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

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

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

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

RCVD 7/29/19

Responsible Party

Responsible Party: Hilcorp Energy Company	OGRID 372171
Contact Name: Lindsay Dumas	Contact Telephone: 832-839-4585
Contact email: Ldumas@hilcorp.com	Incident # *(assigned by OCD)*
Contact mailing address: 1111 Travis St. Houston, TX 77002	nCS1912639200

Location of Release Source

Latitude 36.506033 Longitude -107.182335

(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Tribal C 10E	Site Type: Gas Well
Date Release Discovered: 4/18/19	API# *(if applicable)* 30-039-22130

Unit Letter	Section	Township	Range	County
B	07	26N	03W	Rio Arriba

* No Sampling, Did not meet 19.15.29.12 NMAC Approved be JEPO

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)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) 6 bbls	Volume Recovered (bbls) 40 bbls
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☐ No
☒ Condensate	Volume Released (bbls) 56 bbls	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

The release was caused by corrosion on bottom of production tank.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
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Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? Per 19.15.29.7(A)(1) an unauthorized release of a volume, exclusing gas, of 25 barrels or more.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Yes, by Terry Nelson (HEC Area 14 Foreman) to Cory Smith (NMOCD), Jim Griswold (NMOCD) and Jicarilla on April 18, 2019 at 12:13PM. Email is attached.	

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☒ The source of the release has been stopped.

☒ The impacted area has been secured to protect human health and the environment.

☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.

☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:
All above actions have been completed.

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: _Lindsay Dumas_____ Title: _Environmental Specialist_____

Signature: _____ Date: _5-3-19_____

email: _Ldumas@hilcorp.com_____ Telephone: _832-839-4585_____

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

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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?	≥51 ft (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ 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)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ 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?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ 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 ½-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.

State of New Mexico
Oil Conservation Division

Incident ID	
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I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Lindsay Dumas Title: Environmental Specialist

Signature: Lindsay Dumas Date: 7-29-19

email: Ldumas@hilcorp.com Telephone: 832-839-4585

OCD Only

Received by: Date:

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: ***Each of the following items must be included in the closure report.***

☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

☐ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☒ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Lindsay Dumas Title: Environmental Specialist

Signature: Lindsay Dumas Date: 7-29-19

email: Ldumas@hilcorp.com Telephone: 832-839-4585

OCD Only

Received by: OCD Date: 7/29/19

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: Cory Date: 8/8/19

Printed Name: Cory Title: Environmental Specalist

Lindsay Dumas

From:	Terry Nelson
Sent:	Thursday, April 18, 2019 12:13 PM
To:	'aadeloye@blm.gov'; 'alfredvigiljr@jicarillaoga.com'; 'cory.smith@state.nm.us'; 'deedra.mike@bia.gov'; 'Guillermo'; 'hsandoval_99@yahoo.com'; 'Jason Sandoval'; 'jim.griswold@state.nm.us'; 'kurt.sandoval@bia.gov'; 'marlena.reval@bia.gov'; 'Orson Harrison'; 'rodvelarde@jicarillaoga.com'; 'lthomas@blm.gov'; 'waymorecallado@jicarillaoga.com'
Cc:	Lindsay Dumas; Nick Kunze; Lee Murphy; Joshua Hallum
Subject:	FW: Hilcorp Release - Tribal C 10E

On 4/17/2019 at 7am, Hilcorp Energy discovered a release on the Tribal C 10E caused by corrosion on the bottom of the tank, 30-039-20805, Latitude - 36.506033, Longitude: -107.182335, 7, 26N, 3W. While completing the equipment walk around inspection the Field Operator noticed a 2' x 3' wet spot next to the tank. He then gauged the tank and discovered a volume loss of 62 bbls. Field Operator coordinated the transfer of the remaining 74 bbls. Tank is empty and on the schedule for inspection and repair. Zero fluid was recovered.

Hilcorp Environmental will submit an Initial C-141 within 15 days, and follow up with spill assessment.

Please let me know if there are any questions.

Sincerely,
Terry Nelson
Sr. Foreman Area 14
Hilcorp Energy
505-320-2503

On 4/17/19 HEC discovered the release on the Tribal C 10E of 38 bbls of oil and 12 bbls of produced water. The release was due to corrosion on the bottom of the production tank. HEC contracted with Timberwolf Environmental to provide an environmental assessment of the release. On 5/2/19 and 5/3/19 Timberwolf delineating the Tribal C 10E with a rotary rig from Geomat. On 6/7/19 HEC was provided the site characterization report and remedial action plan from Timberwolf Environmental. HEC presented the findings to NMOCD and Jicarilla Apache, HEC was given the approval to move forward with excavating the contaminated soil to sandstone.

On 6/17/19 HEC began excavating with HEC and Jicarilla Apache tribe members on location. Sandstone was encountered on 6/18/19, HEC was directed by Hobson Sandoval, Jicarilla EPO, to spray the open excavation with potassium permanganate and that no samples needed to be collected. HEC got approval via email from Jicarilla (attached). Also attached is invoice from NRE for the spraying of potassium permanganate.

HEC was working closely with Jicarilla on location. HEC did not notify of NMOCD of sampling because Jicarilla determined sampling to not be necessary.

Lindsay Dumas

From:	Lindsay Dumas
Sent:	Tuesday, June 25, 2019 8:47 AM
To:	Hobson Sandoval - Jicarilla (hsandoval2012@gmail.com); 'sandovalh2019@gmail.com'
Subject:	Tribal C 10E

Hi Hobson – HEC excavated approximately 600 cubic yards from the Tribal C 10E on June 17 – 18, 2019. Sandstone was encountered during the excavation at approximately 6'. Hobson Sandoval was on location June 17th during excavation. On June 18th HEC contacted Hobson to let him know we hit sandstone and the sidewalls were below 1000ppm on the PID. Hobson gave verbal approval to move forward with spraying the base of the excavation with potassium permanganate.

HEC is requesting written approval to move forward with backfilling the excavation. The backfill material will be from a nearby pond (36.503013, -107.190718) Aerial photo below.

Kind regards,

Lindsay Dumas
Environmental Specialist
Hilcorp Energy – L48 West
Office: 832-839-4585
Mobile: 281-794-9159

Lindsay Dumas

From: Hobson Sandoval <sandovalh2019@gmail.com>
Sent: Tuesday, June 25, 2019 9:18 AM
To: Lindsay Dumas; Jason Sandoval; Tecube Cordell
Subject: [EXTERNAL] Re: Tribal C 10E
Attachments: image001.png

Your request to back fill Tribal C 10 ia approved by Jicarilla Apache Environmental Protection Office. approved for 700 cubic yard of clean clay soil. The clay soil is from a pile that is by a pond just across the road from Harvest Midstream compressor.

On Tue, Jun 25, 2019, 7:47 AM Lindsay Dumas <ldumas@hilcorp.com> wrote:

> Hi Hobson – HEC excavated approximately 600 cubic yards from the Tribal C 10E on June 17 – 18, 2019. Sandstone was encountered during the excavation at approximately 6'. Hobson Sandoval was on location June 17th during excavation. On June 18th HEC contacted Hobson to let him know we hit sandstone and the sidewalls were below 1000ppm on the PID. Hobson gave verbal approval to move forward with spraying the base of the excavation with potassium permanganate.
>
> HEC is requesting written approval to move forward with backfilling the excavation. The backfill material will be from a nearby pond (36.503013, -107.190718) Aerial photo below.

Lindsay Dumas

From:	Hobson Sandoval <hsandoval2012@gmail.com>
Sent:	Wednesday, June 26, 2019 4:15 PM
To:	Jason Sandoval; Cordell Tecube; Kurt; Orson Harrison; Lindsay Dumas
Subject:	[EXTERNAL] Hilcorp Tribal C-10E
Attachments:	june 24, 2019 016.JPG; june 24, 2019 008.JPG; june 24, 2019 011.JPG; june 24, 2019 013.JPG; june 24, 2019 014.JPG

Checked this site on June 24, 2019. The site has been clean out well. I did not see any soil discoloration nor any hydrocarbon odor. Bed rock was encounter, so I advised them that they need not excavate further. Envirotech will bring in Potassium Permanganate to spray and the site will be back filled with clay soil pile that Jason Sandoval had located just across from Harvest Midstream Compressor.

NRE Field Services, LLC
3040 Southside River Road
Farmington, NM 87401 US
505-258-4259
office@nrefieldservices.com

Invoice

NRE FIELD SERVICES

BILL TO
Hilcorp San Juan, L.P.
c/o Hilcorp Energy Company
PO Box 61529
Houston, TX 77208-1529

INVOICE #	DATE	TOTAL DUE	DUE DATE		ENCLOSED
2862	07/17/2019	$1,048.94	08/16/2019		

P.O. NUMBER
Area 1414

SALES REP
Travis Munkres

LOCATION
Tribal C 10E

DATE	ACTIVITY	QTY	RATE	AMOUNT
06/19/2019	**2500 Pickup**	7	18.00	126.00T
06/19/2019	**Water Trailer Charge**	7	15.00	105.00T
06/19/2019	**Water**	1,000	0.02	20.00T
06/19/2019	**Potassium Permanganate**	4	50.00	200.00T
06/19/2019	**Roustabout Operator** Carlos Lopez	7	40.00	280.00T
06/19/2019	**Roustabout Laborer** Martin Barron	7	34.00	238.00T
06/19/2019	Filled up the 1000 gallon water tank and loaded equipment, drove to location, rigged up hoses and pump and sprayed potassium in hole.			

FOA Brandie Blakley
Thank you for your business

SUBTOTAL	969.00
TAX	79.94
TOTAL	1,048.94
BALANCE DUE	**$1,048.94**

Hilcorp Energy Company
Travis Munkres
AFE #: 153377
Billing Category: 9110-113
Signature: Travis Munkres
Date: 7/22/19

June 24, 2019 Site Pictures from Hobson Sandoval


Hilcorp Energy Company
TRIBAL C-10E
NW / SE
SEC. 7, T-26-N, R-3-W
JIC. LSE. # 09-000097
RIO ARRIBA COUNTY, NM
EMERGENCY NUMBER: 505-324-5170

961 CR 233, Ste. B-4
Durango, Colorado 81301
979.324.2139
www.teamtimberwolf.com

June 7, 2019

Ms. Lindsay Dumas
Environmental Specialist
Hilcorp Energy Company
1111 Travis Street
Houston, Texas 77002

Re: Site Characterization Report and Remedial Action Plan
Tribal C-10E Battery (NW, SE, Sec. 7, T26N, R3W)
Hilcorp Energy Company
Rio Arriba County, New Mexico
OCD Incident No.: NCS1901155075

Dear Ms. Dumas:

At the request of Hilcorp Energy Company (Hilcorp), Timberwolf Environmental, LLC (Timberwolf) presents this site characterization report and remedial action plan for the Tribal C-10E Battery (Site). The Site is located approximately 31.2 miles south-southwest of Dulce, in Rio Arriba County, New Mexico (Figures 1 – 3).

The purpose of this document is to present Site characterization activities, which establish soil regulatory criteria, and outline the preferred remedial option to bring the Site to regulatory closure.

Site and Release Description

The Site is a single-well upstream oil and gas facility. Surface equipment includes: a wellhead, two oil tanks, produced water tank, line heater, separator, and sales gas meter (Figure 4).

The release occurred due to frozen piping near the production tank; consequently, some of the tank fluids were release. Approximately 38 barrels (bbls) of oil and 12 bbls of produced water were released. All released fluid was contained within the berm. Standing fluid was recovered and the facility was temporarily placed out-of-service until repairs could be made.

Site Characterization Report

Timberwolf characterized the Site which included a field investigation, desktop review of publicly available data, and soil investigation. Significant findings from the desktop review were ground-truthed during the field investigation. The environmental setting, applicable regulatory criteria, sampling methodology, soil investigation, and conclusions are presented below.

Environmental Setting

The Site is situated on the Jicarilla Apache Reservation. The area consists of cedar and conifer trees with no significant understory and sparse vegetative cover. Area terrain is comprised of plateaus or mountain ridges divided by canyons. The primary canyon is the area is Tapicito Creek, which drains west until entering Largo Canon, approximately 18.5 miles from the Site.

