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-144 Revised April 3, 2017

For temporary pits, below-grade tanks, and multi-well fluid management pits, submit to the appropriate NMOCD District Office.

For permanent pits submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office.

Pit, Below-Grade Tank, or RCVD 8/9/19 Proposed Alternative Method Permit or Closure Plan Application
Type of action:  Below grade tank registration  Permit of a pit or proposed alternative method  Closure of a pit, below-grade tank, or proposed alternative method  Modification to an existing permit/or registration  Closure plan only submitted for an existing permitted or non-permitted pit, below-grade tank, or proposed alternative method
Instructions: Please submit one application (Form C-144) per individual pit, below-grade tank or alternative request
lease be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the nvironment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.
1. Operator:
Address: 382 Road 3100 Aztec NM 87410
Facility or well name: Fullerton Federal Com 12 – Pipeline Pit #2
API Number:OCD Permit Number
U/L or Qtr/Qtr D Section 11 Township 27N Range 11W County: San Juan/
Center of Proposed Design: Latitude <u>36.594035</u> °N Longitude <u>-107.979160</u> °W NAD83  Surface Owner: ☑ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment
Temporary: Drilling Workover  Permanent Emergency Cavitation P&A Multi-Well Fluid Management Low Chloride Drilling Fluid yes no Lined Unlined Liner type: Thickness mil LLDPE HDPE PVC Other  String-Reinforced Liner Seams: Welded Factory Other Volume: bbl Dimensions: L x W x D
3.    Below-grade tank: Subsection I of 19.15.17.11 NMAC
Volume: Max 120 bbl Type of fluid: Produced Water
Tank Construction material: Metal
Secondary containment with leak detection Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off
☐ Visible sidewalls and liner ☐ Visible sidewalls only ☐ Other
Liner type: Thickness 45 mil HDPE PVC Other LLDPE
4.  Alternative Method:
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.
5.
Fencing: Subsection D of 19.15.17.11 NMAC (Applies to permanent pits, temporary pits, and below-grade tanks)
Chain link, six feet in height, two strands of barbed wire at top (Required if located within 1000 feet of a permanent residence, school, hospital, institution or church)
☐ Four foot height, four strands of barbed wire evenly spaced between one and four feet  ☐ Alternate. Please specify 4' hog wire fence with a single strand of barbed wire on top
NA Thermate. These specify Those wife tended with a snight straint of barbed wife off the

Netting: Subsection E of 19.15.17.11 NMAC (Applies to permanent pits and permanent open top tanks)	
⊠ Screen □ Netting □ Other	
☐ Monthly inspections (If netting or screening is not physically feasible)	
5igns: Subsection C of 19.15.17.11 NMAC  ☐ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers  ☐ Signed in compliance with 19.15.16.8 NMAC	
•	
Variances and Exceptions:  Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance.  Please check a box if one or more of the following is requested, if not leave blank:  □ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval.  □ Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.	
9. Siting Criteria (regarding permitting): 19.15.17.10 NMAC Instructions: The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of accept material are provided below. Siting criteria does not apply to drying pads or above-grade tanks.	otable source
General siting	
Ground water is less than 25 feet below the bottom of a low chloride temporary pit or below-grade tank.  -   NM Office of the State Engineer - iWATERS database search;   USGS;   Data obtained from nearby wells	☐ Yes ☑ No ☐ NA
Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit.  NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☐ No ☐ NA
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. (Does not apply to below grade tanks)  Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☐ No
Within the area overlying a subsurface mine. (Does not apply to below grade tanks)  - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	☐ Yes ☐ No
<ul> <li>Within an unstable area. (Does not apply to below grade tanks)</li> <li>Engineering measures incorporated into the design; NM Bureau of Geology &amp; Mineral Resources; USGS; NM Geological Society; Topographic map</li> </ul>	☐ Yes ☐ No
Within a 100-year floodplain. (Does not apply to below grade tanks) - FEMA map	Yes No
Below Grade Tanks	
Within 100 feet of a continuously flowing watercourse, significant watercourse, lake bed, sinkhole, wetland or playa lake (measured from the ordinary high-water mark).  - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ⊠ No
Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;.  - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☑ No
Temporary Pit using Low Chloride Drilling Fluid (maximum chloride content 15,000 mg/liter)	
Within 100 feet of a continuously flowing watercourse, or any other significant watercourse or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). (Applies to low chloride temporary pits.)  - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 300 feet from a occupied permanent residence, school, hospital, institution, or church in existence at the time of initial application.	☐ Yes ☐ No
- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image	
Within 200 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 300feet of any other fresh water well or spring, in existence at the time of the initial application.  NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	Yes No

