

# Energy Laboratories Inc

# ANALYTICAL RUN Summary

17-Feb-22

Run ID FID-HEADSPACE\_220131B

**Run Start Date:** 1/31/2022  
**Analyst:** Jeff Whitmer  
**Ical:**  
**Column ID:** porapak Q  
**Comments:** 2022 Calibration for methane, ethane, and ethene. thermometer used for temp:S94278.

Instrument ID	Description
1000_SGE_041819	1000 mL SGE Syringe _ Gas Tight

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
10711	HC-Methane-W-CCV	0.3	ml			lcs	8/9/2022
12173	HC-Methane-W-CCV	0.3	ml			CCV	11/23/2023

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038722	CCV	HC-METHANE-	CCV		1/31/2022 10:32:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		103.519361		100	0	0	2	2	0	104%	85	115	0%	
Ethene	A	ppm		103.057616		100	0	0	2	2	0	103%	85	115	0%	
Methane	A	ppm		103.620197		100	0	0	2	2	0	104%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038723	LCS	HC-METHANE-	LCS		1/31/2022 10:37:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		99.5410871		100	0	0	2	2	0	100%	85	115	0%	
Ethene	A	ppm		99.2906216		100	0	0	2	2	0	99%	85	115	0%	
Methane	A	ppm		100.809349		100	0	0	2	2	0	101%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038724	MBLK	HC-METHANE-	MBLK		1/31/2022 11:15:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

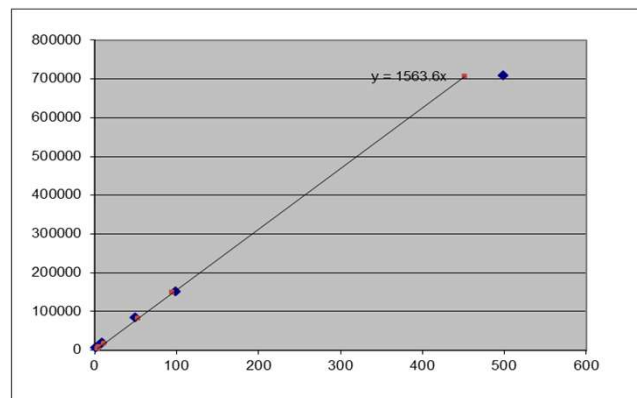
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038724	MBLK	HC-METHANE-	MBLK		1/31/2022 11:15:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		0			0	0	2	2	0	0%	0	0	0%	
Ethene	A	ppm		0			0	0	2	2	0	0%	0	0	0%	
Methane	A	ppm		0			0	0	2	2	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038725	CAL1	HC-METHANE-	CAL1		1/31/2022 11:22:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		2.73020074		2.5	0	0	2	2	0	109%	50	150	0%	
Ethene	A	ppm		2.71682887		2.5	0	0	2	2	0	109%	50	150	0%	
Methane	A	ppm		2.85177946		2.5	0	0	2	2	0	114%	50	150	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038726	CAL2	HC-METHANE-	CAL2		1/31/2022 11:28:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		5.21991748		5	0	0	2	2	0	104%	85	115	0%	
Ethene	A	ppm		5.31883543		5	0	0	2	2	0	106%	85	115	0%	
Methane	A	ppm		4.91242836		5	0	0	2	2	0	98%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038727	CAL3	HC-METHANE-	CAL3		1/31/2022 11:34:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		10.3282735		10	0	0	2	2	0	103%	85	115	0%	
Ethene	A	ppm		10.1476990		10	0	0	2	2	0	101%	85	115	0%	
Methane	A	ppm		10.5936028		10	0	0	2	2	0	106%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038728	CAL4	HC-METHANE-	CAL4		1/31/2022 11:40:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038728	CAL4	HC-METHANE-	CAL4		1/31/2022 11:40:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		51.5359147		50	0	0	2	2	0	103%	85	115	0%	
Ethene	A	ppm		51.3647987		50	0	0	2	2	0	103%	85	115	0%	
Methane	A	ppm		52.2491534		50	0	0	2	2	0	104%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038729	CAL5	HC-METHANE-	CAL5		1/31/2022 11:45:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		93.9925939		100	0	0	2	2	0	94%	85	115	0%	
Ethene	A	ppm		93.8651881		100	0	0	2	2	0	94%	85	115	0%	
Methane	A	ppm		94.7521155		100	0	0	2	2	0	95%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038730	CAL6	HC-METHANE-	CAL6		1/31/2022 11:51:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		430.232311		500	0	0	2	2	0	86%	85	115	0%	
Ethene	A	ppm		434.391804		500	0	0	2	2	0	87%	85	115	0%	
Methane	A	ppm		451.873058		500	0	0	2	2	0	90%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038731	CAL7	HC-METHANE-	CAL7		1/31/2022 12:02:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		921.191920		1000	0	0	2	2	0	92%	85	115	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15038732	CCV	HC-METHANE-	CCV		1/31/2022 12:08:	1	R374783		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Ethane	A	ppm		101.850441		100	0	0	2	2	0	102%	85	115	0%	
Ethene	A	ppm		102.540441		100	0	0	2	2	0	103%	85	115	0%	
Methane	A	ppm		103.796714		100	0	0	2	2	0	104%	85	115	0%	

Inst ID FID-HeadSpace

Blank,cts	STD ID	Sample	Response	Date/Time	Run Id
0	#12173	1000000			
Decimal	Conc ppm	Area Counts	Factor		
Amnt, Injtd/ Equivalent 300uL					
0.0000025	2.5	4459	1783.6	1/31/2022 11:22	19265
0.000005	5	7681	1536.2	1/31/2022 11:28	19266
0.00001	10	16564	1656.4	1/31/2022 11:34	19267
0.00005	50	81696	1633.92	1/31/2022 11:40	19268
0.0001	100	148153	1481.53	1/31/2022 11:45	19269
0.0005	500	706542	1413.084	1/31/2022 11:51	19270
0.001	1000	1440362	1440.362	1/31/2022 12:02	19271

