LABORATORY DATA CONSULTANTS, INC.
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AECOM
1001 Bishop Street Suite 1600
Honolulu, HI 96813
ATTN: Ms. Margie Pascua
Margie.Pascua@aecom.com

April 30, 2021

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 March 26, 2021. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #50747:

SDG #	Fraction
95192/1B26076	Volatiles, Semivolatiles, Lead, Dissolved Organic Carbon, Total Petroleum Hydrocarbons as Extractables

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

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- 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

211 pages-DL/EM

Attachment 1

90/10 2B/4 EDD

LDC #50747 (AECOM-Honolulu, HI / Red Hill Bulk Storage Facility, CTO 18F0126)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (524.2)		SVOA (525.2)		Pb (200.8)		TPH-E (8015B)		SGCU TPH-E (8015B)		DOC (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	95192/1B26076	03/26/21	04/09/21	3	0	3	0	2	0	4	0	2	0	2	0																		
A	95192/1B26076	03/26/21	04/09/21	0	0	1	0	0	0	0	0	0	0	0	0																		
Total	T/J/SC			3	0	4	0	2	0	4	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B/4 validation). These sample counts do not include MS/MSD, and DUPs V:\LOGIN\AECOM\Red Hill\50747ST_A_only_18F0126.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 29, 2021

Parameters: Volatiles

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 95192

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1286	BA27502	Water	02/23/21
ERH1285	BA27503	Water	02/23/21
ERH1287	BA27504	Water	02/23/21

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) Method 524.2

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.

For compounds where average relative response factors (RRFs) were utilized, the 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.

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 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% 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 ERH1285 was identified as a trip blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
ERH1285	02/23/21	Methylene chloride	2.0 ug/L	ERH1286 ERH1287

Sample concentrations were compared to concentrations detected in the field 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 field blanks.

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 95192

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Laboratory Blank Data Qualification Summary - SDG 95192

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Volatiles - Field Blank Data Qualification Summary - SDG 95192

No Sample Data Qualified in this SDG

LDC #: 50747A1a
SDG #: 95192
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/~~4~~A

Date: 04/07/21
Page: 1 of 1
Reviewer: LT
2nd Reviewer: AC

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ~~SW~~	RSD ≤ 20%. r^2 ICV ≤ 30%
IV.	Continuing calibration /ending	A	CCV ≤ 30/50%.
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	TB = 2
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	A	Not reviewed for Stage 2B validation.
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation.
XIV.	System performance	A	Not reviewed for Stage 2B 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 Stage 4 validation

	Client ID		Lab ID	Matrix	Date
1	ERH1286**		BA27502**	Water	02/23/21
2	ERH1285	TB	BA27503	Water	02/23/21
3	ERH1287		BA27504	Water	02/23/21
4					
5					
6					
7					
8					
9					

Notes:

1	210301AZ-BUC						

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 chloride	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 #: 50747A1a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: LT

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Yes x No_ N/A_ Were field blanks identified in this SDG?

Yes x No_ N/A_ Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L

Sampling date: 02/23/21

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: TB Associated Samples: 1,3 (ND) (F)

Compound	Blank ID	Sample Identification								
	2	10X								
Methylene chloride	2.0	20								

Blank units: ug/L **Associated sample units:** ug/L

Sampling date:

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Associated Samples:

Compound	Blank ID	Sample Identification									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field 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 29, 2021

Parameters: Semivolatiles

Validation Level: Level C & D

Laboratory: APPL, Inc./Weck Laboratories, Inc.

Sample Delivery Group (SDG): 95192/1B26076

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1286**	BA27502/1B26076-01**	Water	02/23/21
ERH1287	BA27504/1B26076-02	Water	02/23/21
ERH1287RE	BA27504RE/1B26076-02RE	Water	02/23/21
ERH1288	BA27505/1B26076-03	Water	02/23/21

**Indicates sample underwent Level D validation

Introduction

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The analyses were performed by the following method:

Semivolatile Organic Compounds (SVOCs) by Environmental Protection Agency (EPA) Method 525.2

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 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
ERH1286** ERH1287 ERH1288	All compounds	8	7	J (all detects) UJ (all non-detects)	P
ERH1287RE	All compounds	24	7	R (all non-detects)	P

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 30.0%.

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.

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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
03/12/21	2,6-Dinitrotoluene	40.27	All samples in SDG 95192/1B26076	UJ (all non-detects)	A

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
03/12/21 (GCMS16_03122125)	Disulfoton Metribuzin Butachlor Ethion	31.72 41.51 39.70 37.13	ERH1286** ERH1287 ERH1288	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
03/12/21 (GCMS16_03122127)	cis-Nonachlor	36.12	ERH1286** ERH1287 ERH1288	UJ (all non-detects)	A
03/22/21 (GCMS16_03222106)	Captan Di-n-octylphthalate	49.22 34.36	ERH1287RE	UJ (all non-detects) UJ (all non-detects)	A
03/22/21 (GCMS16_03222107)	Dimethoate Dsulfoton Metribuzin Butachlor Ethion Trithion Benzo(b)fluoranthene Benzo(g,h,i)perylene	58.96 43.24 56.66 54.98 55.48 42.78 53.19 43.74	ERH1287RE	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
03/22/21 (GCMS16_03222109)	Endrin Methoxychlor	30.66 41.06	ERH1287RE	UJ (all non-detects) UJ (all non-detects)	A

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 ERH1288 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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
ERH1287	1,3-Dimethyl-2-nitrobenzene Triphenyl phosphate	88900 (70-130) 3730 (70-130)	Diethylphthalate Fluorene Naphthalene	J (all detects) J (all detects) J (all 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 with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
W1C0221-BS1/BSD1 (ERH1286** ERH1287 ERH1288)	Captan	137 (70-130)	149 (70-130)	NA	-
W1C1238-BS1/BSD1 (ERH1287RE)	Atrazine	148 (70-130)	-	NA	-
	Captan	131 (70-130)	134 (70-130)		
	Chlorpropham	138 (70-130)	-		
	Diethylphthalate	140 (70-130)	-		
	Dimethoate	129 (50-120)	-		
	Ethion	-	131 (70-130)		

LCS ID	Compound	Finding	Associated Samples	Flag	A or P
W1C0221-BS1/BSD1 W1C1238-BS1/BSD1	4,4'-DDD	The laboratory indicated that these compounds were not spiked in the LCS mix analyzed for this SDG.	All samples in SDG 95192/1B26076	UJ (all non-detects)	P
	4,4'-DDE			UJ (all non-detects)	
	4,4'-DDT			UJ (all non-detects)	
	Aldrin			UJ (all non-detects)	
	alpha-BHC			UJ (all non-detects)	
	alpha-Chlordane			UJ (all non-detects)	
	beta-BHC			UJ (all non-detects)	
	delta-BHC			UJ (all non-detects)	
	Dieldrin			UJ (all non-detects)	
	Endosulfan I			UJ (all non-detects)	
	Endosulfan II			UJ (all non-detects)	
	Endosulfan sulfate			UJ (all non-detects)	
	Endrin			UJ (all non-detects)	
	Endrin aldehyde			UJ (all non-detects)	
	Endrin ketone			UJ (all non-detects)	
	gamma-BHC			UJ (all non-detects)	
	gamma-Chlordane			UJ (all non-detects)	
	Heptachlor			UJ (all non-detects)	
	Heptachlor epoxide			UJ (all non-detects)	
	Hexachlorobenzene			UJ (all non-detects)	
	Hexachlorocyclopentadiene			UJ (all non-detects)	
	Methoxychlor			UJ (all non-detects)	
	Propachlor			UJ (all non-detects)	
	Trifluralin			UJ (all non-detects)	

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 with the following exceptions:

Sample	Internal Standards	Area (Limits)	Affected Compound	Flag	A or P
ERH1287	Acenaphthene-d10	1332 (611899.5-1835698-5)	Diethylphthalate Fluorene Naphthalene	J (all detects) J (all detects) J (all detects)	P
ERH1287	Acenaphthene-d10 Phenanthrene-d10	1332 (611899.5-1835698-5) 74326 (1142730-3428190)	EPTC Dimethylphthalate Acenaphthylene Acenaphthene Molinate Chlorpropham Dimethoate Atrazine Pentachloronitrobenzene Terbacil Phenanthrene Disulfoton Anthracene Caffeine Di-n-butylphthalate Cyanazine Diphenanmide Captan Fluoranthene Pyrene Butylbenzylphthalate Bis(2-ethylhexyl)adipate Benzo(a)anthracene Bis(2-ethylhexyl)phthalate Hexachlorocyclopentadiene Propachlor Trifluralin Hexachlorobenzene alpha-BHC beta-BHC gamma-BHC delta-BHC Heptachlor Aldrin Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II Endrin aldehyde 4,4'-DDT Endosulfan sulfate Endrin ketone Methoxychlor 2,6-Dinitrotoluene 2,4-Dinitrotoluene	R (all non-detects) R (all non-detects)	P

For sample ERH1287, although the chrysene-d12 internal standard area was outside the continuing calibration limits, using professional judgment, no data were qualified since the internal standard area was within the initial calibration 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.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Compound	Reason	Flag	A or P
ERH1287RE	All compounds	Extracted outside holding time.	R	A

Due to internal standard area, data were rejected in one sample.

Due to technical holding time, ICV %D, continuing calibration %D, surrogate %R, LCS not spiked, and internal standard area, data were qualified as estimated in three samples.

