May 16, 2019

Vertex Project #: 19E-00614-006

**Spill Closure Report:** Aid State #008 (Section 13, Township 17 South, Range 28 East)
API: 30-015-38142
County: Eddy
Incident Report: 2RP-5350

**Prepared For:** **Marathon Oil Permian LLC**
4111 South Tidwell Road
Carlsbad, New Mexico 88220

**New Mexico Oil Conservation Division – District 2 - Artesia**
811 S. 1st Street
Artesia, New Mexico 88210

Marathon Oil Permian LLC retained Vertex Resource Services Inc. (Vertex) to conduct a Spill Assessment for a release of crude oil caused by the rubber on top of a tubing gauge to fail at Aid State #008, API 30-015-38142, Incident 2RP-5350 (hereafter referred to as "site"). This letter provides a description of the Spill Assessment and includes a request for Spill Closure. The spill area is located at N 32.8405151 W -104.1224747.

## Background

The site is located approximately 35 miles north of Carlsbad, New Mexico. The legal location for the site is Section 13, Township 17 South and Range 28 East in Eddy County, New Mexico. The spill area is located on State Land. An aerial photograph and site schematic are included in Attachment 1.

The *Geological Map of New Mexico* (New Mexico Bureau of Geology and Mineral Resources, 2014 – 2017) indicates the site's surface geology is comprised primarily of Qoa ---- Older alluvial deposits of upland plains and piedmont areas, and calcic soils and eolian cover sediments of High Plains region (middle to lower Pleistocene)—Includes scattered lacustrine, playa, and alluvial deposits of the Tahoka, Double Tanks, Tule, Blackwater Draw, and Gatuña Formations, the latter of which may be Pliocene at base; outcrops, however, are basically of Quaternary deposits. Predominant soil texture on the site is gravelly fine sandy loam.

## Incident Description

A spill occurred on March 31, 2019, due to the rubber top of a tubing gauge failing. The spill was reported March 31, 2019 and involved the release of approximately 9.97 barrels (bbls) of produced oil onto the pad. No free-flowing fluid was removed during the initial spill clean-up. The New Mexico Oil Conservation Division (NMOCD) C-141 Report: 2RP-5350 is included in Attachment 2. The Daily Field Report (DFR) and site photographs are included in Attachment 3.

## Closure Criteria Determination

The depth to groundwater was determined using information from Oil and Gas Drilling records and the New Mexico Office of the State Engineer Water Column/Average Depth to Water report. A 5,000-meter search radius was used to determine groundwater depth. The closest recorded depth to groundwater was determined to be 58 feet below ground surface (bgs) and is 2,450 feet from the location of the spill. Documentation used in Closure Criteria Determination research is included in Attachment 4.

| **Table 1. Closure Criteria Determination** | | | |
|---|---|---|---|
| **Site Name: Aid State 008** | | | |
| **Spill Coordinates: 32.84050 -104.12250** | | | |
| **Site Specific Conditions** | | **Value** | **Unit** |
| 1 | Depth to Groundwater | **58** | feet |
| 2 | Within 300 feet of any continuously flowing watercourse or any other significant watercourse | 2450 | feet |
| 3 | Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark) | 15005 | feet |
| 4 | Within 300 feet from an occupied residence, school, hospital, institution or church | 4968 | feet |
| 5 | i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, **or** | 5231 | feet |
| | ii) Within 1000 feet of any fresh water well or spring | 5231 | feet |
| 6 | Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves | No | (Y/N) |
| 7 | Within 300 feet of a wetland | 5925 | feet |
| 8 | Within the area overlying a subsurface mine | No | (Y/N) |
| 9 | Within an unstable area (Karst Map) | Medium | Critical<br>High<br>Medium<br>Low |
| 10 | Within a 100-year Floodplain | >500 | year |
| **NMAC 19.15.29.12 E (Table 1) Closure Criteria** | | 51-100' | <50'<br>51-100'<br>>100' |

The closure criteria determined for the site are associated with the following constituent concentration limits as presented in Table 2.

| Table 2. Closure Criteria for Soils Impacted by a Release | | |
|---|---|---|
| **Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/l TDS** | **Constituent** | **Limit** |
| 51 feet - 100 feet | Chloride | 10,000 mg/kg |
| | TPH (GRO+DRO+MRO) | 2,500 mg/kg |
| | GRO+DRO | 1,000 mg/kg |
| | BTEX | 50 mg/kg |
| | Benzene | 10 mg/kg |

## Remedial Actions Taken

An initial site inspection of the spill area was completed on March 31, 2019, which identified the area of the spill specified in the initial C-141 Report, estimated the approximate volume of the spill and white lined the area required for the 811 One Call request. The impacted area was determined to be approximately 39 feet long and 25 feet wide; the total affected area was determined to be 497 square feet. The DFR associated with the site is included in Attachment 3.

Remediation efforts began on April 5, 2019 and was completed on April 10, 2019. Vertex personnel supervised the excavation of impacted soils. Field screening was completed on a total of four (4) sample points and consisted of analysis using a Photo Ionization Detector (volatile hydrocarbons), a Dexsil Petroflag using EPA SW-846 Method 9074 (extractable hydrocarbons) and Quantabs (chlorides). Field screening results were used to identify areas requiring further remediation from those areas showing concentrations below determined closure criteria levels. Soils were removed to a depth of 6 inches bgs. Impacted soil was transported by a licensed waste hauler and disposal at an approved waste management facility. Waste Manifest is presented in Attachment 5. Field screening results are presented in Table 3, Attachment 6, as well as in the DFR presented in Attachment 3.

Notification that confirmatory samples were being collected was provided to the NMOCD on April 5, 2019 and are included in Attachment 7. Confirmatory composite samples were collected from the base and walls of the excavation in 200 square foot increments. A total of three (3) samples (SS19-01 to SS19-03), including one (1) background sample, were collected for laboratory analysis following NMOCD soil sampling procedures. Samples were submitted to XENCO Laboratories under chain-of-custody protocols and analyzed for BTEX (EPA Method 8021B), Total Petroleum Hydrocarbons (GRO, DRO, MRO – EPA Method SW8015Mod) and Total Chlorides (EPA Method 300.0). Laboratory results are presented in Table 3, Attachment 6. All confirmatory samples collected and analyzed were below closure criteria for the site.

## Closure Request

The spill area was fully delineated, remediated and backfilled with local soils by April 24, 2019. Confirmatory samples were analyzed by the laboratory and found to be below allowable concentrations as per the New Mexico Administrative Code (NMAC) Closure Criteria for Soils Impacted by a Release, locations “51-100 feet”. Based on these findings, Marathon Oil Permian LLC requests that this spill be closed.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 575.361.1137 or dwilliams@vertex.ca.

Sincerely,

Dennis Williams
ENVIRONMENTAL EARTHWORKS ADVISOR

## Attachments

Attachment 1. Site Schematic
Attachment 2. NMOCD C-141 Report
Attachment 3. Daily Field Report(s) with Pictures
Attachment 4. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
Attachment 5. Waste Manifest(s)
Attachment 6. Table 3 - Laboratory Results Table
Attachment 7. Confirmatory Sample Notification to the NMOCD
Attachment 8. Laboratory Data Reports and COCs

## References

1. *Water Column/Average Depth to Water Report.* New Mexico Water Rights Reporting System, (2019). Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html

2. *Assessed and Impaired Waters of New Mexico.* New Mexico Department of Surface Water Quality Bureau, (2019). Retrieved from https://gis.web.env.nm.gov/oem/?map=swqb

3. *Interactive Geologic Map.* New Mexico Bureau of Geology and Mineral Resources, (2019). Retrieved from http://geoinfo.nmt.edu

4. *Measured Distance from the Subject Site to Residence.* Google Earth Pro, (2019). Retrieved from https://earth.google.com

5. *Point of Diversion Location Report.* New Mexico Water Rights Reporting System, (2019). Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/wellSurfaceDiversion.html

6. *Measured Distance from the Subject Site to Municipal Boundaries.* Google Earth Pro, (2019). Retrieved from https://earth.google.com

7. *National Wetland Inventory Surface Waters and Wetland*. United State Fish and Wildlife Service, (2019). Retrieved from https://www.fws.gov/wetlands/data/mapper.html

8. *Coal Mine Resources in New Mexico*. NM Mining and Minerals Division, (2019). Retrieved from http://www.emnrd.state.nm.us/MMD/gismapminedata.html

9. *New Mexico Cave/Karsts*. United States Department of the Interior, Bureau of Land Management, (2019) Retrieved from https://www.blm.gov/programs/recreation/recreation-programs/caves/new-mexico

10. *Flood Map Number 35015C1875D.* United States Department of Homeland Security, FEMA Flood Map Service Center, (2010). Retrieved from https://msc.fema.gov/portal/search?AddressQuery=malaga%20new%20mexico#searchresultsanchor

11. *Well Log/Meter Information Report.* NM Office of the State Engineer, New Mexico Water Rights Reporting System. (2019). Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/meterReport.html

12. *Natural Resources and Wildlife Oil and Gas Releases*. New Mexico Oil Conservation Division, (2019). Santa Fe, New Mexico.

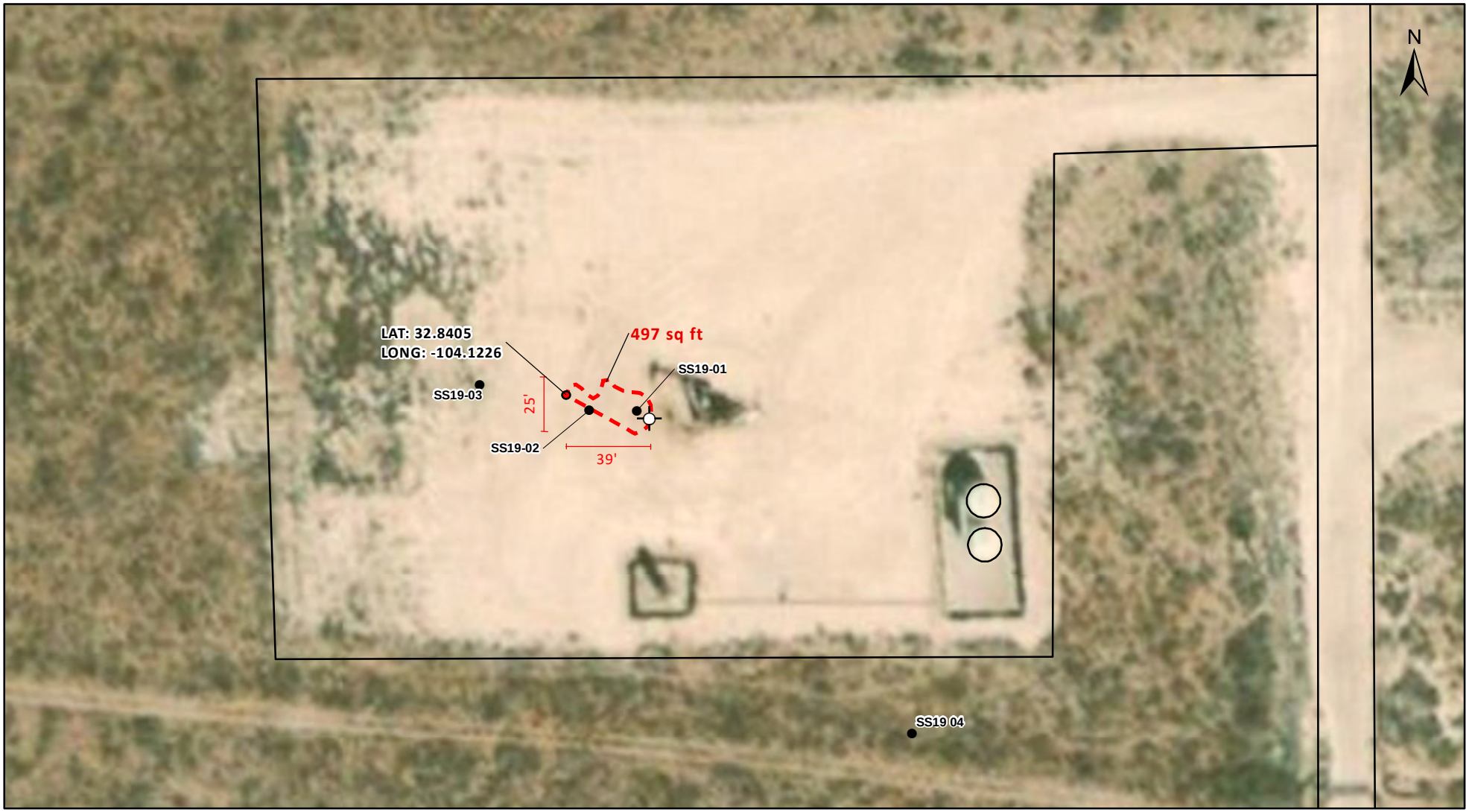
13. *Soil Survey, New Mexico*. United States Department of Agriculture, Soil Conservation Service in Cooperation with New Mexico Agricultural Experiment Station. (1971). Retrieved from http://www.wipp.energy.gov/library/Information_Repository_A/Supplemental_Information/Chugg%20et%20al%201971%20w-map.pdf

## Limitations

This report has been prepared for the sole benefit of Marathon Oil Permian LLC. This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division, without the express written consent of Vertex Resource Services Inc. (Vertex) and Marathon Oil Permian LLC. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of Vertex based on the data collected during the assessment. Due to the nature of the assessment and the data available, Vertex cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be considered legal advice.

