		
ERH1025	BA07944	1	MAGNESIUM	3/4/2020 10:15:00 AM	3/12/2020 3:47:00 PM	C	9710	UG_L		500	30.0		
ERH1025	BA07944	1	MANGANESE	3/4/2020 10:15:00 AM	3/12/2020 3:47:00 PM	C	5.9	UG_L	J	10.0	4.00	J	
ERH1025	BA07944	1	POTASSIUM	3/4/2020 10:15:00 AM	3/12/2020 3:47:00 PM	C	1700	UG_L	J	3000	500.0	J	
ERH1025	BA07944	1	SODIUM	3/4/2020 10:15:00 AM	3/12/2020 3:47:00 PM	C	23500	UG_L		5000	500.0		
METHOD: **8011**													
ERH1022	BA07941	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/3/2020 9:00:00 AM	3/9/2020 9:52:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1023	BA07942	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/3/2020 10:30:00 AM	3/9/2020 10:12:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1024	BA07943	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/4/2020 9:30:00 AM	3/9/2020 10:32:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1025	BA07944	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/4/2020 10:15:00 AM	3/9/2020 10:52:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1033	BA07945	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/4/2020 7:55:00 AM	3/9/2020 11:12:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1034	BA07946	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/4/2020 8:15:00 AM	3/9/2020 11:32:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1035	BA07947	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	3/4/2020 8:35:00 AM	3/9/2020 11:52:00 PM	C	0.019	UG_L	U	0.02	0.019	U	
METHOD: **8015B_E**													
ERH1023	BA07942	1	C10-C24 DIESEL RANGE ORGANICS	3/3/2020 10:30:00 AM	3/10/2020 2:43:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1023	BA07942	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	3/3/2020 10:30:00 AM	3/10/2020 2:43:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1025	BA07944	1	C10-C24 DIESEL RANGE ORGANICS	3/4/2020 10:15:00 AM	3/10/2020 3:06:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1025	BA07944	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	3/4/2020 10:15:00 AM	3/10/2020 3:06:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1034	BA07946	1	C10-C24 DIESEL RANGE ORGANICS	3/4/2020 8:15:00 AM	3/10/2020 3:28:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1034	BA07946	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	3/4/2020 8:15:00 AM	3/10/2020 3:28:00 PM	C	300.0	UG_L	U	320	300.0	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8015B_E**													
ERH1035	BA07947	1	C10-C24 DIESEL RANGE ORGANICS	3/4/2020 8:35:00 AM	3/10/2020 3:51:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1035	BA07947	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	3/4/2020 8:35:00 AM	3/10/2020 3:51:00 PM	C	300.0	UG_L	U	320	300.0	U	
METHOD: **8260B**													
ERH1022	BA07941	1	1,2-DICHLOROETHANE	3/3/2020 9:00:00 AM	3/5/2020 6:23:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1022	BA07941	1	BENZENE	3/3/2020 9:00:00 AM	3/5/2020 6:23:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1022	BA07941	1	ETHYLBENZENE	3/3/2020 9:00:00 AM	3/5/2020 6:23:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1022	BA07941	1	PETROLEUM HYDROCARBONS C6-C10	3/3/2020 9:00:00 AM	3/5/2020 6:22:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1022	BA07941	1	TOLUENE	3/3/2020 9:00:00 AM	3/5/2020 6:23:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1022	BA07941	1	Xylenes	3/3/2020 9:00:00 AM	3/5/2020 6:23:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1023	BA07942	1	1,2-DICHLOROETHANE	3/3/2020 10:30:00 AM	3/5/2020 6:51:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1023	BA07942	1	BENZENE	3/3/2020 10:30:00 AM	3/5/2020 6:51:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1023	BA07942	1	ETHYLBENZENE	3/3/2020 10:30:00 AM	3/5/2020 6:51:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1023	BA07942	1	PETROLEUM HYDROCARBONS C6-C10	3/3/2020 10:30:00 AM	3/5/2020 6:52:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1023	BA07942	1	TOLUENE	3/3/2020 10:30:00 AM	3/5/2020 6:51:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1023	BA07942	1	Xylenes	3/3/2020 10:30:00 AM	3/5/2020 6:51:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1024	BA07943	1	1,2-DICHLOROETHANE	3/4/2020 9:30:00 AM	3/5/2020 7:20:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1024	BA07943	1	BENZENE	3/4/2020 9:30:00 AM	3/5/2020 7:20:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1024	BA07943	1	ETHYLBENZENE	3/4/2020 9:30:00 AM	3/5/2020 7:20:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1024	BA07943	1	PETROLEUM HYDROCARBONS C6-C10	3/4/2020 9:30:00 AM	3/5/2020 7:19:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1024	BA07943	1	TOLUENE	3/4/2020 9:30:00 AM	3/5/2020 7:20:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1024	BA07943	1	Xylenes	3/4/2020 9:30:00 AM	3/5/2020 7:20:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1025	BA07944	1	1,2-DICHLOROETHANE	3/4/2020 10:15:00 AM	3/5/2020 7:49:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1025	BA07944	1	BENZENE	3/4/2020 10:15:00 AM	3/5/2020 7:49:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1025	BA07944	1	ETHYLBENZENE	3/4/2020 10:15:00 AM	3/5/2020 7:49:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1025	BA07944	1	PETROLEUM HYDROCARBONS C6-C10	3/4/2020 10:15:00 AM	3/5/2020 7:48:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1025	BA07944	1	TOLUENE	3/4/2020 10:15:00 AM	3/5/2020 7:49:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1025	BA07944	1	Xylenes	3/4/2020 10:15:00 AM	3/5/2020 7:49:00 PM	C	0.30	UG_L	U	2.0	0.30	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8260B**													
ERH1033	BA07945	1	1,2-DICHLOROETHANE	3/4/2020 7:55:00 AM	3/5/2020 8:16:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1033	BA07945	1	BENZENE	3/4/2020 7:55:00 AM	3/5/2020 8:16:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1033	BA07945	1	ETHYLBENZENE	3/4/2020 7:55:00 AM	3/5/2020 8:16:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1033	BA07945	1	PETROLEUM HYDROCARBONS C6-C10	3/4/2020 7:55:00 AM	3/5/2020 8:17:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1033	BA07945	1	TOLUENE	3/4/2020 7:55:00 AM	3/5/2020 8:16:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1033	BA07945	1	Xylenes	3/4/2020 7:55:00 AM	3/5/2020 8:16:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1034	BA07946	1	1,2-DICHLOROETHANE	3/4/2020 8:15:00 AM	3/5/2020 8:44:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1034	BA07946	1	BENZENE	3/4/2020 8:15:00 AM	3/5/2020 8:44:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1034	BA07946	1	ETHYLBENZENE	3/4/2020 8:15:00 AM	3/5/2020 8:44:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1034	BA07946	1	PETROLEUM HYDROCARBONS C6-C10	3/4/2020 8:15:00 AM	3/5/2020 8:45:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1034	BA07946	1	TOLUENE	3/4/2020 8:15:00 AM	3/5/2020 8:44:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1034	BA07946	1	Xylenes	3/4/2020 8:15:00 AM	3/5/2020 8:44:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1035	BA07947	1	1,2-DICHLOROETHANE	3/4/2020 8:35:00 AM	3/5/2020 9:14:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1035	BA07947	1	BENZENE	3/4/2020 8:35:00 AM	3/5/2020 9:14:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1035	BA07947	1	ETHYLBENZENE	3/4/2020 8:35:00 AM	3/5/2020 9:14:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1035	BA07947	1	PETROLEUM HYDROCARBONS C6-C10	3/4/2020 8:35:00 AM	3/5/2020 9:13:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1035	BA07947	1	TOLUENE	3/4/2020 8:35:00 AM	3/5/2020 9:14:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1035	BA07947	1	Xylenes	3/4/2020 8:35:00 AM	3/5/2020 9:14:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
METHOD: **8270D**													
ERH1023	BA07942	1	2-(2-METHOXY ETHOXY)-ETHANOL	3/3/2020 10:30:00 AM	3/11/2020 2:33:00 PM	C	80.0	UG_L	U	100	80.0	UJ	l
ERH1023	BA07942	1	PHENOL	3/3/2020 10:30:00 AM	3/10/2020 12:36:00 PM	C	4.00	UG_L	U	5.0	4.00	U	
ERH1025	BA07944	1	2-(2-METHOXY ETHOXY)-ETHANOL	3/4/2020 10:15:00 AM	3/11/2020 2:58:00 PM	C	80.0	UG_L	U	100	80.0	UJ	l
ERH1025	BA07944	1	PHENOL	3/4/2020 10:15:00 AM	3/10/2020 1:04:00 PM	C	4.00	UG_L	U	5.0	4.00	U	
ERH1034	BA07946	1	2-(2-METHOXY ETHOXY)-ETHANOL	3/4/2020 8:15:00 AM	3/11/2020 3:22:00 PM	C	80.0	UG_L	U	100	80.0	UJ	l
ERH1034	BA07946	1	PHENOL	3/4/2020 8:15:00 AM	3/10/2020 1:32:00 PM	C	4.00	UG_L	U	5.0	4.00	U	
ERH1035	BA07947	1	2-(2-METHOXY ETHOXY)-ETHANOL	3/4/2020 8:35:00 AM	3/11/2020 3:46:00 PM	C	80.0	UG_L	U	100	80.0	UJ	l
ERH1035	BA07947	1	PHENOL	3/4/2020 8:35:00 AM	3/10/2020 2:00:00 PM	C	4.00	UG_L	U	5.0	4.00	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8270DSIM**													
ERH1023	BA07942	1	1-METHYLNAPHTHALENE	3/3/2020 10:30:00 AM	3/11/2020 11:20:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1023	BA07942	1	2-METHYLNAPHTHALENE	3/3/2020 10:30:00 AM	3/11/2020 11:20:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1023	BA07942	1	NAPHTHALENE	3/3/2020 10:30:00 AM	3/11/2020 11:20:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1025	BA07944	1	1-METHYLNAPHTHALENE	3/4/2020 10:15:00 AM	3/11/2020 11:42:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1025	BA07944	1	2-METHYLNAPHTHALENE	3/4/2020 10:15:00 AM	3/11/2020 11:42:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1025	BA07944	1	NAPHTHALENE	3/4/2020 10:15:00 AM	3/11/2020 11:42:00 AM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1034	BA07946	1	1-METHYLNAPHTHALENE	3/4/2020 8:15:00 AM	3/11/2020 12:04:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1034	BA07946	1	2-METHYLNAPHTHALENE	3/4/2020 8:15:00 AM	3/11/2020 12:04:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1034	BA07946	1	NAPHTHALENE	3/4/2020 8:15:00 AM	3/11/2020 12:04:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1035	BA07947	1	1-METHYLNAPHTHALENE	3/4/2020 8:35:00 AM	3/11/2020 12:26:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1035	BA07947	1	2-METHYLNAPHTHALENE	3/4/2020 8:35:00 AM	3/11/2020 12:26:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1035	BA07947	1	NAPHTHALENE	3/4/2020 8:35:00 AM	3/11/2020 12:26:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
METHOD: **9060A**													
ERH1023	BA07942	1	DISSOLVED ORGANIC CARBON	3/3/2020 10:30:00 AM	3/11/2020 9:40:00 PM	C	19.9	MG_L		0.93	0.350	J	l
ERH1023	BA07942	1	TOTAL ORGANIC CARBON	3/3/2020 10:30:00 AM	3/7/2020 10:10:00 PM	C	7.0	MG_L		0.93	0.350	J	r
ERH1025	BA07944	1	DISSOLVED ORGANIC CARBON	3/4/2020 10:15:00 AM	3/11/2020 10:17:00 PM	C	0.32	MG_L	J	0.93	0.350	J	l
ERH1025	BA07944	1	TOTAL ORGANIC CARBON	3/4/2020 10:15:00 AM	3/7/2020 10:48:00 PM	C	7.0	MG_L		0.93	0.350	J	r
METHOD: **RSK175**													
ERH1022	BA07941	1	METHANE	3/3/2020 9:00:00 AM	3/9/2020 2:13:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1023	BA07942	1	METHANE	3/3/2020 10:30:00 AM	3/9/2020 2:17:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1024	BA07943	1	METHANE	3/4/2020 9:30:00 AM	3/9/2020 2:20:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1025	BA07944	1	METHANE	3/4/2020 10:15:00 AM	3/9/2020 2:25:00 PM	C	1.00	UG_L	U	5.0	1.00	U	

DATA QUALITY ASSESSMENT REPORT

MARCH 2020
ENVIRONMENTAL INVESTIGATION AND GROUNDWATER MONITORING

RED HILL BULK FUEL STORAGE FACILITY
JOINT BASE PEARL HARBOR-HICKAM
OAHU, HAWAII
CTO 18F0126

May 20, 2020

Table of Contents

Section	Title	Page No.
1.0	INTRODUCTION	1
2.0	VOLATILE ORGANIC COMPOUNDS	6
2.1	Precision and Accuracy	6
2.2	Representativeness	7
2.3	Comparability	8
2.4	Completeness	8
2.5	Sensitivity	8
3.0	PHENOL	8
3.1	Precision and Accuracy	8
3.2	Representativeness	9
3.3	Comparability	9
3.4	Completeness	9
3.5	Sensitivity	9
4.0	POLYNUCLEAR AROMATIC HYDROCARBONS	9
4.1	Precision and Accuracy	10
4.2	Representativeness	10
4.3	Comparability	11
4.4	Completeness	11
4.5	Sensitivity	11
5.0	2-(2-METHOXYETHOXY)-ETHANOL	11
5.1	Precision and Accuracy	11
5.2	Representativeness	12
5.3	Comparability	12
5.4	Completeness	12
5.5	Sensitivity	13
6.0	GASOLINE RANGE ORGANICS	13
6.1	Precision and Accuracy	13
6.2	Representativeness	14
6.3	Comparability	14
6.4	Completeness	14
6.5	Sensitivity	14
7.0	TOTAL PETROLEUM HYDROCARBONS AS EXTRACTABLES	14
7.1	Precision and Accuracy	15
7.2	Representativeness	15
7.3	Comparability	16
7.4	Completeness	16
7.5	Sensitivity	16

Table of Contents

Section	Title	Page No.
8.0	ETHYLENE DIBROMIDE	16
8.1	Precision and Accuracy	16
8.2	Representativeness	17
8.3	Comparability	17
8.4	Completeness	17
8.5	Sensitivity	17
9.0	METHANE	17
9.1	Precision and Accuracy	18
9.2	Representativeness	18
9.3	Comparability	18
9.4	Completeness	19
9.5	Sensitivity	19
10.0	METALS	19
10.1	Precision and Accuracy	19
10.2	Representativeness	20
10.3	Comparability	20
10.4	Completeness	20
10.5	Sensitivity	20
11.0	WET CHEMISTRY	20
11.1	Precision and Accuracy	21
11.2	Representativeness	22
11.3	Comparability	22
11.4	Completeness	22
11.5	Sensitivity	22
12.0	VARIANCES IN ANALYTICAL PERFORMANCE	22
13.0	SUMMARY OF PARCCS CRITERIA	23
13.1	Precision and Accuracy	23
13.2	Representativeness	23
13.3	Comparability	23
13.4	Completeness	23
13.5	Sensitivity	24

GLOSSARY

BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CTO	Contract Task Order
DCA	1,2-Dichloroethane
DQAR	Data Quality Assessment Report
DOC	Dissolved Organic Carbon
DOD	Department of Defense
DL	Detection Limit
DUP	Laboratory Duplicate
EB	Equipment Blank
EDB	Ethylene Dibromide
FB	Field Blank
FD	Field Duplicate
GRO	Gasoline Range Organics
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
LDC	Laboratory Data Consultants, Inc
LOD	Limit of Detection
LOQ	Limit of Quantitation
MEE	2-(2-Methoxyethoxy)-ethanol
MS/MSD	Matrix Spike / Matrix Spike Duplicate
NAVFAC	Naval Facilities Engineering Command
PAH	Polynuclear Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity
PQO	Project Quality Objectives
PT	Proficiency Testing sample
QA/QC	Quality Assurance/Quality Control
QSM	Quality Systems Manual
RPD	Relative Percent Difference
RRF	Relative Response Factor
SDG	Sample Delivery Group
SGCU	Silica Gel Clean Up
SIM	Selected Ion Monitoring
TB	Trip Blank
TIC	Tentatively Identified Compounds
TOC	Total Organic Carbon
TPHE	Total Petroleum Hydrocarbons as Extractables
VOC	Volatile Organic Compounds
%D	Percent Difference
%R	Percent Recovery
%RSD	Percent Relative Standard Deviation
mg/L	Milligrams per Liter
ug/L	Micrograms per Liter

1.0 INTRODUCTION

An environmental investigation and groundwater monitoring were conducted on March 2020 at the Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam in Oahu, Hawaii. This part of the investigation included the collection and analyses of 14 environmental and quality control (QC) samples. The analyses were performed by the following methods:

Benzene, Toluene, Ethylbenzene, Xylenes, total (BTEX) and 1,2-Dichloroethane (DCA) by Environmental Protection Agency (EPA) SW-846 Method 8260B
Phenol and Tentatively Identified Compounds (TIC) by EPA SW-846 Method 8270D
Polynuclear Aromatic Hydrocarbons (PAH) by EPA SW-846 Method 8270D-Selected Ion Monitoring (SIM) mode
2-(2-Methoxyethoxy)-ethanol by (MEE) EPA SW-846 Method 8270D Modified
Gasoline Range Organics (GRO) by EPA SW-846 Method 8260B
Total Petroleum Hydrocarbons as Extractables (TPHE) by EPA SW-846 Method 8015B
Ethylene Dibromide (EDB) by EPA SW-846 Method 8011
Methane by Method RSK-175
Metals by EPA SW-846 Method 6010C

Wet Chemistry:
Alkalinity by Standard Method 2320B
Bromide, Chloride, Fluoride, Nitrate, and Sulfate (Anions) by EPA Method 300.0
Ferrous Iron by Standard Method 3500-Fe B
Total Silica and Dissolved Silica by Standard Method 4500-SiO2 C
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Dissolved Organic Carbon (DOC) and Total Organic Carbon (TOC) by EPA SW-846 Method 9060A

Analytical services for the water samples were provided by APPL, Inc. The samples were grouped into sample delivery groups (SDGs) as received by the laboratory. The environmental samples are associated with quality assurance (QA) and QC samples designed to document the data quality of the entire SDG or a sub-group of samples within a SDG. Table I is a cross-reference table listing each sample, analysis, SDG, collection date, laboratory sample number, matrix, and validation level.

Approximately ten percent of the analytical data were validated according to Naval Facilities Engineering Command (NAVFAC) Pacific Level D data validation procedures and ninety percent of the analytical data were validated according to NAVFAC Pacific Level C data validation procedures. The analytical data were evaluated for QA/QC based on the *NAVFAC Pacific Environmental Restoration (ER) Program Data Validation Procedures (DON 2015)* and the *Department of Defense Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (DoD 2017)*.

This data quality assessment report (DQAR) summarizes the QA/QC evaluation of the data according to precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) relative to the project quality objectives (PQOs). This report provides a quantitative and qualitative assessment of the data and identifies potential sources of error, uncertainty, and bias that may affect the overall usability.

The DQAR evaluates and summarizes the results of QA/QC data validation for the entire sampling program. Each analytical fraction has a separate section for each of the PARCCS criteria. These sections interpret specific QC deviations and their effects on both individual data points and the analyses as a whole. Section 13 presents a summary of the PARCCS criteria by comparing quantitative parameters with

acceptability criteria defined in the PQOs. Qualitative PARCCS criteria are also summarized in this section.

Precision and Accuracy of Environmental Data

Environmental data quality depends on sample collection procedures, analytical methods and instrumentation, documentation, and sample matrix properties. Both sampling procedures and laboratory analyses contain potential sources of uncertainty, error, and/or bias, which affect the overall quality of a measurement. Errors in sample data may result from incomplete equipment decontamination, inappropriate sampling techniques, sample heterogeneity, improper filtering, and improper preservation. The accuracy of analytical results is dependent on selecting appropriate analytical methods, maintaining equipment properly, and complying with QC requirements. The sample matrix also is an important factor in the ability to obtain precise and accurate results within a given media.

Environmental and laboratory QA/QC samples assess the effects of sampling procedures and evaluate laboratory contamination, laboratory performance, and matrix effects. QA/QC samples include: method blanks, calibration blanks, laboratory control samples/laboratory control sample duplicates (LCS/LCSD), matrix spike samples/matrix spike sample duplicates (MS/MSD), laboratory duplicates (DUP), field duplicate samples (FD), trip blanks (TB), equipment blanks (EB), field blanks (FB), and proficiency testing (PT) samples.

Before conducting the PARCCS evaluation, the analytical data were validated according to the NAVFAC procedures and DoD QSM. Samples not meeting the NAVFAC procedures and DoD QSM acceptance criteria were qualified with a flag, an abbreviation indicating a deficiency with the data. The following are flags used in data validation.

J Estimated The associated numerical value is an estimated quantity. The analyte was detected but the reported value may not be accurate or precise. The "J" qualification indicates the data fell outside the QC limits, but the exceedance was not sufficient to cause rejection of the data.

R Rejected The data is unusable (the compound or analyte may or may not be present). Use of the "R" qualifier indicates a significant variance from functional guideline acceptance criteria. Either resampling or reanalysis is necessary to determine the presence or absence of the rejected analyte.

U Nondetected Analyses were performed for the compound or analyte, but it was not detected. The "U" designation is also applied to suspected blank contamination. The "U" flag is used to qualify any result detected in an environmental sample at a concentration less than 10 times the value of the concentration in any associated blank for common laboratory contaminants and less than 5 times the concentration in any associated blank for all other contaminants.

UJ Estimated/Nondetected Analyses were performed for the compound or analyte, but it was not detected and the limit of detection (LOD) is an estimated quantity due to poor accuracy or precision. This qualification is also used to flag possible false negative results in the case where low bias in the analytical system is indicated by low calibration response, surrogate, internal standard, or other spike recovery.

Once the data are reviewed and qualified according to the NAVFAC procedures and DoD QSM, the data set is then evaluated using PARCCS criteria. PARCCS criteria provide an evaluation of overall data usability. The following is a discussion of PARCCS criteria as related to the PQOs.

Precision is a measure of the agreement or reproducibility of analytical results under a given set of conditions. It is a quantity that cannot be measured directly but is calculated from the reported concentrations.

Precision is expressed as the relative percent difference (RPD):

$$RPD = (D1–D2)/\{1/2(D1+D2)\} \times 100$$

Where:
D1 = the reported concentration for primary sample analyses
D2 = the reported concentrations for duplicate analyses

Precision is primarily assessed by calculating a RPD from the reported concentrations of the spiked compounds for each sample in the MS/MSD pair. In the absence of a MS/MSD pair, a laboratory duplicate or LCS/LCSD pair can be analyzed as an alternative means of assessing precision. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. An additional measure of sampling precision may be obtained by collecting and analyzing field duplicate samples, which are compared using the RPD result as the evaluation criteria.

MS and MSD samples are field samples spiked by the laboratory with target analytes prior to preparation and analysis. These samples measure the overall efficiency of the analytical method in recovering target analytes from an environmental matrix. A LCS is similar to a MS/MSD sample in that the LCS is spiked with the same target analytes prior to preparation and analysis. However, the LCS is prepared using a controlled interference-free matrix instead of a field sample aliquot. Laboratory reagent water is used to prepare aqueous LCS. The LCS measures laboratory efficiency in recovering target analytes from an aqueous matrix in the absence of matrix interferences.

For inorganic analysis, one primary sample is analyzed and accompanied by an unspiked laboratory duplicate. The data reviewer compares the reported results of the primary analysis and the laboratory duplicate and calculates RPDs to assess laboratory precision.

Laboratory and field precision are further evaluated by calculating RPDs for field duplicate pairs. The sampler collects two field samples at the same location and under identically controlled conditions. The laboratory then analyzes the samples under identical conditions.

An RPD outside the numerical QC limit in MS/MSD samples, LCS/LCSDs, or FDs indicates imprecision. Imprecision is the variance in the consistency with which the laboratory arrives at a particular reported result. Thus, the actual analyte concentration may be higher or lower than the reported result.

Possible causes of poor precision include sample matrix interference, improper sample collection or handling, inconsistent sample preparation, and poor instrument stability. In some duplicates, results maybe reported in either the primary or duplicate samples at levels below the limit of quantitation (LOQ) or non-detected. Since these values are considered to be estimates, RPD exceedances from these duplicate sets do not suggest a significant impact on the data quality.

Accuracy is a measure of the agreement of an experimental determination and the true value of the parameter being measured. It is used to identify bias in a given measurement system. Recoveries outside acceptable QC limits may be caused by factors such as instrumentation, analyst error, or matrix interference. Accuracy is assessed through the analysis of MS, MSD, LCS, and samples containing surrogate spikes. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. Surrogate spikes are either isotopically labeled

compounds or compounds that are not typically detected in the samples. Surrogate spikes are added to every blank, environmental sample, MS/MSD, LCS/LCSD and standard, for all applicable organic analyses. Accuracy of inorganic analyses is determined using the percent recoveries of MS and LCS analyses.

Percent recovery (%R) is calculated using the following equation:

$$\%R = (A–B)/C \times 100$$

Where:
A = measured concentration in the spiked sample
B = measured concentration of the spike compound in the unspiked sample
C = concentration of the spike

The percent recovery of each analyte spiked in MS/MSD samples, LCS, and surrogate compounds added to environmental samples is evaluated against the acceptance criteria specified by the previously noted documents. Spike recoveries outside the acceptable QC accuracy limits provide an indication of bias, where the reported data may overestimate or underestimate the actual concentration of compounds detected or LODs reported for environmental samples.

Accuracy can also be evaluated by analyzing PT samples. PT testing determines the performance of individual laboratories for specific tests or measurements and is used to monitor laboratories' continuing performance.

Representativeness is a qualitative parameter that expresses the degree to which the sample data are characteristic of a population and is evaluated by reviewing the QC results of blank samples and holding times. Positive detects of compounds in the blank samples identify compounds that may have been introduced into the samples during sample collection, transport, preparation, or analysis. The QA/QC blanks collected and analyzed are method blanks, calibration blanks, field blanks, equipment blanks, and trip blanks.

A method blank is a laboratory grade water or solid matrix that contains the method reagents and has undergone the same preparation and analysis as the environmental samples. The method blank provides a measure of the combined contamination derived from the laboratory source water, glassware, instruments, reagents, and sample preparation steps. Method blanks are prepared for each sample of a similar matrix extracted by the same method at a similar concentration level.

For inorganic analyses, initial and continuing calibration blanks (ICB/CCB) consist of acidified laboratory grade water, which are injected at the beginning and at a regular frequency during each 12 -hour sample analysis run. These blanks estimate residual contaminants from the previous sample or standards analysis and measure baseline shifts that commonly occur in emission and absorption spectroscopy.

Trip blanks are used to identify possible volatile organic contamination introduced into the sample during transport. A trip blank is a sample volatile organics analysis vial filled in the laboratory with reagent-grade water and preserved to a pH less than 2 with hydrochloric acid. It is transported to the site, stored with the sample containers, and returned unopened to the laboratory for analysis. Trip blanks were collected and analyzed for BTEX, DCA, GRO, EDB, and methane.

Equipment blanks consist of analyte-free water poured over or through the sample collection equipment. The water is collected in a sample container for laboratory analysis. These blanks are collected after the

sampling equipment is decontaminated and measure efficiency of the decontamination procedure. Equipment blanks were collected and analyzed for BTEX, DCA, phenol, PAH, MEE, GRO, TPHE, and EDB.

Field blanks consist of analyte-free source water stored at the sample collection site. The water is collected from each source water used during each sampling event. Field blanks were collected and analyzed for BTEX, DCA, phenol, PAH, MEE, GRO, TPHE, and EDB.

Contaminants found in both the environmental sample and a blank sample are assumed to be laboratory artifacts if the concentration in the environmental sample is less than 5 times the blank value.

Holding times are evaluated to assure that the sample integrity is intact for accurate sample preparation and analysis. Holding times will be specific for each method and matrix analyzed. Holding time exceedances can cause loss of sample constituents due to biodegradation, precipitation, volatilization, and chemical degradation.

Comparability is a qualitative expression of the confidence with which one data set may be compared to another. It provides an assessment of the equivalence of the analytical results to data obtained from other analyses. It is important that data sets be comparable if they are used in conjunction with other data sets. The factors affecting comparability include the following: sample collection and handling techniques, matrix type, and analytical method. If these aspects of sampling and analysis are carried out according to standard analytical procedures, the data are considered comparable. Comparability can only be compared with confidence when precision, accuracy, and representativeness are known.

Completeness is defined as the percentage of acceptable sample results compared to the total number of sample results. Completeness is evaluated to determine if an acceptable amount of usable data were obtained so that a valid scientific site assessment can be completed. Completeness equals the total number of sample results for each fraction minus the total number of rejected sample results divided by the total number of sample results multiplied by 100. As specified in the PQOs, the goal for completeness for target analytes in each analytical fraction is 90 percent.

Percent completeness is calculated using the following equation:

$$\%C = (T - R)/T \times 100$$

Where:
%C = percent completeness
T = total number of sample results
R = total number of rejected sample results

Completeness is also determined by comparing the planned number of samples per method and matrix as specified in the project planning document, with the number determined above.

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. This capability is established during the planning phase to meet the PQOs. It is important that calibration requirements, detection limits (DLs), and project-specific LODs and LOQs presented in the work plan are achieved and that target analytes can be detected at concentrations necessary to support the PQOs. In addition, sample results are compared to method blank and field blank results to identify potential effects of laboratory background and field procedures on sensitivity.

The following sections present a review of QC data for each analytical method. The details regarding the qualification of results are provided in the data validation reports.

2.0 VOLATILE ORGANIC COMPOUNDS

A total of 14 water samples were analyzed for BTEX and 1,2-DCA by EPA SW 846 Method 8260B. All volatile organic compounds (VOC) data were assessed to be valid since none of the 70 total results were rejected due to holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

2.1 Precision and Accuracy

2.1.1 Instrument Calibration

Initial and continuing calibration results provide a means of evaluating accuracy within a particular SDG. Relative response factor (RRF), percent relative standard deviation (%RSD), and percent difference (%D) are the three major parameters used to measure the effectiveness of instrument calibration. RRF is a measure of the relative spectral response of an analyte compared to its internal standard. %RSD is an expression of the linearity of instrument response. %D is a comparison of a continuing calibration instrumental response with its initial response. %RSD and %D exceedances suggest routine instrumental anomalies, which typically impact all sample results for the affected compounds.

The RRFs met the validation acceptance criteria of ≥ 0.05 in the initial and continuing calibrations. The %RSDs met the method acceptance criteria of 15 percent in the initial calibration. The %Ds in the initial calibration verifications met the method acceptance criteria of 20 percent. The %Ds in the ending continuing calibration verifications met the validation acceptance criteria of 50 percent.

The 1,2-dichloroethane result for samples ERH1026 and ERH1027 were qualified as non-detected estimated (UJ). The %D in the associated continuing calibration verification was outside the method acceptance criteria of 20 percent. Bias cannot be determined.

2.1.2 Surrogates

As a result of low surrogate %Rs, 10 total results in samples ERH1026 and ERH1027 were qualified as non-detected estimated (UJ). Low surrogate %R indicates that the result may be biased low in the associated sample.

2.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

2.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

2.1.5 FD Samples

No VOC were detected for field duplicate samples ERH1031 and ERH1032.

2.1.6 Internal Standards

All internal standard areas and retention areas were within acceptance criteria.

2.1.7 Proficiency Testing Samples

Proficiency testing (PT) samples were not performed for the sampling event.

2.1.8 Compound Quantitation and Target Identification

All compound quantitation and target identifications were found to be acceptable.

2.2 Representativeness

2.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

2.2.2 Blanks

Method blanks, EBs, FBs, and TBs were collected and analyzed to evaluate representativeness. The concentration for an individual target compound in any of the types of QA/QC blanks was used for data qualification.

If contaminants were detected in a blank, corrective actions were made for the chemical analytical data during data validation. The corrective action consisted of amending the laboratory reported results based on the following criteria.

> Results Below or Above the LOQ If a sample result for the blank contaminant was less than the LOQ or greater than the sample LOQ and less than 5 times the blank value for all contaminants, the sample result for the blank contaminant was amended as a non-detect at the concentration reported in the sample results.
>
> No Action If a sample result for the blank contaminant was greater than 5 times the blank value for all contaminants, the result was not amended.

2.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

2.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

2.2.2.3 Trip Blanks

No contaminants were detected in the trip blanks for this analysis.

2.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

2.4 Completeness

The completeness level attained for VOC field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

2.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the QAPP.

3.0 PHENOL & TENTATIVELY IDENTIFIED COMPOUNDS

A total of eight (8) water samples were analyzed for phenol and TIC by EPA SW-846 Method 8270D. All phenol and TIC data were assessed to be valid since none of the 13 total results were rejected due to holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

3.1 Precision and Accuracy

3.1.1 Instrument Calibration

The RRFs met the validation acceptance criteria of ≥ 0.05 in the initial and continuing calibrations. The %RSDs met the method acceptance criteria of 15 percent in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent. The %Ds in the ending continuing calibration verifications met the validation acceptance criteria of 50 percent.

3.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

3.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

3.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

3.1.5 FD Samples

No phenol and TIC were detected for field duplicate samples ERH1031 and ERH1032.

3.1.6 Internal Standards

All internal standard areas and retention times were within the acceptance criteria.

3.1.7 Proficiency Testing Samples

PT samples were not performed for the sampling event.

3.1.8 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

3.2 Representativeness

3.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

3.2.2 Blanks

Method blanks, EBs, and FBs were collected and analyzed to evaluate representativeness.

3.2.2.1 Method Blanks

No data were qualified due to contamination detected in the method blanks.

3.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

3.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

3.4 Completeness

The completeness level attained for phenol and TIC was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

3.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

4.0 POLYNUCLEAR AROMATIC HYDROCARBONS

A total of eight (8) water samples were analyzed for 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene by EPA SW-846 Method 8270D-SIM. All PAH data were assessed to be valid since none of the 24 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

4.1 Precision and Accuracy

4.1.1 Instrument Calibration

The RRFs met the validation acceptance criteria of ≥ 0.05 in the initial and continuing calibrations. The %RSDs met the method acceptance criteria of 15 percent in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent. The %Ds in the ending continuing calibration verifications met the validation acceptance criteria of 50 percent.

4.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

4.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

4.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

4.1.5 FD Samples

No PAH were detected for field duplicate samples ERH1031 and ERH1032.

4.1.6 Internal Standards

All internal standard areas and retention times were within the acceptance criteria.

4.1.7 Proficiency Testing Samples

PT samples were not performed for the sampling event.

4.1.8 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

4.2 Representativeness

4.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

4.2.2 Blanks

Method blanks, EBs, and FBs were collected and analyzed to evaluate representativeness.

4.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

4.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

4.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

4.4 Completeness

The completeness level attained for PAH field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

4.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

5.0 2-(2-METHOXYETHOXY)-ETHANOL

A total of eight (8) water samples were analyzed for MEE by EPA SW 846 Method 8270D modified. All MEE data were assessed to be valid since none of the eight (8) total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

5.1 Precision and Accuracy

5.1.1 Instrument Calibration

The RRFs met the validation acceptance criteria of ≥ 0.05 in the initial and continuing calibrations. The %RSDs met the method acceptance criteria of 15 percent in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent. The %Ds in the ending continuing calibration verifications met the validation acceptance criteria of 50 percent.

5.1.2 Surrogates

Surrogates were not added to all samples as required by the method. No data were qualified since all MS/MSD %Rs, LCS/LCSD %Rs, and all base surrogate %Rs were within the acceptance criteria.

5.1.3 MS/MSD Samples

All MS/MSD %Rs were within the acceptance criteria.

In instances where MS/MSD RPDs were above the laboratory acceptance criteria and the associated results were not detected no data were qualified.

5.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs were within the acceptance criteria.

As a result of high LCS/LCSD RPDs, the MEE result in samples ERH1027, ERH1023, ERH1025, ERH1034, and ERH1035 were qualified as non-detected estimated (UJ). Bias cannot be determined.

5.1.5 FD Samples

No MEE was detected for field duplicate samples ERH1031 and ERH1032.

5.1.6 Internal Standards

All internal standard areas and retention times were within the acceptance criteria.

5.1.7 Proficiency Testing Samples

PT samples were not performed for the sampling event.

5.1.8 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

5.2 Representativeness

5.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

5.2.2 Blanks

Method blanks, EBs, and FBs were collected and analyzed to evaluate representativeness.

5.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

5.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

5.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

5.4 Completeness

The completeness level attained for MEE field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

5.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

6.0 GASOLINE RANGE ORGANICS

A total of 14 water samples were analyzed for GRO by EPA SW-846 Method 8260B. All GRO data were assessed to be valid since none of the 14 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

6.1 Precision and Accuracy

6.1.1 Instrument Calibration

The coefficient of determination (r^2) was ≥ 0.990 in the initial calibration. The %Ds in the initial and continuing calibration verification met the method acceptance criteria of 20 percent.

6.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

6.1.3 MS/MSD Samples

In instances where MS/MSD %Rs were above the laboratory acceptance criteria and the associated results were not detected no data were qualified.

All MS/MSD RPDs were within the acceptance criteria.

6.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

6.1.5 FD Samples

No GRO were detected for field duplicate samples ERH1031 and ERH1032.

6.1.6 Proficiency Testing Samples

PT samples were not performed for the sampling event.

6.1.7 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

6.2 Representativeness

6.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

6.2.2 Blanks

Method blanks, EBs, FBs, and TBs were collected and analyzed to evaluate representativeness.

6.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

6.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

6.2.2.3 Trip Blanks

No contaminants were detected in the trip blanks for this analysis.

6.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

6.4 Completeness

The completeness level attained for GRO field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

6.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

7.0 TOTAL PETROLEUM HYDROCARBONS AS EXTRACTABLES

A total of eight (8) water samples were analyzed for diesel range organics (DRO) and oil range organics (ORO) by EPA SW-846 Method 8015B and three (3) water samples were also analyzed for DRO and ORO with silica gel cleanup (SGCU) by EPA SW-846 Method 8015B. All TPHE data were assessed to be valid since none of the 22 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

7.1 Precision and Accuracy

7.1.1 Instrument Calibration

The %RSDs in the initial calibration and the %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent.

7.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

7.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

7.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

7.1.5 FD Samples

The FD RPDs were within the acceptance criteria for field duplicate samples ERH1031 and ERH1032.

No DRO or ORO were detected for field duplicate samples ERH1031(SGCU) and ERH1032(SGCU).

7.1.6 Proficiency Testing Samples

PT samples were not performed for the sampling event.

7.1.7 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

7.2 Representativeness

7.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

7.2.2 Blanks

Method blanks, EBs, and FBs were collected and analyzed to evaluate representativeness.

7.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

7.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

7.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. Target compounds detected below the LOQs flagged (J) by the laboratory should be considered estimated. The comparability of the data is regarded as acceptable.

7.4 Completeness

The completeness level attained for TPHE field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

7.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

8.0 ETHYLENE DIBROMIDE

A total of 14 water samples were analyzed for EDB by EPA SW-846 Method 8011. All EDB data were assessed to be valid since none of the 14 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

8.1 Precision and Accuracy

8.1.1 Instrument Calibration

The %RSDs in the initial calibration and the %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent.

8.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

8.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

8.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

8.1.5 FD Samples

No EDB was detected for field duplicate samples ERH1031 and ERH1032.

8.1.6 Proficiency Testing Samples

PT samples were not performed for the sampling event.

8.1.7 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

8.2 Representativeness

8.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

8.2.2 Blanks

Method blanks, EBs, FBs, and TBs were collected and analyzed to evaluate representativeness.

8.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

8.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

8.2.2.3 Trip Blanks

No contaminants were detected in the trip blanks for this analysis.

8.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

8.4 Completeness

The completeness level attained for EDB field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

8.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

9.0 METHANE

A total of 10 water samples were analyzed for methane by Method RSK-175. All methane data were assessed to be valid since none of the 10 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

9.1 Precision and Accuracy

9.1.1 Instrument Calibration

The coefficient of determination (r^2) was ≥ 0.990 in the initial calibration. The %Ds in the initial and continuing calibration verification met the method acceptance criteria of 20 percent.

9.1.2 MS/MSD Samples

MS/MSD was not performed for this analysis.

9.1.3 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

9.1.4 FD Samples

Field duplicate samples were not collected for this analysis.

9.1.5 Proficiency Testing Samples

PT samples were not performed for the sampling event.

9.1.6 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

9.2 Representativeness

9.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

9.2.2 Blanks

Method blanks and trip blanks were collected and analyzed to evaluate representativeness.

9.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

9.2.2.2 Trip Blanks

No contaminants were detected in the trip blanks for this analysis.

9.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

9.4 Completeness

The completeness level attained for methane field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

9.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

10.0 METALS

A total of five (5) water samples were analyzed for metals by EPA SW-846 Method 6010C. All metals data were assessed to be valid since none of the 25 total results were rejected due to holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

10.1 Precision and Accuracy

10.1.1 Instrument Calibration

Initial and continuing calibration verification results provide a means of evaluating accuracy within a particular SDG. Correlation coefficient (r) and %R are the two major parameters used to measure the effectiveness of instrument calibration. The r indicates the linearity of the calibration curve. %R is used to verify the ongoing calibration acceptability of the analytical system. The most critical of the two calibration parameters, r, has the potential to affect data accuracy across a SDG when it is outside the acceptable QC limits. %R exceedances suggest more routine instrumental anomalies, which typically impact all sample results for the affected analytes.

The correlation coefficients in the initial calibrations and percent recoveries in the initial and continuing calibration verifications were within the acceptance criteria of ≥ 0.995 and 90-110 percent, respectively.

10.1.2 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

10.1.3 Serial Dilution

Serial dilution was not performed for this analysis.

10.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

10.1.5 FD Samples

Field duplicates were not collected for this analysis.

10.1.6 ICP Interference Check Sample

All ICP interference check %Rs were within the acceptance criteria.

10.1.7 Proficiency Testing Samples

PT samples were not performed for the sampling event.

10.1.8 Sample Result Verification

All sample results were found to be acceptable.

10.2 Representativeness

10.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

10.2.2 Blanks

Method blanks and ICB/CCBs were analyzed to evaluate representativeness.

10.2.2.1 Method and Calibration Blanks

No contaminants were detected in the method blanks for this analysis.

10.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. Target compounds detected below the LOQs flagged (J) by the laboratory should be considered estimated. The comparability of the data is regarded as acceptable.

10.4 Completeness

The completeness level attained for metal field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

10.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory LODs and LOQs met the specified requirements described in the work plan.

11.0 WET CHEMISTRY

A total of five (5) water samples were analyzed for alkalinity by Standard Method 2320B; anions by EPA Method 300.0; ferrous iron by Standard Method 3500-Fe B; total silica and dissolved silica by Standard Method 4500-SiO2 C; nitrate/nitrite as nitrogen by EPA Method 353.2; DOC by EPA SW-846 Method 9060A; and TOC by EPA SW-846 Method 9060A. All wet chemistry data were assessed to be valid since none of the 70 total results were rejected due to holding time or QC exceedances. This section discusses

the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

11.1 Precision and Accuracy

11.1.1 Instrument Calibration

The correlation coefficients in the initial calibrations were within the method acceptance criteria of ≥ 0.995.

Two total organic carbon results were qualified as detected estimated (J). The continuing calibration verification (CCV) %Rs were outside the method acceptance criteria of 90-110 percent. Bias cannot be determined.

11.1.2 MS/MSD Samples

As a result of a high MSD %Rs, the nitrate/nitrite as N result in sample ERH1023 was qualified as detected estimated (J). High MS/MSD %R indicates that the result may be biased high in the associated sample.

No data were qualified for dissolved silica %Rs outside the QC limits since the parent sample results were greater than 4X the spike concentration.

All MS/MSD RPDs were within the acceptance criteria.

11.1.3 LCS/LCSD Samples

As a result of a low LCSD %R, the dissolved organic carbon result in samples ERH1027, ERH1023, and ERH1025 were qualified as detected estimated (J). Low LCS %R indicates that the result may be biased low in the associated sample.

As a result of a high LCSD %R, the alkalinity total result in samples ERH1027, ERH1023, and ERH1025 were qualified as detected estimated (J). High LCS %R indicates that the result may be biased high in the associated sample.

All LCS/LCSD RPDs were within the acceptance criteria.

11.1.4 Laboratory Duplicate Samples

All DUP RPDs were within the acceptance criteria.

11.1.5 FD Samples

Field duplicates were not collected for these analyses.

11.1.6 Proficiency Testing Samples

PT samples were not performed for the sampling event.

11.1.7 Sample Result Verification

All sample results were found to be acceptable.

In instances where data were diluted by the laboratory, data were qualified as not reportable by the validators in order to yield only one complete set of data for a given sample.

11.2 Representativeness

11.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted.

As a result of analysis holding time exceedances, the nitrate result in samples ERH1029, ERH1031, and ERH1023 were qualified as detected estimated (J). Results may be biased low in the associated samples.

11.2.2 Blanks

Method blanks and calibration blanks were analyzed to evaluate representativeness.

11.2.2.1 Method and Calibration Blanks

As a result of calibration blank contamination, the nitrate result in samples ERH1023 and ERH1025 were qualified as not detected (U).

No data were qualified due to contamination detected in the method blanks.

11.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs attained were below the specified LOQs. Target compounds detected below the LOQs flagged (J) by the laboratory should be considered estimated. The comparability of the data is regarded as acceptable.

11.4 Completeness

The completeness level attained for wet chemistry field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

11.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

12.0 VARIANCES IN ANALYTICAL PERFORMANCE

The laboratory used standard analytical methods for all of the analyses throughout the project. No systematic variances in analytical performance were noted in the case narratives.

13.0 SUMMARY OF PARCCS CRITERIA

The validation reports present the PARCCS results for all SDGs. Each PARCCS criterion is discussed in detail in the following sections.

13.1 Precision and Accuracy

Low surrogate %R and LCS/LCSD %R indicate that the associated VOC and dissolved organic carbon results may be biased low in the associated samples.

High MS/MSD %R and LCS/LCSD %R indicates that the associated alkalinity total and nitrate/nitrite as N results may be biased high in the associated samples.

Bias cannot be determined for VOC, MEE, and total organic carbon results due to calibrations and LCS/LCSD RPD outside the acceptance criteria.

Precision and accuracy were evaluated using data quality indicators such as calibration, surrogates, MS/MSD, LCS/LCSD, DUP, FD, and internal standards. The precision and accuracy of the data set were considered acceptable after integration of qualification of estimated results as noted above.

13.2 Representativeness

All samples for each method and matrix were evaluated for holding time compliance. All holding times were met with the exceptions noted in Section 11.2.1. All samples were associated with a method blank in each individual SDG. The representativeness of the project data is considered acceptable.

13.3 Comparability

Sampling frequency requirements were met in obtaining field duplicates and necessary field blanks. The laboratory used standard analytical methods for their analyses. The analytical results were reported in correct standard units. The overall comparability is considered acceptable.

13.4 Completeness

Of the 270 total results reported, none of the results were rejected. The completeness for all SDGs is as follows:

Parameter	Total Analytes	No. of Rejects	% Completeness
VOC	70	0	100
Phenol and TIC	13	0	100
PAH	24	0	100
MEE	8	0	100
GRO	14	0	100
TPH as Extractables	22	0	100
EDB	14	0	100
Methane	10	0	100
Metals	25	0	100
Wet Chemistry	70	0	100
Total	**270**	**0**	**100**

The completeness percentage based on rejected data met the 90 percent PQO goal. A less quantifiable loss of data occurred in the application of blank qualifications as noted in Section 11.2.2.1.

13.5 Sensitivity

Sensitivity was achieved by the laboratory to support the PQOs. Calibration concentrations, DLs, LODs and LOQs met the project requirements and low-level contamination in the calibration blanks did not affect sensitivity.

Table I. Sample Cross-Reference

LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	BTEX (8260B)	1,2-DCA (8260B)	Phenol & TIC (8270D)	PAH (8270D SIM)	MEE (8270D)	GRO (8260B)	TPHE (8015B)	TPHE SGCU (8015B)	EDB (8011)	Methane (RSK 175)	Metals (6010C)	Alkalinity (2320B)	Anions (300.0)	Ferrous Iron (3500-FE-B)	Total Silica and Dissolved Silica (4500 SiO2 C)	NO3/NO2 as N (353.2)	DOC (9060A)	TOC (9060A)
47711A	91638	ERH1028	BA08340	Water	03/09/20	TB	Level C	X	X				X			X	X								
47711A	91638	ERH1029	BA08341	Water	03/09/20		Level D	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
47741A	91607	ERH1026	BA08033	Water	03/05/20	TB	Level C	X	X				X			X	X								
47741A	91607	ERH1027	BA08034	Water	03/05/20		Level C	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
47741B	91653	ERH1030	BA08369	Water	03/10/20	TB	Level C	X	X				X			X	X								
47741B	91653	ERH1031	BA08370	Water	03/10/20	FD1	Level C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
47741B	91653	ERH1032	BA08371	Water	03/10/20	FD1	Level C	X	X	X	X	X	X	X	X	X									
47757A	91585	ERH1022	BA07941	Water	03/03/20	TB	Level C	X	X				X			X	X								
47757A	91585	ERH1023	BA07942	Water	03/03/20		Level C	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
47757A	91585	ERH1024	BA07943	Water	03/04/20	TB	Level C	X	X				X			X	X								
47757A	91585	ERH1025	BA07944	Water	03/04/20		Level C	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
47757A	91585	ERH1033	BA07945	Water	03/04/20	TB	Level C	X	X				X			X									
47757A	91585	ERH1034	BA07946	Water	03/04/20	FB	Level C	X	X	X	X	X	X	X		X									
47757A	91585	ERH1035	BA07947	Water	03/04/20	EB	Level C	X	X	X	X	X	X	X		X									

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

May 21, 2020

SUBJECT: Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Pascua

Enclosed are the final validation reports for the fractions listed below. This SDG was received on May 8, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #47985:

SDG #	Fraction
91957	Volatiles, Phenol, Polynuclear Aromatic Hydrocarbons, 2-(2-Methoxyethoxy)-ethanol, Wet Chemistry, Gasoline Range Organics, Total Petroleum Hydrocarbons as Extractables, Methane

The data validation was performed under Level C validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

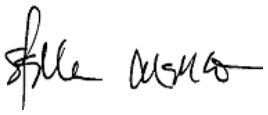
- Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 02, January 2017
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 01, April 2017
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, September 2017
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, June 2018
- Project Procedures Manual U.S. Naval Facilities Engineering Command Environmental Restoration Program, NAVFAC Pacific; DON 2015
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,



Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

149 pages-DL

Attachment 1

EDD 90/10 C/D

LDC #47985 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	BTEX (8260B)		Phenol (8270D)		(3) PAHs (8270D -SIM)		2,2-MEE (8270D-M)		GRO (8260B)		TPH-E (8015B)		SGCU TPH-E (8015B)		Methane (175)		Alk (2320B)		Cl,SO_4 NO_3 (300.0)		NO_3/ NO_2-N (353.2)		Fe II (3500-Fe B)		TOC (9060A)					
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91957	05/08/20	05/22/20	6	0	3	0	3	0	3	0	6	0	6	0	1	0	6	0	3	0	3	0	3	0	3	0	3	0				
Total	J/SC			6	0	3	0	3	0	3	0	6	0	6	0	1	0	6	0	3	0	3	0	3	0	3	0	3	0	0	0	0	49

Shaded cells indicate Level D validation (all other cells are Level C validation). These sample counts do not include MS/MSD, and DUPs

L:\AECOM\Red Hill\47985ST-18F0126.wpd

LDC Report# 47985A1a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 19, 2020

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91957

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1048	BA10086	Water	04/22/20
ERH1049	BA10087	Water	04/22/20
ERH1058	BA10088	Water	04/21/20
ERH1059	BA10089	Water	04/21/20
ERH1062	BA10090	Water	04/22/20
ERH1063	BA10091	Water	04/22/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples ERH1048, ERH1058, and ERH1062 were identified as trip blanks. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

LDC #: 47985A1a
SDG #: 91957
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/14/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1, 3, 5
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification		Not reviewed for Level C validation
XIV.	System performance		Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

~~**Indicates samples underwent Level D validation~~

	Client ID	Lab ID	Matrix	Date
1	ERH1048	BA10086	Water	04/22/20
2	ERH1049	BA10087	Water	04/22/20
3	ERH1058	BA10088	Water	04/21/20
4	ERH1059	BA10089	Water	04/21/20
5	ERH1062	BA10090	Water	04/22/20
6	ERH1063**	BA10091**	Water	04/22/20
7				
8				
9				

Notes:

	200423A-BK						
	200423AT						
	200423BT						

LDC Report# 47985A2a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 19, 2020

Parameters: Phenol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91957

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1049	BA10087	Water	04/22/20
ERH1059	BA10089	Water	04/21/20
ERH1063	BA10091	Water	04/22/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

LDC #: 47985A2a
SDG #: 91957
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/Q

Date: 5/14/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification		Not reviewed for Level C validation
XIV.	System performance		Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

~~**Indicates samples underwent Level D validation~~

	Client ID	Lab ID	Matrix	Date
1	ERH1049	BA10087	Water	04/22/20
2	ERH1059	BA10089	Water	04/21/20
3	ERH1063**	BA10091**	Water	04/22/20
4				
5				
6				
7				
8				
9				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 19, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91957

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1049	BA10087	Water	04/22/20
ERH1059	BA10089	Water	04/21/20
ERH1063	BA10091	Water	04/22/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

LDC #: 47985A2b
SDG #: 91957
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/4/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD≤ 15%. ICV≤ 20%
IV.	Continuing calibration	A	CCV≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	09
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification		Not reviewed for Level C validation
XIV.	System performance		Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**~~Indicates samples underwent Level D validation~~

	Client ID	Lab ID	Matrix	Date
1	ERH1049	BA10087	Water	04/22/20
2	ERH1059	BA10089	Water	04/21/20
3	ERH1063**	BA10091**	Water	04/22/20
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 19, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91957

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1049	BA10087	Water	04/22/20
ERH1059	BA10089	Water	04/21/20
ERH1063	BA10091	Water	04/22/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgement, no data were qualified since the LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

LDC #: 47985A2c
SDG #: 91957
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C~~A~~

Date: 5/14/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD≤15%. ICV≤20%
IV.	Continuing calibration	A	CCV≤20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	See ethenol
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XIII.	Target compound identification		Not reviewed for Level C validation
XIV.	System performance		Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1049	BA10087	Water	04/22/20
2	ERH1059	BA10089	Water	04/21/20
3	ERH1063**	BA10091**	Water	04/22/20
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 19, 2020

Parameters: Wet Chemistry

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91957

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1049	BA10087	Water	04/22/20
ERH1059	BA10089	Water	04/21/20
ERH1063	BA10091	Water	04/22/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Ferrous Iron by Standard Method 3500-Fe B
Total Organic Carbon by EPA SW 846 Method 9060A

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Chloride Total alkalinity Bicarbonate alkalinity	0.61 mg/L 4 mg/L 4 mg/L	1 mg/L 2 mg/L 2 mg/L	All samples in SDG 91957
ICB/CCB	Chloride	0.63 mg/L	1 mg/L	ERH1049 ERH1059
ICB/CCB	Chloride	0.69 mg/L	1 mg/L	ERH1063

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

LDC #: 47985A6
SDG #: 91957
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/18/20

Reviewer: ATL
2nd Reviewer: AC

METHOD: (Analyte) Alkalinity (SM 2320B), Chloride, Nitrate, Sulfate (EPA Method 300.0), Nitrate/Nitrite- N (EPA Method 353.2), Ferrous Iron (SM 3500- Fe B), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	non-client sample used
VII.	Duplicate sample analysis	N	non-client sample used
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1049	BA10087	Water	04/22/20
2	ERH1059	BA10089	Water	04/21/20
3	ERH1063	BA10091	Water	04/22/20
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Notes:

Sample Specific Element Reference

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1,2,3	Cl,NO3,SO4,Alk,TOC,NO3/NO2-N,FE2+

VALIDATION FINDINGS WORKSHEET
Laboratory Blank Contamination (PB/ICB/CCB)

Reviewer: ATL

METHOD: Inorganics
Soil preparation factor applied (if applicable):

Sample Concentration, unless otherwise noted: mg/L Associated Samples: all

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	LOQ								
Cl	0.61		3.05	1								
Tot Alk	4		20	2								
Bicar Alk	4		20	2								

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 1,2

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	LOQ								
Cl		0.63	3.15	1								

Sample Concentration, unless otherwise noted: mg/L Associated Samples: 3

				Sample Identification								
Analyte	**PB (mg/L)**	**Maximum ICB/CCB (mg/L)**	**Action Level**	LOQ								
Cl		0.69	3.45	1								

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 19, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 91957

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1048	BA10086	Water	04/22/20
ERH1049	BA10087	Water	04/22/20
ERH1058	BA10088	Water	04/21/20
ERH1059	BA10089	Water	04/21/20
ERH1062	BA10090	Water	04/22/20
ERH1063	BA10091	Water	04/22/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

Where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1048, ERH1058, and ERH1062 were identified as trip blanks. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

LDC #: 47985A7
SDG #: 91957
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/14/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A A	RSD ≤ 20% or r^2 ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB=1, 3, 5
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs		Not reviewed for Level C validation
XIII.	Target compound identification		Not reviewed for Level C validation
XIV.	System performance		Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1048	BA10086	Water	04/22/20
2	ERH1049	BA10087	Water	04/22/20
3	ERH1058	BA10088	Water	04/21/20
4	ERH1059	BA10089	Water	04/21/20
5	ERH1062	BA10090	Water	04/22/20
6	ERH1063**	BA10091**	Water	04/22/20
7				
8				
9				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 19, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91957

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1049	BA10087	Water	04/22/20
ERH1049RE	BA10087RE	Water	04/22/20
ERH1059	BA10089	Water	04/21/20
ERH1059RE	BA10089RE	Water	04/21/20
ERH1063	BA10091	Water	04/22/20
ERH1063RE	BA10091RE	Water	04/22/20
ERH1063(SGCU)	BA10091(SGCU)	Water	04/22/20

Samples ending in "SGCU" underwent Silica Gel cleanup

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
ERH1049RE ERH1063RE	All compounds	9	7	J (all detects) UJ (all non-detects)	A
ERH1059RE	All compounds	10	7	J (all detects) UJ (all non-detects)	A

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
200427WLCS	Diesel (C10-C24)	142 (36-132)	ERH1049 ERH1063	J (all detects)	P
200427WLCS	Diesel (C10-C24)	142 (36-132)	ERH1059	NA	-
200427WLCS	Oil (C24-C40)	127 (41-113)	ERH1063	J (all detects)	P
200427WLCS	Oil (C24-C40)	127 (41-113)	ERH1049 ERH1059	NA	-

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Reason	Flag	A or P
ERH1049RE ERH1059RE ERH1063RE	All compounds	Extracted outside holding time.	R	A

Due to LCS %R, data were qualified as estimated in two samples.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 91957

Sample	Compound	Flag	A or P	Reason (Code)
ERH1049 ERH1063	Diesel (C10-C24)	J (all detects)	P	Laboratory control samples (%R) (L)
ERH1063	Oil (C24-C40)	J (all detects)	P	Laboratory control samples (%R) (L)
ERH1049RE ERH1059RE ERH1063RE	All compounds	R	A	Overall assessment of data (D)

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

LDC #: 47985A8
SDG #: 91957
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C~~/D~~

Date: 5/14/20
Page: 1 of 1
Reviewer: 1
2nd Reviewer: 1

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / ~~SW~~	
II.	Initial calibration/ICV	~~A~~ / ~~A~~	~~RSD~~ ≤ 20%. ICV ≤ 20%
III.	Continuing calibration	~~A~~	CCV ≤ 20%
IV.	Laboratory Blanks	~~A~~	
V.	Field blanks	N	
VI.	Surrogate spikes	~~A~~	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	~~SW~~	LCS
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for Level C validation
XI.	Target compound identification	N	Not reviewed for Level C validation
XII	Overall assessment of data	~~SW~~	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

~~*Indicates samples underwent Level D validation / Samples appended with "SGCU" underwent Silica Gel Clean Up~~

	Client ID	Lab ID	Matrix	Date
1 1	ERH1049	BA10087	Water	04/22/20
2 3	ERH1049RE	BA10087RE	Water	04/22/20
3 1	ERH1059	BA10089	Water	04/21/20
4 3	ERH1059RE	BA10089RE	Water	04/21/20
5 1	ERH1063*	BA10091*	Water	04/22/20
6 3	ERH1063RE*	BA10091RE*	Water	04/22/20
7 2	ERH1063(SGCU)*	BA10091(SGCU)*	Water	04/22/20
8				
9				
10				
11				
12				

Notes:

	200427A-BK						
	200427A-BLK						
	200501A-BK						

LDC #: 47485A1A

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: 9
2nd Reviewer: M

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	(HT=7) Total # of Days	Qualifier
2,	W		4-22-20	5-1-20		9	√ (H) / A (H)
4	↓		4-21-20	↓		10	↓
6	↓		4-22-20	↓		9	↓
(db3+MD)							

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 47985A8

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 2
2nd Reviewer: 4

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	200427WLCS	Diesel (C10-C24)	142 (36-133	( )	( )	1.3.5 MB (lot3=5)	lot3 (J)
		Oil (C24-C40)	127 41-113	( )	( )	(lot3=5)	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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LDC #: 47985A8

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: 4
2nd Reviewer: RL

METHOD: GC/HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Compound	Finding	Qualifications
		2,4,6	All	Ext outside HT	R/A (D)

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 19, 2020

Parameters: Methane

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91957

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1048	BA10086	Water	04/22/20
ERH1049	BA10087	Water	04/22/20
ERH1058	BA10088	Water	04/21/20
ERH1059	BA10089	Water	04/21/20
ERH1062	BA10090	Water	04/22/20
ERH1063	BA10091	Water	04/22/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1048, ERH1058, and ERH1062 were identified as trip blanks. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

Raw data were not reviewed for Level C validation.