Red Hill Bulk Storage Facility, CTO 18F0126
Semivolatiles - Data Qualification Summary - SDG 95192/1B26076

Sample	Compound	Flag	A or P	Reason (Code)
ERH1286** ERH1288	All compounds	J (all detects) UJ (all non-detects)	P	Technical holding time (H)
ERH1287	All compounds except EPTC Dimethylphthalate Acenaphthylene Acenaphthene Molinate Chlorpropham Dimethoate Atrazine Pentachloronitrobenzene Terbacil Phenanthrene Disulfoton Anthracene Caffeine Di-n-butylphthalate Cyanazine Diphenanmide Captan Fluoranthene Pyrene Butylbenzylphthalate Bis(2-ethylhexyl)adipate Benzo(a)anthracene Bis(2-ethylhexyl)phthalate Hexachlorocyclopentadiene Propachlor Trifluralin Hexachlorobenzene alpha-BHC beta-BHC gamma-BHC delta-BHC Heptachlor Aldrin Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II Endrin aldehyde 4,4'-DDT Endosulfan sulfate Endrin ketone Methoxychlor 2,6-Dinitrotoluene 2,4-Dinitrotoluene	J (all detects) UJ (all non-detects)	P	Technical holding time (H)
ERH1286** ERH1288	2,6-Dinitrotoluene	UJ (all non-detects)	A	Initial calibration verification (%D) (C)

Sample	Compound	Flag	A or P	Reason (Code)
ERH1286** ERH1288	Disulfoton Metribuzin Butachlor Ethion cis-Nonachlor	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (C)
ERH1287	Metribuzin Butachlor Ethion cis-Nonachlor	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (C)
ERH1287	Diethylphthalate Fluorene Naphthalene	J (all detects) J (all detects) J (all detects)	A	Surrogates (%R) (S)
ERH1287	Diethylphthalate Fluorene Naphthalene	J (all detects) J (all detects) J (all detects)	P	Internal standards (area) (I)

Sample	Compound	Flag	A or P	Reason (Code)
ERH1287	EPTC	R (all non-detects)	P	Internal standards (area) (I)
	Dimethylphthalate	R (all non-detects)		
	Acenaphthylene	R (all non-detects)		
	Acenaphthene	R (all non-detects)		
	Molinate	R (all non-detects)		
	Chlorpropham	R (all non-detects)		
	Dimethoate	R (all non-detects)		
	Atrazine	R (all non-detects)		
	Pentachloronitrobenzene	R (all non-detects)		
	Terbacil	R (all non-detects)		
	Phenanthrene	R (all non-detects)		
	Disulfoton	R (all non-detects)		
	Anthracene	R (all non-detects)		
	Caffeine	R (all non-detects)		
	Di-n-butylphthalate	R (all non-detects)		
	Cyanazine	R (all non-detects)		
	Diphenanmide	R (all non-detects)		
	Captan	R (all non-detects)		
	Fluoranthene	R (all non-detects)		
	Pyrene	R (all non-detects)		
	Butylbenzylphthalate	R (all non-detects)		
	Bis(2-ethylhexyl)adipate	R (all non-detects)		
	Benzo(a)anthracene	R (all non-detects)		
	Bis(2-ethylhexyl)phthalate	R (all non-detects)		
	Hexachlorocyclopentadiene	R (all non-detects)		
	Propachlor	R (all non-detects)		
	Trifluralin	R (all non-detects)		
	Hexachlorobenzene	R (all non-detects)		
	alpha-BHC	R (all non-detects)		
	beta-BHC	R (all non-detects)		
	gamma-BHC	R (all non-detects)		
	delta-BHC	R (all non-detects)		
	Heptachlor	R (all non-detects)		
	Aldrin	R (all non-detects)		
	Heptachlor epoxide	R (all non-detects)		
	gamma-Chlordane	R (all non-detects)		
	alpha-Chlordane	R (all non-detects)		
	Endosulfan I	R (all non-detects)		
	4,4'-DDE	R (all non-detects)		
	Dieldrin	R (all non-detects)		
	Endrin	R (all non-detects)		
	4,4'-DDD	R (all non-detects)		
	Endosulfan II	R (all non-detects)		
	Endrin aldehyde	R (all non-detects)		
	4,4'-DDT	R (all non-detects)		
	Endosulfan sulfate	R (all non-detects)		
	Endrin ketone	R (all non-detects)		
	Methoxychlor	R (all non-detects)		
	2,6-Dinitrotoluene	R (all non-detects)		
	2,4-Dinitrotoluene	R (all non-detects)		

Sample	Compound	Flag	A or P	Reason (Code)
ERH1286** ERH1288	4,4'-DDD 4,4'-DDE 4,4'-DDT Aldrin alpha-BHC alpha-Chlordane beta-BHC delta-BHC Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Endrin ketone gamma-BHC gamma-Chlordane Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorocyclopentadiene Methoxychlor Propachlor Trifluralin	UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (not spiked) (V)
ERH1287RE	All compounds	R	A	Overall assessment of data (D)

Red Hill Bulk Storage Facility, CTO 18F0126
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 95192/1B26076

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Semivolatiles - Field Blank Data Qualification Summary - SDG 95192/1B26076

No Sample Data Qualified in this SDG

LDC #: 50747A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 04/07/21
SDG #: 95192/1B26076 Stage 2B/4 Page: 1 of 1
Laboratory: APPL, Inc./Weck Laboratories, Inc. Reviewer: LT
2nd Reviewer: AC

METHOD: GC/MS Semivolatiles (EPA Method 525.2)

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.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/SW	RSD≤30%. r^2 ICV≤30%.
IV.	Continuing calibration	SW	CCV≤30%.
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB=3
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	SW	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation.
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation.
XIV.	System performance	A	Not reviewed for Stage 2B validation.
XV.	Overall assessment of data	SW	

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 Stage 4 validation

	Client ID			Lab ID	Matrix	Date
1	ERH1286**	1B26076-01		BA27502**	Water	02/23/21
2	ERH1287RE	-02RE		BA27504RE	Water	02/23/21
3	ERH1288	-03	FB	BA27505	Water	02/23/21
4	ERH1287	-02		BA27504	"	"
5						
6						
7						
8						
9						

Notes:

1	WIC0231-BLK						
2	WIC1238-						

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. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-BHC	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-BHC	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-BHC	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-BHC	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

Notes:_____

LDC #: 50747A2a

VALIDATION FINDINGS CHECKLIST

Reviewer: LT

Method: Semivolatiles (EPA Method 525.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?		X		All samples extracted past HT.
Was cooler temperature criteria met?	X			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	X			
Were the DFTPP performance results reviewed and found to be within the specified criteria?	X			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	X			
Were all percent relative standard deviations (%RSD) ≤ 30%?	X			
IIIa. Initial Calibration Verification calibration				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	X			
Were all percent differences (%D) ≤ 30%?		X		EE out, samples ND
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	X			
Were all percent differences (%D) of continuing calibration ≤ 30%?		X		Several out, samples ND
V.Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	X			
Was a laboratory blank analyzed with each analysis batch?	X			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		X		
VI. Field blanks				
Field blanks were identified in this SDG.	X			
Target compounds were detected in the field blanks.		X		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	~~X~~	~~X~~		
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?	X		~~X~~	
VIII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?		X		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			X	
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	X			

LDC #: 50747A2a

VALIDATION FINDINGS CHECKLIST

Reviewer: LT

Method: Semivolatiles (EPA Method 525.2)

Was an LCS analyzed per analytical batch?	X			
Were the LCS percent recoveries (%R) within 70-130%?		X		Several analytes out and not spiked
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		X		
Target compounds were detected in the field duplicates.			X	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?	X	X		
Were retention times within +/-30 seconds of the associated calibration standard?	X			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	X		X	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	X			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	X		X	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	X		X	
Were chromatogram peaks verified and accounted for?	X			
XIV. System performance				
System performance was found to be acceptable.	X			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	X			

LDC #: 50747A2a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: LT

All circled dates have exceeded the technical holding times.
YES Were all cooler temperatures within validation criteria?

METHOD : GC/MS SVOA (EPA Method 525.2)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1,3,4 ~~1,3~~(ND/Det)	W	N	02/23/21	03/03/21	03/13/21	8	J/UJ/P (H)
2 (ND)	W	N	02/23/21	03/19/21	03/22/21	24	J/R/P (H)

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 30 days.

LDC #: 50747A2a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: LT

METHOD: GC/MS SVOA (EPA Method 525.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

YES Was an initial calibration verification standard analyzed after each ICAL for each instrument?