# ATTACHMENT 1




LEGEND

- WELL
- SOIL SAMPLE
- ROAD
- SPILL AREA
- TANK

Notes: Aerial Image from ESRI Digital Globe 2017

0 37.5 75 150 ft

SCALE 1:800

Marathon Oil

**Site Schematic**
**Aid State #008**

VERTEX

| | |
|---|---|
| DRAWN: | NM |
| APPROVED: | RF |
| DATE: | APRIL 24/19 |

FIGURE: **1**

VERSATILITY. EXPERTISE.

Document Path: \\vtx-s-fs01.corp.internal\shared\vps\04 - Geomatics\1-Projects_US PROJECTS\Marathon\Figure 2 Site Schematic Aid State 008 with Soil Sample.mxd

# ATTACHMENT 2

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 | NAB1910934590 |
| District RP | 2RP-5350 |
| Facility ID | |
| Application ID | pAB1910934259 |

# Release Notification

## Responsible Party

| | |
|---|---|
| Responsible Party Marathon Oil Permian LLC | OGRID 372098 |
| Contact Name Callie Karrigan | Contact Telephone 575-297-0956 |
| Contact email cnkarrigan@marathonoil.com | Incident # *(assigned by OCD)* NAB1910934590 |
| Contact mailing address 4111 Tidwell Road, Carlsbad New Mexico, 88220 | |

## Location of Release Source

Latitude 32.8405151 Longitude -104.1224747
*(NAD 83 in decimal degrees to 5 decimal places)*

| | |
|---|---|
| Site Name AID STATE #008 | Site Type Oil and gas drilling facility |
| Date Release Discovered 3/31/19 | API# *(if applicable)* 30-015-38142 |

| Unit Letter | Section | Township | Range | County |
|---|---|---|---|---|
| A | 13 | 17S | 28E | Eddy |

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) 9.97 | Volume Recovered (bbls) |
| ☐ Produced Water | Volume Released (bbls) | Volume Recovered (bbls) |
| | Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l? | ☐ Yes ☐ No |
| ☐ Condensate | Volume Released (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

Operator reported a spill do to the rubber on top of a tubing gauge failing.

State of New Mexico
Oil Conservation Division

| | |
|---|---|
| Incident ID | NAB1910934590 |
| District RP | 2RP-5350 |
| Facility ID | |
| Application ID | pAB1910934259 |

| | |
|---|---|
| Was this a major release as defined by 19.15.29.7(A) NMAC?<br><br>☐ Yes ☑ No | If YES, for what reason(s) does the responsible party consider this a major release? |

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?

Yes via email to Mike Bratcher, Victoria Venegas, and Robert Hamlet on 3/31/19 12:24 pm

## 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:

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: Isaac Castro  Title: Adv HES Tech

Signature: Isaac Castro  Date: 4/3/19

email: icastro@marathonoil.com  Telephone: 575-988-0561

**OCD Only**

Received by: Amelia Barrameda  Date: 4/19/2019

# ATTACHMENT 3

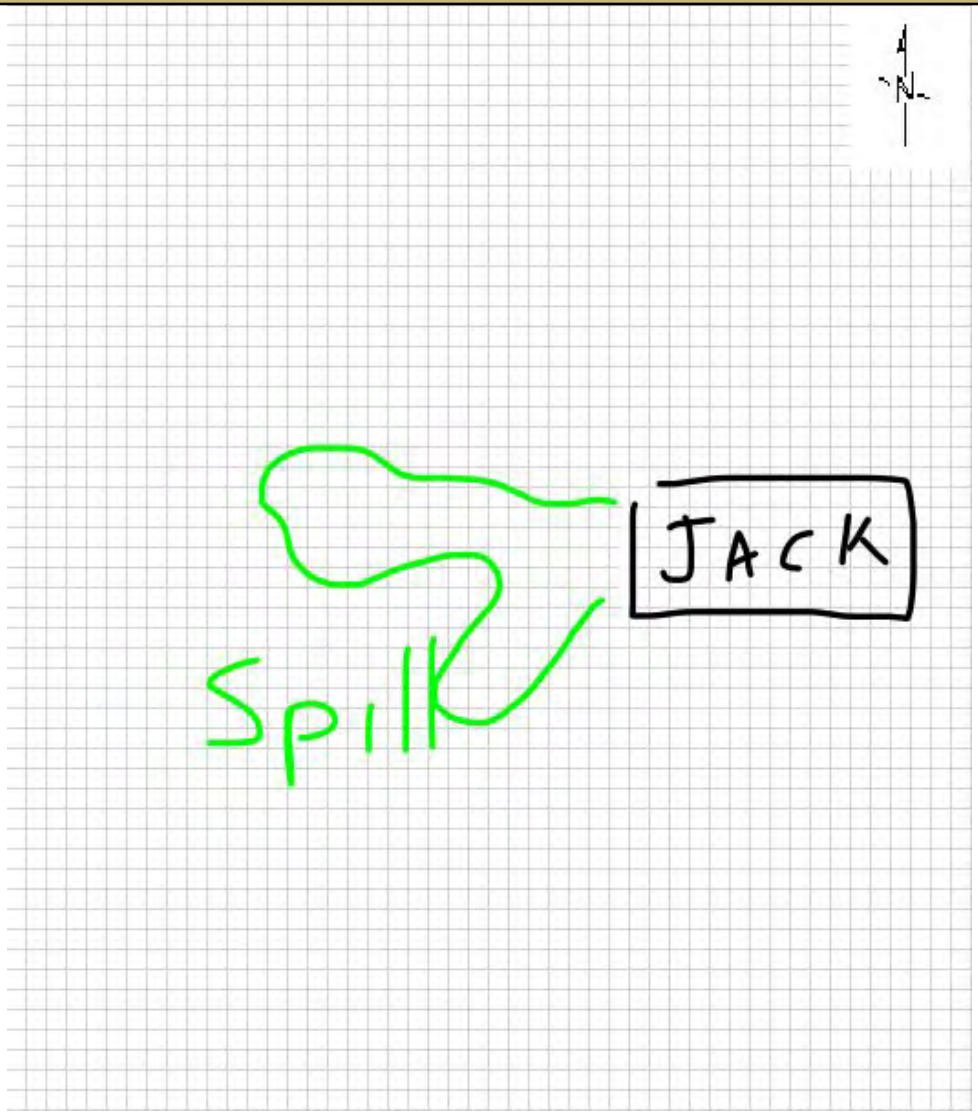
# Daily Site Visit Report

| | | | |
|---|---|---|---|
| Client: | Marathon Oil Permian LLC | Inspection Date: | 3/31/2019 |
| Site Location Name: | Aid State 008 Marathon Oil Permian LLC | Report Run Date: | 4/1/2019 2:39 PM |
| Project Owner: | Isaac Castro | File (Project) #: | 19E-00614 |
| Project Manager: | Dennis Williams | API #: | 30-015-38142 |
| Client Contact Name: | Callie Karrigan | Reference | Tubing Line Gauge failure |
| Client Contact Phone #: | (405) 202-1028 | | |

| Summary of Times | |
|---|---|
| Left Office | 3/31/2019 6:15 PM |
| Arrived at Site | 3/31/2019 7:06 PM |
| Departed Site | 3/31/2019 7:27 PM |
| Returned to Office | 3/31/2019 8:33 PM |

# Daily Site Visit Report

## Site Sketch



# Daily Site Visit Report

## Summary of Daily Operations

**19:07** Locate spill
Take pictures and document on DFR
GPS spill

## Next Steps & Recommendations

**1** Send GPS mapping to create map of spill

**2** Send report to client

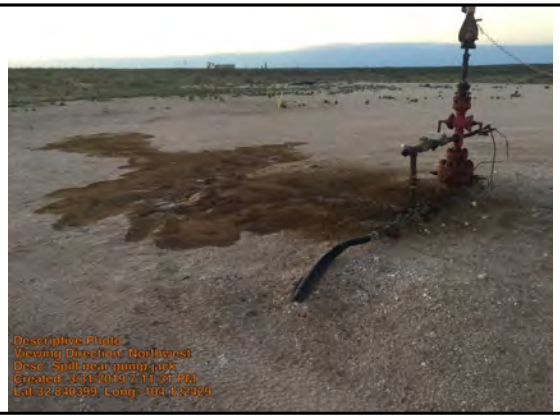
# Daily Site Visit Report

## Site Photos

**Viewing Direction**: Northwest


Spill near pump jack

**Viewing Direction**: Northwest




Spill near pump jack

**Viewing Direction**: Northeast

Spill near pump jack

**Viewing Direction**: East


Spill near pump jack

# Daily Site Visit Report

| **Viewing Direction**: South | **Viewing Direction**: Southeast |
|---|---|
|  |  |
| Spill near pump jack | Spill near pump jack |
| **Viewing Direction**: Southwest | **Viewing Direction**: Southwest |
|  |  |
| Spill near pump jack | Spill near pump jack |

# Daily Site Visit Report

| **Viewing Direction**: West |
| --- |
|  |
| Spill near pump jack |

# Daily Site Visit Report

## Daily Site Visit Signature

**Signature of Inspector:**

# Daily Site Visit Report

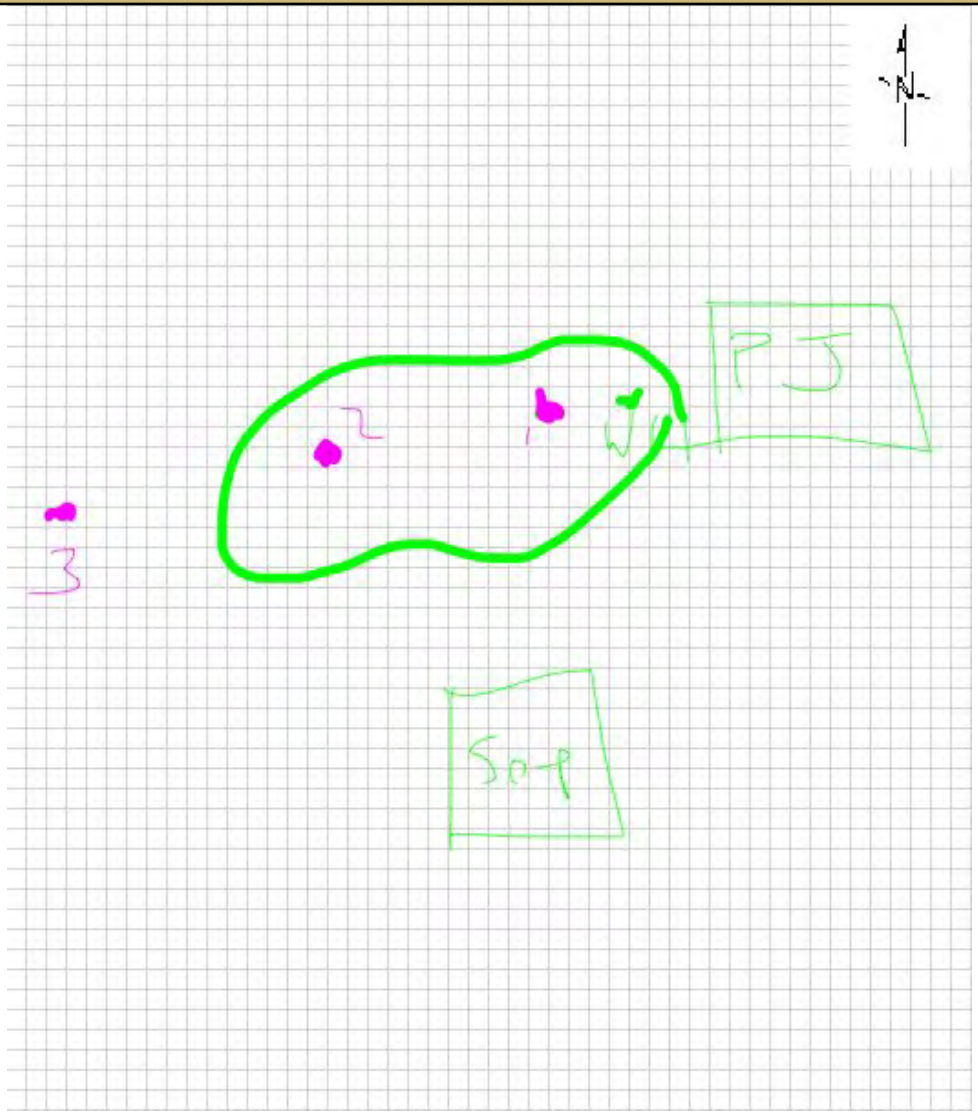
| | | | |
|---|---|---|---|
| Client: | Marathon Oil Permian LLC | Inspection Date: | 4/5/2019 |
| Site Location Name: | Aid State #008 | Report Run Date: | 4/5/2019 7:12 PM |
| Project Owner: | Isaac Castro | File (Project) #: | 19E-00614 |
| Project Manager: | Dennis Williams | API #: | 30-015-38142 |
| Client Contact Name: | Callie Karrigan | Reference | Tubing Line Gauge Failure |
| Client Contact Phone #: | (405) 202-1028 | | |

**Summary of Times**

| | |
|---|---|
| Left Office | 4/5/2019 7:17 AM |
| Arrived at Site | 4/5/2019 8:24 AM |
| Departed Site | 4/5/2019 11:51 AM |
| Returned to Office | 4/5/2019 12:49 PM |

# Daily Site Visit Report

## Site Sketch



# Daily Site Visit Report

## Summary of Daily Operations

**8:46** Complete all safety paperwork, safety meeting and arrival form.

**8:46** Excavate and sample as we go along.

## Next Steps & Recommendations

**1** Collect confirmatory samples.

**2** Wait for lab results and review results.

## Sampling

**SS19-01**

| Depth ft | VOC PID | Petro Flag TPH ppm | Quantab Range ppm | Quantab Reading ppm | Lab Analysis | Picture | Trimble Location | Marked On Site Sketch? |
|---|---|---|---|---|---|---|---|---|
| 0 ft. | 5 ppm | 75 ppm | High (300-6000ppm) | 2262 ppm | | ✓ | 32.50'25.635", -104.07'20.912" | Yes |