StdDev 133.7196  
Avg RF 1563.585  
%RSD 8.552118



Methane MW= 16.04

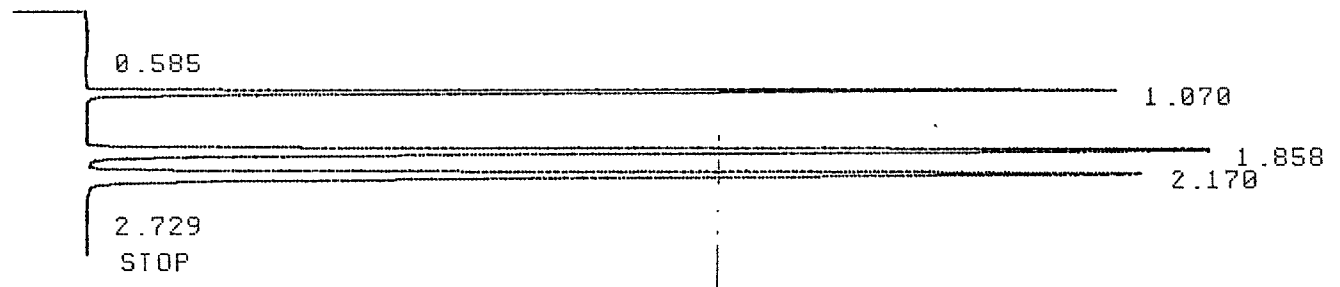
[PPM]	Calculated Recoveries		
	Area Cnts	PPM	% recovery
2.5	4459	2.851779464	114.07%
5	7681	4.912428361	98.25%
10	16564	10.59360283	105.94%
50	81696	52.24915341	104.50%
100	148153	94.75211547	94.75%
500	706542	451.873058	90.37%
1000	1440362	921.1919201	92.12%

Sample	Area Count	Dilution	Temp (°C)	Concentration (ppm)	Date/Time	Analyst	Sample	Test Code	Analyte
CCV	162019	1	20	103.6201967	1/31/2022 10:32	jdw	CCV	HC-METHANE-CCV	Methane
CCV	321986	1	20	103.5193612	1/31/2022 10:32	jdw	CCV	HC-METHANE-CCV	Ethane
CCV	325807	1	20	103.057616	1/31/2022 10:32	jdw	CCV	HC-METHANE-CCV	Ethane
LCS	157624	1	20	100.8093488	1/31/2022 10:37	jdw	LCS	HC-METHANE-CCV	Methane
LCS	309612	1	20	99.54108708	1/31/2022 10:37	jdw	LCS	HC-METHANE-CCV	Ethane
LCS	313898	1	20	99.29062161	1/31/2022 10:37	jdw	LCS	HC-METHANE-CCV	Ethane
MBLK	432	1	20	0.27628812	1/31/2022 11:15	jdw	MBLK	HC-METHANE-CCV	Methane
MBLK	0	1	20	0	1/31/2022 11:15	jdw	MBLK	HC-METHANE-CCV	Ethane
MBLK	0	1	20	0	1/31/2022 11:15	jdw	MBLK	HC-METHANE-CCV	Ethane
CAL1	4459	1	20	2.851779464	1/31/2022 11:22	jdw	CAL1	HC-METHANE-CCV	Methane
CAL1	8492	1	20	2.73020074	1/31/2022 11:22	jdw	CAL1	HC-METHANE-CCV	Ethane
CAL1	8589	1	20	2.716828871	1/31/2022 11:22	jdw	CAL1	HC-METHANE-CCV	Ethane
CAL2	7681	1	20	4.912428361	1/31/2022 11:28	jdw	CAL2	HC-METHANE-CCV	Methane
CAL2	16236	1	20	5.219917477	1/31/2022 11:28	jdw	CAL2	HC-METHANE-CCV	Ethane
CAL2	16815	1	20	5.318835425	1/31/2022 11:28	jdw	CAL2	HC-METHANE-CCV	Ethane
CAL3	16564	1	20	10.59360283	1/31/2022 11:34	jdw	CAL3	HC-METHANE-CCV	Methane
CAL3	32125	1	20	10.32827352	1/31/2022 11:34	jdw	CAL3	HC-METHANE-CCV	Ethane
CAL3	32081	1	20	10.14769904	1/31/2022 11:34	jdw	CAL3	HC-METHANE-CCV	Ethane
CAL4	81696	1	20	52.24915341	1/31/2022 11:40	jdw	CAL4	HC-METHANE-CCV	Methane
CAL4	160297	1	20	51.53591474	1/31/2022 11:40	jdw	CAL4	HC-METHANE-CCV	Ethane
CAL4	162385	1	20	51.36479873	1/31/2022 11:40	jdw	CAL4	HC-METHANE-CCV	Ethane
CAL5	148153	1	20	94.75211547	1/31/2022 11:45	jdw	CAL5	HC-METHANE-CCV	Methane
CAL5	292354	1	20	93.99259386	1/31/2022 11:45	jdw	CAL5	HC-METHANE-CCV	Ethane
CAL5	296746	1	20	93.86518806	1/31/2022 11:45	jdw	CAL5	HC-METHANE-CCV	Ethane
CAL6	706542	1	20	451.873058	1/31/2022 11:51	jdw	CAL6	HC-METHANE-CCV	Methane
CAL6	1338192	1	20	430.2323114	1/31/2022 11:51	jdw	CAL6	HC-METHANE-CCV	Ethane
CAL6	1373289	1	20	434.3918039	1/31/2022 11:51	jdw	CAL6	HC-METHANE-CCV	Ethane
CAL7	1440362	1	20	921.1919201	1/31/2022 12:02	jdw	CAL7	HC-METHANE-CCV	Methane
CCV	162295	1	20	103.7967141	1/31/2022 12:08	jdw	CCV	HC-METHANE-CCV	Methane
CCV	316795	1	20	101.8504408	1/31/2022 12:08	jdw	CCV	HC-METHANE-CCV	Ethane
CCV	324172	1	20	102.5404411	1/31/2022 12:08	jdw	CCV	HC-METHANE-CCV	Ethane

Calibration: Methane, Ethane, Ethene  
JDW  
1/31/2022

\*ID 12173-500X-CCU

\* RUN #19262      JAN 31, 2022    10:32:58  
START



RUN# 19262      JAN 31, 2022    10:32:58

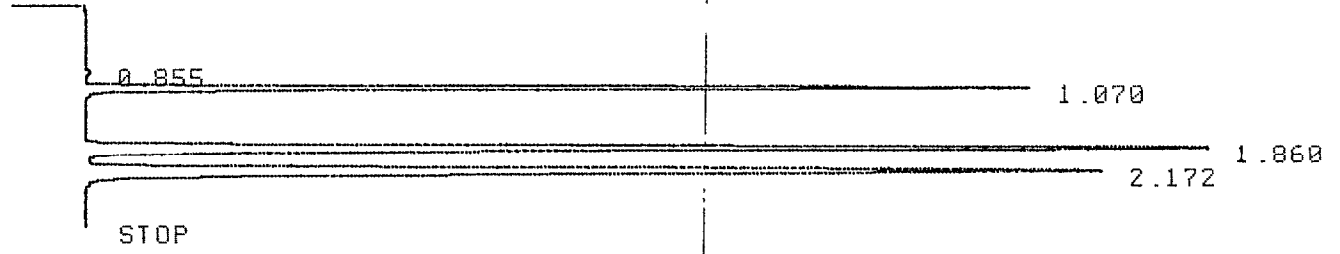
IDENTIFIER : 12173-500X-C  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.585	553	PP	.073	.06822
1.070	162019	PB	.046	19.98594
1.858	325807	UU	.076	40.19010
2.170	321986	UU	.089	39.71875
2.729	300	PV	.045	.03701