NO Were all %D within the validation criteria of ≤30 %D ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	03/12/21	GCMS16_03122123	EE*	40.27	1-4 (ND)	J/UJ/A (C)
			*Use SVOC codes			

LDC #: 50747A2a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

METHOD: GC/MS SVOA (EPA Method 525.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

YES Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

NO Were all percent differences (%D) <30.0/50.0% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0/50.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	03/12/21	GCMS16_03122125	Disulfoton	31.72		4, 1,3 (ND)	J/UJ/A (C)
			Metribuzin	41.51		↓	↓
			Butachlor	39.70		↓	↓
			Ethion	37.13		↓	↓
	03/12/21	GCMS16_03122127	P**	36.12		4, 1,3 (ND)	J/UJ/A (C)
	03/12/21	GCMS16_03122157	FFF*	34.96		None	NQ per SOP IIC
	03/12/21	GCMS16_03122158	Dimethoate	34.92		None	NQ per SOP IIC
			Metribuzin	58.93		↓	↓
			Butachlor	39.90		↓	↓
			Ethion	34.79		↓	↓
			GGG*	45.56		↓	↓
			LLL*	32.02		↓	↓
			Ending CCV for several analytes were not performed due to power outage.				↓
	03/22/21	GCMS16_03222106	Captan	49.22		2 (ND)	J/UJ/A (C)
			FFF*	34.36		↓	↓
	03/22/21	GCMS16_03222107	Dimethoate	58.96		2 (ND)	J/UJ/A (C)
			Disulfoton	43.24		↓	↓
			Metribuzin	56.66		↓	↓
			Butachlor	54.98		↓	↓
			Ethion	55.48		↓	↓
			Trithion	42.78		↓	↓
			GGG*	53.19		↓	↓
			LLL*	43.74		↓	↓
		*Use SVOC codes					
		**Use Pesticides codes					

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

METHOD: GC/MS SVOA (EPA Method 525.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

YES Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

NO Were all percent differences (%D) ≤30.0/50.0% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0/50.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	03/22/21	GCMS16_03222109	K**	30.66		2 (ND)	J/UJ/A (C)
			P**	41.06		↓	↓
	03/22/21	GCMS16_03222127	FFF*	33.23		None	NQ per SOP IIC
	03/22/21	GCMS16_03222128	Disulfoton	38.32		None	NQ per SOP IIC
			Metribuzin	53.40		↓	↓
			Butachlor	42.78		↓	↓
			Ethion	42.72		↓	↓
			Trithion	30.84		↓	↓
			GGG*	46.49		↓	↓
			LLL*	30.37		↓	↓
	03/22/21	GCMS16_03222130	P**	36.10		None	NQ per SOP IIC
		*Use SVOC codes					
		**Use Pesticides codes					

LDC #: 50747A2a

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: LT

METHOD: GC/MS SVOA (EPA Method 525.2)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
NO Were percent recoveries (%R) for surrogates within QC limits stated below?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		4 (ND/DET)	1,3-Dimethyl-2-nitrobenzene	88900 (70 - 130)	J/A DETS (S)
			Triphenyl phosphate	3730 (70 - 130)	↓

* QC limits are advisory
S1 (PRY) = Perylene-d12

QC Limits (Water)
70-130

LDC #: 50747A2a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: LT

METHOD: GC/MS SVOA (EPA Method 525.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

YES Was a LCS analyzed for this SDG?

YES Was a LCS analyzed every 20 samples?

NO Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	Lab ID/Reference	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		W1C0221-BS1/BSD1	Captan	137 (70 - 130)	149 (70 - 130)		4, 1,3 (ND)	J/P DETS
			See attached	Not spiked			↓	J/UJ/P
		W1C1238-BS1/BSD1	KKKK*	148 (70 - 130)			2 (ND)	J/P DETS
			Captan	131 (70 - 130)	134 (70 - 130)		↓	↓
			Chlorpropham	138 (70 - 130)			↓	↓
			LL*	140 (70 - 130)			↓	↓
			Dimethoate	129 (50 - 120)			↓	↓
			Ethion		131 (70 - 130)		↓	↓
			See attached	Not spiked			↓	J/UJ/P
			*SVOA Codes					

APPL, Inc.
908 N. Temperance Avenue
Clovis, CA 93611

Project Number: 95192

Project Manager: Gregory Salata

Reported:
03/24/2021 12:31

Quality Control Results (Continued)

Semivolatile Organic Compounds by GC/MS (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1C0221 - EPA 525.2 (Continued)										
Blank (W1C0221-BLK1)				**Prepared: 03/03/21 Analyzed: 03/13/21**						
Surrogate(s)										
Triphenyl phosphate	4.92		ug/l	5.00		98	70-130			
LCS (W1C0221-BS1)				**Prepared: 03/03/21 Analyzed: 03/13/21**						
4,4'-DDD	ND	0.10	ug/l				70-130			
4,4'-DDE	ND	0.20	ug/l				70-130			
4,4'-DDT	ND	0.10	ug/l				70-130			
Acenaphthene	4.81	0.50	ug/l	5.00		96	70-130			
Acenaphthylene	5.10	0.50	ug/l	5.00		102	70-130			
Acetochlor	4.99	0.10	ug/l	5.00		100	70-130			
Alachlor	5.16	0.10	ug/l	5.00		103	70-130			
Aldrin	ND	0.10	ug/l				70-130			
alpha-BHC	ND	0.10	ug/l				70-130			
alpha-Chlordane	ND	0.10	ug/l				70-130			
Anthracene	4.39	0.50	ug/l	5.00		88	70-130			
Atrazine	5.54	0.10	ug/l	5.00		111	70-130			
Benzo (a) anthracene	5.76	0.50	ug/l	5.00		115	70-130			
Benzo (a) pyrene	5.04	0.10	ug/l	5.00		101	60-130			
Benzo (b) fluoranthene	4.90	0.50	ug/l	5.00		98	70-130			AN-IP
Benzo (g,h,i) perylene	5.06	0.50	ug/l	5.00		101	40-160			
Benzo (k) fluoranthene	5.52	0.50	ug/l	5.00		110	70-130			AN-IP
beta-BHC	ND	0.20	ug/l				70-130			
Bis(2-ethylhexyl)adipate	6.15	5.0	ug/l	5.00		123	70-130			
Bis(2-ethylhexyl)phthalate	5.54	3.0	ug/l	5.00		111	70-130			
Bromacil	5.15	0.50	ug/l	5.00		103	70-130			
Butachlor	5.11	0.10	ug/l	5.00		102	70-130			
Butyl benzyl phthalate	5.57	2.0	ug/l	5.00		111	70-130			
Caffeine	4.13	0.10	ug/l	5.00		83	50-120			
Captan	6.86	1.0	ug/l	5.00		137	70-130			Q-08
Chlorpropham	5.32	0.10	ug/l	5.00		106	70-130			
Chrysene	5.38	0.50	ug/l	5.00		108	70-130			
Cyanazine	5.75	0.10	ug/l	5.00		115	70-130			
delta-BHC	ND	0.10	ug/l				70-130			
Diazinon	4.41	0.10	ug/l	5.00		88	50-120			
Dibenzo (a,h) anthracene	4.90	0.50	ug/l	5.00		98	50-150			
Dieldrin	ND	0.20	ug/l				70-130			
Diethyl phthalate	6.08	2.0	ug/l	5.00		122	70-130			
Dimethoate	5.28	0.20	ug/l	5.00		106	50-120			
Dimethyl phthalate	5.85	2.0	ug/l	5.00		117	70-130			
Di-n-butyl phthalate	5.43	2.0	ug/l	5.00		109	70-130			

Pesticides codes
SVOA codes

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Project Number: 95192

Project Manager: Gregory Salata

Reported:
03/24/2021 12:31

Quality Control Results (Continued)

Semivolatile Organic Compounds by GC/MS (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1C0221 - EPA 525.2 (Continued)										
LCS (W1C0221-BS1)				**Prepared: 03/03/21 Analyzed: 03/13/21**						
Di-n-octyl phthalate	5.26	0.50	ug/l	5.00		105	70-130			
Diphenamid	5.88	0.10	ug/l	5.00		118	70-130			
Disulfoton	3.92	0.10	ug/l	5.00		78	50-120			
H Endosulfan I	ND	1.0	ug/l				70-130			
L Endosulfan II	ND	0.20	ug/l				70-130			
N Endosulfan sulfate	ND	0.20	ug/l				70-130			
F Endrin	ND	0.20	ug/l				70-130			
R Endrin aldehyde	ND	0.20	ug/l				70-130			
Q Endrin ketone	ND	0.10	ug/l				70-130			
EPTC	5.57	0.10	ug/l	5.00		111	70-130			
Ethion	6.28	0.10	ug/l	5.00		126	70-130			
Fluoranthene	5.45	0.50	ug/l	5.00		109	70-130			
Fluorene	5.46	0.50	ug/l	5.00		109	70-130			
D gamma-BHC (Lindane)	ND	0.10	ug/l				70-130			
T gamma-Chlordane	ND	0.10	ug/l				70-130			
E Heptachlor	ND	0.10	ug/l				70-130			
G Heptachlor epoxide	ND	0.10	ug/l				70-130			
FF Hexachlorobenzene	ND	0.10	ug/l				70-130			
X Hexachlorocyclopentadiene	ND	1.0	ug/l				33-106			
Indeno (1,2,3-cd) pyrene	4.72	0.50	ug/l	5.00		94	50-150			
P Methoxychlor	ND	0.20	ug/l				70-130			
Metolachlor	5.18	0.10	ug/l	5.00		104	60-130			
Metribuzin	5.07	0.10	ug/l	5.00		101	50-120			
Molinate	4.49	0.10	ug/l	5.00		90	70-130			
Naphthalene	4.60	0.50	ug/l	5.00		92	70-130			
Pentachloronitrobenzene (PCNB)	4.58	0.10	ug/l	5.00		92	70-130			
Pentachlorophenol	3.94	1.0	ug/l	5.00		79	50-120			
Phenanthrene	5.29	0.50	ug/l	5.00		106	70-130			
Prometon	3.07	0.10	ug/l	5.00		61	15-120			
Prometryn	3.22	0.10	ug/l	5.00		64	30-120			
Propachlor	ND	0.20	ug/l				70-130			
Pyrene	5.34	0.50	ug/l	5.00		107	70-130			
Simazine	4.22	0.10	ug/l	5.00		84	60-130			
Terbacil	4.28	2.0	ug/l	5.00		86	70-130			
Thiobencarb	3.95	0.10	ug/l	5.00		79	70-130			
Trifluralin	ND	0.10	ug/l				70-130			
Trithion	4.66	0.10	ug/l	5.00		93	70-130			
Surrogate(s)										
1,3-Dimethyl-2-nitrobenzene	*4.82*		*ug/l*	*5.00*		*96*	*70-130*			

