

Q3 2020

SVE

Report

From: [Smith, Cory, EMNRD](#)
To: ["Jennifer Deal"](#)
Cc: [Powell, Brandon, EMNRD](#); [Hernandez, Emily, EMNRD](#)
Subject: RE: Bell Federal Gas Com B 1
Date: Tuesday, November 17, 2020 2:36:00 PM

Jennifer,

I have processed this report, thank you for adding the requested sampling data. If possible please also include both oxy and CO2 on your tables for future reports.

The report will be placed into the online Incident file.

Cory Smith
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 115
cory.smith@state.nm.us

From: Jennifer Deal <jdeal@hilcorp.com>
Sent: Monday, October 5, 2020 3:04 PM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>; Powell, Brandon, EMNRD <Brandon.Powell@state.nm.us>
Subject: [EXT] Bell Federal Gas Com B 1

Good afternoon,

Please see the attached SVE report for the Bell Federal Gas Com B 1 regarding remediation activities during the 3rd quarter of 2020. Incident #NCS1729355513. Please contact me if you have any questions.

Thank you,

Jennifer Deal
Environmental Specialist
Hilcorp Energy – L48 West
jdeal@hilcorp.com
382 Road 3100
Aztec, NM 87410
Office: (505) 324-5128
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October 5, 2020

Mr. Cory Smith
New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

11/17/2020 Reviewed

RE: 3rd Quarter-2020 - Solar SVE System Update
Hilcorp Energy Company
Bell Federal GC B #1
San Juan County, New Mexico
API # 30-045-09772
Incident # NCS1729355513

Dear Mr. Smith:

Hilcorp Energy Company (Hilcorp) presents the following quarterly summary report discussing the solar soil vapor extraction (SVE) system performance at the Bell Federal GC B #1 natural gas production well (Site). The solar SVE system was installed on January 16, 2018, to remediate subsurface soil impacts following an act of vandalism, resulting in the release of approximately 58 barrels (bbl) of natural gas condensate. SVE installation, soil sampling, and delineation activities are summarized in earlier reports submitted to the New Mexico Oil Conservation Division (NMOCD) for each quarter of operation.

The solar SVE system consists of a 1/3 horsepower blower capable of producing 22 cubic feet per minute (cfm) at 29 inches of water column vacuum. The blower is powered by four 12-volt deep cycle batteries that are charged throughout the day via three solar panels with a nominal maximum power output of 915 watts. The blower runs off a timer that is scheduled to maximize runtime that coincides with the seasonally available solar recharge, typically 10 hours in the winter and 12 hours in the summer for Farmington, New Mexico. Between startup, January 16, 2018, and the last site visit on September 16, 2020, there have been 890 days of operation, with an estimated 11,653 total hours of available nominal daylight in which the solar SVE system should be in operation. Of the available runtime of 11,933 hours since installation, the system has an actual runtime of 10,933 hours, for an overall runtime efficiency of 93.8 percent (%). Below is a table of SVE runtime in comparison with nominal available daylight hours, per month, according to the National Oceanic and Atmospheric Administration's National Weather Service.

Time Period	January 16, 2018 to March 10, 2020	June 25, 2020 to July 31, 2020	August 1, 2020 to August 31, 2020	September 1, 2020 to September 16, 2020
Days	890	27	31	16
Avg. Nominal Daylight Hrs	12	14	13	12
Available Runtime Hrs	10,680	378	403	192

Total Available Daylight Runtime Hours 11,653

Actual Runtime Hours 10,933

% Runtime 93.8%



An initial air sample was collected on January 24, 2018, from the solar SVE system discharge exhaust stack. Subsequent air samples have been collected quarterly (Table 1) with the last sample collected on September 16, 2020. No air sample was collected during the second quarter of 2018, due to a change in operator from XTO Energy to Hilcorp, and no air sample was collected during the fourth quarter 2018 due to additional delineation in January 2019.

Samples were collected in Tedlar® bags and submitted to Pace Analytical Laboratory of Mount Juliet, TN for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (EPA) Method 8021, and total volatile petroleum hydrocarbons (TVPH) via EPA Method 8015. In addition, a full list of volatile organic compounds (VOCs) by EPA method 8260, including oxygen and carbon dioxide were analyzed. Laboratory analytical results are summarized in Table 1, with complete laboratory reports included as Attachment 1. Overall benzene concentrations have decreased since the solar SVE system installation from 280 micrograms per liter (µg/L) to 186 µg/L.