X. Target Compound Identification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 91957

No Sample Data Qualified in this SDG

LDC #: 47985A51
SDG #: 91957
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/14/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Initial calibration/ICV	A, A	r², ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%.
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB=1.3.5
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs		Not reviewed for Level C validation
X.	Target compound identification		Not reviewed for Level C validation
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1048	BA10086	Water	04/22/20
2	ERH1049	BA10087	Water	04/22/20
3	ERH1058	BA10088	Water	04/21/20
4	ERH1059	BA10089	Water	04/21/20
5	ERH1062	BA10090	Water	04/22/20
6	ERH1063**	BA10091**	Water	04/22/20
7				
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10				
11				
12				
13				

Notes:

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

July 2, 2020

SUBJECT: Revised Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Pascua

Enclosed are the revised validation reports for the fractions listed below. This SDG was received on May 13, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

- Reason code updated for MS/MSD RPD.

LDC Project #48053_RV1:

SDG #	Fraction
91991	Phenol, Polynuclear Aromatic Hydrocarbons, 2-(2-Methoxyethoxy)-ethanol, Wet Chemistry, Gasoline Range Organics, Total Petroleum Hydrocarbons as Extractables, Ethylene Dibromide, Methane

The data validation was performed under Level C & D validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

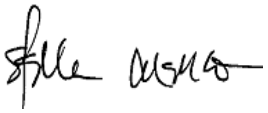
- Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 02, January 2017
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 01, April 2017
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, September 2017
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, June 2018
- Project Procedures Manual U.S. Naval Facilities Engineering Command Environmental Restoration Program, NAVFAC Pacific; DON 2015
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,



Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

235 pages-DL

Attachment 1

EDD 90/10 C/D

LDC #48053 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	BTEX & 1,2-DCA (8260B)		Phenol (8270D)		(3) PAHs (8270D -SIM)		2,2-MEE (8270D-M)		GRO (8260B)		TPH-E (8015B)		SGCU TPH-E (8015B)		EDB (8011)		Methane (175)		Alk (2320B)		Cl,SO_4 NO_3 (300.0)		NO_3/ NO_2-N (353.2)		Fe II (3500-Fe B)		TOC (9060A)			
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91991	05/13/20	05/28/20	9	0	4	0	4	0	4	0	9	0	8	0	2	0	3	0	7	0	3	0	3	0	3	0	3	0	3	0		
A	91991	05/13/20	05/28/20	3	0	3	0	3	0	3	0	3	0	6	0	2	0	1	0	4	0	2	0	2	0	2	0	2	0	2	0		
Total	T/SC			12	0	7	0	7	0	7	0	12	0	14	0	4	0	4	0	11	0	5	0	5	0	5	0	5	0	5	0	0	103

Shaded cells indicate Level D validation (all other cells are Level C validation). These sample counts do not include MS/MSD, and DUPs

L:\AECOM\Red Hill\48053ST-18F0126.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 28, 2020

Parameters: Volatiles

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1038	BA10157	Water	04/23/20
ERH1039**	BA10158**	Water	04/23/20
ERH1040	BA10159	Water	04/23/20
ERH1043	BA10160	Water	04/22/20
ERH1044**	BA10161**	Water	04/22/20
ERH1045	BA10162	Water	04/22/20
ERH1064	BA10163	Water	04/23/20
ERH1065	BA10164	Water	04/23/20
ERH1073	BA10165	Water	04/22/20
ERH1074**	BA10166**	Water	04/22/20
ERH1075	BA10167	Water	04/23/20
ERH1076	BA10168	Water	04/23/20
ERH1039MS	BA10158MS	Water	04/23/20
ERH1039MSD	BA10158MSD	Water	04/23/20
ERH1074MS	BA10166MS	Water	04/22/20
ERH1074MSD	BA10166MSD	Water	04/22/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) which are Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), and 1,2-Dichloroethane by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples ERH1038, ERH1043, ERH1064, ERH1073, and ERH1075 were identified as trip blanks. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples ERH1039** and ERH1040 and samples ERH1044** and ERH1045 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

LDC #: 48053A1a
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 1 of 2
Reviewer: 9
2nd Reviewer: TC

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B) BTEX + L

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD≤15%. ICV≤20%
IV.	Continuing calibration	A	CCV≤20/25%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB=1.4.7.9.11. EB=ERH1068(9194)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D=2+3.5+6
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XIII.	Target compound identification	A	Not reviewed for Level C validation
XIV.	System performance	A	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1 2	ERH1038**	BA10157**	Water	04/23/20
2 2	ERH1039**	BA10158**	Water	04/23/20
3 2	ERH1040	BA10159	Water	04/23/20
4 2	ERH1043	BA10160	Water	04/22/20
5 2	ERH1044**	BA10161**	Water	04/22/20
6 2	ERH1045	BA10162	Water	04/22/20
7 2	ERH1064	BA10163	Water	04/23/20
8 2	ERH1065	BA10164	Water	04/23/20
9 1	ERH1073 +L	BA10165	Water	04/22/20
10 1	ERH1074**	BA10166**	Water	04/22/20
11 1	ERH1075	BA10167	Water	04/23/20
12 1	ERH1076	BA10168	Water	04/23/20
13 2	ERH1039MS	BA10158MS	Water	04/23/20
14 2	ERH1039MSD	BA10158MSD	Water	04/23/20

LDC #: 48053A1a
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 2 of 2
Reviewer: Q
2nd Reviewer: K

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

	Client ID	Lab ID	Matrix	Date
15	ERH1074MS	BA10166MS	Water	04/22/20
16	ERH1074MSD	BA10166MSD	Water	04/22/20
17				
18				
19				
20				

Notes:

	AT20437-Blk1						
	IAT20437-Blk						

LDC #: 48053A9

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: K

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were all percent relative standard deviations (%RSD) ≤ 30%/15% and relative response factors (RRF) ≥ 0.05?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation findings worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	

LDC #: 48052A1a

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: M

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data	✓			
Overall assessment of data was found to be acceptable.				

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 48053A1 9

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: AC

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	4/24/20	V (1st internal standard)	0.3801	0.381	0.4009	0.4009	8.9	8.9
			EE (2nd internal standard)	0.5936	0.5936	0.6307	0.6307	7.5	7.5
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: M

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	~~ICAL~~	4/24/20	V (1st internal standard)	0.4009	0.3645	0.3645	9.1	9.1
	042712		EE (2nd internal standard)	0.6207	0.5736	0.5736	9.0	9.0
			(3rd internal standard)					
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48056A19

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: CL
2nd reviewer: JC

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane			101		
1,2-Dichloroethane-d4			103		
Toluene-d8			99.2		
Bromofluorobenzene			95.1		

Sample ID: 2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	25.00	25.96	104	104	
1,2-Dichloroethane-d4		25.55	102	102	
Toluene-d8		25.17	101	101	
Bromofluorobenzene		24.22	96.9	96.9	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 43053A19

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD sample: 15/16

Compound	Spike Added (µg/L)		Sample Concentration (µg/L)	Spiked Sample Concentration (µg/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene											
Trichloroethene											
Benzene	10.0	10.0	ND	9.29	9.11	92.9	92.9	91.1	91.1	2.0	2.0
Toluene	✓	✓	✓	9.31	9.37	93.1	93.1	93.7	93.7	0.64	0.64
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A19

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: 9
2nd Reviewer: M

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: 200427W

Compound	Spike Added (µg/L)		Spiked Sample Concentration (µg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene										
Trichloroethene	~~10.0~~									
Benzene	10.0	10.0	9.40	9.09	94.0	94.0	90.9	90.9	3.4	3.4
Toluene	↓	↓	9.62	9.27	96.4	96.4	92.7	92.7	3.9	3.9
Chlorobenzene										

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: Q
2nd reviewer: M

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample pruged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. All, NO: 200427WLCS, V

Conc. = (83922)(25.0)(1) / (55642)(0.4009)( )( ) = 9.40 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
	LCS	V	9.40		

LDC Report# 48053A2a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 22, 2020

Parameters: Phenol

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1039**	BA10158**	Water	04/23/20
ERH1040	BA10159	Water	04/23/20
ERH1044**	BA10161**	Water	04/22/20
ERH1045	BA10162	Water	04/22/20
ERH1065	BA10164	Water	04/23/20
ERH1074**	BA10166**	Water	04/22/20
ERH1076	BA10168	Water	04/23/20
ERH1039MS	BA10158MS	Water	04/23/20
ERH1039MSD	BA10158MSD	Water	04/23/20
ERH1074MS	BA10166MS	Water	04/22/20
ERH1074MSD	BA10166MSD	Water	04/22/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples ERH1039** and ERH1040 and samples ERH1044** and ERH1045 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

LDC #: 48053A2a
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	RSD≤15%. ICV ≤20%
IV.	Continuing calibration	A	CCV ≤20/20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=ERH1068 (91941)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D=1+2. 3+4
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XIII.	Target compound identification	A	Not reviewed for Level C validation
XIV.	System performance	A	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1039**	BA10158**	Water	04/23/20
2	ERH1040	BA10159	Water	04/23/20
3	ERH1044 **	BA10161 **	Water	04/22/20
4	ERH1045	BA10162	Water	04/22/20
5	ERH1065	BA10164	Water	04/23/20
6	ERH1074 **	BA10166 **	Water	04/22/20
7	ERH1076	BA10168	Water	04/23/20
8	ERH1039MS	BA10158MS	Water	04/23/20
9	ERH1039MSD	BA10158MSD	Water	04/23/20
10	ERH1074MS	BA10166MS	Water	04/22/20
11	ERH1074MSD	BA10166MSD	Water	04/22/20
12				
13				
14				

LDC #: 48052A2d

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: Q
2nd Reviewer: N

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ ~~20~~ 15% and relative response factors (RRF) within method criteria?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of > 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ ~~30~~ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the blanks validation findings worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10%, was a reanalysis performed to confirm %R ?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			

LDC #: 48053A29

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: R

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU.Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV.Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW.Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

LDC #: 40053A201

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: A

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (40 std)	Recalculated RRF (40 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	4/20/20	Phenol (1st internal standard)	2.503	2.503	2.527	2527	6.9	6.9
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A29

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: 9

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	0420/144	4/30/20	Phenol (1st internal standard)	2.527	2.503	2.503	0.9	0.9
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A24

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: ME

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	125	112.3565	89.9	89.9	
2-Fluorobiphenyl	↓	110.2954	88.2	88.2	
Terphenyl-d14	↓	130.9277	105	105	
Phenol-d5	250	192.5608	77.0	77.0	
2-Fluorophenol	↓	192.5628	77.0	77.0	
2,4,6-Tribromophenol	↓	233.3330	93.3	93.3	
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: ~~45053A2H~~

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: 9

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration

MSDC = Matrix spike duplicate concentration

MS/MSD samples: 8/9

Compound	Spike Added (µg/L)		Sample Concentration (µg/L)	Spiked Sample Concentration (µg/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	62.5	62.5	NB	39.0	38.2	62.4	62.4	61.1	61.1	2.1	2.1
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A20

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer:

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 200423W

Compound	Spike Added (µg/L)		Spike Concentration (µg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	62.5	NA	38.4	NA	61.4	64				
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43053A20

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: 8

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. All, ND
200428ALCS, Phenol

Conc. = $\frac{(77314)(40.0)(1000)(1)(\quad)}{(397160)(2.527)(800)(\quad)(\quad)}$

= 38.4 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
	LCS	Phenol	38.4		

LDC Report# 48053A2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 22, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1039**	BA10158**	Water	04/23/20
ERH1040	BA10159	Water	04/23/20
ERH1044**	BA10161**	Water	04/22/20
ERH1045	BA10162	Water	04/22/20
ERH1065	BA10164	Water	04/23/20
ERH1074**	BA10166**	Water	04/22/20
ERH1076	BA10168	Water	04/23/20
ERH1039MS	BA10158MS	Water	04/23/20
ERH1039MSD	BA10158MSD	Water	04/23/20
ERH1074MS	BA10166MS	Water	04/22/20
ERH1074MSD	BA10166MSD	Water	04/22/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples ERH1039** and ERH1040 and samples ERH1044** and ERH1045 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

LDC #: 48053A2b
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 1 of 1
Reviewer: Q
2nd Reviewer: R

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A+A	RSD≤15%. ICV≤20%
IV.	Continuing calibration	A	CCV≤20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=ERH1068(91941)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	D=1+2. 3+4
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XIII.	Target compound identification	A	Not reviewed for Level C validation
XIV.	System performance	A	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1039**	BA10158**	Water	04/23/20
2	ERH1040	BA10159	Water	04/23/20
3	ERH1044 **	BA10161 **	Water	04/22/20
4	ERH1045	BA10162	Water	04/22/20
5	ERH1065	BA10164	Water	04/23/20
6	ERH1074 **	BA10166 **	Water	04/22/20
7	ERH1076	BA10168	Water	04/23/20
8	ERH1039MS	BA10158MS	Water	04/23/20
9	ERH1039MSD	BA10158MSD	Water	04/23/20
10	ERH1074MS	BA10166MS	Water	04/22/20
11	ERH1074MSD	BA10166MSD	Water	04/22/20
12				
13				
14				

LDC #: 48053A2D

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: M

Method: Semivolatiles (EPA SW 846 Method 8270C-SIM)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check (Not required)				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 15% and relative response factors (RRF) ≥ 0.05?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation findings worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent differences (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data	✓			
Overall assessment of data was found to be acceptable.				

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	AA. 2-Chloronaphthalene	AAA. Butylbenzylphthalate	AAAA. Dibenzothiophene	A1.
B. Bis (2-chloroethyl) ether	BB. 2-Nitroaniline	BBB. 3,3'-Dichlorobenzidine	BBBB. Benzo(a)fluoranthene	B1.
C. 2-Chlorophenol	CC. Dimethylphthalate	CCC. Benzo(a)anthracene	CCCC. Benzo(b)fluorene	C1.
D. 1,3-Dichlorobenzene	DD. Acenaphthylene	DDD. Chrysene	DDDD. cis/trans-Decalin	D1.
E. 1,4-Dichlorobenzene	EE. 2,6-Dinitrotoluene	EEE. Bis(2-ethylhexyl)phthalate	EEEE. Biphenyl	E1.
F. 1,2-Dichlorobenzene	FF. 3-Nitroaniline	FFF. Di-n-octylphthalate	FFFF. Retene	F1.
G. 2-Methylphenol	GG. Acenaphthene	GGG. Benzo(b)fluoranthene	GGGG. C30-Hopane	G1.
H. 2,2'-Oxybis(1-chloropropane)	HH. 2,4-Dinitrophenol	HHH. Benzo(k)fluoranthene	HHHH. 1-Methylphenanthrene	H1.
I. 4-Methylphenol	II. 4-Nitrophenol	III. Benzo(a)pyrene	IIII. 1,4-Dioxane	I1.
J. N-Nitroso-di-n-propylamine	JJ. Dibenzofuran	JJJ. Indeno(1,2,3-cd)pyrene	JJJJ. Acetophenone	J1.
K. Hexachloroethane	KK. 2,4-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	KKKK. Atrazine	K1.
L. Nitrobenzene	LL. Diethylphthalate	LLL. Benzo(g,h,i)perylene	LLLL. Benzaldehyde	L1.
M. Isophorone	MM. 4-Chlorophenyl-phenyl ether	MMM. Bis(2-Chloroisopropyl)ether	MMMM. Caprolactam	M1.
N. 2-Nitrophenol	NN. Fluorene	NNN. Aniline	NNNN. 2,6-Dichlorophenol	N1.
O. 2,4-Dimethylphenol	OO. 4-Nitroaniline	OOO. N-Nitrosodimethylamine	OOOO. 1,2-Diphenylhydrazine	O1.
P. Bis(2-chloroethoxy)methane	PP. 4,6-Dinitro-2-methylphenol	PPP. Benzoic Acid	PPPP. 3-Methylphenol	P1.
Q. 2,4-Dichlorophenol	QQ. N-Nitrosodiphenylamine	QQQ. Benzyl alcohol	QQQQ. 3&4-Methylphenol	Q1.
R. 1,2,4-Trichlorobenzene	RR. 4-Bromophenyl-phenylether	RRR. Pyridine	RRRR. 4-Dimethyldibenzothiophene (4MDT)	R1.
S. Naphthalene	SS. Hexachlorobenzene	SSS. Benzidine	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	S1.
T. 4-Chloroaniline	TT. Pentachlorophenol	TTT. 1-Methylnaphthalene	TTTT. 1-Methyldibenzothiophene (1MDT)	T1.
U. Hexachlorobutadiene	UU. Phenanthrene	UUU.Benzo(b)thiophene	UUUU.	U1.
V. 4-Chloro-3-methylphenol	VV. Anthracene	VVV.Benzonaphthothiophene	VVVV.	V1.
W. 2-Methylnaphthalene	WW. Carbazole	WWW.Benzo(e)pyrene	WWWW.	W1.
X. Hexachlorocyclopentadiene	XX. Di-n-butylphthalate	XXX. 2,6-Dimethylnaphthalene	XXXX.	X1.
Y. 2,4,6-Trichlorophenol	YY. Fluoranthene	YYY. 2,3,5-Trimethylnaphthalene	YYYY.	Y1.
Z. 2,4,5-Trichlorophenol	ZZ. Pyrene	ZZZ. Perylene	ZZZZ.	Z1.

LDC#:48053A2b

VALIDATION FINDINGS WORKSHEET

Field Duplicate

Reviewer:
2nd Reviewer:

METHOD: GC MS PAHs (EPA SW846 Method 8270D-SIM)

Y/N NA Were field duplicatessets identified in this SDG?
Y N NA Were target analytes detected in the field duplicates sets?

Compound	Concentration (µg/L)		RPD (≤50%)
	3	4	
TTT	13	13	0
W	12	11	9
S	33	32	3

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2020\48053A2b.wpd

LDC #: 10CE47

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 9

METHOD: GC/MS BNA (EPA SW 846 Method 8270C-SIM)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (/ std)	Recalculated RRF (/ std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	KAL	2/4/10	(1st internal standard)						
			Naphthalene (2nd internal standard)	1.083	1.083	1.062	1.0616	6.9	6.9
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2			(1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			(1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 18053A26

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: AK

METHOD: GC/MS BNA (EPA SW 846 Method 8270C-SIM)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	04241099	4/30/20	(1st internal standard)					
			Naphthalene (2nd internal standard)	1.062	1.030	1.030	2.9	3.0
			Fluorene (3rd internal standard)					
			Phenanthrene (4th internal standard)					
			Chrysene (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			(1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Phenanthrene (4th internal standard)					
			Chrysene (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			(1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Phenanthrene (4th internal standard)					
			Chrysene (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: ~~18033A2b~~

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C-SIM)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
W-d10	6.250	4.65194	74.4	74.4	
NN-d10	1	4.83034	77.3	77.3	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					

LDC #: 10[illegible]

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 4

METHOD: GC/MS (EPA SW 846 Method 8270C-SIM)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 8/9

Compound	Spike Added (µg/L)		Sample Concentration (µg/L)	Spiked Sample Concentration (µg/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Acenaphthene											
Pyrene											
5	6.25	6.25	ND	4.57	4.68	73.1	73.1	74.9	74.9	2.4	2.4

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C-SIM)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 200428W

Compound	Spike Added (µL)		Spike Concentration (µg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Acenaphthene										
Pyrene										
S	6.25	NA	431	NA	69.0	69.0				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: AL

METHOD: GC/MS PAHs (EPA SW 846 Method 8270D-SIM)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 3, 5:

Conc. = $\frac{84339)(2.5)(1000)(1)(\quad)}{(7543)(1.062)(800)(\quad)(\quad)}$

= 33.0 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
	3	5	33		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 27, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1039**	BA10158**	Water	04/23/20
ERH1040	BA10159	Water	04/23/20
ERH1044**	BA10161**	Water	04/22/20
ERH1045	BA10162	Water	04/22/20
ERH1065	BA10164	Water	04/23/20
ERH1074**	BA10166**	Water	04/22/20
ERH1076	BA10168	Water	04/23/20
ERH1039MS	BA10158MS	Water	04/23/20
ERH1039MSD	BA10158MSD	Water	04/23/20
ERH1074MS	BA10166MS	Water	04/22/20
ERH1074MSD	BA10166MSD	Water	04/22/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgment, no data were qualified since the MS/MSD and LCS percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
ERH1074MS/MSD (ERH1074**)	2-(2-Methoxyethoxy)-ethanol	23.1 (≤20)	NA	-

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples ERH1039** and ERH1040 and samples ERH1044** and ERH1045 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

LDC #: 48053A2c
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=ERH1068 (9/9/41)
VII.	Surrogate spikes	N	(see Phenol)
VIII.	Matrix spike/Matrix spike duplicates	MN	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	ND	D= 1+2. 3+4
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XIII.	Target compound identification	A	Not reviewed for Level C validation
XIV.	System performance	A	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1039**	BA10158**	Water	04/23/20
2	ERH1040	BA10159	Water	04/23/20
3	ERH1044**	BA10161**	Water	04/22/20
4	ERH1045	BA10162	Water	04/22/20
5	ERH1065	BA10164	Water	04/23/20
6	ERH1074**	BA10166**	Water	04/22/20
7	ERH1076	BA10168	Water	04/23/20
8	ERH1039MS	BA10158MS	Water	04/23/20
9	ERH1039MSD	BA10158MSD	Water	04/23/20
10	ERH1074MS	BA10166MS	Water	04/22/20
11	ERH1074MSD	BA10166MSD	Water	04/22/20
12				
13				
14				

LDC #: 48053A2c

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: V
2nd Reviewer: M

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ ~~20~~ 15% and relative response factors (RRF) within method criteria?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) < ~~30~~ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the blanks validation findings worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?		✓		
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10%, was a reanalysis performed to confirm %R ?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			

LDC #: 48053A2C

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: IC

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU.Benzo(b)thiophene	NNNN. 2-(2-Methoxyethoxy-ethanol
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV.Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW.Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

LDC #: 48053A2C

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: Q
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	10/11	NNNN	( )	( )	23.1 (≤20)	6 (ND)	J (all detects) / A (6)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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Privileged and Confidential

LDC #: 43053A2C

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: A

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (~~50~~ std)	Recalculated RRF (~~50~~ 500 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL2	5/1/20	~~Phenol~~ (1st internal standard) NNNN	0.1354	0.1354	0.1574	0.1573	13	12.7
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A2C

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: K

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	050103	5/1/20	~~Phenol~~ (1st internal standard) NNNN	0.1574	0.1794	0.1794	14	14
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene~~ (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene~~ (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A2C

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: Q
2nd Reviewer: Q

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = | MSC - MSC | * 2/(MSC + MSDC)

MSC = Matrix spike concentration

MSDC = Matrix spike duplicate concentration

MS/MSD samples: 3/9

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											
NNNN	80.0	80.0	ND	36.4	44.3	45.5	45.5	55.4	55.4	19.6	19.6

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A2C

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: AK

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 20429W

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										
NNNN	80.0	NA	67.5	NA	84.4	84.4				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A2C

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: 9

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. All, ND:
200429A LCS. NNNN

Conc. = (44929)(40.0)(2)( )( )( )
(33835)(0.1574)( )( )( )

= 67.5 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
	LCS	NNNN	67.5		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 27, 2020

Parameters: Wet Chemistry

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1039**	BA10158**	Water	04/23/20
ERH1044**	BA10161**	Water	04/22/20
ERH1065	BA10164	Water	04/23/20
ERH1074	BA10166	Water	04/22/20
ERH1076	BA10168	Water	04/23/20
ERH1039MS	BA10158MS	Water	04/23/20
ERH1039MSD	BA10158MSD	Water	04/23/20
ERH1039DUP	BA10158DUP	Water	04/23/20
ERH1074MS	BA10166MS	Water	04/22/20
ERH1074MSD	BA10166MSD	Water	04/22/20
ERH1074DUP	BA10166DUP	Water	04/22/20
ERH1076MS	BA10168MS	Water	04/23/20
ERH1076MSD	BA10168MSD	Water	04/23/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Ferrous Iron by Standard Method 3500-Fe B
Total Organic Carbon by EPA SW 846 Method 9060A

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ERH1074	Nitrate	50.75 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable when applicable with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
04/25/20	CCV (12:59)	Total organic carbon	117.3 (90-110)	ERH1044** ERH1065 ERH1074 ERH1076	J (all detects)	P

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Chloride	0.61 mg/L	1 mg/L	ERH1039** ERH1065 ERH1074
PB (prep blank)	Chloride	0.40 mg/L	1 mg/L	ERH1044** ERH1076
ICB/CCB	Chloride	0.44 mg/L	1 mg/L	ERH1044** ERH1076
ICB/CCB	Nitrate/Nitrite as N	0.032 mg/L	0.1 mg/L	All samples in SDG 91991

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
ICB/CCB	Chloride	0.63 mg/L	1 mg/L	ERH1039**
ICB/CCB	Chloride	0.69 mg/L	1 mg/L	ERH1065 ERH1074

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
ERH1039MS/MSD (ERH1039**)	Chloride	83.4 (87-111)	80.2 (87-111)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
ERH1039DUP (ERH1039**)	Total alkalinity Bicarbonate alkalinity	30 (≤20) 30 (≤20)	J (all detects) J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, continuing calibration %R, MS/MSD %R, and DUP RPD, data were qualified as estimated in five samples.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 91991

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1074	Nitrate	J (all detects)	P	Technical holding times (H)
ERH1044** ERH1065 ERH1074 ERH1076	Total organic carbon	J (all detects)	P	Continuing calibration (%R) (R)
ERH1039**	Chloride	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (Q)
ERH1039**	Total alkalinity Bicarbonate alkalinity	J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (E)

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

LDC #: 48053A6
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 1 of 1
Reviewer: ATV
2nd Reviewer: A

METHOD: (Analyte) Alkalinity (SM 2320B), Chloride, Nitrate-~~X~~, Sulfate (EPA Method 300.0), Nitrate/Nitrite- N (EPA Method 353.2), Ferrous Iron (SM 3500- Fe B), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	SW	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	(6,7), (9,10), (12,13)
VII.	Duplicate sample analysis	SW	8, 11
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for Level C validation
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date	
1	ERH1039**	BA10158**	Water	04/23/20	
2	ERH1044 **	BA10161 **	Water	04/22/20	15:10
3	ERH1065	BA10164	Water	04/23/20	
4	ERH1074	BA10166	Water	04/22/20	8:46
5	ERH1076	BA10168	Water	04/23/20	
6	ERH1039MS	BA10158MS	Water	04/23/20	
7	ERH1039MSD	BA10158MSD	Water	04/23/20	
8	ERH1039DUP	BA10158DUP	Water	04/23/20	
9	ERH1074MS	BA10166MS	Water	04/22/20	
10	ERH1074MSD	BA10166MSD	Water	04/22/20	
11	ERH1074DUP	BA10166DUP	Water	04/22/20	
12	ERH1076MS	BA10168MS	Water	04/23/20	
13	ERH1076MSD	BA10168MSD	Water	04/23/20	
14					
15					

Notes:

DC #: 48053A6

VALIDATION FINDINGS CHECKLIST

Reviewer: AIL
2nd Reviewer: JC

Method: Inorganics (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		✓		
II. Calibration				
Were all instruments calibrated daily, each set-up time?		✓		
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?		✓		
Were titrant checks performed as required? (Level IV only)	✓			
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 48053A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATV
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1-5	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (Fe2+) (NO3/NO2-N)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
6,7	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (NO3/NO2-N)
9,10	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (NO3/NO2-N)
12,13	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
8,11	pH TDS Cl F NO3 NO2 SO4 O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 48053A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: ATC
2nd reviewer: M

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ? Code: H
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:	NO_3 (EPA 300.0)	
Parameters:	water	
Technical holding time:	48 hrs.	

Sample ID	Sampling date	Analysis date	Total Time	Qualifier	Analysis date	Total Time	Qualifier
4	8:46 → 11:46 4/22/20	14:31 4/24/20	50.75 hrs.	J/UJ/P(detect)			

LDC #: 48053A6

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% ?
Y N N/A Are all correlation coefficients ≥0.995 ?

LEVEL IV/D ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications Code: R
	4/25/20	CCV (12:59)	TOC	117.3 (90-110)	2 to 5	Jdet/P (all detect)

Comments:

LDC #: 48053A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer: AC

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1,3,4 **Code: B**

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ								
Cl	0.61		3.05	1								

Conc. units: mg/L **Associated Samples:** 2,5

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ								
Cl	0.40		2	1								
Cl		0.44	2.2	1								

Conc. units: mg/L **Associated Samples:** all

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ								
NO3/NO2-N		0.032	0.16	0.1								

Conc. units: mg/L **Associated Samples:** 1

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ								
Cl		0.63		1								

VALIDATION FINDINGS WORKSHEET
Blanks

Conc. units: mg/L **Associated Samples:** 3,4

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ								
Cl		0.69	3.45	1								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 48053A6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: ATL
2nd Reviewer: AC

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125?~~ DOD If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications Code: Q
	6/7	W	Cl	83.4 (87-111)	80.2 (87-111)		1	J/UJ/A (detect)

Comments:

LDC #: 48053A6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications Code: E
		8	W	Alkalinity Total	30 (≤ 20)		1	JUJ/A (all detect)
				Alkalinity Bicarbonate	30 (< 20)		1	JUJ/A (all detect)

Comments:

LDC #: 48053 A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: ATL
2nd Reviewer:

Method: Inorganics, Method see cover

The correlation coefficient (r) for the calibration of SO4 was recalculated. Calibration date: 03/26/20

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (mg/l)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	SO4	s1	0.4	0.067	*0.999923*	0.997903	Y
		s2	1	0.11			
		s3	2.5	0.273			
		s4	5	0.47			
		s5	10	0.977			
		s6	25	2.5			
		s7	35	3.446			
		s8	50	4.978			
Calibration verification	Fe^{2+}	4.0065	4.000		100.2	100.2	Y
Calibration verification	TOC	5.92	5.000		118.3	117.3	Y
Calibration verification	NO3/NO2-N	2.9666	3.000		98.9	98.9	Y

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053-AG

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: ATV
2nd Reviewer: AC

METHOD: Inorganics, Method See cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	mg/L Found / S (units)	mg/L True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Alkalinity total	254.20	239	106	106	Y
6	Matrix spike sample	Cl-	(SSR-SR) 109.013	125	87.2	83.4	Y
7	Duplicate sample	Cl-	192.9223	197.513	2.4	2.1	Y

Comments: _____

LDC #: 48053AG

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: ATL
2nd reviewer: A

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?
(Y) N N/A Are all detection limits below the CRQL?

Compound (analyte) results for Fe reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{raw + 0.00559}{0.10248}$

Recalculation: #2 $\frac{0.201 + 0.00559}{0.10248} = 2.0159 \approx 2.0$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	1	NO3	2.6	2.6	Y
	1	Alkalinity Total	63.8	63.8	↓
	1	NO3/NO2-N	0.66	0.66	
	1	Fe 2+	ND	ND	
	1	TOC	0.16	0.19	
	2	Cl-	42.4	42.5	
	2	Alkalinity Bicarbonate	185	185	
	2	NO3/NO2-N	ND	ND	
	2	Fe 2+	2.0	2.0	
	2	TOC	3.5	3.5	↓

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 22, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C & D

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1038	BA10157	Water	04/23/20
ERH1039**	BA10158**	Water	04/23/20
ERH1040	BA10159	Water	04/23/20
ERH1043	BA10160	Water	04/22/20
ERH1044**	BA10161**	Water	04/22/20
ERH1045	BA10162	Water	04/22/20
ERH1064	BA10163	Water	04/23/20
ERH1065	BA10164	Water	04/23/20
ERH1073	BA10165	Water	04/22/20
ERH1074**	BA10166**	Water	04/22/20
ERH1075	BA10167	Water	04/23/20
ERH1076	BA10168	Water	04/23/20
ERH1039MS	BA10158MS	Water	04/23/20
ERH1039MSD	BA10158MSD	Water	04/23/20
ERH1074MS	BA10166MS	Water	04/22/20
ERH1074MSD	BA10166MSD	Water	04/22/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

Where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1038, ERH1043, ERH1064, ERH1073, and ERH1075 were identified as trip blanks. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples ERH1039** and ERH1040 and samples ERH1044** and ERH1045 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1044**	ERH1045	
Gasoline range organics	49	63	25 (≤50)

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

LDC #: 48053A7
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 1 of 2
Reviewer: CF
2nd Reviewer: AC

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A / A	RSD≤20%. r² RF≥20%
IV.	Continuing calibration	A	CCV≤20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB=1, 4, 7, 9, 11. EB=ERH1068(9:9H)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D=2+3. 5+6
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XIII.	Target compound identification	A	Not reviewed for Level C validation
XIV.	System performance	A	Not reviewed for Level C validation
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1038**	BA10157 **	Water	04/23/20
2	ERH1039**	BA10158**	Water	04/23/20
3	ERH1040	BA10159	Water	04/23/20
4	ERH1043	BA10160	Water	04/22/20
5	ERH1044 **	BA10161 **	Water	04/22/20
6	ERH1045	BA10162	Water	04/22/20
7	ERH1064	BA10163	Water	04/23/20
8	ERH1065	BA10164	Water	04/23/20
9	ERH1073	BA10165	Water	04/22/20
10	ERH1074 **	BA10166 **	Water	04/22/20
11	ERH1075	BA10167	Water	04/23/20
12	ERH1076	BA10168	Water	04/23/20
13	ERH1039MS	BA10158MS	Water	04/23/20
14	ERH1039MSD	BA10158MSD	Water	04/23/20

LDC #: 48053A7
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/20/20

Reviewer:
2nd Reviewer:

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

	Client ID	Lab ID	Matrix	Date
15	ERH1074MS	BA10166MS	Water	04/22/20
16	ERH1074MSD	BA10166MSD	Water	04/22/20
17				
18				
19				
20				

Notes:

LDC #: 43053A7

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: 1C

Method: √ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	√			
Was cooler temperature criteria met?	√			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	√			
Were all percent relative standard deviations (%RSD) ≤ 20%?	√			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?	√			
Were the RT windows properly established?	√			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	√			
Were all percent differences (%D) ≤ 20%?	√			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	√			
Were all percent differences (%D) ≤ 20%?	√			
Were all the retention times within the acceptance windows?	√			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	√			
Was a laboratory blank analyzed for each matrix and concentration?	√			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation findings worksheet.	Ø	√		
V. Field Blanks				
Were field blanks identified in this SDG?	√			
Were target compounds detected in the field blanks?		√		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	√			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			√	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			√	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?	√			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	√			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	√			

LDC #: 18053A7

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: AL

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC#:48053A7 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Page: 1 of 1
Reviewer: CD
2nd Reviewer: AC

METHOD: GRO (EPA SW 846 Method 8260B)

Compound	Concentration (ug/L)		RPD (≤50)
	5	6	
GRO	49	63	25

LDC#: 19053A7

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: AC

Method: GC

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
4/24/2020	Thor	16 - C10	s1	11.407924	0.8
			s2	11.82719899	2.0
			s3	12.21594602	4.0
			s4	14.10511346	12.0
			s5	19.53241091	24.0
			s6	22.18670244	32.0
			s7	24.63776825	40.0

Regression Output

		Reported
Constant	*10.868558*	*10.90000*
Std Err of Y Est		
R Squared	*0.993*	*0.993000*
Degrees of Freedom		
X Coefficient(s)	*0.346979*	*0.34700*
Std Err of Coef.		
Correlation Coefficient	*0.996734*	
Coefficient of Determination (r^2)	*0.993478*	*0.993000*

LDC #: 48053AT

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC / HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	042TT15	4/27/20	ERV	300	309.87	309.87	3.3	3.3
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: [illegible]

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: / **GC** __ **HPLC**

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
BFB		25.00	24.22	~~98.9~~ 96.9	96.9	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 48853A7

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

METHOD: 1 **GC** __ **HPLC**

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 13/14

Compound	Spike Added (ug/L)		Sample Conc. (ug/L)	Spike Sample Concentration (ug/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	300	300	ND	279	287	93.0	93.0	95.7	95.7	2.8	2.8
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #48053A7

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

RPD = I SSCLCS - SSCLCSD I * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 200427W

Compound	Spike Added (µL)		Spiked Sample Concentration (µL)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	300	300	256	298	85.3	85.3	99.3	99.3	15.2	15.2
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A7

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 6 of 1
Reviewer: 9
2nd Reviewer: AC

METHOD: / GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 5 Compound Name 4RD

Concentration = $\frac{(6119084)(25.0)}{(6115330879)(0.346979)}$

$= 48.7$ µg/L

#	Sample ID	Compound	Reported Concentrations (µg/L)	Recalculated Results Concentrations ( )	Qualifications
	5	4RD	49		

Comments: _____

SAMPCAL.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: July 2, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1039**	BA10158**	Water	04/23/20
ERH1039RE**	BA10158RE**	Water	04/23/20
ERH1040	BA10159	Water	04/23/20
ERH1040RE	BA10159RE	Water	04/23/20
ERH1044**	BA10161**	Water	04/22/20
ERH1044RE**	BA10161RE**	Water	04/22/20
ERH1045	BA10162	Water	04/22/20
ERH1045RE	BA10162RE	Water	04/22/20
ERH1065	BA10164	Water	04/23/20
ERH1065RE	BA10164RE	Water	04/23/20
ERH1074**	BA10166**	Water	04/22/20
ERH1074RE**	BA10166RE**	Water	04/22/20
ERH1076	BA10168	Water	04/23/20
ERH1076RE	BA10168RE	Water	04/23/20
ERH1044(SGCU)**	BA10161(SGCU)**	Water	04/22/20
ERH1044(SGCU)RE**	BA10161(SGCU)RE**	Water	04/22/20
ERH1045(SGCU)	BA10162(SGCU)	Water	04/22/20
ERH1045(SGCU)RE	BA10162(SGCU)RE	Water	04/22/20
ERH1039MS	BA10158MS	Water	04/23/20
ERH1039MSD	BA10158MSD	Water	04/23/20
ERH1039REMS	BA10158REMS	Water	04/23/20
ERH1039REMSD	BA10158REMSD	Water	04/23/20
ERH1074MS	BA10166MS	Water	04/22/20
ERH1074MSD	BA10166MSD	Water	04/22/20
ERH1074REMS	BA10166REMS	Water	04/22/20
ERH1074REMSD	BA10166REMSD	Water	04/22/20

**Indicates sample underwent Level D validation
Samples ending in "SGCU" underwent Silica Gel cleanup

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
ERH1039RE** ERH1040RE ERH1065RE	All compounds	8	7	J (all detects) UJ (all non-detects)	A
ERH1044RE** ERH1045RE ERH1074RE** ERH1076RE ERH1044(SGCU)RE** ERH1045(SGCU)RE	All compounds	9	7	J (all detects) UJ (all non-detects)	A

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1068, ERH1068RE, ERH1068(SGCU), and ERH1068(SGCU)RE (all from SDG 91941) were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Limit of Quantitation	Associated Samples
ERH1068RE	04/20/20	Diesel (C10-C24)	150 ug/L	320 ug/L	ERH1074** ERH1074RE** ERH1076 ERH1076RE

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Limit of Quantitation	Modified Final Concentration
ERH1074**	Diesel (C10-C24)	160 ug/L	320 ug/L	160 U ug/L
ERH1074RE**	Diesel (C10-C24)	170 ug/L	320 ug/L	170U ug/L
ERH1076	Diesel (C10-C24)	200 ug/L	320 ug/L	200U ug/L
ERH1076RE	Diesel (C10-C24)	190 ug/L	320 ug/L	190U ug/L

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
ERH1039MS/MSD (ERH1039**)	Oil (C24-C40)	-	117 (41-113)	NA	-
ERH1074MS/MSD (ERH1074**)	Oil (C24-C40)	122 (41-113)	-	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
ERH1039MS/MSD (ERH1039**)	Oil (C24-C40)	40.6 (≤30)	NA	-
ERH1039MS/MSD (ERH1039**)	Diesel (C10-C24)	43.0 (≤30)	J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
200427	Diesel (C10-C24)	142 (36-132)	ERH1039** ERH1040 ERH1044** ERH1045 ERH1065 ERH1074** ERH1076	J (all detects)	P
200427	Oil (C24-C40)	127 (41-113)	ERH1044** ERH1045	J (all detects)	P
200427	Oil (C24-C40)	127 (41-113)	ERH1039** ERH1040 ERH1065 ERH1074** ERH1076	NA	-

IX. Field Duplicates

Samples ERH1039** and ERH1040, samples ERH1039RE** and ERH1040RE, samples ERH1044** and ERH1045, samples ERH1044RE** and ERH1045RE, samples ERH1044(SGCU)** and ERH1045(SGCU), and samples ERH1044(SGCU)RE** and ERH1045(SGCU)RE were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1039**	ERH1040	
Diesel (C10-C24)	180J	280	43 (≤50)

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1039RE**	ERH1040RE	
Diesel (C10-C24)	180J	300U	200 (≤50)

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1044**	ERH1045	
Diesel (C10-C24)	1700	1500	13 (≤50)
Oil (C24-C40)	260J	290J	11 (≤50)

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1044RE**	ERH1045RE	
Diesel (C10-C24)	1500	1500	0 (≤50)
Oil (C24-C40)	190J	250J	27 (≤50)

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1044(SGCU)**	ERH1045(SGCU)	
Diesel (C10-C24)	350	310J	12 (≤50)

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1044(SGCU)RE**	ERH1045(SGCU)RE	
Diesel (C10-C24)	340	300J	13 (≤50)

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Reason	Flag	A or P
ERH1039RE** ERH1040RE ERH1044RE** ERH1045RE ERH1065RE ERH1074RE** ERH1076RE ERH1044(SGCU)RE** ERH1045(SGCU)RE	All compounds	Extracted outside holding time.	R	A

Due to MS/MSD RPD and LCS %R, data were qualified as estimated in seven samples.

Due to equipment blank contamination, data were qualified as not detected in two samples.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 91991

Sample	Compound	Flag	A or P	Reason (Code)
ERH1039**	Diesel (C10-C24)	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (E)
ERH1039** ERH1040 ERH1044** ERH1045 ERH1065 ERH1074** ERH1076	Diesel (C10-C24)	J (all detects)	P	Laboratory control samples (%R) (L)
ERH1044** ERH1045	Oil (C24-C40)	J (all detects)	P	Laboratory control samples (%R) (L)
ERH1039RE** ERH1040RE ERH1044RE** ERH1045RE ERH1065RE ERH1074RE** ERH1076RE ERH1044(SGCU)RE** ERH1045(SGCU)RE	All compounds	R	A	Overall assessment of data (D)

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 91991

Sample	Compound	Modified Final Concentration	A or P	Code
ERH1074**	Diesel (C10-C24)	160 U ug/L	A	F
ERH1076	Diesel (C10-C24)	200U ug/L	A	F

LDC #: 48053A8
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Initial calibration/ICV	A A	RSD ≤ 20%. ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	SW	FB = ERH1068, RE, ERH1068(SGCU), RE (91941)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SA	LCS
IX.	Field duplicates	SW	D = 1+3, 2+4, 5+7, 6+8, 15+17, 16+18
X.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XI.	Target compound identification	A	Not reviewed for Level C validation
XII.	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1039**	BA10158**	Water	04/23/20
2	ERH1039RX**	BA10158RX**	Water	04/23/20
3	ERH1040	BA10159	Water	04/23/20
4	ERH1040RX	BA10159RX	Water	04/23/20
5	ERH1044 **	BA10161 **	Water	04/22/20
6	ERH1044RX **	BA10161RX **	Water	04/22/20
7	ERH1045	BA10162	Water	04/22/20
8	ERH1045RX	BA10162RX	Water	04/22/20
9	ERH1065	BA10164	Water	04/23/20
10	ERH1065RX	BA10164RX	Water	04/23/20
11	ERH1074 **	BA10166 **	Water	04/22/20
12	ERH1074RX *	BA10166RX **	Water	04/22/20
13	ERH1076	BA10168	Water	04/23/20
14	ERH1076RX	BA10168RX	Water	04/23/20
15	ERH1044(SGCU)**	BA10161(SGCU)**	Water	04/22/20
16	ERH1044(SGCU)RX**	BA10161(SGCU)RX**	Water	04/22/20
17	ERH1045(SGCU)	BA10162(SGCU)	Water	04/22/20

LDC #: 48053A8
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20

Reviewer:
2nd Reviewer:

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

	Client ID	Lab ID	Matrix	Date
18	ERH1045(SGCU)RX	BA10162(SGCU)RX	Water	04/22/20
19	ERH1039MS	BA10158MS	Water	04/23/20
20	ERH1039MSD	BA10158MSD	Water	04/23/20
21	ERH1039RXMS	BA10158RXMS	Water	04/23/20
22	ERH1039RXMSD	BA10158RXMSD	Water	04/23/20
23	ERH1074MS	BA10166MS	Water	04/22/20
24	ERH1074MSD	BA10166MSD	Water	04/22/20
25	ERH1074RXMS	BA10166RXMS	Water	04/22/20
26	ERH1074RXMSD	BA10166RXMSD	Water	04/22/20
27				
28				
29				

Notes:

	200-5TA-Bk						
	200-5TA1-Bk						
	200501A1-Bk						
	200501A2-Bk						

LDC #: 48053A8

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: Q
2nd Reviewer: M

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?		✓		
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation findings worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
VIII. Laboratory control samples	✓			
Was an LCS analyzed for this SDG?				

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 48053A8

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: 9
2nd Reviewer: R

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days (HT=7)	Qualifier
2,4,10	W		4-23-20	5-1-20		8	V/UH/A (H)
6,8,16,18			4-22-20	↓		9	↓
12,14			↓	↓		9	↓
(dets+ND)							

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18053A8

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/HPLC

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 4/20/20
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: 11-14 (F)

Compound	Blank ID	Sample Identification								
ERH1068RE	11	12	13	14						
Diesel (C10-C24)	150	160 U	170 U	200 U	190 U					
LOQ	320									

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: ~~48053A8~~

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: / GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

Y N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y N N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	19/20	Oil (C24-C40)	( )	117 (±113)	( )	1 & ND)	~~Dets/A(E)~~ Q
		↓	( )	( )	40.6 (≤30)	↓	↓ (E)
		Diesel (C10-C24)	( )	( )	43.0 (↓)	(dets)	↓ (E)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	23/24	Oil (C24-C40)	122 (±1-113)	( )	( )	11 (ND)	~~Dets/A(E)~~ Q
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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LDC #: ~~48053A8~~

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: AK

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	2224-TWLCS	Diesel (C10-C24)	142 (36-132)	( )	( )	1,3,5,7,9,11,13 & *lcs	lcs (J)
		Oil (C24-C40)	NT (41-113)	( )	( )	(lcs = 5, 7)	✓
			( )	( )	( )		
			( )	( )	( )	~~*lcs = 1,3,5~~	
			( )	( )	( )		
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LDC#:48053A8 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: TPHE (EPA SW 846 Method 8015B)

Compound	Concentration (ug/L)		RPD (≤50)
	1	3	
Diesel (c10-c24)	180J	280	43

Compound	Concentration (ug/L)		RPD (≤50)
	2	4	
Diesel (c10-c24)	180J	300U	200

Compound	Concentration (ug/L)		RPD (≤50)
	5	7	
Diesel (c10-c24)	1700	1500	13
Oil (C24-C40)	260J	290J	11

Compound	Concentration (ug/L)		RPD (≤50)
	6	8	
Diesel (c10-c24)	1500	1500	0
Oil (C24-C40)	190J	250J	27

Compound	Concentration (ug/L)		RPD (≤50)
	15	17	
Diesel (c10-c24)	350	310J	12

Compound	Concentration (ug/L)		RPD (≤50)
	16	18	
Diesel (c10-c24)	340	300J	13

LDC #: 18053A8

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: 9
2nd Reviewer: A

METHOD: / **GC** __ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	2.4.6.8.10.12.14.	All (HT out)		NR/A (D)
	16.18			

Comments: _____

LDC #: 48053A8

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: AC

METHOD: GC ✓ HPLC _____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (250 std)	Recalculated CF (250 std)	Reported Ave CF (initial)	Recalculated Ave CF (intial)	Reported %RSD	Recalculated %RSD
1	~~CAL~~	3/10/60	Diesel (C10-C24)	1956346	1956346	191612	191612	4	4
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053-A8

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC √ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	424043	4/29/20	Diesel (C10-C24)	191T612	19TT110	19TT110	3.1	3.1
2	424057	4/29/20		191T612	2105090	2105090	9.8	9.8
3	424078	5/1/20		191T612	2034540	2034539	6.1	6.1
4	424154	5/6/20		191T612	219T5T0	219T5T1	15	15
	424165		√	191T612	2162020	2162021	13	13

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 40452A0

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: 9
2nd reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Octacosane		75.0	77.074	103	103	
TPH		↓	56.974	76.0	76	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: ~~48053A8~~

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: SK

METHOD: / GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 23/24

Compound	Spike Added (µL)		Sample Conc. (µL)	Spike Sample Concentration (µL)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	1250	1250	160	1770	1580	124	129	114	114	11.3	11.3
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48038A8

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

RPD = I SSCLCS - SSCLCSD I * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 20042TV

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)	1250	NX	1170	NX	142	142				
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A8

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: 9
2nd Reviewer: AC

METHOD: / **GC** __ **HPLC**

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 1 Compound Name Diesel C10-C24

Concentration = $\frac{(2)(2533150)(2000)(1)}{(191612)(800)(2)}$

$= 177.6$ µg/L

#	Sample ID	Compound	Reported Concentrations (µg/L)	Recalculated Results Concentrations ( )	Qualifications
	1	C10-C24	180		

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 22, 2020

Parameters: Ethylene Dibromide

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1073	BA10165	Water	04/22/20
ERH1074**	BA10166**	Water	04/22/20
ERH1075	BA10167	Water	04/23/20
ERH1076	BA10168	Water	04/23/20
ERH1074MS	BA10166MS	Water	04/22/20
ERH1074MSD	BA10166MSD	Water	04/22/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Ethylene Dibromide by Environmental Protection Agency (EPA) SW 846 Method 8011

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

Where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1073 and ERH1075 were identified as trip blanks. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XI. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Field Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

LDC #: 48053A10
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/21/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Ethylene Dibromide (EPA SW846 Method 8011)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Initial calibration/ICV	A/A	RSD≤ 20%, r² ICV≤20%
III.	Continuing calibration	A	CCV≤20%
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB=1.3, EB=ERH1068(9.94)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
XI.	Target compound identification	A	Not reviewed for Level C validation
XII	Overall assessment of data	A	

Note: A = Acceptable; ND = No compounds detected; D = Duplicate; SB=Source blank
N = Not provided/applicable; R = Rinsate; TB = Trip blank; OTHER:
SW = See worksheet; FB = Field blank; EB = Equipment blank

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1073	BA10165	Water	04/22/20
2	ERH1074 **	BA10166 **	Water	04/22/20
3	ERH1075	BA10167	Water	04/23/20
4	ERH1076	BA10168	Water	04/23/20
5	ERH1074MS	BA10166MS	Water	04/22/20
6	ERH1074MSD	BA10166MSD	Water	04/22/20
7				
8				
9				
10				
11				
12				

Notes:

LDC #: 43053A10

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: AC

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation findings worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 48053A10

VALIDATION FINDINGS CHECKLIST

Reviewer: CP
2nd Reviewer: AC

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: ~~48033A10~~

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: (of 1
Reviewer: 9
2nd Reviewer: 9

METHOD: GC / HPLC _____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (0.25 std)	Recalculated CF (0.25 std)	Reported Ave CF (initial)	Recalculated Ave CF (intial)	Reported %RSD	Recalculated %RSD
1	KAZ	4/27/20	EDB (DB-35MS)	834866	834866	840726	840726	9.2	9.2
			EDB (DB-XLB)	4218204	4218204	4248574	4248574	7.8	7.8
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43053A10

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: 9

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	0415/02B	4/29/20	ZBD (DB-35MS)	840726	819916	819916	2.5	2.5
			ZBD (DB-XLB)	4248574	4170580	4170580	1.8	1.8
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 40523A1V

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: 9
2nd reviewer: AK

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
1,3-DCB	DB-35MS	0.250	~~0.254~~	101	101	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #48053A10

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 4

METHOD: / GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 5/6

Compound	Spike Added (µg/L)		Sample Conc. (µg/L)	Spike Sample Concentration (µg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
EDB	0.250	0.250	ND	0.246	0.241	98.4	98.4	96.4	96.4	2.1	2

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A10

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: 9
2nd Reviewer: DC

METHOD: / GC __HPLC

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

RPD = I SSCLCS - SSCLCSD I * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 20243TW

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
2DB	0.250	0.250	0.240	0.242	96.0	96.0	96.8	96.8	0.83	0.83

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A10

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: R
2nd Reviewer: M

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. NTO 200427-LCS Compound Name EDB

Concentration = $\frac{(403621)(1)}{(840726)(2)}$

= 0.240 µg/L

#	Sample ID	Compound	Reported Concentrations (µg/L)	Recalculated Results Concentrations ( )	Qualifications
	2LCS	EDB	0.240		

Comments: _____

LDC Report# 48053A51

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 22, 2020

Parameters: Methane

Validation Level: Level C & D

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91991

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1038	BA10157	Water	04/23/20
ERH1039**	BA10158**	Water	04/23/20
ERH1043	BA10160	Water	04/22/20
ERH1044**	BA10161**	Water	04/22/20
ERH1044DL**	BA10161DL**	Water	04/22/20
ERH1064	BA10163	Water	04/23/20
ERH1065	BA10164	Water	04/23/20
ERH1073	BA10165	Water	04/22/20
ERH1074**	BA10166**	Water	04/22/20
ERH1075	BA10167	Water	04/23/20
ERH1076	BA10168	Water	04/23/20
ERH1039MS	BA10158MS	Water	04/23/20
ERH1039MSD	BA10158MSD	Water	04/23/20

**Indicates sample underwent Level D validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level D data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

Retention time windows were established as required by the method for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

Retention times in the calibration standards were within the established retention time windows for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1038, ERH1043, ERH1064, ERH1073, and ERH1075 were identified as trip blanks. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

X. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Level D validation. Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Reason	Flag	A or P
ERH1044**	Methane	Results exceeded calibration range.	R	A

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 91991

Sample	Compound	Flag	A or P	Reason (Code)
ERH1044**	Methane	R	A	Overall assessment of data (D)

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 91991

No Sample Data Qualified in this SDG

LDC #: 48053A51
SDG #: 91991
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C/D

Date: 5/1/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Initial calibration/ICV	A A	r^2 ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB=1.3.6.8,10
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level C validation
X.	Target compound identification	A	Not reviewed for Level C validation
XI.	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level D validation

	Client ID	Lab ID	Matrix	Date
1	ERH1038	BA10157	Water	04/23/20
2	ERH1039**	BA10158**	Water	04/23/20
3	ERH1043	BA10160	Water	04/22/20
4	ERH1044 **	BA10161 **	Water	04/22/20
5	ERH1044DL **	BA10161DL **	Water	04/22/20
6	ERH1064	BA10163	Water	04/23/20
7	ERH1065	BA10164	Water	04/23/20
8	ERH1073	BA10165	Water	04/22/20
9	ERH1074 **	BA10166 **	Water	04/22/20
10	ERH1075	BA10167	Water	04/23/20
11	ERH1076	BA10168	Water	04/23/20
12	ERH1039MS	BA10158MS	Water	04/23/20
13	ERH1039MSD	BA10158MSD	Water	04/23/20
14				
15				

Notes:

LDC #: 48053A5/

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: M

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation findings worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?			✓	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 48053A5/

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: M

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: ~~48053A5~~

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: 9
2nd Reviewer: N

METHOD: / **GC** __ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	+	All > calib range		NR/A (D)

Comments: _____

LDC#: 40053A5

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: AC

Method: GC

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
3/11/2020	GA	Methane	s1	30923	2.08
			s2	32807	4.16
			s3	56629	8.34
			s4	178225	20.85
			s5	837925	83.4
			s6	1927571	208.5
			s7	6109561	834.0

Regression Output		***Reported***
Constant	*97452.177422*	*97500*
Std Err of Y Est		
R Squared	*0.995*	*0.995000*
Degrees of Freedom		
X Coefficient(s)	*7311.854303*	*7310*
Std Err of Coef.		
Correlation Coefficient	*0.997492*	
Coefficient of Determination (r^2)	*0.994991*	*0.995000*

LDC #: 48053A5/

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: 9

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	04-28 R04	4/28/20	Methane	83.40	85.931	85.95	3.0	3.0
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A5

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: AC

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SA = Spike added; MS = Matrix spike; SC = Sample concentration; MSD = Matrix spike duplicate

MS/MSD samples: 12/13

Compound	Spike Added (µg/L)		Sample Conc. (µg/L)	Spike Sample Concentration (µg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)	83.4	83.4	ND	101	101	121	121	121	121	0.0	0.0
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48053A5/