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Project Number: 95192

Project Manager: Gregory Salata

Reported:
03/24/2021 12:31

Quality Control Results

(Continued)

Semivolatile Organic Compounds by GC/MS (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1C1238 - EPA 525.2 (Continued)										
Blank (W1C1238-BLK1)				**Prepared: 03/19/21 Analyzed: 03/22/21**						
Simazine	ND	0.10	ug/l							
Terbacil	ND	2.0	ug/l							
Thiobencarb	ND	0.10	ug/l							
Trifluralin	ND	0.10	ug/l							
Trithion	ND	0.10	ug/l							
Surrogate(s)										
1,3-Dimethyl-2-nitrobenzene	*4.77*		*ug/l*	*5.00*		*95*	*70-130*			
Perylene-d12	*4.40*		*ug/l*	*5.00*		*88*	*50-120*			
Triphenyl phosphate	*5.43*		*ug/l*	*5.00*		*109*	*70-130*			
LCS (W1C1238-BS1)				**Prepared: 03/19/21 Analyzed: 03/22/21**						
M 4,4'-DDD	ND	0.10	ug/l				70-130			
J 4,4'-DDE	ND	0.20	ug/l				70-130			
O 4,4'-DDT	ND	0.10	ug/l				70-130			
Acenaphthene	4.67	0.50	ug/l	5.00		93	70-130			
Acenaphthylene	5.31	0.50	ug/l	5.00		106	70-130			
Acetochlor	4.81	0.10	ug/l	5.00		96	70-130			
Alachlor	5.05	0.10	ug/l	5.00		101	70-130			
F Aldrin	ND	0.10	ug/l				70-130			
A alpha-BHC	ND	0.10	ug/l				70-130			
S alpha-Chlordane	ND	0.10	ug/l				70-130			
Anthracene	4.80	0.50	ug/l	5.00		96	70-130			
Atrazine	7.40	0.10	ug/l	5.00		148	70-130			Q-08
Benzo (a) anthracene	5.66	0.50	ug/l	5.00		113	70-130			
Benzo (a) pyrene	5.01	0.10	ug/l	5.00		100	60-130			
Benzo (b) fluoranthene	5.01	0.50	ug/l	5.00		100	70-130			AN-IP
Benzo (g,h,i) perylene	5.04	0.50	ug/l	5.00		101	40-160			
Benzo (k) fluoranthene	5.07	0.50	ug/l	5.00		101	70-130			AN-IP
B beta-BHC	ND	0.20	ug/l				70-130			
Bis(2-ethylhexyl)adipate	6.22	5.0	ug/l	5.00		124	70-130			
Bis(2-ethylhexyl)phthalate	5.74	3.0	ug/l	5.00		115	70-130			
Bromacil	5.45	0.50	ug/l	5.00		109	70-130			
Butachlor	4.91	0.10	ug/l	5.00		98	70-130			
Butyl benzyl phthalate	5.69	2.0	ug/l	5.00		114	70-130			
Caffeine	5.02	0.10	ug/l	5.00		100	50-120			
Captan	6.57	1.0	ug/l	5.00		131	70-130			Q-08
Chlorpropham	6.91	0.10	ug/l	5.00		138	70-130			Q-08
Chrysene	5.26	0.50	ug/l	5.00		105	70-130			
Cyanazine	5.97	0.10	ug/l	5.00		119	70-130			
C delta-BHC	ND	0.10	ug/l				70-130			

Pesticides codes
SVOA codes

APPL, Inc.
908 N. Temperance Avenue
Clovis, CA 93611

Project Number: 95192

Project Manager: Gregory Salata

Reported:
03/24/2021 12:31

Quality Control Results (Continued)

Semivolatile Organic Compounds by GC/MS (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1C1238 - EPA 525.2 (Continued)										
LCS (W1C1238-BS1)				**Prepared: 03/19/21 Analyzed: 03/22/21**						
Diazinon	4.38	0.10	ug/l	5.00		88	50-120			
Dibenzo (a,h) anthracene	4.88	0.50	ug/l	5.00		98	50-150			
I Dieldrin	ND	0.20	ug/l				70-130			
Diethyl phthalate	7.02	2.0	ug/l	5.00		140	70-130			Q-08
Dimethoate	6.44	0.20	ug/l	5.00		129	50-120			Q-08
Dimethyl phthalate	6.00	2.0	ug/l	5.00		120	70-130			
Di-n-butyl phthalate	5.60	2.0	ug/l	5.00		112	70-130			
Di-n-octyl phthalate	5.19	0.50	ug/l	5.00		104	70-130			
Diphenamid	6.25	0.10	ug/l	5.00		125	70-130			
Disulfoton	4.13	0.10	ug/l	5.00		83	50-120			
H Endosulfan I	ND	1.0	ug/l				70-130			
L Endosulfan II	ND	0.20	ug/l				70-130			
N Endosulfan sulfate	ND	0.20	ug/l				70-130			
K Endrin	ND	0.20	ug/l				70-130			
R Endrin aldehyde	ND	0.20	ug/l				70-130			
Q Endrin ketone	ND	0.10	ug/l				70-130			
EPTC	4.98	0.10	ug/l	5.00		100	70-130			
Ethion	6.04	0.10	ug/l	5.00		121	70-130			
Fluoranthene	5.57	0.50	ug/l	5.00		111	70-130			
Fluorene	5.75	0.50	ug/l	5.00		115	70-130			
D gamma-BHC (Lindane)	ND	0.10	ug/l				70-130			
T gamma-Chlordane	ND	0.10	ug/l				70-130			
E Heptachlor	ND	0.10	ug/l				70-130			
G Heptachlor epoxide	ND	0.10	ug/l				70-130			
FF Hexachlorobenzene	ND	0.10	ug/l				70-130			
X Hexachlorocyclopentadiene	ND	1.0	ug/l				33-106			
Indeno (1,2,3-cd) pyrene	4.71	0.50	ug/l	5.00		94	50-150			
P Methoxychlor	ND	0.20	ug/l				70-130			
Metolachlor	4.97	0.10	ug/l	5.00		99	60-130			
Metribuzin	5.21	0.10	ug/l	5.00		104	50-120			
Molinate	4.66	0.10	ug/l	5.00		93	70-130			
Naphthalene	4.07	0.50	ug/l	5.00		81	70-130			
Pentachloronitrobenzene (PCNB)	4.06	0.10	ug/l	5.00		81	70-130			
Pentachlorophenol	4.31	1.0	ug/l	5.00		86	50-120			
Phenanthrene	5.30	0.50	ug/l	5.00		106	70-130			
Prometon	2.95	0.10	ug/l	5.00		59	15-120			
Prometryn	3.34	0.10	ug/l	5.00		67	30-120			
Propachlor	ND	0.20	ug/l				70-130			
Pyrene	5.54	0.50	ug/l	5.00		111	70-130			

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Project Number: 95192

Project Manager: Gregory Salata

Reported:
03/24/2021 12:31

Quality Control Results (Continued)