**SS19-02**

| Depth ft | VOC PID | Petro Flag TPH ppm | Quantab Range ppm | Quantab Reading ppm | Lab Analysis | Picture | Trimble Location | Marked On Site Sketch? |
|---|---|---|---|---|---|---|---|---|
| 0 ft. | 4 ppm | 107 ppm | High (300-6000ppm) | 570 ppm | | ✓ | 32.50'25.639", -104.07'21.173" | Yes |

**SS19-03**

| Depth ft | VOC PID | Petro Flag TPH ppm | Quantab Range ppm | Quantab Reading ppm | Lab Analysis | Picture | Trimble Location | Marked On Site Sketch? |
|---|---|---|---|---|---|---|---|---|
| 0 ft. | 0 ppm | 0 ppm | High (300-6000ppm) | 0 ppm | | ✓ | 32.50'25.763", -104.07'21.769" | Yes |

# Daily Site Visit Report

## Site Photos

**Viewing Direction**: North


Excavation area

**Viewing Direction**: South


Excavation area

**Viewing Direction**: East

Excavation area

**Viewing Direction**: East

Ss19-02

# Daily Site Visit Report

| **Viewing Direction**: East | **Viewing Direction**: Northwest |
|---|---|
|  |  |
| Ss19-01 | Excavation area |
| **Viewing Direction**: East | **Viewing Direction**: East |
|  |  |
| Ss19-03 | Excavation area fenced off |

# Daily Site Visit Report

| **Viewing Direction**: North | **Viewing Direction**: West |
| --- | --- |
|  |  |
| Soil pile 18ft x 9ft x 1ft | Soil pile 18ft x 9ft x 1ft |

# Daily Site Visit Report

## Depth Sample Photos

**Sample Point ID**: SS19-01

**Depth:** 0ft.

**Sample Point ID**: SS19-02

**Depth:** 0ft.

**Sample Point ID**: SS19-03

**Depth:** 0ft.

# Daily Site Visit Report

## Daily Site Visit Signature

### Signature of Inspector:

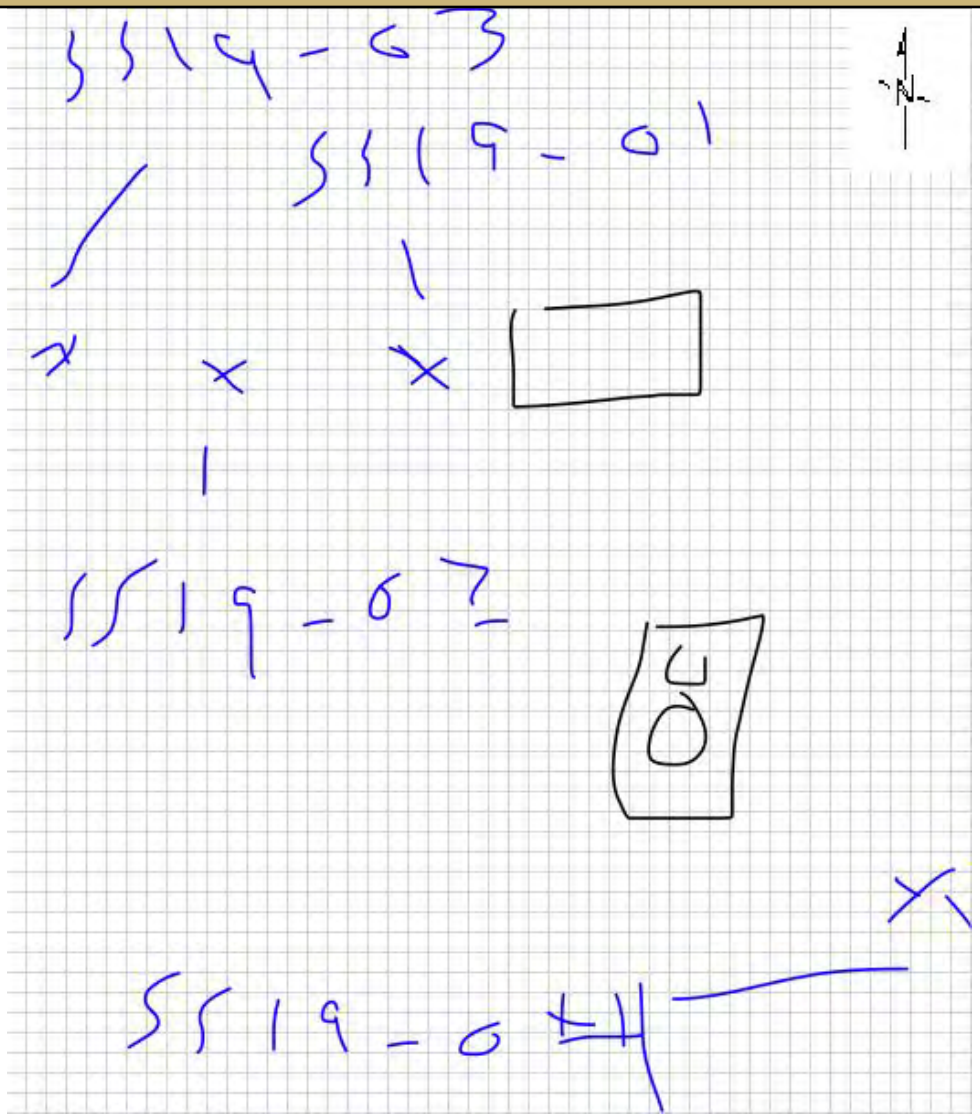
# Daily Site Visit Report

| | | | |
|---|---|---|---|
| Client: | Marathon Oil Permian LLC | Inspection Date: | 4/10/2019 |
| Site Location Name: | Aid State #008 | Report Run Date: | 4/10/2019 9:12 PM |
| Project Owner: | Isaac Castro | File (Project) #: | 19E-00614 |
| Project Manager: | Dennis Williams | API #: | 30-015-38142 |
| Client Contact Name: | Callie Karrigan | Reference | Tubing Line Gauge Failure |
| Client Contact Phone #: | (405) 202-1028 | | |

| Summary of Times | |
|---|---|
| Left Office | 4/10/2019 11:00 AM |
| Arrived at Site | 4/10/2019 12:13 PM |
| Departed Site | 4/10/2019 1:44 PM |
| Returned to Office | 4/10/2019 2:59 PM |

# Daily Site Visit Report

## Site Sketch



# Daily Site Visit Report

## Summary of Daily Operations

**12:50** Fill out arrival and safety forms
Collect confirmation samples
Drop off backhoe
Dump clean fill dirt
Fill out DFR
Take pictures
Head back to office

## Next Steps & Recommendations

**1** Ship samples

**2** Return 4-11-2019 when winds die down to remove contaminated soil

## Sampling

**SS19-01**

| Depth ft | VOC PID | Petro Flag TPH ppm | Quantab Range ppm | Quantab Reading ppm | Lab Analysis | Picture | Trimble Location | Marked On Site Sketch? |
|---|---|---|---|---|---|---|---|---|
| 0 ft. | | | | | BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M) | ✓ | 32°50’25.635”N, 104°07’20.912”W | Yes |

**SS19-02**

| Depth ft | VOC PID | Petro Flag TPH ppm | Quantab Range ppm | Quantab Reading ppm | Lab Analysis | Picture | Trimble Location | Marked On Site Sketch? |
|---|---|---|---|---|---|---|---|---|
| 0 ft. | | | | | BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M) | ✓ | 32°50’25.639”N, 104°07’21.173”W | Yes |

# Daily Site Visit Report

**SS19-03**

| Depth ft | VOC PID | Petro Flag TPH ppm | Quantab Range ppm | Quantab Reading ppm | Lab Analysis | Picture | Trimble Location | Marked On Site Sketch? |
|---|---|---|---|---|---|---|---|---|
| 0 ft. | | | | | BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M) | ✓ | 32°50’25.763”N, 104°07’21.769”W | Yes |

**SS19-04**

| Depth ft | VOC PID | Petro Flag TPH ppm | Quantab Range ppm | Quantab Reading ppm | Lab Analysis | Picture | Trimble Location | Marked On Site Sketch? |
|---|---|---|---|---|---|---|---|---|
| 0 ft. | | | | | BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M) | ✓ | 32°50’24.138”N, 104°07’19.421”W | Yes |

# Daily Site Visit Report

## Site Photos

**Viewing Direction**: South

Fenced off excavation

**Viewing Direction**: East

SS19-01

**Viewing Direction**: East

SS19-02

**Viewing Direction**: East

SS19-03

# Daily Site Visit Report

| **Viewing Direction**: South | **Viewing Direction**: East |
| --- | --- |
|  |  |
| Contaminated soil pile | SS19-04 |

# Daily Site Visit Report

## Depth Sample Photos

**Sample Point ID**: SS19-01


**Depth:** 0ft.

**Sample Point ID**: SS19-02


**Depth:** 0ft.

**Sample Point ID**: SS19-03


**Depth:** 0ft.

**Sample Point ID**: SS19-04

**Depth:** 0ft.

# Daily Site Visit Report

## Daily Site Visit Signature

**Inspector:** Jason Crabtree

**Signature:** 

# Daily Site Visit Report

| | | | |
|---|---|---|---|
| Client: | Marathon Oil Permian LLC | Inspection Date: | 4/11/2019 |
| Site Location Name: | Aid State #008 | Report Run Date: | 4/11/2019 7:52 PM |
| Project Owner: | Isaac Castro | File (Project) #: | 19E-00614 |
| Project Manager: | Dennis Williams | API #: | 30-015-38142 |
| Client Contact Name: | Callie Karrigan | Reference | Tubing Line Gauge Failure |
| Client Contact Phone #: | (405) 202-1028 | | |

## Summary of Times

| | |
|---|---|
| Left Office | 4/11/2019 7:45 AM |
| Arrived at Site | 4/11/2019 8:58 AM |
| Departed Site | 4/11/2019 11:32 AM |
| Returned to Office | 4/11/2019 1:19 PM |

## Summary of Daily Operations

**9:02** Conduct safety meeting.
Load out contaminated material

## Next Steps & Recommendations

**1** Await Lab results.

**2** Backfill, remove fence.

**3** Write closure report

# Daily Site Visit Report

## Site Photos

**Viewing Direction**: Southwest

Containment soil pile.

**Viewing Direction**: West


Contaminated material being loaded out.

**Viewing Direction**: North


Caliche pile for backfill.

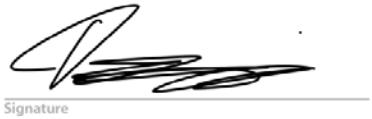
**Viewing Direction**: West

Cleaned up soil pile area.

# Daily Site Visit Report

## Daily Site Visit Signature

**Inspector:** Dennis Williams

**Signature:** 

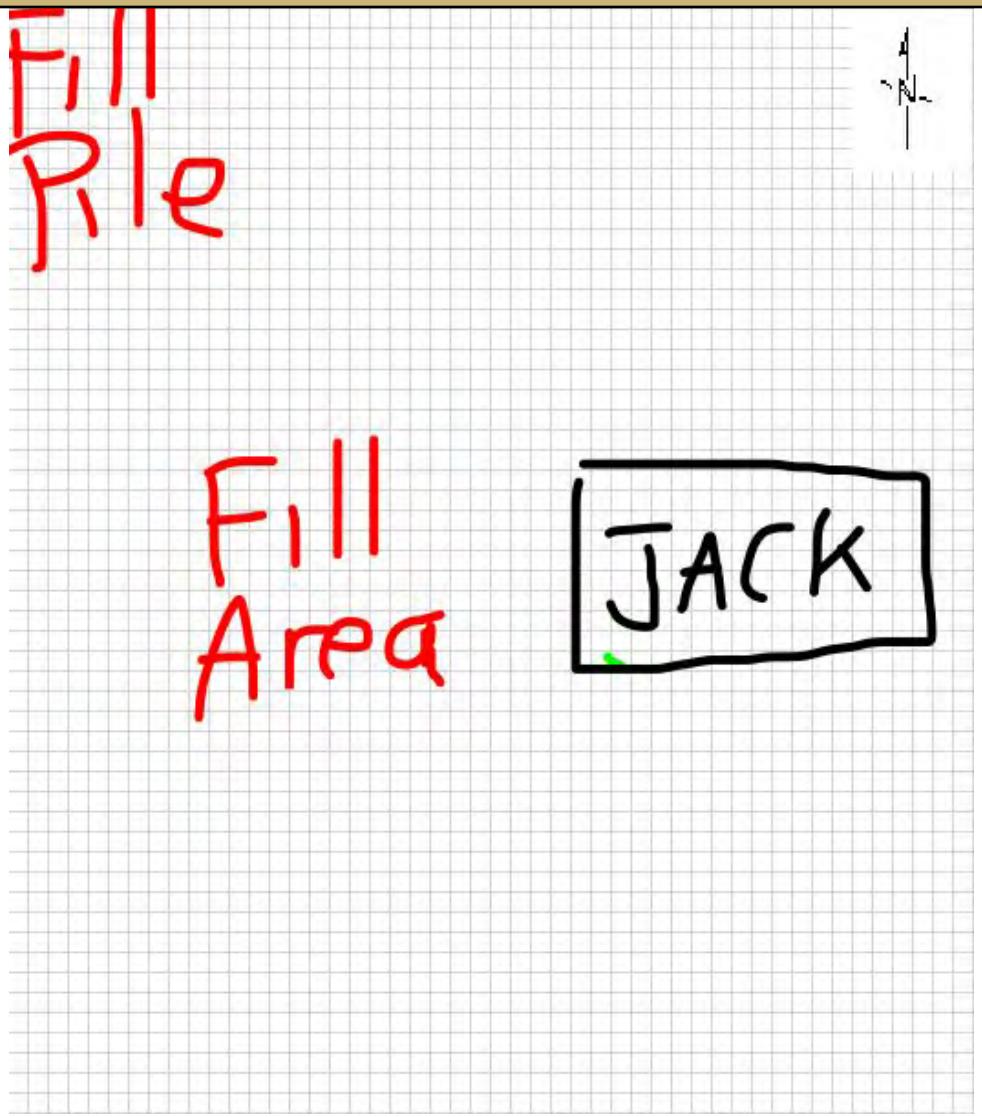
# Daily Site Visit Report

| | | | |
|---|---|---|---|
| Client: | Marathon Oil Permian LLC | Inspection Date: | 4/24/2019 |
| Site Location Name: | Aid State #008 | Report Run Date: | 4/24/2019 5:59 PM |
| Project Owner: | Isaac Castro | File (Project) #: | 19E-00614 |
| Project Manager: | Dennis Williams | API #: | 30-015-38142 |
| Client Contact Name: | Callie Karrigan | Reference | Tubing Line Gauge Failure |
| Client Contact Phone #: | (405) 202-1028 | | |

| Summary of Times | |
|---|---|
| Left Office | 4/24/2019 7:00 AM |
| Arrived at Site | 4/24/2019 8:00 AM |
| Departed Site | 4/24/2019 10:30 AM |
| Returned to Office | 4/24/2019 11:30 AM |