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: 1
2nd Reviewer: A

METHOD: / GC __HPLC

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

RPD = I SSCLCS - SSCLCSD I * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 200428W

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)	83.4	83.4	85.9	87.4	103	103	105	105	1.7	1.7
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 48033A5/

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: DC

METHOD: / **GC** __ **HPLC**

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 5 Compound Name Methane

Concentration = $\frac{(2560914 - 97500)(20)}{(7310)}$

$= 6740$ µL

#	Sample ID	Compound	Reported Concentrations (µL)	Recalculated Results Concentrations ( )	Qualifications
	5	Methane	6700		

Comments: _____

SAMPCAL.wpd

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **2320B**													
ERH1039	BA10158	1	ALKALINITY, TOTAL (AS CACO3)	4/23/2020 8:45:00 AM	4/28/2020 8:34:00 PM	D	63.8	MG_L		2.0	1.70	J	e
ERH1039	BA10158	1	BICARBONATE	4/23/2020 8:45:00 AM	4/28/2020 8:34:00 PM	D	63.8	MG_L		2.0	1.70	J	e
ERH1039	BA10158	1	CARBONATE (AS CO3)	4/23/2020 8:45:00 AM	4/28/2020 8:34:00 PM	D	1.70	MG_L	U	2.0	1.70	U	
ERH1044	BA10161	1	ALKALINITY, TOTAL (AS CACO3)	4/22/2020 3:10:00 PM	4/27/2020 4:45:00 PM	D	185	MG_L		2.0	1.70		
ERH1044	BA10161	1	BICARBONATE	4/22/2020 3:10:00 PM	4/27/2020 4:45:00 PM	D	185	MG_L		2.0	1.70		
ERH1044	BA10161	1	CARBONATE (AS CO3)	4/22/2020 3:10:00 PM	4/27/2020 4:45:00 PM	D	1.70	MG_L	U	2.0	1.70	U	
ERH1065	BA10164	1	ALKALINITY, TOTAL (AS CACO3)	4/23/2020 9:50:00 AM	4/27/2020 4:53:00 PM	C	53.0	MG_L		2.0	1.70		
ERH1065	BA10164	1	BICARBONATE	4/23/2020 9:50:00 AM	4/27/2020 4:53:00 PM	C	53.0	MG_L		2.0	1.70		
ERH1065	BA10164	1	CARBONATE (AS CO3)	4/23/2020 9:50:00 AM	4/27/2020 4:53:00 PM	C	1.70	MG_L	U	2.0	1.70	U	
ERH1074	BA10166	1	ALKALINITY, TOTAL (AS CACO3)	4/22/2020 8:46:00 AM	4/28/2020 9:11:00 PM	C	64.1	MG_L		2.0	1.70		
ERH1074	BA10166	1	BICARBONATE	4/22/2020 8:46:00 AM	4/28/2020 9:11:00 PM	C	64.1	MG_L		2.0	1.70		
ERH1074	BA10166	1	CARBONATE (AS CO3)	4/22/2020 8:46:00 AM	4/28/2020 9:11:00 PM	C	1.70	MG_L	U	2.0	1.70	U	
ERH1076	BA10168	1	ALKALINITY, TOTAL (AS CACO3)	4/23/2020 9:12:00 AM	4/27/2020 5:02:00 PM	C	73.1	MG_L		2.0	1.70		
ERH1076	BA10168	1	BICARBONATE	4/23/2020 9:12:00 AM	4/27/2020 5:02:00 PM	C	73.1	MG_L		2.0	1.70		
ERH1076	BA10168	1	CARBONATE (AS CO3)	4/23/2020 9:12:00 AM	4/27/2020 5:02:00 PM	C	1.70	MG_L	U	2.0	1.70	U	
METHOD: **300.0**													
ERH1039	BA10158	5	CHLORIDE (AS CL)	4/23/2020 8:45:00 AM	4/27/2020 5:06:00 PM	D	88.5	MG_L	D	5.0	1.00	J	q
ERH1039	BA10158	1	NITRATE AS NO3 (ANION)	4/23/2020 8:45:00 AM	4/24/2020 3:23:00 PM	D	2.6	MG_L		0.5	0.18		
ERH1039	BA10158	1	SULFATE (AS SO4)	4/23/2020 8:45:00 AM	4/24/2020 3:23:00 PM	D	16.0	MG_L		1.0	0.20		
ERH1044	BA10161	1	CHLORIDE (AS CL)	4/22/2020 3:10:00 PM	4/24/2020 2:48:00 PM	D	42.4	MG_L		1.0	0.20		
ERH1044	BA10161	1	NITRATE AS NO3 (ANION)	4/22/2020 3:10:00 PM	4/24/2020 2:48:00 PM	D	0.18	MG_L	U	0.5	0.18	U	
ERH1044	BA10161	1	SULFATE (AS SO4)	4/22/2020 3:10:00 PM	4/24/2020 2:48:00 PM	D	0.92	MG_L	J	1.0	0.20	J	
ERH1065	BA10164	5	CHLORIDE (AS CL)	4/23/2020 9:50:00 AM	4/27/2020 5:58:00 PM	C	85.8	MG_L	D	5.0	1.00		
ERH1065	BA10164	1	NITRATE AS NO3 (ANION)	4/23/2020 9:50:00 AM	4/24/2020 3:05:00 PM	C	0.83	MG_L		0.5	0.18		
ERH1065	BA10164	1	SULFATE (AS SO4)	4/23/2020 9:50:00 AM	4/24/2020 3:05:00 PM	C	26.9	MG_L		1.0	0.20		

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **300.0**													
ERH1074	BA10166	5	CHLORIDE (AS CL)	4/22/2020 8:46:00 AM	4/27/2020 6:15:00 PM	C	53.4	MG_L	D	5.0	1.00		
ERH1074	BA10166	1	NITRATE AS NO3 (ANION)	4/22/2020 8:46:00 AM	4/24/2020 2:31:00 PM	C	1.8	MG_L		0.5	0.18	J	h
ERH1074	BA10166	1	SULFATE (AS SO4)	4/22/2020 8:46:00 AM	4/24/2020 2:31:00 PM	C	9.7	MG_L		1.0	0.20		
ERH1076	BA10168	1	CHLORIDE (AS CL)	4/23/2020 9:12:00 AM	4/24/2020 3:40:00 PM	C	48.5	MG_L		1.0	0.20		
ERH1076	BA10168	1	NITRATE AS NO3 (ANION)	4/23/2020 9:12:00 AM	4/24/2020 3:40:00 PM	C	2.0	MG_L		0.5	0.18		
ERH1076	BA10168	1	SULFATE (AS SO4)	4/23/2020 9:12:00 AM	4/24/2020 3:40:00 PM	C	7.5	MG_L		1.0	0.20		
METHOD: **3500-FE-B**													
ERH1039	BA10158	1	Iron, Ion (Fe2+)	4/23/2020 8:45:00 AM	4/24/2020 8:13:00 PM	D	0.32	MG_L	U	1.0	0.32	U	
ERH1044	BA10161	1	Iron, Ion (Fe2+)	4/22/2020 3:10:00 PM	4/24/2020 8:13:00 PM	D	2.0	MG_L		1.0	0.32		
ERH1065	BA10164	1	Iron, Ion (Fe2+)	4/23/2020 9:50:00 AM	4/24/2020 8:14:00 PM	C	2.5	MG_L		1.0	0.32		
ERH1074	BA10166	1	Iron, Ion (Fe2+)	4/22/2020 8:46:00 AM	4/24/2020 8:15:00 PM	C	0.32	MG_L	U	1.0	0.32	U	
ERH1076	BA10168	1	Iron, Ion (Fe2+)	4/23/2020 9:12:00 AM	4/24/2020 8:15:00 PM	C	0.32	MG_L	U	1.0	0.32	U	
METHOD: **353.2**													
ERH1039	BA10158	1	NITROGEN, NITRATE-NITRITE	4/23/2020 8:45:00 AM	4/28/2020 11:35:00 AM	D	0.66	MG_L		0.10	0.090		
ERH1044	BA10161	1	NITROGEN, NITRATE-NITRITE	4/22/2020 3:10:00 PM	4/28/2020 11:36:00 AM	C	0.090	MG_L	U	0.10	0.090	U	
ERH1065	BA10164	1	NITROGEN, NITRATE-NITRITE	4/23/2020 9:50:00 AM	4/28/2020 11:37:00 AM	C	0.23	MG_L		0.10	0.090		
ERH1074	BA10166	1	NITROGEN, NITRATE-NITRITE	4/22/2020 8:46:00 AM	4/28/2020 11:38:00 AM	C	0.43	MG_L		0.10	0.090		
ERH1076	BA10168	1	NITROGEN, NITRATE-NITRITE	4/23/2020 9:12:00 AM	4/28/2020 11:39:00 AM	C	0.48	MG_L		0.10	0.090		
METHOD: **8011**													
ERH1073	BA10165	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	4/22/2020 8:14:00 AM	4/29/2020 10:03:00 AM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1074	BA10166	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	4/22/2020 8:46:00 AM	4/29/2020 11:04:00 AM	D	0.019	UG_L	U	0.02	0.019	U	
ERH1075	BA10167	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	4/23/2020 8:25:00 AM	4/29/2020 11:25:00 AM	C	0.019	UG_L	U	0.02	0.019	U	
ERH1076	BA10168	1	1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	4/23/2020 9:12:00 AM	4/29/2020 11:45:00 AM	C	0.019	UG_L	U	0.02	0.019	U	
METHOD: **8015B_E**													
ERH1039	BA10158	1	C10-C24 DIESEL RANGE ORGANICS	4/23/2020 8:45:00 AM	4/29/2020 2:12:00 PM	D	180	UG_L	J	320	300.0	J	e,l
ERH1039	BA10158	1	C10-C24 DIESEL RANGE ORGANICS	4/23/2020 8:45:00 AM	5/6/2020 3:40:00 PM	D	180	UG_L	J	320	300.0	R	d
ERH1039	BA10158	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/23/2020 8:45:00 AM	5/6/2020 3:40:00 PM	D	300.0	UG_L	U	320	300.0	R	d
ERH1039	BA10158	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/23/2020 8:45:00 AM	4/29/2020 2:12:00 PM	D	300.0	UG_L	U	320	300.0	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8015B_E**													
ERH1040	BA10159	1	C10-C24 DIESEL RANGE ORGANICS	4/23/2020 8:45:00 AM	4/29/2020 2:35:00 PM	C	280	UG_L	J	320	300.0	J	l
ERH1040	BA10159	1	C10-C24 DIESEL RANGE ORGANICS	4/23/2020 8:45:00 AM	5/6/2020 4:03:00 PM	C	300.0	UG_L	U	320	300.0	R	d
ERH1040	BA10159	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/23/2020 8:45:00 AM	5/6/2020 4:03:00 PM	C	300.0	UG_L	U	320	300.0	R	d
ERH1040	BA10159	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/23/2020 8:45:00 AM	4/29/2020 2:35:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1044	BA10161	1	C10-C24 DIESEL RANGE ORG SILICA GEL CLEAN U	4/22/2020 3:10:00 PM	5/1/2020 1:17:00 PM	D	350	UG_L	T6D	320	300.0		
ERH1044	BA10161	1	C10-C24 DIESEL RANGE ORG SILICA GEL CLEAN U	4/22/2020 3:10:00 PM	5/6/2020 8:35:00 PM	D	340	UG_L	T6	320.0	300.00	R	d
ERH1044	BA10161	1	C10-C24 DIESEL RANGE ORGANICS	4/22/2020 3:10:00 PM	5/6/2020 4:25:00 PM	D	1500	UG_L	T6	320	300.0	R	d
ERH1044	BA10161	1	C10-C24 DIESEL RANGE ORGANICS	4/22/2020 3:10:00 PM	4/29/2020 2:57:00 PM	D	1700	UG_L	T6	320	300.0	J	l
ERH1044	BA10161	1	C24-C40 OIL RANGE ORGANICS SILICA GEL CLEAN	4/22/2020 3:10:00 PM	5/1/2020 1:17:00 PM	D	300.0	UG_L	U	320	300.0	U	
ERH1044	BA10161	1	C24-C40 OIL RANGE ORGANICS SILICA GEL CLEAN	4/22/2020 3:10:00 PM	5/6/2020 8:35:00 PM	D	300.00	UG_L	U	320.0	300.00	R	d
ERH1044	BA10161	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/22/2020 3:10:00 PM	4/29/2020 2:57:00 PM	D	260	UG_L	J	320	300.0	J	l
ERH1044	BA10161	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/22/2020 3:10:00 PM	5/6/2020 4:25:00 PM	D	190	UG_L	J	320	300.0	R	d
ERH1045	BA10162	1	C10-C24 DIESEL RANGE ORG SILICA GEL CLEAN U	4/22/2020 3:10:00 PM	5/6/2020 8:58:00 PM	C	300	UG_L	J	320.0	300.00	R	d
ERH1045	BA10162	1	C10-C24 DIESEL RANGE ORG SILICA GEL CLEAN U	4/22/2020 3:10:00 PM	5/1/2020 1:40:00 PM	C	310	UG_L	JD	320	300.0	J	
ERH1045	BA10162	1	C10-C24 DIESEL RANGE ORGANICS	4/22/2020 3:10:00 PM	4/29/2020 3:20:00 PM	C	1500	UG_L	T6	320	300.0	J	l
ERH1045	BA10162	1	C10-C24 DIESEL RANGE ORGANICS	4/22/2020 3:10:00 PM	5/6/2020 4:48:00 PM	C	1500	UG_L	T6	320	300.0	R	d
ERH1045	BA10162	1	C24-C40 OIL RANGE ORGANICS SILICA GEL CLEAN	4/22/2020 3:10:00 PM	5/6/2020 8:58:00 PM	C	300.00	UG_L	U	320.0	300.00	R	d
ERH1045	BA10162	1	C24-C40 OIL RANGE ORGANICS SILICA GEL CLEAN	4/22/2020 3:10:00 PM	5/1/2020 1:40:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1045	BA10162	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/22/2020 3:10:00 PM	5/6/2020 4:48:00 PM	C	250	UG_L	J	320	300.0	R	d
ERH1045	BA10162	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/22/2020 3:10:00 PM	4/29/2020 3:20:00 PM	C	290	UG_L	J	320	300.0	J	l
ERH1065	BA10164	1	C10-C24 DIESEL RANGE ORGANICS	4/23/2020 9:50:00 AM	4/29/2020 3:43:00 PM	C	190	UG_L	J	320	300.0	J	l
ERH1065	BA10164	1	C10-C24 DIESEL RANGE ORGANICS	4/23/2020 9:50:00 AM	5/6/2020 5:11:00 PM	C	160	UG_L	J	320	300.0	R	d
ERH1065	BA10164	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/23/2020 9:50:00 AM	5/6/2020 5:11:00 PM	C	300.0	UG_L	U	320	300.0	R	d
ERH1065	BA10164	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/23/2020 9:50:00 AM	4/29/2020 3:43:00 PM	C	300.0	UG_L	U	320	300.0	U	
ERH1074	BA10166	1	C10-C24 DIESEL RANGE ORGANICS	4/22/2020 8:46:00 AM	4/29/2020 5:14:00 PM	D		UG_L	J	320	160	UJ	f,l
ERH1074	BA10166	1	C10-C24 DIESEL RANGE ORGANICS	4/22/2020 8:46:00 AM	5/6/2020 6:19:00 PM	D	170	UG_L	J	320	300.0	R	d
ERH1074	BA10166	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/22/2020 8:46:00 AM	5/6/2020 6:19:00 PM	D	150	UG_L	J	320	300.0	R	d

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8015B_E**													
ERH1074	BA10166	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/22/2020 8:46:00 AM	4/29/2020 5:14:00 PM	D	300.0	UG_L	U	320	300.0	U	
ERH1076	BA10168	1	C10-C24 DIESEL RANGE ORGANICS	4/23/2020 9:12:00 AM	5/6/2020 7:04:00 PM	C	190	UG_L	J	320	300.0	R	d
ERH1076	BA10168	1	C10-C24 DIESEL RANGE ORGANICS	4/23/2020 9:12:00 AM	4/29/2020 5:36:00 PM	C		UG_L	J	320	200	UJ	f,l
ERH1076	BA10168	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/23/2020 9:12:00 AM	5/6/2020 7:04:00 PM	C	300.0	UG_L	U	320	300.0	R	d
ERH1076	BA10168	1	C24-C40 TOTAL PETROLEUM HYDROCARBONS, OI	4/23/2020 9:12:00 AM	4/29/2020 5:36:00 PM	C	300.0	UG_L	U	320	300.0	U	
METHOD: **8260B**													
ERH1038	BA10157	1	BENZENE	4/23/2020 8:15:00 AM	4/27/2020 5:54:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1038	BA10157	1	ETHYLBENZENE	4/23/2020 8:15:00 AM	4/27/2020 5:54:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1038	BA10157	1	PETROLEUM HYDROCARBONS C6-C10	4/23/2020 8:15:00 AM	4/27/2020 5:53:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1038	BA10157	1	TOLUENE	4/23/2020 8:15:00 AM	4/27/2020 5:54:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1038	BA10157	1	Xylenes	4/23/2020 8:15:00 AM	4/27/2020 5:54:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1039	BA10158	1	BENZENE	4/23/2020 8:45:00 AM	4/27/2020 6:21:00 PM	D	0.30	UG_L	U	1.0	0.30	U	
ERH1039	BA10158	1	ETHYLBENZENE	4/23/2020 8:45:00 AM	4/27/2020 6:21:00 PM	D	0.50	UG_L	U	1.0	0.50	U	
ERH1039	BA10158	1	PETROLEUM HYDROCARBONS C6-C10	4/23/2020 8:45:00 AM	4/27/2020 6:22:00 PM	D	18.0	UG_L	U	20	18.0	U	
ERH1039	BA10158	1	TOLUENE	4/23/2020 8:45:00 AM	4/27/2020 6:21:00 PM	D	0.30	UG_L	U	1.0	0.30	U	
ERH1039	BA10158	1	Xylenes	4/23/2020 8:45:00 AM	4/27/2020 6:21:00 PM	D	0.30	UG_L	U	2.0	0.30	U	
ERH1040	BA10159	1	BENZENE	4/23/2020 8:45:00 AM	4/27/2020 6:49:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1040	BA10159	1	ETHYLBENZENE	4/23/2020 8:45:00 AM	4/27/2020 6:49:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1040	BA10159	1	PETROLEUM HYDROCARBONS C6-C10	4/23/2020 8:45:00 AM	4/27/2020 6:50:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1040	BA10159	1	TOLUENE	4/23/2020 8:45:00 AM	4/27/2020 6:49:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1040	BA10159	1	Xylenes	4/23/2020 8:45:00 AM	4/27/2020 6:49:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1043	BA10160	1	BENZENE	4/22/2020 2:50:00 PM	4/27/2020 7:16:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1043	BA10160	1	ETHYLBENZENE	4/22/2020 2:50:00 PM	4/27/2020 7:16:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1043	BA10160	1	PETROLEUM HYDROCARBONS C6-C10	4/22/2020 2:50:00 PM	4/27/2020 7:17:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1043	BA10160	1	TOLUENE	4/22/2020 2:50:00 PM	4/27/2020 7:16:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1043	BA10160	1	Xylenes	4/22/2020 2:50:00 PM	4/27/2020 7:16:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1044	BA10161	1	BENZENE	4/22/2020 3:10:00 PM	4/27/2020 7:45:00 PM	D	0.30	UG_L	U	1.0	0.30	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8260B**													
ERH1044	BA10161	1	ETHYLBENZENE	4/22/2020 3:10:00 PM	4/27/2020 7:45:00 PM	D	0.50	UG_L	U	1.0	0.50	U	
ERH1044	BA10161	1	PETROLEUM HYDROCARBONS C6-C10	4/22/2020 3:10:00 PM	4/27/2020 7:44:00 PM	D	49	UG_L	G3	20	18.0		
ERH1044	BA10161	1	TOLUENE	4/22/2020 3:10:00 PM	4/27/2020 7:45:00 PM	D	0.30	UG_L	U	1.0	0.30	U	
ERH1044	BA10161	1	Xylenes	4/22/2020 3:10:00 PM	4/27/2020 7:45:00 PM	D	0.30	UG_L	U	2.0	0.30	U	
ERH1045	BA10162	1	BENZENE	4/22/2020 3:10:00 PM	4/27/2020 8:13:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1045	BA10162	1	ETHYLBENZENE	4/22/2020 3:10:00 PM	4/27/2020 8:13:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1045	BA10162	1	PETROLEUM HYDROCARBONS C6-C10	4/22/2020 3:10:00 PM	4/27/2020 8:12:00 PM	C	63	UG_L	G3	20	18.0		
ERH1045	BA10162	1	TOLUENE	4/22/2020 3:10:00 PM	4/27/2020 8:13:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1045	BA10162	1	Xylenes	4/22/2020 3:10:00 PM	4/27/2020 8:13:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1064	BA10163	1	BENZENE	4/23/2020 8:30:00 AM	4/27/2020 8:40:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1064	BA10163	1	ETHYLBENZENE	4/23/2020 8:30:00 AM	4/27/2020 8:40:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1064	BA10163	1	PETROLEUM HYDROCARBONS C6-C10	4/23/2020 8:30:00 AM	4/27/2020 8:41:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1064	BA10163	1	TOLUENE	4/23/2020 8:30:00 AM	4/27/2020 8:40:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1064	BA10163	1	Xylenes	4/23/2020 8:30:00 AM	4/27/2020 8:40:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1065	BA10164	1	BENZENE	4/23/2020 9:50:00 AM	4/27/2020 9:08:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1065	BA10164	1	ETHYLBENZENE	4/23/2020 9:50:00 AM	4/27/2020 9:08:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1065	BA10164	1	PETROLEUM HYDROCARBONS C6-C10	4/23/2020 9:50:00 AM	4/27/2020 9:09:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1065	BA10164	1	TOLUENE	4/23/2020 9:50:00 AM	4/27/2020 9:08:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1065	BA10164	1	Xylenes	4/23/2020 9:50:00 AM	4/27/2020 9:08:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1073	BA10165	1	1,2-DICHLOROETHANE	4/22/2020 8:14:00 AM	4/27/2020 9:36:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1073	BA10165	1	BENZENE	4/22/2020 8:14:00 AM	4/27/2020 9:36:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1073	BA10165	1	ETHYLBENZENE	4/22/2020 8:14:00 AM	4/27/2020 9:36:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1073	BA10165	1	PETROLEUM HYDROCARBONS C6-C10	4/22/2020 8:14:00 AM	4/27/2020 9:37:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1073	BA10165	1	TOLUENE	4/22/2020 8:14:00 AM	4/27/2020 9:36:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1073	BA10165	1	Xylenes	4/22/2020 8:14:00 AM	4/27/2020 9:36:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1074	BA10166	1	1,2-DICHLOROETHANE	4/22/2020 8:46:00 AM	4/27/2020 10:04:00 PM	D	0.30	UG_L	U	1.0	0.30	U	
ERH1074	BA10166	1	BENZENE	4/22/2020 8:46:00 AM	4/27/2020 10:04:00 PM	D	0.30	UG_L	U	1.0	0.30	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8260B**													
ERH1074	BA10166	1	ETHYLBENZENE	4/22/2020 8:46:00 AM	4/27/2020 10:04:00 PM	D	0.50	UG_L	U	1.0	0.50	U	
ERH1074	BA10166	1	PETROLEUM HYDROCARBONS C6-C10	4/22/2020 8:46:00 AM	4/27/2020 10:05:00 PM	D	18.0	UG_L	U	20	18.0	U	
ERH1074	BA10166	1	TOLUENE	4/22/2020 8:46:00 AM	4/27/2020 10:04:00 PM	D	0.30	UG_L	U	1.0	0.30	U	
ERH1074	BA10166	1	Xylenes	4/22/2020 8:46:00 AM	4/27/2020 10:04:00 PM	D	0.30	UG_L	U	2.0	0.30	U	
ERH1075	BA10167	1	1,2-DICHLOROETHANE	4/23/2020 8:25:00 AM	4/27/2020 10:32:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1075	BA10167	1	BENZENE	4/23/2020 8:25:00 AM	4/27/2020 10:32:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1075	BA10167	1	ETHYLBENZENE	4/23/2020 8:25:00 AM	4/27/2020 10:32:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1075	BA10167	1	PETROLEUM HYDROCARBONS C6-C10	4/23/2020 8:25:00 AM	4/27/2020 10:33:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1075	BA10167	1	TOLUENE	4/23/2020 8:25:00 AM	4/27/2020 10:32:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1075	BA10167	1	Xylenes	4/23/2020 8:25:00 AM	4/27/2020 10:32:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
ERH1076	BA10168	1	1,2-DICHLOROETHANE	4/23/2020 9:12:00 AM	4/27/2020 11:01:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1076	BA10168	1	BENZENE	4/23/2020 9:12:00 AM	4/27/2020 11:01:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1076	BA10168	1	ETHYLBENZENE	4/23/2020 9:12:00 AM	4/27/2020 11:01:00 PM	C	0.50	UG_L	U	1.0	0.50	U	
ERH1076	BA10168	1	PETROLEUM HYDROCARBONS C6-C10	4/23/2020 9:12:00 AM	4/27/2020 11:00:00 PM	C	18.0	UG_L	U	20	18.0	U	
ERH1076	BA10168	1	TOLUENE	4/23/2020 9:12:00 AM	4/27/2020 11:01:00 PM	C	0.30	UG_L	U	1.0	0.30	U	
ERH1076	BA10168	1	Xylenes	4/23/2020 9:12:00 AM	4/27/2020 11:01:00 PM	C	0.30	UG_L	U	2.0	0.30	U	
METHOD: **8270D**													
ERH1039	BA10158	1	2-(2-METHOXY ETHOXY)-ETHANOL	4/23/2020 8:45:00 AM	5/1/2020 5:02:00 PM	D	80.0	UG_L	U	100	80.0	U	
ERH1039	BA10158	1	PHENOL	4/23/2020 8:45:00 AM	4/30/2020 10:03:00 PM	D	4.00	UG_L	U	5.0	4.00	U	
ERH1040	BA10159	1	2-(2-METHOXY ETHOXY)-ETHANOL	4/23/2020 8:45:00 AM	5/1/2020 5:26:00 PM	C	80.0	UG_L	U	100	80.0	U	
ERH1040	BA10159	1	PHENOL	4/23/2020 8:45:00 AM	4/30/2020 10:32:00 PM	C	4.00	UG_L	U	5.0	4.00	U	
ERH1044	BA10161	1	2-(2-METHOXY ETHOXY)-ETHANOL	4/22/2020 3:10:00 PM	5/1/2020 5:50:00 PM	D	80.0	UG_L	U	100	80.0	U	
ERH1044	BA10161	1	PHENOL	4/22/2020 3:10:00 PM	4/30/2020 11:00:00 PM	D	4.00	UG_L	U	5.0	4.00	U	
ERH1045	BA10162	1	2-(2-METHOXY ETHOXY)-ETHANOL	4/22/2020 3:10:00 PM	5/1/2020 6:15:00 PM	C	80.0	UG_L	U	100	80.0	U	
ERH1045	BA10162	1	PHENOL	4/22/2020 3:10:00 PM	4/30/2020 11:29:00 PM	C	4.00	UG_L	U	5.0	4.00	U	
ERH1065	BA10164	1	2-(2-METHOXY ETHOXY)-ETHANOL	4/23/2020 9:50:00 AM	5/1/2020 6:39:00 PM	C	80.0	UG_L	U	100	80.0	U	
ERH1065	BA10164	1	PHENOL	4/23/2020 9:50:00 AM	4/30/2020 11:57:00 PM	C	4.00	UG_L	U	5.0	4.00	U	

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **8270D**													
ERH1074	BA10166	1	2-(2-METHOXY ETHOXY)-ETHANOL	4/22/2020 8:46:00 AM	5/1/2020 7:04:00 PM	D	80.0	UG_L	U	100	80.0	U	
ERH1074	BA10166	1	PHENOL	4/22/2020 8:46:00 AM	5/1/2020 1:23:00 AM	D	4.00	UG_L	U	5.0	4.00	U	
ERH1076	BA10168	1	2-(2-METHOXY ETHOXY)-ETHANOL	4/23/2020 9:12:00 AM	5/1/2020 7:28:00 PM	C	80.0	UG_L	U	100	80.0	U	
ERH1076	BA10168	1	PHENOL	4/23/2020 9:12:00 AM	5/1/2020 1:51:00 AM	C	4.00	UG_L	U	5.0	4.00	U	
METHOD: **8270DSIM**													
ERH1039	BA10158	1	1-METHYLNAPHTHALENE	4/23/2020 8:45:00 AM	4/30/2020 4:19:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
ERH1039	BA10158	1	2-METHYLNAPHTHALENE	4/23/2020 8:45:00 AM	4/30/2020 4:19:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
ERH1039	BA10158	1	NAPHTHALENE	4/23/2020 8:45:00 AM	4/30/2020 4:19:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
ERH1040	BA10159	1	1-METHYLNAPHTHALENE	4/23/2020 8:45:00 AM	4/30/2020 4:41:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1040	BA10159	1	2-METHYLNAPHTHALENE	4/23/2020 8:45:00 AM	4/30/2020 4:41:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1040	BA10159	1	NAPHTHALENE	4/23/2020 8:45:00 AM	4/30/2020 4:41:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1044	BA10161	1	1-METHYLNAPHTHALENE	4/22/2020 3:10:00 PM	4/30/2020 5:04:00 PM	D	13	UG_L		0.2	0.10		
ERH1044	BA10161	1	2-METHYLNAPHTHALENE	4/22/2020 3:10:00 PM	4/30/2020 5:04:00 PM	D	12	UG_L		0.2	0.10		
ERH1044	BA10161	1	NAPHTHALENE	4/22/2020 3:10:00 PM	4/30/2020 5:04:00 PM	D	33	UG_L		0.2	0.10		
ERH1045	BA10162	1	1-METHYLNAPHTHALENE	4/22/2020 3:10:00 PM	4/30/2020 5:26:00 PM	C	13	UG_L		0.2	0.10		
ERH1045	BA10162	1	2-METHYLNAPHTHALENE	4/22/2020 3:10:00 PM	4/30/2020 5:26:00 PM	C	11	UG_L		0.2	0.10		
ERH1045	BA10162	1	NAPHTHALENE	4/22/2020 3:10:00 PM	4/30/2020 5:26:00 PM	C	32	UG_L		0.2	0.10		
ERH1065	BA10164	1	1-METHYLNAPHTHALENE	4/23/2020 9:50:00 AM	4/30/2020 5:48:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1065	BA10164	1	2-METHYLNAPHTHALENE	4/23/2020 9:50:00 AM	4/30/2020 5:48:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1065	BA10164	1	NAPHTHALENE	4/23/2020 9:50:00 AM	4/30/2020 5:48:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1074	BA10166	1	1-METHYLNAPHTHALENE	4/22/2020 8:46:00 AM	4/30/2020 6:54:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
ERH1074	BA10166	1	2-METHYLNAPHTHALENE	4/22/2020 8:46:00 AM	4/30/2020 6:54:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
ERH1074	BA10166	1	NAPHTHALENE	4/22/2020 8:46:00 AM	4/30/2020 6:54:00 PM	D	0.10	UG_L	U	0.2	0.10	U	
ERH1076	BA10168	1	1-METHYLNAPHTHALENE	4/23/2020 9:12:00 AM	4/30/2020 7:16:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1076	BA10168	1	2-METHYLNAPHTHALENE	4/23/2020 9:12:00 AM	4/30/2020 7:16:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
ERH1076	BA10168	1	NAPHTHALENE	4/23/2020 9:12:00 AM	4/30/2020 7:16:00 PM	C	0.10	UG_L	U	0.2	0.10	U	
METHOD: **9060A**													

EPA_NO	LAB_ID	DF	ANALYTE	COLL_DATE	ANAL_DATE	QCLev	RESULT	UNITS	LAB_Q	LOQ	LOD	REV	Q_C
METHOD: **9060A**													
ERH1039	BA10158	1	TOTAL ORGANIC CARBON	4/23/2020 8:45:00 AM	4/25/2020 1:08:00 AM	D	0.16	MG_L	JD	0.93	0.350	J	
ERH1044	BA10161	1	TOTAL ORGANIC CARBON	4/22/2020 3:10:00 PM	4/25/2020 8:37:00 AM	D	3.5	MG_L		0.93	0.350	J	r
ERH1065	BA10164	1	TOTAL ORGANIC CARBON	4/23/2020 9:50:00 AM	4/25/2020 9:14:00 AM	C	0.32	MG_L	J	0.93	0.350	J	r
ERH1074	BA10166	1	TOTAL ORGANIC CARBON	4/22/2020 8:46:00 AM	4/25/2020 9:51:00 AM	C	1.6	MG_L	D	0.93	0.350	J	r
ERH1076	BA10168	1	TOTAL ORGANIC CARBON	4/23/2020 9:12:00 AM	4/25/2020 12:22:00 PM	C	16.2	MG_L		0.93	0.350	J	r
METHOD: **RSK175**													
ERH1038	BA10157	1	METHANE	4/23/2020 8:15:00 AM	4/28/2020 1:02:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1039	BA10158	1	METHANE	4/23/2020 8:45:00 AM	4/28/2020 1:04:00 PM	D	1.00	UG_L	U	5.0	1.00	U	
ERH1043	BA10160	1	METHANE	4/22/2020 2:50:00 PM	4/28/2020 1:23:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1044	BA10161	20	METHANE	4/22/2020 3:10:00 PM	4/28/2020 1:28:00 PM	D	6700	UG_L	D	100.0	20.00		
ERH1044	BA10161	1	METHANE	4/22/2020 3:10:00 PM	4/28/2020 1:25:00 PM	D	4100	UG_L	E	5.0	1.00	R	d
ERH1064	BA10163	1	METHANE	4/23/2020 8:30:00 AM	4/28/2020 1:31:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1065	BA10164	1	METHANE	4/23/2020 9:50:00 AM	4/28/2020 1:33:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1073	BA10165	1	METHANE	4/22/2020 8:14:00 AM	4/28/2020 1:36:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1074	BA10166	1	METHANE	4/22/2020 8:46:00 AM	4/28/2020 1:39:00 PM	D	1.00	UG_L	U	5.0	1.00	U	
ERH1075	BA10167	1	METHANE	4/23/2020 8:25:00 AM	4/28/2020 1:41:00 PM	C	1.00	UG_L	U	5.0	1.00	U	
ERH1076	BA10168	1	METHANE	4/23/2020 9:12:00 AM	4/28/2020 1:43:00 PM	C	1.00	UG_L	U	5.0	1.00	U	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

May 27, 2020

SUBJECT: Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Pascua

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on May 15, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48054:

SDG #	Fraction
91926, 91941	Volatiles, Phenol, Polynuclear Aromatic Hydrocarbons, 2-(2-Methoxyethoxy)-ethanol, Wet Chemistry, Gasoline Range Organics, Total Petroleum Hydrocarbons as Extractables, Ethylene Dibromide, Methane

The data validation was performed under Level C validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 02, January 2017
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 01, April 2017
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, September 2017
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, June 2018
- Project Procedures Manual U.S. Naval Facilities Engineering Command Environmental Restoration Program, NAVFAC Pacific; DON 2015
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017

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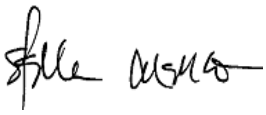
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,



Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

365 pages-DL

Attachment 1

EDD 90/10 C/D

LDC #48054 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	BTEX & 1,2-DCA (8260B)		Phenol (8270D)		(3) PAHs (8270D -SIM)		2,2-MEE (8270D-M)		GRO (8260B)		TPH-E (8015B)		SGCU TPH-E (8015B)		EDB (8011)		Methane (175)		Alk (2320B)		Cl,SO_4 NO_3 (300.0)		NO_3/ NO_2-N (353.2)		Fe II (3500-Fe B)		TOC (9060A)			
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	91926	05/15/20	06/01/20	6	0	3	0	3	0	3	0	6	0	6	0	6	0	-	-	6	0	3	0	3	0	3	0	3	0	3	0		
B	91941	05/15/20	06/01/20	15	0	8	0	8	0	8	0	15	0	16	0	12	0	5	0	12	0	6	0	6	0	6	0	6	0	6	0		
Total	T/SC			21	0	11	0	11	0	11	0	21	0	22	0	18	0	5	0	18	0	9	0	9	0	9	0	9	0	9	0	0	183

Shaded cells indicate Level D validation (all other cells are Level C validation). These sample counts do not include MS/MSD, and DUPs

L:\AECOM\Red Hill\48054ST-18F0126.wpd

LDC Report# 48054A1a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91926

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1046	BA09850	Water	04/20/20
ERH1047	BA09851	Water	04/20/20
ERH1052	BA09852	Water	04/20/20
ERH1053	BA09853	Water	04/20/20
ERH1054	BA09854	Water	04/20/20
ERH1055	BA09855	Water	04/20/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) which are Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples ERH1046, ERH1052, and ERH1054 were identified as trip blanks. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

LDC #: 48054A1a
SDG #: 91926
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B) BTEX

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB-1. 3. 5
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1046	BA09850	Water	04/20/20
2	ERH1047	BA09851	Water	04/20/20
3	ERH1052	BA09852	Water	04/20/20
4	ERH1053	BA09853	Water	04/20/20
5	ERH1054	BA09854	Water	04/20/20
6	ERH1055	BA09855	Water	04/20/20
7				
8				
9				

Notes:

LDC Report# 48054A2a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Phenol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91926

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1047	BA09851	Water	04/20/20
ERH1053	BA09853	Water	04/20/20
ERH1055	BA09855	Water	04/20/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

LDC #: 48054A2a
SDG #: 91926
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration / 12hr	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1047	BA09851	Water	04/20/20
2	ERH1053	BA09853	Water	04/20/20
3	ERH1055	BA09855	Water	04/20/20
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Notes:

	200423A-BLK						

LDC Report# 48054A2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91926

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1047	BA09851	Water	04/20/20
ERH1053	BA09853	Water	04/20/20
ERH1055	BA09855	Water	04/20/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

LDC #: 48054A2b
SDG #: 91926
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer: 1
2nd Reviewer: M

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration / Ending	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1047	BA09851	Water	04/20/20
2	ERH1053	BA09853	Water	04/20/20
3	ERH1055	BA09855	Water	04/20/20
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 27, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91926

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1047	BA09851	Water	04/20/20
ERH1053	BA09853	Water	04/20/20
ERH1055	BA09855	Water	04/20/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgement, no data were qualified since the LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

LDC #: 48054A2c
SDG #: 91926
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration level 2	A	CCV ≤ 20/30%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	from phenol analysis
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1047	BA09851	Water	04/20/20
2	ERH1053	BA09853	Water	04/20/20
3	ERH1055	BA09855	Water	04/20/20
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 22, 2020

Parameters: Wet Chemistry

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91926

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1047	BA09851	Water	04/20/20
ERH1053	BA09853	Water	04/20/20
ERH1055	BA09855	Water	04/20/20
ERH1047MS	BA09851MS	Water	04/20/20
ERH1047MSD	BA09851MSD	Water	04/20/20
ERH1055MS	BA09855MS	Water	04/20/20
ERH1055MSD	BA09855MSD	Water	04/20/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Ferrous Iron by Standard Method 3500-Fe B
Total Organic Carbon by EPA SW 846 Method 9060A

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Chloride	0.14 mg/L	1 mg/L	ERH1053
ICB/CCB	Chloride	0.15 mg/L	1 mg/L	ERH1053
PB (prep blank)	Total alkalinity Bicarbonate alkalinity	4 mg/L 4 mg/L	2 mg/L 2 mg/L	All samples in SDG 91926
ICB/CCB	Chloride	0.22 mg/L	1 mg/L	ERH1047 ERH1055

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

LDC #: 48054A6
SDG #: 91926
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/21/20
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: A

METHOD: (Analyte) Alkalinity (SM 2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrate/Nitrite- N (EPA Method 353.2), Ferrous Iron (SM 3500- Fe B), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	(4,5), (6,7)
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1047	BA09851	Water	04/20/20
2	ERH1053	BA09853	Water	04/20/20
3	ERH1055	BA09855	Water	04/20/20
4	ERH1047MS	BA09851MS	Water	04/20/20
5	ERH1047MSD	BA09851MSD	Water	04/20/20
6	ERH1055MS	BA09855MS	Water	04/20/20
7	ERH1055MSD	BA09855MSD	Water	04/20/20
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

LDC #: 48054AG

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATL
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1,2,3	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (NO3/NO2-N) (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
4,5	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (NO3/NO2-N)
6,7	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 48054A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 2 **Code: B**

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ								
Cl		0.15	0.75	1								
Cl	0.14		0.70	1								

Conc. units: mg/L **Associated Samples:** All

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ								
Alkalinity Total	4		20	2								
Alkalinity Bicarbonate	4		20	2								

Conc. units: mg/L **Associated Samples:** 1,3

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ								
Cl		0.22	1.1	1								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 91926

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1046	BA09850	Water	04/20/20
ERH1047	BA09851	Water	04/20/20
ERH1052	BA09852	Water	04/20/20
ERH1053	BA09853	Water	04/20/20
ERH1054	BA09854	Water	04/20/20
ERH1055	BA09855	Water	04/20/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

Where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1046, ERH1052, and ERH1054 were identified as trip blanks. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

LDC #: 48054A7
SDG #: 91926
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/5/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A/A	r^2 RSD ≤ 30/~~15~~% ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1.3.5
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1046	BA09850	Water	04/20/20
2	ERH1047	BA09851	Water	04/20/20
3	ERH1052	BA09852	Water	04/20/20
4	ERH1053	BA09853	Water	04/20/20
5	ERH1054	BA09854	Water	04/20/20
6	ERH1055	BA09855	Water	04/20/20
7				
8				
9				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91926

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1047	BA09851	Water	04/20/20
ERH1047RE	BA09851RE	Water	04/20/20
ERH1053	BA09853	Water	04/20/20
ERH1053RE	BA09853RE	Water	04/20/20
ERH1055	BA09855	Water	04/20/20
ERH1055RE	BA09855RE	Water	04/20/20
ERH1047(SGCU)	BA09851(SGCU)	Water	04/20/20
ERH1047(SGCU)RE	BA09851(SGCU)RE	Water	04/20/20
ERH1053(SGCU)	BA09853(SGCU)	Water	04/20/20
ERH1053(SGCU)RE	BA09853(SGCU)RE	Water	04/20/20
ERH1055(SGCU)	BA09855(SGCU)	Water	04/20/20
ERH1055(SGCU)RE	BA09855(SGCU)RE	Water	04/20/20

Samples ending in "SGCU" underwent Silica Gel cleanup

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
ERH1047RE ERH1053RE ERH1055RE ERH1047(SGCU)RE ERH1053(SGCU)RE ERH1055(SGCU)RE	All compounds	10	7	J (all detects) UJ (all non-detects)	A

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Limit of Quantitation	Associated Samples
200430W MB	04/30/20	Diesel (C10-C24)	150 ug/L	320 ug/L	ERH1047RE ERH1053RE ERH1055RE

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Limit of Quantitation	Modified Final Concentration
ERH1047RE	Diesel (C10-C24)	190 ug/L	320 ug/L	190U ug/L
ERH1053RE	Diesel (C10-C24)	160 ug/L	320 ug/L	160U ug/L

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
ERH1047(SGCU)	Octacosane	149 (60-142)	All compounds	NA	-
ERH1055	Octacosane	154 (60-142)	All compounds	J (all detects)	A
ERH1055(SGCU)	Octacosane ortho-Terphenyl	173 (60-142) 128 (56-125)	All compounds	NA	-

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
200422WLCS (ERH1047 ERH1055)	Oil (C24-C40)	118 (41-113)	124 (41-113)	J (all detects)	P
200422WLCS (ERH1053)	Oil (C24-C40)	118 (41-113)	124 (41-113)	NA	-

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
200422WLCS(SGC) (ERH1047(SGCU) ERH1053(SGCU) ERH1055(SGCU))	Oil (C24-C40)	116 (41-113)	120 (41-113)	NA	-

Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Reason	Flag	A or P
ERH1047RE ERH1053RE ERH1055RE ERH1047(SGCU)RE ERH1053(SGCU)RE ERH1055(SGCU)RE	All compounds	Extracted outside holding time.	R	A

Due to surrogate %R and LCS/LCSD %R, data were qualified as estimated in two samples.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 91926

Sample	Compound	Flag	A or P	Reason (Code)
ERH1055	All compounds	J (all detects)	A	Surrogates (%R) (S)
ERH1047 ERH1055	Oil (C24-C40)	J (all detects)	P	Laboratory control samples (%R) (L)
ERH1047RE ERH1053RE ERH1055RE ERH1047(SGCU)RE ERH1053(SGCU)RE ERH1055(SGCU)RE	All compounds	R	A	Overall assessment of data (D)

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

LDC #: 48054A8
SDG #: 91926
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / SW	
II.	Initial calibration/ICV	A / A	RSD ≤ 20%. ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	SW	
V.	Field blanks	N	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	N	MS
VIII.	Laboratory control samples	SW	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1 1	ERH1047	BA09851	Water	04/20/20
2 2	ERH1047RX	BA09851RX	Water	04/20/20
3 1	ERH1053	BA09853	Water	04/20/20
4 2	ERH1053RX	BA09853RX	Water	04/20/20
5 1	ERH1055	BA09855	Water	04/20/20
6 2	ERH1055RX	BA09855RX	Water	04/20/20
7	ERH1047(SGCU)	BA09851(SGCU)	Water	04/20/20
8	ERH1047(SGCU)RX	BA09851(SGCU)RX	Water	04/20/20
9	ERH1053(SGCU)	BA09853(SGCU)	Water	04/20/20
10	ERH1053(SGCU)RX	BA09853(SGCU)RX	Water	04/20/20
11	ERH1055(SGCU)	BA09855(SGCU)	Water	04/20/20
12	ERH1055(SGCU)RX	BA09855(SGCU)RX	Water	04/20/20
13				
14				
15	200422A-BK			
16	200430A-BK			
17				

LDC #: 48054A0

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: CT
2nd Reviewer: AK

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2,4,6,8,10	W		4-20-20	4-30-20			J (H)
12							
(dets+ND)							

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:	Water unpreserved:	Aromatic within 7 days, non-aromatic within 14 days of sample collection.
	Water preserved:	Both within 14 days of sample collection.
	Soils:	Both within 14 days of sample collection.
EXTRACTABLES:		
	Water:	Extracted within 7 days, analyzed within 40 days.
	Soil:	Extracted within 14 days, analyzed within 40 days.

LDC #: 48054A8

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: Q

METHOD: / **GC** ___ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: 4/30/20 **Blank analysis date:** 5/4/20 **Associated samples:** 2, 4, 6 (B)
Conc. units: ug/L

Compound	Blank ID	Sample Identification						
	200430W MB		2	4				
Diesel (C10-C24)	150		190 U	160 U				
LOQ	320							

Blank extraction date: _____ **Blank analysis date:** _____ **Associated samples:** _____
Conc. units: _____

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 48054A8

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 2

METHOD: ✓ GC __ HPLC

Are surrogates required by the method? Yes___ or No___.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications (5)
	T		4	149 (60-142)	dets/A (ND)
				( )	
	5		4	154 ( )	(dets+ND)
				( )	
	11		4	173 ( )	
			H	128 (56-125)	(ND)
				( )	
	200422WMB		4	158 (60-142)	dets/P
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	1,2-Dinitrobenzene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 47805A8

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: Q
2nd Reviewer: A

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications (L)
	200422WLCS	Oil (C24-C40)	118 (41-113)	124 (41-113)	( )	1.3.5.MB	dets J
			( )	( )	( )	(dets=1,5)	
			( )	( )	( )		
	200422WLCS(SEC)	✓	116 (41-113)	120 (41-113)	( )	7.9.11.MB	dets J
			( )	( )	( )	(ND)	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 48054A5

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 2

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	2A.6.B.10.12	All		NE/A (D)

Comments: _____

OVRNew.wpd

LDC Report# 48054A51

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Methane

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91926

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1046	BA09850	Water	04/20/20
ERH1047	BA09851	Water	04/20/20
ERH1052	BA09852	Water	04/20/20
ERH1053	BA09853	Water	04/20/20
ERH1054	BA09854	Water	04/20/20
ERH1055	BA09855	Water	04/20/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1046, ERH1052, and ERH1054 were identified as trip blanks. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

Raw data were not reviewed for Level C validation.

X. Target Compound Identification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 91926

No Sample Data Qualified in this SDG

LDC #: 48054A51
SDG #: 91926
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/9/20
Page: 1 of 1
Reviewer: I
2nd Reviewer: M

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Initial calibration/ICV	A/A	r^2 ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%.
IV.	Laboratory Blanks	A	
V.	Field blanks	N	TB=1.3.5
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	N	
X.	Target compound identification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1046	BA09850	Water	04/20/20
2	ERH1047	BA09851	Water	04/20/20
3	ERH1052	BA09852	Water	04/20/20
4	ERH1053	BA09853	Water	04/20/20
5	ERH1054	BA09854	Water	04/20/20
6	ERH1055	BA09855	Water	04/20/20
7				
8				
9				
10				
11				
12				
13				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1041	BA09914	Water	04/20/20
ERH1042	BA09915	Water	04/20/20
ERH1050	BA09916	Water	04/21/20
ERH1051	BA09917	Water	04/21/20
ERH1056	BA09918	Water	04/20/20
ERH1057	BA09919	Water	04/20/20
ERH1060	BA09920	Water	04/21/20
ERH1061	BA09921	Water	04/21/20
ERH1066	BA09922	Water	04/20/20
ERH1067	BA09923	Water	04/20/20
ERH1068	BA09924	Water	04/20/20
ERH1069	BA09925	Water	04/20/20
ERH1070	BA09926	Water	04/20/20
ERH1071	BA09927	Water	04/21/20
ERH1072	BA09928	Water	04/21/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) which are Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and 1,2-Dichloroethane by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples ERH1041, ERH1050, ERH1056, ERH1060, ERH1066, ERH1069, and ERH1071 were identified as trip blanks. No contaminants were found.

Sample ERH1068 was identified as an equipment blank. No contaminants were found.

Sample ERH1067 was identified as a field blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

LDC #: 48054B1a
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/9/20
Page: 1 of 2
Reviewer: 9
2nd Reviewer: MJ

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B) BTEX + 1,2DCA

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD≤15%. ICV≤20%
IV.	Continuing calibration / Encls.	A	CCV≤20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB=1·3,5,7.9,12.14. FB=10. EB=11
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1041	BA09914	Water	04/20/20
2	ERH1042	BA09915	Water	04/20/20
3	ERH1050	BA09916	Water	04/21/20
4	ERH1051	BA09917	Water	04/21/20
5	ERH1056	BA09918	Water	04/20/20
6	ERH1057	BA09919	Water	04/20/20
7	ERH1060	BA09920	Water	04/21/20
8	ERH1061	BA09921	Water	04/21/20
9	ERH1066 +L	BA09922	Water	04/20/20
10	ERH1067 F	BA09923	Water	04/20/20
11	ERH1068 ε	BA09924	Water	04/20/20
12	ERH1069	BA09925	Water	04/20/20
13	ERH1070	BA09926	Water	04/20/20
14	ERH1071 +L	BA09927	Water	04/21/20

LDC #: 48054B1a
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 2 of 2
Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

	Client ID	Lab ID	Matrix	Date
15	ERH1072 +L	BA09928	Water	04/21/20
16				
17				
18				
19				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Phenol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1042	BA09915	Water	04/20/20
ERH1051	BA09917	Water	04/21/20
ERH1057	BA09919	Water	04/20/20
ERH1061	BA09921	Water	04/21/20
ERH1067	BA09923	Water	04/20/20
ERH1068	BA09924	Water	04/20/20
ERH1070	BA09926	Water	04/20/20
ERH1072	BA09928	Water	04/21/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

Ending continuing calibration verifications (CCVs) were performed outside the 12 hour interval. The percent differences (%D) of the ending CCVs were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 was identified as an equipment blank. No contaminants were found.

Sample ERH1067 was identified as a field blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

LDC #: 48054B2a
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer:
2nd Reviewer: M

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration / ending	A	CCV ≤ 20/50% (closing out 12 hr)
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB=5. EB=6
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1042	BA09915	Water	04/20/20
2	ERH1051	BA09917	Water	04/21/20
3	ERH1057	BA09919	Water	04/20/20
4	ERH1061	BA09921	Water	04/21/20
5	ERH1067	BA09923	Water	04/20/20
6	ERH1068	BA09924	Water	04/20/20
7	ERH1070	BA09926	Water	04/20/20
8	ERH1072	BA09928	Water	04/21/20
9				
10				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1042	BA09915	Water	04/20/20
ERH1051	BA09917	Water	04/21/20
ERH1057	BA09919	Water	04/20/20
ERH1061	BA09921	Water	04/21/20
ERH1067	BA09923	Water	04/20/20
ERH1068	BA09924	Water	04/20/20
ERH1070	BA09926	Water	04/20/20
ERH1072	BA09928	Water	04/21/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 was identified as an equipment blank. No contaminants were found.

Sample ERH1067 was identified as a field blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

LDC #: 48054B2b
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer:
2nd Reviewer: AL

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	RSD ≤ 15%, ICV ≤ 20%
IV.	Continuing calibration / Ending	A	CCV ≤ 20/15/20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB = 5. EB = 6
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1042	BA09915	Water	04/20/20
2	ERH1051	BA09917	Water	04/21/20
3	ERH1057	BA09919	Water	04/20/20
4	ERH1061	BA09921	Water	04/21/20
5	ERH1067	BA09923	Water	04/20/20
6	ERH1068	BA09924	Water	04/20/20
7	ERH1070	BA09926	Water	04/20/20
8	ERH1072	BA09928	Water	04/21/20
9				
10				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 27, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1042	BA09915	Water	04/20/20
ERH1051	BA09917	Water	04/21/20
ERH1057	BA09919	Water	04/20/20
ERH1061	BA09921	Water	04/21/20
ERH1067	BA09923	Water	04/20/20
ERH1068	BA09924	Water	04/20/20
ERH1070	BA09926	Water	04/20/20
ERH1072	BA09928	Water	04/21/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 was identified as an equipment blank. No contaminants were found.

Sample ERH1067 was identified as a field blank. No contaminants were found.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgement, no data were qualified since the LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

LDC #: 48054B2c
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 2
Reviewer:
2nd Reviewer: A

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. |r| ≤ 20%
IV.	Continuing calibration / Ending	A	ccv ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB=5. EB=6
VII.	Surrogate spikes	A	(see phenol analysis)
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1042	BA09915	Water	04/20/20
2	ERH1051	BA09917	Water	04/21/20
3	ERH1057	BA09919	Water	04/20/20
4	ERH1061	BA09921	Water	04/21/20
5	ERH1067	BA09923	Water	04/20/20
6	ERH1068	BA09924	Water	04/20/20
7	ERH1070	BA09926	Water	04/20/20
8	ERH1072	BA09928	Water	04/21/20
9				
10				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 22, 2020

Parameters: Wet Chemistry

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1042	BA09915	Water	04/20/20
ERH1051	BA09917	Water	04/21/20
ERH1057	BA09919	Water	04/20/20
ERH1061	BA09921	Water	04/21/20
ERH1070	BA09926	Water	04/20/20
ERH1072	BA09928	Water	04/21/20
ERH1072MS	BA09928MS	Water	04/21/20
ERH1072MSD	BA09928MSD	Water	04/21/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Ferrous Iron by Standard Method 3500-Fe B
Total Organic Carbon by EPA SW 846 Method 9060A

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ERH1070	Nitrate	49.95 hours	48 hours	UJ (all non-detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Chloride	0.14 mg/L	1 mg/L	ERH1042 ERH1061 ERH1072
ICB/CCB	Chloride	0.22 mg/L	1 mg/L	ERH1042 ERH1061 ERH1072
PB (prep blank)	Chloride	0.33 mg/L	1 mg/L	ERH1051 ERH1057 ERH1070
ICB/CCB	Chloride	0.34 mg/L	1 mg/L	ERH1051 ERH1057 ERH1070
PB (prep blank)	Total alkalinity Bicarbonate alkalinity	4 mg/L 4 mg/L	2 mg/L 2 mg/L	All samples in SDG 91941

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were qualified as estimated in one sample.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 91941

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1070	Nitrate	UJ (all non-detects)	P	Technical holding times (H)

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

LDC #: 48054B6
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/21/20
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: VC

METHOD: (Analyte) Alkalinity (SM 2320B), Chloride, Nitrate-~~X~~, Sulfate (EPA Method 300.0), Nitrate/Nitrite- N (EPA Method 353.2), Ferrous Iron (SM 3500- Fe B), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	(7,8), From SDG # 91991 (ERH1039 MS/MSD)
VII.	Duplicate sample analysis	~~N~~A	↓ (ERH1039 DUP)
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date	
1	ERH1042	BA09915	Water	04/20/20	11:45
2	ERH1051	BA09917	Water	04/21/20	
3	ERH1057	BA09919	Water	04/20/20	14:45
4	ERH1061	BA09921	Water	04/21/20	
5	ERH1070	BA09926	Water	04/20/20	11:20
6	ERH1072	BA09928	Water	04/21/20	
7	ERH1072MS	BA09928MS	Water	04/21/20	
8	ERH1072MSD	BA09928MSD	Water	04/21/20	
9					
10					
11					
12					
13					
14					
15					

Notes:

LDC #: 48054BC

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATV
2nd reviewer: V

All circled methods are applicable to each sample.

Sample ID	Parameter
1-26	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (NO3/NO2-N) (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
7,8	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 48054BC

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: ATV
2nd reviewer: AC

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria? Code: H

Method:	NO_3 (EPA 300.0)						
Parameters:	water						
Technical holding time:	48hrs						
Sample ID	**Sampling date**	**Analysis date**	**Total Time**	**Qualifier**	**Analysis date**	**Total Time**	**Qualifier**
5	11:20→14:20 04/20/20	16:17 04/22/20	49.95hrs	J/UJ/P(ND)			

LDC #: 48054B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1,4,6 **Code:** B

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		LOQ									
Cl		0.22	1.10	1									
Cl	0.14		0.70	1									

Conc. units: mg/L **Associated Samples:** 2,3,5

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		LOQ									
Cl		0.34	1.70	1									
Cl	0.33		1.65	1									

Conc. units: mg/L **Associated Samples:** All

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		LOQ									
Alkalinity Total	4		20	2									
Alkalinity Bicarbonate	4		20	2									

Conc. units: mg/L **Associated Samples:**

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		LOQ									
Cl													

LDC Report# 48054B7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1041	BA09914	Water	04/20/20
ERH1042	BA09915	Water	04/20/20
ERH1050	BA09916	Water	04/21/20
ERH1051	BA09917	Water	04/21/20
ERH1056	BA09918	Water	04/20/20
ERH1057	BA09919	Water	04/20/20
ERH1060	BA09920	Water	04/21/20
ERH1061	BA09921	Water	04/21/20
ERH1066	BA09922	Water	04/20/20
ERH1067	BA09923	Water	04/20/20
ERH1068	BA09924	Water	04/20/20
ERH1069	BA09925	Water	04/20/20
ERH1070	BA09926	Water	04/20/20
ERH1071	BA09927	Water	04/21/20
ERH1072	BA09928	Water	04/21/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

Where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1041, ERH1050, ERH1056, ERH1060, ERH1066, ERH1069, and ERH1071 were identified as trip blanks. No contaminants were found.

Sample ERH1068 was identified as an equipment blank. No contaminants were found.