Since the solar SVE system installation, a total of approximately 56.9 gallons of liquid phase separated hydrocarbons (PSH) have been recovered from the SVE wells and liquid-vapor separator tank. Based on the air sample data collected to date, the estimated mass air emissions were calculated using air sample analytical results and exhaust flowrates (Table 2). The impacted mass source removal via the solar SVE system to date is an estimated 13,944 pounds of TVPH. Including the PSH and vapor phase hydrocarbons, an estimated total of 2,306 gallons or 54.9 bbl of PSH and air equivalent condensate has been recovered to date.

During the upcoming 4th quarter 2020 of operations, Site visits will resume on a bi-weekly basis by Hilcorp and LTE personnel to ensure 90% runtime efficiency continues and that any maintenance issues are addressed. An air sample will be collected in the 4th quarter and analyzed for BTEX by EPA Method 8021 and TVPH by EPA Method 8015. An updated quarterly report with sample results, runtime, and mass source removal will be submitted.

If you have any questions or comments regarding this work plan, do not hesitate to contact me at (505) 324-5128 or at jdeal@hilcorp.com.

Sincerely,

Jennifer Deal
Environmental Specialist
Hilcorp Energy Company – L48 West
jdeal@hilcorp.com
505-324-5128 – Office
505-801-6517 – Cell

Attachments:

Table 1 – Air Sampling Analytical Results
Table 2 – Soil Vapor Extraction System Recovery & Emissions Summary
Attachment 1 – Analytical Laboratory Reports

TABLE 1
AIR SAMPLE ANALYTICAL RESULTS

BELL FEDERAL GAS COM B 1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Sample ID	Sample Date	Vapor (PPM)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
Bell Fed GC B#1 SVE	1/24/2018	1,435	280	200	5.0	38	30,000
Stack Exhaust 01	8/17/2018	1,873	160	380	21	320	18,000
SVE Effluent	3/22/2019	1,607	490	920	24	480	NA
Influent 6/18	6/18/2019	1,026	72	270	27	290	NA
Bell Fed 9/25	9/25/2019	1,762	220	480	21	440	35,000
Influent 12/16	12/16/2019	1,902	130	840	21	220	22,000
Bell Fed 3/10/20	3/10/2020	1,171	120	380	19	330	31,000
Influent 6/25	6/25/2020	978	180	430	25	480	45,000
SVE Air Sample	9/16/2020	1,766	186	433	18	497	32,100
Percent Change		23%	-34%	117%	260%	1208%	7%

Notes:

µg/L - micrograms per liter

NA - not analyzed

ppm - parts per million

TVPH - total volatile petroleum hydrocarbons

Italics denote that the laboratory method detection limit was used for calculations for a non-detected result

TABLE 2
SOIL VAPOR EXTRACTION SYSTEM RECOVERY & EMISSIONS SUMMARY

BELL FEDERAL GAS COM B 1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Sample Information and Lab Analysis

Date	Total Flow (cf)	Delta Flow (cf)	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
1/24/2018	164,400	164,400	1,435	280	200	5.0	38	30,000
8/17/2018	2,059,584	1,895,184	1,873	160	380	21	320	18,000
3/22/2019	6,554,304	4,494,720	1,607	490	920	24	480	NA
6/18/2019	12,009,024	5,454,720	1,026	72	270	27	290	NA
9/25/2019	17,848,704	5,839,680	1,762	220	480	21	440	35,000
12/16/2019	23,688,384	11,679,360	1,902	130	840	21	220	22,000
3/10/2020	34,415,184	10,726,800	1,171	120	380	19	330	31,000
6/25/2020	46,436,784	12,021,600	978	180	430	25	480	45,000
9/16/2020	58,244,532	11,807,748	1,766	186	433	18	497	32,100
Average			1,502	204	481	20	344	30,443