The Site is situated on a plateau and overlooks Tapicito Creek with an average elevation of 7,130 feet (ft) above mean sea level. The plateau's edge is comprised of bolder rock outcropping. The closest surface water is a first order tributary of Tapicito Creek, situated 1,167 ft east of the site (Figure 5).

According to the U.S. Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), the Site soil consists of the Parklelei-Menefee-Vessilla complex, 2 to 20 percent slopes. The typical profile for this soil type includes a surface horizon comprised of a fine sandy loam, underlain by sandy clay loam between 2 to 38 inches, which is underlain by sandy loam from 38 to 80 inches. Native salinity of the soil is nonsaline to very slightly saline (0.0 to 2.0 millimhos per centimeter (mmhos/cm)). A soil map is included as Figure 6.

Regulatory Criteria

The New Mexico Oil Conservation Division (NMOCD) established remediation action levels for soil impacted by oilfield products or wastes, which are documented under New Mexico Administrative Code (NMAC) Rule 19.15.29. The Rule was officially promulgated by Oil Conservation Commission Order No.: R-14751, dated June 21, 2018.

Under Rule 19.15.29, soil cleanup criteria is determined based on the depth to usable groundwater and distances to surface water resources and sensitive features. Regulated groundwater intervals, required laboratory methodology, and soil closure criteria are presented in the following table.

Table 1. Closure Criteria for Soil Impacted by a Release

Depth to Groundwater[1]	Constituent	Method[2]	Regulatory Criteria[3] (mg/kg)
≤ 50 feet	Chloride[4]	EPA 300.0	600
	TPH	EPA SW-846 Method 8015M	100
	Total BTEX	EPA SW-846 Method 8021B or 8260B	50
	Benzene	EPA SW-846 Method 8021B or 8015M	10
51 feet-100 feet	Chloride[4]	EPA 300.0	10,000
	TPH	EPA SW-846 Method 8015M	2,500
	GRO+DRO	EPA SW-846 Method 8015M	1,000
	Total BTEX	EPA SW-846 Method 8021B or 8260B	50
	Benzene	EPA SW-846 Method 8021B or 8260B	10
> 100 feet	Chloride[4]	EPA 300.0	20,000
	TPH	EPA SW-846 Method 8015M	2,500
	GRO+DRO	EPA SW-846 Method 8015M	1,000
	Total BTEX	EPA SW-846 Method 8021B or 8260B	50
	Benzene	EPA SW-846 Method 8021B or 8015M	10

[1] From surface to useable groundwater (i.e., less than 10,000 milligrams per liter (mg/L) total dissolved solids (TDS))
[2] Or other test methods approved by the division
[3] Regulatory limits or background level, whichever is greater
mg/kg – milligrams per kilogram
GRO – gasoline range organics
[4] Applies to produced water and fluids containing chloride
TPH = GRO + DRO + MRO
DRO – diesel range organics

Additionally, the most stringent closure criteria as presented in Table 1 (i.e., ≤ 50 feet) are applicable for releases within a municipal boundary, 100-year floodplain, overlying a mine or unstable area, or within the specified protective distances from sensitive features as shown in Table 2.

Table 2. Protective Distances for Sensitive Features

Sensitive Feature	Protective Distance (ft)
Continuously flowing watercourse and its first order tributaries	300
Lakebed, sinkhole, or playa lake	200
Residence, school, hospital, or church	300
Spring or water well for private domestic/livestock water source	500
Any spring or fresh water well	1,000
Wetland	300

ft - feet

Review of well records maintained by the New Mexico Office of the State Engineer (NMOSE) revealed the closest water well is approximately 2.8 miles south-southwest from the Site. The referenced well is NMOSE POD No.: 75039; a copy of the water well log is attached. The depth to groundwater in the referenced well is 30 ft below ground surface (bgs). However, to provide a Site-specific depth to groundwater determination, a test boring (i.e., SB1) was drilled at the Site to a depth of 55 ft; no groundwater or water-bearing sands were encountered. A temporary well was installed and allowed to charge for 24 hours; no water was observed in the well. The temporary well was removed and plugged.

The topographical map in Figure 5 identifies Pine Spring to the southwest which may be within a 1,000 ft of the Site; however, field investigation of the area revealed no springs or surface characteristics consistent with springs (e.g., hydric vegetation). Findings of the field investigation are documented in the attached photographic log.

The Site is not situated within a municipal boundary, floodplain, mine or unstable area, or within 1,000 ft of any sensitive feature (Figure 5); therefore, soil closure criteria at the Site is as follows:

- Chloride < 10,000 mg/kg
- Total petroleum hydrocarbons (TPH) < 2,500 mg/kg
- GRO + DRO < 1,000 mg/kg
- Total BTEX < 50 mg/kg
- Benzene < 10 mg/kg

Sampling Methodology

A total of 19 soil samples were collected from nine borings installed using a rotary rig equipped with a hollow-stem augers and split spoon barrel or flight augers. Prior to soil boring installation, clearance requests were submitted to New Mexico 811 (i.e., One Call) and permits for monitoring well (SJ-4340 POD1-POD5) were obtained from the NMOSE.

During boring installation, soil samples were continuously sampled, logged for morphological characteristics, and field screened for volatile organic compounds (VOCs) using a photoionization detector (PID) until hollow-stem auger (HSA) refusal. HSA auger refusal was typically encountered between 6.5 – 10 ft bgs. Upon refusal, the drill string was converted to flight auger and discrete samples were collected at regular intervals using a split spoon and geotechnical hammer. PID readings are recorded on the attached soil boring logs.

Samples from each boring exhibiting the highest PID reading were selected for chemical analysis along with the boring terminus. Each boring was plugged with a bentonite seal to prevent vertical migration of contaminants.

Soil samples were placed directly into laboratory provided sample containers, labeled, stored on ice, and transported under proper chain-of-custody protocol to Pace Analytical in Mount Juliet, Tennessee for chemical analysis. Selected soil samples were analyzed for one or more of the following constituents of concern (COCs) using the described method:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) by EPA Method 8260B
- TPH by EPA SW-846 Method 8015M/D
- Chloride by EPA Method 300

Laboratory results, analytical methods, and chain-of-custody documents are provided in the attached laboratory reports.

Soil Investigation

On 05/02/19 and 05/03/19, Timberwolf contracted with Geomat, Inc. of Farmington, New Mexico to install soil borings at the Site. Nine soil borings (i.e. SB1 – SB9) were installed at and surrounding the former tank battery to determine the magnitude and extent of any petroleum hydrocarbon and/or chloride impacted soil.

SB1 was positioned immediately adjacent to the point of release. Additionally, SB1 was drilled to a depth of 55 ft bgs to evaluate the depth to groundwater. Soil boring locations are presented in Figure 7.

Fifteen (15) soil samples were selected for laboratory analysis from the borings; sample depths ranged from 3.5 ft bgs to 55 ft bgs. Groundwater was not encountered. The analytical results from the soil investigation are summarized in Table 3 below and presented on Figure 7.

Table 3. Soil Investigation Results – BTEX, TPH, and Chloride

Sample ID	Volatile Organic Compounds (mg /kg)		Petroleum Hydrocarbons (mg/kg)					Chloride (mg/kg)
	B	Total BTEX	GRO	DRO	MRO	GRO+DRO	Total	
SB1 10'	9.22[B]	451.4	5,450	535	30.6	5,985	6,016	< 10.0
SB1 20'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	< 10.0
SB1 55'	< 0.0005	0.0082	< 0.100	366	191	366	557.1	57.9
SB2 3.5'	0.00068	0.0077	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	< 10.0
SB2 15'	0.000693	0.0077	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	16.8[B]
SB2 20'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	26.3[B]
SB3 3.5'	3.71	220.8	3,440	1,080	< 20.0	4,520	4,540	< 10.0
SB3 15'	0.000553	0.0122	0.158[B]	10.1	5.79	10.3	16.0	< 10.0
SB4 7'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	< 10.0
SB5 7'	< 0.0005	0.0075	< 0.100	< 4.00	4.71	< 4.1	8.81	10.0[B]
SB6 6'	< 0.0125	0.2510	29.5	273	17.8	302.5	320.3	< 10.0
SB6 10'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	13.0[B]
SB7 10'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	57.1
SB8 10'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	< 10.0
SB9 7'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	13.4[B]
Regulatory Criteria	**10**	**50**	**--**	**--**	**--**	**1,000**	**2,500**	**10,000**

TPH – total petroleum hydrocarbons (TPH = GRO+DRO+MRO)
BTEX – benzene, toluene, ethylbenzene, and xylenes
mg/kg – milligrams per kilogram
-- – no applicable regulatory criteria
– exceeds regulatory criteria

GRO – gasoline range organics
DRO – diesel range organics
MRO – motor oil range organics

Conclusions of Site Characterization

Based on the Site characterization, the NMOCD regulatory criteria, and analytical results of the soil investigation, the following is concluded:

- Frozen piping at the oil tank resulted in the release of approximately 38 bbls of oil and 12 bbls of produced water; free liquids were recovered upon discovery and the Site was placed out-of-service
- Chloride concentrations were below NMOCD regulatory criteria in all soil samples
- Petroleum hydrocarbon concentrations (i.e., total BTEX, GRO + DRO, and TPH) exceeded NMOCD regulatory criteria in two soil samples (i.e., SB1 10' and SB3 3.5')
    - Total BTEX concentrations in the samples were of 451.4 mg/kg and 220.8 mg/kg, respectively
    - GRO + DRO concentrations in the samples were 5,985 mg/kg and 4,540 mg/kg, respectively
    - TPH concentrations in the samples were 6,016 mg/kg and 4,520 mg/kg, respectively

  - Samples with elevated COC concentrations were collected from SB1, installed immediately adjacent to the point of release and SB3 situated immediately adjacent to the berm
- Soil is vertically and horizontally delineated for all COC
  - The horizontal extent of impacted soil is approximately 45 ft by 50 ft
  - The vertical extent of impacted soil is approximately 12-15 ft bgs
  - The volume of impacted soil is estimated to be 693 cubic yards (yds^3)
  - The impacted area is depicted in Figure 8
- Groundwater at the Site is deeper than 55 ft bgs

Remedial Action Plan

The Site assessment revealed the COCs at the Site include total BTEX, GRO + DRO, and TPH. To bring Site soils into compliance, Hilcorp will remove necessary equipment and piping, excavate, and transport impacted soil to a commercial disposal facility. Soil will be excavated until visual signs of petroleum hydrocarbon are no longer present or until consolidated rock provides refusal. If refusal is encountered, the base of the excavation will be treated by chemical oxidation using potassium permanganate.

Confirmation samples will be collected from the excavation sidewalls and base to ensure that all soil exceeding NMOCD criteria have been removed or treated. Because of the anticipated excavation size, one confirmation samples will be collected for each 1,000 ft^2 area of sidewall an excavation base. Once laboratory analysis confirm that confirmation samples of the excavation meet the remedial targets, the excavation will be backfilled.

This remedial action plan is anticipated to remediate approximately 700 cubic yards of soil. This remedial action plan can be completed in six weeks or 10 weeks with a contingency for additional excavation, if needed. The timeline for this remedial action plan is presented in Table 4 below.

Table 4. Projected Remedial Tasks and Timeline

Task	2018			
	June	July	Aug	Sept
Remove equipment and piping				
Excavate impacted soil				
Confirmation sampling/lab analysis				
Additional excavation (if needed)				
Second confirmation sampling (if needed)				
Backfill				
Rebuild tank battery				
Site Closure Report				

Timberwolf appreciates the opportunity to provide Hilcorp with our professional consulting services. If you have any questions regarding this proposal, please contact us at (979) 324-2139.