TOTAL AREA= 810665  
MUL FACTOR=1.00000E+00

\*ID 10711-LCS

\* RUN #19263      JAN 31, 2022    10:37:36  
START



RUN# 19263      JAN 31, 2022    10:37:36

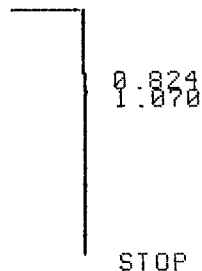
IDENTIFIER : 10711-LCS  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
.855	975	PV	.051	.12466
1.070	157624	PB	.049	20.15372
1.860	313898	BB	.076	40.13482
2.172	309612	BV	.089	39.58680

TOTAL AREA= 782109  
MUL FACTOR=1.00000E+00

\*ID MB

\* RUN #19264      JAN 31, 2022 11:15:04  
START



RUN# 19264                      JAN 31, 2022 11:15:04

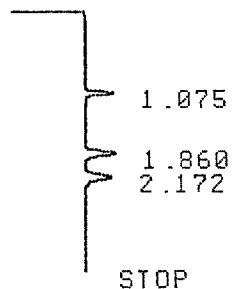
IDENTIFIER : MB  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	432	UU	.049	100.00000

TOTAL AREA= 432  
MUL FACTOR=1.0000E+00

\*ID CAL1-2.5PPM

\* RUN #19265      JAN 31, 2022 11:22:01  
START



RUN# 19265                      JAN 31, 2022 11:22:01

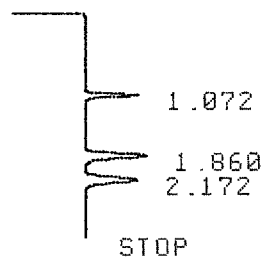
IDENTIFIER : CAL1-2.5PPM  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.075	4891	UU	.048	22.26014
1.860	8589	UP	.079	39.09067
2.172	8492	UP	.091	38.64918

TOTAL AREA= 21972  
MUL FACTOR=1.0000E+00

\*ID CAL2-5PPM

\* RUN #19266      JAN 31, 2022    11:28:46  
START



RUN# 19266                      JAN 31, 2022    11:28:46

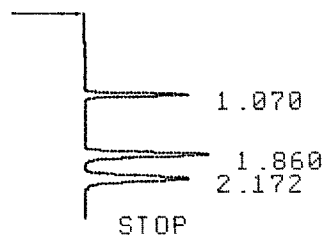
IDENTIFIER : CAL2-5PPM  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.072	8113	BP	.045	19.70897
1.860	16815	PV	.078	40.84880
2.172	16236	UP	.089	39.44222

TOTAL AREA= 41164  
MUL FACTOR=1.0000E+00

\*ID CAL3-10PPM

\* RUN #19267      JAN 31, 2022    11:34:40  
START



RUN# 19267                      JAN 31, 2022    11:34:40

IDENTIFIER : CAL3-10PPM  
AREA%

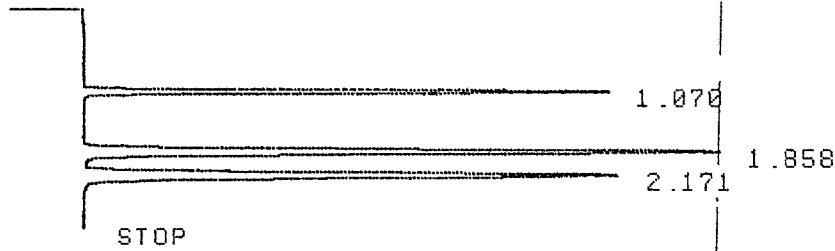
RT	AREA	TYPE	WIDTH	AREA%
1.070	16996	PP	.047	20.93052
1.860	32081	PV	.075	39.50765
2.172	32125	UP	.089	39.56184

TOTAL AREA= 81202  
MUL FACTOR=1.0000E+00



\*ID CAL4-50PPM

\* RUN #19268      JAN 31, 2022    11:40:12  
START



RUN# 19268                      JAN 31, 2022    11:40:12

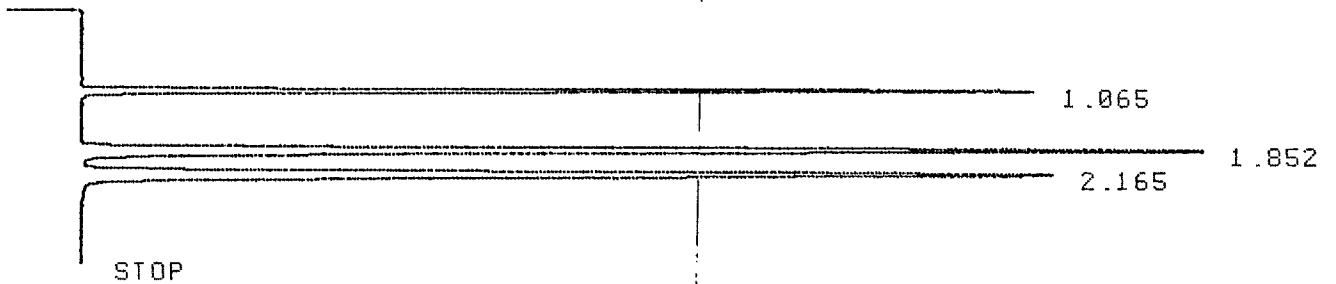
IDENTIFIER : CAL4-50PPM  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.070	82128	PB	.045	20.28803
1.858	162385	PB	.075	40.11387
2.171	160297	BB	.088	39.59808