# Daily Site Visit Report

## Site Sketch



# Daily Site Visit Report

## Summary of Daily Operations

**8:00** Picture documentation of Backfill Operation before and after

## Next Steps & Recommendations

**1** Complete closure report

**2** Close file

# Daily Site Visit Report

## Site Photos

**Viewing Direction**: North

Backfill area by well head

**Viewing Direction**: North

Backfill area by well head

**Viewing Direction**: East

Backfill area by well head

**Viewing Direction**: South

Backfill area by well head

# Daily Site Visit Report

| **Viewing Direction**: Southeast | **Viewing Direction**: East |
|---|---|
|  |  |
| Fill pile | Fill pile |
| **Viewing Direction**: North | **Viewing Direction**: North |
|  |  |
| Fill pile | Well head |

# Daily Site Visit Report

| **Viewing Direction**: East | **Viewing Direction**: South |
|---|---|
|  |  |
| Well head | Well head |

| **Viewing Direction**: South | **Viewing Direction**: South |
|---|---|
|  |  |
| Well head | After backfill near well head |

# Daily Site Visit Report

| **Viewing Direction**: Southeast | **Viewing Direction**: East |
|---|---|
|  |  |
| After backfill near well head | After backfill near well head |
| **Viewing Direction**: East | **Viewing Direction**: North |
|  |  |
| After backfill near well head | After backfill near well head |

# Daily Site Visit Report

**Viewing Direction**: Northwest

After backfill near well head

**Viewing Direction**: North

Fill pile completely used/ compacted

**Viewing Direction**: Southwest

Fill pile completely used/ compacted

# Daily Site Visit Report

## Daily Site Visit Signature

**Inspector:** Austin Harris

**Signature:** 

Signature

# ATTACHMENT 4

# New Mexico Office of the State Engineer
# Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

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

(NAD83 UTM in meters)

(In feet)

| POD Number | POD Sub-basin | County | Q 64 | Q 16 | Q 4 | Sec | Tws | Rng | X | Y | Distance | Depth Well | Depth Water | Water Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RA 12307 POD1 | RA | ED | 4 | 2 | 2 | 14 | 17S | 28E | 580495 | 3633981 | 1626 | 140 | 58 | 82 |

Average Depth to Water: **58 feet**

Minimum Depth: **58 feet**

Maximum Depth: **58 feet**

**Record Count:** 1

**UTMNAD83 Radius Search (in meters):**

**Easting (X):** 582120.9 **Northing (Y):** 3633946 **Radius:** 5000

# New Mexico Office of the State Engineer

# Active & Inactive Points of Diversion

## (with Ownership Information)

(acre ft per annum)

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

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

| WR File Nbr | Sub basin | Use | Diversion | Owner | County | POD Number | Well Tag | Code | Grant | Source | q 6416 | q 4 | q | Sec | Tws | Rng | X | Y | Distance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RA 12307 | RA | STK | 3 | KEY LIVESTOCK LLC | ED | RA 12307 POD1 | | | NON | Shallow | 4 | 2 | 2 | 14 | 17S | 28E | 580494 | 3633981 | 1626 |
| RA 12052 | RA | MON | 0 | CENTURION PIPELINE L.P. | ED | RA 12052 POD1 | | | | | 4 | 2 | 2 | 24 | 17S | 28E | 582117 | 3632226 | 1719 |
| RA 08229 | RA | STK | 1.34 | BOGLE FARMS | ED | RA 08229 | | | | | | | | 02 | 17S | 28E | 579839 | 3636487* | 3415 |
| RA 08231 | RA | STK | 1.34 | BOGLE FARMS | ED | RA 08231 | | | | | 3 | 3 | | 23 | 17S | 28E | 579269 | 3631051* | 4063 |
| RA 08230 | RA | STK | 1.42 | BOGLE FARMS | ED | RA 08230 | | | | | | | | 22 | 17S | 28E | 578281 | 3631638* | 4480 |