Sincerely,
Timberwolf Environmental, LLC

Russell Greer
Project Manager

Jim Foster
President

Attachments: Figures
NMOSE Well Log
NMOSE Monitor Well Permits
Soil Boring Logs
Laboratory Reports and Chain-of-Custody Documents

FIGURES

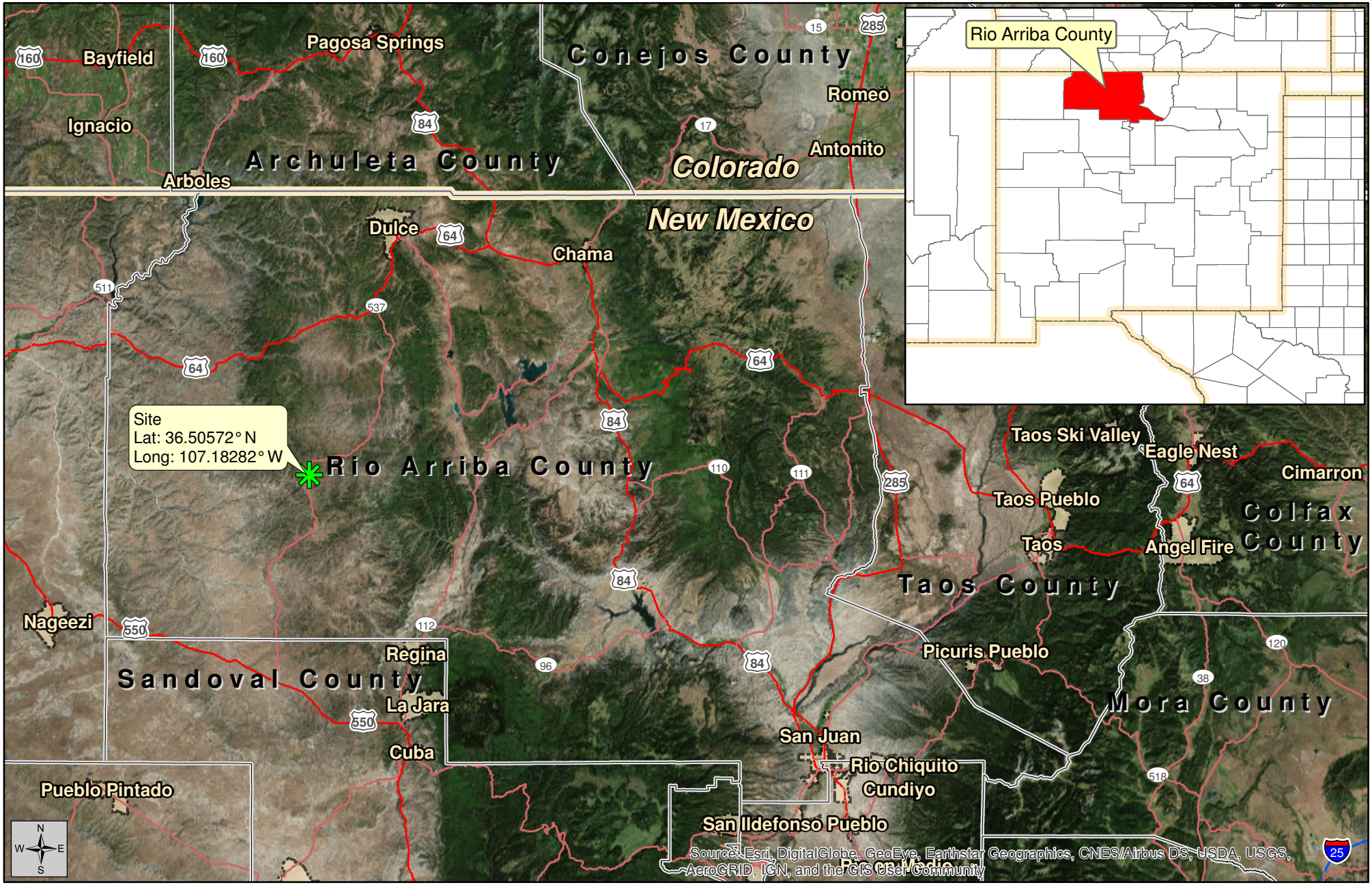


Figure 1 **Site Location Map**	**Site Characterization Report and Remedial Action Plan**	**June 3, 2019**
TIMBERWOLF ENVIRONMENTAL	1:1,250,000 0 20 40 60 80 100 120 Miles **Tribal C 10E** **Hilcorp Energy Company** **Rio Arriba County, New Mexico**	Site
Created By: Russell Greer TE Project No.: HEC-190016	Datum: NAD83 Imagery Source: ESRI Vector Source: ESRI and TE	

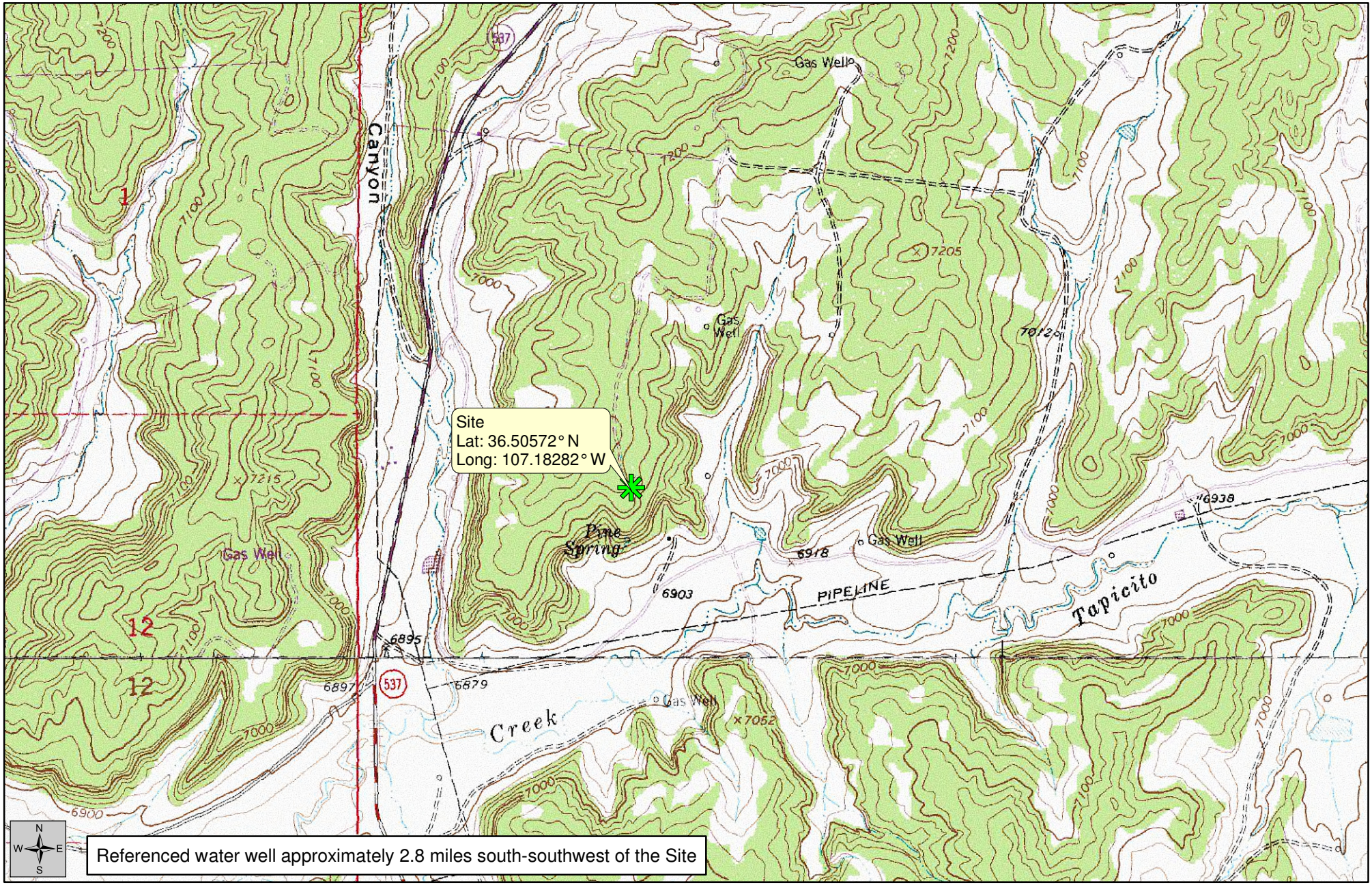


Figure 2 **Topographic Map**	**Site Characterization Report and Remedial Action Plan**	**June 3, 2019**

TIMBERWOLF ENVIRONMENTAL

1:24,000

0 0.5 1 1.5 2 2.5 Miles

Created By:
Russell Greer
TE Project No.: HEC-190016

Tribal C 10E
Hilcorp Energy Company
Rio Arriba County, New Mexico

Datum: NAD83
Imagery Source: USGS
Quads: Pine Lake, Schmitz Ranch
Vector Source: TE

Site

Figure 3
Aerial Map

Site Characterization Report and Remedial Action Plan

June 3, 2019

1:10,000

0 0.25 0.5 0.75 1 Miles

TIMBERWOLF ENVIRONMENTAL

Created By:
Russell Greer
TE Project No.: HEC-190016

Tribal C 10E
Hilcorp Energy Company
Rio Arriba County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Site

Figure 4
Site Diagram

Site Characterization Report and Remedial Action Plan

June 7, 2019

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Tribal C 10E
Hilcorp Energy Company
Rio Arriba County, New Mexico

Created By:
Dominic Ramos
TE Project No.: HEC-190016

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Horizontal Conduit
Production Equipment

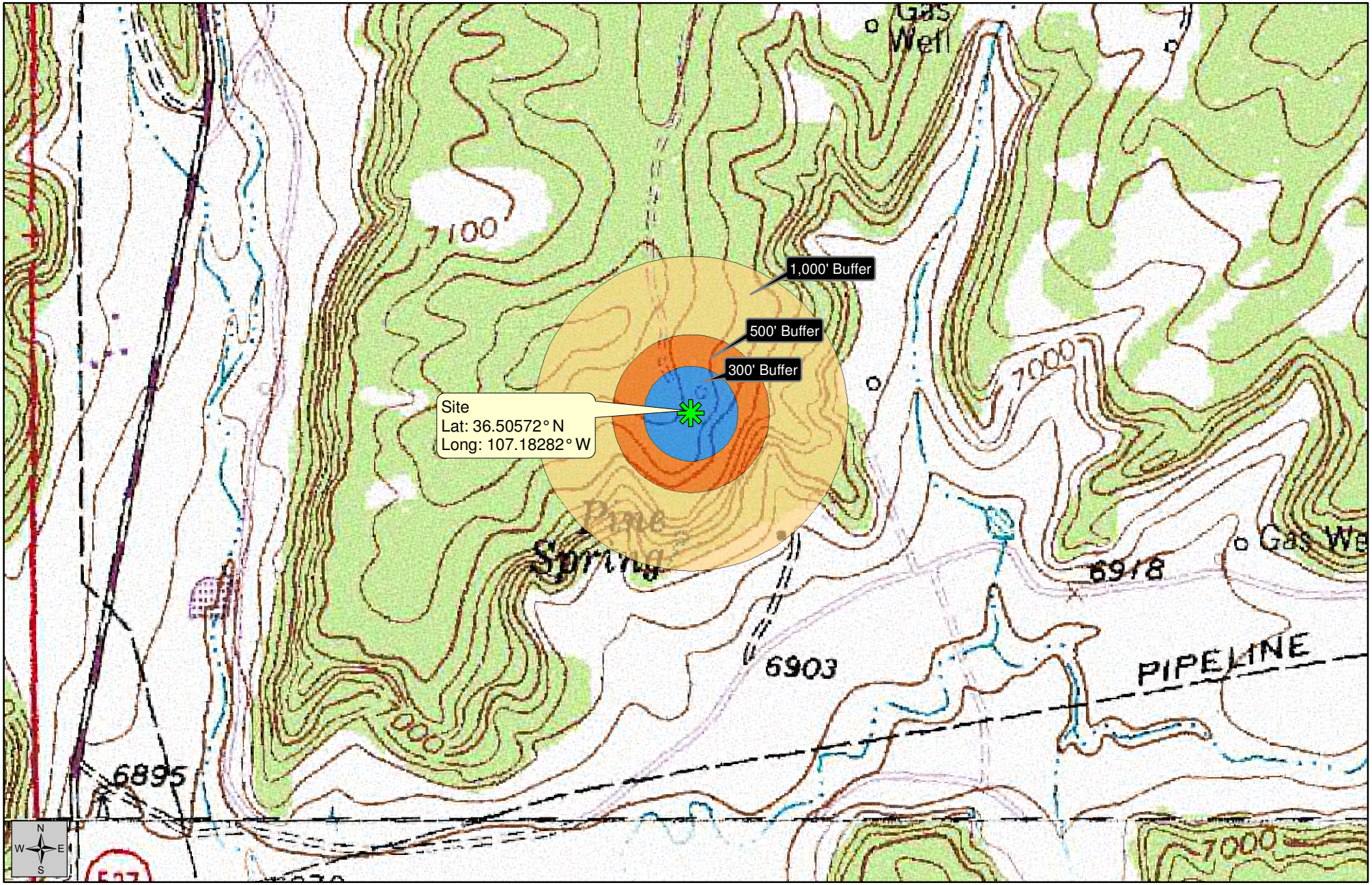


Figure 5
Site Buffer Map

Site Characterization Report and Remedial Action Plan

June 3, 2019

TIMBERWOLF ENVIRONMENTAL

1:10,000

0 0.25 0.5 0.75 1 Miles

Created By:
Russell Greer
TE Project No.: HEC-190016

Tribal C 10E
Hilcorp Energy Company
Rio Arriba County, New Mexico

Datum: NAD83
Imagery Source: USGS
Quads: Pine Lake, Schmitz Ranch
Vector Source: TE