Vapor Extraction Calculations

Date	Flow Rate (cfm)	Benzene (lb/hr)	Toluene (lb/hr)	Ethyl-benzene (lb/hr)	Total Xylenes (lb/hr)	TVPH (lb/hr)
1/24/2018	40	0.0419	0.0299	0.0007	0.0057	4.4921
8/17/2018	12	0.0072	0.0171	0.0009	0.0144	0.8086
3/22/2019	16	0.0293	0.0551	0.0014	0.0287	NA
6/18/2019	16	0.0043	0.0162	0.0016	0.0174	NA
9/25/2019	14	0.0115	0.0252	0.0011	0.0231	1.8343
12/16/2019	16	0.0078	0.0503	0.0013	0.0132	1.3177
3/10/2020	20	0.009	0.0284	0.0014	0.0247	2.3209
6/25/2020	20	0.0135	0.0322	0.0019	0.0359	3.369
9/16/2020	18	0.0125	0.0292	0.0012	0.0335	2.1643
Average		19	0.0152	0.0315	0.0013	2.3296

Pounds Extracted Over Total Operating Time

Date	Total Operational Hours	Delta Hours	Benzene (lbs)	Toluene (lbs)	Ethyl-benzene (lbs)	Total Xylenes (lbs)	TVPH (lbs)	TVPH (tons)
1/24/2018	69	69	2.9	2.1	0.1	0.4	308	0.2
8/17/2018	2,632	2,564	18.4	43.8	2.4	36.9	2,073	1.0
3/22/2019	468	2,050	60.2	112.9	2.9	58.9	NA	NA
6/18/2019	5,682	1,000	4.3	16.2	1.6	17.4	NA	NA
9/25/2019	6,952	1,270	14.6	31.9	1.4	29.3	2,330	1.2
12/16/2019	7,943	991	7.7	49.9	1.2	13.1	1,306	0.7
3/10/2020	8,939	996	8.9	28.3	1.4	24.6	2,312	1.2
6/25/2020	10,018	1,079	14.5	34.7	2.0	38.8	3,635	1.8
9/16/2020	10,933	915	11.5	26.7	1.1	30.7	1,980	1.0
Avg. Mass Extracted Per Period			15.9	38.5	1.6	27.8	1992.0	1.0
Total Mass Extracted to Date			143.0	346.5	14.1	250.1	13944.3	7.1

NOTES

cf - cubic feet

cfm - cubic feet per minute

lbs - pounds

lb/hr - pounds per hour

µg/L - micrograms per hour

NA - not analyzed

PID - photoionization detector

ppm - parts per million

TVPH - total volatile petroleum hydrocarbons

Italics denote the laboratory method detection limit was used for calculations for a non-detected result

ANALYTICAL REPORT

September 29, 2020

Revised Report

HilCorp-Farmington, NM

Sample Delivery Group: L1262912
Samples Received: 09/17/2020
Project Number:
Description: Bell Federal Gas Com B 1
Site: BELL FEDERAL GAS COM B #1
Report To: Jennifer Deal
382 Road 3100
Aztec, NM 87410

Entire Report Reviewed By:



Olivia Studebaker
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Cp: Cover Page	1	¹ Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	² Tc
Cn: Case Narrative	4	
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SVE AIR SAMPLE L1262912-01	5	
Qc: Quality Control Summary	7	⁴ Cn
Volatile Organic Compounds (MS) by Method TO-15	7	⁵ Sr
Organic Compounds (GC) by Method D1946	11	
Gl: Glossary of Terms	12	⁶ Qc
Al: Accreditations & Locations	13	⁷ Gl
Sc: Sample Chain of Custody	14	⁸ Al
		⁹ Sc

SVE AIR SAMPLE L1262912-01 Air

Collected by
K. Hoekstra

Collected date/time
09/16/20 11:00

Received date/time
09/17/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1544680	8000	09/17/20 22:00	09/17/20 22:00	GLN	Mt. Juliet, TN
Organic Compounds (GC) by Method D1946	WG1546975	1	09/23/20 15:37	09/23/20 15:37	JAL	Mt. Juliet, TN

1

Cp

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Olivia Studebaker
Project Manager