Topographic map; Visual inspection (certification) of the proposed site	Within 100 feet of a wetland.  - US Fish and Wildlife Wetland Identification map; Top
<u>fluid</u>	Temporary Pit Non-low chloride drilling flu
any other significant watercourse, or within 200 feet of any lakebed, sinkhole, (x).  Of the proposed site  Yes \( \sum \) No	Within 300 feet of a continuously flowing watercourse, or any or playa lake (measured from the ordinary high-water mark).  - Topographic map; Visual inspection (certification) of
tal, institution, or church in existence at the time of initial application.  te; Aerial photo; Satellite image  Yes  No	Within 300 feet from a permanent residence, school, hospital, - Visual inspection (certification) of the proposed site; A
ic fresh water well used by less than five households for domestic or stock ell or spring, in the existence at the time of the initial application; base search; Visual inspection (certification) of the proposed site	watering purposes, or 1000 feet of any other fresh water well of
Topographic map; Visual inspection (certification) of the proposed site	Within 300 feet of a wetland US Fish and Wildlife Wetland Identification map; Top
gement Pit	Permanent Pit or Multi-Well Fluid Manage
200 feet of any other significant watercourse, or lakebed, sinkhole, or playa  ) of the proposed site  Yes  No	Within 300 feet of a continuously flowing watercourse, or 200 lake (measured from the ordinary high-water mark).  - Topographic map; Visual inspection (certification) of
pital, institution, or church in existence at the time of initial application.  Ite; Aerial photo; Satellite image  Yes  No	Within 1000 feet from a permanent residence, school, hospita  Visual inspection (certification) of the proposed site;
l used for domestic or stock watering purposes, in existence at the time of abase search; Visual inspection (certification) of the proposed site	initial application.
Topographic map; Visual inspection (certification) of the proposed site	Within 500 feet of a wetland.  - US Fish and Wildlife Wetland Identification map; To
nks Permit Application Attachment Checklist: Subsection B of 19.15.17.9 NMAC need to the application. Please indicate, by a check mark in the box, that the documents are supposed upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC ts) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC upon the appropriate requirements of 19.15.17.10 NMAC subsection to 19.15.17.11 NMAC ppropriate requirements of 19.15.17.12 NMAC to 19.15.17.11 NMAC ppropriate requirements of 19.15.17.12 NMAC applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC applicable:  API Number: or Permit Number:	Instructions: Each of the following items must be attached attached.  ☐ Hydrogeologic Report (Below-grade Tanks) - based upport Hydrogeologic Data (Temporary and Emergency Pits) - ☐ Siting Criteria Compliance Demonstrations - based upo ☐ Design Plan - based upon the appropriate requirements ☐ Operating and Maintenance Plan - based upon the approfice Closure Plan (Please complete Boxes 14 through 18, if and 19.15.17.13 NMAC
ents of 19.15.17.11 NMAC appropriate requirements of 19.15.17.12 NMAC it to drill associated with the pit. 8, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC	attached.  ☐ Design Plan - based upon the appropriate requirements ☐ Operating and Maintenance Plan - based upon the appr ☐ A List of wells with approved application for permit to ☐ Closure Plan (Please complete Boxes 14 through 18, if and 19.15.17.13 NMAC ☐ Hydrogeologic Data - based upon the requirements of ☐ Siting Criteria Compliance Demonstrations - based up
thed to the application. Please indicate, by a check mark in the box, that the document ents of 19.15.17.11 NMAC appropriate requirements of 19.15.17.12 NMAC it to drill associated with the pit.  8, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.5 of Paragraph (4) of Subsection B of 19.15.17.9 NMAC I upon the appropriate requirements of 19.15.17.10 NMAC	Multi-Well Fluid Management Pit Checklist: Subsection Instructions: Each of the following items must be attached attached.  □ Design Plan - based upon the appropriate requirements □ Operating and Maintenance Plan - based upon the appr □ A List of wells with approved application for permit to □ Closure Plan (Please complete Boxes 14 through 18, if and 19.15.17.13 NMAC □ Hydrogeologic Data - based upon the requirements of □ Siting Criteria Compliance Demonstrations - based up

Permanent Pits Permit Application Checklist: Subsection B of 19.15.17.9 NMAC  Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the definition is a check mark in the box, that the definition is a check mark in the box, that the definition is a check mark in the box, that the definition is a check mark in the box, that the definition is a check mark in the box, that the definition is a check mark in the box, that the definition is a check mark in the box, that the definition is a check mark in the box, that the definition is a check mark in the box is a check mark in the box.	ocuments are
attached.  Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC  Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC  Climatological Factors Assessment	;
Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC  Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC	i
Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC  Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC  Quality Control/Quality Assurance Construction and Installation Plan	
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC ☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC ☐ Nuisance or Hazardous Odors, including H <sub>2</sub> S, Prevention Plan	
☐ Emergency Response Plan ☐ Oil Field Waste Stream Characterization	
<ul> <li>☐ Monitoring and Inspection Plan</li> <li>☐ Erosion Control Plan</li> <li>☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC</li> </ul>	
Proposed Closure: 19.15.17.13 NMAC	
Instructions: Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.  Type:   Drilling   Workover   Emergency   Cavitation   P&A   Permanent Pit   Below-grade Tank   Multi-well Fire	uid Management Pit
☐ Alternative Proposed Closure Method: ☑ Waste Excavation and Removal	
Waste Removal (Closed-loop systems only) On-site Closure Method (Only for temporary pits and closed-loop systems)	
☐ In-place Burial ☐ On-site Trench Burial ☐ Alternative Closure Method	
closure plan. Please indicate, by a check mark in the box, that the documents are attached.  Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.13 NMAC Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings) Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC	
15. Siting Criteria (regarding on-site closure methods only): 19.15.17.10 NMAC Instructions: Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable sour provided below. Requests regarding changes to certain siting criteria require justifications and/or demonstrations of equivalency. P. 19.15.17.10 NMAC for guidance.	ce material are lease refer to
Ground water is less than 25 feet below the bottom of the buried waste.  - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☐ No ☐ NA
Ground water is between 25-50 feet below the bottom of the buried waste  - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☐ No ☐ NA
Ground water is more than 100 feet below the bottom of the buried waste.  NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	Yes No
Within 100 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).  Topographic map; Visual inspection (certification) of the proposed site	Yes No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.  - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image	☐ Yes ☐ No
Within 300 horizontal feet of a private, domestic fresh water well or spring used for domestic or stock watering purposes, in existence at the time of initial application.  - NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site	Yes No
Written confirmation or verification from the municipality; Written approval obtained from the municipality	Yes No
Within 300 feet of a wetland. US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance	