1,000' Buffer
500' Buffer
300' Buffer
Site

Figure 6 **Soil Series Map**	**Site Characterization Report and Remedial Action Plan**	**June 7, 2019**
TIMBERWOLF ENVIRONMENTAL	1:1,000 0 100 200 300 400 500 Feet **Tribal C 10E** **Hilcorp Energy Company** **Rio Arriba County, New Mexico**	Datum: NAD83 Imagery Source: ESRI Vector Source: TE
Created By: Dominic Ramos TE Project No.: HEC-190016		

Sample ID	Volatile Organic Compounds (mg/kg)		Petroleum Hydrocarbons (mg/kg)					Chloride (mg/kg)
	B	Total BTEX	GRO	DRO	ORO	DRO+GRO	Total	
SB1 10'	9.22[B]	451.42	5,450	535	30.6	5,985	6,016	< 10.0
SB1 20'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	< 10.0
SB1 55'	< 0.0005	0.0082	< 0.100	366	191	366	557.1	57.9
SB2 3.5'	0.00068	0.0077	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	< 10.0
SB2 15'	0.000693	0.0077	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	16.8[B]
SB2 20'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	26.3[B]
SB3 3.5'	3.71	220.78	3,440	1,080	< 20.0	4,520	4,540	< 10.0
SB3 15'	0.000553	0.0122	0.158[B]	10.1	5.79	10.3	16.0	< 10.0
SB4 7'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	< 10.0
SB5 7'	< 0.0005	0.0075	< 0.100	< 4.00	4.71	< 4.1	8.81	10.0[B]
SB6 6'	< 0.0125	0.2510	29.5	273	17.8	302.5	320.3	< 10.0
SB6 10'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	13.0[B]
SB7 10'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	57.1
SB8 10'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	< 10.0
SB9 7'	< 0.0005	0.0075	< 0.100	< 4.00	< 4.00	< 4.1	< 8.1	13.4[B]
Regulatory Criteria	**10**	**50**	**--**	**--**	**--**	**1,000**	**2,500**	**10,000**

Figure 7
Sample Location Map

Site Characterization Report and Remedial Action Plan

Sample Date:
May 2, 2019

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Created By:
Kevin Cole
TE Project No.: HEC-190016

Tribal C 10E
Hilcorp Energy Company
Rio Arriba County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

- Sample Location (clean)
- Sample Location (elevated)
- Point of Release

Figure 8
Proposed Excavation Map

Site Characterization Report and Remedial Action Plan

June 7, 2019

TIMBERWOLF ENVIRONMENTAL

1:450

0 50 100 150 200 250 Feet

Created By:
Russell Greer
TE Project No.: HEC-190016

Tribal C 10E
Hilcorp Energy Company
Rio Arriba County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Proposed Excavation (depth 6 - 7 ft)

Proposed Excavation (depth 12 - 15 ft)

NMOSE WELL RECORDS

TIMBERWOLF ENVIRONMENTAL

New Mexico Office of the State Engineer
Point of Diversion Summary

Well Tag	POD Number	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64 Q16 Q4	Sec	Twn	Rng	(NAD83 UTM in meters) X	Y
	RG 75039		26	32N	13E	303204	4037971

Driller License:	987	**Driller Company:**	FENNELL DRILLING COMPANY		
Driller Name:	JIM L. FENNELL				
Drill Start Date:	11/20/2000	**Drill Finish Date:**	11/20/2000	**Plug Date:**	
Log File Date:	11/28/2000	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	20 GPM
Casing Size:	5.00	**Depth Well:**	62 feet	**Depth Water:**	18 feet

Water Bearing Stratifications:	Top	Bottom	Description
	30	62	Other/Unknown

Casing Perforations:	Top	Bottom
	32	62

PHOTOGRAPHIC LOG

691 CR 233, Suite B-4
Durango, CO 81301
(979) 324-2139
www.teamtimberwolf.com

PHOTOGRAPHIC LOG

Project No.:	HEC-190016	**Client:**	Hilcorp Energy Company
Project Name:	Tribal C-10E	**Site Location:**	Rio Arriba County, New Mexico
Task Description:	Site Characterization	**Date:**	June 3, 2018

Photo No.:
1

Direction:
Northeast

Comments:
View of the point of release, and SB1 and temporary well location.

Photo No.:
2

Direction:
Northwest

Comments:
View of ephemeral stream; no primary or secondary indicators of springs.

691 CR 233, Suite B-4
Durango, CO 81301
(979) 324-2139
www.teamtimberwolf.com

PHOTOGRAPHIC LOG

Project No.:	HEC-190016	**Client:**	Hilcorp Energy Company
Project Name:	Tribal C-10E	**Site Location:**	Rio Arriba County, New Mexico
Task Description:	Site Characterization	**Date:**	June 3, 2018

Photo No.:
3

Direction:
North

Comments:
View of ephemeral stream; no primary or secondary indicators of springs.

Photo No.:
4

Direction:
East

Comments:
View of downgradient area of tank battery and boring locations for SB2, SB3, SB4, and SB5.

Note: SB3 was the only boring with elevated constituents in soil

NMOSE PERMIT

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
AZTEC

John R. D'Antonio, Jr., P.E.
State Engineer

100 Gossett Drive, Suite A
Aztec, New Mexico 87410

April 30, 2019

Hilcorp Energy Company
Via Timberwolf Environmental, LLC, as Agent
382 Road 3100
Aztec, NM 87410

RE: Permit Approval for Monitoring Wells, SJ-4340 POD1-POD5; Hilcorp Energy Company; Tribal C 10E Release Investigation; Rural Rio Arriba County, New Mexico

Dear Ms. Deal:

On April 26, 2019, the New Mexico Office of the State Engineer received an application for a permit for the drilling and use of five proposed new monitoring wells at the above referenced location. Enclosed is a copy of the above numbered permit that has been approved subject to the conditions set forth on the approval page and in the attached Conditions of Approval. A receipt for the fees paid is also attached.

Please be aware that there are deadlines to submit well records for the newly installed monitoring wells. These deadlines can be found in the attached Conditions of Approval. A standardized plugging method has also been included in the Conditions of Approval for the future abandonment of the wells covered by this permit. This eliminates the need to submit a separate Well Plugging Plan of Operations for approval by the NMOSE prior to plugging, unless an alternate plugging method is proposed, required by a separate oversight agency, necessary due to incompatibility with actual conditions, or artesian conditions are encountered. The well and plugging records should be sent to the NMOSE District V, 100 Gossett Drive, Suite A, Aztec, NM, 87410.

If you have any questions regarding this permitting action, please feel free to contact me at (505) 334-4751.

Sincerely,

Miles Juett
Assistant Watermaster
Water Rights Division – District V

Enclosures

cc: Aztec Reading (w/o enclosures)
SJ-4340 File
WATERS
Jim Foster, Timberwolf Environmental, LLC, via e-mail: jim@teamtimberwolf.com
Brandon Powell, NMOCD District 3, via email: brandon.powell@state.nm.us

OFFICE OF THE STATE ENGINEER/INTERSTATE STREAM COMMISSION – AZTEC OFFICE

OFFICIAL RECEIPT NUMBER: 5 - 6355 DATE: 4-23-2019 FILE NO.: TBD

TOTAL: 25.00 RECEIVED: Twenty-five DOLLARS ☐ CASH: ☒ CHECK NO.: 002351

PAYOR: Timberwolf Env. ADDRESS: 1920 W. Villa Maria Rd., STE 205

CITY: Bryan STATE: TX ZIP: 77807 RECEIVED BY: MJ

INSTRUCTIONS: Indicate the number of actions to the left of the appropriate type of filing. Complete the receipt information. **Original** to payor; **pink** copy to Program Support/ASD; **yellow** copy remains in district office; and **goldenrod** copy to accompany application being filed. If a mistake is made, void the original and all copies and submit to Program Support/ASD as part of the daily deposit.

A. Ground Water Filing Fees

___	1. Change of Ownership of Water Right	$ 2.00
___	2. Application to Appropriate or Supplement Domestic 72-12-1 Well	$ 125.00
___	3. Application to Repair or Deepen 72-12-1 Well	$ 75.00
___	4. Application for Replacement 72-12-1 Well	$ 75.00
___	5. Application to Change Purpose of Use 72-12-1 Well	$ 75.00
___	6. Application for Stock Well/Temp. Use	$ 5.00
___	7. Application to Appropriate Irrigation, Municipal, or Commercial Use	$ 25.00
___	8. Declaration of Water Right	$ 1.00
___	9. Application for Supplemental Non 72-12-1 Well	$ 25.00
___	10. Application to Change Place or Purpose of Use Non 72-12-1 Well	$ 25.00
___	11. Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Ground Water	$ 50.00
___	12. Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Ground Water	$ 50.00
___	13. Application to Change Point of Diversion of Non 72-12-1 Well	$ 25.00
___	14. Application to Repair or Deepen Non 72-12-1 Well	$ 5.00
5	15. Application for Test, Expl. Observ. Well	$ 5.00
___	16. Application for Extension of Time	$ 25.00
___	17. Proof of Application to Beneficial Use	$ 25.00
___	18. Notice of Intent to Appropriate	$ 25.00

B. Surface Water Filing Fees

___	1. Change of Ownership of a Water Right	$ 5.00
___	2. Declaration of Water Right	$ 10.00
___	3. Amended Declaration	$ 25.00
___	4. Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Surface Water	$ 200.00
___	5. Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Surface Water	$ 200.00
___	6. Application to Change Point of Diversion	$ 100.00
___	7. Application to Change Place and/or Purpose of Use	$ 100.00
___	8. Application to Appropriate	$ 25.00
___	9. Notice of Intent to Appropriate	$ 25.00
___	10. Application for Extension of Time	$ 50.00
___	11. Supplemental Well to a Surface Right	$ 100.00
___	12. Return Flow Credit	$ 100.00
___	13. Proof of Completion of Works	$ 25.00
___	14. Proof of Application of Water to Beneficial Use	$ 25.00
___	15. Water Development Plan	$ 100.00
___	16. Declaration of Livestock Water Impoundment	$ 10.00
___	17. Application for Livestock Water Impoundment	$ 10.00

All fees are non-refundable.

C. Well Driller Fees

___	1. Application for Well Driller's License	$ 50.00
___	2. Application for Renewal of Well Driller's License	$ 50.00

D. Reproduction of Documents

___	@ 25¢/copy	$_____
___	Map(s)	$_____

E. Certification $_____

F. *Credit Card Convenience Fee $_____

G. Other _____ $_____

Comments: Hilcorp Energy Tribal C 10E site MW-5

File No. SJ-4340 POD1-POD5

NEW MEXICO OFFICE OF THE STATE ENGINEER

WR-07 APPLICATION FOR PERMIT TO DRILL

A WELL WITH NO WATER RIGHT

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/

Purpose:	☐ Pollution Control And/Or Recovery	☐ Ground Source Heat Pump
☐ Exploratory Well (Pump test)	☐ Construction Site/Public Works Dewatering	☒ Other(Describe): Soil borings may breach GW
☒ Monitoring Well	☐ Mine Dewatering	

A separate permit will be required to apply water to beneficial use regardless if use is consumptive or nonconsumptive.