Report Revision History

Level II Report - Version 1: 09/18/20 15:32

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	10000	23800	ND	ND		8000	WG1544680
Allyl chloride	107-05-1	76.53	1600	5010	ND	ND		8000	WG1544680
Benzene	71-43-2	78.10	1600	5110	58100	186000		8000	WG1544680
Benzyl Chloride	100-44-7	127	1600	8310	ND	ND		8000	WG1544680
Bromodichloromethane	75-27-4	164	1600	10700	ND	ND		8000	WG1544680
Bromoform	75-25-2	253	4800	49700	ND	ND		8000	WG1544680
Bromomethane	74-83-9	94.90	1600	6210	ND	ND		8000	WG1544680
1,3-Butadiene	106-99-0	54.10	16000	35400	ND	ND		8000	WG1544680
Carbon disulfide	75-15-0	76.10	1600	4980	ND	ND		8000	WG1544680
Carbon tetrachloride	56-23-5	154	1600	10100	ND	ND		8000	WG1544680
Chlorobenzene	108-90-7	113	1600	7390	ND	ND		8000	WG1544680
Chloroethane	75-00-3	64.50	1600	4220	ND	ND		8000	WG1544680
Chloroform	67-66-3	119	1600	7790	ND	ND		8000	WG1544680
Chloromethane	74-87-3	50.50	1600	3300	ND	ND		8000	WG1544680
2-Chlorotoluene	95-49-8	126	1600	8250	ND	ND		8000	WG1544680
Cyclohexane	110-82-7	84.20	1600	5510	741000	2550000		8000	WG1544680
Dibromochloromethane	124-48-1	208	1600	13600	ND	ND		8000	WG1544680
1,2-Dibromoethane	106-93-4	188	1600	12300	ND	ND		8000	WG1544680
1,2-Dichlorobenzene	95-50-1	147	1600	9620	ND	ND		8000	WG1544680
1,3-Dichlorobenzene	541-73-1	147	1600	9620	ND	ND	J3	8000	WG1544680
1,4-Dichlorobenzene	106-46-7	147	1600	9620	ND	ND	J4	8000	WG1544680
1,2-Dichloroethane	107-06-2	99	1600	6480	ND	ND		8000	WG1544680
1,1-Dichloroethane	75-34-3	98	1600	6410	ND	ND		8000	WG1544680
1,1-Dichloroethene	75-35-4	96.90	1600	6340	ND	ND		8000	WG1544680
cis-1,2-Dichloroethene	156-59-2	96.90	1600	6340	ND	ND		8000	WG1544680
trans-1,2-Dichloroethene	156-60-5	96.90	1600	6340	ND	ND		8000	WG1544680
1,2-Dichloropropane	78-87-5	113	1600	7390	ND	ND		8000	WG1544680
cis-1,3-Dichloropropene	10061-01-5	111	1600	7260	ND	ND		8000	WG1544680
trans-1,3-Dichloropropene	10061-02-6	111	1600	7260	ND	ND		8000	WG1544680
1,4-Dioxane	123-91-1	88.10	1600	5770	ND	ND		8000	WG1544680
Ethanol	64-17-5	46.10	5040	9500	5920	11200		8000	WG1544680
Ethylbenzene	100-41-4	106	1600	6940	4150	18000		8000	WG1544680
4-Ethyltoluene	622-96-8	120	1600	7850	8770	43000		8000	WG1544680
Trichlorofluoromethane	75-69-4	137.40	1600	8990	ND	ND		8000	WG1544680
Dichlorodifluoromethane	75-71-8	120.92	1600	7910	ND	ND		8000	WG1544680
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	1600	12300	ND	ND		8000	WG1544680
1,2-Dichlorotetrafluoroethane	76-14-2	171	1600	11200	ND	ND		8000	WG1544680
Heptane	142-82-5	100	1600	6540	281000	1150000		8000	WG1544680
Hexachloro-1,3-butadiene	87-68-3	261	5040	53800	ND	ND		8000	WG1544680
n-Hexane	110-54-3	86.20	5040	17800	439000	1550000		8000	WG1544680
Isopropylbenzene	98-82-8	120.20	1600	7870	ND	ND		8000	WG1544680
Methylene Chloride	75-09-2	84.90	1600	5560	ND	ND		8000	WG1544680
Methyl Butyl Ketone	591-78-6	100	10000	40900	ND	ND		8000	WG1544680
2-Butanone (MEK)	78-93-3	72.10	10000	29500	ND	ND		8000	WG1544680
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	10000	40900	ND	ND		8000	WG1544680
Methyl methacrylate	80-62-6	100.12	1600	6550	ND	ND		8000	WG1544680
MTBE	1634-04-4	88.10	1600	5770	ND	ND		8000	WG1544680
Naphthalene	91-20-3	128	5040	26400	ND	ND		8000	WG1544680
2-Propanol	67-63-0	60.10	10000	24600	14100	34700		8000	WG1544680
Propene	115-07-1	42.10	3200	5510	ND	ND		8000	WG1544680
Styrene	100-42-5	104	1600	6810	ND	ND		8000	WG1544680
1,1,2,2-Tetrachloroethane	79-34-5	168	1600	11000	ND	ND		8000	WG1544680
Tetrachloroethylene	127-18-4	166	1600	10900	ND	ND		8000	WG1544680
Tetrahydrofuran	109-99-9	72.10	1600	4720	ND	ND		8000	WG1544680
Toluene	108-88-3	92.10	4000	15100	115000	433000		8000	WG1544680
1,2,4-Trichlorobenzene	120-82-1	181	5040	37300	ND	ND		8000	WG1544680