Sample ERH1067 was identified as a field blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

LDC #: 48054B7
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 2
Reviewer: Q
2nd Reviewer: M

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A/A	RSD≤20%. r^2 ICV≤20%
IV.	Continuing calibration	A	CCV≤20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB=1, 3, 5, 7, 9, 12, 14 FB=10. EB=11
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	ES
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1041	BA09914	Water	04/20/20
2	ERH1042	BA09915	Water	04/20/20
3	ERH1050	BA09916	Water	04/21/20
4	ERH1051	BA09917	Water	04/21/20
5	ERH1056	BA09918	Water	04/20/20
6	ERH1057	BA09919	Water	04/20/20
7	ERH1060	BA09920	Water	04/21/20
8	ERH1061	BA09921	Water	04/21/20
9	ERH1066	BA09922	Water	04/20/20
10	ERH1067	BA09923	Water	04/20/20
11	ERH1068	BA09924	Water	04/20/20
12	ERH1069	BA09925	Water	04/20/20
13	ERH1070	BA09926	Water	04/20/20
14	ERH1071	BA09927	Water	04/21/20

LDC #: 48054B7
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 2 of 2
Reviewer: T
2nd Reviewer: DC

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

	Client ID	Lab ID	Matrix	Date
15	ERH1072	BA09928	Water	04/21/20
16				
17				
18				
19				

Notes:

LDC Report# 48054B8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1042	BA09915	Water	04/20/20
ERH1042RE	BA09915RE	Water	04/20/20
ERH1051	BA09917	Water	04/21/20
ERH1051RE	BA09917RE	Water	04/21/20
ERH1057	BA09919	Water	04/20/20
ERH1057RE	BA09919RE	Water	04/20/20
ERH1061	BA09921	Water	04/21/20
ERH1061RE	BA09921RE	Water	04/21/20
ERH1067	BA09923	Water	04/20/20
ERH1067RE	BA09923RE	Water	04/20/20
ERH1068	BA09924	Water	04/20/20
ERH1068RE	BA09924RE	Water	04/20/20
ERH1070	BA09926	Water	04/20/20
ERH1070RE	BA09926RE	Water	04/20/20
ERH1072	BA09928	Water	04/21/20
ERH1072RE	BA09928RE	Water	04/21/20
ERH1042(SGCU)	BA09915(SGCU)	Water	04/20/20
ERH1042(SGCU)RE	BA09915(SGCU)RE	Water	04/20/20
ERH1057(SGCU)	BA09919(SGCU)	Water	04/20/20
ERH1057(SGCU)RE	BA09919(SGCU)RE	Water	04/20/20
ERH1067(SGCU)	BA09923(SGCU)	Water	04/20/20
ERH1067(SGCU)RE	BA09923(SGCU)RE	Water	04/20/20
ERH1068(SGCU)	BA09924(SGCU)	Water	04/20/20
ERH1068(SGCU)RE	BA09924(SGCU)RE	Water	04/20/20
ERH1070(SGCU)	BA09926(SGCU)	Water	04/20/20
ERH1070(SGCU)RE	BA09926(SGCU)RE	Water	04/20/20

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1072(SGCU)	BA09928(SGCU)	Water	04/21/20
ERH1072(SGCU)RE	BA09928(SGCU)RE	Water	04/21/20

Samples ending in "SGCU" underwent Silica Gel cleanup

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
ERH1042RE ERH1057RE ERH1067RE ERH1068RE ERH1070RE ERH1042(SGCU)RE ERH1057(SGCU)RE ERH1067(SGCU)RE ERH1068(SGCU)RE ERH1070(SGCU)RE	All compounds	10	7	J (all detects) UJ (all non-detects)	A
ERH1051RE ERH1061RE ERH1072RE ERH1070(SGCU)RE	All compounds	9	7	J (all detects) UJ (all non-detects)	A

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Limit of Quantitation	Associated Samples
200430W MB	04/30/20	Diesel (C10-C24)	150 ug/L	320 ug/L	ERH1042RE ERH1051RE ERH1057RE ERH1061RE ERH1067RE ERH1068RE ERH1070RE ERH1072RE

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Limit of Quantitation	Modified Final Concentration
ERH1042RE	Diesel (C10-C24)	190 ug/L	320 ug/L	190U ug/L
ERH1067RE	Diesel (C10-C24)	250 ug/L	320 ug/L	250U ug/L
ERH1068RE	Diesel (C10-C24)	150 ug/L	320 ug/L	150U ug/L
ERH1072RE	Diesel (C10-C24)	190 ug/L	320 ug/L	190U ug/L

V. Field Blanks

Samples ERH1068, ERH1068RE, ERH1068(SGCU), and ERH1068(SGCU)RE were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Limit of Quantitation	Associated Samples
ERH1068RE	04/20/20	Diesel (C10-C24)	150 ug/L	320 ug/L	ERH1070 ERH1070RE ERH1072 ERH1072RE

Samples ERH1067, ERH1067RE, ERH1067(SGCU), and ERH1067(SGCU)RE were identified as field blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Limit of Quantitation	Associated Samples
ERH1067RE	04/20/20	Diesel (C10-C24)	250 ug/L	320 ug/L	ERH1068 ERH1068RE

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Limit of Quantitation	Modified Final Concentration
ERH1068RE	Diesel (C10-C24)	150 ug/L	320 ug/L	150U ug/L
ERH1070	Diesel (C10-C24)	260 ug/L	320 ug/L	260U ug/L
ERH1072RE	Diesel (C10-C24)	190 ug/L	320 ug/L	190U ug/L

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
ERH1057	Octacosane	153 (60-142)	All compounds	J (all detects)	A
ERH1057(SGCU)	Octacosane	149 (60-142)	All compounds	NA	-
ERH1067RE	Octacosane ortho-Terphenyl	31.9 (60-142) 49.6 (56-125)	All compounds	J (all detects) UJ (all non-detects)	A
ERH1067(SGCU)RE	Octacosane ortho-Terphenyl	34.6 (60-142) 51.0 (56-125)	All compounds	UJ (all non-detects)	A

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
200422WLCS (ERH1057 ERH1070 ERH1072)	Oil (C24-C40)	118 (41-113)	124 (41-113)	J (all detects)	P
200422WLCS (ERH1042 ERH1051 ERH1061 ERH1067 ERH1068)	Oil (C24-C40)	118 (41-113)	124 (41-113)	NA	-
200422WLCS(SGC) (ERH1042(SGCU) ERH1057(SGCU) ERH1067(SGCU) ERH1068(SGCU) ERH1070(SGCU) ERH1072(SGCU))	Oil (C24-C40)	116 (41-113)	120 (41-113)	NA	-

Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Reason	Flag	A or P
ERH1042RE ERH1051RE ERH1057RE ERH1061RE ERH1067RE ERH1068RE ERH1070RE ERH1072RE ERH1042(SGCU)RE ERH1057(SGCU)RE ERH1067(SGCU)RE ERH1068(SGCU)RE ERH1070(SGCU)RE ERH1072(SGCU)RE	All compounds	Extracted outside holding time.	R	A

Due to surrogate %R and LCS %R, data were qualified as estimated in three samples.

Due to equipment blank contamination, data were qualified as not detected in one sample.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 91941

Sample	Compound	Flag	A or P	Reason (Code)
ERH1057	All compounds	J (all detects)	A	Surrogates (%R) (S)
ERH1057 ERH1070 ERH1072	Oil (C24-C40)	J (all detects)	P	Laboratory control samples (%R) (L)
ERH1042RE ERH1051RE ERH1057RE ERH1061RE ERH1067RE ERH1068RE ERH1070RE ERH1072RE ERH1042(SGCU)RE ERH1057(SGCU)RE ERH1067(SGCU)RE ERH1068(SGCU)RE ERH1070(SGCU)RE ERH1072(SGCU)RE	All compounds	R	A	Overall assessment of data (D)

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 91941

Sample	Compound	Modified Final Concentration	A or P	Code
ERH1070	Diesel (C10-C24)	260U ug/L	A	F

LDC #: 48054B8
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 2
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Initial calibration/ICV	A	RSD ≤ 20%. ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	TW	
V.	Field blanks	TW	FB = 9, 10, 21, 22. EB = 11, 12, 23, 24
VI.	Surrogate spikes	TW	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	SW	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	Overall assessment of data	TW	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1042	BA09915	Water	04/20/20
2	ERH1042RX	BA09915RX	Water	04/20/20
3	ERH1051	BA09917	Water	04/21/20
4	ERH1051RX	BA09917RX	Water	04/21/20
5	ERH1057	BA09919	Water	04/20/20
6	ERH1057RX	BA09919RX	Water	04/20/20
7	ERH1061	BA09921	Water	04/21/20
8	ERH1061RX	BA09921RX	Water	04/21/20
9	ERH1067	BA09923	Water	04/20/20
10	ERH1067RX	BA09923RX	Water	04/20/20
11	ERH1068	BA09924	Water	04/20/20
12	ERH1068RX	BA09924RX	Water	04/20/20
13	ERH1070	BA09926	Water	04/20/20
14	ERH1070RX	BA09926RX	Water	04/20/20
15	ERH1072	BA09928	Water	04/21/20
16	ERH1072RX	BA09928RX	Water	04/21/20
17	ERH1042(SGCU)	BA09915(SGCU)	Water	04/20/20

LDC #: 48054B8
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 2 of 2
Reviewer:
2nd Reviewer:

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

	Client ID	Lab ID	Matrix	Date
18	ERH1042(SGCU)RX	BA09915(SGCU)RX	Water	04/20/20
19	ERH1057(SGCU)	BA09919(SGCU)	Water	04/20/20
20	ERH1057(SGCU)RX	BA09919(SGCU)RX	Water	04/20/20
21	ERH1067(SGCU)	BA09923(SGCU)	Water	04/20/20
22	ERH1067(SGCU)RX	BA09923(SGCU)RX	Water	04/20/20
23	ERH1068(SGCU)	BA09924(SGCU)	Water	04/20/20
24	ERH1068(SGCU)RX	BA09924(SGCU)RX	Water	04/20/20
25	ERH1070(SGCU)	BA09926(SGCU)	Water	04/20/20
26	ERH1070(SGCU)RX	BA09926(SGCU)RX	Water	04/20/20
27	ERH1072(SGCU)	BA09928(SGCU)	Water	04/21/20
28	ERH1072(SGCU)RX	BA09928(SGCU)RX	Water	04/21/20
29				
30				
31				
32				

Notes:

LDC #: 48054B8

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: 9
2nd Reviewer: MC

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2,6,10,12,14		W	4-20-20	4-30-20		10	J/UJ/A
4,8,16			4-21-20			9	
18,20,22,24			4-20-20			10	
26			↓			10	
28		↓	4-21-20	↓		9	↓
Lab Blk+MD1							

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 43054B8

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: AC

METHOD: / **GC** ___ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: 4/30/20 **Blank analysis date:** 5/4/20 **Associated samples:** 2.4.6.8.10.12.14.16
Conc. units: ug/L

Compound	Blank ID	Sample Identification						
	200430W MB	2	4	10	12	16		
Diesel (C10-C24)	150	190/U	180/U	250/U	150/U	190/U		

Blank extraction date: _____ **Blank analysis date:** _____ **Associated samples:** _____
Conc. units: _____

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 48054B8

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Q
2nd Reviewer: AC

METHOD: GC/HPLC

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?

Blank units: uL **Associated sample units:** uL
Sampling date: ~~4/20/20~~ 4/20/20
Field blank type: (circle one) Field Blank / Rinsate / Other: ~~EB~~ Associated Samples: ~~12~~ ~~10~~ 11-12 (F)

Compound	Blank ID	Sample Identification									
	~~10~~		12								
Diesel (C10-C24)	250		150/U								

Blank units: uL **Associated sample units:** uL
Sampling date: 4/20/20
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: 13-16

Compound	Blank ID	Sample Identification									
	12		13	16							
Diesel (C10-C24)	150		260/U	190/U							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 48054B8

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: 9
2nd Reviewer: A

METHOD: ✓ GC __ HPLC

Are surrogates required by the method? Yes___ or No___.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	200422WMB		4	158 (60-142)	↓ dot3 / 4 (ND)
	5		4	153 ( )	↓ dot3 / A (dot3+ND)
	19		4	149 ( )	(ND)
	10		4	31.9 ( )	↓ TH / A (dot3+ND)
			H	49.6 (56-125)	
	22		4	34.6 (60-142)	↓ TH / A (ND)
			H	51.0 (56-125)	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	1,2-Dinitrobenzene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 48054B8

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: AC

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications (4)
	200422WLCS	Oil (C24-C40)	118 (41-113)	124 (41-113)	( )	1,3,5,7,9,11,13,15 MB	J+ (all det) / UJ (all non-det)
			( )	( )	( )	(det=5, 13, 15	
			( )	( )	( )		
	200422WLCS(SEC)	↓	116 (41-113)	120 (41-113)	( )	17,19,21,23,25,27	J+ (all det) / UJ (all non-det)
			( )	( )	( )	MB (ND)	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )

LDC #: 45054B8

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	All Rx	All		NR/A (D)

Comments: _____

OVRNew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Ethylene Dibromide

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1066	BA09922	Water	04/20/20
ERH1067	BA09923	Water	04/20/20
ERH1068	BA09924	Water	04/20/20
ERH1071	BA09927	Water	04/21/20
ERH1072	BA09928	Water	04/21/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Ethylene Dibromide by Environmental Protection Agency (EPA) SW 846 Method 8011

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

Where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1066 and ERH1071 were identified as trip blanks. No contaminants were found.

Sample ERH1068 was identified as an equipment blank. No contaminants were found.

Sample ERH1067 was identified as a field blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Field Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

LDC #: 48054B10
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Ethylene Dibromide (EPA SW846 Method 8011)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Initial calibration/ICV	A/A	RSD ≤ 20%. r² ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB=1.4. FB=2. EB=3
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1066	BA09922	Water	04/20/20
2	ERH1067	BA09923	Water	04/20/20
3	ERH1068	BA09924	Water	04/20/20
4	ERH1071	BA09927	Water	04/21/20
5	ERH1072	BA09928	Water	04/21/20
6				
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13				

Notes:

LDC Report# 48054B51

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: May 20, 2020

Parameters: Methane

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 91941

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1041	BA09914	Water	04/20/20
ERH1042	BA09915	Water	04/20/20
ERH1050	BA09916	Water	04/21/20
ERH1051	BA09917	Water	04/21/20
ERH1056	BA09918	Water	04/20/20
ERH1057	BA09919	Water	04/20/20
ERH1060	BA09920	Water	04/21/20
ERH1061	BA09921	Water	04/21/20
ERH1069	BA09925	Water	04/20/20
ERH1070	BA09926	Water	04/20/20
ERH1071	BA09927	Water	04/21/20
ERH1072	BA09928	Water	04/21/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples ERH1041, ERH1050, ERH1056, ERH1060, ERH1069, and ERH1071 were identified as trip blanks. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

Raw data were not reviewed for Level C validation.

X. Target Compound Identification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 91941

No Sample Data Qualified in this SDG

LDC #: 48054B51
SDG #: 91941
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/19/20
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	Initial calibration/ICV	A/A	r^2 ICV ≤ 20%
III.	Continuing calibration	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB=1.3.5.7.9.11
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	N	
X.	Target compound identification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1041	BA09914	Water	04/20/20
2	ERH1042	BA09915	Water	04/20/20
3	ERH1050	BA09916	Water	04/21/20
4	ERH1051	BA09917	Water	04/21/20
5	ERH1056	BA09918	Water	04/20/20
6	ERH1057	BA09919	Water	04/20/20
7	ERH1060	BA09920	Water	04/21/20
8	ERH1061	BA09921	Water	04/21/20
9	ERH1069	BA09925	Water	04/20/20
10	ERH1070	BA09926	Water	04/20/20
11	ERH1071	BA09927	Water	04/21/20
12	ERH1072	BA09928	Water	04/21/20
13				
14				

Notes:

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

June 4, 2020

SUBJECT: Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Pascua

Enclosed are the final validation reports for the fractions listed below. This SDG was received on May 26, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48138:

SDG #	Fraction
92025	Volatiles, Phenol, Polynuclear Aromatic Hydrocarbons, 2-(2-Methoxyethoxy)-ethanol, Wet Chemistry, Gasoline Range Organics, Total Petroleum Hydrocarbons as Extractables, Ethylene Dibromide, Methane

The data validation was performed under Level C validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

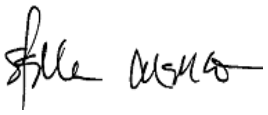
- Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 02, January 2017
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 01, April 2017
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, September 2017
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, June 2018
- Project Procedures Manual U.S. Naval Facilities Engineering Command Environmental Restoration Program, NAVFAC Pacific; DON 2015
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,



Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

EDD 90/10 C/D

LDC #48138 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	BTEX & 1,2-DCA (8260B)		Phenol (8270D)		(3) PAHs (8270D -SIM)		2,2-MEE (8270D-M)		GRO (8260B)		TPH-E (8015B)		SGCU TPH-E (8015B)		EDB (8011)		Methane (175)		Alk (2320B)		Cl, SO_4 NO_3 (300.0)		NO_3/ NO_2-N (353.2)		Fe II (3500-Fe B)		TOC (9060A)			
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	92025	05/26/20	06/09/20	2	0	1	0	1	0	1	0	2	0	1	0	1	0	2	0	2	0	1	0	1	0	1	0	1	0	1	0		
Total	T/SC			2	0	1	0	1	0	1	0	2	0	1	0	1	0	2	0	2	0	1	0	1	0	1	0	1	0	1	0	0	18

Shaded cells indicate Level D validation (all other cells are Level C validation). These sample counts do not include MS/MSD, and DUPs

L:\AECOM\Red Hill\48138ST-18F0126.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 2, 2020

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1077	BA10438	Water	04/27/20
ERH1078	BA10439	Water	04/27/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) which are Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), and 1,2-Dichloroethane by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1077 was identified as a trip blank. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

LDC #: 48138A1a
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: PT
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)
BTEX + 1,2-DCA

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 15 RY ≤ 20
IV.	Continuing calibration ending	A	CCV ≤ 20/20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1068 (91941) TB=1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS LD
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1077 TB	BA10438	Water	04/27/20
2	ERH1078	BA10439	Water	04/27/20
3				
4				
5				
6				
7				
8				
9				

Notes:

	200430BT						

LDC Report# 48138A2a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 2, 2020

Parameters: Phenol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1078	BA10439	Water	04/27/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

LDC #: 48138A2a
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: EM
2nd Reviewer: AE

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	%RSD ≤ 15/20 ICV ≤ 20
IV.	Continuing calibration / ending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB= ERH1068 (91941)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS 1D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1078	BA10439	Water	04/27/20
2				
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Notes:

	200504A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 2, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1078	BA10439	Water	04/27/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

LDC #: 48138A2b
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: RC

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration ending	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1068 (91941)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1078	BA10439	Water	04/27/20
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Notes:

1	200504A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1078	BA10439	Water	04/27/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgement, no data were qualified since the LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
200504A-LCS/LCSD (All samples in SDG 92025)	2-(2-Methoxyethoxy)-ethanol	27 (≤20)	UJ (all non-detects)	P

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII.

Due to LCS/LCSD RPD, data were qualified as estimated in one sample.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 92025

Sample	Compound	Flag	A or P	Reason (Code)
ERH1078	2-(2-Methoxyethoxy)-ethanol	UJ (all non-detects)	P	Laboratory control samples (RPD) (L)

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

LDC #: 48138A2c
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%D RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1068 (91941)
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1078	BA10439	Water	04/27/20
2				
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Notes:

	200504A						

LDC #: 48138A2C

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	all	Surrogates were not added to all samples as required by the method. Using professional judgment, no data were qualified. Although the LCS/LCSD % RPD was outside the QC limit, the LCS/LCSD percent recovery were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.		Text

(NBZ) = Nitrobenzene - d5 (2FP) = 2-Fluorophenol

LDC #: 48134A2C

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

(L)

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	200504A	*	( )	( )	27 (20)	All	J/UJ/P ND
	LCSID		( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
		* 2-(2-Methoxyethoxy)-Ethanol	( )				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Wet Chemistry

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1078	BA10439	Water	04/27/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Ferrous Iron by Standard Method 3500-Fe B
Total Organic Carbon by EPA SW 846 Method 9060A

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ERH1078	Nitrate	50.28 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Chloride Alkalinity, bicarbonate Alkalinity, total	0.11 mg/L 3.5 mg/L 3.5 mg/L	1 mg/L 2.0 mg/L 2.0 mg/L	All samples in SDG 92025
ICB/CCB	Chloride	0.22 mg/L	1 mg/L	All samples in SDG 92025

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were qualified as estimated in one sample.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 92025

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1078	Nitrate	J (all detects)	P	Technical holding times (H)

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

LDC #: 48138A6
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/28/20
Page: 1 of 1
Reviewer: ATV
2nd Reviewer: AC

METHOD: (Analyte) Alkalinity (SM 2320B), Chloride, Nitrate-~~X~~, Sulfate (EPA Method 300.0), Nitrate/Nitrite- N (EPA Method 353.2), Ferrous Iron (SM 3500- Fe B), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	From SDG #92039 (ERH1080 MS/MSD)
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1078	BA10439	Water	04/27/20 9:30
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

LDC #: 48138A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATV
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (NO3/NO2-N) (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 48138A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: ATV
2nd reviewer: ~~A~~

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ? Code: H
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:	NO_3 (EPA 300)	
Parameters:	water	
Technical holding time:	48 hrs	

Sample ID	Sampling date	Analysis date	Total Time	Qualifier	Analysis date	Total Time	Qualifier
1	9:30→12:30 4/27/20	14:47 4/29/20	50.28 hrs	J/UJ/P(dded)			

LDC #: 48138A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All Code: B

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		LOQ									
Cl	0.11		0.55	1									
Cl		0.22	1.10	1									
Alkalinity Bicarbonate	3.5		17.5	2.0									
Alkalinity Total	3.5		17.5	2.0									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 2, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1077	BA10438	Water	04/27/20
ERH1078	BA10439	Water	04/27/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1077 was identified as a trip blank. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

LDC #: 48138A7
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	r^2
III.	Initial calibration/ICV	A/A	~~%RSD ≤30~~ FT ICV ≤20 CCV ≤20
IV.	Continuing calibration	A	
V.	Laboratory Blanks	A	
VI.	Field blanks	NV	EB = ERH1068 (91941) TB=1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1077 TB	BA10438	Water	04/27/20
2	ERH1078	BA10439	Water	04/27/20
3				
4				
5				
6				
7				
8				
9				

Notes:

	200430BT						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1078	BA10439	Water	04/27/20
ERH1078(SGCU)	BA10439(SGCU)	Water	04/27/20

Samples ending in "SGCU" underwent Silica Gel cleanup

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Limit of Quantitation	Associated Samples
200430A1-Blank	04/30/20	Diesel (C10-C24)	150 ug/L	320 ug/L	ERH1078

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Limit of Quantitation	Modified Final Concentration
ERH1078	Diesel (C10-C24)	160 ug/L	320 ug/L	160U ug/L

V. Field Blanks

Samples ERH1068, ERH1068RE, ERH1068(SGCU), and ERH1068(SGCURE) (all four from SDG 91941) were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Limit of Quantitation	Associated Samples
ERH1068RE	04/20/20	Diesel (C10-C24)	150 ug/L	320 ug/L	ERH1078

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Limit of Quantitation	Modified Final Concentration
ERH1078	Diesel (C10-C24)	160 ug/L	320 ug/L	160U ug/L

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

Due to equipment blank contamination, data were qualified as not detected in one sample.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 92025

Sample	Compound	Modified Final Concentration	A or P	Code
ERH1078	Diesel (C10-C24)	160U ug/L	A	B

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 92025

Sample	Compound	Modified Final Concentration	A or P	Code
ERH1078	Diesel (C10-C24)	160U ug/L	A	F

LDC #: 48138A8
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Initial calibration/ICV	A/A	%RSD/RV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	SW	
V.	Field blanks	SW	EB = *ERH1068 (91941)
VI.	Surrogate spikes	A	= ERH1068RE
VII.	Matrix spike/Matrix spike duplicates	N CS	* = ERH1068 (SGCU)
VIII.	Laboratory control samples LCSID	A	* = ERH1068 (SGCURE)
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1†	ERH1078	BA10439	Water	04/27/20
2	ERH1078(SGCU)	BA10439(SGCU)	Water	04/27/20
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

	200430A1						
	200430A3						

LDC #: 48138AB

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: FT
2nd Reviewer: A

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Result/LOQ

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

(B)

Blank extraction date: 4/30/20 **Blank analysis date:** 5/4/20 **Associated samples:** 1

Conc. units: ug/L

Compound	Blank ID	Sample Identification						
	200430A1-Blank		1					
Diesel (C_{10}-C_{24})	150 / 320		160 U					
			~~320~~					

Blank extraction date: ___ **Blank analysis date:** ___ **Associated samples:** ___

Conc. units: ___

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 48138AB

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd Reviewer:

METHOD: ✓ **GC** __ **HPLC**

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sr Result/PQL (F)

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 4/20/20
Field blank type: (circle one) Field Blank / Trip Blank / Atmospheric Blank / Ambient Blank Associated Samples: 1
Rinsate / Equipment Rinsate / Equipment Blank / Source Blank / Other: EB

Compound	Blank ID	Blank ID	Sample Identification							
	ERH106RE		1							
Diesel (C10-C24)	150 / 320		1600 / 320							
CRQL										

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Trip Blank/ Atmospheric Blank/ Ambient Blank Associated Samples: _____
Rinsate / Equipment Rinsate / Equipment Blank / Source Blank / Other: _____

Compound	Blank ID	Blank ID	Sample Identification							
CRQL										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 2, 2020

Parameters: Ethylene Dibromide

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1077	BA10438	Water	04/27/20
ERH1078	BA10439	Water	04/27/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Ethylene Dibromide by Environmental Protection Agency (EPA) SW 846 Method 8011

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1077 was identified as a trip blank. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Laboratory Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Field Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

LDC #: 48138A10
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC Ethylene Dibromide (EPA SW846 Method 8011)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = ERH1068 (91941) TB = 1
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS / D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1077 TB	BA10438	Water	04/27/20
2	ERH1078	BA10439	Water	04/27/20
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Notes:

	200504A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 2, 2020

Parameters: Methane

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92025

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1077	BA10438	Water	04/27/20
ERH1078	BA10439	Water	04/27/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1077 was identified as a trip blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

Raw data were not reviewed for Level C validation.

X. Target Compound Identification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 92025

No Sample Data Qualified in this SDG

LDC #: 48138A51
SDG #: 92025
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	r^2 ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	TB = 1
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS ID
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	N	
X.	Target compound identification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1077 TB	BA10438	Water	04/27/20
2	ERH1078	BA10439	Water	04/27/20
3				
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Notes:

	200505A						

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

June 3, 2020

SUBJECT: Red Hill Bulk Storage Facility, CTO 18F0126, Data Validation

Dear Ms. Pascua

Enclosed are the final validation reports for the fractions listed below. This SDG was received on May 27, 2020. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #48154:

SDG #	Fraction
92039	Volatiles, Phenol, Polynuclear Aromatic Hydrocarbons, 2-(2-Methoxyethoxy)-ethanol, Wet Chemistry, Gasoline Range Organics, Total Petroleum Hydrocarbons as Extractables, Ethylene Dibromide, Methane

The data validation was performed under Level C validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

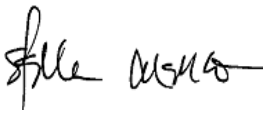
- Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 02, January 2017
- Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 01, April 2017
- Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, September 2017
- Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; Revision 00, June 2018
- Project Procedures Manual U.S. Naval Facilities Engineering Command Environmental Restoration Program, NAVFAC Pacific; DON 2015
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,



Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

115 pages-DL

Attachment 1

EDD 90/10 C/D

LDC #48154 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	BTEX & 1,2-DCA (8260B)		Phenol (8270D)		(3) PAHs (8270D -SIM)		2,2-MEE (8270D-M)		GRO (8260B)		TPH-E (8015B)		SGCU TPH-E (8015B)		EDB (8011)		Methane (175)		Alk (2320B)		Cl, SO_4 NO_3 (300.0)		NO_3/ NO_2-N (353.2)		Fe II (3500-Fe B)		TOC (9060A)			
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	92039	05/27/20	06/10/20	3	0	2	0	2	0	2	0	3	0	2	0	2	0	3	0	2	0	1	0	1	0	1	0	1	0	1	0		
Total	T/SC			3	0	2	0	2	0	2	0	3	0	2	0	2	0	3	0	2	0	1	0	1	0	1	0	1	0	1	0	0	26

Shaded cells indicate Level D validation (all other cells are Level C validation). These sample counts do not include MS/MSD, and DUPs

L:\AECOM\Red Hill\48154ST-18F0126.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1079	BA10503	Water	04/28/20
ERH1080	BA10504	Water	04/28/20
ERH1081	BA10505	Water	04/28/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1079 was identified as a trip blank. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples ERH1080 and ERH1081 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

LDC #: 48154A1a
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: EZ
2nd Reviewer: R

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B) ~~BTEX~~ + 12 oxy

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	% RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1068 (91941) TB = 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	ND	D = 2,3
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1	ERH1079	TB	BA10503	Water	04/28/20
2	ERH1080	D	BA10504	Water	04/28/20
3	ERH1081	D	BA10505	Water	04/28/20
4					
5					
6					
7					
8					
9					

Notes:

	200501AM						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Phenol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1080	BA10504	Water	04/28/20
ERH1081	BA10505	Water	04/28/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Phenol by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples ERH1080 and ERH1081 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Laboratory Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Phenol - Field Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

LDC #: 48154A2a
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: EF
2nd Reviewer: AC

METHOD: GC/MS Phenol (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤15 ICV ≤20
IV.	Continuing calibration pending	A	CCV ≤20/50
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = ERH1068 (91941)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D = 1,2
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1080	BA10504	Water	04/28/20
2	ERH1081	BA10505	Water	04/28/20
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Notes:

	200504A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1080	BA10504	Water	04/28/20
ERH1081	BA10505	Water	04/28/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) which are 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples ERH1080 and ERH1081 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

LDC #: 48154A2b
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: PT
2nd Reviewer: A

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration ending	A	CCV ≤ 20 | 50
V.	Laboratory Blanks	A	
VI.	Field blanks	NR	EB= ERH1068 (91941)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCSD
X.	Field duplicates	NR	D = 1,2
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1080	BA10504	Water	04/28/20
2	ERH1081	BA10505	Water	04/28/20
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Notes:

	200504A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: 2-(2-Methoxyethoxy)-ethanol

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1080	BA10504	Water	04/28/20
ERH1081	BA10505	Water	04/28/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

2-(2-Methoxyethoxy)-ethanol by Environmental Protection Agency (EPA) SW 846 Method 8270D Modified

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not added to all samples as required by the method. Using professional judgement, no data were qualified since the LCS/LCSD percent recoveries were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
200504A LCS/LCSD (All samples in SDG 92039)	2-(2-Methoxyethoxy)-ethanol	27.0 (≤20)	UJ (all non-detects)	P

X. Field Duplicates

Samples ERH1080 and ERH1081 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level C validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XIV. System Performance

Raw data were not reviewed for Level C validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method with the exception noted in Section VII.

Due to LCS/LCSD RPD, data were qualified as estimated in two samples.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Data Qualification Summary - SDG 92039

Sample	Compound	Flag	A or P	Reason (Code)
ERH1080 ERH1081	2-(2-Methoxyethoxy)-ethanol	UJ (all non-detects)	P	Laboratory control samples (RPD) (L)

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Laboratory Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
2-(2-Methoxyethoxy)-ethanol - Field Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

LDC #: 48154A2c
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS 2-(2-Methoxyethoxy)-Ethanol (EPA SW 846 Method 8270D-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%D/RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration ending	A	CCV ≤ 20 | SW
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB = ERH1068 (91941)
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	SW	LCS | D
X.	Field duplicates	ND	D = 1, 2
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1080	BA10504	Water	04/28/20
2	ERH1081	BA10505	Water	04/28/20
3				
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Notes:

	200504A						

LDC #: 48154A2c

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	all	Surrogates were not added to all samples as required by the method. Using professional judgment, no data were qualified. Although the LCS/LCSD % RPD was outside the QC limit, the LCS/LCSD percent recovery were within QC limits. Additionally, all base surrogate percent recoveries were within QC limits in the phenol analysis.		Text

(NBZ) = Nitrobenzene - d5 (2FP) = 2-Fluorophenol

LDC #: 48154A2C

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: EJ
2nd Reviewer:

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

(L)

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		200504A LCSD	*	( )	( )	27.0 (20)	All	J/UJ/P ND
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
			* 2-(2-Methoxyethoxy)-Ethanol			( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Wet Chemistry

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1080	BA10504	Water	04/28/20
ERH1080MS	BA10504MS	Water	04/28/20
ERH1080MSD	BA10504MSD	Water	04/28/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Alkalinity by Standard Method 2320B
Chloride, Nitrate, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Ferrous Iron by Standard Method 3500-Fe B
Total Organic Carbon by EPA SW 846 Method 9060A

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S The sequence or number of standards used for the calibration was incorrect.

C Correlation coefficient is <0.995.

R %R for calibration is not within control limits.

B Presumed contamination from preparation (method) blank or calibration blank.

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD or difference was high.

I ICP ICS results were unsatisfactory.

A ICP Serial Dilution %D were not within control limits.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Post Digestion Spike recovery was not within control limits.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
ERH1080	Nitrate	53.23 hours	48 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Limit of Quantitation	Associated Samples
PB (prep blank)	Chloride Alkalinity bicarbonate Alkalinity total	0.40 mg/L 3.5 mg/L 3.5 mg/L	1 mg/L 2.0 mg/L 2.0 mg/L	All samples in SDG 92039
ICB/CCB	Chloride	0.51 mg/L	1 mg/L	All samples in SDG 92039

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were qualified as estimated in one sample.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Data Qualification Summary - SDG 92039

Sample	Analyte	Flag	A or P	Reason (Code)
ERH1080	Nitrate	J (all detects)	P	Technical holding times (H)

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Wet Chemistry - Field Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

LDC #: 48154A6
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/28/20
Page: 1 of 1
Reviewer: ATL
2nd Reviewer: [illegible]

METHOD: (Analyte) Alkalinity (SM 2320B), Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrate/Nitrite- N (EPA Method 353.2), Ferrous Iron (SM 3500- Fe B), TOC (EPA SW846 Method 9060A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	(2,3)
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1080	BA10504	Water	04/28/20 10:20
2	ERH1080MS	BA10504MS	Water	04/28/20
3	ERH1080MSD	BA10504MSD	Water	04/28/20
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15				

Notes:

LDC #: 48154A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: ATL
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (NO3/NO2-N) (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
2,3	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 48154A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: ATV
2nd reviewer: AC

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

code: H

Method:	NO3 (EPA 300.0)						
Parameters:	water						
Technical holding time:	48 hrs						
Sample ID	**Sampling date**	**Analysis date**	**Total Time**	**Qualifier**	**Analysis date**	**Total Time**	**Qualifier**
1	10:20→13:20 4/28/20	18:34 4/30/20	53.23 hrs	J/UJ/P(detect)			

LDC #: 48154A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ATL
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All **Code: B**

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		LOQ									
Cl	0.40		2.0	1									
Cl		0.51	2.55	1									
Alkalinity Bicarbonate	3.5		17.5	2.0									
Alkalinity Total	3.5		17.5	2.0									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Gasoline Range Organics

Validation Level: Level C

Laboratory: APPL, Inc

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1079	BA10503	Water	04/28/20
ERH1080	BA10504	Water	04/28/20
ERH1081	BA10505	Water	04/28/20

Introduction

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The analyses were performed by the following method:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1079 was identified as a trip blank. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples ERH1080 and ERH1081 were identified as field duplicates. No results were detected in any of the samples.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

LDC #: 48154A7
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Gasoline Range Organics (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A /A	~~%RSD~~ r2 ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB= ERH1068 (91941) TB= 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D = 2,3
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1079	BA10503	Water	04/28/20
2	ERH1080	BA10504	Water	04/28/20
3	ERH1081	BA10505	Water	04/28/20
4				
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Notes:

	200501 AM						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1080	BA10504	Water	04/28/20
ERH1081	BA10505	Water	04/28/20
ERH1080(SGCU)	BA10504(SGCU)	Water	04/28/20
ERH1081(SGCU)	BA10505(SGCU)	Water	04/28/20

Samples ending in "SGCU" underwent Silica Gel cleanup

Introduction

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The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Limit of Quantitation	Associated Samples
200430A1-Blank	04/30/20	Diesel (C10-C24)	150 ug/L	320 ug/L	All samples in SDG 92039

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
ERH1080	Diesel (C10-C24)	210 ug/L	210U ug/L
ERH1081	Diesel (C10-C24)	180 ug/L	180U ug/L

V. Field Blanks

Samples ERH1068, ERH1068RE, ERH1068(SGCU), and ERH1068RE(SGCU) (all from SDG 91941) were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Limit of Quantitation	Associated Samples
ERH1068RE	04/20/20	Diesel (C10-C24)	150 ug/L	320 ug/L	All samples in SDG 92039

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
ERH1080	Diesel (C10-C24)	210 ug/L	210U ug/L
ERH1081	Diesel (C10-C24)	180 ug/L	180U ug/L

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples ERH1080 and ERH1081 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)
	ERH1080	ERH1081	
Diesel (C10-C24)	210J	180J	15 (≤50)

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

Due to equipment blank contamination, data were qualified as not detected in two samples.

No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 92039

Sample	Compound	Modified Final Concentration	A or P	Code
ERH1080	Diesel (C10-C24)	210U ug/L	A	B
ERH1081	Diesel (C10-C24)	180U ug/L	A	B

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 92039

Sample	Compound	Modified Final Concentration	A or P	Code
ERH1080	Diesel (C10-C24)	210U ug/L	A	F
ERH1081	Diesel (C10-C24)	180U ug/L	A	F

LDC #: 48154A8
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Initial calibration/ICV	A/A	%RSD ≤ 20 ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	SW	
V.	Field blanks	SW	EB = ERH1068 (91941)* = ERH1068RE
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	as *ERH1068(SGCU) *ERH1068(SGCURE)
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	D = 1,2
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1+	ERH1080	D	BA10504	Water	04/28/20
2	ERH1081	D	BA10505	Water	04/28/20
3-	ERH1080(SGCU)		BA10504(SGCU)	Water	04/28/20
4	ERH1081(SGCU)		BA10505(SGCU)	Water	04/28/20
5					
6					
7					
8					
9					
10					
11					
12					
13					

Notes:

+	200430A1						
-	200430A3						

LDC #: 48154A8

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below. Result/LOQ (B)

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: 4/30/20 **Blank analysis date:** 5/4/20 **Associated samples:** All

Conc. units: ug/L

Compound	Blank ID	Sample Identification						
	200430A1-Blank	1	2					
Diesel (C10-C24)	150 / 320		2104 / 320	1804 / 320				

Blank extraction date: ___ **Blank analysis date:** ___ **Associated samples:** ___

Conc. units: ___

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 48154A8

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd Reviewer:

METHOD: ✓ **GC** __ **HPLC**

Result / PQL LOQ

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target compounds detected in the field blanks? (F)

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 4/20/20
Field blank type: (circle one) Field Blank / Trip Blank / Atmospheric Blank / Ambient Blank
Rinsate / Equipment Rinsate / Equipment Blank / Source Blank / Other: FB

Associated Samples: All

Compound	Blank ID	Blank ID	Sample Identification							
	ERH106RE		1	2						
Diesel [C10-C24]	150 / 320		210U / 320	180U / 320						
CRQL										

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Trip Blank/ Atmospheric Blank/ Ambient Blank
Rinsate / Equipment Rinsate / Equipment Blank / Source Blank / Other: _____

Associated Samples: _____

Compound	Blank ID	Blank ID	Sample Identification							
CRQL										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 48154A8

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: FT
2nd reviewer: M

METHOD: V **GC** __ **HPLC**

Y N N/A Were field duplicate pairs identified in this SDG?

Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		%RPD Limit (≤ 50 %)	Qualification (Parent only)
	1	2		
Diesel (C_{10}-C_{24})	210 J	~~300 J~~ 180 J	15 ~~100~~	
		F1		

Compound	Concentration ( )		%RPD Limit (≤_____%)	Qualification (Parent only)

Compound	Concentration ( )		%RPD Limit (≤_____%))	Qualification (Parent only)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Ethylene Dibromide

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1079	BA10503	Water	04/28/20
ERH1080	BA10504	Water	04/28/20
ERH1081	BA10505	Water	04/28/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Ethylene Dibromide by Environmental Protection Agency (EPA) SW 846 Method 8011

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1079 was identified as a trip blank. No contaminants were found.

Sample ERH1068 (from SDG 91941) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples ERH1080 and ERH1081 were identified as field duplicates. No results were detected in any of the samples.

X. Compound Quantitation

Raw data were not reviewed for Level C validation.

XI. Target Compound Identification

Raw data were not reviewed for Level C validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Laboratory Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Ethylene Dibromide - Field Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

LDC #: 48154A10
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: [illegible]

METHOD: GC Ethylene Dibromide (EPA SW846 Method 8011)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%D RSD / ICV ≤ 20
III.	Continuing calibration	A	CW ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = ERH1068 (91941) TB = 1
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCS 1D
IX.	Field duplicates	ND	D = 2, 3
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1	ERH1079	TB	BA10503	Water	04/28/20
2	ERH1080	D	BA10504	Water	04/28/20
3	ERH1081	D	BA10505	Water	04/28/20
4					
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Notes:

	200504A						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: June 1, 2020

Parameters: Methane

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 92039

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1079	BA10503	Water	04/28/20
ERH1080	BA10504	Water	04/28/20

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Work Plan/Scope of Work, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 02, January 2017), the Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017), the Sampling and Analysis Plan, Addendum 01, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, September 2017), the Sampling and Analysis Plan, Addendum 03, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 00, June 2018), the Project Procedures Manual, U.S. Naval Facilities Engineering Command (NAVFAC) Environmental Restoration (ER) Program, NAVFAC Pacific (DON 2015), and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Methane by Method RSK-175

All sample results were subjected to Level C data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

H Holding times were exceeded.

S Surrogate recovery was outside QC limits.

C Calibration %RSD, r, r^2 or %D were noncompliant.

R Calibration RRF was <0.05.

B Presumed contamination from preparation (method blank).

L Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.

Q MS/MSD recovery was poor.

E MS/MSD or Duplicate RPD was high.

I Internal standard performance was unsatisfactory.

M Instrument Performance Check (BFB or DFTPP) was noncompliant.

T Presumed contamination from trip blank.

F Presumed contamination from FB or ER.

D The analysis with this flag should not be used because another more technically sound analysis is available.

P Instrument performance for pesticides was poor.

V Unusual problems found with the data not defined elsewhere. Description of the problem can be found in the validation report.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample ERH1079 was identified as a trip blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

Raw data were not reviewed for Level C validation.

X. Target Compound Identification

Raw data were not reviewed for Level C validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Laboratory Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Methane - Field Blank Data Qualification Summary - SDG 92039

No Sample Data Qualified in this SDG

LDC #: 48154A51
SDG #: 92039
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level C

Date: 5/29/20
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	Initial calibration/ICV	A /A	~~0/0 psi~~ r^2 ICV ≤ 20
III.	Continuing calibration	A	CW ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	~~EB= ERH1068 (9/9/41)~~ FD TB = 1
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	N	
X.	Target compound identification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	ERH1079	BA10503	Water	04/28/20
2	ERH1080	BA10504	Water	04/28/20
3				
4				
5				
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Notes:

	200505A						

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

June 29, 2020

SUBJECT: **Data Quality Assessment Report**
April 2020
Environmental Investigation and
Groundwater Monitoring
Red Hill Bulk Fuel Storage Facility
Joint Base Pearl Harbor-Hickam
Oahu, Hawaii
CTO 18F0126

Enclosed is the Data Quality Assessment Report, April 2020, Environmental Investigation and Groundwater Monitoring for Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, Oahu, Hawaii, CTO 18F0126.

We appreciate this opportunity to support AECOM in the performance of this project.

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
scuenco@lab-data.com
Operations Manager/Senior Chemist

DATA QUALITY ASSESSMENT REPORT

APRIL 2020
ENVIRONMENTAL INVESTIGATION AND GROUNDWATER MONITORING

RED HILL BULK FUEL STORAGE FACILITY
JOINT BASE PEARL HARBOR-HICKAM
OAHU, HAWAII
CTO 18F0126

June 29, 2020

Table of Contents

Section	Title	Page No.
1.0	INTRODUCTION	1
2.0	VOLATILE ORGANIC COMPOUNDS	6
2.1	Precision and Accuracy	6
2.2	Representativeness	7
2.3	Comparability	7
2.4	Completeness	7
2.5	Sensitivity	8
3.0	PHENOL	8
3.1	Precision and Accuracy	8
3.2	Representativeness	9
3.3	Comparability	9
3.4	Completeness	9
3.5	Sensitivity	9
4.0	POLYNUCLEAR AROMATIC HYDROCARBONS	9
4.1	Precision and Accuracy	9
4.2	Representativeness	10
4.3	Comparability	11
4.4	Completeness	11
4.5	Sensitivity	11
5.0	2-(2-METHOXYETHOXY)-ETHANOL	11
5.1	Precision and Accuracy	11
5.2	Representativeness	12
5.3	Comparability	12
5.4	Completeness	12
5.5	Sensitivity	12
6.0	GASOLINE RANGE ORGANICS	13
6.1	Precision and Accuracy	13
6.2	Representativeness	13
6.3	Comparability	14
6.4	Completeness	14
6.5	Sensitivity	14
7.0	TOTAL PETROLEUM HYDROCARBONS AS EXTRACTABLES	14
7.1	Precision and Accuracy	14
7.2	Representativeness	15
7.3	Comparability	16
7.4	Completeness	16
7.5	Sensitivity	16

Table of Contents

Section	Title	Page No.
8.0	ETHYLENE DIBROMIDE	16
8.1	Precision and Accuracy	16
8.2	Representativeness	17
8.3	Comparability	17
8.4	Completeness	18
8.5	Sensitivity	18
9.0	METHANE	18
9.1	Precision and Accuracy	18
9.2	Representativeness	19
9.3	Comparability	19
9.4	Completeness	19
9.5	Sensitivity	19
10.0	WET CHEMISTRY	19
10.1	Precision and Accuracy	19
10.2	Representativeness	20
10.3	Comparability	21
10.4	Completeness	21
10.5	Sensitivity	21
11.0	VARIANCES IN ANALYTICAL PERFORMANCE	21
12.0	SUMMARY OF PARCCS CRITERIA	21
12.1	Precision and Accuracy	21
12.2	Representativeness	22
12.3	Comparability	22
12.4	Completeness	22
12.5	Sensitivity	22

GLOSSARY

BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CTO	Contract Task Order
DCA	1,2-Dichloroethane
DL	Detection Limit
DOD	Department of Defense
DQAR	Data Quality Assessment Report
DRO	Diesel Range Organics
DUP	Laboratory Duplicate
EB	Equipment Blank
EDB	Ethylene Dibromide
FB	Field Blank
FD	Field Duplicate
GRO	Gasoline Range Organics
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
LDC	Laboratory Data Consultants, Inc
LOD	Limit of Detection
LOQ	Limit of Quantitation
MEE	2-(2-Methoxyethoxy)-ethanol
MS/MSD	Matrix Spike / Matrix Spike Duplicate
NAVFAC	Naval Facilities Engineering Command
ORO	Oil Range Organics
PAH	Polynuclear Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity
PQO	Project Quality Objectives
PT	Proficiency Testing sample
QA/QC	Quality Assurance/Quality Control
QSM	Quality Systems Manual
RPD	Relative Percent Difference
RRF	Relative Response Factor
SDG	Sample Delivery Group
SGCU	Silica Gel Clean Up
SIM	Selected Ion Monitoring
TB	Trip Blank
TOC	Total Organic Carbon
TPHE	Total Petroleum Hydrocarbons as Extractables
VOC	Volatile Organic Compounds
%D	Percent Difference
%R	Percent Recovery
%RSD	Percent Relative Standard Deviation
mg/L	Milligrams per Liter
ug/L	Micrograms per Liter

1.0 INTRODUCTION

An environmental investigation and groundwater monitoring were conducted on April 2020 at the Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam in Oahu, Hawaii. This part of the investigation included the collection and analyses of 44 environmental and quality control (QC) samples. The analyses were performed by the following methods:

Benzene, Toluene, Ethylbenzene, Xylenes, total (BTEX) and 1,2-Dichloroethane (DCA) by Environmental Protection Agency (EPA) SW-846 Method 8260B
Phenol by EPA SW-846 Method 8270D
Polynuclear Aromatic Hydrocarbons (PAH) by EPA SW-846 Method 8270D-Selected Ion Monitoring (SIM) mode
2-(2-Methoxyethoxy)-ethanol by (MEE) EPA SW-846 Method 8270D Modified
Gasoline Range Organics (GRO) by EPA SW-846 Method 8260B
Total Petroleum Hydrocarbons as Extractables (TPHE) by EPA SW-846 Method 8015B
Ethylene Dibromide (EDB) by EPA SW-846 Method 8011
Methane by Method RSK-175

Wet Chemistry:
Alkalinity by Standard Method 2320B
Chloride, Nitrate, and Sulfate (Anions) by EPA Method 300.0
Ferrous Iron by Standard Method 3500-Fe B
Nitrate/Nitrite as Nitrogen by EPA Method 353.2
Total Organic Carbon (TOC) by EPA SW-846 Method 9060A

Analytical services for the water samples were provided by APPL, Inc. The samples were grouped into sample delivery groups (SDGs) as received by the laboratory. The environmental samples are associated with quality assurance (QA) and QC samples designed to document the data quality of the entire SDG or a sub-group of samples within a SDG. Table I is a cross-reference table listing each sample, analysis, SDG, collection date, laboratory sample number, matrix, and validation level.

Approximately ten percent of the analytical data were validated according to Naval Facilities Engineering Command (NAVFAC) Pacific Level D data validation procedures and ninety percent of the analytical data were validated according to NAVFAC Pacific Level C data validation procedures. The analytical data were evaluated for QA/QC based on the *NAVFAC Pacific Environmental Restoration (ER) Program Data Validation Procedures (DON 2015)* and the *Department of Defense Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (DoD 2017)*.

This data quality assessment report (DQAR) summarizes the QA/QC evaluation of the data according to precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) relative to the project quality objectives (PQOs). This report provides a quantitative and qualitative assessment of the data and identifies potential sources of error, uncertainty, and bias that may affect the overall usability.

The DQAR evaluates and summarizes the results of QA/QC data validation for the entire sampling program. Each analytical fraction has a separate section for each of the PARCCS criteria. These sections interpret specific QC deviations and their effects on both individual data points and the analyses as a whole. Section 12 presents a summary of the PARCCS criteria by comparing quantitative parameters with acceptability criteria defined in the PQOs. Qualitative PARCCS criteria are also summarized in this section.

Precision and Accuracy of Environmental Data

Environmental data quality depends on sample collection procedures, analytical methods and instrumentation, documentation, and sample matrix properties. Both sampling procedures and laboratory analyses contain potential sources of uncertainty, error, and/or bias, which affect the overall quality of a measurement. Errors in sample data may result from incomplete equipment decontamination, inappropriate sampling techniques, sample heterogeneity, improper filtering, and improper preservation. The accuracy of analytical results is dependent on selecting appropriate analytical methods, maintaining equipment properly, and complying with QC requirements. The sample matrix also is an important factor in the ability to obtain precise and accurate results within a given media.

Environmental and laboratory QA/QC samples assess the effects of sampling procedures and evaluate laboratory contamination, laboratory performance, and matrix effects. QA/QC samples include: method blanks, calibration blanks, laboratory control samples/laboratory control sample duplicates (LCS/LCSD), matrix spike samples/matrix spike sample duplicates (MS/MSD), laboratory duplicates (DUP), field duplicate samples (FD), trip blanks (TB), equipment blanks (EB), field blanks (FB), and proficiency testing (PT) samples.

Before conducting the PARCCS evaluation, the analytical data were validated according to the NAVFAC procedures and DoD QSM. Samples not meeting the NAVFAC procedures and DoD QSM acceptance criteria were qualified with a flag, an abbreviation indicating a deficiency with the data. The following are flags used in data validation.

J Estimated The associated numerical value is an estimated quantity. The analyte was detected but the reported value may not be accurate or precise. The "J" qualification indicates the data fell outside the QC limits, but the exceedance was not sufficient to cause rejection of the data.

R Rejected The data is unusable (the compound or analyte may or may not be present). Use of the "R" qualifier indicates a significant variance from functional guideline acceptance criteria. Either resampling or reanalysis is necessary to determine the presence or absence of the rejected analyte.

U Nondetected Analyses were performed for the compound or analyte, but it was not detected. The "U" designation is also applied to suspected blank contamination. The "U" flag is used to qualify any result detected in an environmental sample at a concentration less than 10 times the value of the concentration in any associated blank for common laboratory contaminants and less than 5 times the concentration in any associated blank for all other contaminants.

UJ Estimated/Nondetected Analyses were performed for the compound or analyte, but it was not detected and the limit of detection (LOD) is an estimated quantity due to poor accuracy or precision. This qualification is also used to flag possible false negative results in the case where low bias in the analytical system is indicated by low calibration response, surrogate, internal standard, or other spike recovery.

Once the data are reviewed and qualified according to the NAVFAC procedures and DoD QSM, the data set is then evaluated using PARCCS criteria. PARCCS criteria provide an evaluation of overall data usability. The following is a discussion of PARCCS criteria as related to the PQOs.

Precision is a measure of the agreement or reproducibility of analytical results under a given set of conditions. It is a quantity that cannot be measured directly but is calculated from the reported concentrations.

Precision is expressed as the relative percent difference (RPD):

$RPD = (D1–D2)/\{1/2(D1+D2)\} \times 100$

Where:
D1 = the reported concentration for primary sample analyses
D2 = the reported concentrations for duplicate analyses

Precision is primarily assessed by calculating a RPD from the reported concentrations of the spiked compounds for each sample in the MS/MSD pair. In the absence of a MS/MSD pair, a laboratory duplicate or LCS/LCSD pair can be analyzed as an alternative means of assessing precision. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. An additional measure of sampling precision may be obtained by collecting and analyzing field duplicate samples, which are compared using the RPD result as the evaluation criteria.

MS and MSD samples are field samples spiked by the laboratory with target analytes prior to preparation and analysis. These samples measure the overall efficiency of the analytical method in recovering target analytes from an environmental matrix. A LCS is similar to a MS/MSD sample in that the LCS is spiked with the same target analytes prior to preparation and analysis. However, the LCS is prepared using a controlled interference-free matrix instead of a field sample aliquot. Laboratory reagent water is used to prepare aqueous LCS. The LCS measures laboratory efficiency in recovering target analytes from an aqueous matrix in the absence of matrix interferences.

For inorganic analysis, one primary sample is analyzed and accompanied by an unspiked laboratory duplicate. The data reviewer compares the reported results of the primary analysis and the laboratory duplicate and calculates RPDs to assess laboratory precision.

Laboratory and field precision are further evaluated by calculating RPDs for field duplicate pairs. The sampler collects two field samples at the same location and under identically controlled conditions. The laboratory then analyzes the samples under identical conditions.

An RPD outside the numerical QC limit in MS/MSD samples, LCS/LCSDs, or FDs indicates imprecision. Imprecision is the variance in the consistency with which the laboratory arrives at a particular reported result. Thus, the actual analyte concentration may be higher or lower than the reported result.

Possible causes of poor precision include sample matrix interference, improper sample collection or handling, inconsistent sample preparation, and poor instrument stability. In some duplicates, results maybe reported in either the primary or duplicate samples at levels below the limit of quantitation (LOQ) or non-detected. Since these values are considered to be estimates, RPD exceedances from these duplicate sets do not suggest a significant impact on the data quality.

Accuracy is a measure of the agreement of an experimental determination and the true value of the parameter being measured. It is used to identify bias in a given measurement system. Recoveries outside acceptable QC limits may be caused by factors such as instrumentation, analyst error, or matrix interference. Accuracy is assessed through the analysis of MS, MSD, LCS, and samples containing surrogate spikes. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. Surrogate spikes are either isotopically labeled compounds or compounds that are not typically detected in the samples. Surrogate spikes are added to every blank, environmental sample, MS/MSD, LCS/LCSD and standard, for all applicable organic analyses. Accuracy of inorganic analyses is determined using the percent recoveries of MS and LCS analyses.

Percent recovery (%R) is calculated using the following equation:

$\%R = (A–B)/C \times 100$

Where:
A = measured concentration in the spiked sample
B = measured concentration of the spike compound in the unspiked sample
C = concentration of the spike

The percent recovery of each analyte spiked in MS/MSD samples, LCS, and surrogate compounds added to environmental samples is evaluated against the acceptance criteria specified by the previously noted documents. Spike recoveries outside the acceptable QC accuracy limits provide an indication of bias, where the reported data may overestimate or underestimate the actual concentration of compounds detected or LODs reported for environmental samples.

Accuracy can also be evaluated by analyzing PT samples. PT testing determines the performance of individual laboratories for specific tests or measurements and is used to monitor laboratories' continuing performance.

Representativeness is a qualitative parameter that expresses the degree to which the sample data are characteristic of a population and is evaluated by reviewing the QC results of blank samples and holding times. Positive detects of compounds in the blank samples identify compounds that may have been introduced into the samples during sample collection, transport, preparation, or analysis. The QA/QC blanks collected and analyzed are method blanks, calibration blanks, field blanks, equipment blanks, and trip blanks.

A method blank is a laboratory grade water or solid matrix that contains the method reagents and has undergone the same preparation and analysis as the environmental samples. The method blank provides a measure of the combined contamination derived from the laboratory source water, glassware, instruments, reagents, and sample preparation steps. Method blanks are prepared for each sample of a similar matrix extracted by the same method at a similar concentration level.

For inorganic analyses, initial and continuing calibration blanks (ICB/CCB) consist of acidified laboratory grade water, which are injected at the beginning and at a regular frequency during each 12 - hour sample analysis run. These blanks estimate residual contaminants from the previous sample or standards analysis and measure baseline shifts that commonly occur in emission and absorption spectroscopy.

Trip blanks are used to identify possible volatile organic contamination introduced into the sample during transport. A trip blank is a sample volatile organics analysis vial filled in the laboratory with reagent-grade water and preserved to a pH less than 2 with hydrochloric acid. It is transported to the site, stored with the sample containers, and returned unopened to the laboratory for analysis. Trip blanks were collected and analyzed for BTEX, DCA, GRO, EDB, and methane.

Equipment blanks consist of analyte-free water poured over or through the sample collection equipment. The water is collected in a sample container for laboratory analysis. These blanks are collected after the sampling equipment is decontaminated and measure efficiency of the decontamination procedure. Equipment blanks were collected and analyzed for BTEX, DCA, phenol, PAH, MEE, GRO, TPHE, and EDB.

Field blanks consist of analyte-free source water stored at the sample collection site. The water is collected from each source water used during each sampling event. Field blanks were collected and analyzed for BTEX, DCA, phenol, PAH, MEE, GRO, TPHE, and EDB.

Contaminants found in both the environmental sample and a blank sample are assumed to be laboratory artifacts if the concentration in the environmental sample is less than 5 times the blank value.

Holding times are evaluated to assure that the sample integrity is intact for accurate sample preparation and analysis. Holding times will be specific for each method and matrix analyzed. Holding time exceedances can cause loss of sample constituents due to biodegradation, precipitation, volatilization, and chemical degradation.