Semivolatile Organic Compounds by GC/MS (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1C1238 - EPA 525.2 (Continued)										
LCS (W1C1238-BS1)				**Prepared: 03/19/21**	**Analyzed: 03/22/21**					
Simazine	4.40	0.10	ug/l	5.00		88	60-130			
Terbacil	5.07	2.0	ug/l	5.00		101	70-130			
Thiobencarb	3.94	0.10	ug/l	5.00		79	70-130			
Trifluralin	ND	0.10	ug/l				70-130			
Trithion	4.44	0.10	ug/l	5.00		89	70-130			
Surrogate(s)										
1,3-Dimethyl-2-nitrobenzene	*4.17*		*ug/l*	*5.00*		*83*	*70-130*			
Perylene-d12	*4.89*		*ug/l*	*5.00*		*98*	*50-120*			
Triphenyl phosphate	*6.41*		*ug/l*	*5.00*		*128*	*70-130*			
LCS Dup (W1C1238-BSD1)				**Prepared: 03/19/21**	**Analyzed: 03/22/21**					
4,4'-DDD	ND	0.10	ug/l				70-130		30	
4,4'-DDE	ND	0.20	ug/l				70-130		30	
4,4'-DDT	ND	0.10	ug/l				70-130		30	
Acenaphthene	4.70	0.50	ug/l	5.00		94	70-130	0.8	30	
Acenaphthylene	5.57	0.50	ug/l	5.00		111	70-130	5	30	
Acetochlor	5.28	0.10	ug/l	5.00		106	70-130	9	30	
Alachlor	5.46	0.10	ug/l	5.00		109	70-130	8	30	
Aldrin	ND	0.10	ug/l				70-130		30	
alpha-BHC	ND	0.10	ug/l				70-130		30	
alpha-Chlordane	ND	0.10	ug/l				70-130		30	
Anthracene	4.87	0.50	ug/l	5.00		97	70-130	2	30	
Atrazine	5.47	0.10	ug/l	5.00		109	70-130	30	30	
Benzo (a) anthracene	5.51	0.50	ug/l	5.00		110	70-130	3	30	
Benzo (a) pyrene	5.45	0.10	ug/l	5.00		109	60-130	8	30	
Benzo (b) fluoranthene	5.59	0.50	ug/l	5.00		112	70-130	11	30	AN-IP
Benzo (g,h,i) perylene	5.51	0.50	ug/l	5.00		110	40-160	9	30	
Benzo (k) fluoranthene	5.60	0.50	ug/l	5.00		112	70-130	10	30	AN-IP
beta-BHC	ND	0.20	ug/l				70-130		30	
Bis(2-ethylhexyl)adipate	6.09	5.0	ug/l	5.00		122	70-130	2	30	
Bis(2-ethylhexyl)phthalate	5.67	3.0	ug/l	5.00		113	70-130	1	30	
Bromacil	6.13	0.50	ug/l	5.00		123	70-130	12	30	
Butachlor	5.41	0.10	ug/l	5.00		108	70-130	10	30	
Butyl benzyl phthalate	5.49	2.0	ug/l	5.00		110	70-130	4	30	
Caffeine	4.83	0.10	ug/l	5.00		97	50-120	4	30	
Captan	6.70	1.0	ug/l	5.00		134	70-130	2	30	Q-08
Chlorpropham	5.52	0.10	ug/l	5.00		110	70-130	22	30	
Chrysene	5.61	0.50	ug/l	5.00		112	70-130	6	30	
Cyanazine	5.96	0.10	ug/l	5.00		119	70-130	0.2	30	
delta-BHC	ND	0.10	ug/l				70-130		30	

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LDC #: 50747A2a

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: LT

METHOD: GC/MS SVOA (EPA Method 525.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

NO Were all internal standard area counts within -30% of continuing standard or + 50% of the associated initial calibration standard?

YES Were the retention times of the internal standards within ± 30 seconds of the retention times of the associated calibration standard?

#	Date	Lab ID/Reference	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		4 (ND/DET)*	ANT (ICAL)	1332 (611899.5 - 1835698.5)		J/R/P
		(ND/DET)*	ANT (CCV)	1332 (962293.5 - 1787116.5)		↓
		(ND)	PHN (ICAL)	74326 (1142730 - 3428190)		↓
		(ND)	PHN (CCV)	74326 (1713967.5 - 3183082.5)		↓
		(ND)	CRY (CCV)	1124223 (1483514.2 - 2755097.8)		NQ, PJ passed in ICAL limits
		*DET for LL,NN, S only				

* QC limits are advisory
IS1 (ANT) = Acenaphthene-d10
IS2 IS4 (PHN) = Phenanthrene-d10
IS3 IS5 (CRY) = Chrysene-d12

Quantitative Analysis Results With Qualifier Ratio Report

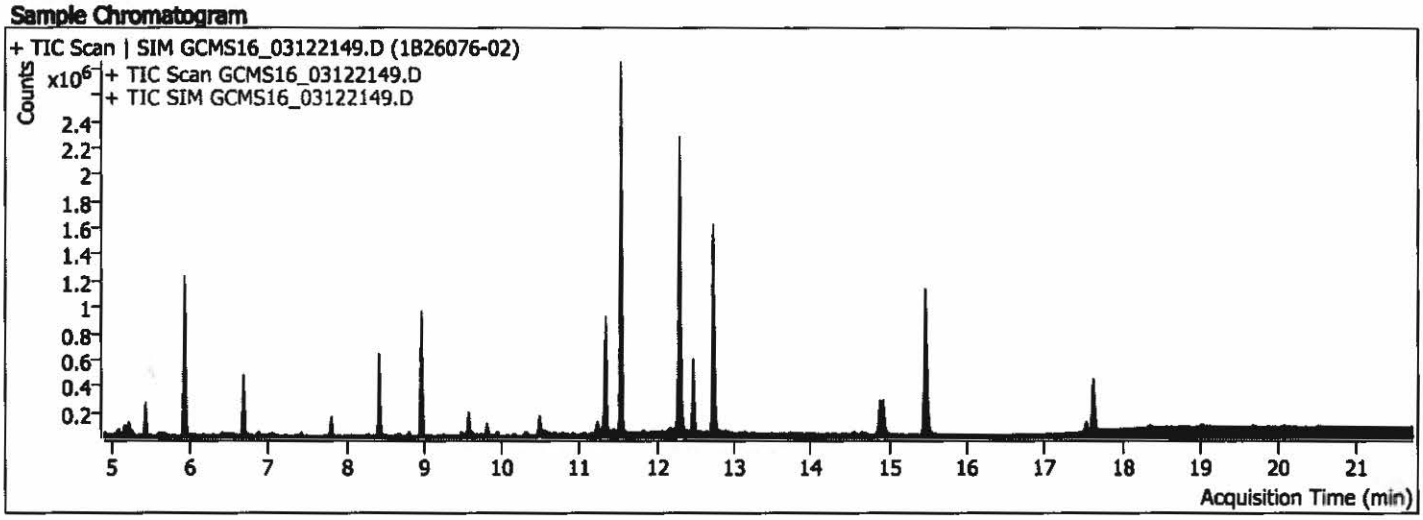
Batch Path	\\WSCIXIGCMS16\InstData\GCMS16\DATA\2021\031221_525.2\QuantResults\031221_525.2.batch.bin		
Analysis Time	3/16/2021 4:28:09 PM	**Analyst Name**	WECK\ryan.raymond
Report Time	3/16/2021 4:33:43 PM	**Reporter Name**	ryan.raymond
Last Calib Update	3/10/2021 10:39:20 AM	**Batch State**	Processed
Quant Batch Version	10.0	**Quant Report Version**	10.0

AnalysisInfo

Acq. Time	3/13/2021 11:53:48 AM	**Data File**	GCMS16_03122149.D
Sample Type	Sample	**Sample Name**	1B26076-02
Dilution	1	**Acq. Method**	525
Position	40	**Inj Vol**	1
DA Method File	507PNA 030921_031221RT.m	**Comment**	Full List

Sample fails IS and will be re-extracted past hold time. rmr 03/17/2021

Sample Chromatogram



Compound	ISTD	RT	Resp.	ISTD Resp.	Conc	Units	Accuracy
1,3 Dimethyl-2-Nitrobenzene	Acenaphthene-d10	5.925	322803	1332	4444.9479	mg/l	
*S Naphthalene	Acenaphthene-d10	5.996	2708	1332	4.7935	mg/l	
EPTC	Acenaphthene-d10	7.063	0	1332	ND	mg/l	
*CC Dimethyl phthalate	Acenaphthene-d10	7.767	0	1332	ND	mg/l	
*DD Acenaphthylene	Acenaphthene-d10	7.969	0	1332	ND	mg/l	
*GG Acenaphthene	Acenaphthene-d10	8.100	0	1332	ND	mg/l	
Molinate	Acenaphthene-d10	8.422	0	1332	ND	mg/l	
*LL Diethyl phthalate	Acenaphthene-d10	8.633	2071	1332	6.4224	mg/l	
*NN Fluorene	Acenaphthene-d10	8.724	294	1332	0.8282	mg/l	
Chlorpropham	Acenaphthene-d10	8.965	0	1332	ND	mg/l	
Dimethoate	Acenaphthene-d10	9.358	0	1332	ND	mg/l	
Prometon	Chrysene-d12	9.479	0	1124223	ND	mg/l	
Simazine	Chrysene-d12			1124223	ND	mg/l	
Atrazine	Acenaphthene-d10	9.529	0	1332	ND	mg/l	
* TT Pentachlorophenol	Chrysene-d12	9.620	0	1124223	ND	mg/l	
Pentachloronitrobenzene	Phenanthrene-d10	9.660	0	74326	ND	mg/l	
Diazinon (Dimpylate)	Chrysene-d12	9.630	0	1124223	ND	mg/l	
Terbacil	Phenanthrene-d10	9.771	0	74326	ND	mg/l	
*UU Phenanthrene	Phenanthrene-d10	9.831	4733	74326	0.2621	mg/l	
Disulfoton	Phenanthrene-d10			74326	ND	mg/l	
* VV Anthracene	Phenanthrene-d10	9.831	0	74326	ND	mg/l	
Caffeine	Phenanthrene-d10	10.032	0	74326	ND	mg/l	
Acetochlor	Chrysene-d12	10.153	0	1124223	ND	mg/l	
Metribuzin	Chrysene-d12	10.405	0	1124223	ND	mg/l	
Alachlor	Chrysene-d12	10.264	0	1124223	ND	mg/l	
Prometryn	Chrysene-d12			1124223	ND	mg/l	