**Record Count:** 5

**UTMNAD83 Radius Search (in meters):**

**Easting (X):** 582120.9 **Northing (Y):** 3633946 **Radius:** 5000

**Sorted by:** Distance

***UTM location was derived from PLSS - see Help**

U.S. Fish and Wildlife Service
National Wetlands Inventory

# Aid State 008 Riverine 2450 feet

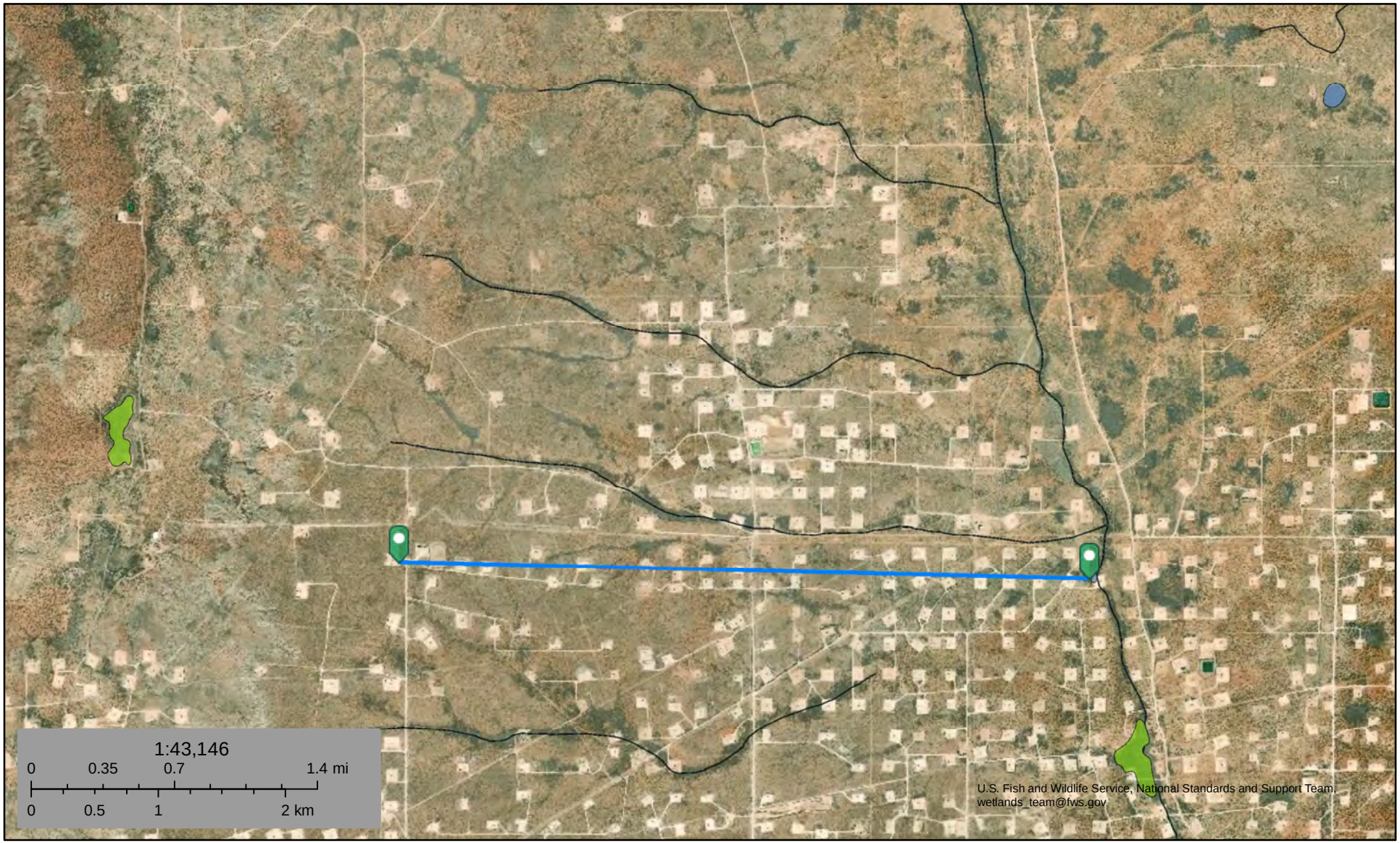

March 31, 2019

**Wetlands**

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

U.S. Fish and Wildlife Service
National Wetlands Inventory

# Aid State 8 fresh water pond 15,005ft

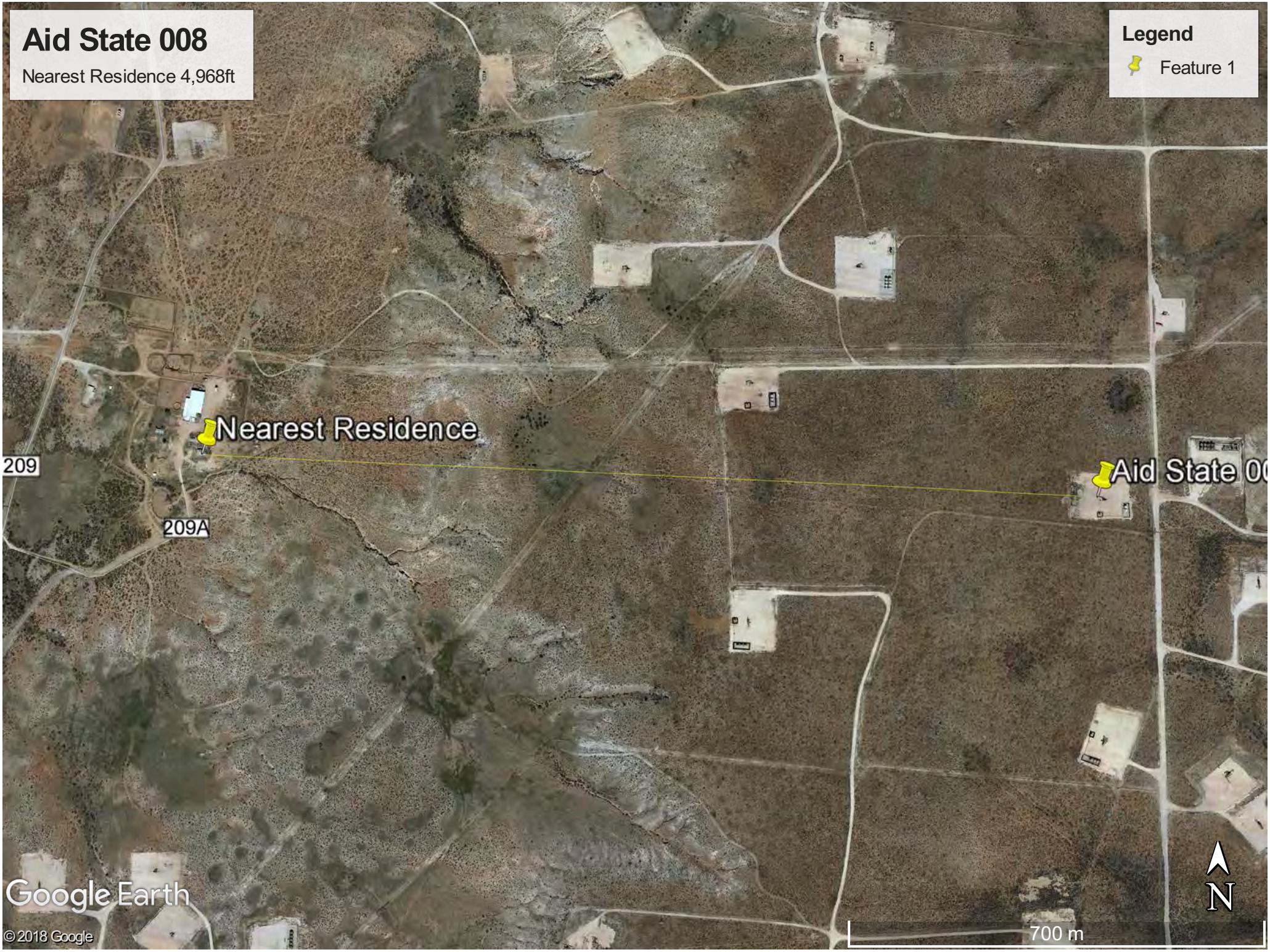


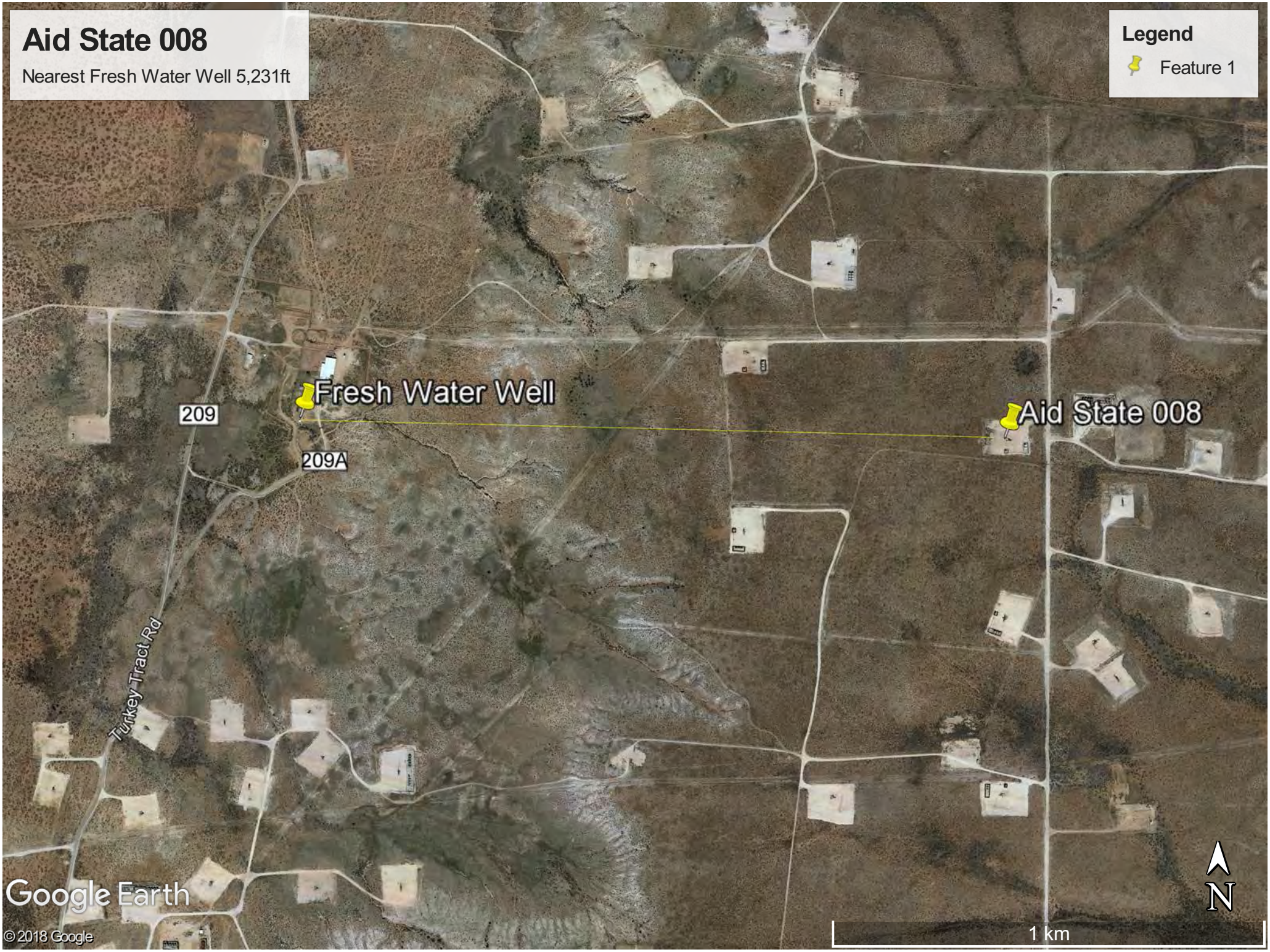

April 4, 2019

**Wetlands**

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

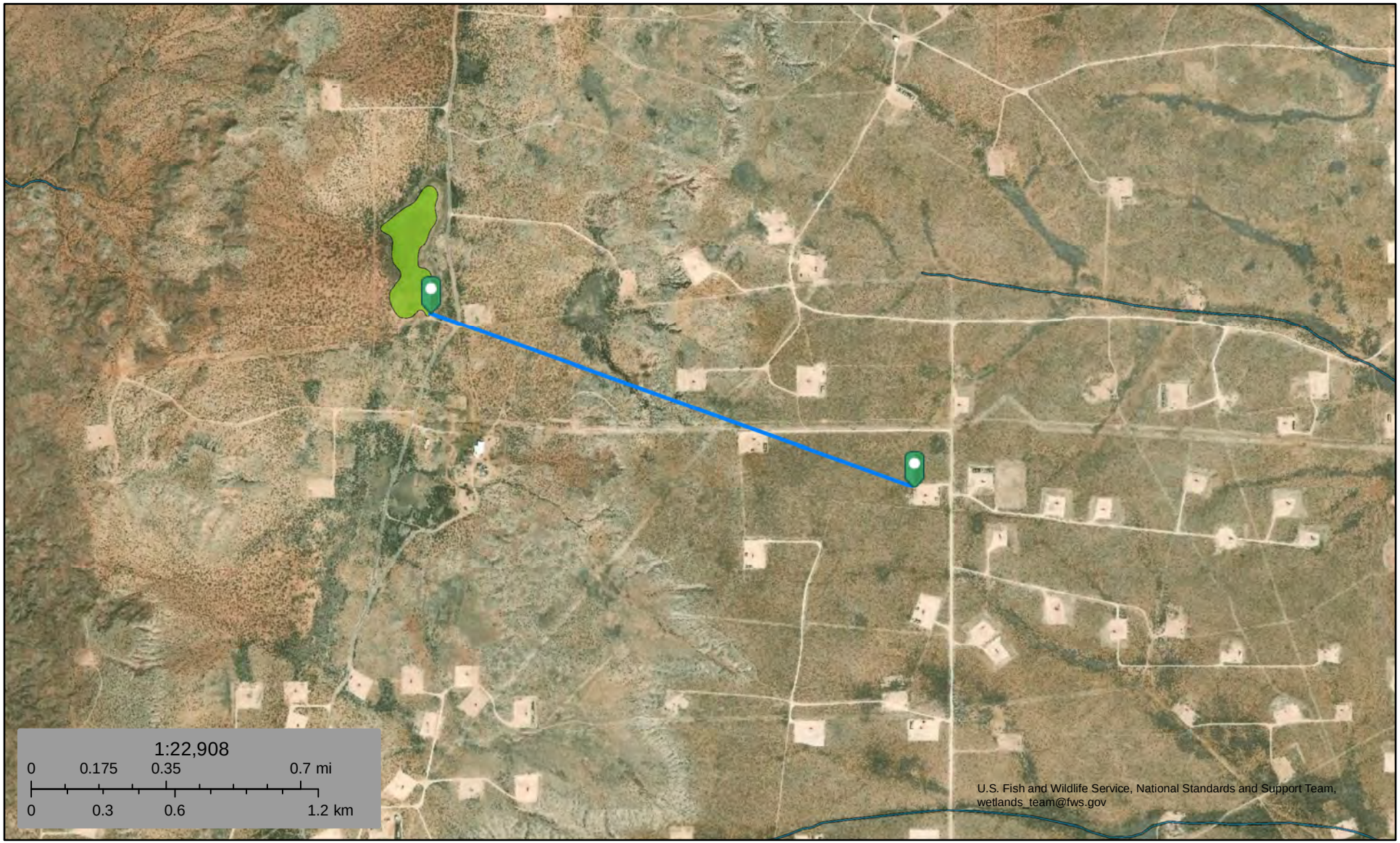
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.


Aid State 008
Nearest Residence 4,968ft
Legend
Feature 1
Nearest Residence
209
209A
Aid State 00
Google Earth
© 2018 Google
700 m
N


Aid State 008
Nearest Fresh Water Well 5,231ft
Legend
Feature 1
Fresh Water Well
Aid State 008
209
209A
Turkey Tract Rd
Google Earth
© 2018 Google
N
1 km

U.S. Fish and Wildlife Service
National Wetlands Inventory

# Aid State 008 Wetland 5926 feet

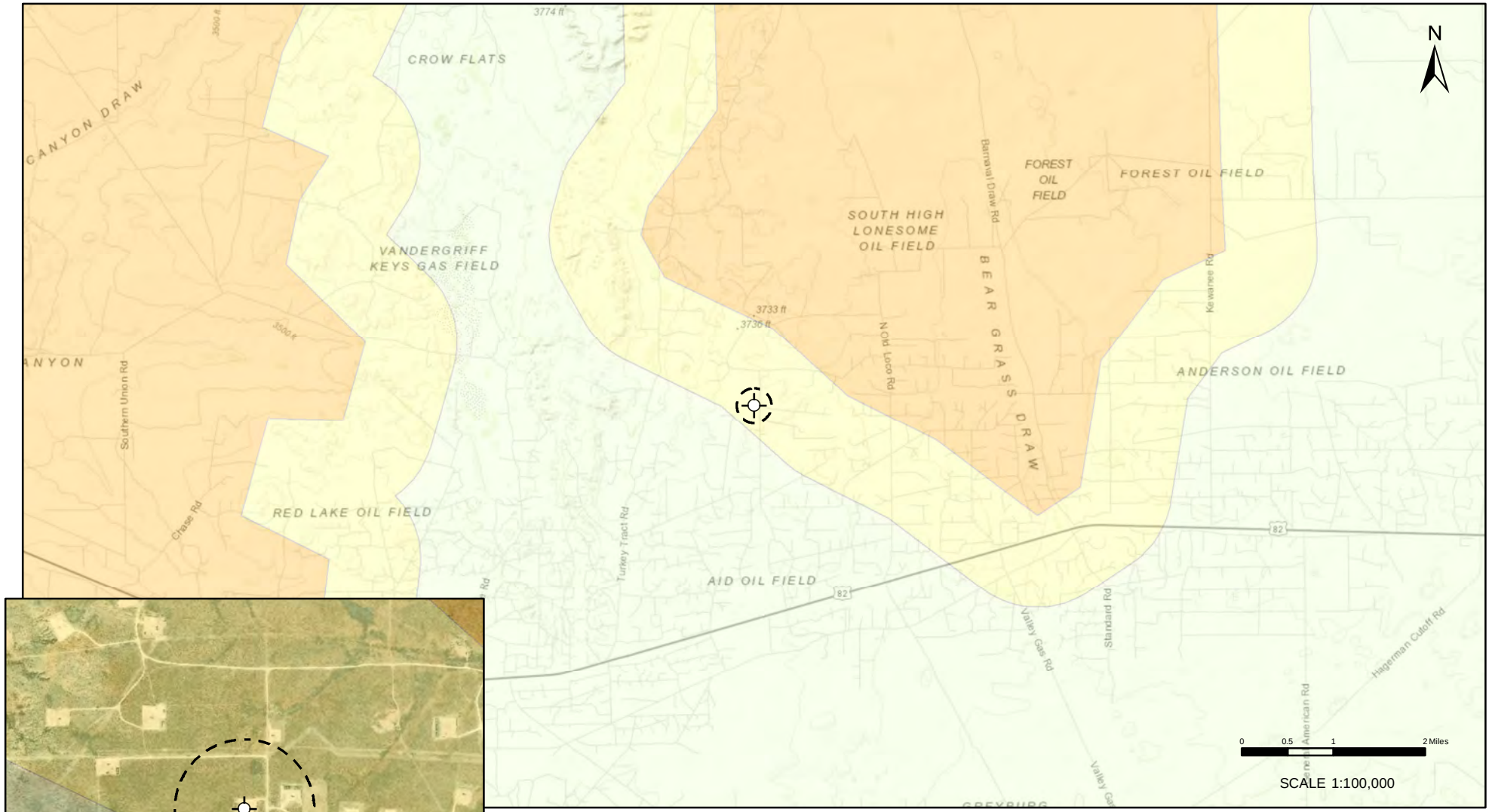


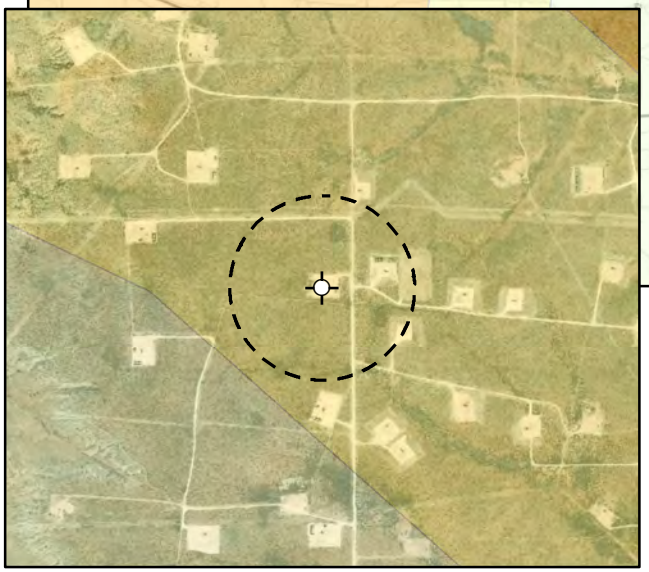

March 31, 2019

**Wetlands**

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



LEGEND

KARST POTENTIAL

- CRITICAL
- HIGH
- MEDIUM
- LOW

Notes: Aerial Image from ESRI Digital Globe 2017

Marathon Oil

**Karst Potential**
**Aid State 008**

VERTEX

| | |
|---|---|
| DRAWN: | NM |
| APPROVED: | KM |
| DATE: | APRIL 1/19 |

FIGURE: **1**

VERSATILITY. EXPERTISE.