adopted pursuant to NMSA 1978, Section 3-27-3, as amended.  - Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☐ No
Within the area overlying a subsurface mine.  - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	☐ Yes ☐ No
Within an unstable area.  - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological	
Society; Topographic map Within a 100-year floodplain.	☐ Yes ☐ No
- FEMA map	☐ Yes ☐ No
On-Site Closure Plan Checklist: (19.15.17.13 NMAC) Instructions: Each of the following items must be attached to the closure plan by a check mark in the box, that the documents are attached.  Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC  Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection E of 19.15.17.13 NMAC  Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of Subsection K of 19.15.17.  Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.  Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC  Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of 19.15.17.13 NMAC  Waste Material Sampling Plan - based upon the appropriate requirements of 19.15.17.13 NMAC  Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cann Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC	11 NMAC 15.17.11 NMAC
17.  Operator Application Certification:  I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and bel	ief.
Name (Print): Christine Brock Title: Operations/Regulatory Technician - S	Sr.
Signature: Le Mistine Lock Date: 8919	
e-mail address: <u>cbrock@hilcorp.com</u> Telephone: <u>505-324-5155</u>	
18.  OCD Approval: Permit Application (including closure plan) Closure Plan (only) COCD Conditions (see attachment)	
OCD Representative Signature: Approval Date: 8/26/	19
Title: Environmental Specialist OCD Permit Number: 16524	
Closure Report (required within 60 days of closure completion): 19.15.17.13 NMAC  Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do no section of the form until an approved closure plan has been obtained and the closure activities have been completed.  Closure Completion Date:	g the closure report. t complete this
20.	
Closure Method:  Waste Excavation and Removal On-Site Closure Method Alternative Closure Method Waste Removal (Closed-I If different from approved plan, please explain.	oop systems only)
Closure Report Attachment Checklist: Instructions: Each of the following items must be attached to the closure report. Please it mark in the box, that the documents are attached.  Proof of Closure Notice (surface owner and division) Proof of Deed Notice (required for on-site closure for private land only) Plot Plan (for on-site closures and temporary pits) Confirmation Sampling Analytical Results (if applicable)	ndicate, by a check

Operator Closure Certification:  I hereby certify that the information and attachments submitted with this closure report belief. I also certify that the closure complies with all applicable closure requirements	t is true, accurate and complete to the best of my knowledge and and conditions specified in the approved closure plan.
Name (Print):	Title:
Signature:	Date:
e-mail address:	Telephone:

Fullerton Federal Com 12 – Pipeline Pit 2 (BELOW GRADE TANK)

Hilcorp Energy Company requests a variance for the items listed below. The requested variance, per 19.15.17.15.A, provides equal or better protection of fresh water, public health & the environment.

#### 1. Fencing

Fencing as described in Section 5 under Alternate, Hilcorp will construct all new fences
around the below grade tank utilizing 48" steel mesh field-fence (hog-wire) on the bottom
with a single strand of barbed wire on top. T-posts shall be installed every 12 feet and
corners shall be anchored utilizing a secondary T-post. Below grade tanks will be fenced,
regardless of location.

#### 2. Geo-membrane Liner

- The geo-membrane liner consists of a 45-mil flexible LLDPE material manufactured by Brawler Industries, LLC as SuperScrim H45. SuperScrim H45 is manufactured with LLDPE and is 45 mil inch thickness and is reinforced with polyester scrim. The geomembrane liner has a hydraulic conductivity of less than 5 X 10-14 cm/s and is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. The manufacturer specific sheet is attached.
- 3. Hilcorp will notify Public Entity Surface Owners by email in lieu of certified mail. Private Entity Surface Owners will still be notified via certified mail.



## New Mexico Office of the State Engineer

## **Active & Inactive Points of Diversion**

(with Well Drill Dates & Depths)

(R=POD has been replaced and no longer serves this file, C=the file is closed)

Well

Tag Code Grant

(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) (NAD83 UTM in meters)

(in feet)

| Country | Coun

9 q q q Source 6416 4 See Twa Rng Shallow 3 1 2 26 27N 11W

Artesian 2 2 07 27N 11W

3 2 01 27N 11W

233964 4049155\*

| Depth | Depth | Water | | 11/22/1969 | 1102 | 550 |

10/26/1960

235864 4055247\* **3**228180 4054262\* **3** 

0 650

#### Record Count:

POD Search:

POD Basin: San Juan

PLSS Search:

Township: 27N Range: 11W

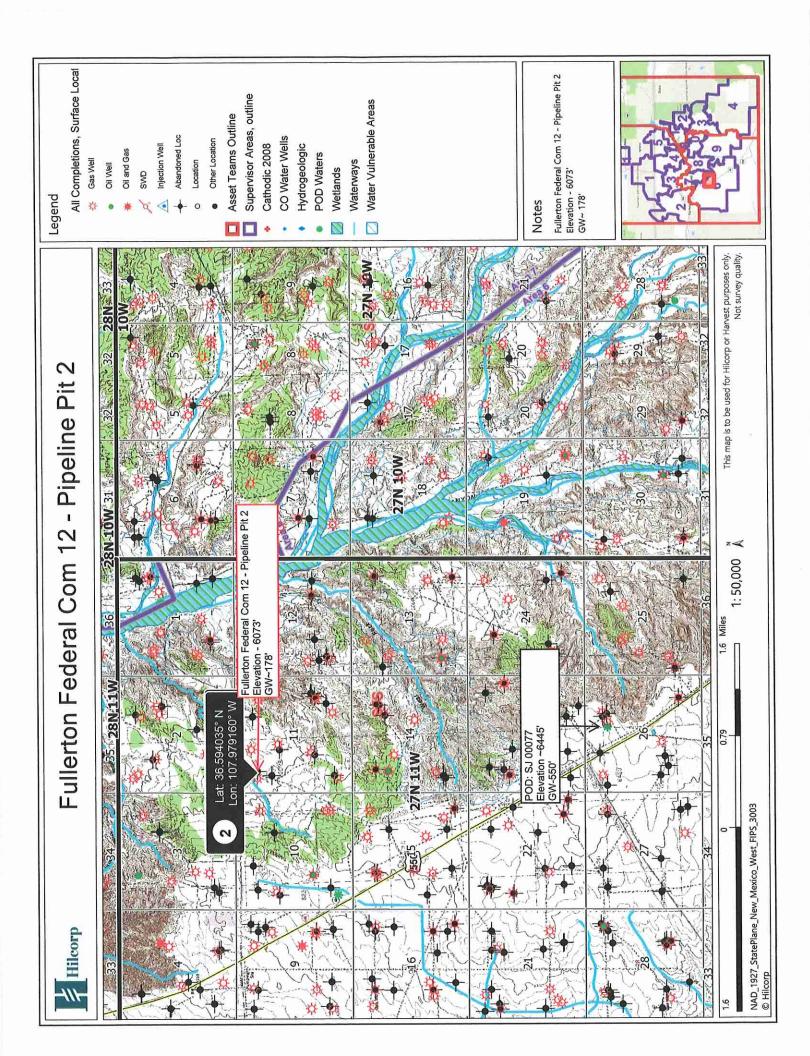
Sorted by: File Number

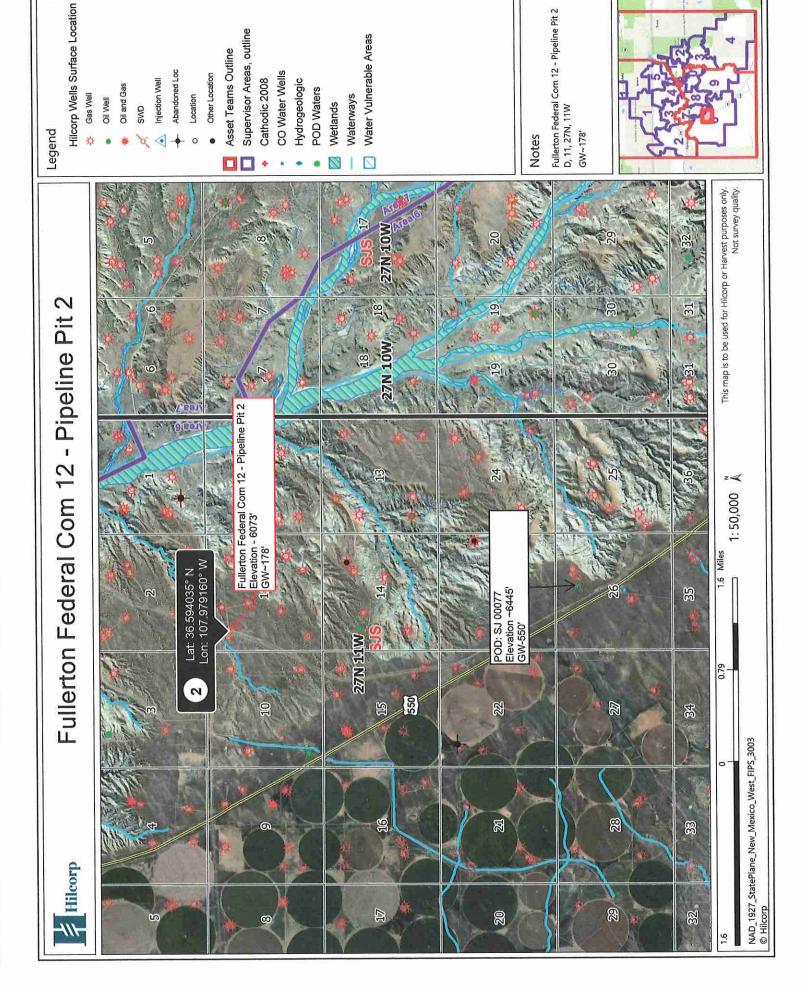
\*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

7/16/19 9:39 AM

**ACTIVE & INACTIVE POINTS OF DIVERSION** 





### **Below Grade Tank (BGT) Siting Criteria and Compliance Demonstrations**

Well Name:	Fullerton Federal Com 12 – Pipeline Pit 2
	<del></del>

1. Depth to groundwater (should not be less than 25 feet):

The nearest recorded well with available water-depth information is the **POD # SJ00077** with groundwater @ 550' as indicated in the **iWaters 9 section report** attached. The subject well is 372' less in elevation making depth to groundwater at 178'.

2. <u>Distance to watercourse (should not be within 100 feet of a continuously flowing watercourse, other significant watercourse, lakebed, sinkhole, wetland or playa lake [measured from the ordinary high-water mark]):</u>

Aerial map attached indicates that there are **no** lakebeds, sinkholes, playa lakes, or watercourses within 100 feet of the proposed Below Grade Tank.

3. <u>Distance to springs or wells (should not be within 200 feet of a spring or a fresh water well used for public or livestock consumption):</u>

Aerial map attached indicates that the Below Grade Tank will **not** be within 200 feet of any recorded well or spring.

# Hydrogeological Report for Fullerton Federal Com 12 - Pipeline Pit 2

#### Regional Geological context:

The Nacimiento Formation is of Paleocene age (Baltz, 1967, p. 35). It crops out in a broad band inside the southern and western margins of the central basin and in a narrow band along the west face of the Nacimiento Uplift. The Nacimiento is a nonresistant unit and typically erodes to low, rounded hills or forms badland topography.

The Nacimiento Formation occurs in approximately only the southern two-thirds of the San Juan Basin where it conformably overlies and intertongues with the Ojo Alamo Sandstone (Fassett, 1974, p. 229). The Nacimiento Formation grades laterally into the main part of the Animas Formation (Fassett and Hinds, 1971, p. 34); thus, in this area, the two formations occupy the same stratigraphic interval.