Quantitative Analysis Results With Qualifier Ratio Report

Compound	ISTD	RT	Resp.	ISTD Resp.	Conc	Units	Accuracy
Bromacil	Chrysene-d12	10.546	0	1124223	ND	mg/l	
Di-n-butyl phthalate	Phenanthrene-d10	10.495	10649	74326	0.6234	mg/l	
Metolachlor	Chrysene-d12	10.646	0	1124223	ND	mg/l	
Cyanazine	Phenanthrene-d10	10.475	0	74326	ND	mg/l	
Thiobencarb	Chrysene-d12	10.596	0	1124223	ND	mg/l	
Diphenamide	Phenanthrene-d10	10.817	0	74326	ND	mg/l	
Captan	Phenanthrene-d10	11.099	0	74326	ND	mg/l	
Fluoranthene	Phenanthrene-d10	11.119	0	74326	ND	mg/l	
Butachlor	Chrysene-d12	11.230	0	1124223	ND	mg/l	
Pyrene	Phenanthrene-d10	11.331	0	74326	ND	mg/l	
Terphenyl-d14	Chrysene-d12	11.532	1873172	1124223	8.2769	mg/l	
Ethion	Chrysene-d12	11.804	0	1124223	ND	mg/l	
Trithion (carbofenotion)	Chrysene-d12	11.945	0	1124223	ND	mg/l	
Butyl benzyl phthalate	Phenanthrene-d10	12.055	3187	74326	0.9134	mg/l	
Bis(2-ethylhexyl)adipate	Phenanthrene-d10	12.176	11424	74326	2.4831	mg/l	
TPP	Phenanthrene-d10	12.287	680880	74326	186.6268	mg/l	
Benzo [a] anthracene	Phenanthrene-d10	12.730	0	74326	ND	mg/l	
Chrysene	Chrysene-d12	12.730	0	1124223	ND	mg/l	
Bis(2-ethylhexyl)phthalate	Phenanthrene-d10	12.810	8177	74326	1.1443	mg/l	
Di-n-octyl phthalate	Chrysene-d12	14.018	0	1124223	ND	mg/l	
Benzo [b] fluoranthene	Chrysene-d12	14.562	0	1124223	ND	mg/l	
Benzo [k] fluoranthene	Chrysene-d12	14.562	0	1124223	ND	mg/l	
Benzo[a] pyrene	Chrysene-d12	15.468	0	1124223	ND	mg/l	
Perylene-d12	Chrysene-d12	15.468	1236624	1124223	4.9010	mg/l	
Indeno [1,2,3-cd] pyrene	Chrysene-d12			1124223	ND	mg/l	
Dibenz [a,h] anthracene	Chrysene-d12			1124223	ND	mg/l	
Benzo [g,h,i] perylene	Chrysene-d12			1124223	ND	mg/l	

* USE SVOC CODES

Quantitative Analysis Results With Qualifier Ratio Report

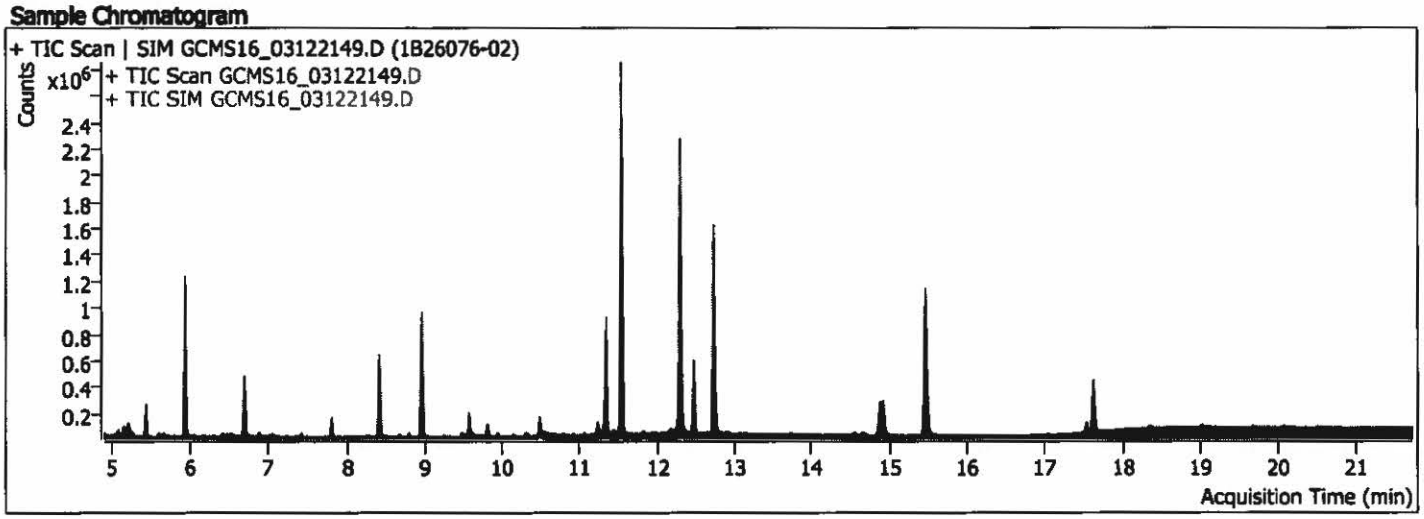
Batch Path	\\WSCIXIGCMS16\InstData\GCMS16\DATA\2021\031221_525.2\QuantResults\031221_SL.batch.bin		
Analysis Time	3/17/2021 9:23:38 AM	**Analyst Name**	WECK\ryan.raymond
Report Time	3/17/2021 9:26:41 AM	**Reporter Name**	ryan.raymond
Last Calib Update	2/3/2021 9:39:57 AM	**Batch State**	Processed
Quant Batch Version	10.0	**Quant Report Version**	10.0

AnalysisInfo

Acq. Time	3/13/2021 11:53:48 AM	**Data File**	GCMS16_03122149.D
Sample Type	Sample	**Sample Name**	1B26076-02
Dilution	1	**Acq. Method**	525
Position	40	**Inj Vol**	1
DA Method File	525 SL 020221_031221RT.m	**Comment**	Full List

Sample fails IS and will be re-extracted past hold time. rmr 03/17/2021

Sample Chromatogram



Compound	ISTD	RT	Resp.	ISTD Resp.	Conc	Units	Accuracy
Hexachlorocyclopentadiene	Acenaphthene-d10	6.680	0	1332	ND	mg/l	
Propachlor	Acenaphthene-d10	9.177	0	1332	ND	mg/l	
Trifuralin	Acenaphthene-d10			1332	ND	mg/l	
Hexachlorobenzene	Acenaphthene-d10			1332	ND	mg/l	

Quantitative Analysis Results With Qualifier Ratio Report

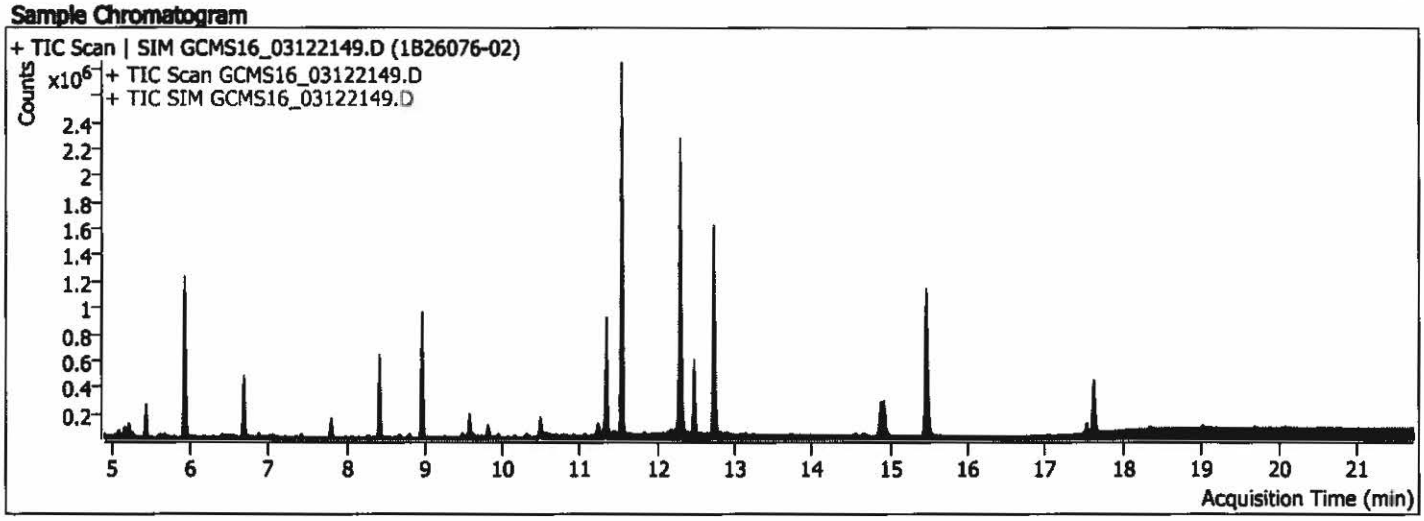
Batch Path	\\WSCIXIGCMS16\InstData\GCMS16\DATA\2021\031221_525.2\QuantResults\031221_LL.batch.bin		
Analysis Time	3/17/2021 9:52:58 AM	**Analyst Name**	WECK\ryan.raymond
Report Time	3/17/2021 9:54:55 AM	**Reporter Name**	ryan.raymond
Last Calib Update	3/16/2021 3:21:36 PM	**Batch State**	Processed
Quant Batch Version	10.0	**Quant Report Version**	10.0

AnalysisInfo

Acq. Time	3/13/2021 11:53:48 AM	**Data File**	GCMS16_03122149.D
Sample Type	Sample	**Sample Name**	1B26076-02
Dilution	1	**Acq. Method**	525
Position	40	**Inj Vol**	1
DA Method File	525 LL 031221.m	**Comment**	Full List

