



Accepted - 09/27/2022

NV

January 11, 2021

New Mexico Oil Conservation Division
New Mexico Energy, Minerals, and Natural Resources Department
1000 Rio Brazos Road
Aztec, NM 87410

**Subject: Fourth Quarter 2021 - Solar SVE System Update
Bell Federal Gas Com B 1
San Juan County, New Mexico
Hilcorp Energy Company
API # 30-045-09772
Incident # NCS1729355513**

To Whom it May Concern:

WSP USA, Inc. (WSP), on behalf of Hilcorp Energy Company (Hilcorp), presents the following fourth quarter 2021 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 that resulted in the release of approximately 58 barrels (bbls) of natural gas condensate. SVE installation, soil sampling, and delineation activities are summarized in previous reports submitted to the New Mexico Oil Conservation Division (NMOCD) for each quarter of operation.

SITE BACKGROUND

The solar SVE system consists of a 1/3 horsepower blower capable of producing 22 cubic feet per minute (cfm) at a vacuum of 29 inches of water column. 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. Blower operation is controlled via 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.

FOURTH QUARTER 2021 ACTIVITIES

During the fourth quarter of 2021, Hilcorp and WSP personnel conducted bi-weekly operation and maintenance visits to ensure the system was operating, to maximize runtime efficiency, and conduct any required system maintenance. Between September 27, 2021 and December 15, 2021, there have been 80 days, with an estimated 824 total hours of available nominal daylight in which the solar SVE system could charge and operate. Of the available runtime hours during the fourth quarter of 2021, the system has an actual runtime of 924 hours, for an overall runtime efficiency during the fourth quarter of 2021 of 112 percent (%). When operating at optimum performance, the solar panels are able to charge the system's batteries during daylight hours and continue to run the SVE blower longer than the nominal daylight hours available in a particular day.

Below is a table summarizing SVE runtime in comparison with nominal available daylight hours, per month, according to the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service.

WSP USA
848 EAST 2ND AVENUE
DURANGO CO 81301

Tel.: 970-385-1096
wsp.com



4th Quarter Table 2021				
Time Period	September 27, 2021 to September 30, 2021	October 1, 2021 to October 31, 2021	November 1, 2021 to November 30, 2021	December 1, 2021 to December 15, 2021
Days	4	31	30	15
Avg. Nominal Daylight Hrs	12	11	10	9
Available Runtime Hrs	48	341	300	135
Total Available Daylight Runtime Hours				824
Actual Runtime Hours				924
% Runtime				112.1%

AIR SAMPLING AND SYSTEM PERFORMANCE

A fourth quarter air sample was collected on December 15, 2021 from the inlet side of the SVE blower using a high-vacuum air sampler. The air sample was collected directly into a 1-Liter Tedlar® bag and submitted to Hall Environmental Analysis Laboratory (Hall) for analysis of volatile organic compounds (VOCs) by United States Environmental Protection Agency (EPA) Method 8260 and fixed gas analysis of oxygen and carbon dioxide. Prior to collection, the air from the influent side was field screened with a photoionization detector (PID) for organic vapor monitoring (OVM). The PID to TVPH relationship was correlated to estimate TVPH concentrations and estimate emissions and contaminant mass removal for the fourth quarter 2021. Table 1 presents a summary of analytical data collected during this sampling event, with the full laboratory analytical report included in Enclosure A. Table 1 also includes historical data collected during past sampling events.

Since the solar SVE system installation, approximately 64.9 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 flow rates (Table 2). The impacted mass source removal via the solar SVE system to date is an estimated 21,389 pounds of TVPH. Including the PSH and vapor phase hydrocarbons, an estimated total of 3,576 gallons (or 85 bbls) of PSH and air equivalent condensate have been recovered to date.

RECOMMENDATIONS

Regular operation and maintenance (O&M) visits will continue to be conducted bi-weekly by WSP and/or Hilcorp personnel. During O&M visits, personnel will ensure that the SVE system is operating within normal working temperature, pressure, and vacuum ranges. Any deviations from regular operations will be noted and included in the subsequent quarterly report.