TOTAL AREA= 404810  
MUL FACTOR=1.0000E+00

\*ID CAL5-100PPM

\* RUN #19269      JAN 31, 2022    11:45:49  
START



RUN# 19269                      JAN 31, 2022    11:45:49

IDENTIFIER : CAL5-100PPM  
AREA%

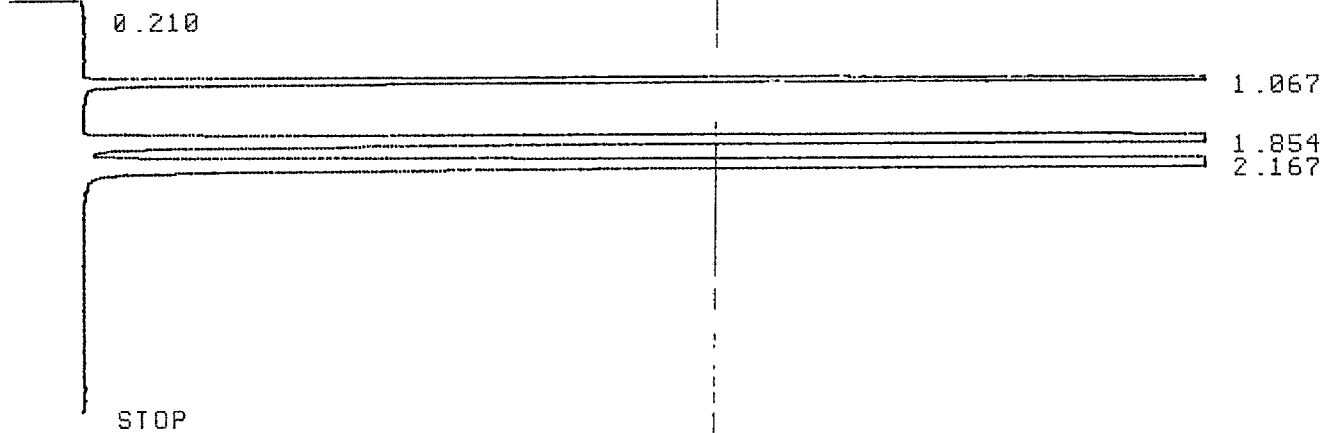
RT	AREA	TYPE	WIDTH	AREA%
1.065	148585	PB	.046	20.14206
1.852	296746	UU	.075	40.22666
2.165	292354	UP	.088	39.63126

TOTAL AREA= 737685  
MUL FACTOR=1.0000E+00

~~\*ID CAL5-500PPM~~ *30w*  
*1/31/2022*

\*ID CAL6-500PPM

\* RUN #19270      JAN 31, 2022    11:51:57  
START



RUN# 19270      JAN 31, 2022    11:51:57

IDENTIFIER : CAL6-500PPM  
AREA%

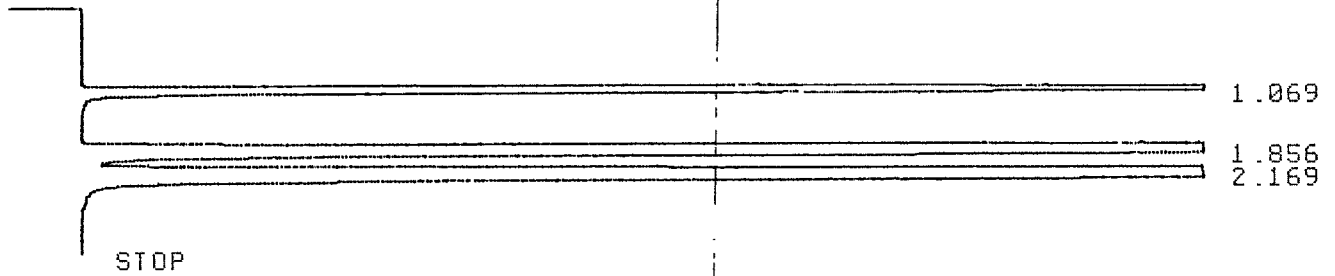
RT	AREA	TYPE	WIDTH	AREA%
1.067	706974	BB	.047	20.68110
1.854	1373289	PB	.078	40.17278
2.167	1338192	BB	.091	39.14610

TOTAL AREA=3418454  
MUL FACTOR=1.0000E+00

\*

\*ID CAL7-1000PPM

\* RUN #19271      JAN 31, 2022 12:02:20  
START



RUN# 19271      JAN 31, 2022 12:02:20

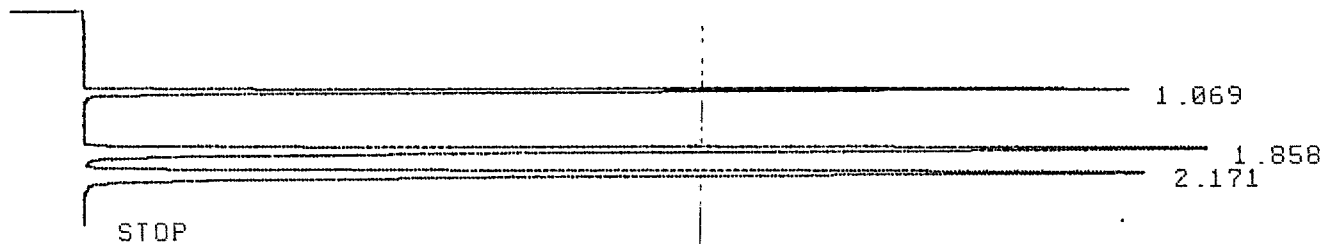
IDENTIFIER : CAL7-1000PPM  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.069	1440794	PB	.048	22.10318
1.856	2645432	PB	.082	40.58349
2.169	2432269	BB	.097	37.31334

TOTAL AREA=6518493  
MUL FACTOR=1.0000E+00

\*ID 12173-500X-CCU

\* RUN #19272      JAN 31, 2022 12:08:57  
START



RUN# 19272      JAN 31, 2022 12:08:57

IDENTIFIER : 12173-500X-C  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.069	162295	PB	.045	20.20449
1.858	324172	PB	.075	40.35604
2.171	316795	BB	.088	39.43858

TOTAL AREA= 803262  
MUL FACTOR=1.0000E+00

# Energy Laboratories Inc

# ANALYTICAL RUN Summary

23-Feb-22

Run ID FID-HEADSPACE\_220223A

**Run Start Date:** 2/23/2022  
**Analyst:** Jeff Whitmer  
**Ical:**  
**Column ID:** porapak Q  
**Comments:** See Preservation Comment column for sample pH; thermometer used for temp:S94278.