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	1600	8700	ND	ND		8000	WG1544680
1,1,2-Trichloroethane	79-00-5	133	1600	8700	ND	ND		8000	WG1544680
Trichloroethylene	79-01-6	131	1600	8570	ND	ND		8000	WG1544680
1,2,4-Trimethylbenzene	95-63-6	120	1600	7850	6450	31700		8000	WG1544680
1,3,5-Trimethylbenzene	108-67-8	120	1600	7850	8160	40000		8000	WG1544680
2,2,4-Trimethylpentane	540-84-1	114.22	1600	7470	ND	ND		8000	WG1544680
Vinyl chloride	75-01-4	62.50	1600	4090	ND	ND		8000	WG1544680
Vinyl Bromide	593-60-2	106.95	1600	7000	ND	ND		8000	WG1544680
Vinyl acetate	108-05-4	86.10	1600	5630	ND	ND		8000	WG1544680
m&p-Xylene	1330-20-7	106	3200	13900	95000	412000		8000	WG1544680
o-Xylene	95-47-6	106	1600	6940	19600	85000		8000	WG1544680
TPH (GC/MS) Low Fraction	8006-61-9	101	1600000	6610000	7780000	32100000		8000	WG1544680
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		94.2				WG1544680

Organic Compounds (GC) by Method D1946

Analyte	CAS #	Mol. Wt.	RDL %	Result %	Qualifier	Dilution	Batch
Oxygen	7782-44-7	32	5.00	18.2		1	WG1546975
Carbon Dioxide	124-38-9	44.01	0.500	3.29		1	WG1546975

1
Cp2
Tc3
Ss4
Cn5
Sr6
Qc7
Gl8
Al9
Sc

Method Blank (MB)

(MB) R3571577-3 09/17/20 09:48

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.584	1.25
Allyl Chloride	U		0.114	0.200
Benzene	U		0.0715	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0702	0.200
Bromoform	U		0.0732	0.600
Bromomethane	U		0.0982	0.200
1,3-Butadiene	U		0.104	2.00
Carbon disulfide	U		0.102	0.200
Carbon tetrachloride	U		0.0732	0.200
Chlorobenzene	U		0.0832	0.200
Chloroethane	U		0.0996	0.200
Chloroform	U		0.0717	0.200
Chloromethane	U		0.103	0.200
2-Chlorotoluene	U		0.0828	0.200
Cyclohexane	U		0.0753	0.200
Dibromochloromethane	U		0.0727	0.200
1,2-Dibromoethane	U		0.0721	0.200
1,2-Dichlorobenzene	U		0.128	0.200
1,3-Dichlorobenzene	U		0.182	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0700	0.200
1,1-Dichloroethane	U		0.0723	0.200
1,1-Dichloroethene	U		0.0762	0.200
cis-1,2-Dichloroethene	U		0.0784	0.200
trans-1,2-Dichloroethene	U		0.0673	0.200
1,2-Dichloropropane	U		0.0760	0.200
cis-1,3-Dichloropropene	U		0.0689	0.200
trans-1,3-Dichloropropene	U		0.0728	0.200
1,4-Dioxane	U		0.0833	0.200
Ethylbenzene	U		0.0835	0.200
4-Ethyltoluene	U		0.0783	0.200
Trichlorofluoromethane	U		0.0819	0.200
Dichlorodifluoromethane	U		0.137	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0793	0.200
1,2-Dichlorotetrafluoroethane	U		0.0890	0.200
Heptane	U		0.104	0.200
Hexachloro-1,3-butadiene	U		0.105	0.630
n-Hexane	U		0.206	0.630
Isopropylbenzene	U		0.0777	0.200