WSP appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this work plan, do not hesitate to contact Stuart Hyde at (970) 903-1607 or at stuart.hyde@wsp.com, or Mitch Killough at (713) 757-5247 or at mkillough@hilcorp.com.

Kind regards,

Stuart Hyde, L.G.
Senior Geologist

Ashley Ager, M.S., P.G.
Regional Vice President, Geologist

Enclosures:

Table 1 – Air Sample Results Summary

Table 2 – Soil Vapor Extraction System Recovery & Emissions Summary

Enclosure A – Analytical Laboratory Reports

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural
Resources Department

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Incident ID	NCS 1729355513
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party Hilcorp Energy Company	OGRID 372171
Contact Name Jennifer Deal	Contact Telephone 505-801-6517
Contact email jdeal@hilcorp.com	Incident # NCS1729355513
Contact mailing address 382 Road 3100 Aztec, NM 87410	

Location of Release Source

Latitude 36.8324852 _____ Longitude -108.168396 _____
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Bell Federal Gas Com B 1	Site Type Gas Well
Date Release Discovered September 15, 2017 (Historic)	API# (if applicable) 30-045-09772

Unit Letter	Section	Township	Range	County
A	11	30N	13W	San Juan

Surface Owner: State Federal Tribal Private (Name: _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Condensate	Volume Released (bbls) 58 (Historic)	Volume Recovered (bbls) 0
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

XTO (previous operator) discovered a bullet hole in the side of a condensate tank. The vandalized tank resulted in approx.. 58 bbls of condensate draining onto the ground and infiltrating into the subsurface. The release was contained within the bermed area and no liquids were recovered.

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	<u>>100</u> (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: *Each of the following items must be included in the report.*

- Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- Field data
- Data table of soil contaminant concentration data
- Depth to water determination
- Determination of water sources and significant watercourses within 1/2-mile of the lateral extents of the release
- Boring or excavation logs
- Photographs including date and GIS information
- Topographic/Aerial maps
- Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

TABLES

**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)	Oxygen (%)	Carbon Dioxide (%)
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	18.20%	3.29%
SVE Q4 Air Sample	12/8/2020	1,741	114	292	10.6	323.8	16,000	17.30%	4.45%
SVE	3/23/2021	1,252	45.4	86.3	2.33	95.4	7,930	20.2%	<0.500%
Influent 6-10-21	6/10/2021	166	8.5	20	<0.50	20	5,700	17.3%	2.21%
Influent 9-8-2021	9/8/2021	NM	130	240	5.9	150	33,000	NA	NA
Influent 12-15	12/15/2021	1,374	95	160	11	220	24,098 (1)	16.3%	3.32%

Notes:

(1) - data extrapolated from PID measurements

µg/L - micrograms per liter

NA - not analyzed

NM - not measured

ppm - parts per million

TVPH - total volatile petroleum hydrocarbons

% - percent

< - indicates result is less than the stated laboratory reporting limit

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)	Ethylbenzene (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	5,240,130	5,075,730	1,873	160	380	21	320	18,000
3/22/2019	9,176,130	3,936,000	1,607	490	920	24	480	NA
6/18/2019	11,096,130	1,920,000	1,026	72	270	27	290	NA
9/25/2019	13,610,730	2,514,600	1,762	220	480	21	440	35,000
12/16/2019	15,513,450	1,902,720	1,902	130	840	21	220	22,000
3/10/2020	17,246,490	1,733,040	1,171	120	380	19	330	31,000
6/25/2020	19,123,950	1,877,460	978	180	430	25	480	45,000
9/16/2020	20,825,850	1,701,900	1,766	186	433	18	497	32,100
12/8/2020	22,050,570	1,224,720	1,741	114	292	10.6	324	16,000
3/23/2021	23,121,750	1,071,180	1,252	45.4	86.3	2.33	95.4	7,930
6/10/2021	23,514,780	393,030	166	8.5	20	0.50	20	5,700
9/8/2021	23,831,580	316,800	NM	130	240	5.9	150	33,000
12/15/2021	26,137,092	2,305,512	1,374	95	160	11	220	24,098
Average			1,389	159	367	15	279	24,986