Instrument ID	Description
1000_SGE_041819	1000 mL SGE Syringe _ Gas Tight

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
10711	HC-Methane-W-CCV	0.3	ml			lcs	8/9/2022
12173	HC-Methane-W-CCV	0.3	ml			CCV	11/23/2023

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049607	CCV	HC-METHANE-	CCV		2/23/2022 8:47:0	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		98.0029778		100	0	0	2	2	0	98%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049608	LCS	HC-METHANE-	LCS		2/23/2022 8:56:0	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		101.113777		100	0	0	2	2	0	101%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049609	LCSD	HC-METHANE-	LCSD		2/23/2022 9:02:0	1	R375084		0	2E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		100.550329		100	0	101.11378	2	2	0	101%	85	115	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049610	MBLK	HC-METHANE-	MBLK		2/23/2022 10:32:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.001	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049611	B22021435-001I	HC-METHANE-	SAMP		2/23/2022 10:38:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049612	B22021435-005	HC-METHANE-	SAMP		2/23/2022 10:45:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049613	B22021435-006I	HC-METHANE-	SAMP		2/23/2022 10:51:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049614	B22021435-011	HC-METHANE-	SAMP		2/23/2022 11:04:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049615	B22021435-012I	HC-METHANE-	SAMP		2/23/2022 11:09:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049616	B22021435-016	HC-METHANE-	SAMP		2/23/2022 11:15:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049617	B22021435-017I	HC-METHANE-	SAMP		2/23/2022 11:36:	78	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.34540631			0	0	0.054912	0.156	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049618	B22021435-017I	HC-METHANE-	DUP		2/23/2022 11:48:	78	R375084		0	2E+07						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.33592558			0	0.3454063	0.054912	0.156	0	0%	0	0	3%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049619	B22021435-021	HC-METHANE-	SAMP		2/23/2022 11:59:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049620	B22021435-022I	HC-METHANE-	SAMP		2/23/2022 12:05:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049621	B22021435-026	HC-METHANE-	SAMP		2/23/2022 12:11:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049622	B22021435-027I	HC-METHANE-	SAMP		2/23/2022 12:16:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049623	B22021435-031	HC-METHANE-	SAMP		2/23/2022 12:23:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049624	B22021435-032I	HC-METHANE-	SAMP		2/23/2022 12:32:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0.00216084			0	0	0.000704	0.002	0	0%	0	0	0%	
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049625	B22021435-036	HC-METHANE-	SAMP		2/23/2022 12:43:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	mg/L		0			0	0	0.000704	0.002	0	0%	0	0	0%	U
Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist					
15049626	CCV	HC-METHANE-	CCV		2/23/2022 12:48:	1	R375084		0	0						
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Methane	A	ppm		100.762022		100	0	0	2	2	0	101%	85	115	0%	

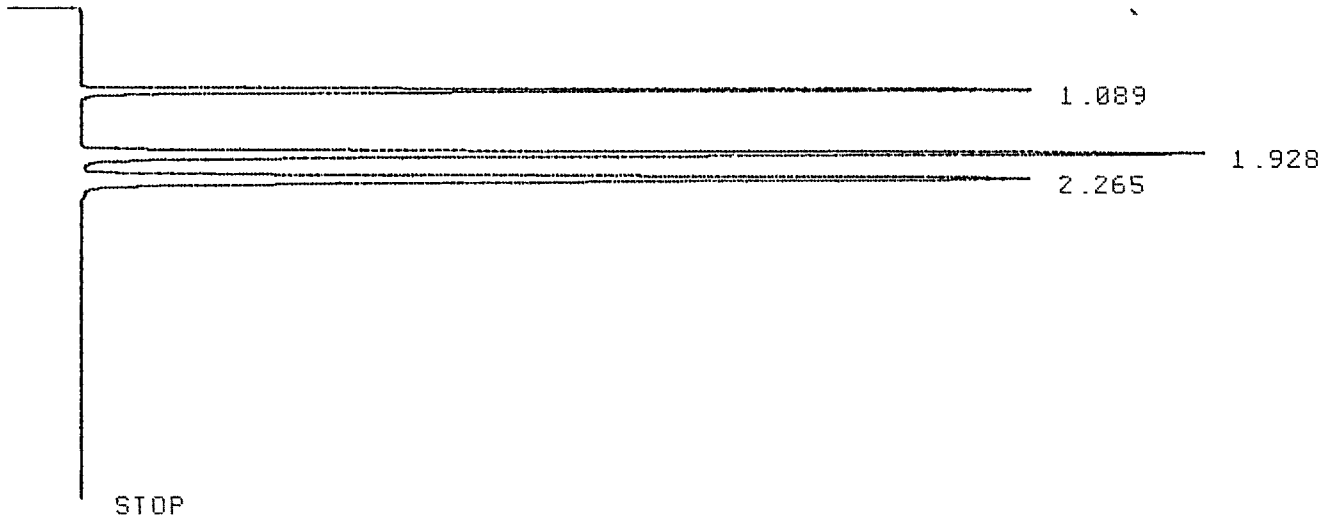
Sample ID	Area Count	Dilution Factor	Temperature (C)	Concentration	Date/Time Analyzed	Analyst	Sample Type	Test Code	Analyte	Headspace Volume	Liquid Volume
CCV	153236	1	19	98.00297777	2/23/2022 8:47	jdw	CCV	HC-METHANE-CCV	Methane		
LCS	158100	1	19	101.1137773	2/23/2022 8:56	jdw	LCS	HC-METHANE-CCV	Methane		
LCSD	157219	1	19	100.5503287	2/23/2022 9:02	jdw	LCSD	HC-METHANE-CCV	Methane		
MBLK	937	1	19	0.000139914	2/23/2022 10:32	jdw	MBLK	HC-METHANE-W	Methane	10	32
B22021435-001I	893	1	19	-6.57E-06	2/23/2022 10:38	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-005A	992	1	19	8.21E-06	2/23/2022 10:45	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-006I	1313	1	19	5.61E-05	2/23/2022 10:51	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-011A	830	1	19	-1.60E-05	2/23/2022 11:04	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-012I	793	1	19	-2.15E-05	2/23/2022 11:09	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-016A	887	1	19	-7.47E-06	2/23/2022 11:15	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-017I	30593	78	19	0.345406313	2/23/2022 11:36	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-017IDUP	29779	78	19	0.335925576	2/23/2022 11:48	jdw	DUP	HC-METHANE-W	Methane	10	32
B22021435-021A	894	1	19	-6.42E-06	2/23/2022 11:59	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-022I	1209	1	19	4.06E-05	2/23/2022 12:05	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-026A	1025	1	19	1.31E-05	2/23/2022 12:11	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-027I	1448	1	19	7.63E-05	2/23/2022 12:16	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-031A	1246	1	19	4.61E-05	2/23/2022 12:23	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-032I	15408	1	19	0.002160835	2/23/2022 12:32	jdw	SAMP	HC-METHANE-W	Methane	10	32
B22021435-036A	839	1	19	-1.46E-05	2/23/2022 12:43	jdw	SAMP	HC-METHANE-W	Methane	10	32
CCV	157550	1	19	100.7620216	2/23/2022 12:48	jdw	CCV	HC-METHANE-CCV	Methane		