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Method Blank (MB)

(MB) R3571577-3 09/17/20 09:48

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0979	0.200
Methyl Butyl Ketone	U		0.133	1.25
2-Butanone (MEK)	U		0.0814	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0765	1.25
Methyl Methacrylate	U		0.0876	0.200
MTBE	U		0.0647	0.200
Naphthalene	U		0.350	0.630
2-Propanol	U		0.264	1.25
Propene	0.222	U	0.0932	0.400
Styrene	U		0.0788	0.200
1,1,2,2-Tetrachloroethane	U		0.0743	0.200
Tetrachloroethylene	U		0.0814	0.200
Tetrahydrofuran	U		0.0734	0.200
Toluene	U		0.0870	0.500
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0736	0.200
1,1,2-Trichloroethane	U		0.0775	0.200
Trichloroethylene	U		0.0680	0.200
1,2,4-Trimethylbenzene	U		0.0764	0.200
1,3,5-Trimethylbenzene	U		0.0779	0.200
2,2,4-Trimethylpentane	U		0.133	0.200
Vinyl chloride	U		0.0949	0.200
Vinyl Bromide	U		0.0852	0.200
Vinyl acetate	U		0.116	0.200
m&p-Xylene	U		0.135	0.400
o-Xylene	U		0.0828	0.200
Ethanol	U		0.265	0.630
TPH (GC/MS) Low Fraction	U		39.7	200
(S) 1,4-Bromofluorobenzene	86.3			60.0-140

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Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3571577-1 09/17/20 08:31 • (LCSD) R3571577-2 09/17/20 09:09

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	3.73	3.78	99.5	101	55.0-148			1.33	25
Propene	3.75	3.79	3.72	101	99.2	64.0-144			1.86	25
Dichlorodifluoromethane	3.75	4.10	4.01	109	107	64.0-139			2.22	25
1,2-Dichlorotetrafluoroethane	3.75	4.09	4.01	109	107	70.0-130			1.98	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3571577-1 09/17/20 08:31 • (LCSD) R3571577-2 09/17/20 09:09