# National Flood Hazard Layer FIRMette

FEMA

32°50'40.91"N

104°7'39.73"W


104°7'2.27"W

32°50'10.69"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/31/2019 at 3:01:28 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Eddy Area, New Mexico


April 23, 2019

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# Contents

# How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map


Map Scale: 1:694 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 14, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 30, 2015—Dec 15, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| SG | Simona gravelly fine sandy loam, 0 to 3 percent slopes | 2.2 | 100.0% |
| **Totals for Area of Interest** | | **2.2** | **100.0%** |

# Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

# Eddy Area, New Mexico

## SG—Simona gravelly fine sandy loam, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 1w5w
*Elevation:* 2,750 to 5,000 feet
*Mean annual precipitation:* 8 to 16 inches
*Mean annual air temperature:* 57 to 70 degrees F
*Frost-free period:* 180 to 230 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Simona and similar soils:* 95 percent
*Minor components:* 1 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Simona

#### Setting

*Landform:* Alluvial fans, plains
*Landform position (three-dimensional):* Rise
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear
*Parent material:* Mixed alluvium and/or eolian sands

#### Typical profile

*H1 - 0 to 19 inches:* gravelly fine sandy loam
*H2 - 19 to 23 inches:* indurated

#### Properties and qualities

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* 7 to 20 inches to petrocalcic
*Natural drainage class:* Well drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum in profile:* 15 percent
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum in profile:* 1.0
*Available water storage in profile:* Very low (about 2.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7e
*Hydrologic Soil Group:* D
*Ecological site:* Shallow Sandy (R042XC002NM)
*Hydric soil rating:* No

### Minor Components

#### Playa

*Percent of map unit:* 1 percent
*Landform:* Playas
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Convex, concave
*Across-slope shape:* Linear, concave
*Ecological site:* Bottomland (R042XC017NM)
*Hydric soil rating:* Yes

#### Simona

*Percent of map unit:*
*Ecological site:* Shallow Sandy (R042XC002NM)
*Hydric soil rating:* No

# References

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# ATTACHMENT 5

# Invoice

| Date | Invoice # |
|---|---|
| 4/18/2019 | 109178 |

BDS Enterprises, LLC.
2510 Monte Vista
Carlsbad, NM 88220

**Bill To:**

Vertex Resource Group, Ltd.
213 S Mesa Street
Carlsbad, NM 88220

| Terms |
|---|
| Net 30 |

| Company Rep: | Asset # | MOE # | Project / Lease Name |
|---|---|---|---|
| Dennis Williams | | | AID STATE COM 008 |

| Service Date | Ticket # | Qty | Item | Description | Rate | Amount |
|---|---|---|---|---|---|---|
| 4/10/2019 | 96363 | | | Hauled Calilche from BDS N 80 pit to location. | | |
| | | 10 | Belly Dump | Belly Dump | 90.00 | 900.00T |
| | | 24 | Caliche | Caliche | 9.00 | 216.00T |
| 4/11/2019 | 96366 | | | Hauled 1 load material to R360 for disposal. Ticket # 700-1000436 | | |
| | | 5 | Belly Dump | Belly Dump | 90.00 | 450.00T |

*Thank you for your business!*

Phone # 575-689-8324

| | |
|---|---|
| **Sales Tax (5.9583%)** | $93.31 |
| **Total** | $1,659.31 |

# BDS ENTERPRISES LLC

OILFIELD SERVICES

Mailing Address: 2510 Monte Vista Carlsbad, NM 88220

1705 E. Greene St., Carlsbad, NM 88220
bdsoilfield@gmail.com

Louie Barnes 575.499.9153
Brent Wilson 575.689.5134

## TIME TICKET

№ 96363

OFFICE: 575.689.8324

FAX: 575.689.8325

| CUSTOMER | ENTER LOCATION WHERE WORK WAS DONE | DATE |
|---|---|---|
| VERTEX | CITY: None | 4/10/19 |
| WORK LOCATION (NAME): AID State Com #8 | COUNTY: Eddy | CUSTOMER P.O. NUMBER: None |
| CUSTOMER BILLING ADDRESS: Dennis Williams 575.361.1137 | STATE: NM | CUSTOMER NUMBER: None |
| | TAX CODE: None | SESI JOB NO.: None |
| | TAX RATE: None | |

| FROM | TO | HOURS | DESCRIPTION |
|---|---|---|---|
| 5:30 | 3:30 | 10 | hauled caliche from North 80 to location |

| NAME | TITLE | HRS | RATE | AMOUNT | EQUIPMENT | UNIT NO. | HOURS | RATE | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| Billy Thompson | | 10 | | | Belly Loader | | | 90 | 90 |
| Orlando Morales | | 1 | | | | | | | |

| | |
|---|---|
| TOTAL | |
| NON-TAXABLE | |
| TAXABLE | |
| % SALES TAX | |
| **TOTAL AMOUNT INCLUDING TAX** | |

| MATERIALS / SUBCONTRACTOR / SUBSISTENCE | AMOUNT |
|---|---|
| hauled 1 load caliche from North 80 to location | 216 |
| 24 yds caliche @ 9.00/yd | |
| TOTAL | |

CUSTOMER SIGNATURE

Billy Thompson
CONTRACTOR SIGNATURE

SC

# BDS ENTERPRISES LLC

OILFIELD SERVICES

Mailing Address: 2510 Monte Vista Carlsbad, NM 88220

1705 E. Greene St., Carlsbad, NM 88220
bdsoilfield@gmail.com

Louie Barnes 575.499.9153
Brent Wilson 575.689.5134

## TIME TICKET

Nº 96366

OFFICE: 575.689.8324

FAX: 575.689.8325

| CUSTOMER | ENTER LOCATION WHERE WORK WAS DONE | DATE |
|---|---|---|
| VERTEX | CITY: None | 4/11/19 |
| WORK LOCATION (NAME): AID State Com #8 | COUNTY: Eddy | CUSTOMER P.O. NUMBER: None |
| CUSTOMER BILLING ADDRESS: ( | STATE: NM | CUSTOMER NUMBER: None |
| | TAX CODE: None | SESI JOB NO.: None |
| | TAX RATE: None | |

| FROM | TO | HOURS | DESCRIPTION |
|---|---|---|---|
| 10:30 | 3:30 | 5 | hauled non hazardous contaminated soil from location to R360 disposal |

| NAME | TITLE | HRS | RATE | AMOUNT | EQUIPMENT | UNIT NO. | HOURS | RATE | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| Billy Thompson | | 5 | | | Belly | | | 90 | |

| | |
|---|---|
| TOTAL | |
| NON-TAXABLE | |
| TAXABLE | |
| % SALES TAX | |
| **TOTAL AMOUNT INCLUDING TAX** | |

| MATERIALS / SUBCONTRACTOR / SUBSISTENCE | AMOUNT |
|---|---|
| hauled 1 load contaminate soil to Be R360 disposal | |
| TOTAL | |

CUSTOMER SIGNATURE

Billy Thompson
CONTRACTOR SIGNATURE



NICHOLS PRINTING, INC. • 575.885.3313

R360 ENVIRONMENTAL SOLUTIONS

**Permian Basin**

| | |
|---|---|
| Customer: | MARATHON OIL COMPANY |
| Customer #: | CRI3930 |
| Ordered by: | CALLIE KARRIGAN |
| AFE #: | |
| PO #: | |
| Manifest #: | 381599 |
| Manif. Date: | 4/11/2019 |
| Hauler: | BDS TRUCKING |
| Driver | BILLY |
| Truck # | 42 |
| Card # | |
| Job Ref # | |

| | |
|---|---|
| Ticket #: | 700-1000436 |
| Bid #: | O6UJ9A000AM5 |
| Date: | 4/11/2019 |
| Generator: | MARATHON OIL COMPANY |
| Generator #: | |
| Well Ser. #: | 38142 |
| Well Name: | AID STATE |
| Well #: | 008 |
| Field: | |
| Field #: | |
| Rig: | NON-DRILLING |
| County | EDDY (NM) |

**Facility: CRI**

| Product / Service | Quantity Units |
|---|---|
| **Contaminated Soil (RCRA Exempt)** | 7.00 yards |

| | Cell | pH | Cl | Cond. | %Solids | TDS | PCI/GM | MR/HR | H2S | % Oil | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Lab Analysis:*** | 50/51 | 0.00 | 0.00 | 0.00 | 0 | | | | | | |

**Generator Certification Statement of Waste Status**

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

X RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt wast

__ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):

__ MSDS Information __ RCRA Hazardous Waste Analysis __ Process Knowledge __ Other (Provide description above)

**Driver/ Agent Signature** **R360 Representative Signature**

_____ _____

**Customer Approval**

## THIS IS NOT AN INVOICE!

Approved By: _____ Date: _____

R360 ENVIRONMENTAL SOLUTIONS

# NEW MEXICO NON-HAZARDOUS OILFIELD WASTE MANIFEST

(PLEASE PRINT)

Company Man Contact Information
Name
Phone No.

## GENERATOR

NO. 381599

Operator No.
Operators Name: Marathon oil
Address: 4111 S Tidwell Road
City, State, Zip: Carlsbad NM 88220
Phone No.: 405-202-1028

Permit/RRC No.: 29500900
Lease/Well Name & No.: And 5932 #006
County: Eddy County
API No.: 30-015-38142
Rig Name & No.:
AFE/PO No.: NM. Drill

**EXEMPT E&P Waste/Service Identification and Amount: (place volume next to waste type in barrels or cubic yards)**

| | | | | | |
|---|---|---|---|---|---|
| Oil Based Muds | | NON-INJECTABLE WATERS | | INJECTABLE WATERS | |
| Oil Based Cuttings | | Washout Water (Non-Injectable) | | Washout Water (Injectable) | |
| Water Based Muds | | Completion Fluid/Flow back (Non-Injectable) | | Completion Fluid/Flow back (Injectable) | |
| Water Based Cuttings | | Produced Water (Non-Injectable) | | Produced Water (Injectable) | |
| Produced Formation Solids | | Gathering Line Water/Waste (Non-Injectable) | | Gathering Line Water/Waste (Injectable) | |
| Tank Bottoms | | INTERNAL USE ONLY | | OTHER EXEMPT WASTES (type and generation process of the waste) | |
| E&P Contaminated Soil | 7 | Truck Washout (exempt waste) | | Belly Dump | |
| Gas Plant Waste | | | | | |

WASTE GENERATION PROCESS: ☐ DRILLING ☐ COMPLETION ☒ PRODUCTION ☐ GATHERING LINES

**NON-EXEMPT E&P Waste/Service Identification and Amount:**
All non-exempt E&P waste must be analyzed and be below the threshold limits for toxicity (TCLP), ignitability, corrosivity and reactivity

Non-Exempt Other: *please select from Non-Exempt Waste List on back

QUANTITY: B - BARRELS L - LIQUID (Y - YARDS) E - EACH

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste load is (Check the appropriate classification)

☑ RCRA EXEMPT: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste (R360 Accepts certifications on a per load basis only)

☐ RCRA NON-EXEMPT: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined by 40 CFR, part 261, subpart D, as amended. The following documentation demonstrating the waste as non-hazardous is attached. (Check the appropriate items as provided)

☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Other (Provide Description Below)

☐ EMERGENCY NON-OILFEILD: Emergency non-hazradous, non-oilfeild waste that has been ordered by the Department of Public Safety (the order, documentation of non-hazardous waste determination and a desciption of the waste must accompany this form)

Callie Kerrigan Per Dennis Williams/Vertex (PRINT) AUTHORIZED AGENTS NAME — April 11 2019 DATE — SIGNATURE

## TRANSPORTER

Transporter's Name: BDS
Address: Carlsbad NM
Phone No.:
Driver's Name: Billy Thompson
Print Name:
Phone No.:
Truck No.: 42

I hereby certify that the above named material(s) was/were picked up at the Generator's site listed above and delivered without incident to the disposal facility listed below.

4-11-19 SHIPMENT DATE — Billy Thomps DRIVER'S SIGNATURE — 4/11 DELIVERY DATE — DRIVER'S SIGNATURE

TRUCK TIME STAMP
IN: OUT:

## DISPOSAL FACILITY

RECEIVING AREA
Name/No. 50/51

Site Name/Permit No.: Halfway Facility / NM1-006
Address: 6601 Hobbs Hwy US 62/180 Mile Marker 66 Carlsbad, NM 88220
Phone No.: 575-393-1079

NORM READINGS TAKEN? (Circle One) YES NO — If YES, was reading > 50 micro roentgens? (circle one) YES NO

PASS THE PAINT FILTER TEST? (Circle One) YES NO

## TANK BOTTOMS

| | Feet | Inches |
|---|---|---|
| 1st Gauge | | |
| 2nd Gauge | | |
| Received | | |

| | | | |
|---|---|---|---|
| BS&W/BBLS Received | | BS&W (%) | |
| Free Water | | | |
| Total Received | | | |

I hereby certify that the above load material has been (circle one): ACCEPTED DENIED If denied, why?