Comparability is a qualitative expression of the confidence with which one data set may be compared to another. It provides an assessment of the equivalence of the analytical results to data obtained from other analyses. It is important that data sets be comparable if they are used in conjunction with other data sets. The factors affecting comparability include the following: sample collection and handling techniques, matrix type, and analytical method. If these aspects of sampling and analysis are carried out according to standard analytical procedures, the data are considered comparable. Comparability can only be compared with confidence when precision, accuracy, and representativeness are known.

Completeness is defined as the percentage of acceptable sample results compared to the total number of sample results. Completeness is evaluated to determine if an acceptable amount of usable data were obtained so that a valid scientific site assessment can be completed. Completeness equals the total number of sample results for each fraction minus the total number of rejected sample results divided by the total number of sample results multiplied by 100. As specified in the PQOs, the goal for completeness for target analytes in each analytical fraction is 90 percent.

Percent completeness is calculated using the following equation:

$$\%C = (T - R)/T \times 100$$

Where:
%C = percent completeness
T = total number of sample results
R = total number of rejected sample results

Completeness is also determined by comparing the planned number of samples per method and matrix as specified in the project planning document, with the number determined above.

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. This capability is established during the planning phase to meet the PQOs. It is important that calibration requirements, detection limits (DLs), and project-specific LODs and LOQs presented in the work plan are achieved and that target analytes can be detected at concentrations necessary to support the PQOs. In addition, sample results are compared to method blank and field blank results to identify potential effects of laboratory background and field procedures on sensitivity.

The following sections present a review of QC data for each analytical method. The details regarding the qualification of results are provided in the data validation reports.

2.0 VOLATILE ORGANIC COMPOUNDS

A total of 44 water samples were analyzed for BTEX and a total of 14 water samples were analyzed for 1,2-DCA by EPA SW 846 Method 8260B. All volatile organic compounds (VOC) data were assessed to be valid since none of the 190 total results were rejected due to holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

2.1 Precision and Accuracy

2.1.1 Instrument Calibration

Initial and continuing calibration results provide a means of evaluating accuracy within a particular SDG. Relative response factor (RRF), percent relative standard deviation (%RSD), and percent difference (%D) are the three major parameters used to measure the effectiveness of instrument calibration. RRF is a measure of the relative spectral response of an analyte compared to its internal standard. %RSD is an expression of the linearity of instrument response. %D is a comparison of a continuing calibration instrumental response with its initial response. %RSD and %D exceedances suggest routine instrumental anomalies, which typically impact all sample results for the affected compounds.

The RRFs met the validation acceptance criteria of ≥ 0.05 in the initial and continuing calibrations. The %RSDs met the method acceptance criteria of 15 percent in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent. The %Ds in the ending continuing calibration verifications met the validation acceptance criteria of 50 percent.

2.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

2.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

2.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

2.1.5 FD Samples

No VOC were detected for field duplicate samples ERH1039 and ERH1040, field duplicate samples ERH1044 and ERH1045, and field duplicate samples ERH1080 and ERH1081.

2.1.6 Internal Standards

All internal standard areas and retention areas were within acceptance criteria.

2.1.7 Proficiency Testing Samples

Proficiency testing (PT) samples were not performed for the sampling event.

2.1.8 Compound Quantitation and Target Identification

All compound quantitation and target identifications were found to be acceptable.

2.2 Representativeness

2.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

2.2.2 Blanks

Method blanks, EBs, FBs, and TBs were collected and analyzed to evaluate representativeness. The concentration for an individual target compound in any of the types of QA/QC blanks was used for data qualification.

If contaminants were detected in a blank, corrective actions were made for the chemical analytical data during data validation. The corrective action consisted of amending the laboratory reported results based on the following criteria.

> Results Below or Above the LOQ If a sample result for the blank contaminant was less than the LOQ or greater than the sample LOQ and less than 5 times the blank value for all contaminants, the sample result for the blank contaminant was amended as a non-detect at the concentration reported in the sample results.
>
> No Action If a sample result for the blank contaminant was greater than 5 times the blank value for all contaminants, the result was not amended.

2.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

2.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

2.2.2.3 Trip Blanks

No contaminants were detected in the trip blanks for this analysis.

2.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

2.4 Completeness

The completeness level attained for VOC field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

2.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

3.0 PHENOL

A total of 24 water samples were analyzed for phenol by EPA SW-846 Method 8270D. All phenol data were assessed to be valid since none of the 24 total results were rejected due to holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

3.1 Precision and Accuracy

3.1.1 Instrument Calibration

The RRFs met the validation acceptance criteria of ≥ 0.05 in the initial and continuing calibrations. The %RSDs met the method acceptance criteria of 15 percent in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent. The %Ds in the ending continuing calibration verifications met the validation acceptance criteria of 50 percent.

3.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

3.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

3.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

3.1.5 FD Samples

No phenol were detected for field duplicate samples ERH1039 and ERH1040, field duplicate samples ERH1044 and ERH1045, and field duplicate samples ERH1080 and ERH1081.

3.1.6 Internal Standards

All internal standard areas and retention times were within the acceptance criteria.

3.1.7 Proficiency Testing Samples

PT samples were not performed for the sampling event.

3.1.8 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

3.2 Representativeness

3.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

3.2.2 Blanks

Method blanks, EBs, and FBs were collected and analyzed to evaluate representativeness.

3.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

3.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

3.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

3.4 Completeness

The completeness level attained for phenol was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

3.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

4.0 POLYNUCLEAR AROMATIC HYDROCARBONS

A total of 24 water samples were analyzed for 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene by EPA SW-846 Method 8270D-SIM. All PAH data were assessed to be valid since none of the 72 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

4.1 Precision and Accuracy

4.1.1 Instrument Calibration

The RRFs met the validation acceptance criteria of ≥ 0.05 in the initial and continuing calibrations. The %RSDs met the method acceptance criteria of 15 percent in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent. The %Ds in the ending continuing calibration verifications met the validation acceptance criteria of 50 percent.

4.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

4.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

4.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

4.1.5 FD Samples

No PAH were detected for field duplicate samples ERH1039 and ERH1040, field duplicate samples ERH1044 and ERH1045, and field duplicate samples ERH1080 and ERH1081.

4.1.6 Internal Standards

All internal standard areas and retention times were within the acceptance criteria.

4.1.7 Proficiency Testing Samples

PT samples were not performed for the sampling event.

4.1.8 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

4.2 Representativeness

4.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

4.2.2 Blanks

Method blanks, EBs, and FBs were collected and analyzed to evaluate representativeness.

4.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

4.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

4.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

4.4 Completeness

The completeness level attained for PAH field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

4.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

5.0 2-(2-METHOXYETHOXY)-ETHANOL

A total of 24 water samples were analyzed for MEE by EPA SW 846 Method 8270D modified. All MEE data were assessed to be valid since none of the 24 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

5.1 Precision and Accuracy

5.1.1 Instrument Calibration

The RRFs met the validation acceptance criteria of ≥ 0.05 in the initial and continuing calibrations. The %RSDs met the method acceptance criteria of 15 percent in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent. The %Ds in the ending continuing calibration verifications met the validation acceptance criteria of 50 percent.

5.1.2 Surrogates

Surrogates were not added to all samples as required by the method. No data were qualified since all MS/MSD %Rs, LCS/LCSD %Rs, and all base surrogate %Rs were within the acceptance criteria.

5.1.3 MS/MSD Samples

All MS/MSD %Rs were within the acceptance criteria.

In instances where MS/MSD RPDs were above the laboratory acceptance criteria and the associated results were not detected, no data were qualified.

5.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs were within the acceptance criteria.

As a result of high LCS/LCSD RPDs, the MEE result in samples ERH1078, ERH1080, and ERH1081 were qualified as non-detected estimated (UJ). Bias cannot be determined.

5.1.5 FD Samples

No MEE was detected for field duplicate samples ERH1039 and ERH1040, field duplicate samples ERH1044 and ERH1045, and field duplicate samples ERH1080 and ERH1081.

5.1.6 Internal Standards

All internal standard areas and retention times were within the acceptance criteria.

5.1.7 Proficiency Testing Samples

PT samples were not performed for the sampling event.

5.1.8 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

5.2 Representativeness

5.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

5.2.2 Blanks

Method blanks, EBs, and FBs were collected and analyzed to evaluate representativeness.

5.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

5.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

5.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

5.4 Completeness

The completeness level attained for MEE field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

5.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

6.0 GASOLINE RANGE ORGANICS

A total of 44 water samples were analyzed for GRO by EPA SW-846 Method 8260B. All GRO data were assessed to be valid since none of the 44 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

6.1 Precision and Accuracy

6.1.1 Instrument Calibration

The %RSDs met the method acceptance criteria of 20 percent or the coefficient of determination (r^2) was $\geq$ 0.990 in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent.

6.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

6.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

6.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

6.1.5 FD Samples

The FD RPDs were within the acceptance criteria for field duplicate samples ERH1044 and ERH1045.

No GRO were detected for field duplicate samples ERH1039 and ERH1040 and field duplicate samples ERH1080 and ERH1081.

6.1.6 Proficiency Testing Samples

PT samples were not performed for the sampling event.

6.1.7 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

6.2 Representativeness

6.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

6.2.2 Blanks

Method blanks, EBs, FBs, and TBs were collected and analyzed to evaluate representativeness.

6.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

6.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

6.2.2.3 Trip Blanks

No contaminants were detected in the trip blanks for this analysis.

6.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

6.4 Completeness

The completeness level attained for GRO field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

6.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

7.0 TOTAL PETROLEUM HYDROCARBONS AS EXTRACTABLES

A total of 24 water samples were analyzed for diesel range organics (DRO) and oil range organics (ORO) by EPA SW-846 Method 8015B and 15 water samples were also analyzed for DRO and ORO with silica gel cleanup (SGCU) by EPA SW-846 Method 8015B. All TPHE data were assessed to be valid since none of the 78 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

7.1 Precision and Accuracy

7.1.1 Instrument Calibration

The %RSDs in the initial calibration and the %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent.

7.1.2 Surrogates

As a result of high surrogate %Rs, the TPHE results in samples ERH1055 and ERH1057 were qualified as detected estimated (J). High surrogate %R indicates that the result may be biased high in the associated sample.

In instances where surrogate %Rs were above the laboratory acceptance criteria and the associated results were not detected, no data were qualified.

7.1.3 MS/MSD Samples

As a result of a high MS/MSD RPD, the Diesel (C10 – C24) result in sample ERH1039 was qualified as detected estimated (J). Bias cannot be determined.

In instances where MS/MSD %Rs and RPDs were above the laboratory acceptance criteria and the associated results were not detected, no data were qualified.

7.1.4 LCS/LCSD Samples

As a result of high LCS %Rs, the Diesel (C10 – C24) result in nine samples and the Oil (C24 – C40) result in eight samples were qualified as detected estimated (J). High MS/MSD %R indicates that the result may be biased high in the associated sample.

In instances where LCS %Rs were above the laboratory acceptance criteria and the associated results were not detected, no data were qualified.

All LCS/LCSD RPDs were within the acceptance criteria.

7.1.5 FD Samples

The FD RPDs were within the acceptance criteria for field duplicate samples ERH1039 and ERH1040, field duplicate samples ERH1044 and ERH1045, field duplicate samples ERH1044(SGCU) and ERH1045(SGCU), and field duplicate samples ERH1080 and ERH1081.

7.1.6 Proficiency Testing Samples

PT samples were not performed for the sampling event.

7.1.7 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

In instances where more than one result was reported for an individual sample, data were qualified as not reportable by the validators in order to yield only one complete set of data for a given sample.

7.2 Representativeness

7.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

7.2.2 Blanks

Method blanks, EBs, and FBs were collected and analyzed to evaluate representativeness.

7.2.2.1 Method Blanks

As a result of method blank contaminations, the Diesel (C10 – C24) result in samples ERH1078, ERH1080, and ERH1081 were qualified as not detected (U).

7.2.2.2 EBs and FBs

As a result of equipment blank contamination, the Diesel (C10 – C24) result in samples ERH1074, ERH1076, ERH1070, ERH1078, ERH1080, and ERH1081 were qualified as not detected (U).

No contaminants were detected in the field blank for this analysis.

7.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. Target compounds detected below the LOQs flagged (J) by the laboratory should be considered estimated. The comparability of the data is regarded as acceptable.

7.4 Completeness

The completeness level attained for TPHE field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

7.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

8.0 ETHYLENE DIBROMIDE

A total of 14 water samples were analyzed for EDB by EPA SW-846 Method 8011. All EDB data were assessed to be valid since none of the 14 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

8.1 Precision and Accuracy

8.1.1 Instrument Calibration

The %RSDs met the method acceptance criteria of 20 percent or the coefficient of determination (r^2) was $\geq$ 0.990 in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent.

8.1.2 Surrogates

All surrogate %Rs were within the acceptance criteria.

8.1.3 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

8.1.4 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

8.1.5 FD Samples

No EDB was detected for field duplicate samples ERH1080 and ERH1081.

8.1.6 Proficiency Testing Samples

PT samples were not performed for the sampling event.

8.1.7 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

8.2 Representativeness

8.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

8.2.2 Blanks

Method blanks, EBs, FBs, and TBs were collected and analyzed to evaluate representativeness.

8.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

8.2.2.2 EBs and FBs

No contaminants were detected in the equipment blank and field blank for this analysis.

8.2.2.3 Trip Blanks

No contaminants were detected in the trip blanks for this analysis.

8.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

8.4 Completeness

The completeness level attained for EDB field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

8.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

9.0 METHANE

A total of 38 water samples were analyzed for methane by Method RSK-175. All methane data were assessed to be valid since none of the 38 total results were rejected based on holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

9.1 Precision and Accuracy

9.1.1 Instrument Calibration

The coefficient of determination (r^2) was ≥ 0.990 in the initial calibration. The %Ds in the initial and continuing calibration verifications met the method acceptance criteria of 20 percent.

9.1.2 MS/MSD Samples

All MS/MSD %Rs and RPDs were within the acceptance criteria.

9.1.3 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

9.1.4 FD Samples

Field duplicate samples were not collected for this analysis.

9.1.5 Proficiency Testing Samples

PT samples were not performed for the sampling event.

9.1.6 Compound Quantitation and Target Identification

All compound quantitation and target compound identification were found to be acceptable.

In instances where more than one result was reported for an individual sample, data were qualified as not reportable by the validators in order to yield only one complete set of data for a given sample.

9.2 Representativeness

9.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All holding times were met.

9.2.2 Blanks

Method blanks and trip blanks were collected and analyzed to evaluate representativeness.

9.2.2.1 Method Blanks

No contaminants were detected in the method blanks for this analysis.

9.2.2.2 Trip Blanks

No contaminants were detected in the trip blanks for this analysis.

9.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. The comparability of the data is regarded as acceptable.

9.4 Completeness

The completeness level attained for methane field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

9.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

10.0 WET CHEMISTRY

A total of 19 water samples were analyzed for alkalinity by Standard Method 2320B; anions by EPA Method 300.0; ferrous iron by Standard Method 3500-Fe B; nitrate/nitrite as nitrogen by EPA Method 353.2; and TOC by EPA SW-846 Method 9060A. All wet chemistry data were assessed to be valid since none of the 171 total results were rejected due to holding time or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the PQOs.

10.1 Precision and Accuracy

10.1.1 Instrument Calibration

Initial and continuing calibration verification results provide a means of evaluating accuracy within a particular SDG. Correlation coefficient (r) and %R are the two major parameters used to measure the effectiveness of instrument calibration. The r indicates the linearity of the calibration curve. %R is used to

verify the ongoing calibration acceptability of the analytical system. The most critical of the two calibration parameters, r, has the potential to affect data accuracy across a SDG when it is outside the acceptable QC limits. %R exceedances suggest more routine instrumental anomalies, which typically impact all sample results for the affected analytes.

The correlation coefficients in the initial calibrations were within the method acceptance criteria of ≥ 0.995.

Four total organic carbon results were qualified as detected estimated (J). The continuing calibration verification (CCV) %Rs were outside the method acceptance criteria of 90-110 percent. Bias cannot be determined.

10.1.2 MS/MSD Samples

As a result of low MS/MSD %Rs, the chloride result in sample ERH1039 was qualified as detected estimated (J). Low MS/MSD %R indicates that the result may be biased low in the associated sample.

All MS/MSD RPDs were within the acceptance criteria.

10.1.3 LCS/LCSD Samples

All LCS/LCSD %Rs and RPDs were within the acceptance criteria.

10.1.4 Laboratory Duplicate Samples

As a result of high DUP RPDs, the total alkalinity and bicarbonate alkalinity results in sample ERH1039 were qualified as detected estimated (J). Bias cannot be determined.

10.1.5 FD Samples

Field duplicates were not collected for these analyses.

10.1.6 Proficiency Testing Samples

PT samples were not performed for the sampling event.

10.1.7 Sample Result Verification

All sample results were found to be acceptable.

10.2 Representativeness

10.2.1 Holding Times

The evaluation of holding times to verify compliance with the method was conducted.

As a result of analysis holding time exceedances, the nitrate result in samples ERH1074, ERH1070, ERH1078, and ERH1080 were qualified as detected estimated (J). Results may be biased low in the associated samples.

10.2.2 Blanks

Method blanks and calibration blanks were analyzed to evaluate representativeness.

10.2.2.1 Method and Calibration Blanks

No data were qualified due to contamination detected in the method blanks and calibration blanks.

10.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the DLs and LODs attained were below the specified LOQs. Target compounds detected below the LOQs flagged (J) by the laboratory should be considered estimated. The comparability of the data is regarded as acceptable.

10.4 Completeness

The completeness level attained for wet chemistry field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

10.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory DLs and LOQs met the specified requirements described in the work plan.

11.0 VARIANCES IN ANALYTICAL PERFORMANCE

The laboratory used standard analytical methods for all of the analyses throughout the project. No systematic variances in analytical performance were noted in the case narratives.

12.0 SUMMARY OF PARCCS CRITERIA

The validation reports present the PARCCS results for all SDGs. Each PARCCS criterion is discussed in detail in the following sections.

12.1 Precision and Accuracy

Low MS/MSD %R indicates that the associated chloride results may be biased low in the associated samples.

High surrogate %R and LCS %R indicates that the associated TPHE results may be biased high in the associated samples.

Bias cannot be determined for MEE, TPHE, total organic carbon, total alkalinity, and bicarbonate alkalinity results due to calibrations, MS/MSD RPD, LCS/LCSD RPD, and DUP RPD outside the acceptance criteria.

Precision and accuracy were evaluated using data quality indicators such as calibration, surrogates, MS/MSD, LCS/LCSD, DUP, FD, and internal standards. The precision and accuracy of the data set were considered acceptable after integration of qualification of estimated results as noted above.

12.2 Representativeness

All samples for each method and matrix were evaluated for holding time compliance. All holding times were met with the exceptions noted in Section 10.2.1. All samples were associated with a method blank in each individual SDG. The representativeness of the project data is considered acceptable.

12.3 Comparability

Sampling frequency requirements were met in obtaining field duplicates and necessary field blanks. The laboratory used standard analytical methods for their analyses. The analytical results were reported in correct standard units. The overall comparability is considered acceptable.

12.4 Completeness

Of the 655 total results reported, none of the results were rejected. The completeness for all SDGs is as follows:

Parameter	Total Analytes	No. of Rejects	% Completeness
VOC	190	0	100
Phenol	24	0	100
PAH	72	0	100
MEE	24	0	100
GRO	44	0	100
TPH as Extractables	78	0	100
EDB	14	0	100
Methane	38	0	100
Wet Chemistry	171	0	100
Total	**655**	**0**	**100**

The completeness percentage based on rejected data met the 90 percent PQO goal. A less quantifiable loss of data occurred in the application of blank qualifications as noted in Sections 7.2.2.1 and 7.2.2.2.

12.5 Sensitivity

Sensitivity was achieved by the laboratory to support the PQOs. Calibration concentrations, DLs, LODs and LOQs met the project requirements and low-level contamination in the method blanks and equipment blanks did not affect sensitivity.

Table I. Sample Cross-Reference

LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	BTEX (8260B)	1,2-DCA (8260B)	Phenol (8270D)	PAH (8270D SIM)	MEE (8270D)	GRO (8260B)	TPHE (8015B)	TPHE SGCU (8015B)	EDB (8011)	Methane (RSK 175)	Alkalinity (2320B)	Anions (300.0)	Ferrous Iron (3500-FE-B)	NO3/NO2 as N (353.2)	TOC (9060A)
47985A	91957	ERH1048	BA10086	Water	04/22/20	TB	Level C	X					X				X					
47985A	91957	ERH1049	BA10087	Water	04/22/20		Level C	X		X	X	X	X	X			X	X	X	X	X	X
47985A	91957	ERH1058	BA10088	Water	04/21/20	TB	Level C	X					X				X					
47985A	91957	ERH1059	BA10089	Water	04/21/20		Level C	X		X	X	X	X	X			X	X	X	X	X	X
47985A	91957	ERH1062	BA10090	Water	04/22/20	TB	Level C	X					X				X					
47985A	91957	ERH1063	BA10091	Water	04/22/20		Level C	X		X	X	X	X	X	X		X	X	X	X	X	X
48053A	91991	ERH1038	BA10157	Water	04/23/20	TB	Level C	X					X				X					
48053A	91991	ERH1039	BA10158	Water	04/23/20	FD1	Level D	X		X	X	X	X	X			X	X	X	X	X	X
48053A	91991	ERH1040	BA10159	Water	04/23/20	FD1	Level C	X		X	X	X	X	X								
48053A	91991	ERH1043	BA10160	Water	04/22/20	TB	Level C	X					X				X					
48053A	91991	ERH1044	BA10161	Water	04/22/20	FD2	Level D	X		X	X	X	X	X	X		X	X	X	X	X	X
48053A	91991	ERH1045	BA10162	Water	04/22/20	FD2	Level C	X		X	X	X	X	X	X							
48053A	91991	ERH1064	BA10163	Water	04/23/20	TB	Level C	X					X				X					
48053A	91991	ERH1065	BA10164	Water	04/23/20		Level C	X		X	X	X	X	X			X	X	X	X	X	X
48053A	91991	ERH1073	BA10165	Water	04/22/20	TB	Level C	X	X				X			X	X					
48053A	91991	ERH1074	BA10166	Water	04/22/20		Level C											X	X	X	X	X
48053A	91991	ERH1074	BA10166	Water	04/22/20		Level D	X	X	X	X	X	X	X		X	X					
48053A	91991	ERH1075	BA10167	Water	04/23/20	TB	Level C	X	X				X			X	X					
48053A	91991	ERH1076	BA10168	Water	04/23/20		Level C	X	X	X	X	X	X	X		X	X	X	X	X	X	X
48054A	91926	ERH1046	BA09850	Water	04/20/20	TB	Level C	X					X				X					
48054A	91926	ERH1047	BA09851	Water	04/20/20		Level C	X		X	X	X	X	X	X		X	X	X	X	X	X
48054A	91926	ERH1052	BA09852	Water	04/20/20	TB	Level C	X					X				X					
48054A	91926	ERH1053	BA09853	Water	04/20/20		Level C	X		X	X	X	X	X	X		X	X	X	X	X	X
48054A	91926	ERH1054	BA09854	Water	04/20/20	TB	Level C	X					X				X					
48054A	91926	ERH1055	BA09855	Water	04/20/20		Level C	X		X	X	X	X	X	X		X	X	X	X	X	X
48054B	91941	ERH1041	BA09914	Water	04/20/20	TB	Level C	X					X				X					
48054B	91941	ERH1042	BA09915	Water	04/20/20		Level C	X		X	X	X	X	X	X		X	X	X	X	X	X

Table I. Sample Cross-Reference

LDC	SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	QC Type	Validation Level	BTEX (8260B)	1,2-DCA (8260B)	Phenol (8270D)	PAH (8270D SIM)	MEE (8270D)	GRO (8260B)	TPHE (8015B)	TPHE SGCU (8015B)	EDB (8011)	Methane (RSK 175)	Alkalinity (2320B)	Anions (300.0)	Ferrous Iron (3500-FE-B)	NO3/NO2 as N (353.2)	TOC (9060A)
48054B	91941	ERH1050	BA09916	Water	04/21/20	TB	Level C	X					X				X					
48054B	91941	ERH1051	BA09917	Water	04/21/20		Level C	X		X	X	X	X	X			X	X	X	X	X	X
48054B	91941	ERH1056	BA09918	Water	04/20/20	TB	Level C	X					X				X					
48054B	91941	ERH1057	BA09919	Water	04/20/20		Level C	X		X	X	X	X	X	X		X	X	X	X	X	X
48054B	91941	ERH1060	BA09920	Water	04/21/20	TB	Level C	X					X				X					
48054B	91941	ERH1061	BA09921	Water	04/21/20		Level C	X		X	X	X	X	X			X	X	X	X	X	X
48054B	91941	ERH1066	BA09922	Water	04/20/20	TB	Level C	X	X				X			X						
48054B	91941	ERH1067	BA09923	Water	04/20/20	FB	Level C	X	X	X	X	X	X	X	X	X						
48054B	91941	ERH1068	BA09924	Water	04/20/20	EB	Level C	X	X	X	X	X	X	X	X	X						
48054B	91941	ERH1069	BA09925	Water	04/20/20	TB	Level C	X					X				X					
48054B	91941	ERH1070	BA09926	Water	04/20/20		Level C	X		X	X	X	X	X	X		X	X	X	X	X	X
48054B	91941	ERH1071	BA09927	Water	04/21/20	TB	Level C	X	X				X			X	X					
48054B	91941	ERH1072	BA09928	Water	04/21/20		Level C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48138A	92025	ERH1077	BA10438	Water	04/27/20	TB	Level C	X	X				X			X	X					
48138A	92025	ERH1078	BA10439	Water	04/27/20		Level C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48154A	92039	ERH1079	BA10503	Water	04/28/20	TB	Level C	X	X				X			X	X					
48154A	92039	ERH1080	BA10504	Water	04/28/20	FD3	Level C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48154A	92039	ERH1081	BA10505	Water	04/28/20	FD3	Level C	X	X	X	X	X	X	X	X	X						

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Appendix C.3:
Fact Sheet

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Fact Sheet: Detection and Quantitation – What Project Managers and Data Users Need to Know

As a Project Manager or decision-maker, you may use environmental data to accomplish one or more of the following tasks:

- Determine whether a chemical substance is present in an environmental sample at or above some threshold value or action level;
- Verify that a pollutant concentration remains below a permit limit;
- Evaluate potential risks to human health or the environment;
- Monitor changes in concentrations of contaminants; or
- Determine the effectiveness of remediation activities.

Making correct decisions in these cases often depends on the ability of an analytical method to detect and measure extremely low concentrations of a substance.

This Fact Sheet has been prepared to: 1) provide Project Managers and data users with basic information about detection and quantitation concepts; and 2) acquaint the reader with detection and quantitation terminology and requirements contained in the *DoD Quality Systems Manual for Environmental Laboratories (DoD QSM),* Version 5.1. This information should help clarify the uncertainty associated with reporting low-concentration data. It should also help project teams understand the importance of selecting analytical methods that are sensitive enough for their intended uses, i.e., capable of generating reliable data (data of known precision and bias) at the project-specific decision levels.[1]

Measures of Sensitivity – Basic Concepts

The following terms are used to describe the routine sensitivity of analytical procedures:

- DL – Detection Limit
- LOD – Limit of Detection
- LOQ – Limit of Quantitation

All measures of sensitivity are specific to the analyte, sample matrix, test method, instrumentation, and analyst/laboratory performance. Therefore, analytical performance must be demonstrated for each variable (e.g., it is possible that two "identical" instruments from the same manufacturer may exhibit different sensitivities). A graphical representation of these terms is shown as Figure 1.

The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration with 99% confidence. At the DL, the false positive rate (Type I error) is 1% (red shaded region in Figure 1). A DL may be used as the lowest

[1] A discussion on the Minimum Detectable Concentration (or Minimum Detectable Activity) for radiological data is beyond the scope of this Fact Sheet. For a discussion on this, see DoD/DOE QSM 5.1 Module 6, Section 1.5.2.1.1.

concentration for reliably reporting a detection of a specific analyte in a specific matrix with a specific method with 99% confidence.

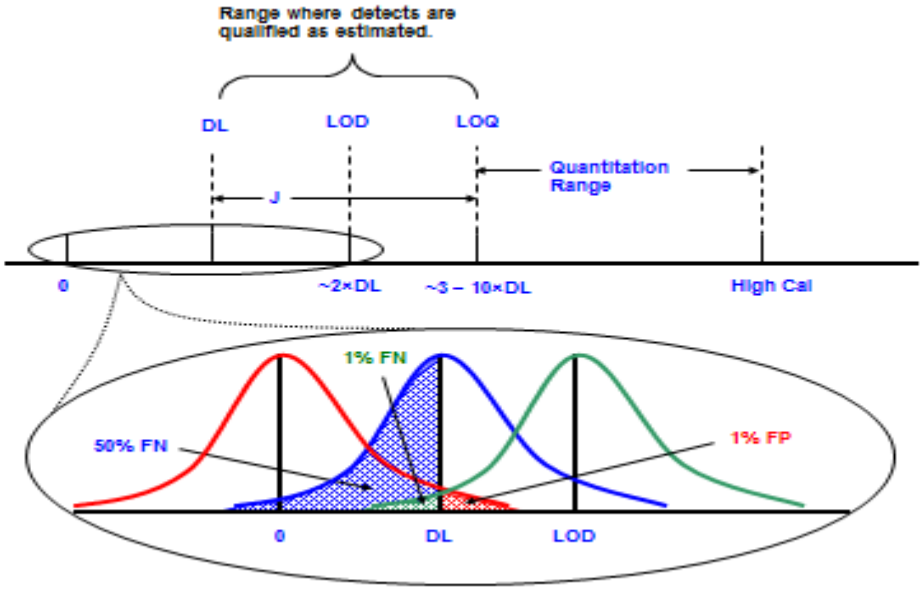

Figure 1: Summary of data quality characteristics below and above DL, LOD, and LOQ. The red trace shows the distribution of results given a sample with a true concentration of zero. The blue trace shows the distribution of results given a sample with a true concentration at the Detection Limit. The green trace shows the distribution of results given a sample with a true concentration at the Limit of Detection. The red shaded region represents those results which would yield a false positive (i.e., the true concentration is zero but the analytical result is detection). The blue and green shaded regions represent those results which would yield a false negative if the true concentration is at the reporting limit and the reporting limit is set at the DL or LOD, respectively (i.e., a sample with a true concentration at the DL has a 50% chance of yielding a false negative, and a sample with a true concentration at the LOD has a 1% chance of yielding a false negative).

Note that for reporting purposes, any result at or above the DL must also meet qualitative identification criteria required by the test method. Although a result at or above the DL indicates that the analyte is present, the absence of a result at or above the DL is inconclusive (i.e., one cannot confidently state whether the analyte is present or absent), because the false negative rate if the analyte is present at the DL is 50% (blue shaded region in Figure 1).

The Limit of Detection (LOD) is defined as the lowest concentration for reliable reporting of a non-detect of a specific analyte in a specific matrix with a specific method at 99% confidence. At the LOD, the false negative rate (Type II error) is 1% (green shaded region in Figure 1). In other words, if a sample has a true concentration at the LOD, there is at least a 99% probability of reporting a "detection" (a measured value ≥ DL) and a 1% chance of falsely reporting a non-detect (a false negative).

For reporting purposes, the failure to obtain a "detection" should be reported as "<LOD," because the false negative rate at the LOD is only 1%. Reporting the sample result as "<DL," is inappropriate because the false negative rate at the DL is 50%.

The Limit of Quantitation (LOQ) is the smallest concentration that produces a quantitative result with known and recorded precision and bias. For DoD/DOE projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard and within the calibration range. Because of the requirements on precision and bias, the LOQ is larger than the LOD[2]; therefore, the following is true:

$$DL < LOD < LOQ$$

Quantitative results, with a known degree of precision and bias, can only be achieved at or above the LOQ. Detections between the DL and the LOQ assure the *presence* of the analyte, but their numeric values are estimates and are therefore indicated as such on test reports. Figure 2 summarizes the differences and the relationship between DL, LOD, and LOQ.

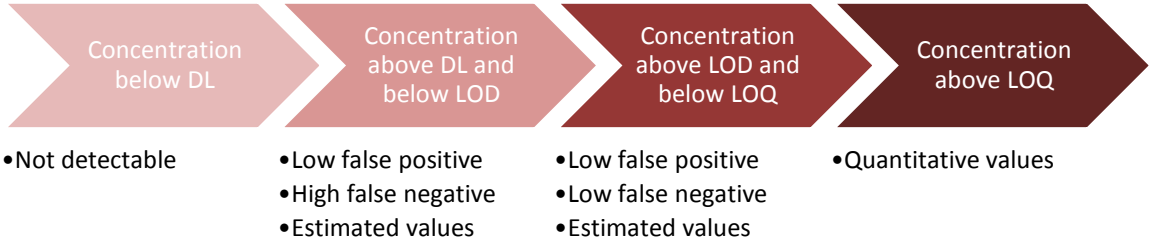

Figure 2: Summary of data quality characteristics below and above DL, LOD, and LOQ.

Types of Procedures for Estimating Sensitivity

Numerical estimates of the DL, LOD, or LOQ for a specific analyte, matrix, and method can be calculated using various statistical procedures, which involve spiking reagent water or other specific matrix with low concentrations of the analyte of interest. At this time, unfortunately, universally accepted statistical procedures do not exist.

The estimator that has been most commonly used by environmental laboratories is the EPA Method Detection Limit (MDL), which is an approximation of the DL. EPA has defined the MDL as "the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero."[3] Calculating the MDL at 99% confidence means there is a 1% probability of a false positive when a sample has a result at the MDL. The EPA MDL was designed to protect against false positives; however, it does not protect against false negatives.

[2] See TNI Module 4, Section 1.5.2.2d.
[3] 40 Code of Federal Regulations (CFR) Part 136, Appendix B, rev.2

Uses and Limitations of the MDL

When performed correctly and consistently, MDLs determined using the EPA procedure can be useful for comparing the performance of different laboratories using the same methods or the performance of different methods within the same laboratory. Laboratories typically determine the MDL in reagent water, resulting in a "best-case" MDL, which provides limited information about method performance on real-world samples.

The EPA MDL procedure as originally defined in 40 CFR Part 136, (Appendix B, 1984) has been criticized as a poor estimator of the DL for numerous reasons including but not limited to:

1. It is a single laboratory, short-term estimator that fails to account for analytical bias, changing instrument conditions or analyst skill.
2. It assumes uniform variance across all possible spike concentrations, failing to account for the fact that variance changes at higher concentrations.
3. It assumes that measured values at the spike concentration are normally distributed. By using the procedure and spiking at very low concentrations, laboratories have been able to calculate MDLs that cannot be achieved in practice.
4. It does not require a demonstration of the ability to detect an analyte at the calculated MDL.
5. It is not reproducible from day-to-day, lab-to-lab, etc.

Since 2000 the EPA has increased efforts to address these issues. In 2016 the EPA updated the MDL procedure in 40 CFR 136 which did include provisions for addressing background contamination, multiple analysts and instruments, and included verification requirements; however, the MDL calculation of spikes remains unchanged.

DoD QSM Requirements

Requirements for the DL, LOD and the LOQ which are designed to address some of the concerns discussed in the previous paragraph are contained in DoD QSM Module 4 Sections 1.5.2.1 and 1.5.2.2. Requirements that may be of particular note to Project Managers and Data Users are:

- Laboratories are required to verify measures of sensitivity, in terms of the LOD and LOQ, at least quarterly.
- Laboratories shall establish a detection limit (DL) for each suite of analyte-matrix-method, including surrogates. The DL shall be used to determine the LOD for each analyte and matrix as well as for all preparatory and cleanup methods routinely used on samples.
- After each DL determination, the laboratory must establish the LOD. It is specific to each suite of analyte, matrix, and method (including sample preparation).
- The laboratory must establish the LOD by spiking a quality system matrix at a concentration of at least 2 times but no greater than four times the DL.
- The signal to noise (S/N) ratio at the LOD must be at least three, and the results must meet all method requirements for analyte identification.

- The DL and LOD must be reported for all analyte-matrix-method suites unless it is not applicable to the test or specifically excluded by project requirements.
- The laboratory procedure for establishing the LOQ must empirically demonstrate precision and bias at the LOQ for each suite of analyte-matrix-method, including surrogates. The LOQ and associated precision and bias must meet client requirements and must be reported. If the method is modified, precision and bias at the new LOQ must be demonstrated and reported For DoD/DOE projects, the LOQ must be set within the calibration range, including the lowest calibration level.

Establishing Project-Specific Requirements for Method Sensitivity

Project teams should establish their project-specific requirements for method sensitivity in terms of a Reporting Limit (RL) for each analyte and matrix. As defined in the DoD QSM, the RL is a customer-specified lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix. The RL cannot be less than the LOQ, if precision and bias of the RL and the LOQ are identical. If the LOQ for a particular analytical method or laboratory cannot meet the RL, then a project team has four options:

1. Consult with the laboratory to improve method performance or modify the method to achieve a lower LOQ.
2. Select a different method with an LOQ less than or equal to the RL.
3. Raise the RL.
4. If no other options are available to meet project needs, allow for increased level of uncertainty such that adjusted LOQ can meet RL. This LOQ must be verified.

Please note that precision and bias must be taken into consideration when assessing the LOQ versus the RL. Also note that data below the RL may be reported; however, they are estimated values if less than the LOQ. Although data reporting and flagging requirements are project-specific, all reported LOD and LOQ shall be adjusted for the size of sample aliquots, concentration/dilution factors, and percent solids.

Reporting and Flagging Analytical Data

The following example (based on QSM 5.1 Module 2 section 5.10.3.1.1) illustrates the proper use of the “U” and “J” data qualifier flags for non-detect and estimated analytical results, respectively.

Data Qualifier flags in this example are defined as:
U- Analyte was not detected and is reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J- The reported result is an estimated value (e.g. matrix interference was observed, or the analyte was detected at a concentration outside the calibration range).

Example: Detection Limit (DL) = 2, Limit of Detection (LOD) = 4, Limit of Quantitation (LOQ) = 20, Reporting Limit (RL) for the project = 30, with precision and bias of the LOQ meeting precision and bias of the RL. All samples are undiluted.

Sample #1:	Analytical Result: Non-detect	Reported Result: 4U
Sample #2:	Analytical Result: 2	Reported Result: 2J
Sample #3:	Analytical Result: 10	Reported Result: 10J
Sample #4:	Analytical Result: 20	Reported Result: 20
Sample #5:	Analytical Result: 30	Reported Result: 30

Note that the laboratory may use additional data qualifiers or different letters or symbols to denote the qualifiers as long as they are appropriately defined and their use is consistent with project-specific requirements. Additionally, the laboratory-defined data qualifiers are for laboratory use only. Data usability must be determined by the project team.

Understanding and Documenting Uncertainty for Low-Concentration Data

As mentioned above, detection and quantitation limits are laboratory specific. The following are some steps Project Managers can take to document measurement uncertainty for low concentration data.

- As part of the laboratory selection process, provide the laboratory with project-specific RLs, including precision and bias, for each analyte and matrix. Ask the laboratory to provide its DL, LOD, and LOQ with associated precision and bias for each target analyte in each matrix of concern (e.g., reagent water, clean sand, etc.) and verify that these values meet project-specific RLs. Request laboratory SOPs for establishing the DL and for establishing and verifying the LOD and LOQ.
- Ask the laboratory to verify the LOD by processing an LOD verification check sample with each batch of samples. This is a quality control sample that is spiked at a concentration at or slightly above the LOD to evaluate whether the analyte of interest is in fact "detectable" in the matrix of interest. To accurately report non-detects, set the reporting for non-detects to "less than the LOD" or report the LOD with a "U" flag.
- If the project involves the collection of unusual or difficult matrices, or if the project-specific RL is near the LOQ, ask the laboratory to verify the LOQ in the project-specific matrix by analyzing a minimum of four replicate samples with known concentrations at the LOQ.
- Review low concentration raw data (e.g., chromatograms). If a result is reported above the DL, make sure that the signal-to-noise ratio is at least 3.
- Compare sample result with blank results. If sample results (including chromatograms) cannot be distinguished from blank results, the data may not be useable for decision making.

Appendix C.4:
EPA Method 8015 Laboratory Limits Study

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908 North Temperance Ave. ∇ Clovis, CA 93611 ∇ Phone 559-275-2175 ∇ Fax 559-275-4422

Certification Number: CA1312
NELAP Certification number: CA00046
DoD-ELAP Certificate number: 4064.01

EPA 3520C / 8015B

DL-LOD-LOQ Study

TABLE OF CONTENTS

LABORATORY NAME: *APPL, Inc.*

Case Narrative Letter	**2**
Method Blank Study	4
MDLb & MDLs Study	27
LOD / LOQ Checks	60

CASE NARRATIVE Letter

908 North Temperance Ave. ∇ Clovis, CA 93611 ∇ Phone 559-275-2175 ∇ Fax 559-275-4422

April 14, 2020

To Whom It May Concern:

APPL Inc compiled a Method Blank Study for the purpose of re-establishing DL-LOD-LOQ limits, due to recent contamination found in the solvent used for extraction and analysis of DRO/RRO by EPA 3520C/8015B. The attached Method Blank Study consisted of seven blanks extracted and analyzed on seven separate days between the months of November 2019 – March 2020.

The new laboratory limits (i.e., detection limit [DL], limit of detection [LOD], and limit of quantitation [LOQ] aim to address false positive detections for total petroleum hydrocarbon (TPH) in the diesel range organics (DRO) and residual range organics (RRO) due to the solvent contamination.

In April 2020, APPL performed a new Method Detection Limit (MDL) Study for the EPA Method 8015B analysis using the EPA Method 3520C continuous liquid-liquid extraction. This MDL Study was done in accordance with the Department of Defense Quality Systems Manual (DoD QSM) (DoD 2019), TNI 2016, and 40CFR part 136 (2017 MUR) with the purpose of verifying the new DL-LOD_LOQ limits established in March 2020. In addition, LOD and LOQ checks were performed at the new limits.

Attached is the Method Blank Study, and MDL/LOD/LOQ Study data. The new recommended limits for TPH-DRO and TPH-RRO are as follows:

DL = 150 µg/L
LOD = 300 µg/L
LOQ = 320 µg/L

Please let us know if you have any questions or concerns.

Sincerely,

Sharon Dehmlow

Sharon Dehmlow
Quality Assurance Director

Method Blank Study

Method Blank Study
APPL, Inc.

EPA 3520C / 8015B
TPH Extractables
DOC1114

Instrument: Apollo
Matrix: Water
Units: ug/L
Data Path: G:\APOLLO\DATA\2019\191121\
Column ID (1): DB-1
Extraction Ratio: 2mL / 0.8L
Date: 03/30/20
Analyzed By: Sarah Sevy

File ID:	1121046.D	129083.D	129126.D	310010.D	310101.D	312157.D	317281.D
Extracted:	11/20/19	01/29/20	02/03/20	03/06/20	03/10/20	03/12/20	03/23/20
Injected:	11/22/19	01/31/20	02/04/20	03/10/20	03/12/20	03/16/20	03/26/20

Analyte	1	2	3	4	5	6	7	StdDev	SpkAmt	Previous LOQ	MDLb
Diesel (C10-C24)	87.7	108.7	116.1	98.7	120.1	149.1	77.7	23.51	NA	40	73.9
Motor Oil (C24-C40)	90.6	105.4	76.4	94.0	133.3	110.5	127.5	20.35	NA	40	64.0
Ortho-Terphenyl(S)	75.2	71.6	71.9	61.2	63.8	67.0	60.4	5.75	75	NA	18.1
Octacosane(S)	57.3	82.8	87.5	79.4	83.4	88.1	81.8	10.48	75	NA	32.9

Interim Limits were established based on individual TPH concentrations

DL = 150 ug/L
LOQ = 300 ug/L
LOQ = 320 ug/L

_LIQ005

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	191120A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Spike 11-11-19 11-11-20		Surrogate ID 1	THC Surrogate 11-12-19 11-12-20	
Spiked ID 2	Motor Oil Spike 11-13-19 11-13-20		Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:		
Spiked ID 7			Ext. Start Time:	11/20/19 11:25	
Spiked ID 8			Ext. End Time:	11/21/19 11:10	
			GC Requires Extract By:		

pH1			Water Bath Temp 1 °C	35/38.5 °C
pH2			Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: DL **Date** 11/20/19 **Witnessed By:** CFM **Date** 11/20/19

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	191120A Blk				0.100	1	800	2	2	11/20/19 11:25	
						equip	E-HP26 E-WB1				
2	191120A LCS-1		0.020	1,2	0.100	1	800	2	2	11/20/19 11:25	
						equip	E-HP27 E-WB2				
3	191120A LCSD-1		0.020	1,2	0.100	1	800	2	2	11/20/19 11:25	
						equip	E-HP28 E-WB3				
4	BA03010	BA03010W16			0.100	1	800	2	2	11/20/19 11:25	90768
						equip	E-HP29 E-WB1				

Solvent and Lot#	
1+1 HCL	6-15-19
PH Strips	HC 863463
Dicholormethane (DCM)	59130
Filter Paper	400171
B. Sodium Sulfate	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	BT
Date	
Time	
Refrigerator	HOBART1

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	12/30/19 7:22:47 AM

Reviewed By: **Date**

Quantitation Report (Not Reviewed)

Data File : G:\APOLLO\DATA\2019\191121\1121046.D Vial: 46
Acq On : 11-22-19 11:07:59 Operator: BT
Sample : 191120A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Mar 30 13:38 2020 Quant Results File: DOC1114.RES

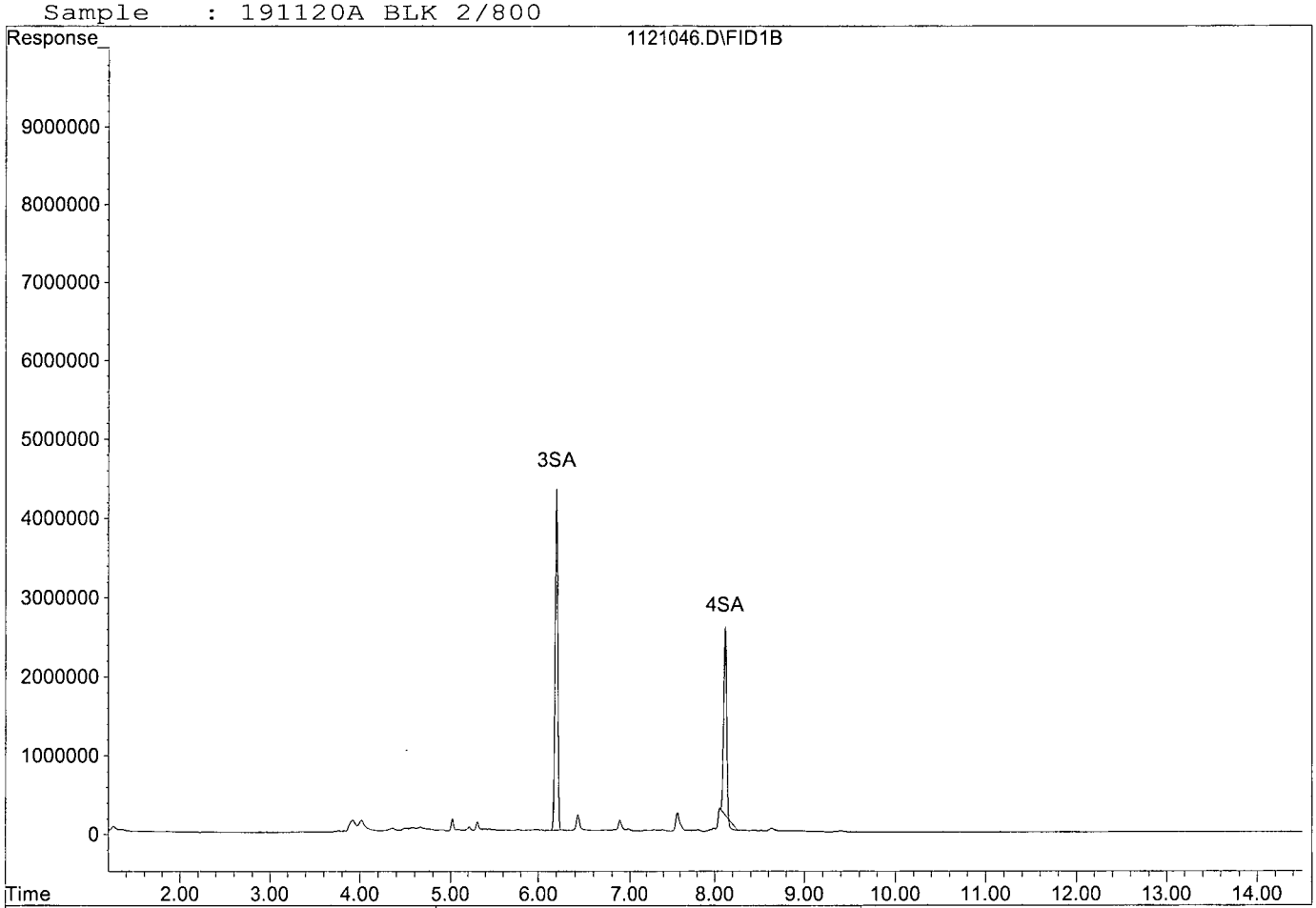
Method : G:\APOLLO\DATA\2019\191114\DOC1114.M (Chemstation Integrato
Title : 8015 B&C
Last Update : Wed Dec 04 16:45:44 2019
Response via : Multiple Level Calibration

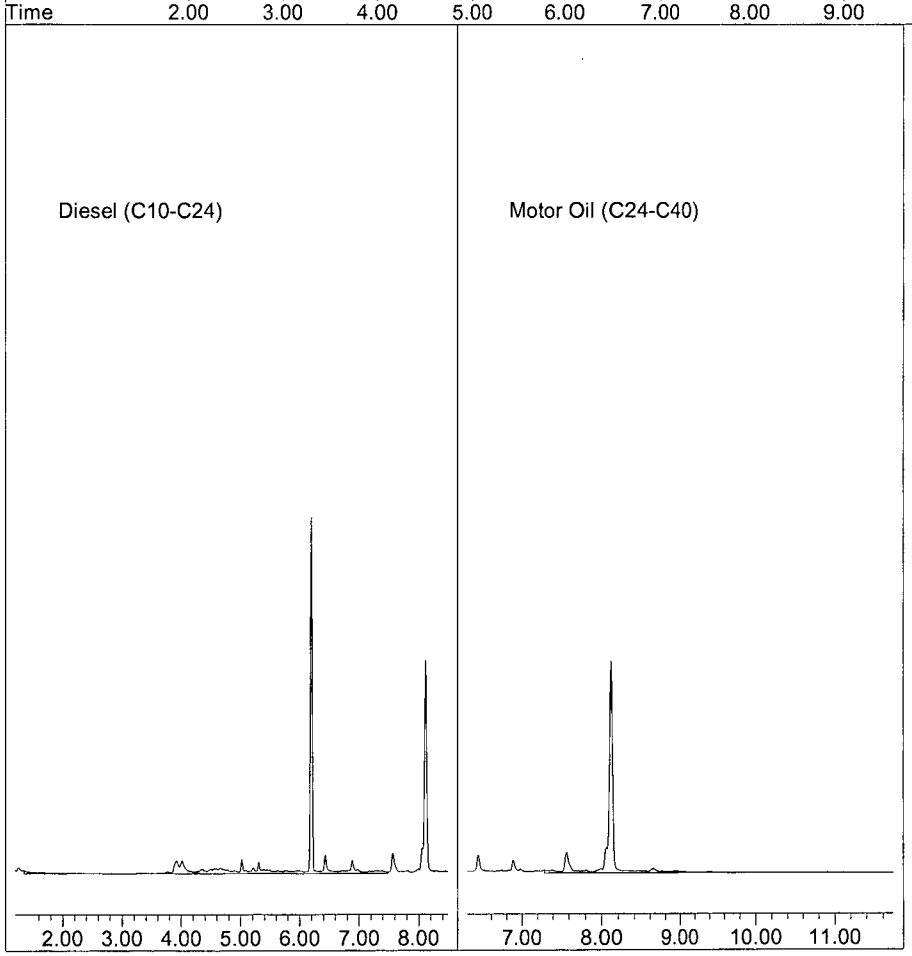
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	6.20	85508329	75.152	ppb
Surrogate Spike 75.000	Recovery =		100.20%	
4) SA Octacosane(S)	8.12	51941237	57.323	ppb
Surrogate Spike 75.000	Recovery =		76.43%	
Target Compounds				
1) HATM Diesel (C10-C24)	4.42	105886086	87.728	ppb
2) HBTM Motor Oil (C24-C40)	9.01	57035050	90.607	ppb

Target Compounds

Data File: G:\APOLLO\DATA\2019\191121\1121046.D
Sample : 191120A BLK 2/800





_LIQ005

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200129A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 1-15-20 1-15-21		Surrogate ID 1	THC Surrogate 1-27-20 1-27-21	
Spiked ID 2	Decanoic Acid SOLUTION 12-11-19 12-11-20		Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	01/29/20 13:15	
Spiked ID 8			Ext. End Time:	01/30/20 7:15	
			GC Requires Extract By:		

pH1	2	01/29/20 9:45	Water Bath Temp 1 °C	35/38.5 °C
pH2	2	01/29/20 12:50	Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: DL **Date** 01/29/20 **Witnessed By:** CFM **Date** 01/29/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200129A Blk		0.050	2	0.100	1	800	2	2	01/29/20 10:16	*
						equip	E-HP26 E-WB1				
2	200129A LCS-1		0.04,0.05	1,2	0.100	1	800	2	2	01/29/20 10:16	*
						equip	E-HP27 E-WB2				
3	200129A LCSD-1		0.04,0.05	1,2	0.100	1	800	2	2	01/29/20 10:16	*
						equip	E-HP28 E-WB3				
4	BA06427	BA06427W19	0.050	2	0.100	1	800	2	2	01/29/20 10:16	91319 *
						equip	E-HP29 E-WB1				
5	BA06469	BA06469W18	0.050	2	0.100	1	800	2	2	01/29/20 12:55	91328 *
						equip	E-HP17 E-WB2				

Solvent and Lot#	
1+1 HCL	6-15-19
PH Strips	HC 863463
Dicholormethane (DCM)	59239
Filter Paper	400171
B. Sodium Sulfate	2019020631
Silica Gel (*)	17F195203

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	
Time	
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	01/31/20 10:36:30 AM

Reviewed By: KY **Date** 01/31/20

03/30/20 7:51:57 AM Ext_ID 65832

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200129\129083.D Vial: 83
Acq On : 1-31-20 15:35:59 Operator: BT
Sample : 200129A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Mar 30 13:34 2020 Quant Results File: DOC0129.RES

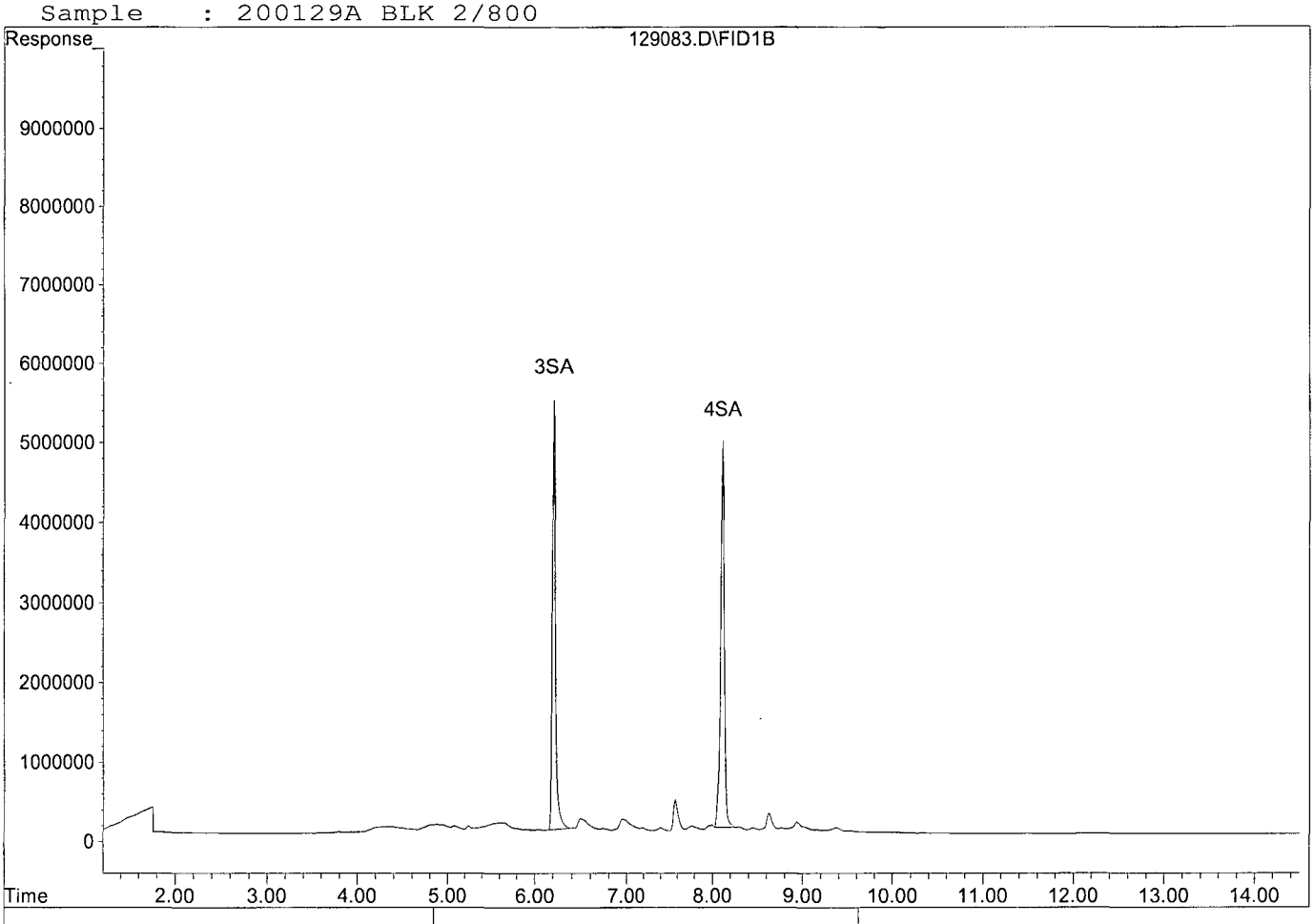
Method : G:\APOLLO\DATA\200129\DOC0129.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Thu Jan 30 08:01:08 2020
Response via : Multiple Level Calibration