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloromethane	3.75	3.79	3.85	101	103	70.0-130			1.57	25
Vinyl chloride	3.75	4.15	3.98	111	106	70.0-130			4.18	25
1,3-Butadiene	3.75	4.15	4.12	111	110	70.0-130			0.726	25
Bromomethane	3.75	3.97	3.97	106	106	70.0-130			0.000	25
Chloroethane	3.75	4.12	4.00	110	107	70.0-130			2.96	25
Trichlorofluoromethane	3.75	4.09	4.02	109	107	70.0-130			1.73	25
1,1,2-Trichlorotrifluoroethane	3.75	4.14	4.03	110	107	70.0-130			2.69	25
1,1-Dichloroethene	3.75	4.12	4.01	110	107	70.0-130			2.71	25
1,1-Dichloroethane	3.75	4.10	4.05	109	108	70.0-130			1.23	25
Acetone	3.75	4.19	4.04	112	108	70.0-130			3.65	25
2-Propanol	3.75	4.05	3.95	108	105	70.0-139			2.50	25
Carbon disulfide	3.75	4.03	3.96	107	106	70.0-130			1.75	25
Methylene Chloride	3.75	4.00	3.98	107	106	70.0-130			0.501	25
MTBE	3.75	4.03	3.98	107	106	70.0-130			1.25	25
trans-1,2-Dichloroethene	3.75	4.11	4.00	110	107	70.0-130			2.71	25
n-Hexane	3.75	4.02	3.94	107	105	70.0-130			2.01	25
Vinyl acetate	3.75	3.20	3.25	85.3	86.7	70.0-130			1.55	25
Methyl Ethyl Ketone	3.75	4.28	4.25	114	113	70.0-130			0.703	25
cis-1,2-Dichloroethene	3.75	3.98	4.02	106	107	70.0-130			1.00	25
Chloroform	3.75	4.06	4.00	108	107	70.0-130			1.49	25
Cyclohexane	3.75	4.01	3.97	107	106	70.0-130			1.00	25
1,1,1-Trichloroethane	3.75	4.07	4.02	109	107	70.0-130			1.24	25
Carbon tetrachloride	3.75	4.09	3.96	109	106	70.0-130			3.23	25
Benzene	3.75	4.01	3.94	107	105	70.0-130			1.76	25
1,2-Dichloroethane	3.75	4.13	4.01	110	107	70.0-130			2.95	25
Heptane	3.75	4.16	4.06	111	108	70.0-130			2.43	25
Trichloroethylene	3.75	3.91	3.86	104	103	70.0-130			1.29	25
1,2-Dichloropropane	3.75	4.05	3.96	108	106	70.0-130			2.25	25
1,4-Dioxane	3.75	4.07	3.98	109	106	70.0-140			2.24	25
Bromodichloromethane	3.75	4.00	3.95	107	105	70.0-130			1.26	25
cis-1,3-Dichloropropene	3.75	3.88	3.89	103	104	70.0-130			0.257	25
4-Methyl-2-pentanone (MIBK)	3.75	4.15	4.08	111	109	70.0-139			1.70	25
Toluene	3.75	3.99	3.93	106	105	70.0-130			1.52	25
trans-1,3-Dichloropropene	3.75	4.01	3.91	107	104	70.0-130			2.53	25
1,1,2-Trichloroethane	3.75	4.01	3.98	107	106	70.0-130			0.751	25
Tetrachloroethylene	3.75	3.96	3.91	106	104	70.0-130			1.27	25
Methyl Butyl Ketone	3.75	4.30	4.13	115	110	70.0-149			4.03	25
Dibromochloromethane	3.75	3.94	3.86	105	103	70.0-130			2.05	25
1,2-Dibromoethane	3.75	3.98	3.98	106	106	70.0-130			0.000	25
Chlorobenzene	3.75	3.99	3.97	106	106	70.0-130			0.503	25

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Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3571577-1 09/17/20 08:31 • (LCSD) R3571577-2 09/17/20 09:09

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylbenzene	3.75	4.16	4.07	111	109	70.0-130			2.19	25
m&p-Xylene	7.50	8.32	8.17	111	109	70.0-130			1.82	25
o-Xylene	3.75	4.09	4.04	109	108	70.0-130			1.23	25
Styrene	3.75	4.08	4.04	109	108	70.0-130			0.985	25
Bromoform	3.75	3.94	3.83	105	102	70.0-130			2.83	25
1,1,2,2-Tetrachloroethane	3.75	4.07	4.02	109	107	70.0-130			1.24	25
4-Ethyltoluene	3.75	4.21	4.19	112	112	70.0-130			0.476	25
1,3,5-Trimethylbenzene	3.75	4.22	4.24	113	113	70.0-130			0.473	25
1,2,4-Trimethylbenzene	3.75	4.20	4.18	112	111	70.0-130			0.477	25
1,3-Dichlorobenzene	3.75	4.26	2.74	114	73.1	70.0-130		J3	43.4	25
1,4-Dichlorobenzene	3.75	4.99	4.92	133	131	70.0-130	J4	J4	1.41	25
Benzyl Chloride	3.75	3.81	3.79	102	101	70.0-152			0.526	25
1,2-Dichlorobenzene	3.75	4.11	4.11	110	110	70.0-130			0.000	25
1,2,4-Trichlorobenzene	3.75	5.16	5.11	138	136	70.0-160			0.974	25
Hexachloro-1,3-butadiene	3.75	4.08	4.06	109	108	70.0-151			0.491	25
Naphthalene	3.75	4.62	4.53	123	121	70.0-159			1.97	25
TPH (GC/MS) Low Fraction	203	251	247	124	122	70.0-130			1.61	25
Allyl Chloride	3.75	4.04	3.92	108	105	70.0-130			3.02	25
2-Chlorotoluene	3.75	4.26	4.14	114	110	70.0-130			2.86	25
Methyl Methacrylate	3.75	4.20	4.14	112	110	70.0-130			1.44	25
Tetrahydrofuran	3.75	4.11	4.04	110	108	70.0-137			1.72	25
2,2,4-Trimethylpentane	3.75	4.10	4.00	109	107	70.0-130			2.47	25
Vinyl Bromide	3.75	4.07	3.90	109	104	70.0-130			4.27	25
Isopropylbenzene	3.75	4.10	4.03	109	107	70.0-130			1.72	25
(S) 1,4-Bromofluorobenzene				98.0	98.7	60.0-140				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3574009-3 09/23/20 15:30