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	33	0.0072	0.0171	0.0009	0.0144	0.8086
3/22/2019	32	0.0293	0.0551	0.0014	0.0287	NA
6/18/2019	32	0.0043	0.0162	0.0016	0.0174	NA
9/25/2019	33	0.0115	0.0252	0.0011	0.0231	1.8343
12/16/2019	32	0.0078	0.0503	0.0013	0.0132	1.3177
3/10/2020	29	0.009	0.0284	0.0014	0.0247	2.3209
6/25/2020	29	0.0196	0.0467	0.0019	0.0359	3.369
9/16/2020	31	0.0216	0.0503	0.0021	0.0577	3.7273
12/8/2020	30	0.0128	0.0328	0.0012	0.0364	1.7979
3/23/2021	30	0.0051	0.0097	0.0003	0.0107	0.8911
6/10/2021	33	0.0011	0.0025	0.0001	0.0025	0.7046
9/8/2021	33	0.0161	0.0297	0.0007	0.0185	4.0791
12/15/2021	33	0.0117	0.0198	0.0014	0.0272	2.9787
Average	32	0.0142	0.0295	0.0011	0.0226	2.3601

Pounds Extracted Over Total Operating Time

Date	Total Operational Hours	Delta Hours	Benzene (lbs)	Toluene (lbs)	Ethylbenzene (lbs)	Total Xylenes (lbs)	TVPH (lbs)	TVPH (tons)
1/24/2018	69	69	2.9	2.1	0.1	0.4	308	0.15
8/17/2018	2,632	2,564	18.4	43.8	2.4	36.9	2,073	1.04
3/22/2019	4,682	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	1.17
12/16/2019	7,943	991	7.7	49.9	1.2	13.1	1,306	0.65
3/10/2020	8,939	996	8.9	28.3	1.4	24.6	2,312	1.16
6/25/2020	10,018	1,079	14.5	34.7	2.0	38.8	3,635	1.82
9/16/2020	10,933	915	19.8	46.0	1.9	52.8	3,411	1.71
12/8/2020	11,613	680	8.7	22.3	0.8	24.8	1,223	0.61
3/23/2021	12,209	595	3.0	5.8	0.2	6.4	530	0.27
6/10/2021	12,407	199	0.2	0.5	0.01	0.5	140	0.07
9/8/2021	12,567	160	2.6	4.7	0.12	3.0	653	0.33
12/15/2021	13,731	1,164	13.7	23.0	1.58	31.7	3,468	1.73
Avg. Mass Extracted Per Period			12.8	30.2	1.3	24.2	1,782	0.9
Total Mass Extracted to Date			179.5	422.2	17.6	338.5	21,389	10.7

Notes:

cf - cubic feet

cfm - cubic feet per minute

lbs - pounds

lb/hr - pounds per hour

µg/L - micrograms per hour

NA - not analyzed

NM - not measured

PID - photoionization detector

ppm - parts per million

TVPH - total volatile petroleum hydrocarbons

Italics and gray indicate laboratory result was less than reporting limit. Reporting limit utilized in calculations.

ENCLOSURE A – ANALYTICAL LABORATORY REPORTS



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

December 28, 2021

Stuart Hyde
Hilcorp Energy
PO Box 61529
Houston, TX 77208-1529
TEL: (337) 276-7676
FAX:

RE: Bell Federal

OrderNo.: 2112A24

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 1 sample(s) on 12/16/2021 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2112A24

Date Reported: 12/28/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Influent 12-15