J Matheus (NAME (PRINT)) 4/11 (DATE) DRIVER (TITLE) J Ma (SIGNATURE)

C-138 White - R360 ORIGINAL Yellow - TRANSPORTER COPY Pink - GENERATOR SITE COPY Gold - RETURN TO GENERATOR Version 1

# ATTACHMENT 6

**Table 3. Soil Characterization - Salinity and Petroleum Hydrocarbon Parameters**
**Client Name: Marathon Oil LLC**
**Site Name: Aid State 8**
**Project #: 19E-00614**
**Lab Report(s): April 19, 2019**

**Table 3. Soil Analysis - April 10, 2019**

| Sample Description | | | Field Screening | | | Petroleum Hydrocarbons | | | | | | | | | | | | Inorganic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Volatile | | | | | | | Extractable | | | | | |
| Sample ID | Depth (ft) | Sample Date | Volatile Organic Compounds (PID) | Extractable Organic Compounds (PetroFlag | Quantab Result (High/Low) | Benzene | Toluene | Ethylbenzene | Xylenes (p&m) | Xylenes (o) | Xylenes (Total) | BTEX (Total) | Gasoline Range Organics (GRO) | Diesel Range Organics (DRO) | Motor Oil Hydrocarbons (MRO) | (GRO + DRO) | Total Petroleum Hydrocarbons (TPH) | Chloride |
| | | | (ppm) | (ppm) | (+/-) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| **SS 19-01** | **0** | 4/10/2019 | 4.9 | 75 | High 2262 | < 0.00201 | < 0.00201 | < 0.00201 | < 0.00402 | < 0.00201 | < 0.00201 | < 0.00201 | < 15.0 | **3,200** | 745 | 3,215 | **3,950** | 22,100.0 |
| **SS 19-02** | **0** | 4/10/2019 | 4.5 | 107 | High 570 | < 0.00202 | < 0.00202 | < 0.00202 | < 0.00404 | < 0.00202 | < 0.00202 | < 0.00202 | < 14.9 | **955** | 146 | 969.9 | **1,100** | 20,000.0 |
| **SS 19-03** | **0** | 4/10/2019 | 0.4 | 0 | High ND | < 0.00198 | < 0.00198 | < 0.00198 | < 0.00397 | < 0.00198 | < 0.00198 | < 0.00198 | < 15.0 | **63.1** | 15.6 | 78.1 | **78.7** | 3,310.0 |
| **SS 19-04** | **0** | 4/10/2019 | N/A | N/A | N/A | < 0.00199 | < 0.00199 | < 0.00199 | < 0.00398 | < 0.00199 | < 0.00199 | < 0.00199 | < 15.0 | **< 15.0** | < 15.0 | 30 | **< 15.0** | < 5.04 |

**Bold and Shaded indicates exceedance outside of applied action level.**

VERTEX

# ATTACHMENT 7

| | |
|---|---|
| **From:** | Dhugal Hanton |
| **To:** | Bratcher, Mike, EMNRD; Hamlet, Robert, EMNRD; Venegas, Victoria, EMNRD (Victoria.Venegas@state.nm.us) |
| **Cc:** | Callie Karrigan - Marathon Oil Permain LLC (cnkarrigan@marathonoil.com); Isaac Castro; Dennis Williams |
| **Subject:** | Marathon Oil - Aid State #008 - Final Confirmatory Sampling Notification - RP Not Yet Assigned |
| **Date:** | April 5, 2019 8:44:00 AM |

Morning,

Please accept this email as 48 hr notification that Vertex Resource Services Inc. has scheduled final confirmatory sampling at the above mentioned location on April 9, 2019 at approximately 1:00 PM. Jason Crabtree from Vertex will be on site performing the sampling and can be reached at (432) 250-3456. If you need assistance with directions to site please do not hesitate to contact them.

If you have any other questions or concerns, please do not hesitate to contact me.

Cheers,
Dhugal

**Dhugal Hanton** B.Sc., P.Ag., SR/WA, P.Biol.
Vice President,
US Operations

Vertex Resource Services Inc.
7223 Empire Central Drive,
Houston, TX
77040

**O 832-535-1585 Ext. 700**
**C 832-588-0674**

# ATTACHMENT 8

# Certificate of Analysis Summary 620948

## Marathon Oil Company, Tulsa, OK

## Project Name: Aid State #008

**Project Id:** 19E-00614
**Contact:** Callie Karrigan
**Project Location:** Eddy County, New Mexico

**Date Received in Lab:** Fri Apr-12-19 11:25 am
**Report Date:** 19-APR-19
**Project Manager:** Kalei Stout

| *Analysis Requested* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Lab Id:*** | 620948-001 | | 620948-002 | | 620948-003 | | 620948-004 | | | |
| | ***Field Id:*** | SS19-01 | | SS19-02 | | SS19-03 | | SS19-04 | | | |
| | ***Depth:*** | | | | | | | | | | |
| | ***Matrix:*** | SOIL | | SOIL | | SOIL | | SOIL | | | |
| | ***Sampled:*** | Apr-10-19 12:00 | | Apr-10-19 12:05 | | Apr-10-19 12:10 | | Apr-10-19 12:15 | | | |
| **BTEX by EPA 8021B** | ***Extracted:*** | Apr-17-19 13:00 | | Apr-17-19 13:00 | | Apr-17-19 13:00 | | Apr-17-19 13:00 | | | |
| | ***Analyzed:*** | Apr-18-19 00:08 | | Apr-18-19 02:19 | | Apr-18-19 02:38 | | Apr-18-19 02:57 | | | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | | |
| Benzene | | <0.00201 | 0.00201 | <0.00202 | 0.00202 | <0.00198 | 0.00198 | <0.00199 | 0.00199 | | |
| Toluene | | <0.00201 | 0.00201 | <0.00202 | 0.00202 | <0.00198 | 0.00198 | <0.00199 | 0.00199 | | |
| Ethylbenzene | | <0.00201 | 0.00201 | <0.00202 | 0.00202 | <0.00198 | 0.00198 | <0.00199 | 0.00199 | | |
| m,p-Xylenes | | <0.00402 | 0.00402 | <0.00404 | 0.00404 | <0.00397 | 0.00397 | <0.00398 | 0.00398 | | |
| o-Xylene | | <0.00201 | 0.00201 | <0.00202 | 0.00202 | <0.00198 | 0.00198 | <0.00199 | 0.00199 | | |
| Total Xylenes | | <0.00201 | 0.00201 | <0.00202 | 0.00202 | <0.00198 | 0.00198 | <0.00199 | 0.00199 | | |
| Total BTEX | | <0.00201 | 0.00201 | <0.00202 | 0.00202 | <0.00198 | 0.00198 | <0.00199 | 0.00199 | | |
| **Inorganic Anions by EPA 300** | ***Extracted:*** | Apr-18-19 17:00 | | Apr-17-19 19:00 | | Apr-17-19 19:00 | | Apr-17-19 19:00 | | | |
| | ***Analyzed:*** | Apr-19-19 10:13 | | Apr-18-19 00:51 | | Apr-18-19 00:06 | | Apr-17-19 23:33 | | | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | | |
| Chloride | | 22100 | 250 | 20000 | 250 | 3310 | 50.4 | <5.04 | 5.04 | | |
| **TPH by SW8015 Mod** | ***Extracted:*** | Apr-13-19 11:00 | | Apr-13-19 11:00 | | Apr-13-19 11:00 | | Apr-13-19 11:00 | | | |
| | ***Analyzed:*** | Apr-14-19 10:09 | | Apr-14-19 02:50 | | Apr-14-19 03:10 | | Apr-14-19 03:30 | | | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | | |
| Gasoline Range Hydrocarbons (GRO) | | <15.0 | 15.0 | <14.9 | 14.9 | <15.0 | 15.0 | <15.0 | 15.0 | | |
| Diesel Range Organics (DRO) | | 3200 | 15.0 | 955 | 14.9 | 63.1 | 15.0 | <15.0 | 15.0 | | |
| Motor Oil Range Hydrocarbons (MRO) | | 745 | 15.0 | 146 | 14.9 | 15.6 | 15.0 | <15.0 | 15.0 | | |
| Total TPH | | 3950 | 15.0 | 1100 | 14.9 | 78.7 | 15.0 | <15.0 | 15.0 | | |





Kalei Stout
Midland Laboratory Director



Final 1.000

# Analytical Report 620948

## for

## Marathon Oil Company

**Project Manager: Callie Karrigan**

**Aid State #008**

**19E-00614**

**19-APR-19**

Collected By: Client



**1211 W. Florida Ave**
**Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429), North Carolina (483)
Xenco-Lakeland: Florida (E84098)

19-APR-19

Project Manager: **Callie Karrigan**
**Marathon Oil Company**
P. O. Box 22164
Tulsa, OK 74121-2164

Reference: XENCO Report No(s): **620948**
**Aid State #008**
Project Address: Eddy County, New Mexico

**Callie Karrigan** :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 620948. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 620948 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

**Kalei Stout**
Midland Laboratory Director

# Sample Cross Reference 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| Sample Id | Matrix | Date Collected | Sample Depth | Lab Sample Id |
|---|---|---|---|---|
| SS19-01 | S | 04-10-19 12:00 | | 620948-001 |
| SS19-02 | S | 04-10-19 12:05 | | 620948-002 |
| SS19-03 | S | 04-10-19 12:10 | | 620948-003 |
| SS19-04 | S | 04-10-19 12:15 | | 620948-004 |

**Sample receipt non conformances and comments:**

None

**Sample receipt non conformances and comments per sample:**

None

**Analytical non conformances and comments:**

Batch: LBA-3086143 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

# Certificate of Analytical Results 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS19-01** | Matrix: | Soil | Date Received: | 04.12.19 11.25 |
| Lab Sample Id: | 620948-001 | Date Collected: | 04.10.19 12.00 | | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | Inorganic Anions by EPA 300 | | | Prep Method: | E300P |
| Tech: | SPC | | | % Moisture: | |
| Analyst: | SPC | Date Prep: | 04.18.19 17.00 | Basis: | Wet Weight |
| Seq Number: | 3086271 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| **Chloride** | 16887-00-6 | **22100** | 250 | mg/kg | 04.19.19 10.13 | | 50 |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH by SW8015 Mod | | | Prep Method: | TX1005P |
| Tech: | ARM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 04.13.19 11.00 | Basis: | Wet Weight |
| Seq Number: | 3085702 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <15.0 | 15.0 | mg/kg | 04.14.19 10.09 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **3200** | 15.0 | mg/kg | 04.14.19 10.09 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **745** | 15.0 | mg/kg | 04.14.19 10.09 | | 1 |
| **Total TPH** | PHC635 | **3950** | 15.0 | mg/kg | 04.14.19 10.09 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 96 | % | 70-135 | 04.14.19 10.09 | |
| o-Terphenyl | 84-15-1 | 115 | % | 70-135 | 04.14.19 10.09 | |

# Certificate of Analytical Results 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS19-01** | Matrix: | Soil | Date Received: | 04.12.19 11.25 |
| Lab Sample Id: | 620948-001 | Date Collected: | 04.10.19 12.00 | | |
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | SCM | | | % Moisture: | |
| Analyst: | SCM | Date Prep: | 04.17.19 13.00 | Basis: | Wet Weight |
| Seq Number: | 3086143 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00201 | 0.00201 | mg/kg | 04.18.19 00.08 | U | 1 |
| Toluene | 108-88-3 | <0.00201 | 0.00201 | mg/kg | 04.18.19 00.08 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00201 | 0.00201 | mg/kg | 04.18.19 00.08 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00402 | 0.00402 | mg/kg | 04.18.19 00.08 | U | 1 |
| o-Xylene | 95-47-6 | <0.00201 | 0.00201 | mg/kg | 04.18.19 00.08 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00201 | 0.00201 | mg/kg | 04.18.19 00.08 | U | 1 |
| Total BTEX | | <0.00201 | 0.00201 | mg/kg | 04.18.19 00.08 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 99 | % | 70-130 | 04.18.19 00.08 | |
| 1,4-Difluorobenzene | 540-36-3 | 104 | % | 70-130 | 04.18.19 00.08 | |

# Certificate of Analytical Results 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS19-02** | Matrix: | Soil | Date Received: | 04.12.19 11.25 |
| Lab Sample Id: | 620948-002 | Date Collected: | 04.10.19 12.05 | | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | Inorganic Anions by EPA 300 | | | Prep Method: | E300P |
| Tech: | SPC | | | % Moisture: | |
| Analyst: | SPC | Date Prep: | 04.17.19 19.00 | Basis: | Wet Weight |
| Seq Number: | 3086191 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| **Chloride** | 16887-00-6 | **20000** | 250 | mg/kg | 04.18.19 00.51 | | 50 |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH by SW8015 Mod | | | Prep Method: | TX1005P |
| Tech: | ARM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 04.13.19 11.00 | Basis: | Wet Weight |
| Seq Number: | 3085702 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <14.9 | 14.9 | mg/kg | 04.14.19 02.50 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **955** | 14.9 | mg/kg | 04.14.19 02.50 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **146** | 14.9 | mg/kg | 04.14.19 02.50 | | 1 |
| **Total TPH** | PHC635 | **1100** | 14.9 | mg/kg | 04.14.19 02.50 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 92 | % | 70-135 | 04.14.19 02.50 | |
| o-Terphenyl | 84-15-1 | 107 | % | 70-135 | 04.14.19 02.50 | |

# Certificate of Analytical Results 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS19-02** | Matrix: | Soil | Date Received: | 04.12.19 11.25 |
| Lab Sample Id: | 620948-002 | Date Collected: | 04.10.19 12.05 | | |
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | SCM | | | % Moisture: | |
| Analyst: | SCM | Date Prep: | 04.17.19 13.00 | Basis: | Wet Weight |
| Seq Number: | 3086143 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00202 | 0.00202 | mg/kg | 04.18.19 02.19 | U | 1 |
| Toluene | 108-88-3 | <0.00202 | 0.00202 | mg/kg | 04.18.19 02.19 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00202 | 0.00202 | mg/kg | 04.18.19 02.19 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00404 | 0.00404 | mg/kg | 04.18.19 02.19 | U | 1 |
| o-Xylene | 95-47-6 | <0.00202 | 0.00202 | mg/kg | 04.18.19 02.19 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00202 | 0.00202 | mg/kg | 04.18.19 02.19 | U | 1 |
| Total BTEX | | <0.00202 | 0.00202 | mg/kg | 04.18.19 02.19 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 98 | % | 70-130 | 04.18.19 02.19 | |
| 1,4-Difluorobenzene | 540-36-3 | 101 | % | 70-130 | 04.18.19 02.19 | |