☒ Temporary Request - Requested Start Date: April 22, 2019 Requested End Date: Unknown

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

1. APPLICANT(S)

Name: Hilcorp Energy Company	Name:
Contact or Agent: check here if Agent ☒ Jim Foster	Contact or Agent: check here if Agent ☐
Mailing Address: 382 Rd 3100	Mailing Address:
City: Aztec	City:
State: NM Zip Code: 87410	State: Zip Code:
Phone: 879-324-2139 ☐ Home ☒ Cell Phone (Work):	Phone: ☐ Home ☐ Cell Phone (Work):
E-mail (optional): jim@teamtimberwolf.com	E-mail (optional):

OFFICE OF THE STATE ENGINEER AZTEC, NEW MEXICO 2019 APR 26 PM 5

FOR OSE INTERNAL USE Application for Permit, Form WR-07, Rev 11/17/16

File No.: SJ-4340 POD1-POD5	Trn. No.:	Receipt No.: 5-6355
Trans Description (optional):		
Sub-Basin:	PCW/LOG Due Date: 4-30-2020	

2. **WELL(S)** Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

■ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
SJ-4340 POD1 MW-01	-107.18282	36.50571	T26N, R3W, S7, NW1/4 of NE1/4
SJ-4340 POD2 MW-02	-107.18292	36.50591	T26N, R3W, S7, NW1/4 of NE1/4
SJ-4340 POD3 MW-03	-107.18297	36.50563	T26N, R3W, S7, NW1/4 of NE1/4
SJ-4340 POD4 MW-04	-107.18255	36.50584	T26N, R3W, S7, NW1/4 of NE1/4
SJ-4340 POD5 MW-05	-107.18263	36.50561	T26N, R3W, S7m NW1/4 of NE1/4

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ☐ Yes ■ No **If yes, how many**_____

Other description relating well to common landmarks, streets, or other:
0.8 miles from intersection of J6 Rd. and NM-537

Well is on land owned by: Federal Land - Managed by B.L.M.

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. Attached? ☐ Yes ☐ No
If yes, how many_____

Approximate depth of well (feet): Unknown	Outside diameter of well casing (inches): 2 3/8"
Driller Name: Geomat Inc.	Driller License Number:1762

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

Exploration: Soil borings will be installed initially, and have potential to breach upper groundwater bearing unit. Monitor wells will be installed according to initial exploratory soil borings

Reason for monitor wells: Suspected groundwater contamination from a condesate/crude oil release

Duration of planned monitoring: Ongoing, potential for multi-year, to progress site toward regulatory closure.

2019 APR 26 PM 5:13

AZTEC, NEW MEXICO

FOR OSE INTERNAL USE

Application for Permit, Form WR-07

File No.: SJ-4340 POD1-POD5	Trn No.:

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory: ☐ Include a description of any proposed pump test, if applicable.	**Pollution Control and/or Recovery:** ☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for the pollution control or recovery operation. ☐ The estimated maximum period of time for completion of the operation. ☐ The annual diversion amount. ☐ The annual consumptive use amount. ☐ The maximum amount of water to be diverted and injected for the duration of the operation. ☐ The method and place of discharge.	**Construction De-Watering:** ☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	**Mine De-Watering:** ☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ■ Include the reason for the monitoring well, and, ■ The duration of the planned monitoring.	☐ The method of measurement of water produced and discharged. ☐ The source of water to be injected. ☐ The method of measurement of water injected. ☐ The characteristics of the aquifer. ☐ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☐ Proof of any permit required from the New Mexico Environment Department. ☐ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	**Ground Source Heat Pump:** ☐ Include a description of the geothermal heat exchange project, ☐ The number of boreholes for the completed project and required depths. ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), Jim Foster
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

STATE ENGINEER OFFICE
AZTEC, NEW MEXICO
2019 APR 26 PM 5:14

ACTION OF THE STATE ENGINEER

This application is:

☒ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this 30 day of April 20 19, for the State Engineer,

John R. D'Antonio, Jr., P.E., State Engineer

By: Miles Juett
Signature Print

Title: Assistant Watermaster
Print

FOR OSE INTERNAL USE

Application for Permit, Form WR-07

File No.: SJ-4340 POD1-POD5	Trn No.:

NMOSE Permit to Drill a Well(s) With No Water Right - Conditions of Approval
SJ-4340 POD1–POD5

The New Mexico Office of the State Engineer (NMOSE) has determined that existing water rights will not be impaired by this activity. This application is approved without publication provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state. This application approval (i.e., permit) is further subject to the following conditions of approval.

1. This permit is approved as follows:

Permittee(s): Hilcorp Energy Company
(via Timberwolf Environmental, LLC, as Agent)
382 Road 3100
Aztec, NM 87410

Permit Number: SJ-4340

Application File Date: April 26, 2019

Priority: N/A

Source: Groundwater

Point(s) of Diversion: Five points of diversion (PODs), SJ-4340 POD1 through POD5, are proposed. The PODs consist of five proposed monitoring wells (Table 1) that will be used for periodic groundwater sampling. The wells will be located at the Hilcorp Tribal C 10E release site located on land owned by The U.S. Department of the Interior Bureau of Land Management in rural Rio Arriba County, New Mexico. The PODs will be located within the NW/4 NE/4 of Section 7, Township 26 North, Range 3 West, NMPM, at the following approximate point locations (Long/Lat, WGS84).

Table 1: Proposed New Monitoring Wells

POD Number and Owner's Well Name	Casing: Diameter (inches) and Depth (feet)		Longitude (Decimal Deg.)	Latitude (Decimal Deg.)
SJ-4340 POD1 (MW-1)	2 3/8	unknown	107.18282° W	36.50571° N
SJ-4340 POD2 (MW-2)	2 3/8	unknown	107.18292° W	36.50591° N
SJ-4340 POD3 (MW-3)	2 3/8	unknown	107.18297° W	36.50563° N
SJ-4340 POD4 (MW-4)	2 3/8	unknown	107.18255° W	36.50584° N
SJ-4340 POD5 (MW-5)	2 3/8	unknown	107.18263° W	36.50561° N

Purpose of Use: Groundwater sampling

Place of Use: N/A

Amount of Water: N/A

2. No water shall be appropriated and beneficially used from any wells or borings approved under this permit.

3. No water shall be diverted from the well(s) except for initial well development and periodic sampling purposes. Upon completion of monitoring activities the well(s) shall be plugged in accordance with Subsection C of 19.27.4.30 NMAC, unless a permit to use water is acquired from the NMOSE.

4. The well(s) may continue to be used indefinitely for groundwater sampling or monitoring required for the current site investigation and any associated remediation, so long as they remain in good repair. **A new permit shall be obtained from the NMOSE prior to replacing a well(s) or for any change in use as approved herein.**

5. Water well drilling and well drilling activities, including well plugging, are regulated under NMOSE Regulations 19.27.4 NMAC. These regulations apply, and provide both general and specific direction regarding the drilling of wells in New Mexico. Note that the construction of any well that allows groundwater to flow uncontrolled to the land surface or to move appreciably between geologic units is prohibited.

6. In accordance with Subsection A of 19.27.4.29 NMAC, on-site supervision of well drilling/plugging is required by the holder of a New Mexico Well Driller License or a NMOSE-registered Drill Rig Supervisor. The New Mexico licensed Well Driller shall ensure that well drilling activities are completed in accordance with 19.27.4.29, 19.27.4.30 and 19.27.4.31 NMAC. However, pursuant to 72-12-12 NMSA 1978 and 19.27.4.8 NMAC, a driller's license is not required for the construction of a driven well with an outside casing diameter of 2⅜ inches or less and that does not require the use of a drill rig (e.g., auger) for installation. This exemption is not applicable to well plugging.

7. The permittee has not stated whether artesian conditions are likely to be encountered at the proposed well/borehole location(s). However, if artesian conditions are encountered during drilling, all rules and regulations pertaining to the drilling and casing and plugging of artesian wells shall be followed.

8. A Well Record documenting the as-built well construction and materials used shall be filed for each of the new wells in accordance with Subsection N of 19.27.4.29 NMAC. **Well Records shall be filed with the State Engineer (NMOSE District V, 100 Gossett Drive, Suite A, Aztec, NM, 87410) within 30 days after completion of the well(s).** Well installation(s) shall be complete and the well record(s) filed no later than one year from the date of approval of this permit.

9. If the required Well Record documentation is not received within one year of the date of permit approval, this permit will automatically expire.

10. When the permittee receives approval or direction to permanently abandon the well(s)/borehole(s) covered by this permit, plugging shall be performed by a New Mexico licensed well driller. The well(s)/borehole(s) shall be plugged pursuant to Subsection C of 19.27.4.30 NMAC using the following method, unless an alternate plugging method has been proposed by or on behalf of the well owner and approved by the NMOSE. If a well/borehole has encountered artesian conditions, a Well Plugging Plan of Operations shall be submitted and

NMOSE approval obtained *prior* to the initiation of *any* well plugging activities concerning artesian wells. Additionally, if the following standardized plugging sealant is not appropriate for use due to incompatibility with the water quality or any soil and water contaminates encountered, a Well Plugging Plan of Operations shall be submitted and NMOSE approval obtained *prior* to the initiation of *any* well plugging activities.

a. Obstructions in a well/borehole shall be identified and removed if possible. If an obstruction cannot be removed, the method used to grout below and around the obstruction shall be described in detail in the plugging record.

b. Prior to plugging, calculate the theoretical volume of sealant needed for abandonment of the well/borehole based on the actual measured pluggable depth of the well/borehole and the volume factor for the casing/borehole diameter. Compare the actual volume of sealant placed in the well/borehole with the theoretical volume to verify the actual volume of sealant is equal to or exceeds the theoretical volume.

c. Portland Type I/II cement shall be used for the plugging sealant. The water mixed with the cement to create the plugging sealant shall be potable water or of similar quality. Portland cement has a fundamental water demand of 5.2 gallons of water per 94-lb sack of cement. Up to a maximum of 6.0 gallons per 94-lb sack is acceptable to allow for greater pumpability.

   Pure bentonite powder ("90 barrel yield") is allowed as a cement additive by NMOSE and American Water Works Association (AWWA) guidelines. If a bentonite additive is used, the following rates and mixing guidelines shall be followed. For a rate or a mixing procedure other than that provided below, the NMOSE District V office must be contacted for pre-approval. Neither granular bentonite nor extended-yield bentonite shall be mixed with cement for the purpose of this plugging activity. When supplementing a cement slurry with bentonite powder, water demand for the mix increases at a rate of approximately 0.65 gallon of water for each 1% increment of bentonite bdwc (by dry weight cement) above the stated base water demand of 5.2 gallons water per 94-lb sack of cement for neat cement. Bentonite powder must be hydrated separately with its required increment of water before being mixed into the wet neat cement. If water is otherwise added to the combination of dry ingredients or the dry bentonite is blended into wet cement, the alkalinity of the cement will restrict the yield of the bentonite powder, resulting in excess free water in the slurry and excessive cement shrinkage upon curing.

d. Placement of the sealant within the well/borehole shall be by pumping through a tremie pipe extended to near the bottom of the well/borehole and kept below the top of the slurry column (i.e., immersed in the slurry) as the well/borehole is plugged from bottom upwards in a manner that displaces the standing water column.

e. Prior to, or upon completion of plugging, the well casing may be cut-off below grade as necessary to allow for approved construction onsite, provided a minimum six-inch thickness of reinforced abandonment plugging sealant or concrete completely covers the top of the cut-off casing. Any remaining void to the surface may be filled with native soil, concrete, or asphalt as needed to match the surrounding surface material and blended with the surface topography to prevent ponding.

f. **Within 30 days after completion of well/borehole plugging, a complete Plugging Record shall be filed with the State Engineer** in accordance with Paragraph (3) of Subsection C of 19.27.4.30 NMAC for each well/boring plugged. The Well Plugging

Record(s) shall be filed with the State Engineer at the NMOSE District V Office, 100 Gossett Drive, Suite A, Aztec, NM 87410. The required well plugging record form is available at http://www.ose.state.nm.us/STST/wdForms.php.