Project: Bell Federal

Collection Date: 12/15/2021 3:00:00 PM

Lab ID: 2112A24-001

Matrix: AIR

Received Date: 12/16/2021 7:52:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Benzene	95	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Toluene	160	5.0		µg/L	50	12/17/2021 4:46:00 PM	R84633
Ethylbenzene	11	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Methyl tert-butyl ether (MTBE)	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2,4-Trimethylbenzene	17	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,3,5-Trimethylbenzene	17	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2-Dichloroethane (EDC)	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2-Dibromoethane (EDB)	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Naphthalene	ND	4.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1-Methylnaphthalene	ND	8.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
2-Methylnaphthalene	ND	8.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Acetone	ND	20		µg/L	20	12/17/2021 3:59:00 PM	R84633
Bromobenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Bromodichloromethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Bromoform	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Bromomethane	ND	4.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
2-Butanone	ND	20		µg/L	20	12/17/2021 3:59:00 PM	R84633
Carbon disulfide	ND	20		µg/L	20	12/17/2021 3:59:00 PM	R84633
Carbon tetrachloride	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Chlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Chloroethane	ND	4.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Chloroform	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Chloromethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
2-Chlorotoluene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
4-Chlorotoluene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
cis-1,2-DCE	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
cis-1,3-Dichloropropene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2-Dibromo-3-chloropropane	ND	4.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Dibromochloromethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Dibromomethane	ND	4.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2-Dichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,3-Dichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,4-Dichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Dichlorodifluoromethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,1-Dichloroethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,1-Dichloroethene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2-Dichloropropane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,3-Dichloropropane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
2,2-Dichloropropane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix interference		

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Analytical Report

Lab Order 2112A24

Date Reported: 12/28/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: Influent 12-15

Project: Bell Federal

Collection Date: 12/15/2021 3:00:00 PM

Lab ID: 2112A24-001

Matrix: AIR

Received Date: 12/16/2021 7:52:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
1,1-Dichloropropene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Hexachlorobutadiene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
2-Hexanone	ND	20		µg/L	20	12/17/2021 3:59:00 PM	R84633
Isopropylbenzene	2.0	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
4-Isopropyltoluene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
4-Methyl-2-pentanone	ND	20		µg/L	20	12/17/2021 3:59:00 PM	R84633
Methylene chloride	ND	6.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
n-Butylbenzene	ND	6.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
n-Propylbenzene	2.2	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
sec-Butylbenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Styrene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
tert-Butylbenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,1,1,2-Tetrachloroethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Tetrachloroethene (PCE)	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
trans-1,2-DCE	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
trans-1,3-Dichloropropene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2,3-Trichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2,4-Trichlorobenzene	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,1,1-Trichloroethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,1,2-Trichloroethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Trichloroethene (TCE)	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Trichlorofluoromethane	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
1,2,3-Trichloropropane	ND	4.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Vinyl chloride	ND	2.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Xylenes, Total	220	3.0		µg/L	20	12/17/2021 3:59:00 PM	R84633
Surr: Dibromofluoromethane	107	70-130		%Rec	20	12/17/2021 3:59:00 PM	R84633
Surr: 1,2-Dichloroethane-d4	90.9	70-130		%Rec	20	12/17/2021 3:59:00 PM	R84633
Surr: Toluene-d8	129	70-130		%Rec	20	12/17/2021 3:59:00 PM	R84633
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	20	12/17/2021 3:59:00 PM	R84633

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix interference		

Page 2 of 2



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ANALYTICAL SUMMARY REPORT

December 20, 2021

Hall Environmental
4901 Hawkins St NE Ste D
Albuquerque, NM 87109-4372

Work Order: G21120326
Project Name: Not Indicated

Energy Laboratories Inc. Gillette WY received the following 1 sample for Hall Environmental on 12/17/2021 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G21120326-001	2112A24-001B; Influent 12-15	12/15/21 15:00	12/17/21	Gas	Natural Gas Analysis - BTU Natural Gas Analysis - Compressibility Factor Natural Gas Analysis - GPM Natural Gas Analysis - Molecular Weight Natural Gas Analysis - Routine Natural Gas Analysis - Pressure Base Natural Gas Analysis - Psuedo- Critical Pressure Natural Gas Analysis - Psuedo- Critical Temperature Natural Gas Analysis - Specific Gravity Natural Gas Analysis - Temperature Base

The analyses presented in this report were performed by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these tests results, please contact your Project Manager.