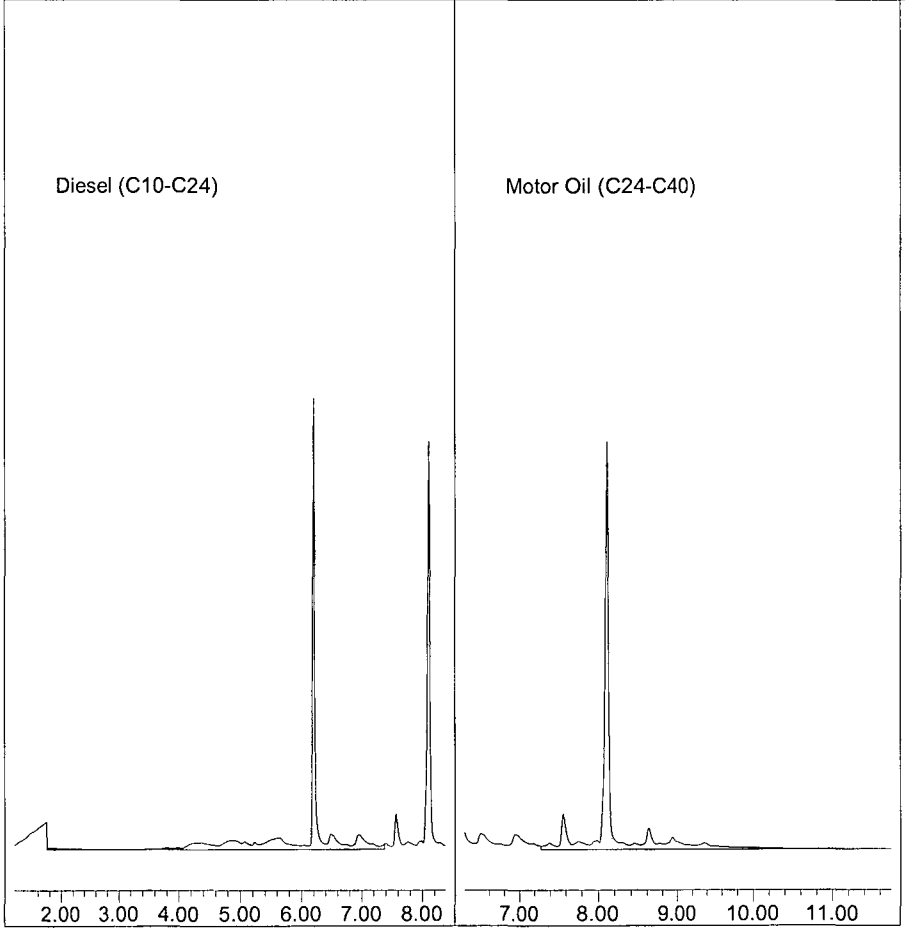
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	6.20	126439334	71.614 ppb
Surrogate Spike 75.000	Recovery =		95.49%
4) SA Octacosane(S)	8.11	136715158	82.823 ppb
Surrogate Spike 75.000	Recovery =		110.43%
Target Compounds			
1) HATM Diesel (C10-C24)	4.42	170664761	108.723 ppb
2) HBTM Motor Oil (C24-C40)	9.01	118441106	105.436 ppb

Target Compounds

Data File: G:\APOLLO\DATA\200129\129083.D
Sample : 200129A BLK 2/800





_LIQ005

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200203A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 1-15-20 1-15-21		Surrogate ID 1	THC Surrogate 1-27-20 1-27-21	
Spiked ID 2	Decanoic Acid SOLUTION 12-11-19 12-11-20		Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	02/03/20 13:00	
Spiked ID 8			Ext. End Time:	02/04/20 7:00	
			GC Requires Extract By:		

pH1	2	02/03/20 10:25	Water Bath Temp 1 °C	35/38.5 °C
pH2			Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: DL **Date** 02/03/20 **Witnessed By:** RP **Date** 02/03/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200203A Blk		0.050	2	0.100	1	800	2	2	02/03/20 10:30	*
						equip	E-HP30 E-WB1				
2	200203A LCS-1		0.040,0.050	1,2	0.100	1	800	2	2	02/03/20 10:30	*
						equip	E-HP17 E-WB2				
3	BA06272	BA06272W33	0.050	2	0.100	1	800	2	2	02/03/20 10:30	91282 RE-EXTRACT HT: 1-28-20 *
						equip	E-HP16 E-WB3				
4	BA06275	BA06275W14	0.050	2	0.100	1	800	2	2	02/03/20 10:30	91282 RE-EXTRACT HT: 1-27-20 *
						equip	E-HP15 E-WB1				
5	BA06564	BA06564W16	0.050	2	0.100	1	800	2	2	02/03/20 10:30	91334 *
						equip	E-HP14 E-WB2				
6	BA06602	BA06602W16	0.050	2	0.100	1	800	2	2	02/03/20 10:30	91343 *
						equip	E-HP13 E-WB3				
7	BA06604 MS-1	BA06604W42	0.040,0.050	1,2	0.100	1	800	2	2	02/03/20 10:30	91343 *
						equip	E-HP12 E-WB1				
8	BA06604 MSD-1	BA06604W38	0.040,0.050	1,2	0.100	1	800	2	2	02/03/20 10:30	91343 *
						equip	E-HP11 E-WB2				
9	BA06604	BA06604W40	0.050	2	0.100	1	800	2	2	02/03/20 10:30	91343 *
						equip	E-HP10 E-WB3				

Solvent and Lot#	
1+1 HCL	6-15-19
PH Strips	HC 863463
Dicholormethane (DCM)	59239
Filter Paper	400171
Sodium Sulfate (Na2SO4)	2019020631
Silica Gel (*)	050627T

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	
Time	
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	02/05/20 1:52:31 PM

Reviewed By: KY **Date** 02/05/20

Quantitation Report (Not Reviewed)

Data File : G:\APOLLO\DATA\200129\129126.D Vial: 26
Acq On : 2-4-20 14:58:51 Operator: BT
Sample : 200203A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Mar 30 13:35 2020 Quant Results File: DOC0129.RES

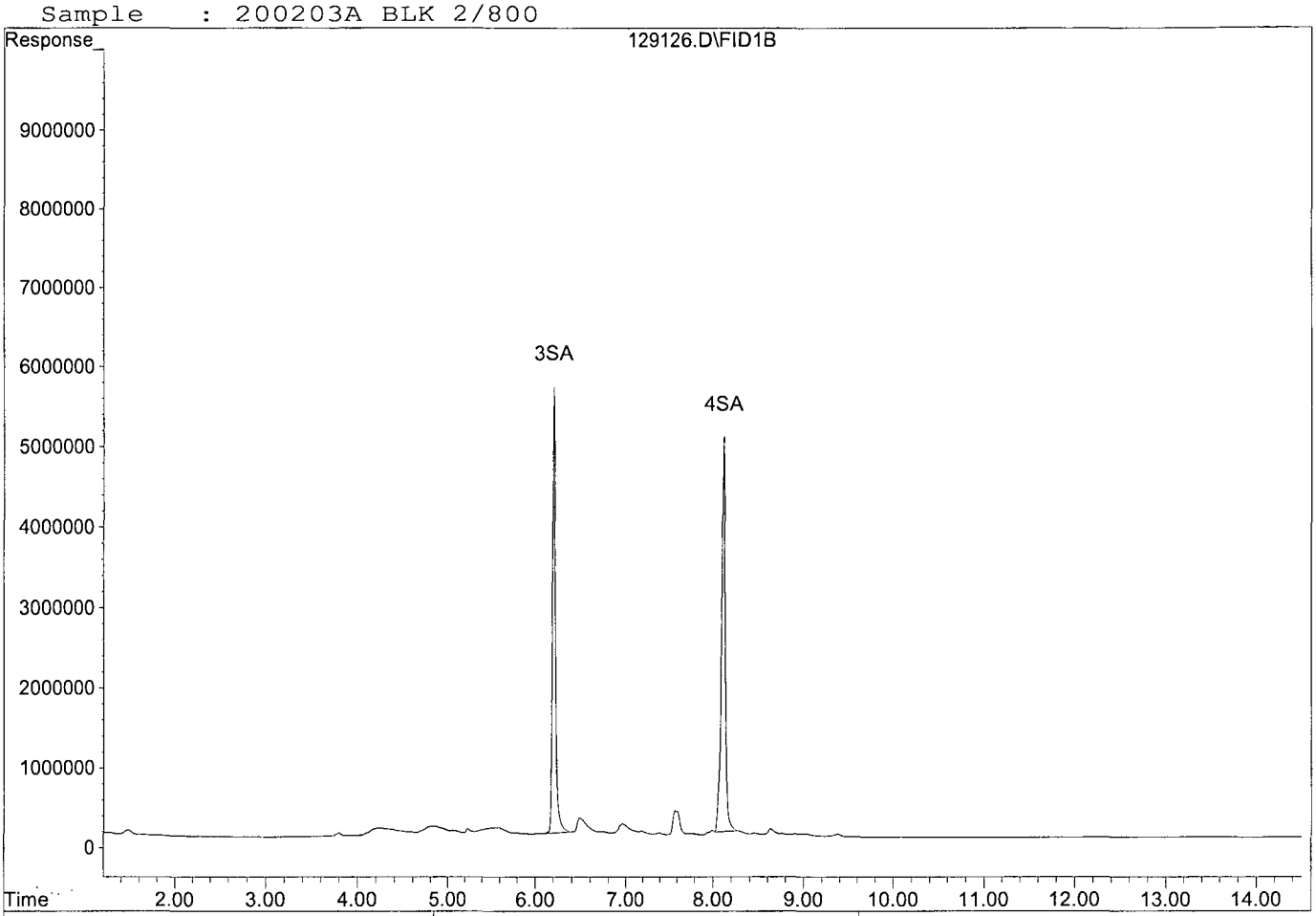
Method : G:\APOLLO\DATA\200129\DOC0129.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Thu Jan 30 08:01:08 2020
Response via : Multiple Level Calibration

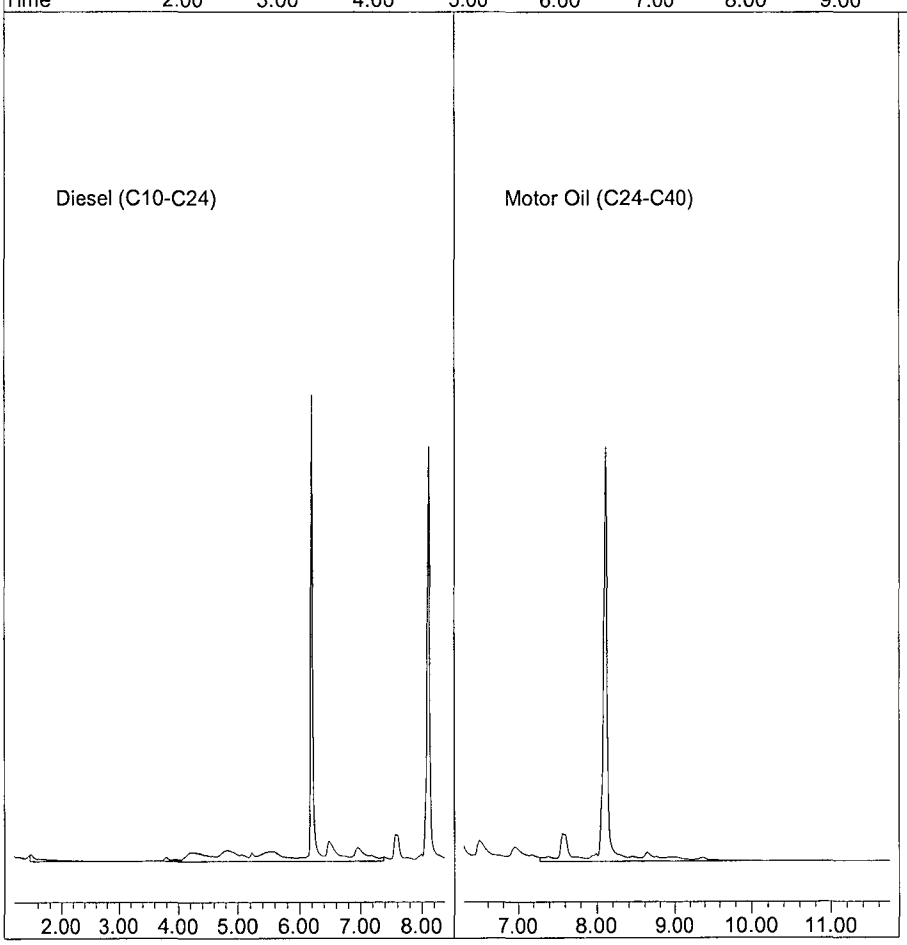
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	6.20	126919584	71.876 ppb
Surrogate Spike 75.000	Recovery =		95.83%
4) SA Octacosane(S)	8.11	144553809	87.472 ppb
Surrogate Spike 75.000	Recovery =		116.63%
Target Compounds			
1) HATM Diesel (C10-C24)	4.42	182589431	116.095 ppb
2) HBTM Motor Oil (C24-C40)	9.01	81474655	76.358 ppb

Target Compounds

Data File: G:\APOLLO\DATA\200129\129126.D
Sample : 200203A BLK 2/800





_LIQ005

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200306A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 2-10-20 2-10-21		Surrogate ID 1	THC Surrogate 2-24-20 2-24-21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	03/06/20 11:00	
Spiked ID 8			Ext. End Time:	03/07/20 7:30	
			GC Requires Extract By:		

pH1	2	03/06/20 7:40	Water Bath Temp 1 °C	35/38.5 °C
pH2			Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: DL **Date** 03/06/20 **Witnessed By:** KY **Date** 03/06/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200306A Blk				0.100	1	800	2	2	03/06/20 10:20	
						equip	E-HP29 E-WB1				
2	200306A LCS-1		0.040	1	0.100	1	800	2	2	03/06/20 10:20	
						equip	E-HP30 E-WB2				
3	200306A LCSD-1		0.040	1	0.100	1	800	2	2	03/06/20 10:20	
						equip	E-HP17 E-WB3				
4	BA07942	BA07942W21			0.100	1	800	2	2	03/06/20 10:20	91585
						equip	E-HP16 E-WB1				
5	BA07944	BA07944W21			0.100	1	800	2	2	03/06/20 10:20	91585
						equip	E-HP15 E-WB2				
6	BA07946	BA07946W11			0.100	1	800	2	2	03/06/20 10:20	91585
						equip	E-HP14 E-WB3				
7	BA07947	BA07947W13			0.100	1	800	2	2	03/06/20 10:20	91585
						equip	E-HP13 E-WB1				

Solvent and Lot#	
1+1 HCL	2-15-20
PH Strips	HC998032
Dicholormethane (DCM)	59289
Filter Paper	400171
Sodium Sulfate (Na2SO4)	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	
Time	
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	03/10/20 8:43:04 AM

Reviewed By: KY **Date** 03/09/20

03/30/20 7:52:57 AM Ext_ID 66235 Page 1 of 1

Quantitation Report (Not Reviewed)

Data File : G:\APOLLO\DATA\200310\310010.D Vial: 10
Acq On : 3-10-20 13:35:44 Operator: SS
Sample : 200306A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Mar 30 13:35 2020 Quant Results File: DOC0310.RES

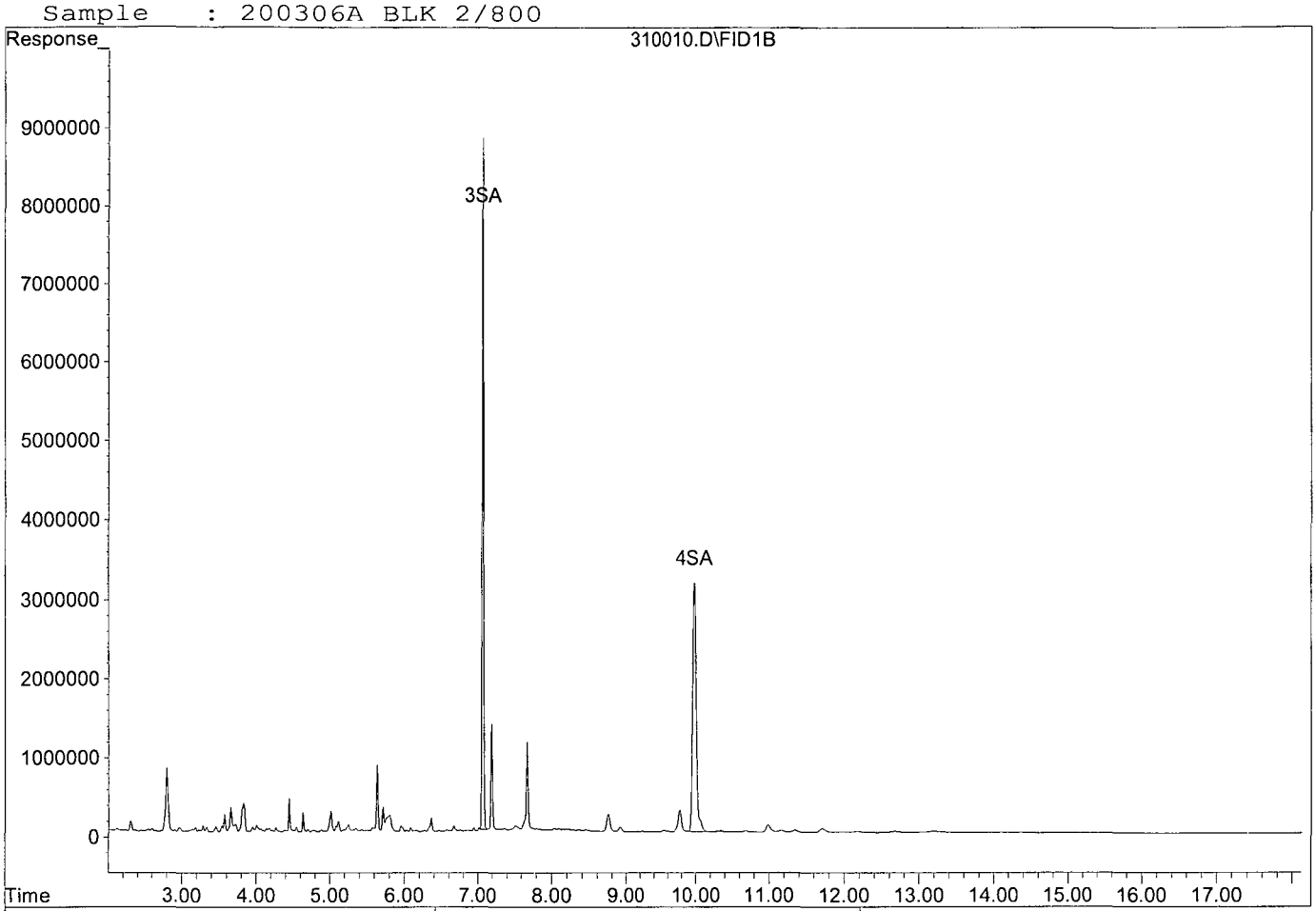
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

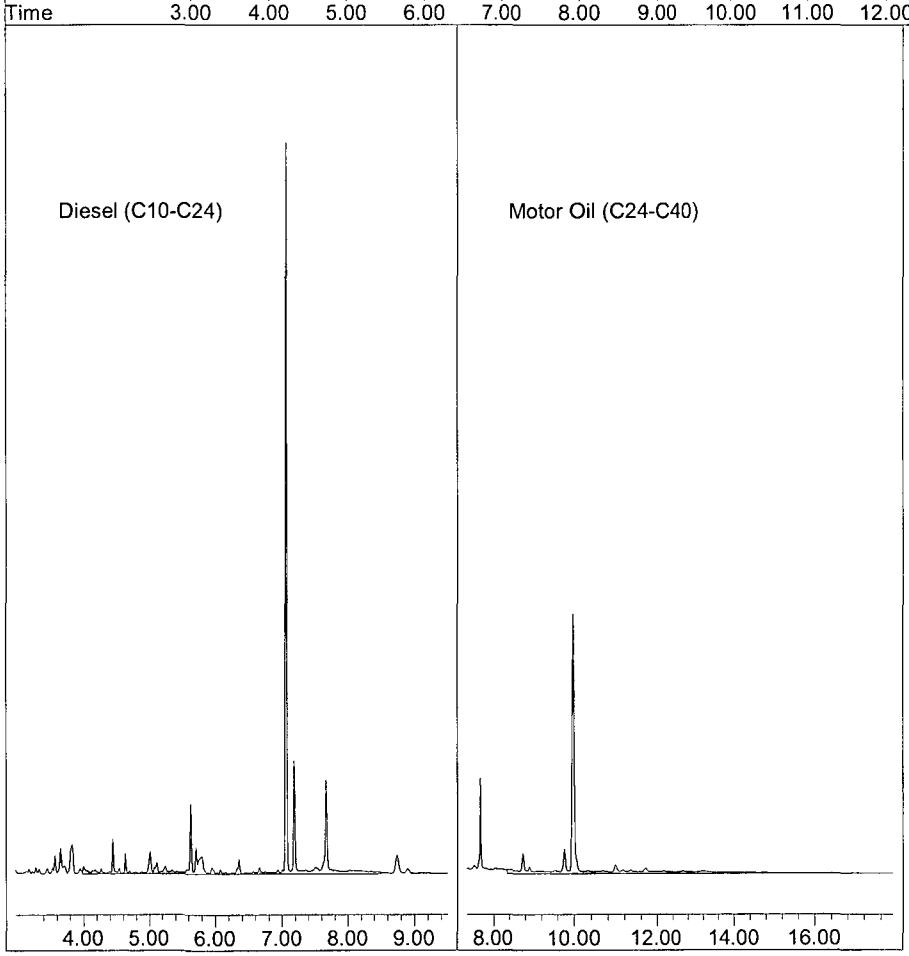
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	122820475	61.153 ppb
Surrogate Spike 75.000	Recovery =		81.54%
4) SA Octacosane(S)	9.98	110966714	79.432 ppb
Surrogate Spike 75.000	Recovery =		105.91%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	151340486	98.652 ppb
2) HBTM Motor Oil (C24-C40)	12.60	110828906	93.961 ppb

Target Compounds

Data File: G:\APOLLO\DATA\200310\310010.D
Sample : 200306A BLK 2/800





_LIQ005

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200310A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 2-10-20 2-10-21		Surrogate ID 1	THC Surrogate 2-24-20 2-24-21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	03/10/20 13:30	
Spiked ID 8			Ext. End Time:	03/11/20 6:35	
			GC Requires Extract By:		

pH1	2	03/10/20 12:20	Water Bath Temp 1 °C	39/38.5 °C
pH2			Water Bath Temp 2 °C	35/38.5
pH3			Water Bath Temp 3 °C	35/38.4 °C

Spiked By: DL **Date** 03/10/20 **Witnessed By:** KY **Date** 03/10/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200310A Blk				0.100	1	800	2	2	03/10/20 12:25	
						equip	E-HP26 e-wb1				
2	200310A LCS-1		0.040	1	0.100	1	800	2	2	03/10/20 12:25	
						equip	E-HP27 E-WB2				
3	200310A LCSD-1		0.040	1	0.100	1	800	2	2	03/10/20 12:25	
						equip	E-HP28 E-WB2				
4	BA08034	BA08034W21			0.100	1	800	2	2	03/10/20 12:25	91607
						equip	E-HP29 E-WB3				

Solvent and Lot#	
1+1 HCL	2-15-20
PH Strips	HC998032
Dicholormethane (DCM)	59239
Filter Paper	400171
Sodium Sulfate (Na2SO4)	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	
Date	
Time	
Refrigerator	

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	03/11/20 11:08:09 AM

Reviewed By: KY **Date** 03/11/20

Quantitation Report (Not Reviewed)

Data File : G:\APOLLO\DATA\200310\310101.D Vial: 1
Acq On : 3-12-20 9:21:35 Operator: SS
Sample : 200310A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Mar 30 13:35 2020 Quant Results File: DOC0310.RES

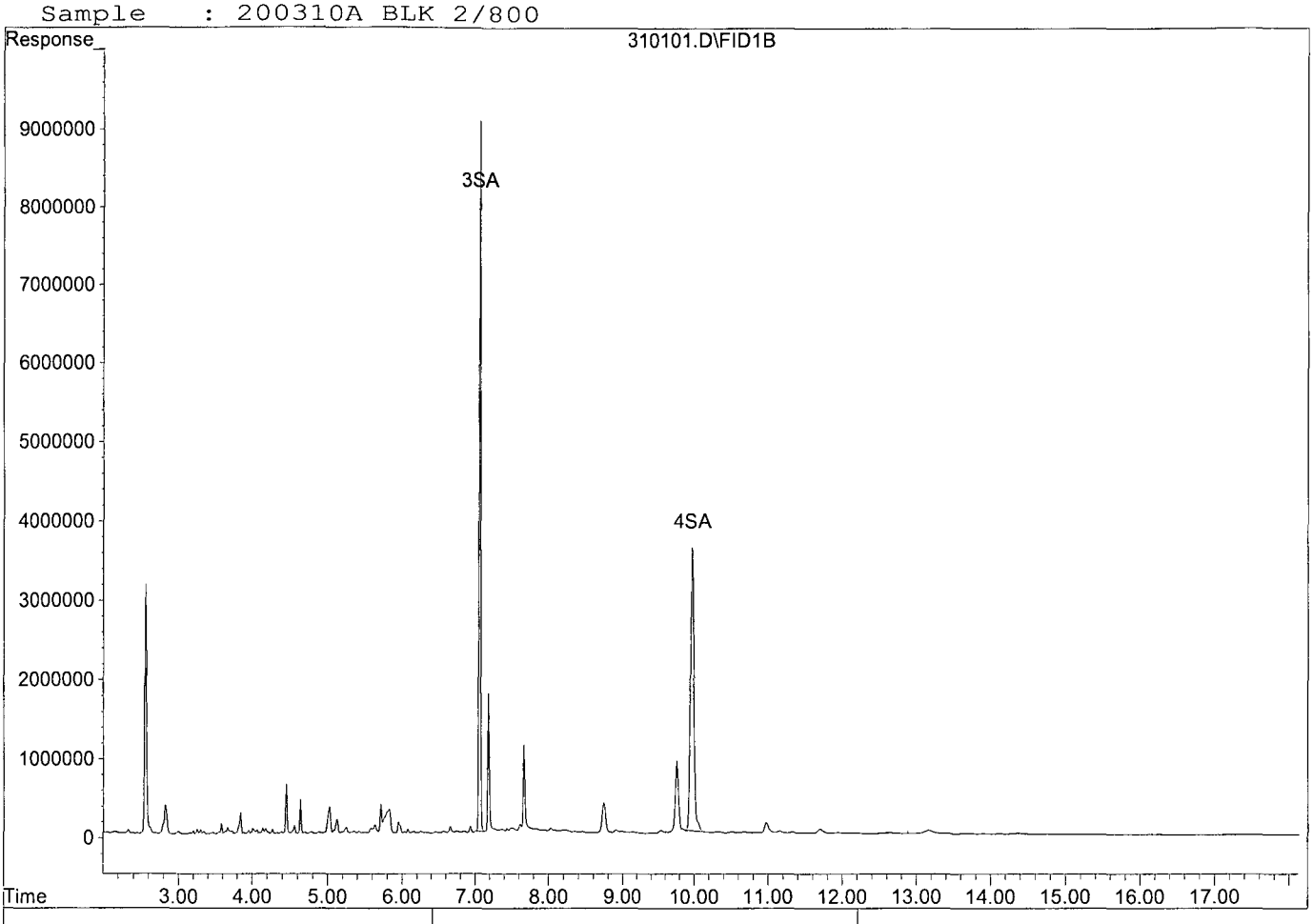
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

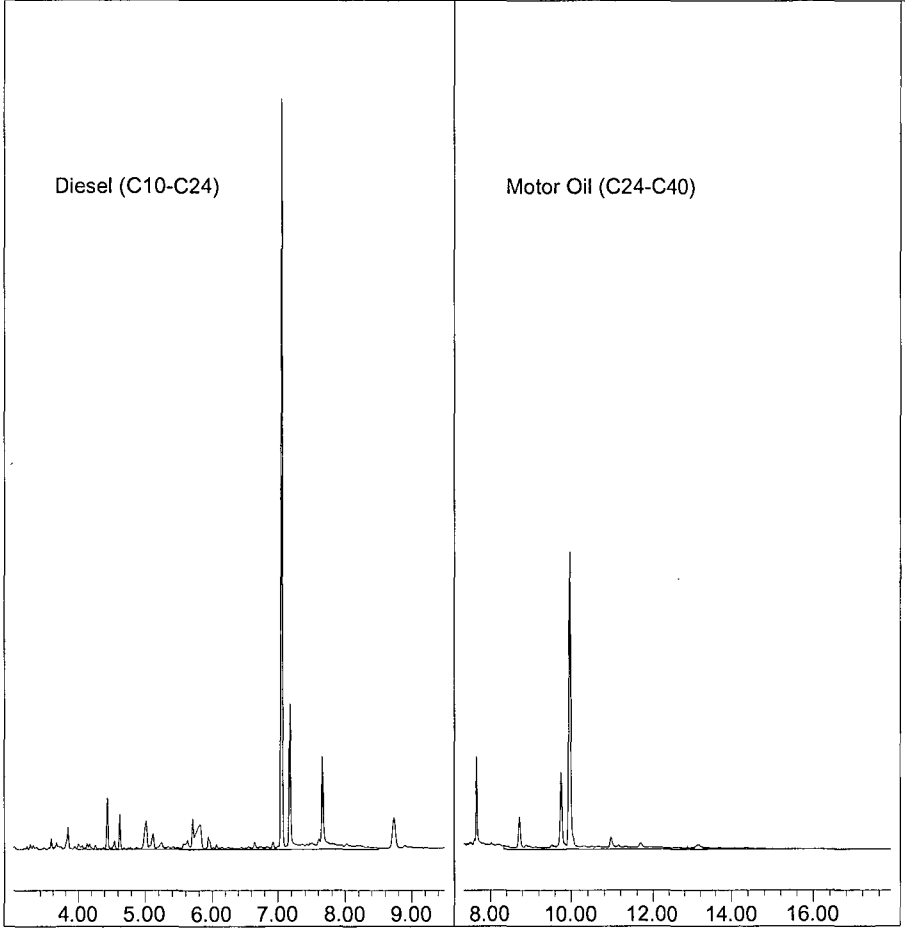
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	128159127	63.811 ppb
Surrogate Spike 75.000	Recovery =		85.08%
4) SA Octacosane(S)	9.97	116580158	83.450 ppb
Surrogate Spike 75.000	Recovery =		111.27%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	184193000	120.067 ppb
2) HBTM Motor Oil (C24-C40)	12.60	157237225	133.307 ppb

Target Compounds

Data File: G:\APOLLO\DATA\200310\310101.D
Sample : 200310A BLK 2/800





_LIQ005

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200312A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 2-10-20 2-10-21		Surrogate ID 1	THC Surrogate 2-24-20 2-24-21	
Spiked ID 2	Decanoic 1000ug/mL Acid Solution 1-24-20 1-24-21		Surrogate ID 2		
Spiked ID 3	Decanoic 1000ug/mL Acid Solution 3-17-20 3-17-20		Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	YES	
Spiked ID 7			Ext. Start Time:	03/12/20 15:00	
Spiked ID 8			Ext. End Time:	03/13/20 9:00	
			GC Requires Extract By:		

pH1	2	03/12/20 12:45	Water Bath Temp 1 °C	39/38.5 °C
pH2	2	03/12/20 14:10	Water Bath Temp 2 °C	35/38.5
pH3			Water Bath Temp 3 °C	35/38.4 °C

Spiked By: DL **Date** 03/12/20 **Witnessed By:** CFM **Date** 03/12/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200312A Blk		0.050	2	0.100	1	800	2	2	03/12/20 12:55	*
						equip	E-HP30 E-WB1				
2	200312A LCS-1		0.040,0.050	1,2	0.100	1	800	2	2	03/12/20 12:55	*
						equip	E-HP17 E-WB2				
3	BA08341 MS-1	BA08341W45	0.040,0.050	1,2	0.100	1	800	2	2	03/12/20 14:18	91638 *
						equip	E-HP12 E-WB2				
4	BA08341 MSD-1	BA08341W46	0.040,0.050	1,2	0.100	1	800	2	2	03/12/20 14:18	91638 *
						equip	E-HP14 E-WB2				
5	BA08341	BA08341W44	0.050	2	0.100	1	800	2	2	03/12/20 14:18	91638 *
						equip	E-HP13 E-WB3				
6	BA08370	BA08370W20	0.050	3	0.100	1	800	2	2	03/12/20 12:55	91653 *
						equip	E-HP16 E-WB1				
7	BA08371	BA08371W13	0.050	3	0.100	1	800	2	2	03/12/20 12:55	91653 *
						equip	E-HP15 E-WB2				

Solvent and Lot#	
1+1 HCL	2-15-20
PH Strips	HC998032
Dicholormethane (DCM)	59239
Filter Paper	400171
Sodium Sulfate (Na2SO4)	2019020631
Silica Gel (*)	050627t

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	
Time	
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	03/17/20 10:54:55 AM

Reviewed By: KY **Date** 03/16/20

Quantitation Report (Not Reviewed)

Data File : G:\APOLLO\DATA\200312\312157.D Vial: 57
Acq On : 3-16-20 15:16:46 Operator: SS
Sample : 200312A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Mar 30 13:36 2020 Quant Results File: DOC0310.RES

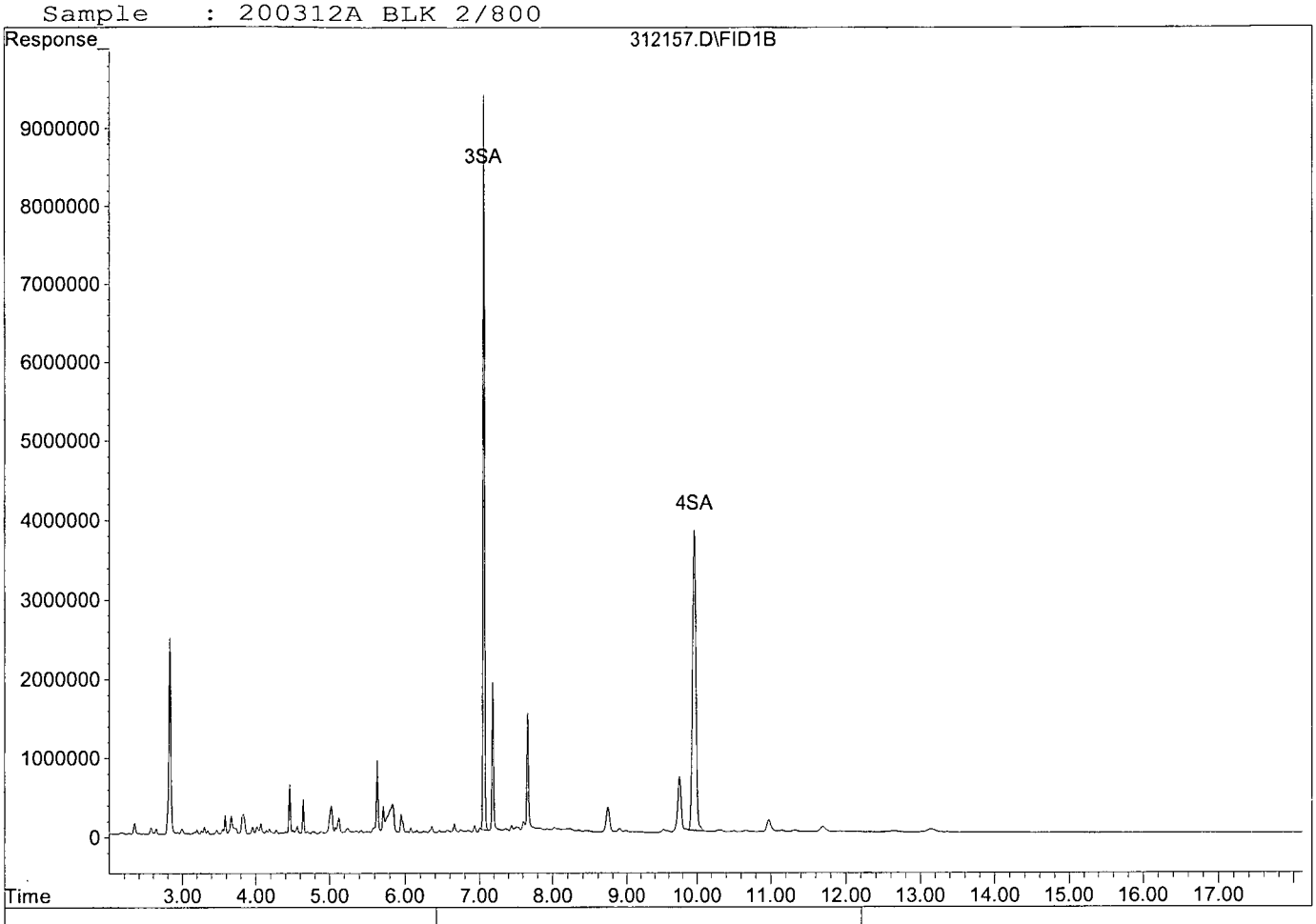
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

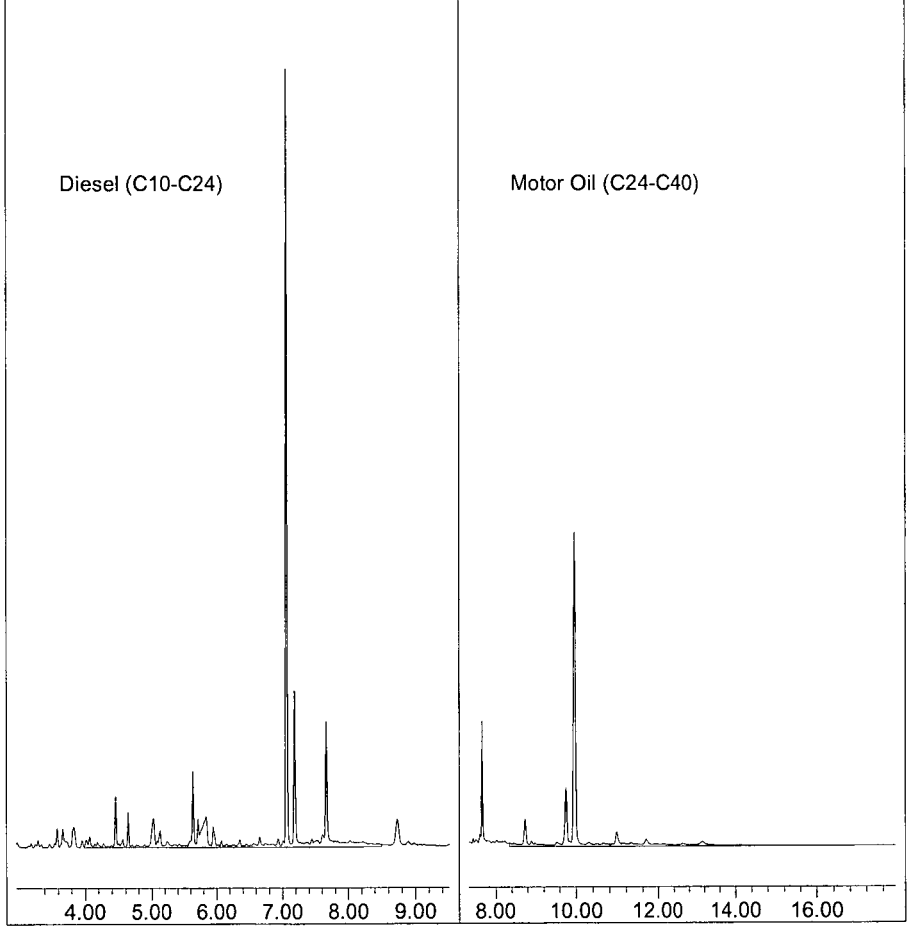
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.06	134572680	67.004 ppb
Surrogate Spike 75.000	Recovery =		89.34%
4) SA Octacosane(S)	9.96	123085531	88.106 ppb
Surrogate Spike 75.000	Recovery =		117.47%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	228756800	149.116 ppb
2) HBTM Motor Oil (C24-C40)	12.60	130358197	110.518 ppb

Target Compounds

Data File: G:\APOLLO\DATA\200312\312157.D
Sample : 200312A BLK 2/800





_LIQ005

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200323A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 2-10-20 2-10-21		Surrogate ID 1	THC Surrogate 3-12-20 3-12-21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	03/23/20 13:30	
Spiked ID 8			Ext. End Time:	03/24/20 7:30	
			GC Requires Extract By:		

pH1	2	03/23/20 13:05	Water Bath Temp 1 °C	35/38.5 °C
pH2			Water Bath Temp 2 °C	35/34.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: DL **Date** 03/23/20 **Witnessed By:** RP **Date** 03/23/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200323A Blk				0.100	1	800	2	2	03/23/20 13:10	
						equip	E-HP28 E-WB1				
2	200323A LCS-1		0.040	1	0.100	1	800	2	2	03/23/20 13:10	
						equip	E-HP29 E-WB2				
3	200323A LCSD-1		0.040	1	0.100	1	800	2	2	03/23/20 13:10	
						equip	E-HP30 E-WB3				
4	BA08961	BA08961W09			0.100	1	800	2	2	03/23/20 13:10	91729
						equip	E-HP17 E-WB1				

Solvent and Lot#	
1+1 HCL	2-15-20
PH Strips	HC998032
Dicholormethane (DCM)	59239
Filter Paper	400171
Sodium Sulfate (Na2SO4)	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	
Time	
Refrigerator	HOBART

	Technician's Initials
Scanned By	DL
Sample Preparation	DL
Extraction	DL
Concentration	DL

Modified	03/25/20 1:52:18 PM

Reviewed By: KY **Date** 03/25/20

Quantitation Report (Not Reviewed)

Data File : G:\APOLLO\DATA\200317\317281.D Vial: 81
Acq On : 3-26-20 15:50:59 Operator: SS
Sample : 200323A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Mar 30 13:36 2020 Quant Results File: DOC0310.RES

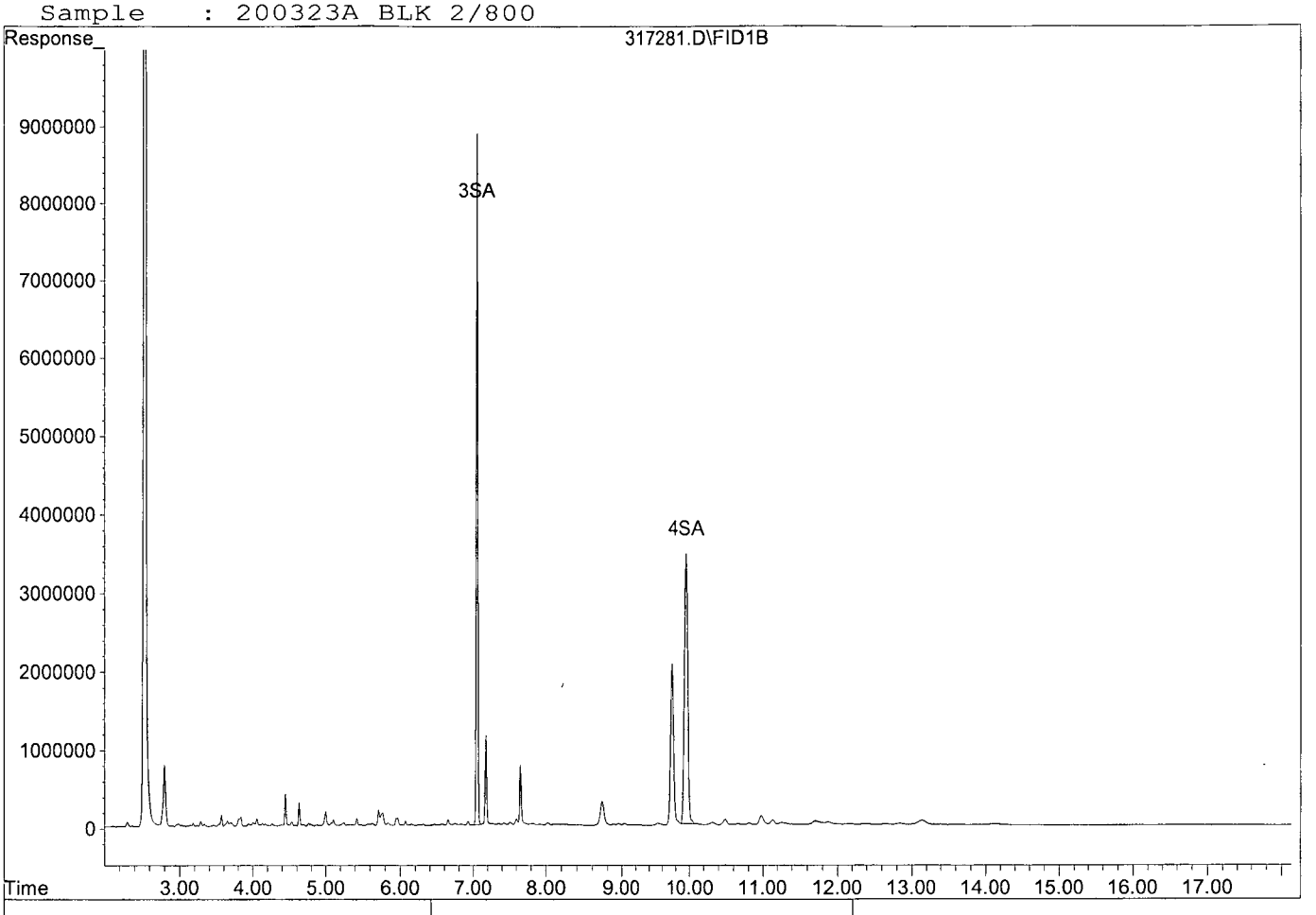
Method : G:\APOLLO\DATA\200310\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Mar 10 11:57:01 2020
Response via : Multiple Level Calibration

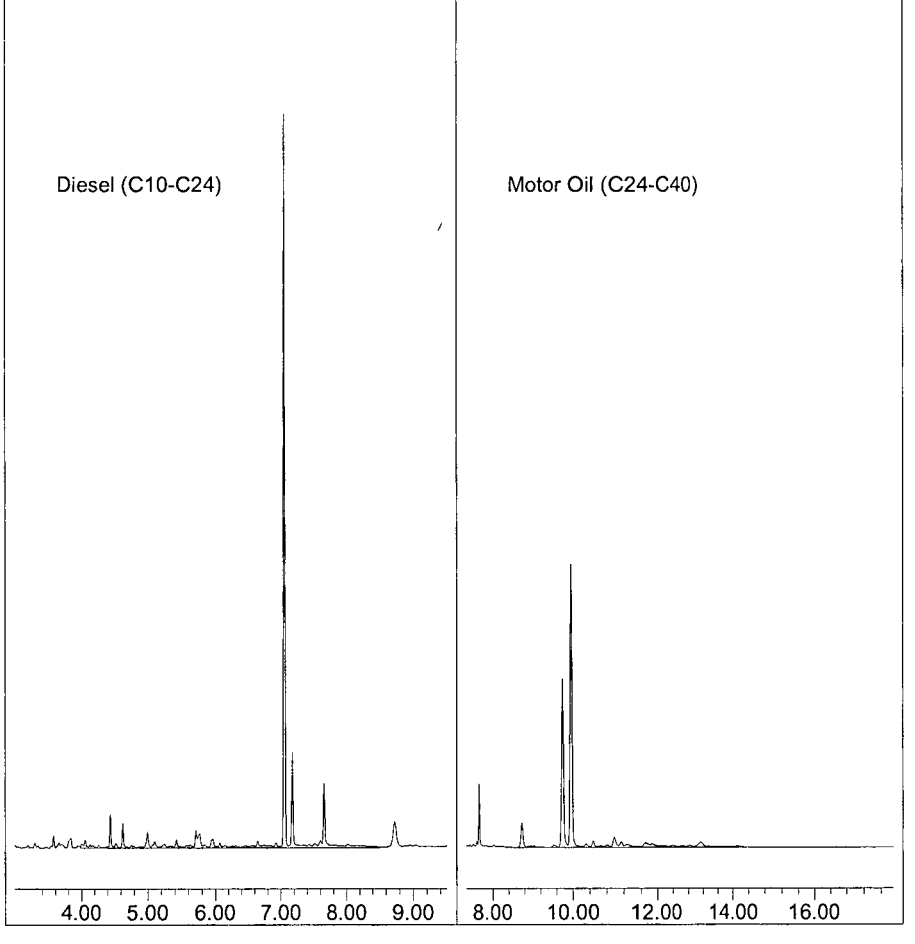
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	121393598	60.442 ppb
Surrogate Spike 75.000	Recovery =		80.59%
4) SA Octacosane(S)	9.95	114293754	81.813 ppb
Surrogate Spike 75.000	Recovery =		109.08%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	119225000	77.717 ppb
2) HBTM Motor Oil (C24-C40)	12.60	150338276	127.458 ppb

Target Compounds

Data File: G:\APOLLO\DATA\200317\317281.D
Sample : 200323A BLK 2/800





MDLb & MDLs Study

Method Detection Limit Blank Report

APPL, Inc.

EPA 3520C / 8015B

TPH Extractables

DOC0310

Instrument: Apollo
Matrix: Water
Units: ug/L

Data Path: G:\APOLLO\DATA\200402\
Column ID (1): DB-1
Extraction Ratio: 2mL / 0.8L

Date: 04/21/20
Analyzed By: Sarah Sevy

File ID:	402221.D	402222.D	402261.D	402262.D	402273.D	402274.D	402275.D
Extracted:	4-15-20	4-15-20	4-16-20	4-16-20	4-17-20	4-17-20	4-17-20
Injected:	4-17-20	4-17-20	4-20-20	4-20-20	4-21-20	4-21-20	4-21-20

Analyte	1	2	3	4	5	6	7	StdDev	SpkAmt	RL	MDLb
Diesel (C10-C24)	98.0	116.8	108.8	115.8	112.2	101.4	108.4	7.02	NA	320	22.07
Motor Oil (C24-C40)	78.8	90.8	88.1	97.5	124.0	123.1	116.4	18.32	NA	320	57.57
Ortho-Terphenyl(S)	56.9	64.0	62.3	71.5	59.1	60.7	60.5	4.71	75	NA	14.81
Octacosane(S)	71.8	80.1	79.6	91.6	80.8	76.8	82.6	6.04	75	NA	18.98

Method Detection Limit Spike Report

APPL, Inc.

EPA 3520C / 8015B

TPH Extractables

DOC0310

Instrument: Apollo
Matrix: Water
Units: ug/L

Data Path: G:\APOLLO\DATA\200402\
Column ID (1): DB-1
Extraction Ratio: 2mL / 0.8L

Date: 04/21/20
Analyzed By: Sarah Sevy

File ID:	402223.D	402224.D	402263.D	402264.D	402276.D	402277.D	402278.D
Extracted:	4-15-20	4-15-20	4-16-20	4-16-20	4-17-20	4-17-20	4-17-20
Injected:	4-17-20	4-17-20	4-20-20	4-20-20	4-21-20	4-21-20	4-21-20

Analyte	1	2	3	4	5	6	7	StdDev	SpkAmt	RL	MDLs
Diesel (C10-C24)	359.4	360.8	286.2	331.7	327.1	354.6	336.0	26.08	250	320	81.97
Motor Oil (C24-C40)	349.1	347.0	302.1	317.5	350.5	377.1	358.8	25.34	250	320	79.64
Ortho-Terphenyl(S)	13.2	14.0	11.3	11.9	11.7	11.7	11.8	0.98	12.5	NA	3.09
Octacosane(S)	13.3	14.9	12.4	12.9	11.1	12.3	11.5	1.26	12.5	NA	3.96

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH-Diesel/MO 3520C	Extraction Set	200415A	Extraction Method	LIQ005	Units	mL

Spiked ID 1	Diesel Motor Oil Mix 4-1-20 4-1-21		Surrogate ID 1	THC Surrogate 3-25-20 3-25-21	
Spiked ID 2	Diesel Motor Oil Calib Std 2-13-20 2-13-21		Surrogate ID 2		
Spiked ID 3	Decanoic Acid Std 3-17-20 3-17-21		Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	04/15/20 15:00	
Spiked ID 8			Ext. End Time:	04/16/20 9:00	
			GC Requires Extract By:		

pH1	2	04/15/20 12:10	Water Bath Temp 1 °C	37/36.5 °C
pH2			Water Bath Temp 2 °C	35/38.5
pH3			Water Bath Temp 3 °C	36/35.4 °C

Spiked By: ERR **Date** 04/15/20 **Witnessed By:** DL **Date** 04/15/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200415A Blk		0.050	3	0.100	1	800	2	2	04/15/20 12:15	*
						equip	E-HP26 E-WB2				
2	200415A LCS-1		0.040,0.050	1,3	0.100	1	800	2	2	04/15/20 12:15	*
						equip	E-HP27 E-WB1				
3	200415A LCSD-1		0.04,0.050	1,3	0.100	1	800	2	2	04/15/20 12:15	*
						equip	E-HP28 E-WB3				
4	BA09663	BA09663W07			0.100	1	800	2	2	04/15/20 12:15	91886
						equip	E-HP29 E-WB1				
5	BA09664	BA09664W04	0.050	3	0.100	1	800	2	2	04/15/20 12:15	91886 *
						equip	E-HP30 E-WB3				
6	MDLb-1				0.100	1	800	2	2	04/15/20 12:15	DAY 1
						equip	E-HP14 E-WB1				
7	MDLb-2				0.100	1	800	2	2	04/15/20 12:15	DAY 1
						equip	E-HP11 E-WB3				
8	MDLs-1		0.100	2	NA	NA	800	2	2	04/15/20 12:15	DAY 1
						equip	E-HP16 E-WB2				
9	MDLs-2		0.100	2	NA	NA	800	2	2	04/15/20 12:15	DAY 1
						equip	E-HP15 E-WB2				

Solvent and Lot#	
1+1 HCL Amber Liter	59072
PH Strips	HC998032
Dicholormethane	59239
Filter Paper	400171
B. Sodium Sulfate	2019020631
Silica Gel (*)	

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	4/16/20
Time	13:20
Refrigerator	HOBART

	Technician's Initials
Scanned By	ERR
Sample Preparation	ERR,KY
Extraction	ERR,KY
Concentration	ERR

Modified	04/20/20 9:58:29 AM

Reviewed By: KY **Date** 04/16/20

_LIQ005SGC

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH- 3520C w/SGC	Extraction Set	200416A	Extraction Method	LIQ005SGC	Units	mL

Spiked ID 1	Diesel Motor Oil Calib Std 4-13-20 3-25-21		Surrogate ID 1	THC Surrogate 3-25-20 3-25-21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	04/16/20 13:15	
Spiked ID 8			Ext. End Time:	04/17/20 7:30	
			GC Requires Extract By:		

pH1	2	04/16/20 9:45	Water Bath Temp 1 °C	38/37.5 °C
pH2			Water Bath Temp 2 °C	36/39.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: KY **Date** 04/16/20 **Witnessed By:** DL **Date** 04/16/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	LOD CHK		0.120	1	NA	NA	800	2	2	04/16/20 10:56	DAY 2, 300 ug/L
						equip	E-HP51 E-WB1				
2	LOQ CHK		0.200	1	NA	NA	800	2	2	04/16/20 10:56	DAY 2, 500 ug/L
						equip	E-HP50 E-WB1				
3	MDLb-3				0.100	1	800	2	2	04/16/20 10:56	DAY 2
						equip	E-HP49 E-WB2				
4	MDLb-4				0.100	1	800	2	2	04/16/20 10:56	DAY 2
						equip	E-HP48 E-WB2				
5	MDLs-3		0.100	1	NA	NA	800	2	2	04/16/20 10:56	DAY 2, 250 ug/L
						equip	E-HP47 E-WB3				
6	MDLs-4		0.100	1	NA	NA	800	2	2	04/16/20 10:56	DAY 2, 250 ug/L
						equip	E-HP25 E-WB3				

Solvent and Lot#	
1+1 HCL (5mLs) AMBER	59072
PH Strips	HC998032
Filter Paper	400171
B. Sodium Sulfate	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	4/17/20
Time	1305
Refrigerator	HOBART

	Technician's Initials
Scanned By	KY
Sample Preparation	KY,DL
Extraction	KY,DL
Concentration	DL

Modified	04/20/20 1:56:24 PM

Reviewed By: KY **Date** 04/20/20

04/21/20 11:37:00 AM Ext_ID 66677 Page 1 of 1

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH- 3520C w/SGC	Extraction Set	200417A	Extraction Method	LIQ005SGC	Units	mL

Spiked ID 1	Diesel Motor Oil Calib Std 4/13/20-3/25/21		Surrogate ID 1	THC Surrogate 4/16/20-4/16/21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	04/17/20 12:45	
Spiked ID 8			Ext. End Time:	04/20/20 9:30	
			GC Requires Extract By:		

pH1	2		Water Bath Temp 1 °C	38/37.5 EWB1 °
pH2			Water Bath Temp 2 °C	36/39.5 EWB2
pH3			Water Bath Temp 3 °C	35/34.4 EWB3 °

Spiked By: KY **Date** 04/17/20 **Witnessed By:** CFM **Date** 04/17/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	MDLb-5				0.100	1	800	2	2	04/17/20 12:45	DAY 3
						equip	E-HP51 E-WB1				
2	MDLb-6				0.100	1	800	2	2	04/17/20 12:45	DAY 3
						equip	E-HP50 E-WB2				
3	MDLb-7				0.100	1	800	2	2	04/17/20 12:45	DAY 3
						equip	E-HP49 E-WB3				
4	MDLs-5		0.100	1	NA	NA	800	2	2	04/17/20 12:45	DAY 3, 250 ug/L
						equip	E-HP48 E-WB1				
5	MDLs-6		0.100	1	NA	NA	800	2	2	04/17/20 12:45	DAY 3, 250 ug/L
						equip	E-HP47 E-WB2				
6	MDLs-7		0.100	1	NA	NA	800	2	2	04/17/20 12:45	DAY 3, 250 ug/L
						equip	E-HP25 E-WB3				

Solvent and Lot#	
1+1 HCL (5mLs) AMBER	59072
PH Strips	HC863463
Filter Paper	400171
B. Sodium Sulfate	209020631
SILICA GEL (*)	*

Extraction COC Transfer	
Extraction lab employee Initials	SS
GC analyst's initials	CD
Date	4/20/20
Time	13:06
Refrigerator	HOBART

	Technician's Initials
Scanned By	-----
Sample Preparation	DS,KY
Extraction	KY,DS
Concentration	DS

Modified	04/21/20 11:43:44 AM

Reviewed By: SS **Date** 04/21/20

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402223.D Vial: 23
Acq On : 4-17-20 19:59:55 Operator: SS
Sample : MDLs-1 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:08 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:08:25 2020
Response via : Multiple Level Calibration