11. In accordance with Subsection C of 19.27.4.30 NMAC, a well/borehole that does not encounter groundwater may be immediately plugged by filling with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet to the land surface with a sealant approved by the Office of the State Engineer. A Plugging Record shall be filed with the State Engineer as described above.

12. Should another regulatory agency sharing jurisdiction of the project authorize, or by regulation require, more stringent requirements than stated herein, the more stringent procedure should be followed. These, among others, may include provisions regarding pre-authorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the drilling and/or monitoring process.

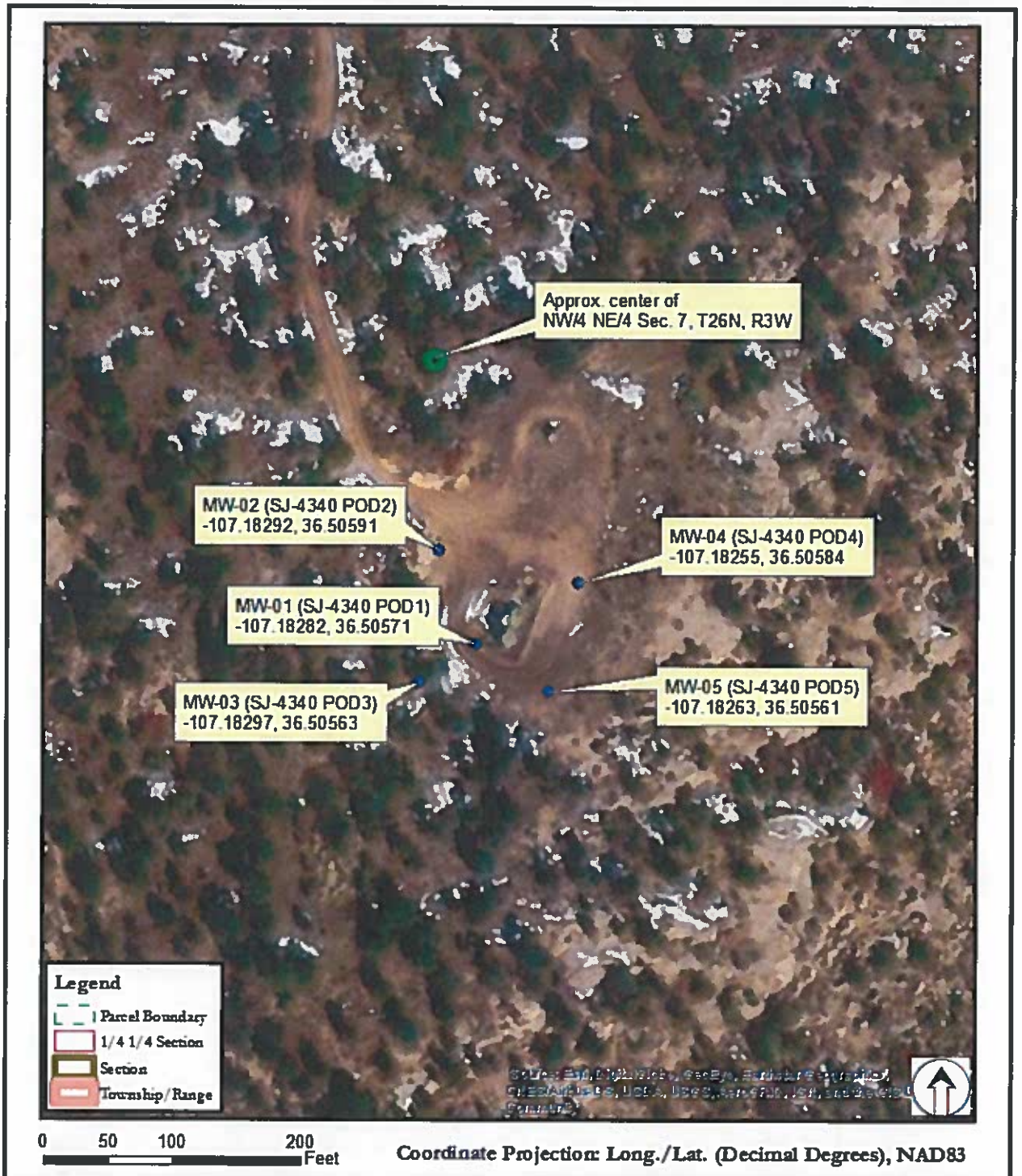
13. Pursuant to 72-12-3 NMSA 1978, the applicant may or may not have provided written documentation with the application, which the applicant claims as confirmation that access has been granted for the aforementioned well(s) to be located on property owned by someone other than the well owner/applicant. NMOSE approval of this permit in no way infers the right of access to land not owned by the well owner/applicant.

14. The State Engineer retains jurisdiction of this permit.

The application for drilling well(s) SJ-4340 POD1-POD5 without a water right, submitted on April 26, 2019, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and seal this 30th day of April, A.D. 2019.
John R. D'Antionio, Jr., P.E., State Engineer

By: _____
Miles Juett, Assistant Watermaster
District V Office, Water Rights Division



Map Description: Hilcorp Energy Company
Tribal C 10E Site Investigation
Data sources: Application materials
File number: SJ-4340 POD1-POD5
Aerial Photography: World Imagery

STATE OF NEW MEXICO
Office of the State Engineer
John R. D'Antonio Jr., P.E.
State Engineer

District V Office, Aztec
Well Location Map

SOIL BORING LOGS

SOIL BORING REPORT

SB1

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Jicarilla, NM	Drilled By: Geomat, Inc.
Project Number: 190016	Drilling Method: Hollow-stem and flight augers
Boring Coordinates: 36.505717, -107.182813	Total Depth (ft): 55'
Ground Surface Elevation (ft, msl):	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
	SM-SC	360.0		SANDY LOAM	
		137.0			
	SC			SAND	
	SC	260.0		SANDY CLAY	
5				CLAY	
		75.5			
	C				
		56.5			
		471.0			
	ML			FINE SANDY LOAM	
10				FLIGHT AUGER	
		423.0			
	SP			SANDSTONE	
15				FLIGHT AUGER	
		4.47			
	SP			SANDSTONE	
20				FLIGHT AUGER	
		0.51			
	SP			SANDSTONE	
25					

Notes:
Well Completion: No water or water sand observed, Set temp well to evaluate if groundwater presence in the upper 50', Drilled to 55', Set well with 10' screen (45'-55'); sandpack to 43'

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

SOIL BORING REPORT

SB1

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Jicarilla, NM	Drilled By: Geomat, Inc.
Project Number: 170038	Drilling Method: Hollow-stem and flight augers
Boring Coordinates: 36.505713, -107.182828	Total Depth (ft): 55'
Ground Surface Elevation (ft, msl):	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
30		0.42		FLIGHT AUGER	
35	SP			SANDSTONE	
				FLIGHT AUGER	
40		5.50			
45	SP			SANDSTONE	
				FLIGHT AUGER	
50		0.60			
55	SP			SANDSTONE	

Notes:
Drilled to 55', set well with 10' screen (45'-55'); sandpack to 43'

SOIL BORING REPORT

SB2

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Rio Arriba County, New Mexico	Drilled By: Geomat Inc.
Project Number: 190016	Drilling Method: Hollow Stem with Flight Auger
Boring Coordinates: 36.50566, -107.18274	Total Depth (ft): 20'
Ground Surface Elevation (ft, msl): 7,130	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
	SC	1.50	Hollow-stem auger	SANDY LOAM	
		2.10		LOAMY SAND	
	SW	52.0		SAND	
				SANDSTONE	
5		20.1	Flight auger	FLIGHT AUGER	
10	SW	1.1		SANDSTONE	
				FLIGHT AUGER	
15	SW	13.5		SANDSTONE	
				FLIGHT AUGER	
20	SW	2.50		SANDSTONE	
				TD=20'	
25					

Notes:
Groundwater not encountered; no well completion

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

SOIL BORING REPORT

SB3

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Rio Arriba County, New Mexico	Drilled By: Geomat Inc.
Project Number: 190016	Drilling Method: Hollow Stem with Flight Auger
Boring Coordinates: 36.50573, -107.18269	Total Depth (ft): 15'
Ground Surface Elevation (ft, msl): 7,130	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
0	SW		Hollow-stem auger	SAND	
				CLAYEY SAND	
5	CL			SANDY CLAY	
			Flight auger	FLIGHT AUGER	
10	SW		Split spoon sample	SANDSTONE	
			Flight auger	FLIGHT AUGER	
15	SW		Split spoon sample	SANDSTONE	
				TD=15'	
20					
25					

Notes:
Groundwater not encountered; no well completion

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

SOIL BORING REPORT

SB4

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Rio Arriba County, New Mexico	Drilled By: Geomat Inc.
Project Number: 190016	Drilling Method: Hollow Stem with Flight Auger
Boring Coordinates: 36.50573, -107.18264	Total Depth (ft): 7'
Ground Surface Elevation (ft, msl): 7,130	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
	SC			SANDY LOAM	
	SW			SAND	
		0.55			
5	SC	0.60		SANDY CLAY	
	SW	0.50		SANDSTONE	
		0.60			
				TD=7'	
10					
15					
20					
25					

Notes:
Groundwater not encountered; no well completion

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

SOIL BORING REPORT

SB5

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Rio Arriba County, New Mexico	Drilled By: Geomat Inc.
Project Number: 190016	Drilling Method: Hollow Stem with Flight Auger
Boring Coordinates: 36.50578, -107.18269	Total Depth (ft): 7'
Ground Surface Elevation (ft, msl): 7,130	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
	SW	0.50		SAND	
5	SC	0.40		SANDY CLAY	
	SW	0.45 0.50		SANDSTONE	
				TD=7'	
10					
15					
20					
25					

Notes:
Groundwater not encountered; no well completion

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

SOIL BORING REPORT

SB6

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Rio Arriba County, New Mexico	Drilled By: Geomat Inc.
Project Number: 190016	Drilling Method: Hollow Stem with Flight Auger
Boring Coordinates: 36.50577, -107.18285	Total Depth (ft): 10'
Ground Surface Elevation (ft, msl): 7,130	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
	SC			SANDY LOAM	
	ML	0.30		LOAMY SAND	
	MH			SILTY CLAY	
				CLAY	
5	CL	0.30			
		207			
				FLIGHT AUGER	
		2.75		SANDSTONE	
	SW				
10		0.60		TD=10'	
15					
20					
25					

Notes:
Groundwater not encountered; no well completion

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

SOIL BORING REPORT

SB7

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Rio Arriba County, New Mexico	Drilled By: Geomat Inc.
Project Number: 190016	Drilling Method: Hollow Stem with Flight Auger
Boring Coordinates: 36.50568, -107.18286	Total Depth (ft): 10'
Ground Surface Elevation (ft, msl): 7,130	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
	SC	0.50		SANDY LOAM	
				CLAY LOAM	
	CL			CLAY	
5		0.50			
		0.50			
				FLIGHT AUGER	
	SW	1.20		SANDSTONE	
10				TD=10'	
15					
20					
25					

Notes:
Groundwater not encountered; no well completion

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

SOIL BORING REPORT

SB8

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Rio Arriba County, New Mexico	Drilled By: Geomat Inc.
Project Number: 190016	Drilling Method: Hollow Stem with Flight Auger
Boring Coordinates: 36.50579, -107.18290	Total Depth (ft): 7'
Ground Surface Elevation (ft, msl): 7,130	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
				CLAY	
		0.25		CLAY LOAM	
	CL			CLAY	
5		0.30			
		0.25			
	SW	0.30		SANDSTONE	
				TD=7'	
10					
15					
20					
25					

Notes:
Groundwater not encountered; no well completion

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

SOIL BORING REPORT

SB9

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 05/02/19
Project Name: Tribal C 10E	Logged By: Jim Foster
Site Location: Rio Arriba County, New Mexico	Drilled By: Geomat Inc.
Project Number: 190016	Drilling Method: Hollow Stem with Flight Auger
Boring Coordinates: 36.50579, -107.18284	Total Depth (ft): 7'
Ground Surface Elevation (ft, msl): 7,130	First Water Encountered (ft): NA

Depth (feet)	USCS	PID Reading (ppm)	Drilling Technique	Soil Description	Well Completion
				CLAY	
		0.30		CLAY LOAM	
	CL			CLAY	
5		0.30			
		0.30			
	SW	0.30		SANDSTONE	
				TD=7'	
10					
15					
20					
25					