Report Approved By:



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LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Hall Environmental
Project: Not Indicated
Client Sample ID: 2112A24-001B; Influent 12-15
Location:
Lab ID: G21120326-001

Report Date: 12/20/21
Collection Date: 12/15/21 15:00
Date Received: 12/17/21
Sampled By: Not Provided

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
----------	--------	-------	-----------	--------	--------------------

NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT

Oxygen	16.316	Mol %		GPA 2261	12/17/21 15:13 / djb
Nitrogen	80.084	Mol %		GPA 2261	12/17/21 15:13 / djb
Carbon Monoxide	< 0.001	Mol %		GPA 2261	12/17/21 15:13 / djb
Carbon Dioxide	3.321	Mol %		GPA 2261	12/17/21 15:13 / djb
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	12/17/21 15:13 / djb
Methane	< 0.001	Mol %		GPA 2261	12/17/21 15:13 / djb
Ethane	< 0.001	Mol %		GPA 2261	12/17/21 15:13 / djb
Propane	< 0.001	Mol %		GPA 2261	12/17/21 15:13 / djb
Isobutane	< 0.001	Mol %		GPA 2261	12/17/21 15:13 / djb
n-Butane	0.002	Mol %		GPA 2261	12/17/21 15:13 / djb
Isopentane	0.010	Mol %		GPA 2261	12/17/21 15:13 / djb
n-Pentane	0.013	Mol %		GPA 2261	12/17/21 15:13 / djb
Hexanes plus	0.254	Mol %		GPA 2261	12/17/21 15:13 / djb

GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS

GPM Ethane	< 0.0003	gal/MCF		GPA 2261	12/17/21 15:13 / djb
GPM Propane	< 0.0003	gal/MCF		GPA 2261	12/17/21 15:13 / djb
GPM Isobutane	< 0.0003	gal/MCF		GPA 2261	12/17/21 15:13 / djb
GPM n-Butane	0.0010	gal/MCF		GPA 2261	12/17/21 15:13 / djb
GPM Isopentane	0.0040	gal/MCF		GPA 2261	12/17/21 15:13 / djb
GPM n-Pentane	0.0050	gal/MCF		GPA 2261	12/17/21 15:13 / djb
GPM Hexanes plus	0.1110	gal/MCF		GPA 2261	12/17/21 15:13 / djb
GPM Pentanes plus	0.1190	gal/MCF		GPA 2261	12/17/21 15:13 / djb
GPM Total	0.1200	gal/MCF		GPA 2261	12/17/21 15:13 / djb

CALCULATED PROPERTIES

Calculation Pressure Base	14.730	psia		GPA 2261	12/17/21 15:13 / djb
Calculation Temperature Base	60	°F		GPA 2261	12/17/21 15:13 / djb
Compressibility Factor, Z	1.0000	unitless		GPA 2261	12/17/21 15:13 / djb
Molecular Weight	29.37	unitless		GPA 2261	12/17/21 15:13 / djb
Pseudo-critical Pressure, psia	552	psia		GPA 2261	12/17/21 15:13 / djb
Pseudo-critical Temperature, deg R	249	deg R		GPA 2261	12/17/21 15:13 / djb
Specific Gravity (air=1.000)	1.017	unitless		GPA 2261	12/17/21 15:13 / djb
Gross BTU per cu ft @ std cond, dry	14.09	BTU/cu ft		GPA 2261	12/17/21 15:13 / djb
Gross BTU per cu ft @ std cond, wet	13.85	BTU/cu ft		GPA 2261	12/17/21 15:13 / djb

Report RL - Analyte Reporting Limit
Definitions: QCL - Quality Control Limit

MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)



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QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental

Work Order: G21120326

Report Date: 12/20/21

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261							Analytical Run: R268601		
Lab ID: CCV1-2112170940	Continuing Calibration Verification Standard						12/17/21 09:41		
Nitrogen	99.906	Mol %	0.001	100	85	110			
Carbon Monoxide	0.094	Mol %	0.001	93	90	110			
Lab ID: ICV-2112170950	Initial Calibration Verification Standard						12/17/21 09:51		
Oxygen	0.379	Mol %	0.001	94	75	110			
Nitrogen	5.088	Mol %	0.001	101	90	110			
Carbon Dioxide	4.899	Mol %	0.001	99	90	110			
Hydrogen Sulfide	0.125	Mol %	0.001	126	100	136			
Methane	73.254	Mol %	0.001	100	90	110			
Ethane	4.995	Mol %	0.001	101	90	110			
Propane	4.999	Mol %	0.001	100	90	110			
Isobutane	1.991	Mol %	0.001	99	90	110			
n-Butane	1.973	Mol %	0.001	98	90	110			
Isopentane	0.988	Mol %	0.001	99	90	110			
n-Pentane	1.001	Mol %	0.001	100	90	110			
Hexanes plus	0.308	Mol %	0.001	102	90	110			
Lab ID: CCV-2112170957	Continuing Calibration Verification Standard						12/17/21 09:58		
Oxygen	0.602	Mol %	0.001	100	90	110			
Nitrogen	1.283	Mol %	0.001	92	85	110			
Carbon Dioxide	0.956	Mol %	0.001	96	90	110			
Hydrogen Sulfide	0.023	Mol %	0.001	92	70	130			
Methane	93.575	Mol %	0.001	100	90	110			
Ethane	1.012	Mol %	0.001	101	90	110			
Propane	1.006	Mol %	0.001	101	90	110			
Isobutane	0.493	Mol %	0.001	98	90	110			
n-Butane	0.492	Mol %	0.001	98	90	110			
Isopentane	0.199	Mol %	0.001	99	90	110			
n-Pentane	0.200	Mol %	0.001	100	90	110			
Hexanes plus	0.159	Mol %	0.001	106	90	110			
Lab ID: ICV1-2112171020	Initial Calibration Verification Standard						12/17/21 10:20		
Nitrogen	98.972	Mol %	0.001	100	90	110			
Carbon Monoxide	1.028	Mol %	0.001	101	90	110			
Lab ID: CCV-2112171552	Continuing Calibration Verification Standard						12/17/21 15:52		
Oxygen	0.618	Mol %	0.001	103	90	110			
Nitrogen	1.326	Mol %	0.001	95	85	110			
Carbon Dioxide	0.954	Mol %	0.001	95	90	110			
Hydrogen Sulfide	0.022	Mol %	0.001	88	70	130			
Methane	93.525	Mol %	0.001	100	90	110			
Ethane	1.011	Mol %	0.001	101	90	110			
Propane	1.008	Mol %	0.001	101	90	110			
Isobutane	0.493	Mol %	0.001	98	90	110			
n-Butane	0.492	Mol %	0.001	98	90	110			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



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QA/QC Summary Report

Prepared by Gillette, WY Branch

Client: Hall Environmental

Work Order: G21120326

Report Date: 12/20/21

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261							Analytical Run: R268601		
Lab ID: CCV-2112171552	Continuing Calibration Verification Standard						12/17/21 15:52		
Isopentane	0.198	Mol %	0.001	99	90	110			
n-Pentane	0.199	Mol %	0.001	99	90	110			
Hexanes plus	0.154	Mol %	0.001	103	90	110			
Method: GPA 2261							Batch: R268601		
Lab ID: G21120326-001ADUP	Sample Duplicate		Run: Varian GC_211217A				12/17/21 15:17		
Oxygen	16.318	Mol %	0.001				0.0	10	
Nitrogen	80.083	Mol %	0.001				0.0	10	
Carbon Monoxide	< 0.001	Mol %	0.001					10	
Carbon Dioxide	3.318	Mol %	0.001				0.1	10	
Hydrogen Sulfide	< 0.001	Mol %	0.001					10	
Methane	< 0.001	Mol %	0.001					10	
Ethane	< 0.001	Mol %	0.001					10	
Propane	< 0.001	Mol %	0.001					10	
Isobutane	< 0.001	Mol %	0.001					10	
n-Butane	0.002	Mol %	0.001				0.0	10	
Isopentane	0.010	Mol %	0.001				0.0	10	
n-Pentane	0.013	Mol %	0.001				0.0	10	
Hexanes plus	0.256	Mol %	0.001				0.8	10	

Qualifiers:

RL - Analyte Reporting Limit

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Work Order Receipt Checklist

Hall Environmental

G21120326

Login completed by: Chantel S. Johnson

Date Received: 12/17/2021

Reviewed by: Misty Stephens

Received by: csj

Reviewed Date: 12/20/2021

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on all shipping container(s)/cooler(s)? Yes No Not Present
- Custody seals intact on all sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time?
(Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.) Yes No
- Temp Blank received in all shipping container(s)/cooler(s)? Yes No Not Applicable
- Container/Temp Blank temperature: °C
- Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4"). Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No Not Applicable