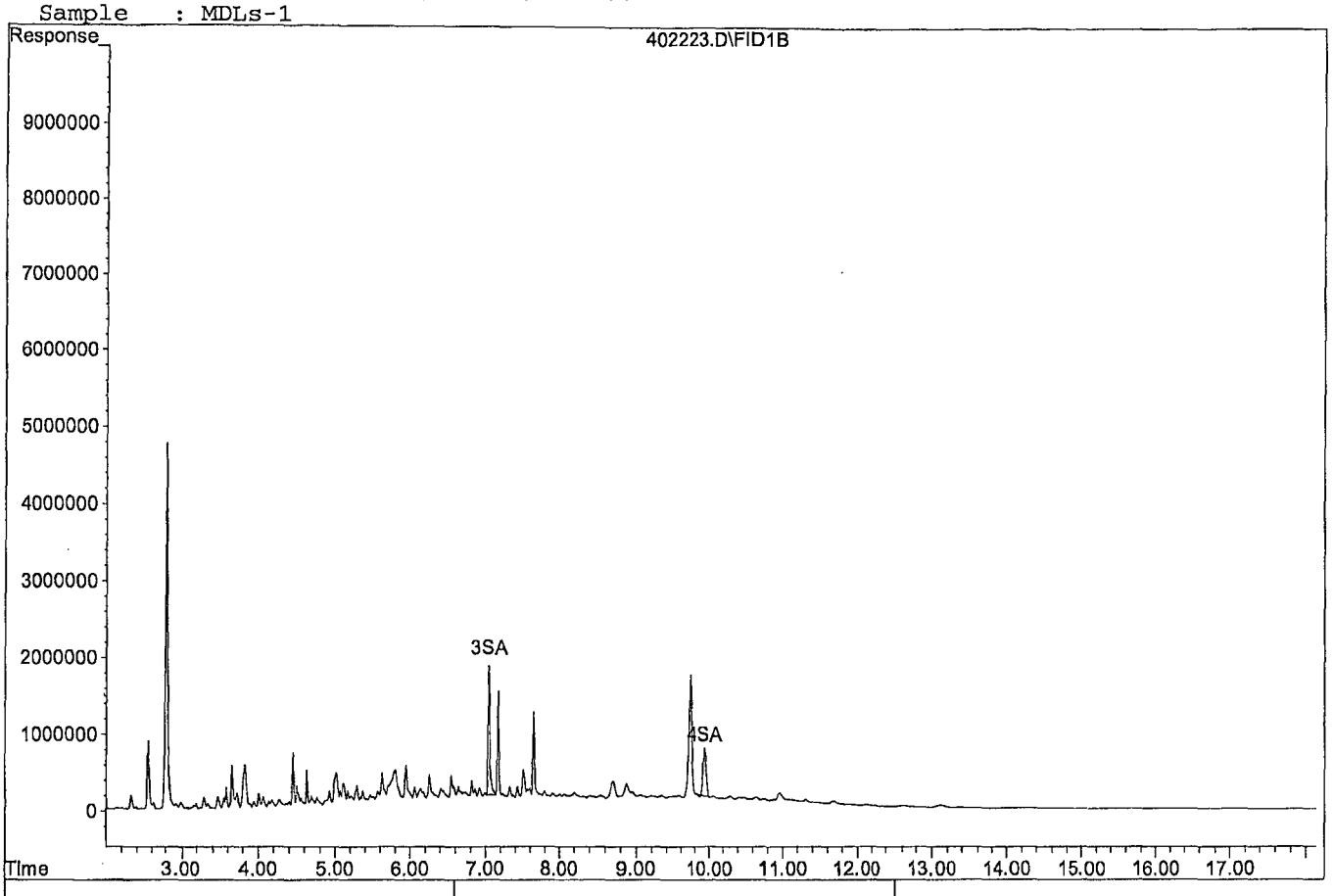
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

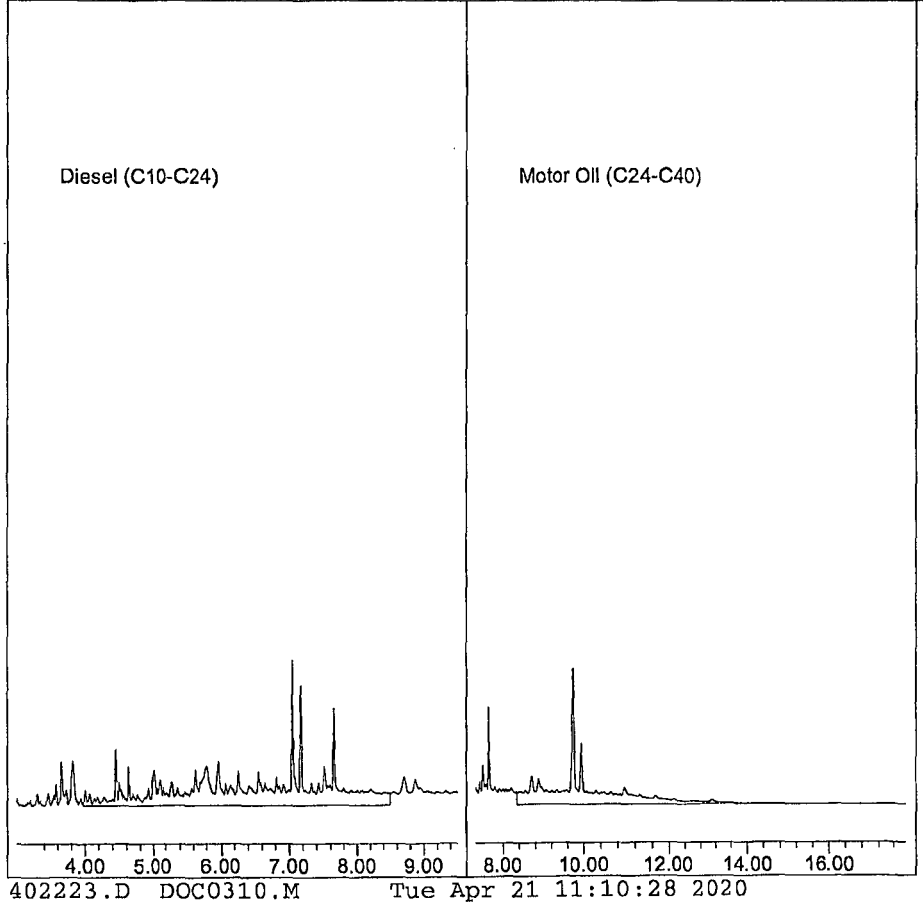
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	26568351	13.229 ppb
Surrogate Spike 12.500	Recovery =		105.83%
4) SA Octacosane(S)	9.94	18556337	13.283 ppb
Surrogate Spike 12.500	Recovery =		106.26%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	551274360	359.350 ppb
2) HBTM Motor Oil (C24-C40)	12.60	411811388	349.136 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.
402223.D DOC0310.M Tue Apr 21 11:10:27 2020 Page 1

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402223.D
Sample : MDLs-1





402223.D DOC0310.M Tue Apr 21 11:10:28 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402224.D Vial: 24
Acq On : 4-17-20 20:22:36 Operator: SS
Sample : MDLs-2 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:08 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:08:25 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

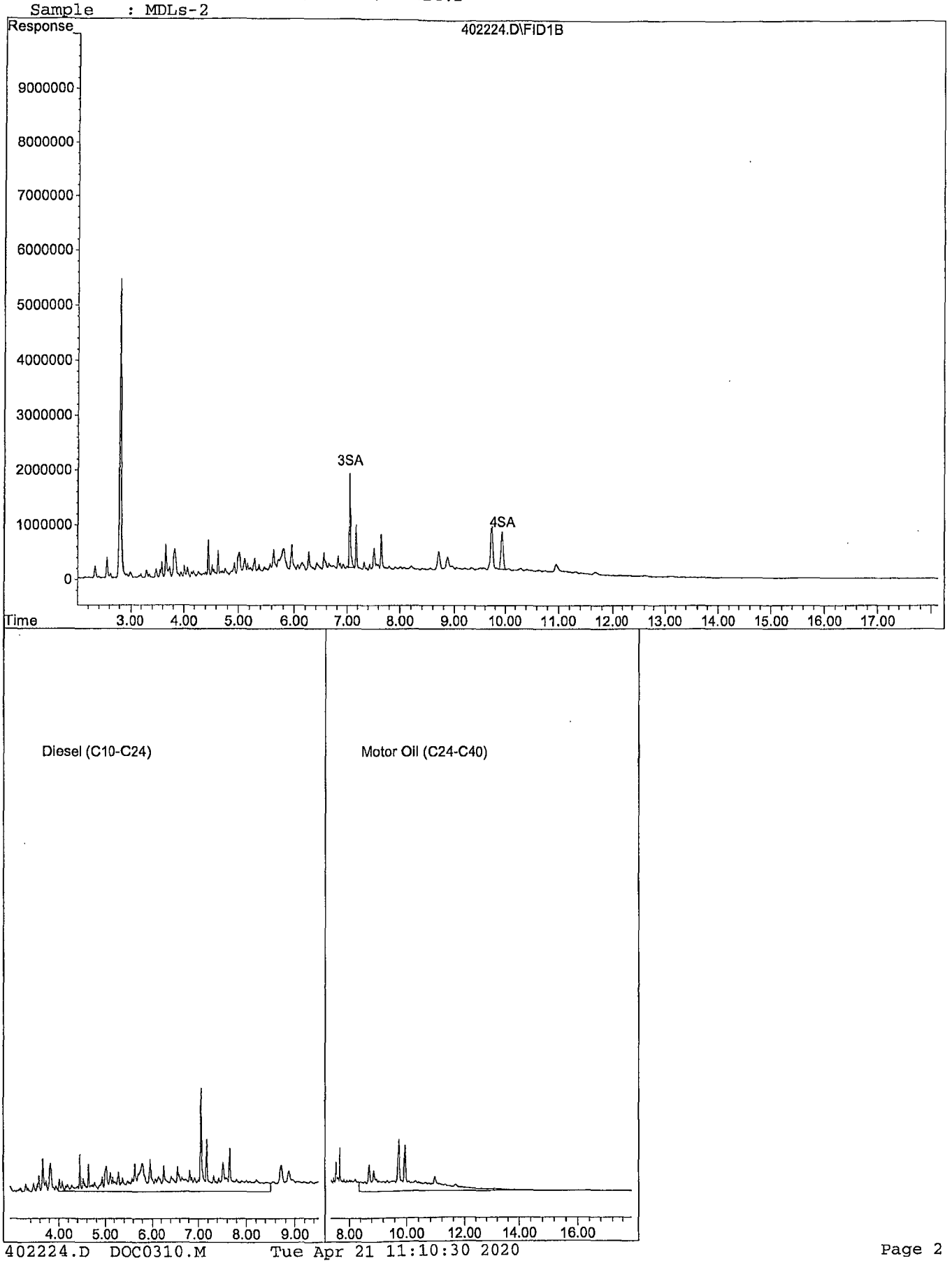
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	28019162	13.951 ppb
Surrogate Spike 12.500	Recovery =		111.61%
4) SA Octacosane(S)	9.94	20850635	14.925 ppb
Surrogate Spike 12.500	Recovery =		119.40%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	553500120	360.800 ppb
2) HBTM Motor Oil (C24-C40)	12.60	409250355	346.965 ppb

Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402224.D
Sample : MDLs-2



402224.D DOC0310.M Tue Apr 21 11:10:30 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402263.D Vial: 63
Acq On : 4-20-20 16:35:27 Operator: SS
Sample : MDLs-3 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:08 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:08:25 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

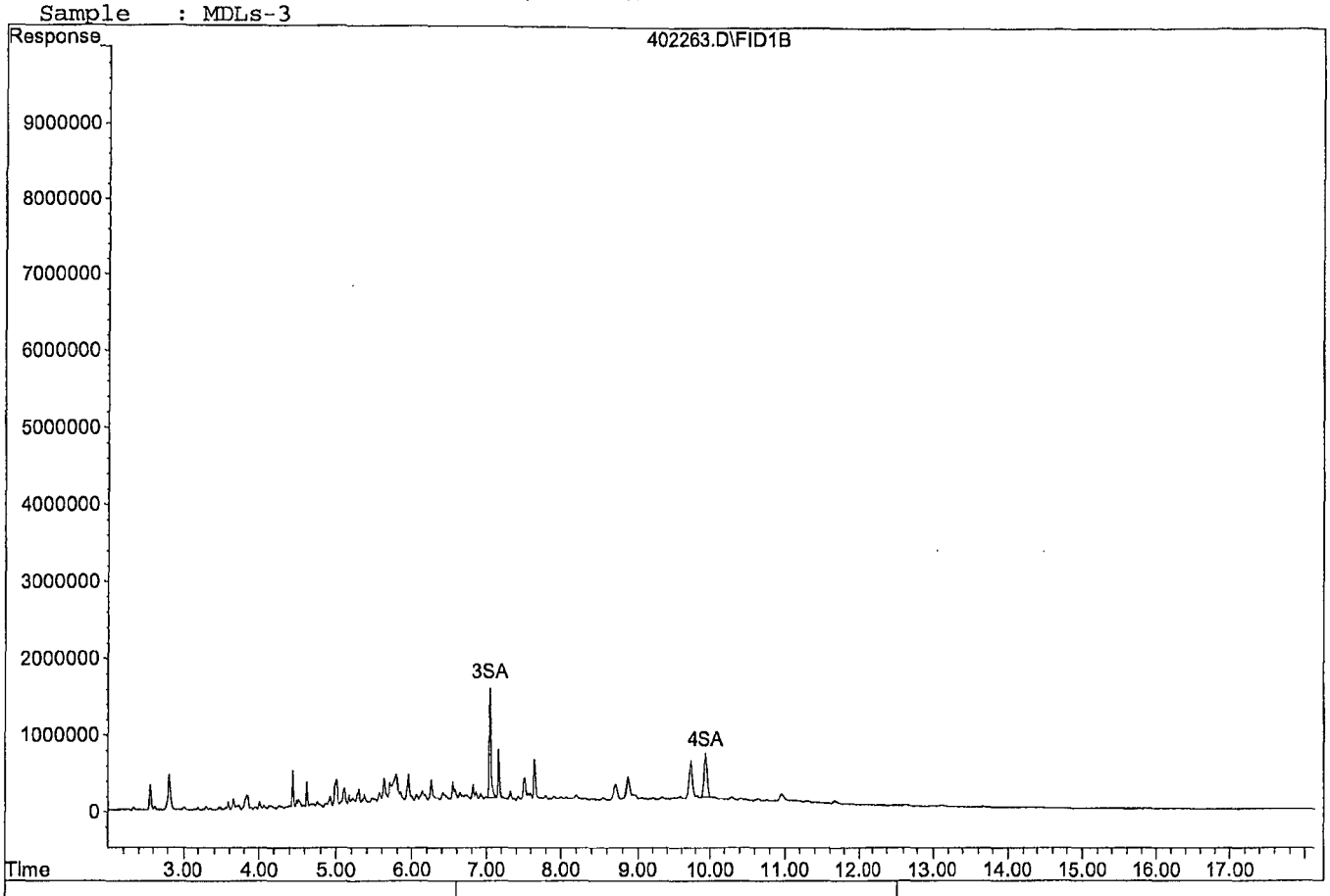
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	22668165	11.287 ppb
Surrogate Spike 12.500	Recovery =		90.30%
4) SA Octacosane(S)	9.94	17279895	12.369 ppb
Surrogate Spike 12.500	Recovery =		98.95%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	439031438	286.184 ppb
2) HBTM Motor Oil (C24-C40)	12.60	356306803	302.079 ppb

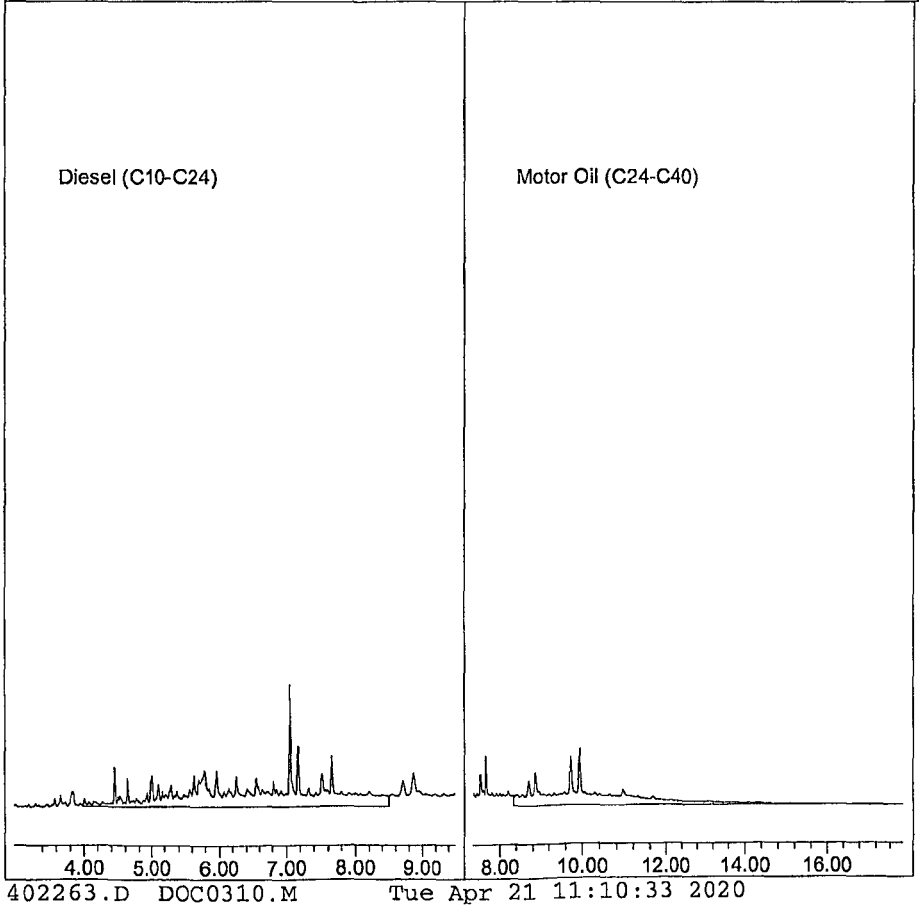
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402263.D
Sample : MDLs-3





402263.D DOC0310.M Tue Apr 21 11:10:33 2020

Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402264.D Vial: 64
Acq On : 4-20-20 16:58:06 Operator: SS
Sample : MDLs-4 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:08 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:08:25 2020
Response via : Multiple Level Calibration

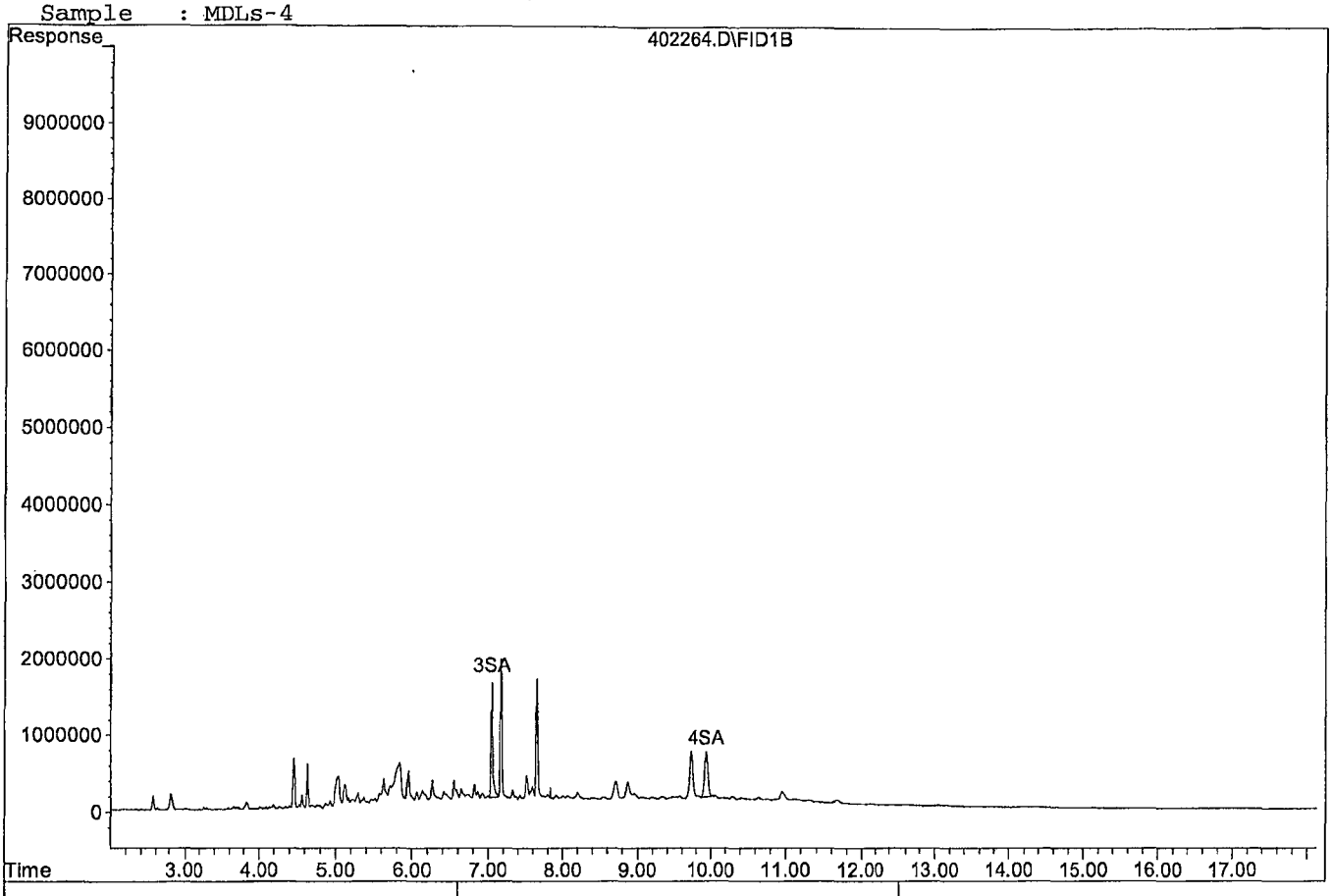
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

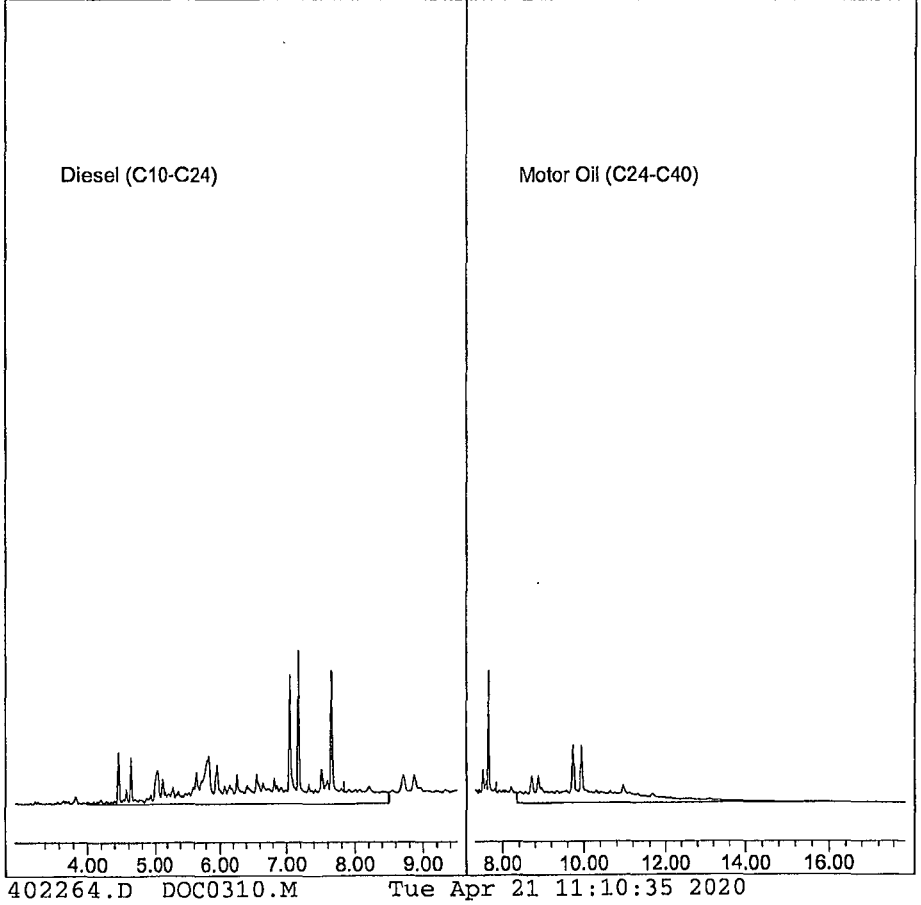
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	23870931	11.885 ppb
Surrogate Spike 12.500	Recovery =		95.08%
4) SA Octacosane(S)	9.94	18074588	12.938 ppb
Surrogate Spike 12.500	Recovery =		103.50%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	508791703	331.657 ppb
2) HBTM Motor Oil (C24-C40)	12.60	374439014	317.451 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402264.D
Sample : MDLs-4





402264.D DOC0310.M Tue Apr 21 11:10:35 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402276.D Vial: 76
Acq On : 4-21-20 10:18:23 Operator: SS
Sample : MDLs-5 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:08 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:08:25 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

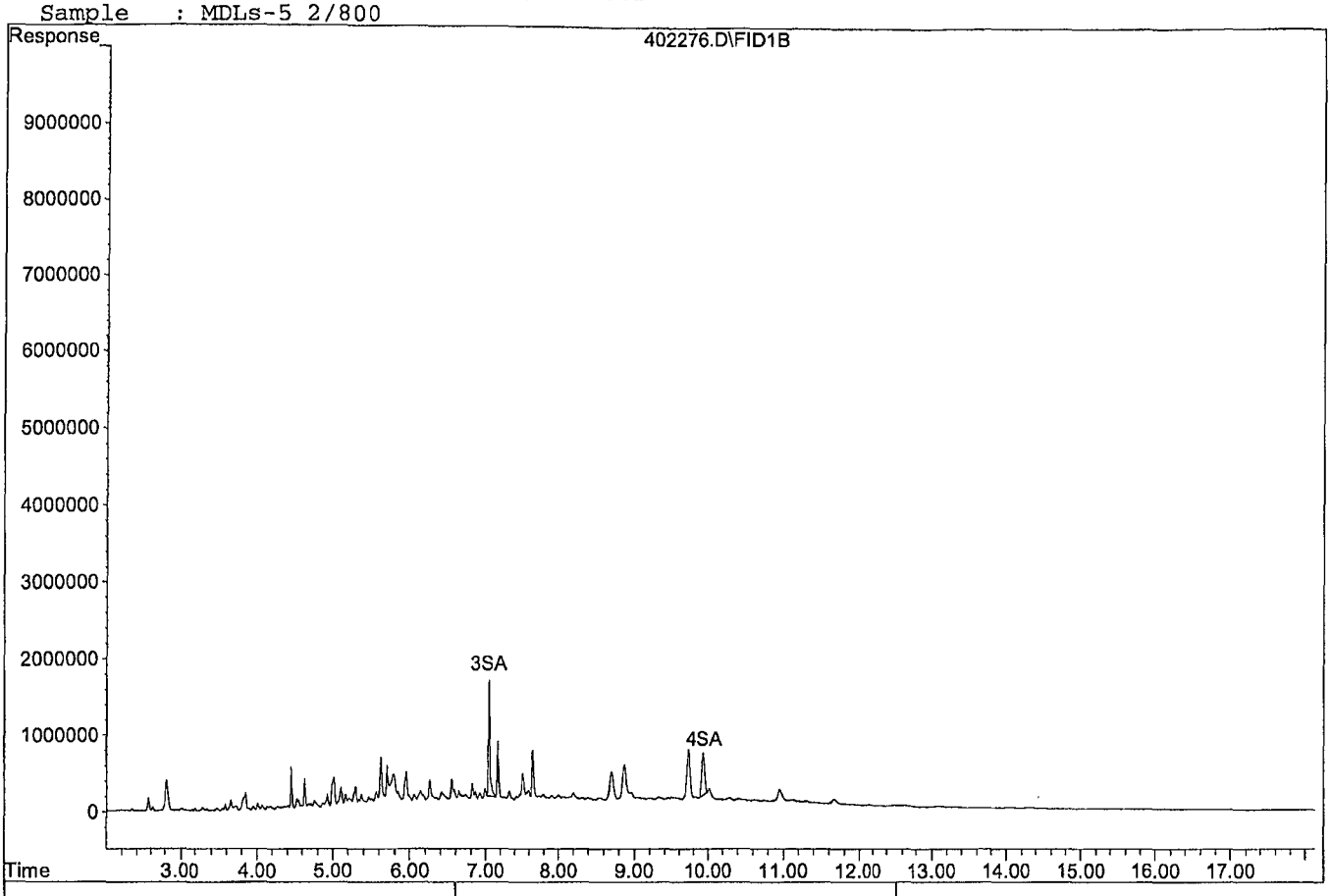
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	23402785	11.652 ppb
Surrogate Spike 12.500	Recovery =		93.22%
4) SA Octacosane(S)	9.93	15551043	11.132 ppb
Surrogate Spike 12.500	Recovery =		89.06%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	501865231	327.142 ppb
2) HBTM Motor Oil (C24-C40)	12.60	413464449	350.537 ppb

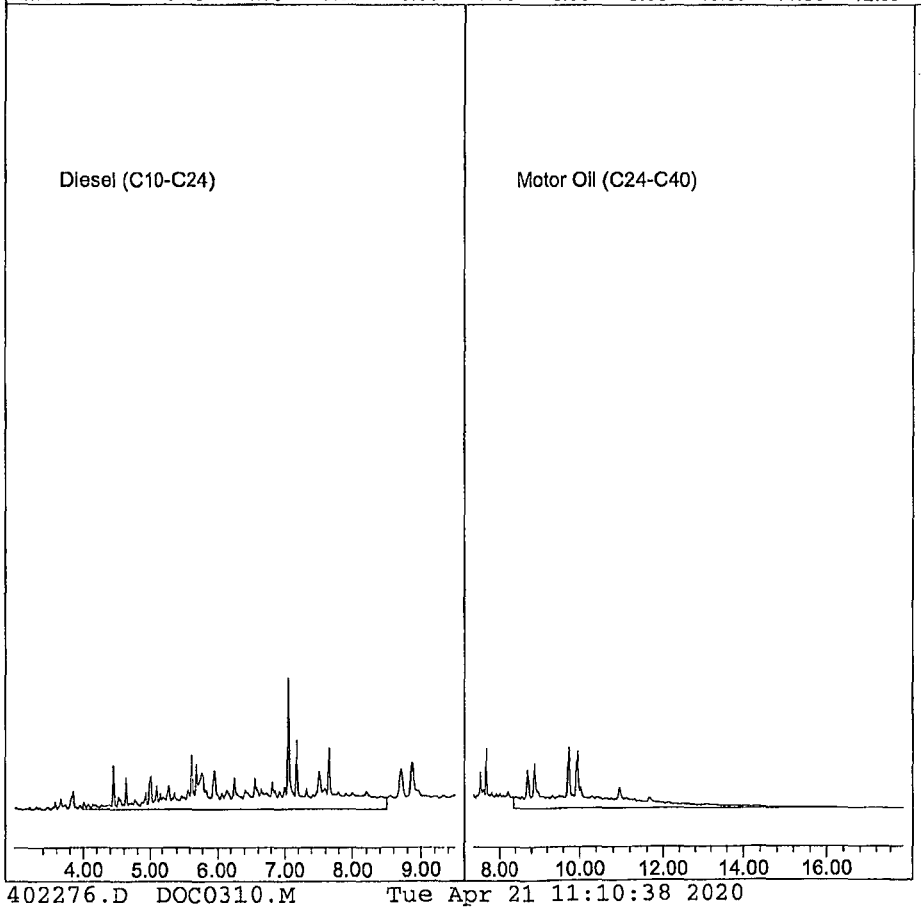
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402276.D
Sample : MDLs-5 2/800





402276.D DOC0310.M Tue Apr 21 11:10:38 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402277.D Vial: 77
Acq On : 4-21-20 10:40:57 Operator: SS
Sample : MDLs-6 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:08 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:08:25 2020
Response via : Multiple Level Calibration

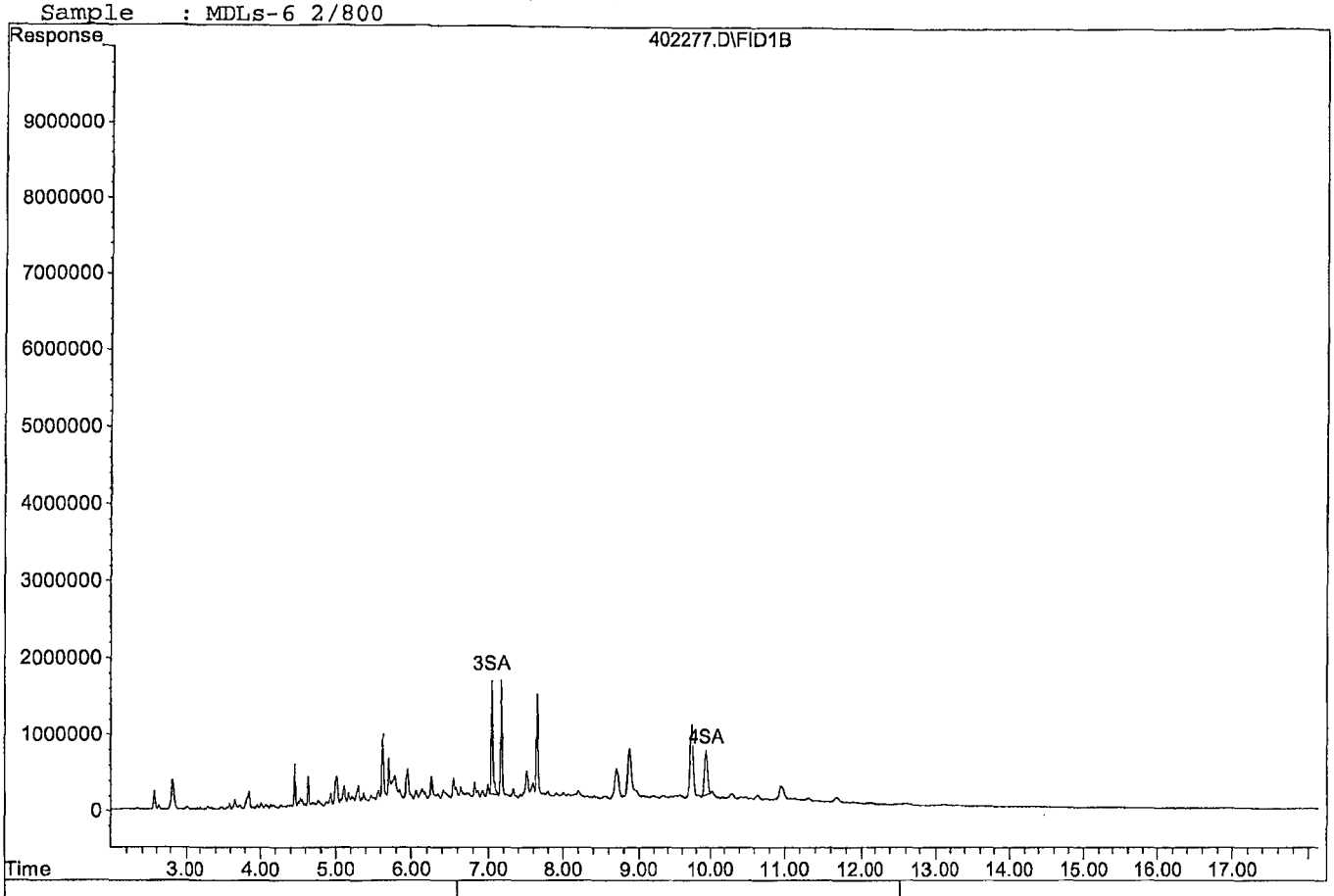
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

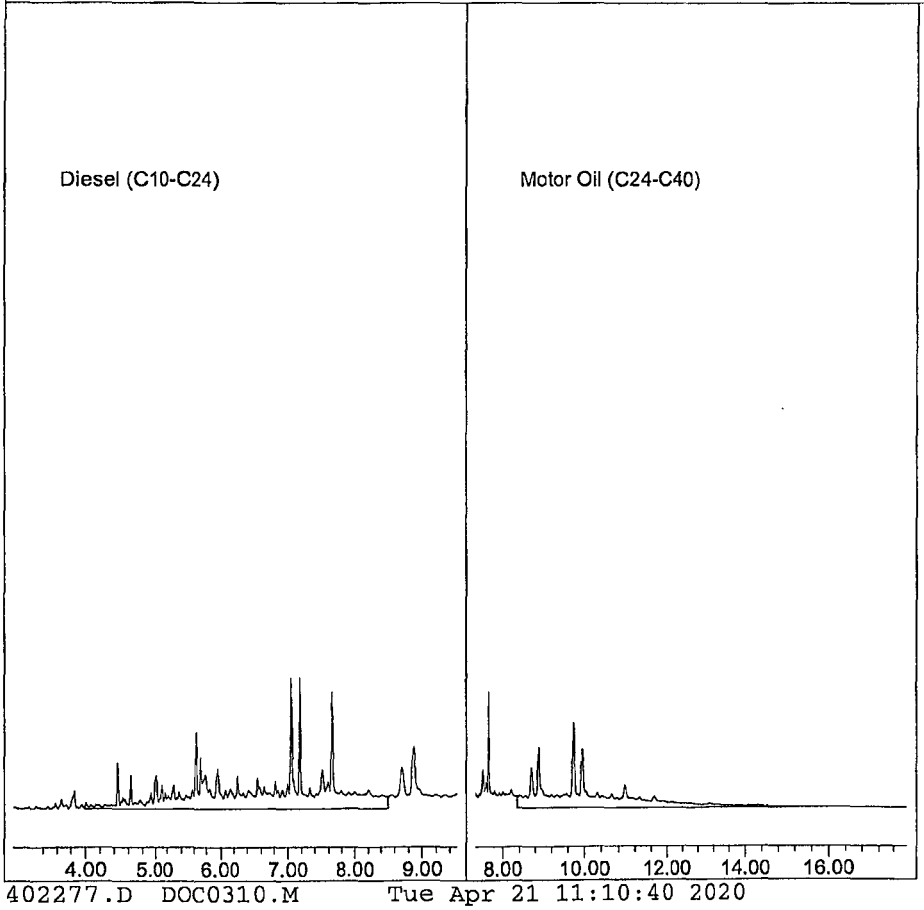
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	23477100	11.689 ppb
Surrogate Spike 12.500		Recovery =	93.51%
4) SA Octacosane(S)	9.94	17205309	12.316 ppb
Surrogate Spike 12.500		Recovery =	98.53%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	543914082	354.552 ppb
2) HBTM Motor Oil (C24-C40)	12.60	444840794	377.138 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402277.D
Sample : MDLs-6 2/800





402277.D DOC0310.M Tue Apr 21 11:10:40 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402278.D Vial: 78
Acq On : 4-21-20 11:03:31 Operator: SS
Sample : MDLs-7 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:23 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:12:44 2020
Response via : Multiple Level Calibration

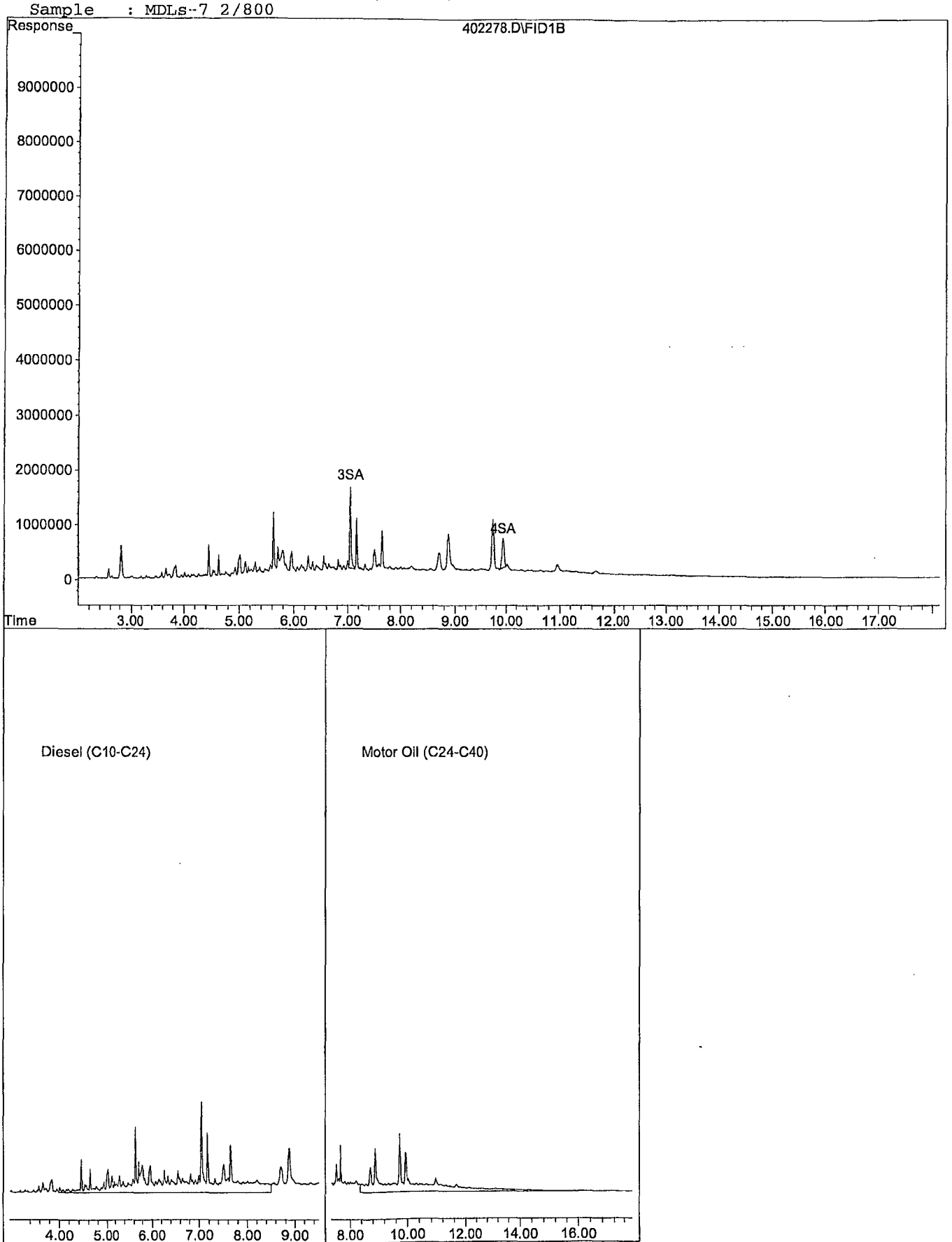
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	23662751	11.782 ppb
Surrogate Spike 12.500	Recovery =		94.26%
4) SA Octacosane(S)	9.93	16036510	11.479 ppb
Surrogate Spike 12.500	Recovery =		91.83%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	521517119	339.952 ppb
2) HBTM Motor Oil (C24-C40)	12.60	423227862	358.815 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402278.D
Sample : MDLs-7 2/800



Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402221.D Vial: 21
Acq On : 4-17-20 19:14:32 Operator: SS
Sample : MDLb-1 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 10:57 2020 Quant Results File: DOC0310.RES

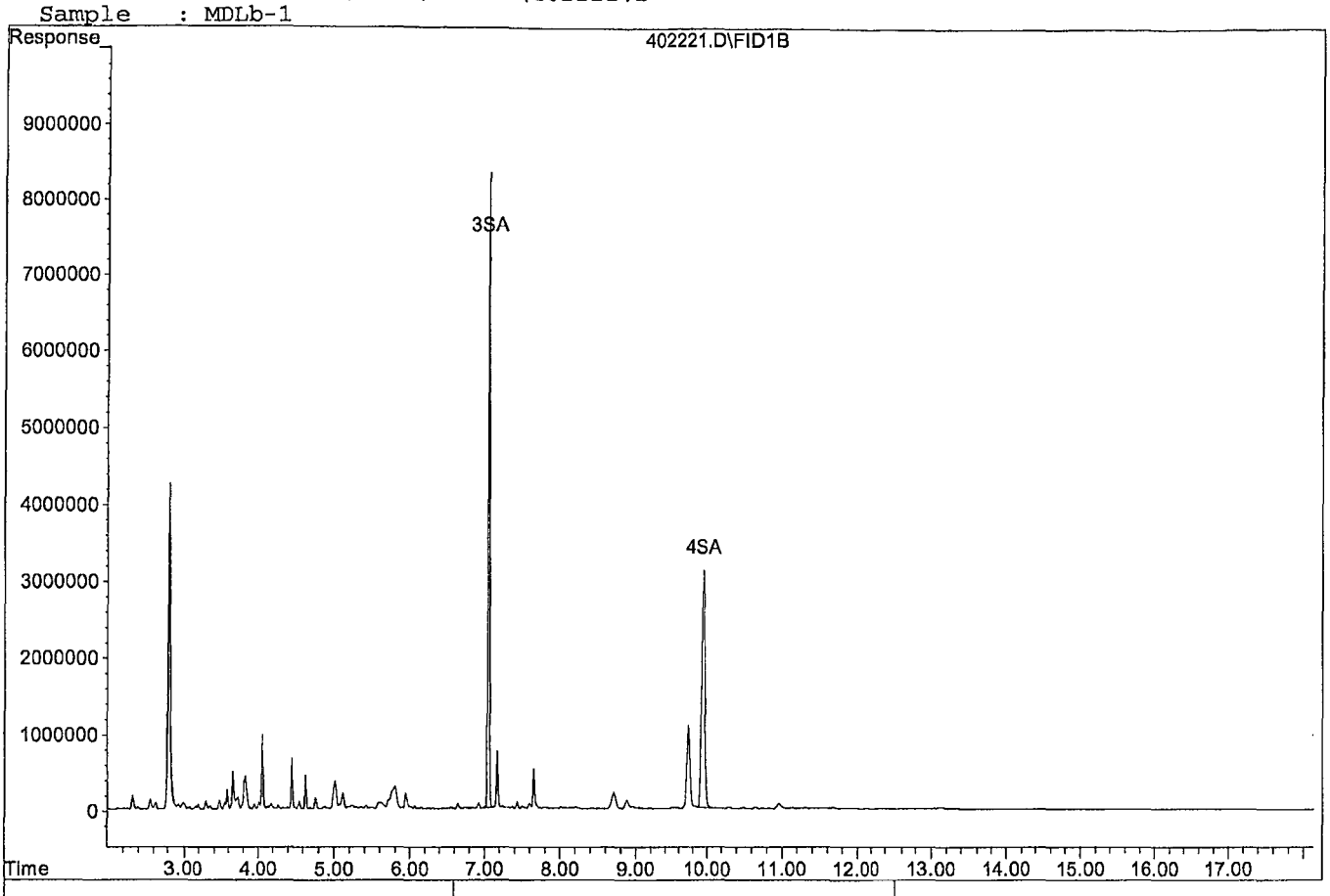
Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

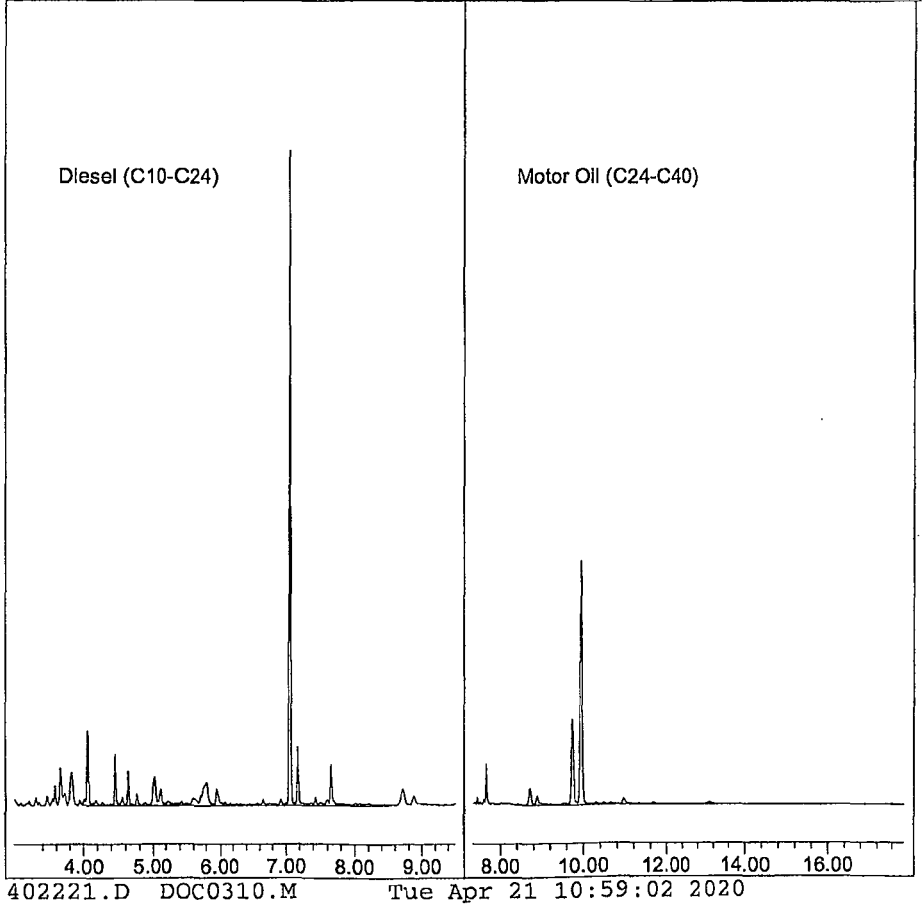
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	114354973	56.938 ppb
Surrogate Spike 75.000		Recovery =	75.92%
4) SA Octacosane(S)	9.94	100248553	71.759 ppb
Surrogate Spike 75.000		Recovery =	95.68%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	150380264	98.026 ppb
2) HBTM Motor Oil (C24-C40)	12.60	92896982	78.759 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File: G:\APOLLO\DATA\200402\402221.D
Sample : MDLb-1





402221.D DOC0310.M Tue Apr 21 10:59:02 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402222.D Vial: 22
Acq On : 4-17-20 19:37:15 Operator: SS
Sample : MDLb-2 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 10:57 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

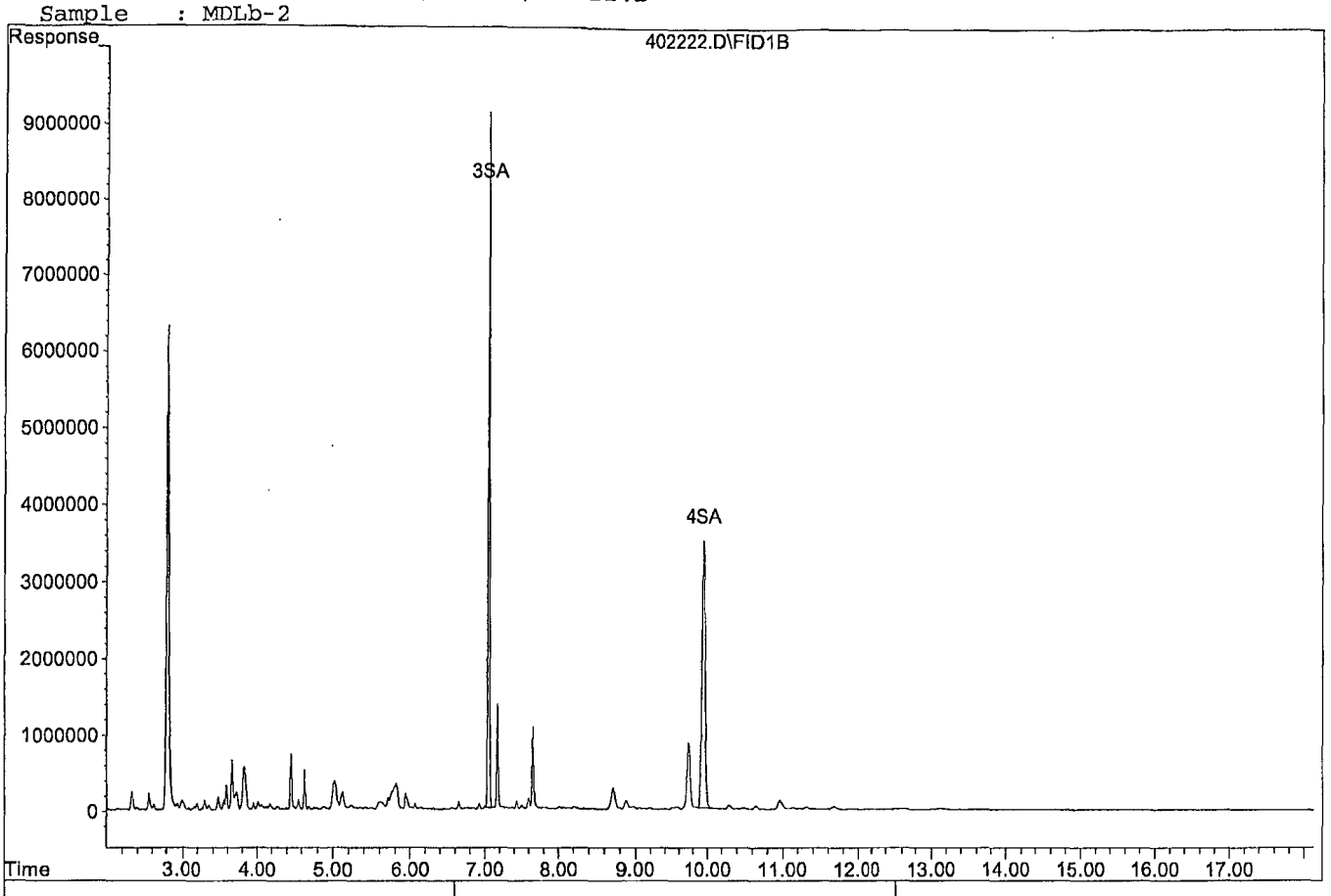
Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.05	128463431	63.963	ppb
Surrogate Spike 75.000		Recovery =	85.28%	
4) SA Octacosane(S)	9.94	111893820	80.095	ppb
Surrogate Spike 75.000		Recovery =	106.79%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	179238020	116.837	ppb
2) HBTM Motor Oil (C24-C40)	12.60	107097814	90.798	ppb

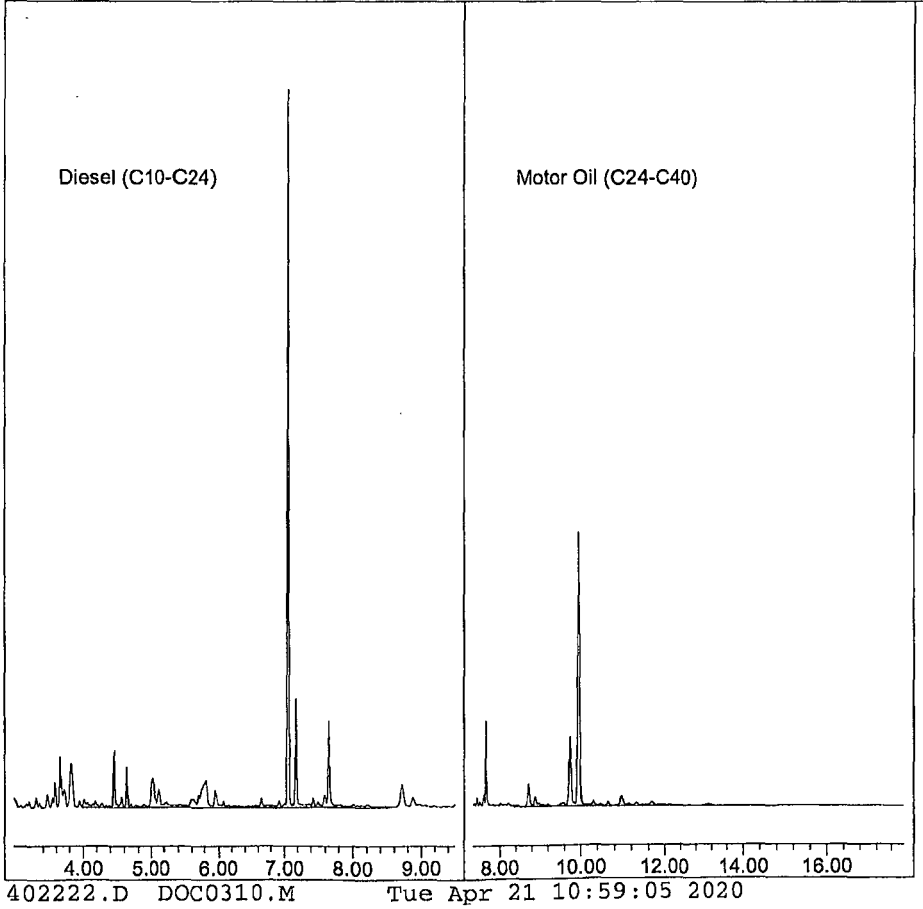
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402222.D
Sample : MDLb-2





402222.D DOC0310.M Tue Apr 21 10:59:05 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402261.D Vial: 61
Acq On : 4-20-20 15:50:20 Operator: SS
Sample : MDLb-3 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 8:29 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

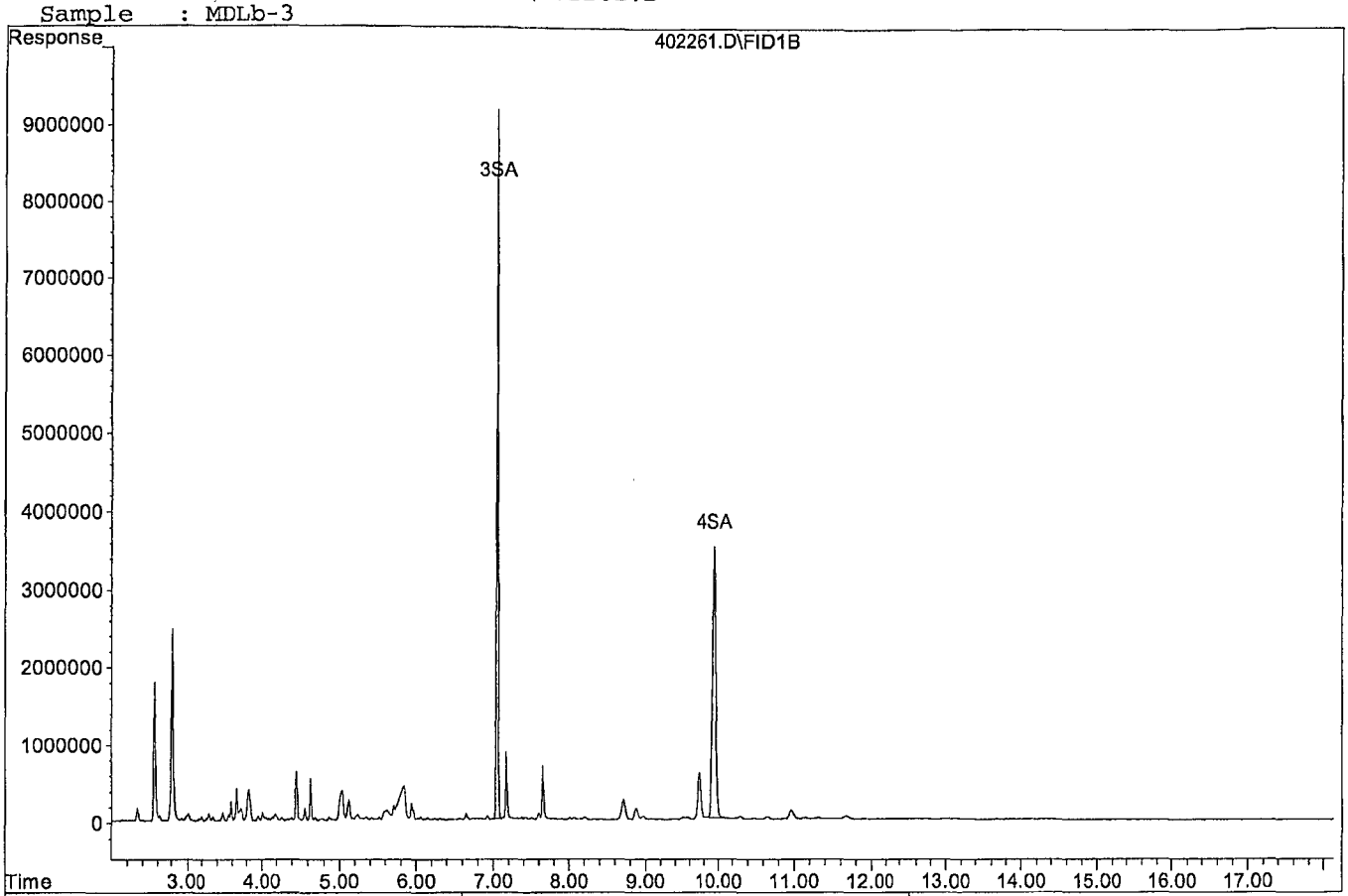
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