Strata of the Nacimiento Formation were deposited in lakebeds in the central basin area with lesser deposition in stream channels (Brimhall, 1973, p. 201). In general, the Nacimiento consists of drab, interbedded black and gray shale with discontinuous, white, medium- to very coarse grained arkosic sandstone (Stone e al., 1983, p.30). Stone et al. indicated that the formation may contain more sandstone than commonly reported because some investigators assume the slope-forming strata in the unit area shales, whereas in many places the strata actually are poorly consolidated sandstones. Total thickness of the Nacimiento Formation ranges from about 500 to 1,300 feet. The unit generally thickens from the basin margins toward the basin center (Steven et al., 1974). The sandstone deposits within the Nacimiento Formation are much thinner than the total thickness of the formation because their environment of deposition was localized stream channels (Brimhall, 1973, p. 201). The thickness of the combined San Jose, Animas, and Nacimiento Formations ranges from 500 to more than 3.500 feet.

#### **Hydraulic Properties:**

Reported well yields for 53 wells completed in either the Animas or Nacimiento Formations range from 2 to 90 gallons per minute and the median yield is 7.5 gallons per minute. The primary use of water from Nacimiento and Animas Formations is domestic and livestock supplies. There are no known aquifer tests for the Animas or Nacimiento Formations, but specific capacities reported for six wells range from 0.24 to 2.30 gallons per minute per foot of drawdown (Levings et al., 1990).

The Animas and Nacimiento Formations are in many ways hydrologically similar to the San Jose Formation because sands in both units produce approximately the same quantities of water. However, the greater percentage of fine materials in the Animas and Nacimiento Formations may restrict downward vertical leakage to the Ojo Alamo Sandstone or Kirtland Shale. The poorly cemented fine material is highly erodible, forms a badland terrain, and supports only spotty vegetation. These conditions are more conductive to runoff than retention of precipitation.

#### References:

Baltz, E.H., 1967, Stratigraphy and regional tectonic implications of part of Upper Cretaceous rocks, east-central San Juan Basin, New Mexico: USGS Professional Paper

552, 101 p.

Brimhall, R.M., 1973, Ground-water hydrology of Tertiary rocks of the San Juan Basin, New Mexico, in Fassett, J.E., ed., Cretaceous and Tertiary rocks of the Southern Colorado Plateau: Four Corners Geological Society Memoir, p. 197-207.

Fassett, J.E., 1974, Cretaceous and Tertiary rocks of the eastern San Juan Basin, New Mexico and Colorado, in Guidebook of Ghost Ranch, central-northern New Mexico: New Mexico Geological Society, 25th Field Conference, p. 225-230.

Fassett, J.E., and Hinds, J.S., 1971, Geology and fuel resources of the Fruitland Formation and Kirtland Shale of the San Juan Basin, New Mexico and Colorado: USGS Professional Paper 676, 76 p.

Levings, G.W., Craigg, S.d., Dam, W.L., Kernodle, J.M., and Thorn, C.R., 1990, Hydrogeology of the San Jose, Nacimiento, and Animas Formations in the San Juan structural basin, New Mexico, Colorado, Arizona, and Utah: USGS Hydrologic Investigations Atlas HA-720-A, 2 sheets.

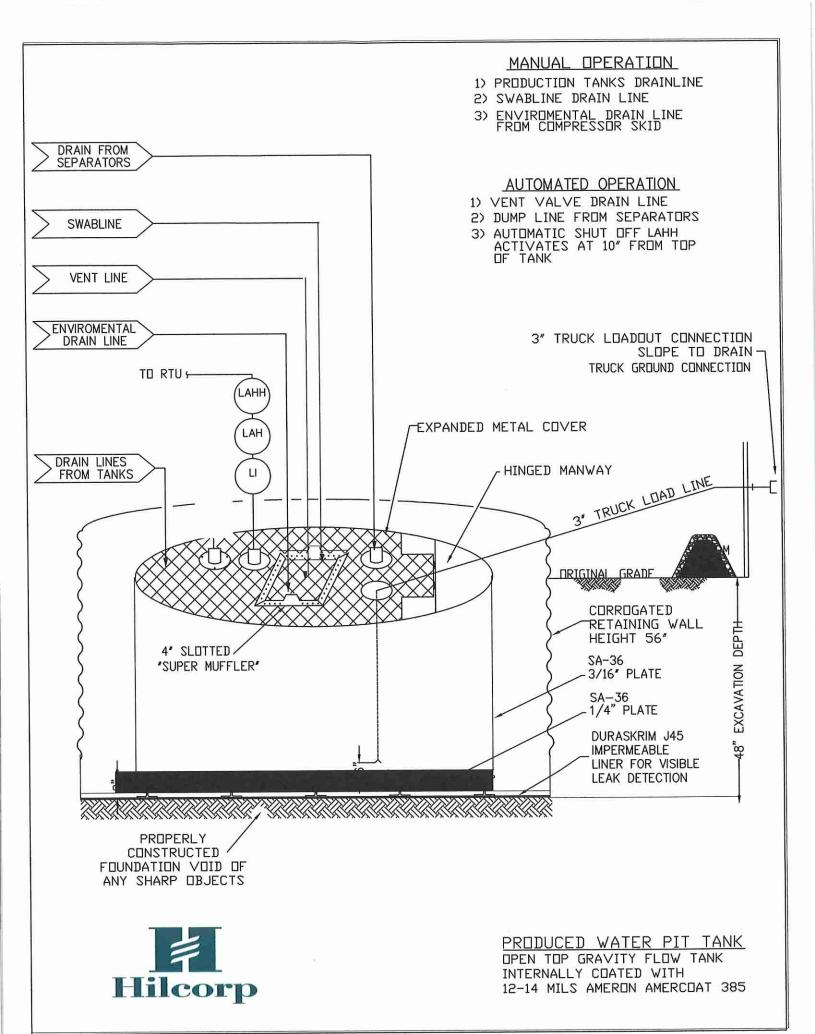
Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizell, N.H., and Padgett, E.T., 1983, Hydrogeology and water resources of San Juan Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Hydrologic Report 6.