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None



CHAIN OF CUSTODY RECORD

1 1

Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975
 FAX: 505-345-4107
 Website: clients.hallenvironmental.com

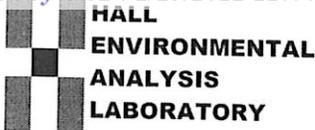
S/B CONTRACTOR: Energy Labs-Gillette		COMPANY: Energy Laboratories		PHONE: (866) 686-7175	FAX:
ADDRESS: 400 W Boxelder Rd		CITY, STATE, ZIP: Gillette, WY 82718		ACCOUNT #:	EMAIL:
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE
1	2112AZ4-001B	Influent 12-15	TEDLAR	Air	12/15/2021 3:00:00 PM
					# CONTAINERS
					1
ANALYTICAL COMMENTS					
Natural gas analysis O2, CO, CO2					

SPECIAL INSTRUCTIONS/COMMENTS:
 Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By:	Date: 12/16/2021	Time: 10:08 AM	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
TAT:	Standard <input type="checkbox"/>	RUSH <input type="checkbox"/>	Next BD <input type="checkbox"/>	2nd BD <input type="checkbox"/>	3rd BD <input type="checkbox"/>

REPORT TRANSMITTAL DESIRED:
 HARDCOPY (extra cost) FAX EMAIL ONLINE
 FOR LAB USE ONLY

Temp of samples _____ Attempt to Cool: _____
 Comment: G21120320



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: Hilcorp Energy Work Order Number: 2112A24 RcptNo: 1

Received By: Tracy Casarrubias 12/16/2021 7:52:00 AM
Completed By: Tracy Casarrubias 12/16/2021 9:09:24 AM
Reviewed By: See 12/16/21

Chain of Custody

- 1. Is Chain of Custody complete? Yes [checked] No [] Not Present []
2. How was the sample delivered? Courier

Log In

- 3. Was an attempt made to cool the samples? Yes [checked] No [] NA []
4. Were all samples received at a temperature of >0° C to 6.0°C Yes [] No [checked] NA []
5. Sample(s) in proper container(s)? Not required Yes [checked] No []
6. Sufficient sample volume for indicated test(s)? Yes [checked] No []
7. Are samples (except VOA and ONG) properly preserved? Yes [checked] No []
8. Was preservative added to bottles? Yes [] No [checked] NA []
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes [] No [] NA [checked]
10. Were any sample containers received broken? Yes [] No [checked]
11. Does paperwork match bottle labels? Yes [checked] No []
12. Are matrices correctly identified on Chain of Custody? Yes [checked] No []
13. Is it clear what analyses were requested? Yes [checked] No []
14. Were all holding times able to be met? Yes [checked] No []

of preserved bottles checked for pH: (<2 or >12 unless noted) Adjusted? Checked by: KPGA 12/16/21

Special Handling (if applicable)

- 15. Was client notified of all discrepancies with this order? Yes [] No [] NA [checked]

Person Notified: [] Date: []
By Whom: [] Via: [] eMail [] Phone [] Fax [] In Person []
Regarding: []
Client Instructions: []

16. Additional remarks:

17. Cooler Information

Table with 7 columns: Cooler No, Temp °C, Condition, Seal Intact, Seal No, Seal Date, Signed By. Row 1: 1, N/A, Good, Not Present, [], [], []

District I
 1625 N. French Dr., Hobbs, NM 88240
 Phone:(575) 393-6161 Fax:(575) 393-0720

District II
 811 S. First St., Artesia, NM 88210
 Phone:(575) 748-1283 Fax:(575) 748-9720

District III
 1000 Rio Brazos Rd., Aztec, NM 87410
 Phone:(505) 334-6178 Fax:(505) 334-6170

District IV
 1220 S. St Francis Dr., Santa Fe, NM 87505
 Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS
 Action 72211

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 72211
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See App ID 124694 for most updated status.	9/27/2022