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Oxygen	1.78		0.225	5.00
Carbon Dioxide	U		0.121	0.500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3574009-1 09/23/20 15:09 • (LCSD) R3574009-2 09/23/20 15:15

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	%	%	%	%	%	%			%	%
Oxygen	20.0	23.1	24.1	116	121	70.0-130			4.24	20
Carbon Dioxide	2.50	2.13	2.22	85.2	88.8	70.0-130			4.14	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

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Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

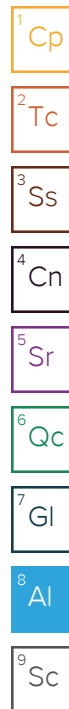
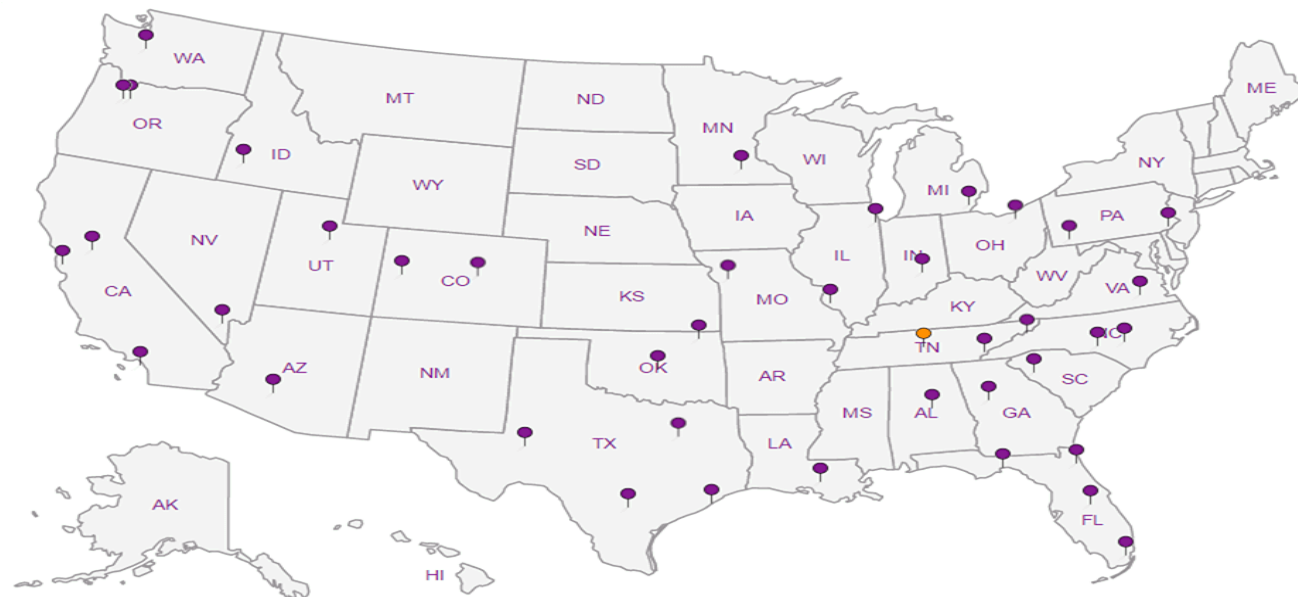
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



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