#### **Below Grade Tank Design and Construction**

In accordance with NMAC 19.15.17 the following information describes the design and construction of below-grade tanks on Hilcorp Energy Company, hereinafter known as HEC, locations. This is HEC's standard procedure for all below grade tanks (BGT). A separate plan will be submitted for any BGT which does not conform to this plan.

#### General Plan:

- 1. HEC will design and construct a properly sized and approved BGT which will contain liquids and should prevent contamination of fresh water to protect the public health and environment.
- 2. HEC signage will comply with 19.15.17.11.C NMAC.
- 3. HEC is requesting approval of an alternative fencing to be used on BGT tank locations. HEC requests to utilize 48" steel mesh field-fence (hog-wire) on the bottom with a single strand of barbed wire on top. T-posts shall be installed every 12 feet and corners shall be anchored utilizing a secondary T-post. BGTs will be fenced, regardless of location.
  - a. If the BGT is located within 1000' of an occupied permanent residence, school, hospital, institution or church, HEC will construct A 6' chain link fence with two strands of barbed wire on top. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.
- 4. HEC will construct a screened, expanded metal covering, on the top of the BGT.
- 5. HEC will ensure that a BGT is constructed of materials resistant to the BGT's particular contents and resistant to damage from sunlight as shown on design drawing and specification sheet.
- 6. The HEC BGT system will have a properly constructed foundation consisting of a level base free of rocks, debris, sharp edges or irregularities to prevent punctures, cracks or indentations of the liner or tank bottom as shown on design drawing.
- 7. HEC shall operate and install the BGT to prevent the collection of surface water run-on. HEC has built in shut off devices that do not allow a BGT to overflow. HEC constructs berms and corrugated retaining walls at least 6" above ground to keep from surface water run-on entering the BGT as shown on the design plan.
- 8. If HEC needs to modify/retrofit the existing BGT it will meet the below specifications.
- 9. HEC will construct and use a BGT that does not have double walls. The BGT's side walls will be open for visual inspection for leaks, the BGT's bottom is elevated a minimum of six inches above the underlying ground surface and the BGT is underlain with a geomembrane liner to divert leaked liquid to a location that can be visually inspected.
- 10. HEC will equip below grade tanks with a properly functioning, automatic high-level shut off control device, as well as manual controls, to prevent overflows.
- 11. HEC will utilize a geomembrane liner manufactured by Brawler Industries, LLC as SuperScrim H45. SuperScrim H45 is manufactured with LLDPE and is 45 mil inch thickness and is reinforced with polyester scrim. The geomembrane liner has a hydraulic conductivity of less than 5 X 10<sup>-14</sup> cm/s and is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. The manufacturer specific sheet is attached.
- 12. The general specification for design and construction are attached





# SuperScrim™ H Product Specifications

This product meets GRI GM 25 Specifications

Properties	Test Method	Minimur	n Average	Values	
Charles and the second			H30	H36	H45
Thickness, Nominal (mils) Min. Ave. (mils)	ASTM D5199	Per roll	30 27	36 32	45 40
Weight Nominal (lb/1000, ft²) Min. Ave. (lb/1000, ft²)	ASTM D5261	Per roll	140 125	168 151	210 189
Grab Tensile Strength (lb), min. ave. Elongation (%), min. ave.	ASTM D7004 (each direction) (each direction)	(each direction) 30,000 lb		310 25	320 25
Tongue Tear (lb), min. ave.	ASTM D5884 (each direction)	130	130	130	
Index Puncture (lb), min. ave.	ASTM D4833	85	103	105	
Ply Adhesion (lb), min. ave. (1)	ASTM D6636	20	25	25	
Oxidative Induction Time (OIT) (2) (a) Standard OIT Or	ASTM D3895 Formulation		>100	>100	>100
(b) High Pressure OIT	ASTM D5885		>1000	>1000	>1000
Standard Roll Dimensions					
Roll Width (3), ft			11.83	11.83	11.83
Roll Length (3), ft	Roll Length (3), ft			1230	1000
Roll Area, ft <sup>2</sup>			17,745	14,551	11,830

(1)Alternatively, an acceptable ply adhesion is to have a film tearing bond occur within the sheet material. (2) The Manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant effectiveness in the geomembrane.

This data is provided for informational purposes only. Brawler Industries, LLC makes no warranties as to the suitability of the fitness for a specific use or merchantability of products referred to, no guarantee of satisfactory results upon contained information or recommendations and disclaims all liability from resulting loss or damage. This information is subject to change without notice, please check with Brawler Industries, LLC for current updates.

This is a preliminary data sheet based upon laboratory testing of initial manufacturing lots and may be changed without notice as additional product testing data becomes available.