JDW  
2/23/2022

\*ID 12173-500X-CCU

\* RUN #19375      FEB 23, 2022    08:47:44  
START



RUN# 19375      FEB 23, 2022    08:47:44

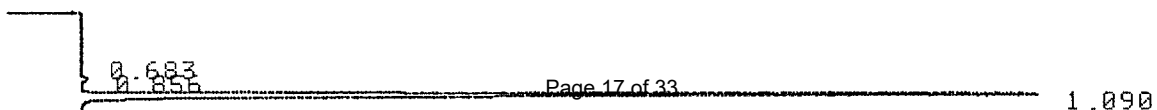
IDENTIFIER : 12173-500X-C  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.089	153236	PB	.047	20.13982
1.928	306507	PB	.079	40.28422
2.265	301118	BB	.093	39.57595

TOTAL AREA= 760861  
MUL FACTOR=1.0000E+00

ID 10711-LCS JDW 2/23/2022

\* RUN #19376      FEB 23, 2022    08:56:30  
START



STOP

RUN# 19376 FEB 23, 2022 08:56:30

IDENTIFIER : ~~42173 500H C~~ 10711-LCS SDW 2/23/2022

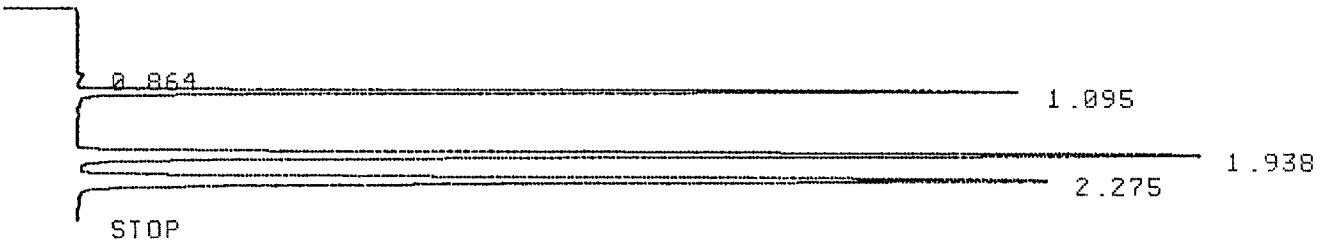
RT	AREA	TYPE	WIDTH	AREA%
.683	356	PU	.045	.04527
.856	1300	UP	.053	.16530
1.090	158100	PB	.048	20.10312
1.933	316330	PU	.079	40.22278
2.270	310359	UU	.093	39.46354

TOTAL AREA= 786445  
MUL FACTOR=1.0000E+00

\*ID 10711-LCSD

\* RUN #19377 FEB 23, 2022 09:02:08

START



RUN# 19377 FEB 23, 2022 09:02:08

IDENTIFIER : 10711-LCSD

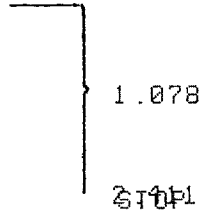
RT	AREA	TYPE	WIDTH	AREA%
.864	1523	UP	.064	.19569
1.095	157219	PB	.049	20.20059
1.938	313160	PB	.079	40.23699
2.275	306387	BP	.093	39.36675

TOTAL AREA= 778289  
MUL FACTOR=1.0000E+00

\*

\*ID MB

\* RUN #19378 FEB 23, 2022 10:32:37  
START



RUN# 19378 FEB 23, 2022 10:32:37

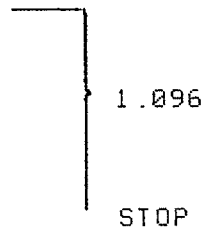
IDENTIFIER : MB  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.078	937	PP	.066	68.39418
2.411	433	I PP	.073	31.60583

TOTAL AREA= 1370  
MUL FACTOR=1.0000E+00

\*ID 1435-1I

\* RUN #19379 FEB 23, 2022 10:38:32  
START



RUN# 19379 FEB 23, 2022 10:38:32

IDENTIFIER : 1435-1I  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.096	893	PP	.063	100.00000

TOTAL AREA= 893  
MUL FACTOR=1.0000E+00

\*ID 1435-5A

\* RUN #19380            FEB 23, 2022  10:45:22  
START

┌───┐  
│    │  
│    │  
│    │  
└───┘ } 1.088  
      │  
      └───┘ STOP

RUN# 19380            FEB 23, 2022  10:45:22

IDENTIFIER : 1435-5A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.088	992	PU	.061	100.00000

TOTAL AREA=        992  
MUL FACTOR=1.0000E+00

\*ID 1435-6I

\* RUN #19381            FEB 23, 2022  10:51:12  
START

┌───┐  
│    │  
│    │  
│    │  
└───┘ } 1.092  
      │  
      └───┘ : 2.759  
          STOP

RUN# 19381            FEB 23, 2022  10:51:12

IDENTIFIER : 1435-6I

AREA%

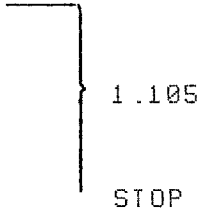
RT	AREA	TYPE	WIDTH	AREA%
1.092	1313	PU	.055	100.00000

TOTAL AREA=        1313  
MUL FACTOR=1.0000E+00

\*  
\*

\*ID 1435-11A

\* RUN #19382            FEB 23, 2022  11:04:42  
START



RUN# 19382                    FEB 23, 2022  11:04:42

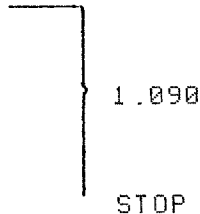
IDENTIFIER : 1435-11A  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.105	830	BP	.052	100.00000

TOTAL AREA=        830  
MUL FACTOR=1.0000E+00

\*ID 1435-12I

\* RUN #19383            FEB 23, 2022  11:09:58  
START



RUN# 19383                    FEB 23, 2022  11:09:58

IDENTIFIER : 1435-12I  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.090	793	PP	.060	100.00000