Sample fails IS and will be re-extracted past hold time. rmr 03/17/2021

Sample Chromatogram



Compound	ISTD	RT	Resp.	ISTD Resp.	Conc	Units	Accuracy
1,3-Dimethyl-2-NB (SSTD)	Acenaphthene-d10	5.925	322850	1332	4597.2582	mg/l	
alpha-BHC	Acenaphthene-d10	9.599	0	1332	ND	mg/l	
beta-BHC	Acenaphthene-d10	9.529	0	1332	ND	mg/l	
Gamma-BHC (Lindane)	Acenaphthene-d10	9.599	0	1332	ND	mg/l	
Delta-BHC	Phenanthrene-d10	9.599	0	74706	ND	mg/l	
Heptachlor	Phenanthrene-d10	10.153	0	74706	ND	mg/l	
Aldrin	Phenanthrene-d10	10.576	0	74706	ND	mg/l	
Heptachlor Epoxide (B)	Phenanthrene-d10	10.767	0	74706	ND	mg/l	
Gamma-Chlordane	Phenanthrene-d10			74706	ND	mg/l	
Alpha-Chlordane	Phenanthrene-d10			74706	ND	mg/l	
Endosulfan I	Phenanthrene-d10	10.999	0	74706	ND	mg/l	
4,4'-DDE	Phenanthrene-d10	11.220	0	74706	ND	mg/l	
Dieldrin	Phenanthrene-d10	11.321	0	74706	ND	mg/l	
Endrin	Phenanthrene-d10	11.532	0	74706	ND	mg/l	
4,4'-DDD	Phenanthrene-d10	11.532	0	74706	ND	mg/l	
Endosulfan II	Phenanthrene-d10	11.532	0	74706	ND	mg/l	
Endrin aldehyde	Phenanthrene-d10	11.683	0	74706	ND	mg/l	
4,4'-DDT	Phenanthrene-d10	12.287	0	74706	ND	mg/l	
Endosulfan sulfate	Phenanthrene-d10	11.864	0	74706	ND	mg/l	
TPP (SSTD)	Phenanthrene-d10	12.287	680880	74706	218.1113	mg/l	
Endrin ketone	Phenanthrene-d10	12.287	0	74706	ND	mg/l	
Methoxychlor	Phenanthrene-d10	12.287	0	74706	ND	mg/l	
Perylene-d12 (SSRD)	Chrysene-d12	15.468	1243579	1124831	5.6844	mg/l	

A B D C E F G T S H J H K M L R O N A P

** PESTICIDES CODES

Quantitative Analysis Results With Qualifier Ratio Report

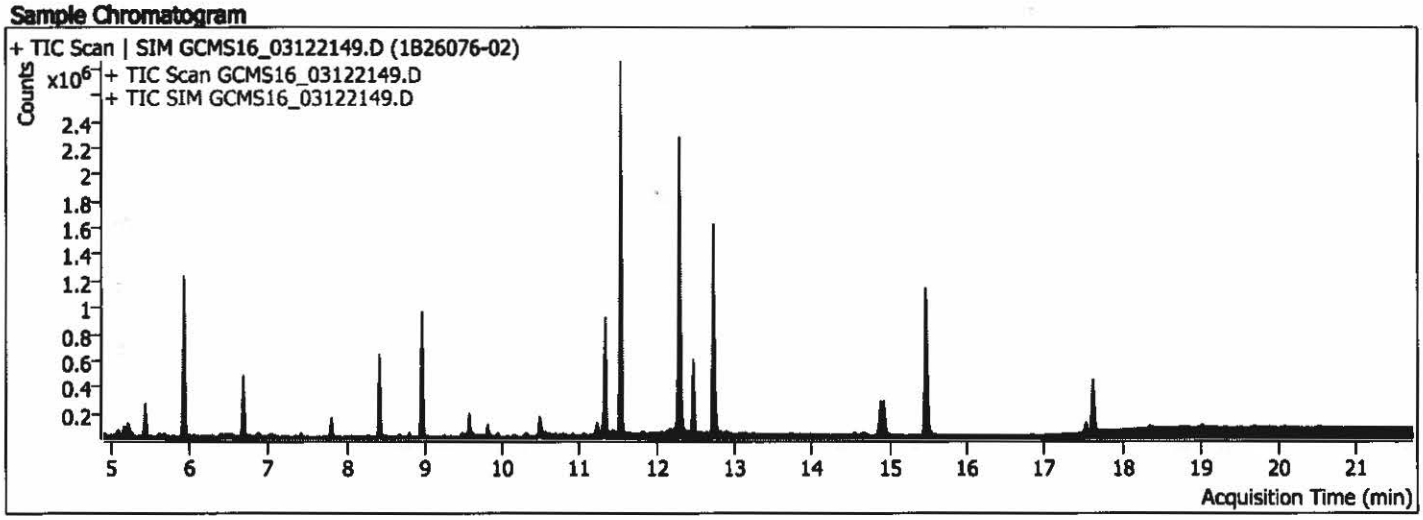
Batch Path	\\WSCIXIGCMS16\InstData\GCMS16\DATA\2021\031221_525.2\QuantResults\031221_ADD.batch.bin		
Analysis Time	3/17/2021 9:36:07 AM	**Analyst Name**	WECK\ryan.raymond
Report Time	3/17/2021 9:37:06 AM	**Reporter Name**	ryan.raymond
Last Calib Update	3/17/2021 9:32:48 AM	**Batch State**	Processed
Quant Batch Version	10.0	**Quant Report Version**	10.0

AnalysisInfo

Acq. Time	3/13/2021 11:53:48 AM	**Data File**	GCMS16_03122149.D
Sample Type	Sample	**Sample Name**	1B26076-02
Dilution	1	**Acq. Method**	525
Position	40	**Inj Vol**	1
DA Method File	ADD 031221.m	**Comment**	Full List

Sample fails IS and will be re-extracted past hold time. rmr 03/17/2021

Sample Chromatogram



Compound	ISTD	RT	Resp.	ISTD Resp.	Conc	Units	Accuracy
2,6-Dinitrotoluene	Acenapthene-d10	8.069	0	1332	ND	mg/l	
2,4-Dinitrotoluene	Acenapthene-d10	8.220	0	1332	ND	mg/l	

LDC #: 50747A2a

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: LT

METHOD: GC/MS SVOA (EPA Method 525.2)

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.

YES Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Compounds	Qualifications
		2	exceeded HT	All	R (D)

Comments: _____

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS SVOA (EPA Method 525.2)

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 (0.04/0.2ppm)	Recalculated RRF (0.04/0.2ppm)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	02/02/21	SS (1st internal standard)	0.4070	0.4069217	0.436927	0.4369286	4.128809	4.1283636
	GCMS16	03/09/21	TT (2nd internal standard)	See attached					
		03/09/21	AAA (3rd internal standard)	See attached					
2	ICAL	03/12/21	alpha-BHC (1st internal standard)	See attached					
	GCMS16	03/12/21	Delta-BHC (2nd internal standard)	See attached					
			(3rd internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
5			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
6			(1st internal standard)						
			(2nd internal standard)						
			(3rd 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.

Method: SVOA (EPA Method 525.2)

Calibration Date	System	Compound	Standard	(Y) Response Ratio	(X) Concentration Ratio
3/9/2021	GCMS16	Pentachlorophenol (TT) IS = Chrysene-d12	1	0.007985927	0.1
			2	0.020505029	0.2
			3	0.054500118	0.4
			4	0.140501636	1
			5	0.374004594	2
			6	0.72973457	4
			7	1.247744693	8

Regression Output		*Reported (WLR)*
Constant	*0.007146*	*-0.010061*
Std Err of Y Est		
R Squared	*0.990749*	*0.990433*
Degrees of Freedom		
X Coefficient(s)	*0.160825*	*0.168497*
Std Err of Coef.		
Correlation Coefficient	*0.995364*	
Coefficient of Determination (r^2)	*0.990749*	*0.990433*

Linear fit + constant

Method: SVOA (EPA Method 525.2)

Calibration Date	System	Compound	Standard	(Y) Response Ratio	(X) Concentration Ratio
3/12/2021	GCMS16	alpha-BHC	1	0.001823385	0.01
			2	0.003342773	0.02
		IS = Acenaphthene-d10	3	0.021451022	0.1
			4	0.109061744	0.4
			5	0.264545284	1
			6	0.516638167	2
			7	0.898142661	4

Regression Output		*Reported (WLR)*
Constant	*0.013713*	*-0.000654*
Std Err of Y Est		
R Squared	*0.993945*	*0.993447*
Degrees of Freedom		
X Coefficient(s)	*0.228289*	*0.241645*
Std Err of Coef.		
Correlation Coefficient	*0.996968*	
Coefficient of Determination (r^2)	*0.993945*	*0.993447*

Linear fit + constant

Method: SVOA (EPA Method 525.2)

Calibration Date	System	Compound	Standard	(Y) Response Ratio	(X) Concentration Ratio
3/12/2021	GCMS16	Delta-BHC	1	0.000827362	0.01
			2	0.001777753	0.02
		IS = Phenanthrene-d10	3	0.010385085	0.1
			4	0.053329516	0.4
			5	0.126174864	1
			6	0.230680847	2
			7	0.406914706	4