© 2015 Brawler Industries, LLC

MILES CITY, MT 184 Hwy 59 N Miles City, MT . 59301 800.488.3592 406.234.1680

MIDLAND, TX 11701 Co. Rd. 125 W Midland, TX . 79711 800,583,6005 432.563.4005

PLEASANTON, TX 4300 S Hwy 281 Pleasanton, TX . 78064 830,569,4005

HOUSTON, TX 8615 Golden Spike Ln Houston, TX . 77086 800.364.7688 281,272,1660

 $<sup>^{(3)}</sup>$ Roll widths and lengths have a tolerance of  $\pm 1\%$ 

<sup>\*</sup>Custom material thicknesses also available



# SuperScrim™ WC Product Specifications

Properties	Test Method	Minimum Average Values					
		9 mil	12 mil	16 mil	20 mil	24 mil	30 mil
Weight	D5261	5.4 oz/yd <sup>2</sup>	5.7 oz/yd²	7.2 oz/yd²	9.6 oz/yd²	11.5 oz/yd <sup>2</sup>	13.4 oz/yd²
Thickness		9 mil	12 mil	16 mil	20 mil	24 mil	30 mil
Grab Tensile (lbs.)	D751	MD 200 CD 135	MD 210 CD 176	MD 230 CD 210	MD 330 CD 286	MD 352 CD 300	MD 352 CD 300
Mullen Burst	D6241	300 psi	350 psi	400 psi	600 psi	680 psi	780 psi
Accelerated UV Weathering	D4355	>80% after 2000 hrs exposure	>90% after 2000 hrs exposure	>90% after 2000 hrs exposure	>90% after 2000 hrs exposure	>90% after 2000 hrs exposure	>90% after 2000 hrs exposure
		Standard	Roll Dimensio	ns	4		
Roll Length (2), Ft		3,000	3,000	4,000	3,000	2,250	2,250
Roll Width (2), Ft	Roll Width (2), Ft		12	12	12	12	12
Roll Area, Ft <sup>2</sup>		36,000 36,000 48,000 36,000 27,000 27,			27,000		

 $^{(1)}9$  of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.  $^{(2)}Roll$  widths and lengths have a tolerance of  $\pm$  1%

Custom material thicknesses also available

This data is provided for informational purposes only. Brawler Industries, LLC makes no warranties as to the suitability of the fitness for a specific use or merchantability of products referred to, no guarantee of satisfactory results upon contained information or recommendations and disclaims all liability from resulting loss or damage. This information is subject to change without notice, please check with Brawler Industries, LLC for current updates.





© 2014 Brawler Industries, LLC

MILES CITY, MT 184 Hwy 59 N Miles City, MT . 59301 800.488.3592 406.234.1680

MIDLAND, TX 11701 Co. Rd. 125 W Midland, TX . 79711 800.583.6005 432.563.4005 PLEASANTON, TX 4300 S Hwy 281 Pleasanton, TX . 78064 830.569.4005 HOUSTON, TX 8615 Golden Spike Ln Houston, TX . 77086 800.364.7688 281.272.1660

# Hilcorp Energy Company San Juan Basin Below Grade Tank Maintenance and Operating Plan

In accordance with Rule 19.15.17 the following information describes the operation and maintenance of a below-grade tank (BGT) on a Hilcorp Energy Company (HEC) location. This is HEC's standard procedure for all BGT's. A separate plan will be submitted for any BGT which does not conform to this plan.

#### **General Plan:**

- 1. HEC will operator and maintain a BGT to contain liquids and solids and maintain the integrity of the liner, liner system and secondary containment system to prevent contamination of fresh water and protect public health and the environmental. HEC will perform an inspection on a monthly basis, install cathodic protection and automatic overflow shutoff devices as seen on the design plan.
- 2. HEC will not discharge into or store any hazardous waste in the BGT.
- 3. HEC shall operator and install the BGT to prevent the collection of surface water run-on. HEC has built in shut-off devices that do not all ow a BGT to overflow. HEC constructs berms and corrugated retained walls at least 6" above grade to keep surface water run-on from entering the BGT as shown on the design plan.
- 4. As per 19.15.17.12.D(3), HEC will inspect the BGT for leakage and damage at least monthly. The operator will document the integrity of each tank at least annually and maintain a written record for 5 years. Inspections may include 1) containment berms adequate and no oil present, 2) tanks had no visible leaks or sign of corrosion, 3) tank valves, flanges, and hatches had no visible leaks and 4) no evidence of significant spillage of produced liquids. HEC shall remove any visible or measurable layer of oil from the fluid surface of the BGT in an effort to prevent significant accumulation of oil overtime.
- 5. HEC shall maintain adequate freeboard to prevent overtopping of the BGT.
- 6. If a BGT develops a leak, then HEC shall removal all liquid above the damage or leak within 48 hours of discovery, notify the appropriate division office pursuant to 19.15.29 NMAC and repair the damage or replace BGT as applicable.
- 7. If HEC discovers a BGT designed in accordance with 19.15.17.11.I(5) has lost integrity the BGT will promptly be drained and removed from service and HEC will follow the approved closure plan. If HEC discovers a retrofitted BGT designed in accordance with 19.15.17.11.I(4)(a-c), does not demonstrate integrity or that the BGT develops any of the conditions identified in Paragraph (5) of Subsection A of 19.15.17.12 NMAC shall repair the damage or close the existing BGT pursuant to the closure requirements of 19.15.17.13 NMAC.
- 8. If HEC equips or retrofits the existing BGT to comply with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC, HEC shall visually inspect the area beneath the BGT during the retrofit and document any areas that are wet, discolored or showing other evidence of a release on form C-141. HEC shall measure and report to the division the concentration of contaminants in the wet or discolored soil with respect to the standards set forth in Table I of 19.15.17.13 NMAC. If there is no wet or discolored soil or if the concentration of contaminants in the wet or discolored soil is less than the standard set forth in Table I of 19.15.17.13 NMAC, then HEC will proceed with the closure requirements of 19.15.17.13 NMAC prior to initiating the retrofit or replacement.

# Hilcorp Energy Company San Juan Asset Production BGT Closure Plan

In accordance with Rule 19.15.17.13 NMAC, the following plan describes the general closure requirements of a below-grade tank (BGT) on any Hilcorp Energy Company (HEC) location in the San Juan Asset. This is HEC's standard closure procedure for all BGT's regulated under Rule 19.15.17 NMAC and operated by HEC. For those closures which do not conform to this standard closure plan, a separate BGT specific closure plan will be developed and utilized.

#### **Closure Conditions and Timing for BGT:**

- Within 60 days of cessation of operation HEC will:
  - o Remove all liquids and sludge and dispose in a division approved manner.
- Within 72 hours or 1 week prior to closure HEC will:
  - o Give notice to surface owners by certified mail. For public entities by email as specified on the variance page.
  - o Give notice to Division District Office verbal or in writing/email.
- Within 6 months of cessation of operation HEC will:
  - o Remove BGT and dispose, recycle, reuse, or reclaim in a division approved manner.
  - o Remove unused onsite equipment associated with the BGT.
- Within 60 days of closure HEC will:
  - o Send the Division District Office a Closure Report per 19.15.17.13.F (1).