Notes:
Groundwater not encountered; no well completion

Legend:
- Hollow-stem auger
- Flight auger
- Split spoon sample

LABORATORY REPORT AND CHAIN OF CUSTODY DOCUMENTS

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

May 15, 2019

Hilcorp Energy_Timberwolf

Sample Delivery Group:	L1095995
Samples Received:	05/07/2019
Project Number:	190016
Description:	Jiacrilla Tribal C-10E
Site:	JIACRILLA TRIBAL C-10E
Report To:	Jim Foster 1920 W. Villa Maria Ste 205 Bryan, TX 77807

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 National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

SB1 10' L1095995-01 Solid

Collected by: Jim Foster | Collected date/time: 05/02/19 10:55 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 14:22	ST	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1280518	5000	05/08/19 14:10	05/14/19 14:50	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	5	05/11/19 22:28	05/13/19 05:38	MTJ	Mt. Juliet, TN

SB1 20' L1095995-02 Solid

Collected by: Jim Foster | Collected date/time: 05/02/19 11:15 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 14:59	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 13:17	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 11:19	TJD	Mt. Juliet, TN

SB1 55' L1095995-03 Solid

Collected by: Jim Foster | Collected date/time: 05/02/19 14:30 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 15:08	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 13:37	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	5	05/11/19 22:28	05/12/19 16:51	TJD	Mt. Juliet, TN

SB2 3.5' L1095995-04 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 09:10 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 15:17	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 13:57	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 11:35	TJD	Mt. Juliet, TN

SB2 15' L1095995-05 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 09:20 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 15:26	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 14:17	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 11:52	TJD	Mt. Juliet, TN

SB2 20' L1095995-06 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 09:30 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 15:35	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 14:57	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 12:06	TJD	Mt. Juliet, TN

SB3 5.5' L1095995-07 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 10:15 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 15:44	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015	WG1279158	500	05/08/19 14:10	05/10/19 21:39	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8021	WG1280518	500	05/08/19 14:10	05/14/19 14:29	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	5	05/11/19 22:28	05/12/19 16:03	TJD	Mt. Juliet, TN

SB3 15' L1095995-08 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 10:25 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 15:53	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 15:28	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 12:22	TJD	Mt. Juliet, TN

SB4 7' L1095995-09 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 10:55 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 16:02	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 15:48	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 13:58	TJD	Mt. Juliet, TN

SB5 7' L1095995-10 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 11:30 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 16:11	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 16:08	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 14:14	TJD	Mt. Juliet, TN

SB6 6' L1095995-11 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 12:35 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 16:55	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1280518	25	05/08/19 14:10	05/14/19 14:09	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 12:39	TJD	Mt. Juliet, TN

SB6 10' L1095995-12 Solid

Collected by: Jim Foster | Collected date/time: 05/03/19 12:45 | Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 17:04	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 16:28	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 12:54	TJD	Mt. Juliet, TN

SB7 10' L1095995-13 Solid

Collected by: Jim Foster
Collected date/time: 05/03/19 13:15
Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 17:13	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 16:48	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 13:41	TJD	Mt. Juliet, TN

SB8 10' L1095995-14 Solid

Collected by: Jim Foster
Collected date/time: 05/03/19 13:40
Received date/time: 05/07/19 08:45

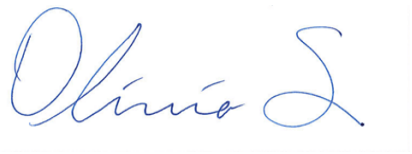
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 17:22	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 17:49	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 13:11	TJD	Mt. Juliet, TN

SB9 7' L1095995-15 Solid

Collected by: Jim Foster
Collected date/time: 05/03/19 14:10
Received date/time: 05/07/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1277447	1	05/09/19 14:50	05/13/19 17:31	ELN	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1279158	1	05/08/19 14:10	05/10/19 18:09	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1279502	1	05/11/19 22:28	05/12/19 13:26	TJD	Mt. Juliet, TN

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

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	ND		10.0	1	05/13/2019 14:22	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	9.22	B	2.50	5000	05/14/2019 14:50	WG1280518
Toluene	109		25.0	5000	05/14/2019 14:50	WG1280518
Ethylbenzene	15.2		2.50	5000	05/14/2019 14:50	WG1280518
Total Xylene	318		7.50	5000	05/14/2019 14:50	WG1280518
TPH (GC/FID) Low Fraction	5450		500	5000	05/14/2019 14:50	WG1280518
(S) a,a,a-Trifluorotoluene(FID)	*92.1*		*77.0-120*		*05/14/2019 14:50*	WG1280518
(S) a,a,a-Trifluorotoluene(PID)	*96.8*		*72.0-128*		*05/14/2019 14:50*	WG1280518

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	535		20.0	5	05/13/2019 05:38	WG1279502
C28-C40 Oil Range	30.6		20.0	5	05/13/2019 05:38	WG1279502
(S) o-Terphenyl	*88.8*		*18.0-148*		*05/13/2019 05:38*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	ND		10.0	1	05/13/2019 14:59	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 13:17	WG1279158
Toluene	ND		0.00500	1	05/10/2019 13:17	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 13:17	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 13:17	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 13:17	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*103*		*77.0-120*		*05/10/2019 13:17*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*94.3*		*72.0-128*		*05/10/2019 13:17*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 11:19	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 11:19	WG1279502
(S) o-Terphenyl	*70.8*		*18.0-148*		*05/12/2019 11:19*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	57.9		10.0	1	05/13/2019 15:08	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 13:37	WG1279158
Toluene	ND		0.00500	1	05/10/2019 13:37	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 13:37	WG1279158
Total Xylene	0.00218		0.00150	1	05/10/2019 13:37	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 13:37	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*105*		*77.0-120*		*05/10/2019 13:37*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*96.1*		*72.0-128*		*05/10/2019 13:37*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	366		20.0	5	05/12/2019 16:51	WG1279502
C28-C40 Oil Range	191		20.0	5	05/12/2019 16:51	WG1279502
(S) o-Terphenyl	*76.2*		*18.0-148*		*05/12/2019 16:51*	WG1279502

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	ND		10.0	1	05/13/2019 15:17	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	0.000680		0.000500	1	05/10/2019 13:57	WG1279158
Toluene	ND		0.00500	1	05/10/2019 13:57	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 13:57	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 13:57	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 13:57	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*102*		*77.0-120*		*05/10/2019 13:57*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*93.9*		*72.0-128*		*05/10/2019 13:57*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 11:35	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 11:35	WG1279502
(S) o-Terphenyl	*64.9*		*18.0-148*		*05/12/2019 11:35*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chloride	16.8	B	10.0	1	05/13/2019 15:26	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.000693		0.000500	1	05/10/2019 14:17	WG1279158
Toluene	ND		0.00500	1	05/10/2019 14:17	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 14:17	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 14:17	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 14:17	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*104*		*77.0-120*		*05/10/2019 14:17*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*94.1*		*72.0-128*		*05/10/2019 14:17*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 11:52	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 11:52	WG1279502
(S) o-Terphenyl	*76.8*		*18.0-148*		*05/12/2019 11:52*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	26.3	B	10.0	1	05/13/2019 15:35	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 14:57	WG1279158
Toluene	ND		0.00500	1	05/10/2019 14:57	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 14:57	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 14:57	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 14:57	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*103*		*77.0-120*		*05/10/2019 14:57*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*92.3*		*72.0-128*		*05/10/2019 14:57*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 12:06	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 12:06	WG1279502
(S) o-Terphenyl	*77.9*		*18.0-148*		*05/12/2019 12:06*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chloride	ND		10.0	1	05/13/2019 15:44	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	3.71		0.250	500	05/14/2019 14:29	WG1280518
Toluene	50.9		2.50	500	05/14/2019 14:29	WG1280518
Ethylbenzene	8.17		0.250	500	05/14/2019 14:29	WG1280518
Total Xylene	158		0.750	500	05/14/2019 14:29	WG1280518
TPH (GC/FID) Low Fraction	3440		50.0	500	05/10/2019 21:39	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*97.9*		*77.0-120*		*05/10/2019 21:39*	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*83.1*		*77.0-120*		*05/14/2019 14:29*	WG1280518
(S) a,a,a-Trifluorotoluene(PID)	*100*		*72.0-128*		*05/10/2019 21:39*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*96.6*		*72.0-128*		*05/14/2019 14:29*	WG1280518

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	1080		20.0	5	05/12/2019 16:03	WG1279502
C28-C40 Oil Range	ND		20.0	5	05/12/2019 16:03	WG1279502
(S) o-Terphenyl	*93.8*		*18.0-148*		*05/12/2019 16:03*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	ND		10.0	1	05/13/2019 15:53	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	0.000553		0.000500	1	05/10/2019 15:28	WG1279158
Toluene	ND		0.00500	1	05/10/2019 15:28	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 15:28	WG1279158
Total Xylene	0.00612		0.00150	1	05/10/2019 15:28	WG1279158
TPH (GC/FID) Low Fraction	0.158	B	0.100	1	05/10/2019 15:28	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*104*		*77.0-120*		*05/10/2019 15:28*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*93.5*		*72.0-128*		*05/10/2019 15:28*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	10.1		4.00	1	05/12/2019 12:22	WG1279502
C28-C40 Oil Range	5.79		4.00	1	05/12/2019 12:22	WG1279502
(S) o-Terphenyl	*84.1*		*18.0-148*		*05/12/2019 12:22*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	ND		10.0	1	05/13/2019 16:02	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 15:48	WG1279158
Toluene	ND		0.00500	1	05/10/2019 15:48	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 15:48	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 15:48	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 15:48	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*103*		*77.0-120*		*05/10/2019 15:48*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*94.6*		*72.0-128*		*05/10/2019 15:48*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 13:58	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 13:58	WG1279502
(S) o-Terphenyl	*76.9*		*18.0-148*		*05/12/2019 13:58*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	10.0	B	10.0	1	05/13/2019 16:11	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 16:08	WG1279158
Toluene	ND		0.00500	1	05/10/2019 16:08	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 16:08	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 16:08	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 16:08	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*102*		*77.0-120*		*05/10/2019 16:08*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*93.9*		*72.0-128*		*05/10/2019 16:08*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 14:14	WG1279502
C28-C40 Oil Range	4.71		4.00	1	05/12/2019 14:14	WG1279502
(S) o-Terphenyl	*73.7*		*18.0-148*		*05/12/2019 14:14*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	ND		10.0	1	05/13/2019 16:55	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.0125	25	05/14/2019 14:09	WG1280518
Toluene	ND		0.125	25	05/14/2019 14:09	WG1280518
Ethylbenzene	ND		0.0125	25	05/14/2019 14:09	WG1280518
Total Xylene	0.101	B	0.0375	25	05/14/2019 14:09	WG1280518
TPH (GC/FID) Low Fraction	29.5		2.50	25	05/14/2019 14:09	WG1280518
(S) a,a,a-Trifluorotoluene(FID)	*95.4*		*77.0-120*		*05/14/2019 14:09*	WG1280518
(S) a,a,a-Trifluorotoluene(PID)	*97.6*		*72.0-128*		*05/14/2019 14:09*	WG1280518

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	273		4.00	1	05/12/2019 12:39	WG1279502
C28-C40 Oil Range	17.8		4.00	1	05/12/2019 12:39	WG1279502
(S) o-Terphenyl	*87.3*		*18.0-148*		*05/12/2019 12:39*	WG1279502

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	13.0	B	10.0	1	05/13/2019 17:04	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 16:28	WG1279158
Toluene	ND		0.00500	1	05/10/2019 16:28	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 16:28	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 16:28	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 16:28	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*103*		*77.0-120*		*05/10/2019 16:28*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*95.1*		*72.0-128*		*05/10/2019 16:28*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 12:54	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 12:54	WG1279502
(S) o-Terphenyl	*78.2*		*18.0-148*		*05/12/2019 12:54*	WG1279502