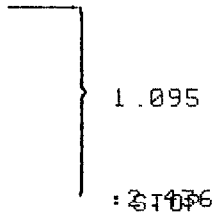
TOTAL AREA=        793  
MUL FACTOR=1.0000E+00

\*

\*ID 1435-16A

\* RUN #19384 FEB 23, 2022 11:15:52

START



RUN# 19384 FEB 23, 2022 11:15:52

IDENTIFIER : 1435-16A

AREA%

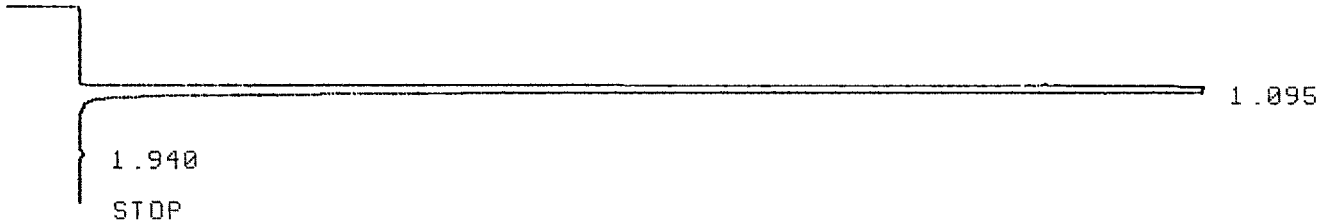
RT	AREA	TYPE	WIDTH	AREA%
1.095	887	PV	.060	100.00000

TOTAL AREA= 887  
MUL FACTOR=1.0000E+00

\*ID 1435-17I

\* RUN #19385 FEB 23, 2022 11:21:39

START



RUN# 19385 FEB 23, 2022 11:21:39

IDENTIFIER : 1435-17I

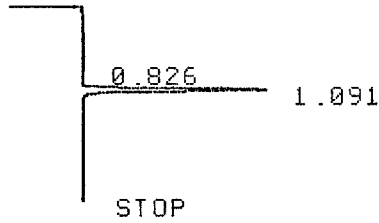
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.095	2075854	PB	.052	99.94899
1.940	1059	UP	.069	.05099

TOTAL AREA=2076913  
MUL FACTOR=1.0000E+00

\*ID 1435-17I-78X

\* RUN #19386      FEB 23, 2022  11:36:32  
START



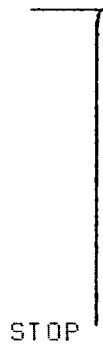
RUN# 19386              FEB 23, 2022  11:36:32

IDENTIFIER : 1435-17I-78X  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.091	30593	UU	.048	100.00000

TOTAL AREA= 30593  
MUL FACTOR=1.0000E+00

\* PLOT



\* PLOT



\*

\*ID 1435-17I-78XDUP

\* RUN #19387      FEB 23, 2022 11:48:39  
START



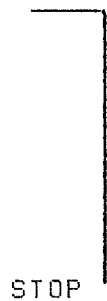
RUN# 19387                      FEB 23, 2022 11:48:39

IDENTIFIER : 1435-17I-78X  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.093	29779	PU	.047	100.00000

TOTAL AREA= 29779  
MUL FACTOR=1.0000E+00

\* PLOT



\*



\*ID 1435-21A

\* RUN #19388      FEB 23, 2022 11:59:45  
START

┌───┐  
│ │  
│ │ } 1.086  
│ │ }  
│ │ } 2.101  
│ │ }  
└───┘ STOP

RUN# 19388      FEB 23, 2022 11:59:45

IDENTIFIER : 1435-21A  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.086	894	PP	.058	69.35610
2.101	395	PU	.053	30.64390

TOTAL AREA= 1289  
MUL FACTOR=1.0000E+00

\*ID 1435-22I

\* RUN #19389      FEB 23, 2022 12:05:34  
START

┌───┐  
│ │  
│ │ } 1.104  
│ │ }  
└───┘ STOP

RUN# 19389      FEB 23, 2022 12:05:34

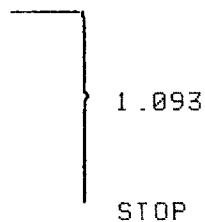
IDENTIFIER : 1435-22I  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.104	1209	UP	.078	100.00000