#### **General Plan Requirements:**

- 1. Prior to initiating any BGT closure, except in the case of an emergency, HEC will notify the surface owner of the intent to close the BGT by certified mail no later than 72 hours or 1 week before closure and a copy of this notification will be included in the closure report. In the case of an emergency, the surface owner will be notified as soon as practical.
- 2. Notice of closure will be given to the Division District office between 72 hours and 1 week of the scheduled closure via email or phone. The notification of closure will include the following:
  - a. Operators Name
  - b. Well Name and API Number
  - c. Location
- 3. All liquids will be removed from the BGT following cessation of operation. Produced water will be disposed of at one of HEC's approved Salt Water Disposal facilities or at a Division District Office approved facility.
- 4. Solids and sludge's will be shoveled and/or vacuumed out for disposal at one of the Division District Office approved facilities, depending on the proximity of the BGT site: Envirotech Land Farm (Permit #NM-01-011), Industrial Ecosystems Inc. JFJ Land Farm (Permit #NM-01-0010B), and Basin Disposal (Permit #NM-01-005).
- 5. HEC will obtain prior approval from the Division District Office to dispose, recycle, reuse, or reclaim the BGT and provide documentation of the disposition of the BGT in the closure report. Steel materials will be recycled or reused as approved by the Division District Office. Fiberglass tanks will be empty, cut up or shredded, and EPA cleaned for disposal as solid waste. Liner materials will be cleaned without soils or contaminated material for disposal as solid waste. Fiberglass tanks and liner materials will meet the conditions of 19.15.35 NMAC. Disposal will be at a licensed disposal facility, presently San Juan County Landfill operated by Waste Management under NMED Permit SWM-052426.
- 6. Any equipment associated with the BGT that is no longer required for some other purpose, following the closure, will be removed.

- 7. Following removal of the tank and any liner material, HEC will test the soils beneath the BGT as follows:
  - a. At a minimum, a five-point composite sample will be taken to include any obvious stained or wet soils or any other evidence of contamination.
  - b. The laboratory sample shall be analyzed for the constituents listed in Table I of 19.15.17.13.

Table I  Closure Criteria for Soils Beneath Below-Grade Tanks, Drying Pads Associated with Closed-Loop Systems and Pits						
	where Co	ontents are Removed				
Depth below bottom of pit to	Constituent	Method*	Limit**			
groundwater less than 10,000						
mg/I TDS						
	Chloride	EPA 300.0	600 mg/kg			
≤50 feet	TPH	EPA SW-846 Method 418.1	100 mg/kg			
250,550	BTEX	EPA SW-846 Method 8021B or 8260B	50 mg/kg			
	Benzene	EPA SW-846 Method 8021B or 8015M	10 mg/kg			
	Chloride	EPA 300.0	10,000 mg/kg			
51 feet-100 feet	TPH	EPA SW-846 Method 418.1	2,500 mg/kg			
	GRO+DRO	EPA SW-846 Method 8015M	1,000 mg/kg			
Ī	BTEX	EPA SW-846 Method 8021B or 8260B	50 mg/kg			
	Benzene	EPA SW-846 Method 8021B or 8015M	10 mg/kg			
	Chloride	EPA 300.0	20,000 mg/kg			
>100 feet	TPH	EPA SW-846 Method 418.1	2,500 mg/kg			
( )	GRO+DRO	EPA SW-846 Method 8015M	1,000 mg/kg			
	BTEX	EPA SW-846 Method 8021B or 8260B	50 mg/kg			
	Benzene	EPA SW-846 Method 8021B or 8015M	10 mg/kg			

<sup>\*</sup>Or other test methods approved by the division

(19.15.17.13 NMAC-Ro, 19.15.17.13 NMAC 3/28/2013)

- 8. If the Division District Office and/or HEC determine there is a release, HEC will comply with 19.15.17.13.C.3b.
- 9. Upon completion of the tank removal, pursuant to 19.15.17.13.C.3c, if all contaminant concentrations are less than or equal to the parameters listed in Table I of 19.15.17.13 NMAC, the excavation will be backfilled with non-waste containing earthen material compacted and covered with a minimum of one foot top soil, or background thickness of top soil, whichever is greater. The surface will then be re-contoured to match the native grade, prevent ponding of water, and prevent erosion of cover material.
- 10. For those portions of the former BGT area no longer required for production activities, HEC will seed the disturbed area in the first favorable growing season following the closure of the BGT. Seeding will be accomplished via drilling on the contour whenever practical, or by other Division District Office approved methods. HEC will notify the Division District Office when reclamation and re-vegetation is complete.

Reclamation of the BGT shall be considered complete when:

- Established vegetative cover reflects a life form ratio of +/- 50% of pre disturbance levels.
- Total plant cover is at least 70% of pre-disturbance levels (Excluding noxious weeds) OR
- Pursuant to 19.15.17.13.H.5d HEC will comply with obligations imposed by other applicable federal or tribal agencies in which there re-vegetation and reclamation requirements provide equal or better protection of fresh water, human health and the environment.

<sup>\*\*</sup>Numerical limits or natural background level, whichever is greater

11. For those portions of the former BGT area required for production activities, reseeding will be done at well abandonment, and following the procedure noted above.

#### **Closure Report:**

All closure activities will include proper documentation and will be submitted to OCD within 60 days of the BGT closure on a Closure Report using Division District Office Form C-144. The Report will include the following:

- Proof of Closure Notice (surface owner and Division District Office)
- Backfilling & cover installation
- Confirmation Sampling Analytical Results
- Application Rate & Seeding techniques
- Photo Documentation of Reclamation