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	57.1		10.0	1	05/13/2019 17:13	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 16:48	WG1279158
Toluene	ND		0.00500	1	05/10/2019 16:48	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 16:48	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 16:48	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 16:48	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*103*		*77.0-120*		*05/10/2019 16:48*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*93.9*		*72.0-128*		*05/10/2019 16:48*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 13:41	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 13:41	WG1279502
(S) o-Terphenyl	*74.2*		*18.0-148*		*05/12/2019 13:41*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	ND		10.0	1	05/13/2019 17:22	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 17:49	WG1279158
Toluene	ND		0.00500	1	05/10/2019 17:49	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 17:49	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 17:49	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 17:49	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*103*		*77.0-120*		*05/10/2019 17:49*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*91.7*		*72.0-128*		*05/10/2019 17:49*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 13:11	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 13:11	WG1279502
(S) o-Terphenyl	*75.2*		*18.0-148*		*05/12/2019 13:11*	WG1279502

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Chloride	13.4	B	10.0	1	05/13/2019 17:31	WG1277447

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.000500	1	05/10/2019 18:09	WG1279158
Toluene	ND		0.00500	1	05/10/2019 18:09	WG1279158
Ethylbenzene	ND		0.000500	1	05/10/2019 18:09	WG1279158
Total Xylene	ND		0.00150	1	05/10/2019 18:09	WG1279158
TPH (GC/FID) Low Fraction	ND		0.100	1	05/10/2019 18:09	WG1279158
(S) a,a,a-Trifluorotoluene(FID)	*103*		*77.0-120*		*05/10/2019 18:09*	WG1279158
(S) a,a,a-Trifluorotoluene(PID)	*97.0*		*72.0-128*		*05/10/2019 18:09*	WG1279158

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	ND		4.00	1	05/12/2019 13:26	WG1279502
C28-C40 Oil Range	ND		4.00	1	05/12/2019 13:26	WG1279502
(S) o-Terphenyl	*65.2*		*18.0-148*		*05/12/2019 13:26*	WG1279502

Method Blank (MB)

(MB) R3410702-1 05/13/19 13:11

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chloride	3.79	J	0.795	10.0

L1095333-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1095333-02 05/13/19 13:37 • (DUP) R3410702-3 05/13/19 13:46

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	ND	4.14	1	0.000		15

L1096012-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1096012-01 05/13/19 17:40 • (DUP) R3410702-6 05/13/19 17:49

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	ND	6.35	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R3410702-2 05/13/19 13:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	200	214	107	80.0-120	

L1095995-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1095995-10 05/13/19 16:11 • (MS) R3410702-4 05/13/19 16:20 • (MSD) R3410702-5 05/13/19 16:46

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	500	10.0	538	552	106	108	1	80.0-120			2.53	15

Method Blank (MB)

(MB) R3410819-5 05/10/19 11:46

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000394	J	0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	0.0228	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*109*			*77.0-120*
(S) a,a,a-Trifluorotoluene(PID)	*99.8*			*72.0-128*

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

(LCS) R3410819-1 05/10/19 09:22 • (LCSD) R3410819-2 05/10/19 09:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0487	0.0491	97.4	98.2	76.0-121			0.842	20
Toluene	0.0500	0.0485	0.0484	97.0	96.9	80.0-120			0.153	20
Ethylbenzene	0.0500	0.0509	0.0509	102	102	80.0-124			0.0936	20
Total Xylene	0.150	0.154	0.153	103	102	37.0-160			0.652	20
(S) a,a,a-Trifluorotoluene(FID)				*105*	*108*	*77.0-120*				
(S) a,a,a-Trifluorotoluene(PID)				*105*	*105*	*72.0-128*				

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

(LCS) R3410819-3 05/10/19 10:22 • (LCSD) R3410819-4 05/10/19 11:06

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	6.34	6.11	115	111	72.0-127			3.75	20
(S) a,a,a-Trifluorotoluene(FID)				*96.4*	*97.7*	*77.0-120*				
(S) a,a,a-Trifluorotoluene(PID)				*110*	*110*	*72.0-128*				

Method Blank (MB)

(MB) R3411095-5 05/14/19 12:52

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	0.000214	J	0.000120	0.000500
Toluene	0.000273	J	0.000150	0.00500
Ethylbenzene	0.000148	J	0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*97.5*			*77.0-120*
(S) a,a,a-Trifluorotoluene(PID)	*99.8*			*72.0-128*

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

(LCS) R3411095-1 05/14/19 10:43 • (LCSD) R3411095-2 05/14/19 11:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0501	0.0483	100	96.6	76.0-121			3.57	20
Toluene	0.0500	0.0490	0.0465	98.0	92.9	80.0-120			5.36	20
Ethylbenzene	0.0500	0.0515	0.0472	103	94.5	80.0-124			8.71	20
Total Xylene	0.150	0.156	0.146	104	97.4	37.0-160			6.75	20
(S) a,a,a-Trifluorotoluene(FID)				*96.3*	*95.1*	*77.0-120*				
(S) a,a,a-Trifluorotoluene(PID)				*99.4*	*97.0*	*72.0-128*				

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

(LCS) R3411095-3 05/14/19 11:24 • (LCSD) R3411095-4 05/14/19 12:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	6.11	5.47	111	99.5	72.0-127			11.1	20
(S) a,a,a-Trifluorotoluene(FID)				*112*	*109*	*77.0-120*				
(S) a,a,a-Trifluorotoluene(PID)				*109*	*109*	*72.0-128*				

Method Blank (MB)

(MB) R3410483-1 05/12/19 10:50

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*79.9*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R3410483-2 05/12/19 11:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	40.4	80.8	50.0-150	
(S) o-Terphenyl			*104*	*18.0-148*	

L1095466-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1095466-01 05/12/19 14:29 • (MS) R3410483-3 05/12/19 14:46 • (MSD) R3410483-4 05/12/19 15:00

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	50.7	ND	47.1	42.4	92.9	82.3	1	50.0-150			10.7	20
(S) o-Terphenyl					*105*	*92.6*		*18.0-148*				

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.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.

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	LAO00356
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

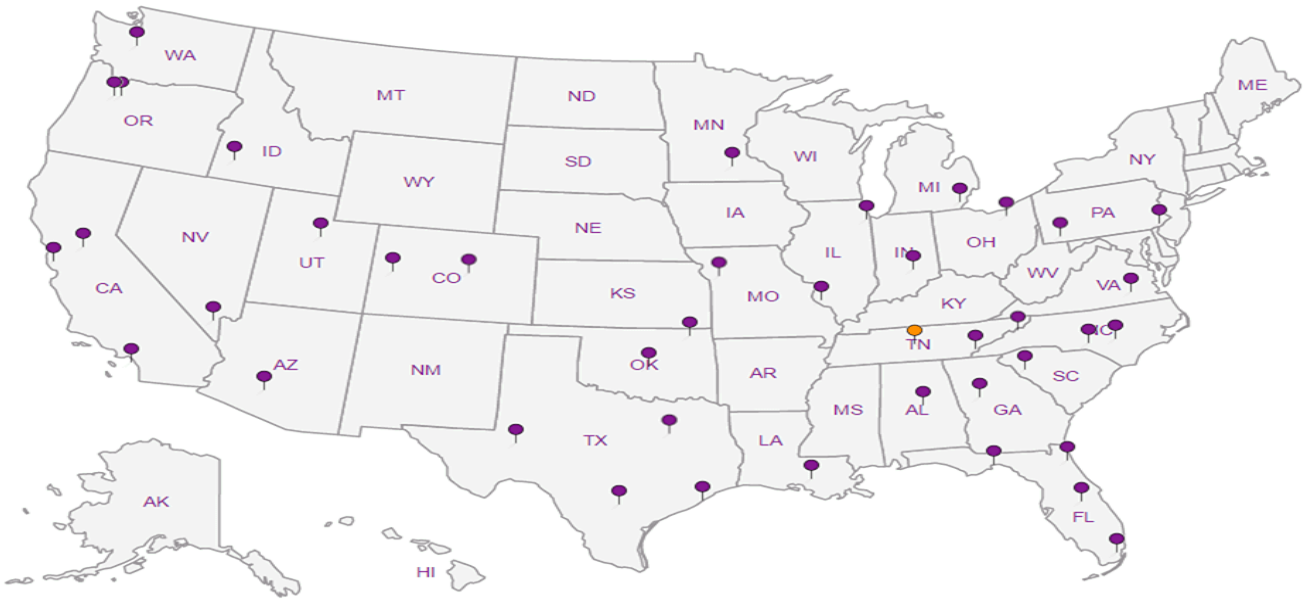
Third Party Federal Accreditations

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.



Timberwolf Environmental, LLC

1920 W Villa Maria, Ste 205
Bryan, TX 77807

Billing Information: Invoice Hilcorp
Accounts Payable
1920 W Villa Maria, Ste 205
Bryan, TX 77807 Lindsay Dumas
Hilcorp Energy
ldumas@hilcorp.com

Report to: Jim Foster

Email To: jim@teamtimberwolf.com

Project Description: Jicarilla Tribal C-10E

City/State Collected: NM

Phone: ~~361-772-8706~~
Fax: 979 324-2139

Client Project # 190016

Lab Project #

Collected by (print): Jim Foster

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Pres Chk

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	GRO/DRO-Ext+Range (8015)	BTEX	Cl-	Hold								Remarks	Sample # (lab only)
SB2 1.5'	G	SS		5/2/19	1045	1				✓									-
SB2 10'	G	SS		5/2/19	1055	1	✓	✓	✓										-01
SB1 20'	G	SS		5/2/19	1115	1	✓	✓	✓										02
SB2 25'	G	SS		5/2/19	1130	1				✓									
SB2 35'	G	SS		5/2/19	1220	1				✓									
SB2 45'	G	SS		5/2/19	1345	1				✓									
SB1 55'	G	SS		5/2/19	1430	1	✓	✓	✓										03
SB2 3.5'	G	SS		5/3/19	0910	1	✓	✓	✓										04
SB2 15'	G	SS		5/3/19	0920	1	✓	✓	✓										05
SB2 20'	G	SS		5/3/19	0930	1	✓	✓	✓										06

PAD SCREEN: <0.5 mR/hr

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 4686 6475 5445

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	5/6/19	1345		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 0.9-0=0.9 PO AZ 19
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 5/7/19 Time: 8:45

If preservation required by Login: Date/Time

Hold:

Condition: NCF OK

Chain of Custody Page 1 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1095995

1173

Acctnum: TIMENVBTX
Template:
Prelogin:
TSR: 823 - Olivia Studebaker
PB:
Shipped Via:

Timberwolf Environmental, LLC

1920 W Villa Maria, Ste 205
Bryan, TX 77807

Billing Information:
Accounts Payable
1920 W Villa Maria, Ste 205
Bryan, TX 77807
Lindsay Dumas – ltilcorp
ldumas@bilcorpi.com

Report to: Jim Foster

Email To: jim@teamtimberwolf.com

Project Description: Jicarilla Tribal C-10E

City/State Collected: NM

Phone: ~~361-772-8706~~
Fax: 979-324-2139

Client Project # 190016

Lab Project #

Collected by (print): Jim Foster

Site/Facility ID #

P.O. #

Collected by (signature):

Quote #

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pres Chk	GRO/DRO-Ext Range (8015)	BTEX	Cl-								Remarks	Sample # (lab only)
SB3 5.5'	SS	G		5/3/19	1015	1		✓	✓	✓				RAD SCREEN: <0.5 mR/hr					-07
SB3 15'	SS	G		5/3/19	1025	1		✓	✓	✓									08
SB4 7'	SS	G		5/3/19	1055	1		✓	✓	✓									09
SB5 7"	SS	G		5/3/19	1130	1		✓	✓	✓									10
SB6 6'	SS	G		5/3/19	1235	1		✓	✓	✓									11
SB6 10'	SS	G		5/3/19	1245	1		✓	✓	✓									12
SB7 10'	SS	G		5/3/19	1315	1		✓	✓	✓									13
SB8 10'	SS	G		5/3/19	1340	1		✓	✓	✓									14
SB9 7'	SS	G		5/3/19	1410	1		✓	✓	✓									15

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

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L# L1095995

Table #

Acctnum: TIMENVBTX

Template:

Prelogin:

TSR: 823 - Olivia Studebaker

PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # L1686 6475 5445

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	5/6/19	1345	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No (No)
HCL / MeoH
TBR

Temp: 0.9 °C Bottles Received: 19

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Date: 5/7/19 Time: 8:45