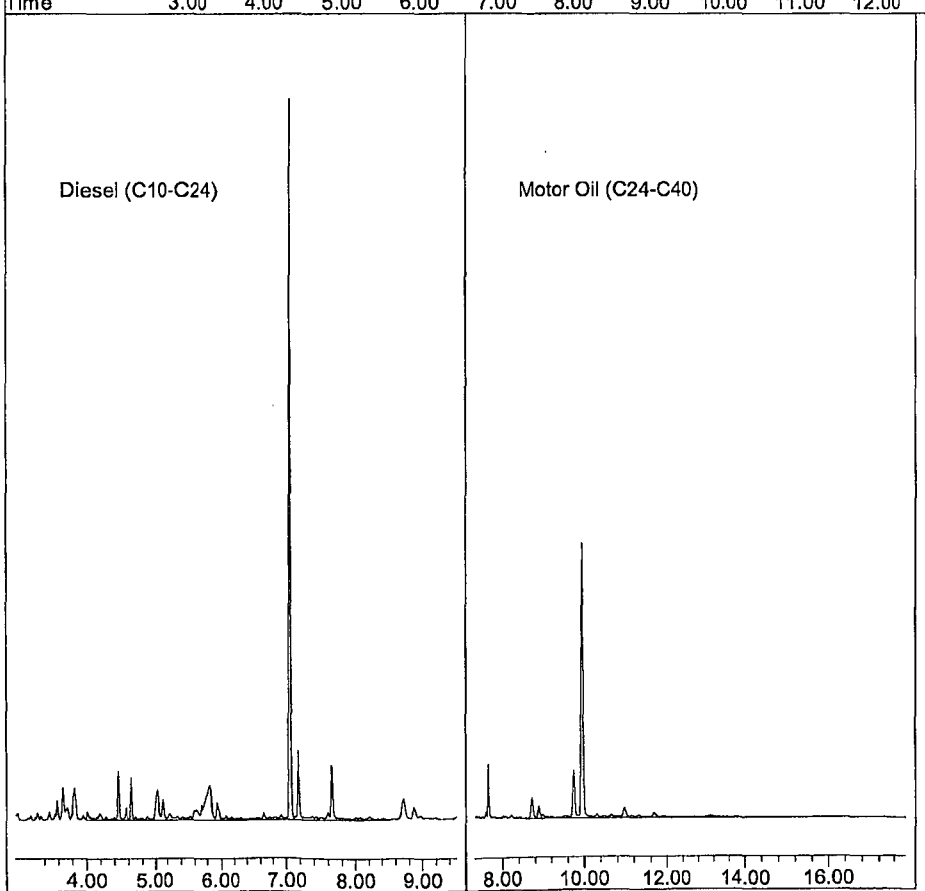
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	125192954	62.334 ppb
Surrogate Spike 75.000		Recovery =	83.11%
4) SA Octacosane(S)	9.94	111202708	79.601 ppb
Surrogate Spike 75.000		Recovery =	106.13%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	166977329	108.845 ppb
2) HBTM Motor Oil (C24-C40)	12.60	103896309	88.084 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402261.D
Sample : MDLb-3





402261.D DOC0310.M Tue Apr 21 10:59:07 2020

Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402262.D Vial: 62
Acq On : 4-20-20 16:12:53 Operator: SS
Sample : MDLb-4 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 8:29 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

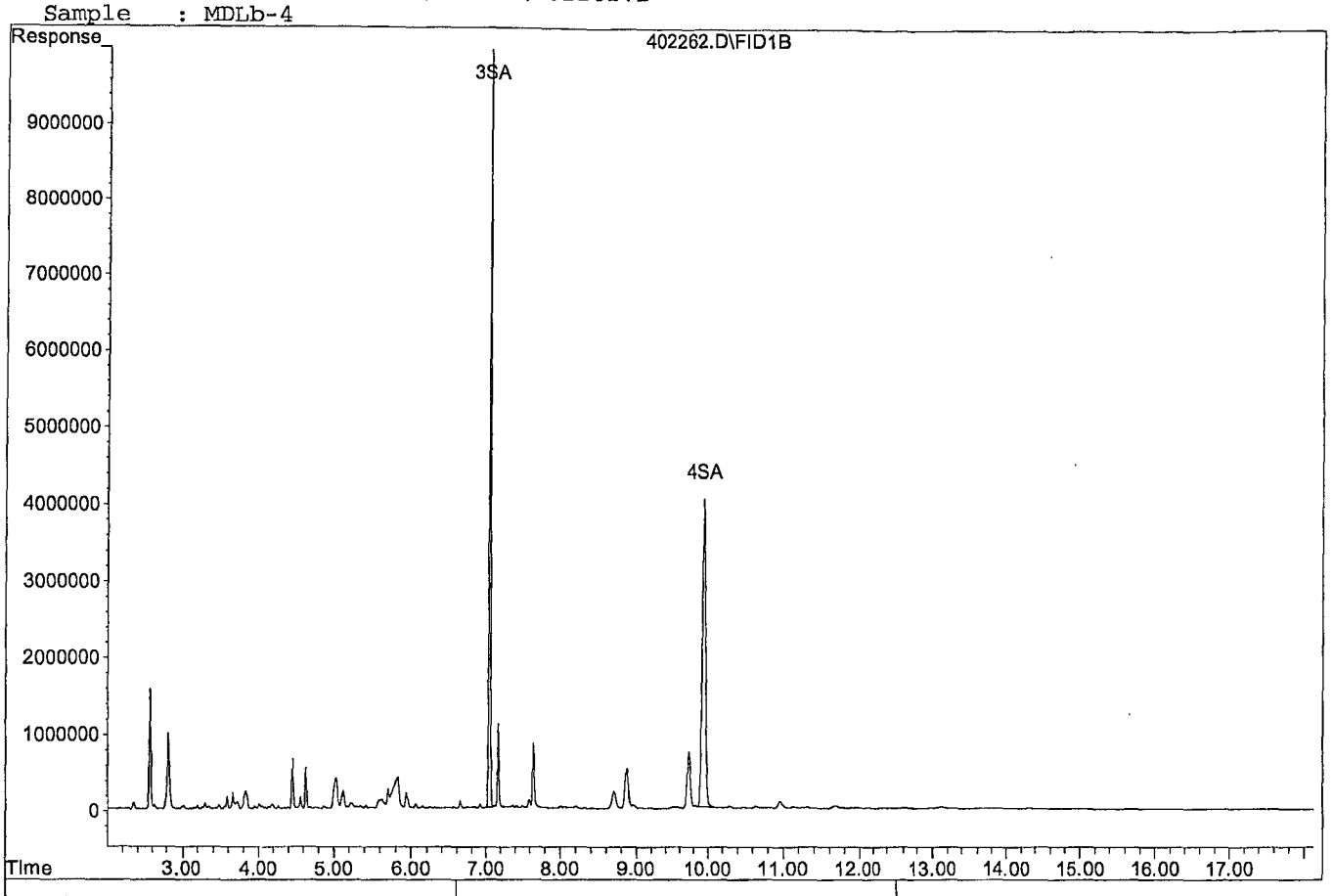
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

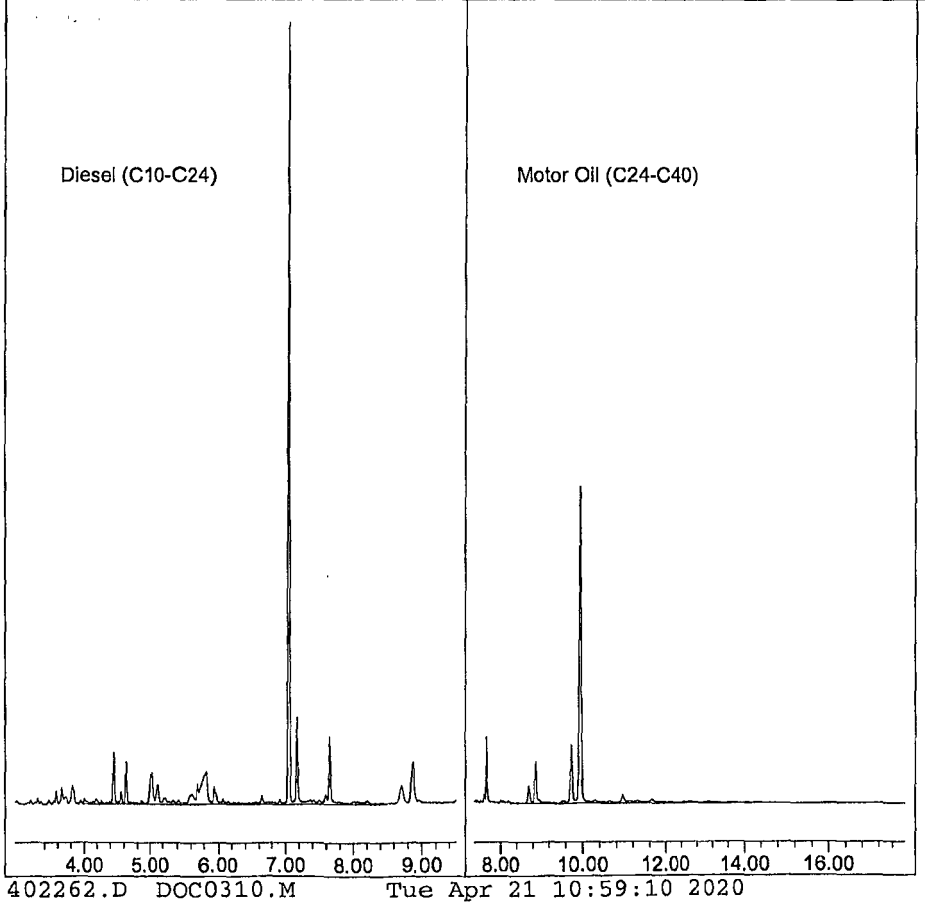
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	143687937	71.543 ppb
Surrogate Spike 75.000		Recovery =	95.39%
4) SA Octacosane(S)	9.94	127963668	91.598 ppb
Surrogate Spike 75.000		Recovery =	122.13%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	177640245	115.795 ppb
2) HBTM Motor Oil (C24-C40)	12.60	115009622	97.506 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402262.D
Sample : MDLb-4





402262.D DOC0310.M Tue Apr 21 10:59:10 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402273.D Vial: 73
Acq On : 4-21-20 9:10:59 Operator: SS
Sample : MDLb-5 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 10:57 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

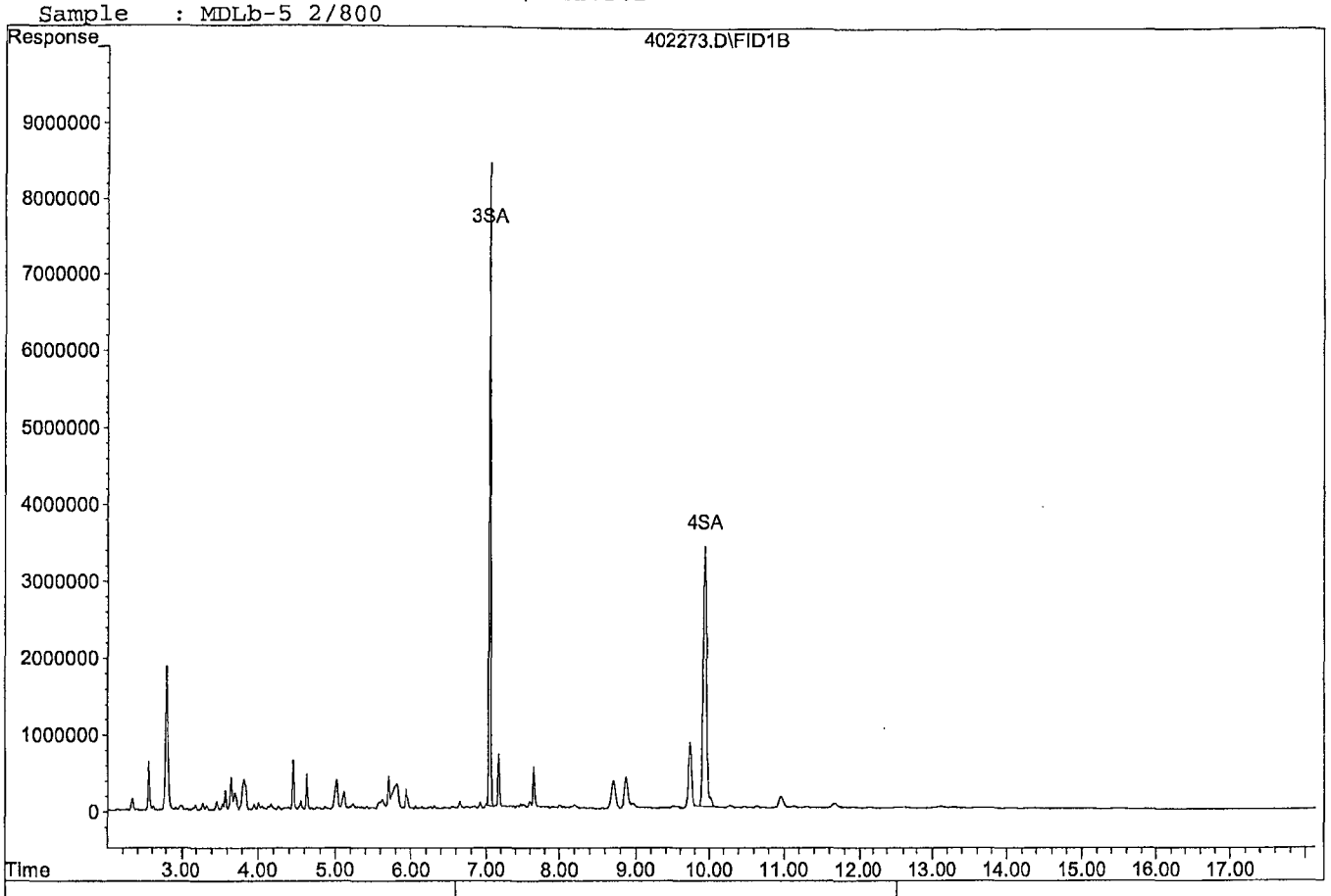
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	118602809	59.053 ppb
Surrogate Spike 75.000	Recovery =		78.74%
4) SA Octacosane(S)	9.94	112859299	80.786 ppb
Surrogate Spike 75.000	Recovery =		107.71%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	172179667	112.236 ppb
2) HBTM Motor Oil (C24-C40)	12.60	146304047	124.037 ppb

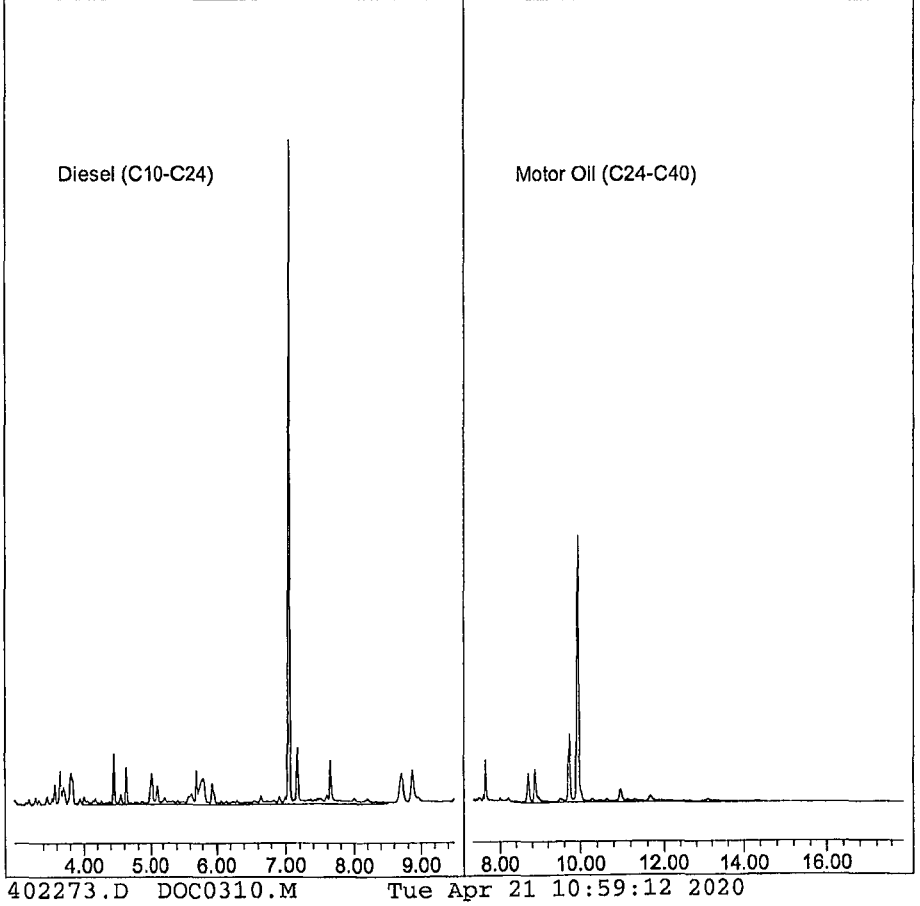
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.
402273.D DOC0310.M Tue Apr 21 10:59:11 2020 Page 1

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402273.D
Sample : MDLb-5 2/800





402273.D DOC0310.M Tue Apr 21 10:59:12 2020

Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402274.D Vial: 74
Acq On : 4-21-20 9:33:24 Operator: SS
Sample : MDLb-6 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 10:57 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

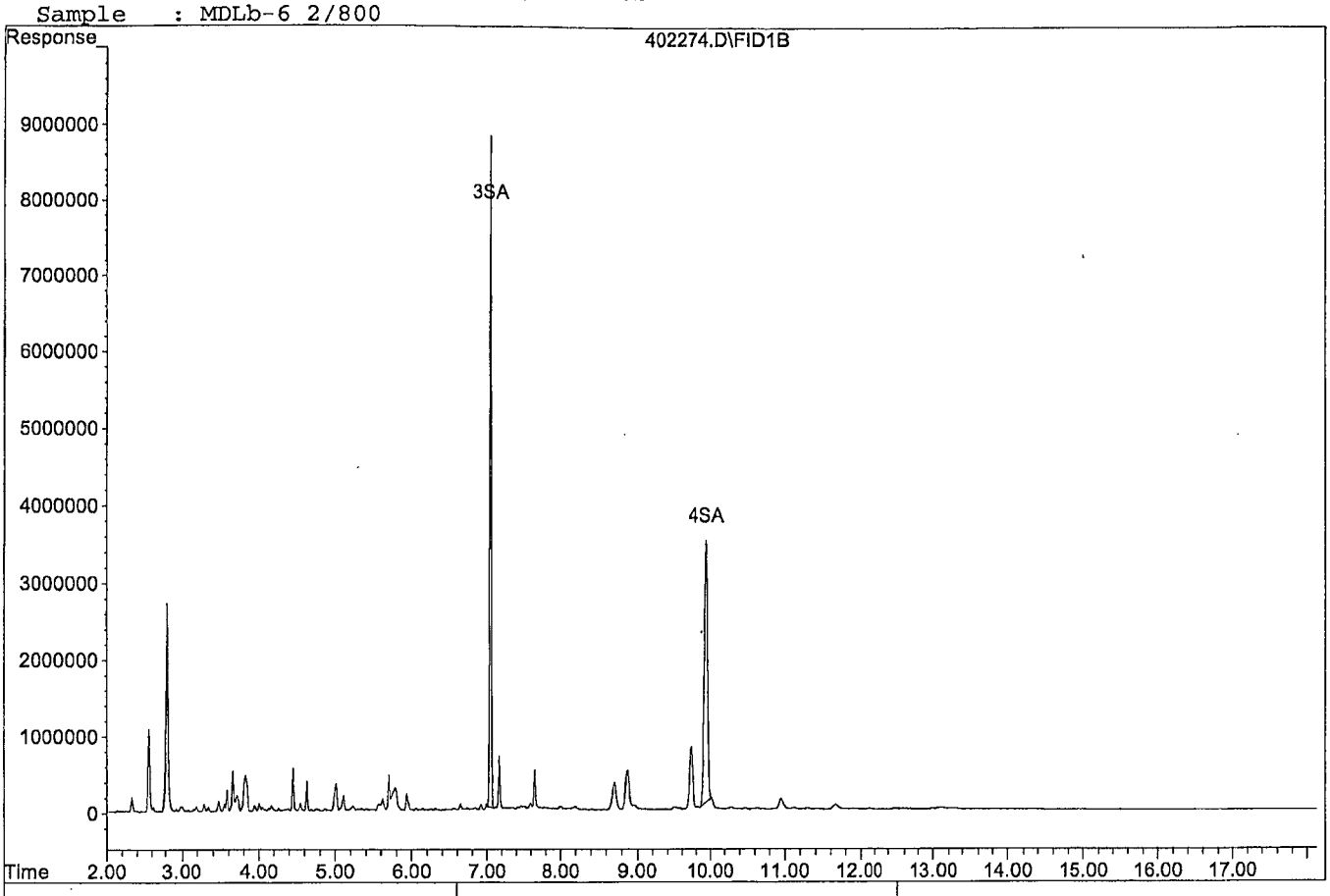
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

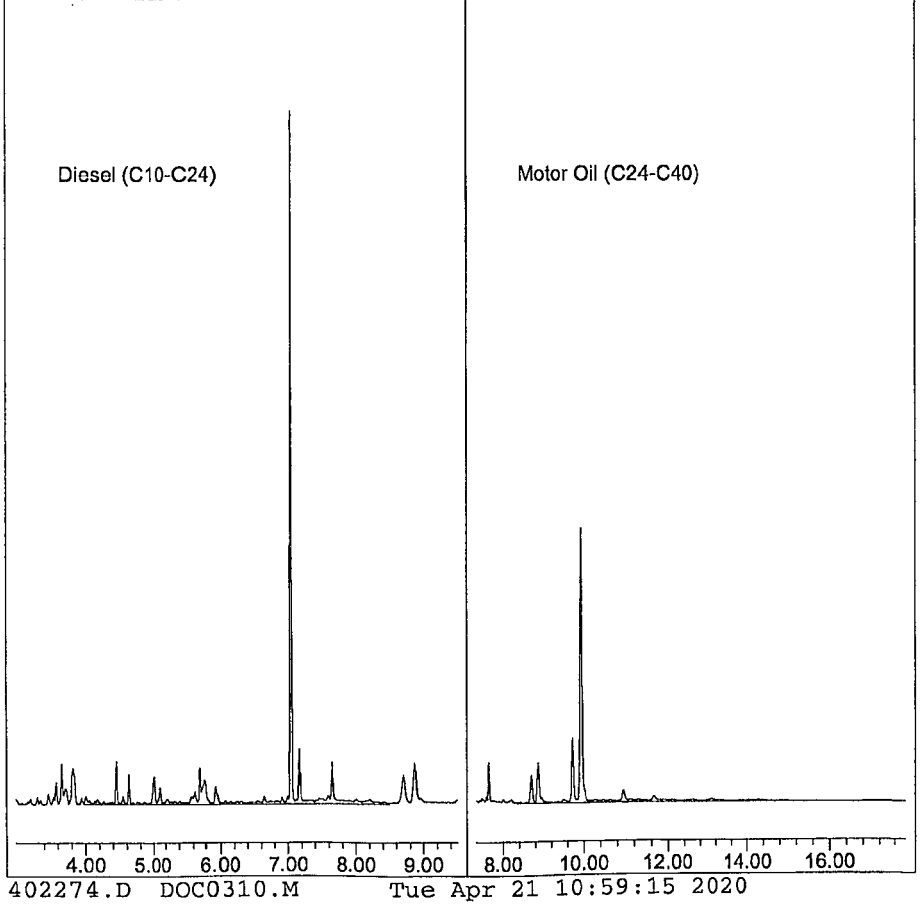
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	121828395	60.659 ppb
Surrogate Spike 75.000		Recovery =	80.88%
4) SA Octacosane(S)	9.94	107293415	76.802 ppb
Surrogate Spike 75.000		Recovery =	102.40%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	155607374	101.433 ppb
2) HBTM Motor Oil (C24-C40)	12.60	145139389	123.050 ppb
Target Compounds			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402274.D
Sample : MDLb-6 2/800





402274.D DOC0310.M Tue Apr 21 10:59:15 2020

Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402275.D Vial: 75
Acq On : 4-21-20 9:55:50 Operator: SS
Sample : MDLb-7 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 10:57 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 10:56:52 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

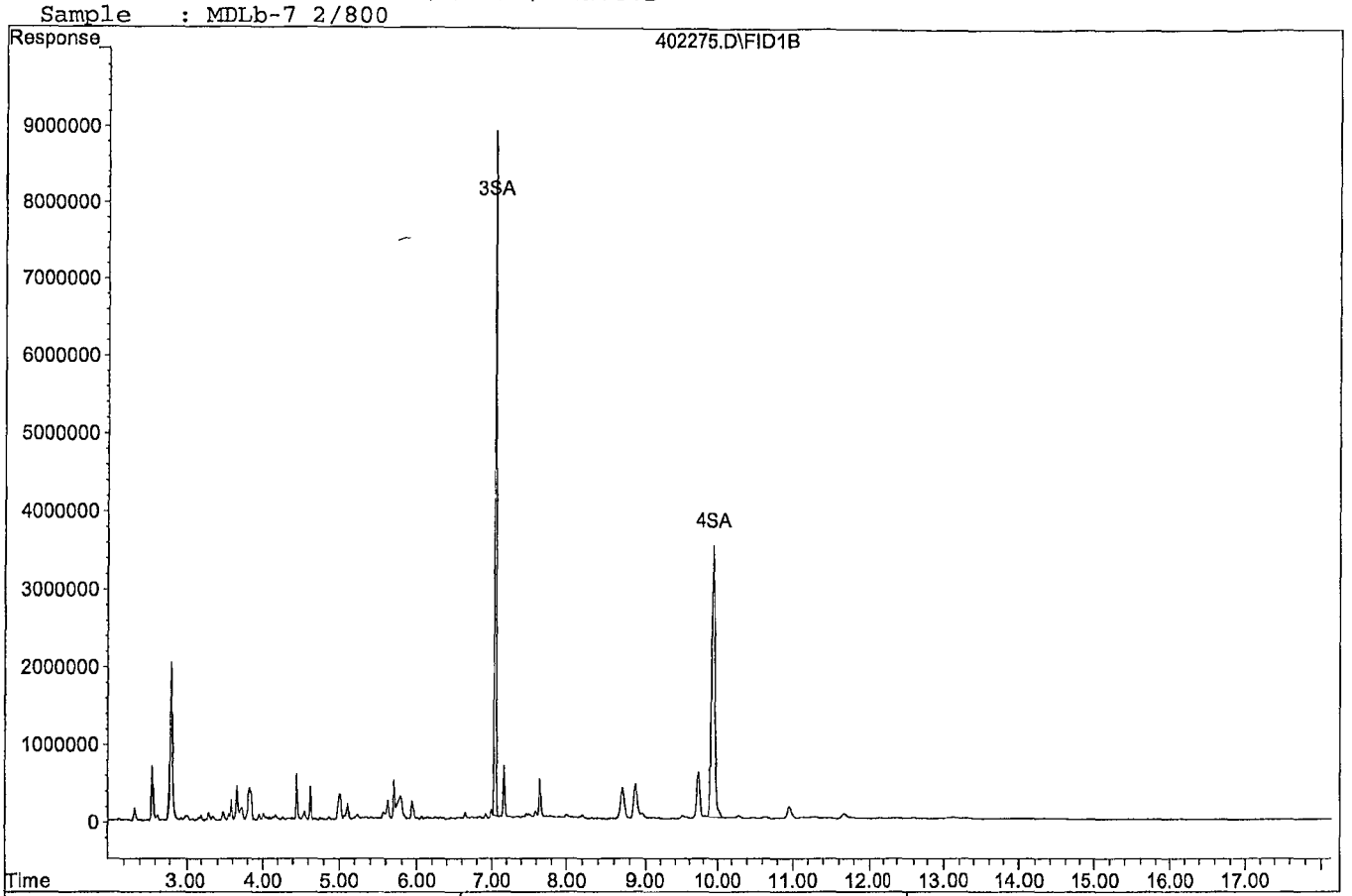
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	121562146	60.526 ppb
Surrogate Spike 75.000	Recovery =		80.70%
4) SA Octacosane(S)	9.94	115439821	82.634 ppb
Surrogate Spike 75.000	Recovery =		110.18%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	166355393	108.439 ppb
2) HBTM Motor Oil (C24-C40)	12.60	137315119	116.416 ppb

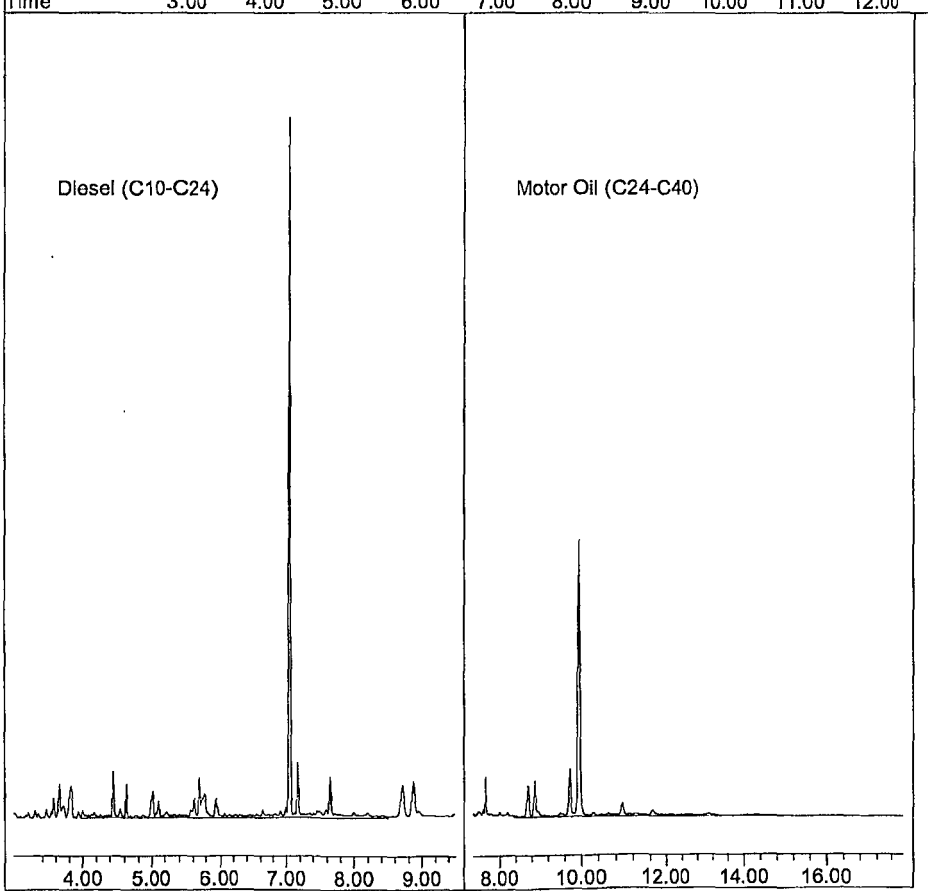
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.
402275.D DOC0310.M Tue Apr 21 10:59:16 2020 Page 1

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402275.D
Sample : MDLb-7 2/800





402275.D DOC0310.M Tue Apr 21 10:59:17 2020 Page 2

LOD / LOQ Checks

EPA 8015B TPH LIQ-LIQ

APPL Inc.
908 N. Temperance Avenue
Clovis, CA 93611

LOD Chk
(Spk conc 300 ug/L)
se 4-22-20

Attn: Sharon Dehmlow
Project: Limit of Quantitation Study - GC
Sample ID: 8015-AK102-NWTPH-Dx WATER
Sample Collection Date: 01/01/20

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

ARF: 91265
APPL ID: BA06107
QCG: #DOC53-200416A-251886

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8015B-e	DIESEL (C10-C24)	340 ✓	320	300.0	150.0	ug/L	04/16/20	04/20/20
EPA 8015B-e	OIL (C24-C40)	350 ✓	320	300.0	150.0	ug/L	04/16/20	04/20/20
EPA 8015B-e	SURROGATE: OCTACOSANE (S)	101	60-142			%	04/16/20	04/20/20
EPA 8015B-e	SURROGATE: ORTHO-TERPHENYL (S)	91.3	56-125			%	04/16/20	04/20/20

Quant Method: DOC0310.M
Run #: 402259
Instrument: Apollo
Sequence: 200402
Dilution Factor: 1
Initials: SSE

Printed: 04/21/20 11:32:30 AM
APPL-F1-SC-NoMC-REG MDLs-DOD

Laboratory Control Spike Recovery

EPA 8015B TPH LIQ-LIQ

LOQ Chk
(spk Conc 500 ug/L)

APPL ID: **200416W-06107 LCS - 251886**
Batch ID: #DOC53-200416A

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Compound Name	(Lab LOQ)	Spike Level ug/L	SPK Result ug/L	SPK % Recovery	Recovery Limits
DIESEL (C10-C24)	320	500	513	103 ✓	36-132
OIL (C24-C40)	320	500	515	103 ✓	41-113
SURROGATE: OCTACOSANE (S)		25.0	25.0	100	60-142
SURROGATE: ORTHO-TERPHENYL (S)		25.0	22.5	90.0	56-125

✓ JE 4-22-20

Comments: _____

Primary	SPK
Quant Method :	DOC0310.M
Extraction Date :	04/16/20
Analysis Date :	04/20/20
Instrument :	Apollo
Run :	402260
Initials :	SSE

Printed: 04/21/20 11:35:41 AM
APPL Standard LCS

Method Blank
EPA 8015B TPH LIQ-LIQ

Blank Name/QCG: **200416W-06107 - 251886**
Batch ID: #DOC53-200416A

APPL Inc.
908 North Temperance Avenu
Clovis, CA 93611

Sample Type	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
BLANK	DIESEL (C10-C24)	300.0 U	320	300.0	150.0	ug/L	04/16/20	04/20/20
BLANK	OIL (C24-C40)	300.0 U	320	300.0	150.0	ug/L	04/16/20	04/20/20
BLANK	SURROGATE: OCTACOSANE (S)	106	60-142			%	04/16/20	04/20/20
BLANK	SURROGATE: ORTHO-TERPHEN	83.1	56-125			%	04/16/20	04/20/20

Quant Method:DOC0310.M
Run #:402261
Instrument:Apollo
Sequence:200402
Initials:SSE

GC SC-Blank-REG MDLs-DOD
Printed: 04/21/20 11:32:30 AM

_LIQ005SGC

Organic Extraction Worksheet

Method	Continuous Liq/Liq TPH- 3520C w/SGC	Extraction Set	200416A	Extraction Method	LIQ005SGC	Units	mL

Spiked ID 1	Diesel Motor Oil Calib Std 4-13-20 3-25-21		Surrogate ID 1	THC Surrogate 3-25-20 3-25-21	
Spiked ID 2			Surrogate ID 2		
Spiked ID 3			Surrogate ID 3		
Spiked ID 4			Surrogate ID 4		
Spiked ID 5			Surrogate ID 5		
Spiked ID 6			Sufficient Vol for Matrix QC:	NO	
Spiked ID 7			Ext. Start Time:	04/16/20 13:15	
Spiked ID 8			Ext. End Time:	04/17/20 7:30	
			GC Requires Extract By:		

pH1	2	04/16/20 9:45	Water Bath Temp 1 °C	38/37.5 °C
pH2			Water Bath Temp 2 °C	36/39.5
pH3			Water Bath Temp 3 °C	35/34.4 °C

Spiked By: KY **Date** 04/16/20 **Witnessed By:** DL **Date** 04/16/20

	Sample	Sample Container	Spike Amount	Spike ID	Surrogate Amount	Surrogate ID	Extract Amount	Final Volume	pH	Extract Date/Time	Comments
1	200416A Blk		0.050	2	0.100	1	800	2	2	04/16/20 10:56	Day 2 MDLb-3
						equip	E-HP49 E-WB2				
2	200416A LCS		0.200	1	NA	NA	800	2	2	04/16/20 10:56	LOQ, 500 ppb
						equip	E-HP50 E-WB1				
3	BA06107	BA06107W01	0.120	1	NA	NA	800	2	2	04/16/20 10:56	LOD, 300ppb
						equip	E-HP51 E-WB1				
4	MDLb-4				0.100	1	800	2	2	04/16/20 10:56	DAY 2
						equip	E-HP48 E-WB2				
5	MDLs-3		0.100	1	NA	NA	800	2	2	04/16/20 10:56	DAY 2, 250 ug/L
						equip	E-HP47 E-WB3				
6	MDLs-4		0.100	1	NA	NA	800	2	2	04/16/20 10:56	DAY 2, 250 ug/L
						equip	E-HP25 E-WB3				

Solvent and Lot#	
1+1 HCL (5mLs) AMBER	59072
PH Strips	HC998032
Filter Paper	400171
B. Sodium Sulfate	2019020631

Extraction COC Transfer	
Extraction lab employee Initials	KY
GC analyst's initials	SS
Date	4/17/20
Time	13:05
Refrigerator	HOBART

	Technician's Initials
Scanned By	KY
Sample Preparation	KY,DL
Extraction	KY,DL
Concentration	DL

Modified	04/21/20 11:39:31 AM

Reviewed By: KY **Date** 04/20/20

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402259.D Vial: 59
Acq On : 4-20-20 15:05:19 Operator: SS
Sample : BA06107W01 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:11 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:11:07 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

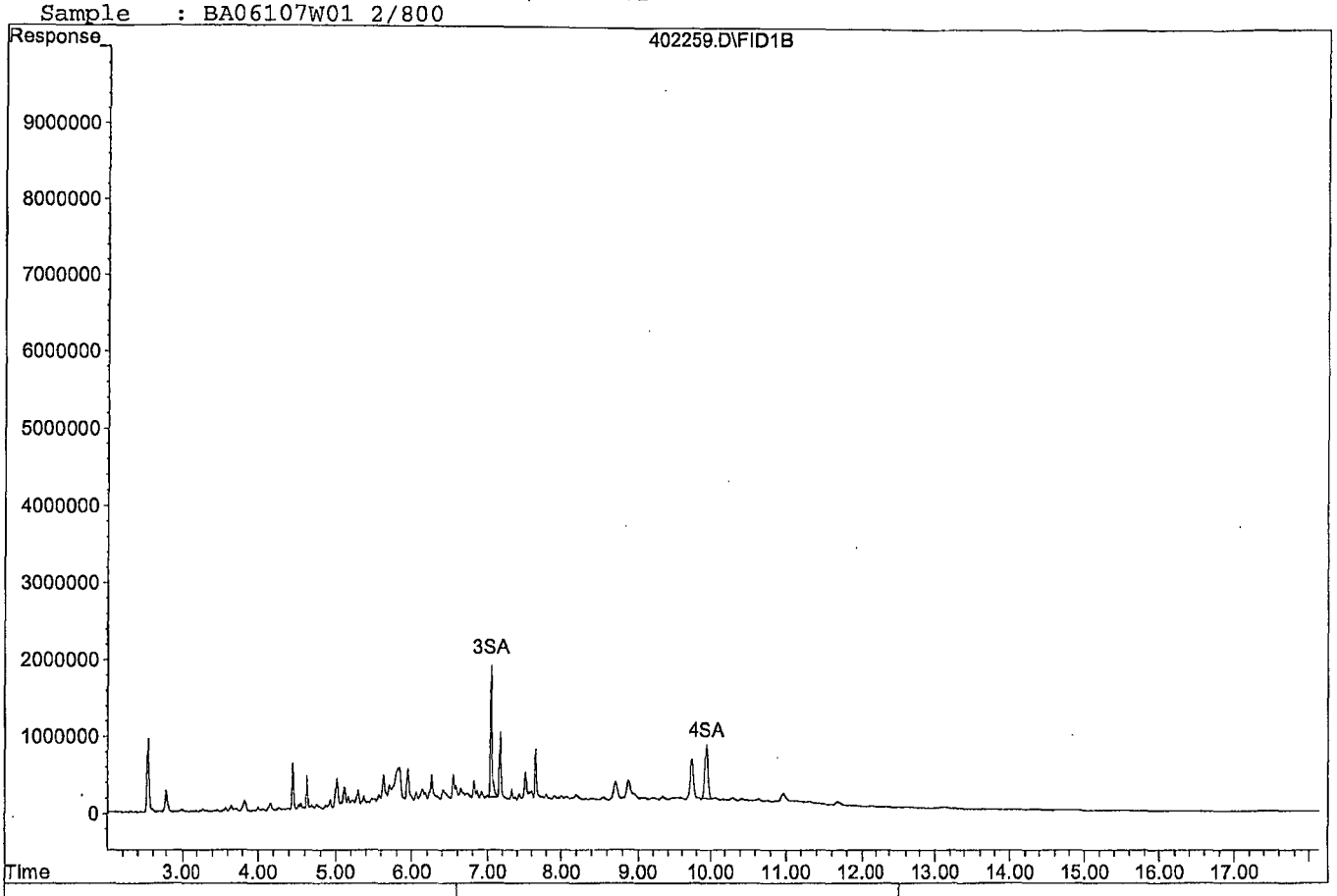
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	27497943	13.691 ppb
Surrogate Spike 15.000	Recovery =		91.27%
4) SA Octacosane(S)	9.94	21244624	15.207 ppb
Surrogate Spike 15.000	Recovery =		101.38%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	521908360	340.207 ppb
2) HBTM Motor Oil (C24-C40)	12.60	410849398	348.320 ppb

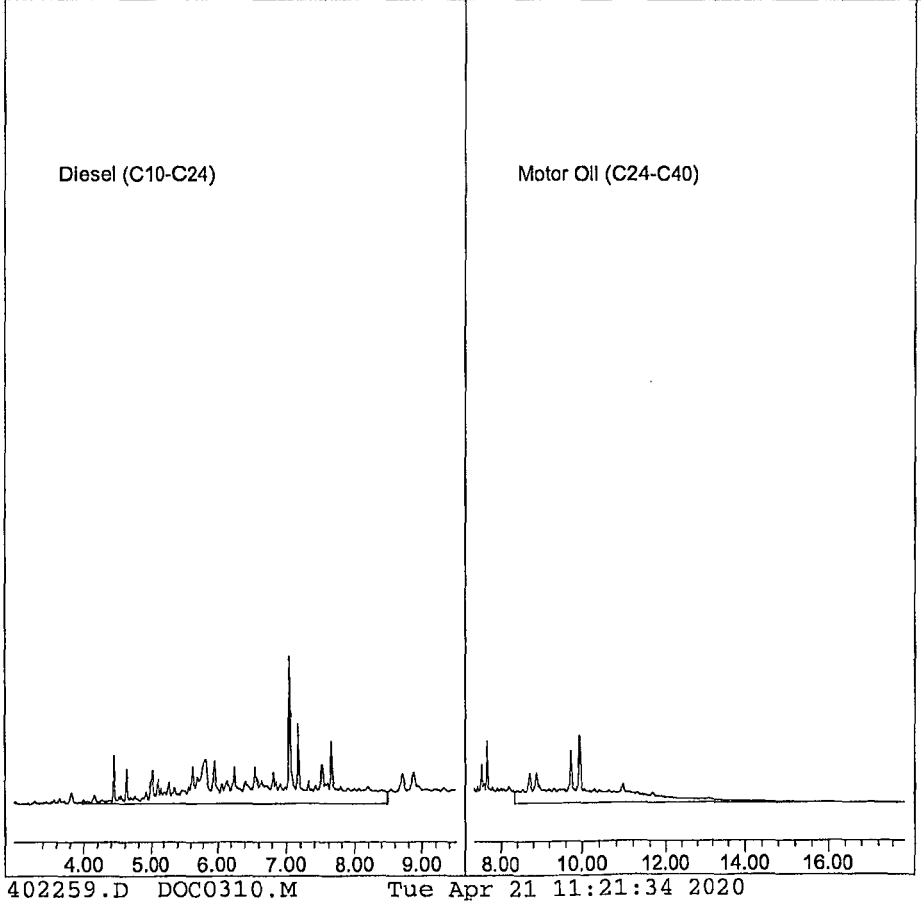
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402259.D
Sample : BA06107W01 2/800





402259.D DOC0310.M Tue Apr 21 11:21:34 2020 Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402260.D Vial: 60
Acq On : 4-20-20 15:27:48 Operator: SS
Sample : 200416A LCS-1 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 11:11 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:11:07 2020
Response via : Multiple Level Calibration

Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

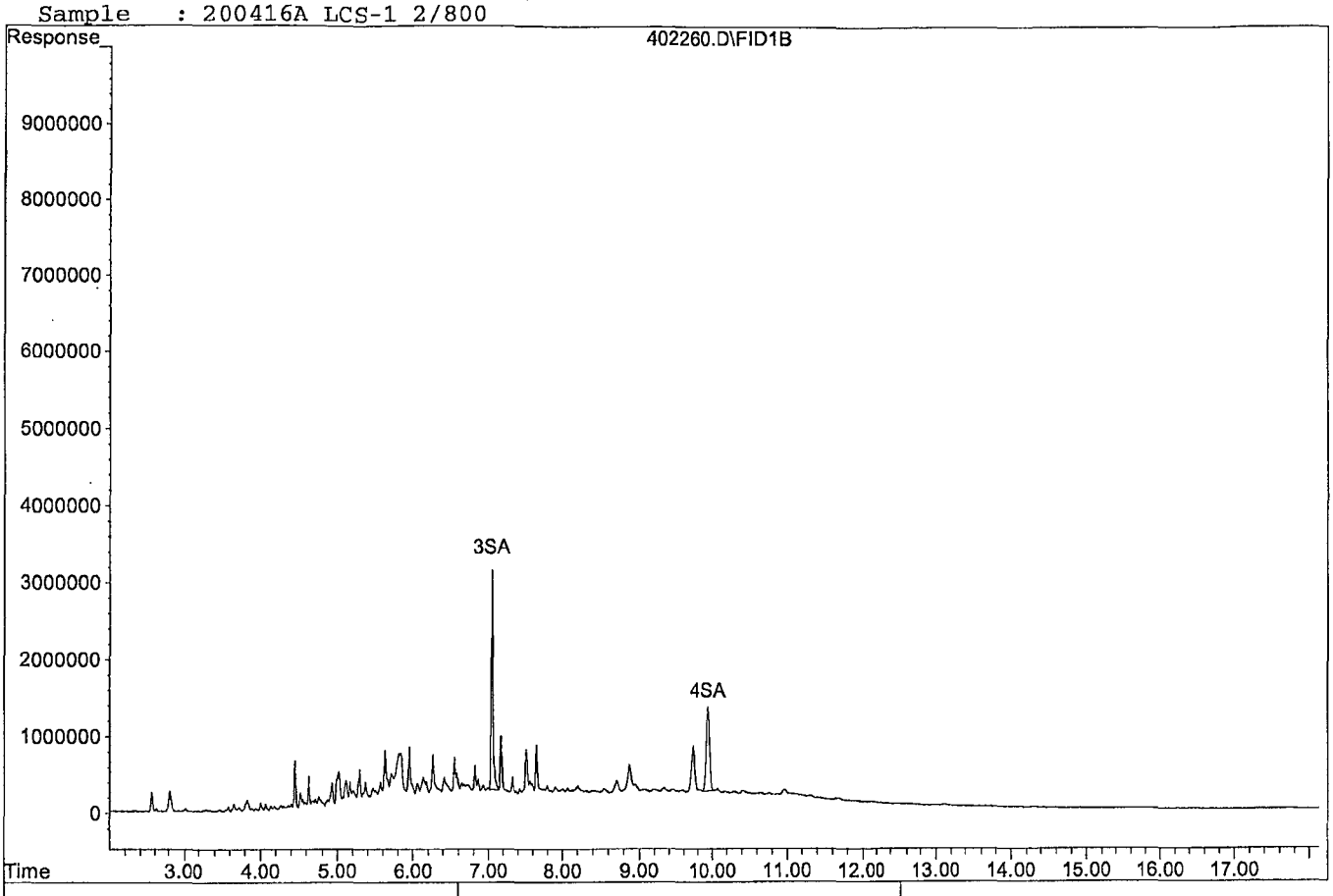
Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
3) SA Ortho-Terphenyl(S)	7.05	45239876	22.525 ppb
Surrogate Spike 15.000	Recovery =		150.17%
4) SA Octacosane(S)	9.94	34975757	25.036 ppb
Surrogate Spike 15.000	Recovery =		166.91%
Target Compounds			
1) HATM Diesel (C10-C24)	6.24	786563392	512.723 ppb
2) HBTM Motor Oil (C24-C40)	12.60	607710332	515.220 ppb

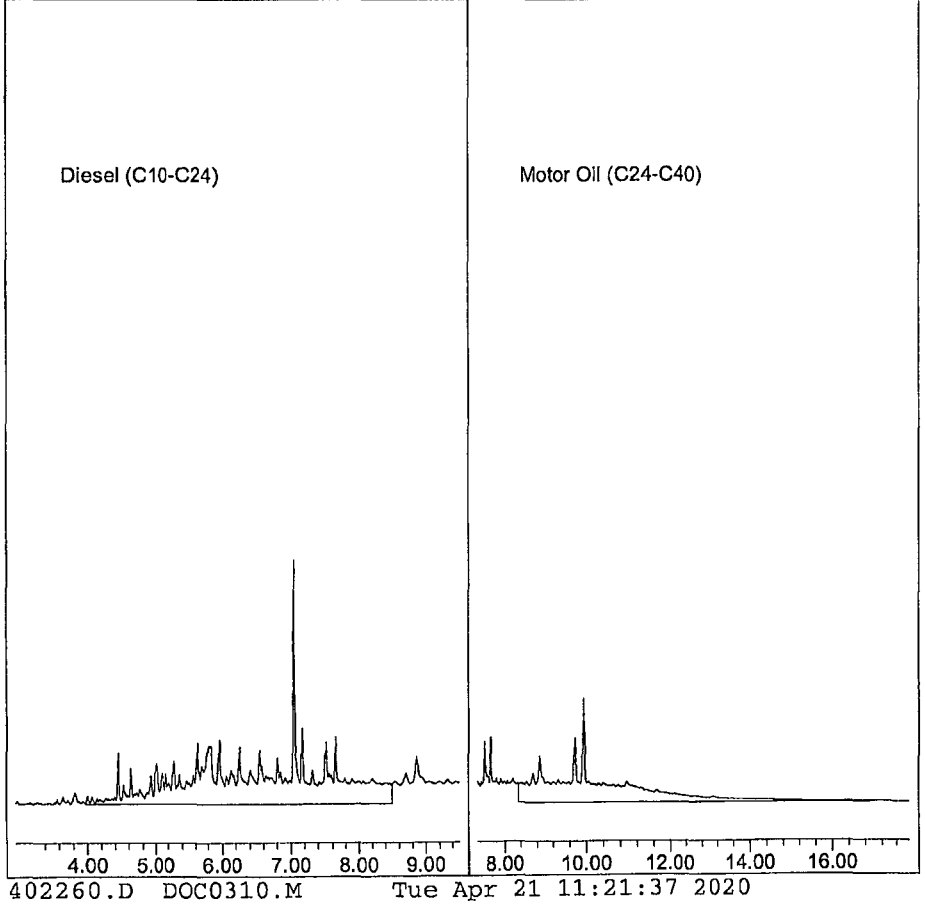
Target Compounds

(f)=RT Delta > 1/2 Window (m)=manual int.
402260.D DOC0310.M Tue Apr 21 11:21:36 2020 Page 1

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402260.D
Sample : 200416A LCS-1 2/800





402260.D DOC0310.M Tue Apr 21 11:21:37 2020

Page 2

Quantitation Report (QT Reviewed)

Data File : G:\APOLLO\DATA\200402\402261.D Vial: 61
Acq On : 4-20-20 15:50:20 Operator: SS
Sample : 200416A BLK 2/800 Inst : Apollo
Misc : water Multiplr: 2.50
IntFile : events.e
Quant Time: Apr 21 8:29 2020 Quant Results File: DOC0310.RES

Method : G:\APOLLO\DATA\200402\DOC0310.M (Chemstation Integrator)
Title : 8015 B&C
Last Update : Tue Apr 21 11:11:07 2020
Response via : Multiple Level Calibration

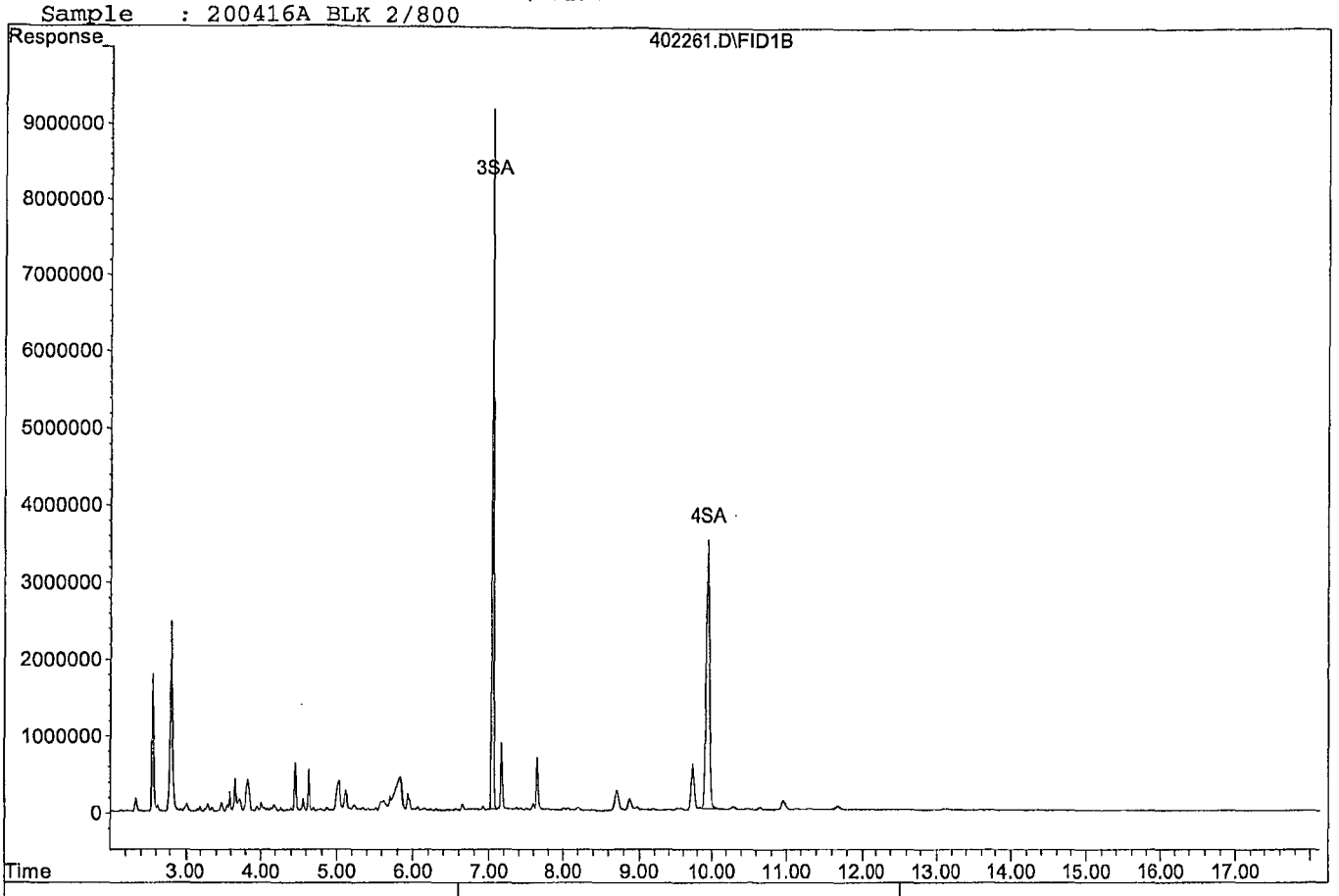
Volume Inj. : 2UL
Signal Phase : DB-5
Signal Info : FID02A

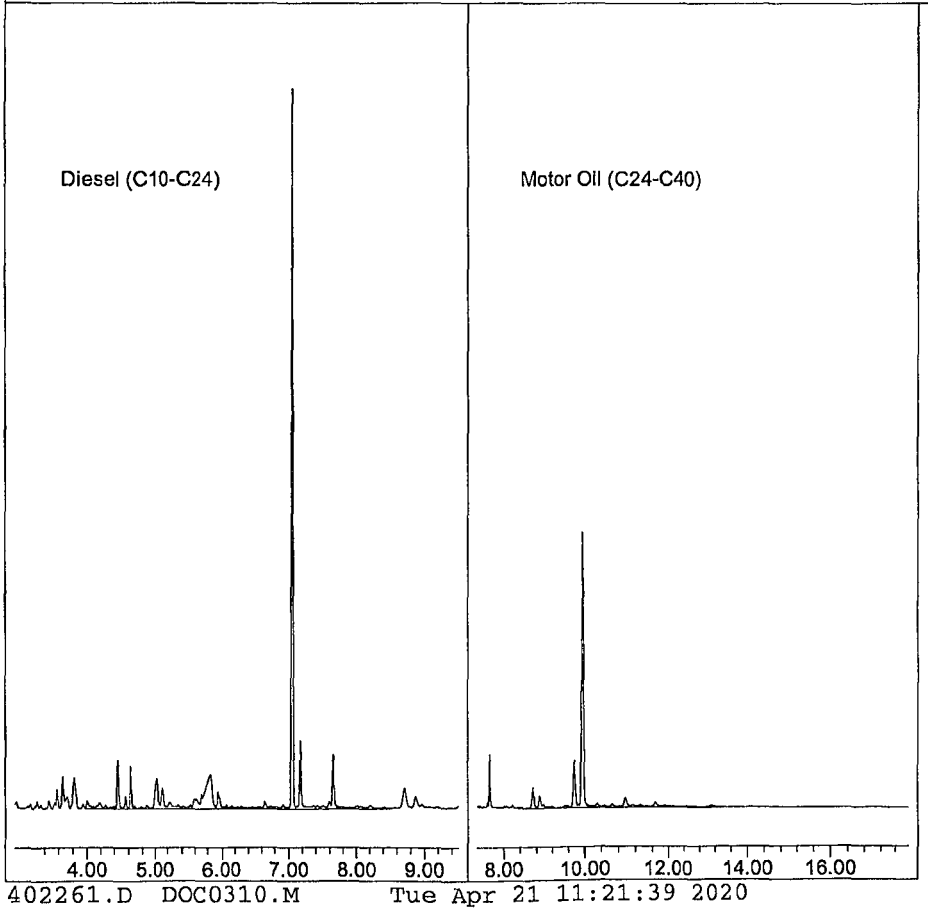
Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
3) SA Ortho-Terphenyl(S)	7.05	125192954	62.334	ppb
Surrogate Spike 75.000		Recovery =	83.11%	
4) SA Octacosane(S)	9.94	111202708	79.601	ppb
Surrogate Spike 75.000		Recovery =	106.13%	
Target Compounds				
1) HATM Diesel (C10-C24)	6.24	166977329	108.845	ppb
2) HBTM Motor Oil (C24-C40)	12.60	103896309	88.084	ppb
Target Compounds				

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report

Data File: G:\APOLLO\DATA\200402\402261.D
Sample : 200416A BLK 2/800





402261.D DOC0310.M Tue Apr 21 11:21:39 2020 Page 2