TOTAL AREA= 1209  
MUL FACTOR=1.0000E+00

\*ID 1435-26A

\* RUN #19390      FEB 23, 2022 12:11:04  
START



RUN# 19390      FEB 23, 2022 12:11:04

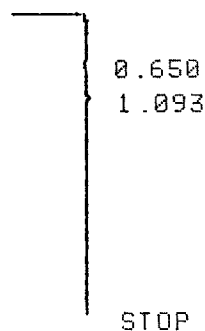
IDENTIFIER : 1435-26A  
AREA%

RT	AREA TYPE	WIDTH	AREA%
1.093	1025 PU	.064	100.00000

TOTAL AREA= 1025  
MUL FACTOR=1.0000E+00

\*ID 1435-27I

\* RUN #19391      FEB 23, 2022 12:16:36  
START



RUN# 19391      FEB 23, 2022 12:16:36

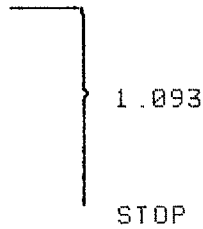
IDENTIFIER : 1435-27I  
AREA%

RT	AREA TYPE	WIDTH	AREA%
.650	571 PU	.051	28.28133
1.093	1448 UU	.073	71.71866

TOTAL AREA= 2019  
MUL FACTOR=1.0000E+00

\*  
\*ID 1435-31A

\* RUN #19392      FEB 23, 2022 12:23:06  
START



RUN# 19392      FEB 23, 2022 12:23:06

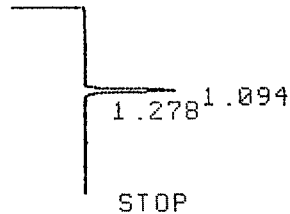
IDENTIFIER : 1435-31A  
AREA%

RT	AREA TYPE	WIDTH	AREA%
1.093	1246 PU	.064	100.00000

TOTAL AREA= 1246  
MUL FACTOR=1.0000E+00

\*ID 1435-32I

\* RUN #19393      FEB 23, 2022 12:32:15  
START



RUN# 19393      FEB 23, 2022 12:32:15

IDENTIFIER : 1435-32I  
AREA%

RT	AREA TYPE	WIDTH	AREA%
1.094	15408 UU	.049	97.61782
1.278	376 UP	.039	2.38216

TOTAL AREA= 15784  
MUL FACTOR=1.0000E+00

STOP

\*ID 1435-36A

\* RUN #19394 FEB 23, 2022 12:43:11

START

┌───┐  
│ │  
│ │ } 1.100  
│ │  
└───┘  
STOP

RUN# 19394 FEB 23, 2022 12:43:11

IDENTIFIER : 1435-36A

AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.100	839	UP	.056	100.00000

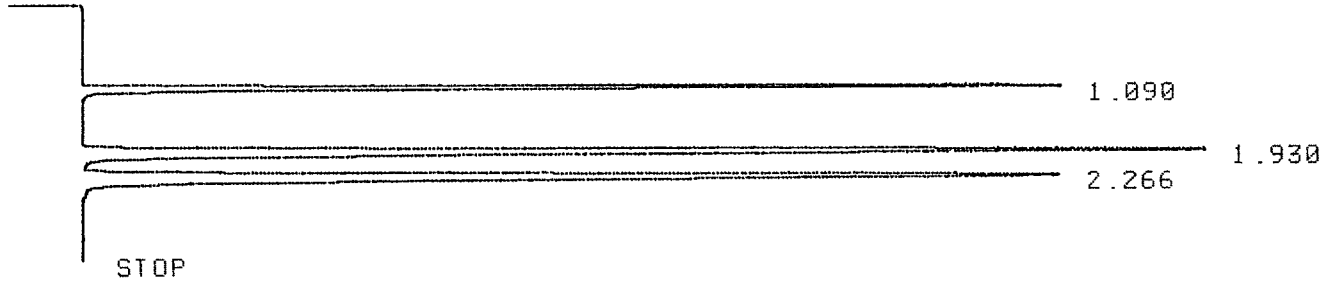
TOTAL AREA= 839

MUL FACTOR=1.0000E+00

\*

\*ID 12173-500X-CCU

\* RUN #19395      FEB 23, 2022 12:48:41  
START



RUN# 19395      FEB 23, 2022 12:48:41

IDENTIFIER : 12173-500X-C  
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.090	157550	PB	.047	20.07554
1.930	315979	PU	.079	40.26307
2.266	311257	UB	.093	39.66138

TOTAL AREA= 784786  
MUL FACTOR=1.0000E+00

\*

# Energy Laboratories Inc

# Spike LOG

Standard ID: 12173  
 Standard Name: HC-Methane-W-CCV  
 Date Prepared: 11/22/2019  
 Date Expires: 11/23/2023  
 Department: GAS  
 Vendor: Matheson  
 Lot Number: 109-96-04454  
 Balance ID:

Type: Primary  
 BY:  
 Status: New

Comments: CCV Gas Standard for Methane, Ethene, Ethane: 50000ppm stock diluted from 100 - 500ppm with Helium for CCV. Diluted from 2.5ppm - 1000ppm with Helium for Calibration.

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
3 Multi-Component Gas Standard in Ni	12173		mL	11/23

Final Volume: mL

Stock Source

Base Units

Amount Added

Analyses

CAS

Conc: ug/mL

MATHESON TRI-GAS INC  
1650 Enterprise Pkwy  
Twinsburg, OH 44087  
1-215-648-4000

## CERTIFICATE OF ANALYSIS

Energy Laboratories Inc  
1120 South 27th Street  
Billings, MT 59101

Ref Po# 3008099

### 14 LITER DISPOSABLE

LOT NUMBER: 109-96-04454

COMPONENT

CONCENTRATION

methane	50010	ppm
ethane	50030	ppm
ethylene	50030	ppm
nitrogen	Bal	

ITEM NUMBER: GMT2685284TC

CGA: 160

PSIG: 240

FILL DATE: 11/22/19

EXPIRATION DATE: 11/23/23

ID #: 12173

Opened: \_\_\_\_\_

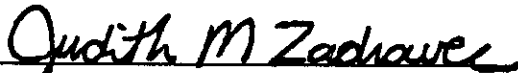
3 Multi-Component Gas Standard in Nitrogen

Expires: 11/23/2023

Rec'd: 12/3/2019

Energy Laboratories Inc 1120 So. 27th Street  
Billings MT 59107

Above are the results of the analysis you requested, as reported by our laboratory. Results are in mole percent, unless otherwise indicated. Mixture accuracy is  $\pm 2\%$ . NIST traceable by weights or gaseous standards.



Judy Zadravec, Chemist

10/19/2018

DATE

# Energy Laboratories Inc

# Spike LOG

Standard ID: 10711  
 Standard Name: HC-Methane-W-CCV  
 Date Prepared: 8/8/2018  
 Date Expires: 8/9/2022  
 Department: GAS  
 Vendor: Matheson  
 Lot Number: 109-86-03507  
 Balance ID:

Type: Primary  
 BY:  
 Status: New

Comments: LCS Gas Standard for Methane, Ethene, Ethane: 100ppm per standard used undiluted for LCS

---

Chemical / Solvent Used	BottleNo	Amt	Units	Exp
3 Multi-Component Gas Standard in Ni	10711		mL	8/9/22

Final Volume: mL

Stock Source

Base Units

Amount Added

Analyses

CAS

Conc: ug/mL



MATHESON TRI-GAS INC  
1650 Enterprise Pkwy  
Twinsburg, OH 44087  
1-215-648-4000

## CERTIFICATE OF ANALYSIS

Energy Laboratories Inc  
1120 South 27th Street  
Billings, MT 59101

Ref Po# 3005062

### 14 LITER DISPOSABLE

LOT NUMBER: 109-86-03507

**COMPONENT**

**CONCENTRATION**

methane	100.0	ppm
ethane	100.0	ppm
ethylene	100.0	ppm
nitrogen	Bal	

ITEM NUMBER: GMT2677328TC

CGA: 160

PSIG: 240

FILL DATE: 08/08/18

EXPIRATION DATE: 08/09/22

Above are the results of the analysis you requested, as reported by our laboratory. Results are in mole percent, unless otherwise indicated. Mixture accuracy is  $\pm 2\%$ . NIST traceable by weights or gaseous standards.

*Judith M Zadravec*

Judy Zadravec, Chemist

8/14/2018

DATE

ID #: 10711  
Opened: \_\_\_\_\_  
3 Multi-Component Gas Standard in Nitrogen  
Expires: 8/9/2022  
Rec'd: 8/27/2018  
Energy Laboratories Inc 1120 So. 27th Street  
Billings MT 59107