Regression Output		*Reported (WLR)*
Constant	*0.007916*	*-0.000112*
Std Err of Y Est		
R Squared	*0.993573*	*0.990695*
Degrees of Freedom		
X Coefficient(s)	*0.102879*	*0.110353*
Std Err of Coef.		
Correlation Coefficient	*0.996781*	
Coefficient of Determination (r^2)	*0.993573*	*0.990695*

Linear fit + constant

Method: GC/MS SVOA (EPA Method 525.2)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
03/09/21	GCMS16	Butyl Benzyl Phthalate	0.5	0.017	0.1000	0.01000
			1	0.047	0.2000	0.0400
		IS = Phenanthrene-d10	2	0.115	0.4000	0.1600
			5	0.263	1.0000	1.0000
			10	0.650	2.0000	4.0000
			20	1.073	4.0000	16.0000
			40	1.880	8.0000	64.0000

Regression Output	Calculated		Reported WLR
Constant	b =	-0.0125	-0.01622
R Squared	r2 =	0.9958	0.9962
X Coefficient(s)	m1 =	3.2202E-01	3.2555E-01
Std Err of Coef.	m2 =	-1.07433E-02	-1.1160E-02
Correlation Coefficient		0.997899	
Coefficient of Determination (r^2)		0.995803	

VALIDATION FINDINGS WORSHEET
Continuing Calibration Results Verification

METHOD: GC/MS SVOA (EPA Method 525.2)

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 = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound
Cx = Concentration of compound
Ais = Area of associated internal standard
Cis = Concentration of internal standard

		Calibration		Average RRF	Reported	Recalculated	Reported	Recalculated
#	Standard ID	Date	Compound (IS)	(Initial RRF/r2)	(Concentration)	(Concentration)	%D	%D
1	GCMS16_03122126	3/12/21	SS (Acenaphthene-d10)	0.436927	0.0388	0.03883	97.09	97.085
	GCMS16_03122124	3/12/21	TT (Chrysene-d12)	0.990433	0.5151	0.51507	103.02	103.014
	GCMS16_03122124	3/12/21	AAA (Phenanthrene-d10)	0.996232	0.5208	0.52082	104.16	104.164
	GCMS16_03122127	3/12/21	alpha-BHC (Acenaphthene-d10)	0.993447	0.0833	0.08326	83.26	83.259
	GCMS16_03122127	3/12/21	Delta-BHC (Phenanthrene-d10)	0.990695	0.0780	0.07802	78.02	78.025
2	GCMS16_03222108	3/22/21	SS (Acenaphthene-d10)	0.436927	0.0417	0.04168	104.19	104.189
	GCMS16_03222106	3/22/21	TT (Chrysene-d12)	0.990433	0.5899	0.58990	117.98	117.980
	GCMS16_03222106	3/22/21	AAA (Phenanthrene-d10)	0.996232	0.6156	0.61559	123.12	123.118
	GCMS16_03222109	3/22/21	alpha-BHC (Acenaphthene-d10)	0.993447	0.1064	0.10644	106.44	106.440
	GCMS16_03222109	3/22/21	Delta-BHC (Phenanthrene-d10)	0.990695	0.0912	0.09118	91.18	91.177

LDC #: 50747A2a

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1

Reviewer: LT

METHOD: GC/MS Semivolatiles (EPA Method 525.2)

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	Percent Recovery	Percent Difference
			Reported	Recalculated	
1,3-Dimethyl-2-nitrobenzene	5.00	4.79	96	95.8	-
Perylene-d12	5.00	4.64	93	92.8	-
Triphenylphosphate	5.00	5.60	112	112	-

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Perylene-d12					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Perylene-d12					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Perylene-d12					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Perylene-d12					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Perylene-d12					

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: GC/MS SVOA (EPA Method 525.2)

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 Where: SSC = Spiked sample concentration SC = Sample concentation
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: W1C0221-BS1/BSD1

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
TT	5.00	5.00	3.94	4.29	79	78.8	86	85.8	8	8.51
AAA	5.00	5.00	5.57	5.88	111	111.4	118	117.6	5	5.41

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 #: 50747A2a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: LT

METHOD: GC/MS SVOA (EPA Method 525.2)

Compound results for TT reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)}{(A_{is})(RRF)(V_o)(V_i)}$

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)

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

Example:

Sample I.D. 1 - ND , TT :

LCS Conc. = $\frac{((243866/1986713)- -0.010061)*5}{0.168497}$

3.9410

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	W1C0221-BS1	TT	3.94	3.9410	Y

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 29, 2021

Parameters: Lead

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 95192

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1286	BA27502	Water	02/23/21
ERH1285	BA27503	Water	02/23/21
ERH1287MS	BA27504MS	Water	02/23/21

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:

Lead by Environmental Protection Agency (EPA) Method 200.8

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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. 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.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

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. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VIII. 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.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. 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.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

XIII. Sample Result Verification

Raw data were not reviewed for Level C validation.

XIV. 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
Lead - Data Qualification Summary - SDG 95192

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Lead - Laboratory Blank Data Qualification Summary - SDG 95192

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Lead - Field Blank Data Qualification Summary - SDG 95192

No Sample Data Qualified in this SDG

LDC #: 50747A4a
SDG #: 95192
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/~~4~~

Date: 3/30/21
Page: 1 of 1
Reviewer: ATV
2nd Reviewer: AC

METHOD: Lead (EPA Method 200.8)

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.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	A	4
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/LCSD
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	
XIII.	Sample Result Verification	A	Not reviewed for Stage 2B validation.
XIV.	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 Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	ERH1286**	BA27502**	Water	02/23/21
2	~~ERH1285~~	~~BA27503~~	Water	02/23/21
3	ERH1287	BA27504	Water	02/23/21
4	ERH1287MS	BA27504MS	Water	02/23/21
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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: April 29, 2021

Parameters: Dissolved Organic Carbon

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 95192

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1286	BA27502	Water	02/23/21
ERH1287	BA27504	Water	02/23/21
ERH1287DUP	BA27504DUP	Water	02/23/21

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:

Dissolved Organic Carbon by Standard Method 5310C

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 were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

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

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 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 method. No results were rejected in this SDG.

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Data Qualification Summary - SDG 95192

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Laboratory Blank Data Qualification Summary - SDG 95192

No Sample Data Qualified in this SDG

Red Hill Bulk Storage Facility, CTO 18F0126
Dissolved Organic Carbon - Field Blank Data Qualification Summary - SDG 95192

No Sample Data Qualified in this SDG

LDC #: 50747A6
SDG #: 95192
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 3/30/21
Page: 1 of 1
Reviewer: AT
2nd Reviewer: DC

METHOD: (Analyte) DOC (EPA SW846 Method ~~9060A~~ SM5310C)

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	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	A	3
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for Stage 2B 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 Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	ERH1286**	BA27502**	Water	02/23/21
2	ERH1287	BA27504	Water	02/23/21
3	ERH1287DUP	BA27504DUP	Water	02/23/21
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15				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Red Hill Bulk Storage Facility, CTO 18F0126

LDC Report Date: April 29, 2021

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level C

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 95192

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
ERH1286	BA27502	Water	02/23/21
ERH1286RE	BA27502RE	Water	02/23/21
ERH1287	BA27504	Water	02/23/21
ERH1287RE	BA27504RE	Water	02/23/21
ERH1286(SGCU)	BA27502(SGCU)	Water	02/23/21
ERH1287(SGCU)	BA27504(SGCU)	Water	02/23/21

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 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
ERH1286RE ERH1287RE	All compounds	22	7	R (all non-detects)	A

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds 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% 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) 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.

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
ERH1286RE ERH1287RE	All compounds	Extracted outside holding time.	R	A

Red Hill Bulk Storage Facility, CTO 18F0126
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 95192

Sample	Compound	Flag	A or P	Reason (Code)
ERH1286RE ERH1287RE	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 95192

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 95192

No Sample Data Qualified in this SDG

LDC #: 50747A8
SDG #: 95192
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 04/07/21
Page: 1 of 1
Reviewer: VT
2nd Reviewer: MC

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%, r² 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	
VIII.	Laboratory control samples	A	LCS(D)
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation.
XI.	Target compound identification	A	Not reviewed for Stage 2B 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 sample underwent Stage 4 validation / Sample appended with "SGCU" underwent Silica Gel Clean Up

	Client ID	Lab ID	Matrix	Date
1	ERH1286**	BA27502**	Water	02/23/21
2	ERH1286RE**	BA27502RE**	Water	02/23/21
3	ERH1287	BA27504	Water	02/23/21
4	ERH1287RE	BA27504RE	Water	02/23/21
5	ERH1286(SGCU)**	BA27502(SGCU)**	Water	02/23/21
6	ERH1287(SGCU)	BA27504(SGCU)	Water	02/23/21
7				
8				
9				
10				
11				
12				

Notes:

1	210225A-BLK						
2	210317A-1						
3	261889- ↓						

LDC #: 50747A8

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: LT

All circled dates have exceeded the technical holding times.
Y x N N/A Were all cooler temperatures within validation criteria?

METHOD: x GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2,4 (ND)	W	N	02/23/21	03/17/21	03/23/21	22	J/R/A (H)

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 #: 50747A8

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

METHOD: X 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.

Yes Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	All	exceeded holding time > 2X HT	2,4	R (D)

Comments: _____