# Certificate of Analytical Results 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS19-03** | Matrix: | Soil | Date Received: | 04.12.19 11.25 |
| Lab Sample Id: | 620948-003 | Date Collected: | 04.10.19 12.10 | | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | Inorganic Anions by EPA 300 | | | Prep Method: | E300P |
| Tech: | SPC | | | % Moisture: | |
| Analyst: | SPC | Date Prep: | 04.17.19 19.00 | Basis: | Wet Weight |
| Seq Number: | 3086191 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| **Chloride** | 16887-00-6 | **3310** | 50.4 | mg/kg | 04.18.19 00.06 | | 10 |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH by SW8015 Mod | | | Prep Method: | TX1005P |
| Tech: | ARM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 04.13.19 11.00 | Basis: | Wet Weight |
| Seq Number: | 3085702 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <15.0 | 15.0 | mg/kg | 04.14.19 03.10 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **63.1** | 15.0 | mg/kg | 04.14.19 03.10 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **15.6** | 15.0 | mg/kg | 04.14.19 03.10 | | 1 |
| **Total TPH** | PHC635 | **78.7** | 15.0 | mg/kg | 04.14.19 03.10 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 93 | % | 70-135 | 04.14.19 03.10 | |
| o-Terphenyl | 84-15-1 | 92 | % | 70-135 | 04.14.19 03.10 | |

# Certificate of Analytical Results 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS19-03** | Matrix: | Soil | Date Received: | 04.12.19 11.25 |
| Lab Sample Id: | 620948-003 | Date Collected: | 04.10.19 12.10 | | |
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | SCM | | | % Moisture: | |
| Analyst: | SCM | Date Prep: | 04.17.19 13.00 | Basis: | Wet Weight |
| Seq Number: | 3086143 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00198 | 0.00198 | mg/kg | 04.18.19 02.38 | U | 1 |
| Toluene | 108-88-3 | <0.00198 | 0.00198 | mg/kg | 04.18.19 02.38 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00198 | 0.00198 | mg/kg | 04.18.19 02.38 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00397 | 0.00397 | mg/kg | 04.18.19 02.38 | U | 1 |
| o-Xylene | 95-47-6 | <0.00198 | 0.00198 | mg/kg | 04.18.19 02.38 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00198 | 0.00198 | mg/kg | 04.18.19 02.38 | U | 1 |
| Total BTEX | | <0.00198 | 0.00198 | mg/kg | 04.18.19 02.38 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 540-36-3 | 101 | % | 70-130 | 04.18.19 02.38 | |
| 4-Bromofluorobenzene | 460-00-4 | 102 | % | 70-130 | 04.18.19 02.38 | |

# Certificate of Analytical Results 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS19-04** | Matrix: | Soil | Date Received: | 04.12.19 11.25 |
| Lab Sample Id: | 620948-004 | Date Collected: | 04.10.19 12.15 | | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | Inorganic Anions by EPA 300 | | | Prep Method: | E300P |
| Tech: | SPC | | | % Moisture: | |
| Analyst: | SPC | Date Prep: | 04.17.19 19.00 | Basis: | Wet Weight |
| Seq Number: | 3086191 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Chloride | 16887-00-6 | <5.04 | 5.04 | mg/kg | 04.17.19 23.33 | U | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH by SW8015 Mod | | | Prep Method: | TX1005P |
| Tech: | ARM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 04.13.19 11.00 | Basis: | Wet Weight |
| Seq Number: | 3085702 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <15.0 | 15.0 | mg/kg | 04.14.19 03.30 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <15.0 | 15.0 | mg/kg | 04.14.19 03.30 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <15.0 | 15.0 | mg/kg | 04.14.19 03.30 | U | 1 |
| Total TPH | PHC635 | <15.0 | 15.0 | mg/kg | 04.14.19 03.30 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 88 | % | 70-135 | 04.14.19 03.30 | |
| o-Terphenyl | 84-15-1 | 83 | % | 70-135 | 04.14.19 03.30 | |

# Certificate of Analytical Results 620948

## Marathon Oil Company, Tulsa, OK

Aid State #008

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS19-04** | Matrix: | Soil | Date Received: | 04.12.19 11.25 |
| Lab Sample Id: | 620948-004 | Date Collected: | 04.10.19 12.15 | | |
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | SCM | | | % Moisture: | |
| Analyst: | SCM | Date Prep: | 04.17.19 13.00 | Basis: | Wet Weight |
| Seq Number: | 3086143 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00199 | 0.00199 | mg/kg | 04.18.19 02.57 | U | 1 |
| Toluene | 108-88-3 | <0.00199 | 0.00199 | mg/kg | 04.18.19 02.57 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00199 | 0.00199 | mg/kg | 04.18.19 02.57 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00398 | 0.00398 | mg/kg | 04.18.19 02.57 | U | 1 |
| o-Xylene | 95-47-6 | <0.00199 | 0.00199 | mg/kg | 04.18.19 02.57 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00199 | 0.00199 | mg/kg | 04.18.19 02.57 | U | 1 |
| Total BTEX | | <0.00199 | 0.00199 | mg/kg | 04.18.19 02.57 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 540-36-3 | 101 | % | 70-130 | 04.18.19 02.57 | |
| 4-Bromofluorobenzene | 460-00-4 | 98 | % | 70-130 | 04.18.19 02.57 | |

# Flagging Criteria

**X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

**B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

**D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

**E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

**F** RPD exceeded lab control limits.

**J** The target analyte was positively identified below the quantitation limit and above the detection limit.

**U** Analyte was not detected.

**L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

**H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

**K** Sample analyzed outside of recommended hold time.

**JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

**BRL** Below Reporting Limit.

**RL** Reporting Limit

**MDL** Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

**PQL** Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

**DL** Method Detection Limit

**NC** Non-Calculable

**SMP** Client Sample **BLK** Method Blank

**BKS/LCS** Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

**MD/SD** Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

# QC Summary 620948

## Marathon Oil Company

Aid State #008

**Analytical Method:** **Inorganic Anions by EPA 300** Prep Method: E300P
Seq Number: 3086191 Matrix: Solid Date Prep: 04.17.19
MB Sample Id: 7676024-1-BLK LCS Sample Id: 7676024-1-BKS LCSD Sample Id: 7676024-1-BSD

| Parameter | MB Result | Spike Amount | LCS Result | LCS %Rec | LCSD Result | LCSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | <0.858 | 250 | 249 | 100 | 252 | 101 | 90-110 | 1 | 20 | mg/kg | 04.17.19 23:20 | |

**Analytical Method:** **Inorganic Anions by EPA 300** Prep Method: E300P
Seq Number: 3086271 Matrix: Solid Date Prep: 04.18.19
MB Sample Id: 7676095-1-BLK LCS Sample Id: 7676095-1-BKS LCSD Sample Id: 7676095-1-BSD

| Parameter | MB Result | Spike Amount | LCS Result | LCS %Rec | LCSD Result | LCSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | <5.00 | 250 | 240 | 96 | 237 | 95 | 90-110 | 1 | 20 | mg/kg | 04.19.19 08:12 | |

**Analytical Method:** **Inorganic Anions by EPA 300** Prep Method: E300P
Seq Number: 3086191 Matrix: Soil Date Prep: 04.17.19
Parent Sample Id: 620782-002 MS Sample Id: 620782-002 S MSD Sample Id: 620782-002 SD

| Parameter | Parent Result | Spike Amount | MS Result | MS %Rec | MSD Result | MSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 279 | 250 | 514 | 94 | 507 | 91 | 90-110 | 1 | 20 | mg/kg | 04.18.19 17:07 | |

**Analytical Method:** **Inorganic Anions by EPA 300** Prep Method: E300P
Seq Number: 3086191 Matrix: Soil Date Prep: 04.17.19
Parent Sample Id: 620948-004 MS Sample Id: 620948-004 S MSD Sample Id: 620948-004 SD

| Parameter | Parent Result | Spike Amount | MS Result | MS %Rec | MSD Result | MSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.16 | 252 | 254 | 100 | 258 | 102 | 90-110 | 2 | 20 | mg/kg | 04.17.19 23:40 | |

**Analytical Method:** **Inorganic Anions by EPA 300** Prep Method: E300P
Seq Number: 3086271 Matrix: Soil Date Prep: 04.18.19
Parent Sample Id: 620911-011 MS Sample Id: 620911-011 S MSD Sample Id: 620911-011 SD

| Parameter | Parent Result | Spike Amount | MS Result | MS %Rec | MSD Result | MSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 3.22 | 250 | 274 | 108 | 274 | 108 | 90-110 | 0 | 20 | mg/kg | 04.19.19 08:32 | |

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200* | (C-E) / (C+E) |
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Final 1.000

# QC Summary 620948

## Marathon Oil Company

Aid State #008

**Analytical Method:** **Inorganic Anions by EPA 300** Prep Method: E300P
Seq Number: 3086271 Matrix: Soil Date Prep: 04.18.19
Parent Sample Id: 620983-003 MS Sample Id: 620983-003 S MSD Sample Id: 620983-003 SD

| Parameter | Parent Result | Spike Amount | MS Result | MS %Rec | MSD Result | MSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 202 | 252 | 408 | 82 | 404 | 80 | 90-110 | 1 | 20 | mg/kg | 04.19.19 10:39 | X |

**Analytical Method:** **TPH by SW8015 Mod** Prep Method: TX1005P
Seq Number: 3085702 Matrix: Solid Date Prep: 04.13.19
MB Sample Id: 7675751-1-BLK LCS Sample Id: 7675751-1-BKS LCSD Sample Id: 7675751-1-BSD

| Parameter | MB Result | Spike Amount | LCS Result | LCS %Rec | LCSD Result | LCSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | <8.00 | 1000 | 960 | 96 | 936 | 94 | 70-135 | 3 | 20 | mg/kg | 04.13.19 19:19 | |
| Diesel Range Organics (DRO) | <8.13 | 1000 | 978 | 98 | 969 | 97 | 70-135 | 1 | 20 | mg/kg | 04.13.19 19:19 | |

| Surrogate | MB %Rec | MB Flag | LCS %Rec | LCS Flag | LCSD %Rec | LCSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 107 | | 123 | | 120 | | 70-135 | % | 04.13.19 19:19 |
| o-Terphenyl | 108 | | 119 | | 115 | | 70-135 | % | 04.13.19 19:19 |

**Analytical Method:** **TPH by SW8015 Mod** Prep Method: TX1005P
Seq Number: 3085702 Matrix: Soil Date Prep: 04.13.19
Parent Sample Id: 621017-001 MS Sample Id: 621017-001 S MSD Sample Id: 621017-001 SD

| Parameter | Parent Result | Spike Amount | MS Result | MS %Rec | MSD Result | MSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | <7.99 | 998 | 911 | 91 | 887 | 89 | 70-135 | 3 | 20 | mg/kg | 04.13.19 20:18 | |
| Diesel Range Organics (DRO) | <8.11 | 998 | 920 | 92 | 937 | 94 | 70-135 | 2 | 20 | mg/kg | 04.13.19 20:18 | |

| Surrogate | MS %Rec | MS Flag | MSD %Rec | MSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 118 | | 117 | | 70-135 | % | 04.13.19 20:18 |
| o-Terphenyl | 114 | | 110 | | 70-135 | % | 04.13.19 20:18 |

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

# QC Summary 620948

## Marathon Oil Company

Aid State #008

**Analytical Method:** **BTEX by EPA 8021B** Prep Method: SW5030B

Seq Number: 3086143 Matrix: Solid Date Prep: 04.17.19

MB Sample Id: 7676058-1-BLK LCS Sample Id: 7676058-1-BKS LCSD Sample Id: 7676058-1-BSD

| Parameter | MB Result | Spike Amount | LCS Result | LCS %Rec | LCSD Result | LCSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | <0.000388 | 0.101 | 0.0880 | 87 | 0.0926 | 93 | 70-130 | 5 | 35 | mg/kg | 04.17.19 19:25 | |
| Toluene | <0.000459 | 0.101 | 0.0889 | 88 | 0.0930 | 93 | 70-130 | 5 | 35 | mg/kg | 04.17.19 19:25 | |
| Ethylbenzene | <0.000569 | 0.101 | 0.0822 | 81 | 0.0855 | 86 | 70-130 | 4 | 35 | mg/kg | 04.17.19 19:25 | |
| m,p-Xylenes | <0.00102 | 0.202 | 0.162 | 80 | 0.169 | 85 | 70-130 | 4 | 35 | mg/kg | 04.17.19 19:25 | |
| o-Xylene | <0.000347 | 0.101 | 0.0814 | 81 | 0.0853 | 85 | 70-130 | 5 | 35 | mg/kg | 04.17.19 19:25 | |

| Surrogate | MB %Rec | MB Flag | LCS %Rec | LCS Flag | LCSD %Rec | LCSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 91 | | 99 | | 100 | | 70-130 | % | 04.17.19 19:25 |
| 4-Bromofluorobenzene | 86 | | 89 | | 90 | | 70-130 | % | 04.17.19 19:25 |

**Analytical Method:** **BTEX by EPA 8021B** Prep Method: SW5030B

Seq Number: 3086143 Matrix: Soil Date Prep: 04.17.19

Parent Sample Id: 621042-001 MS Sample Id: 621042-001 S MSD Sample Id: 621042-001 SD

| Parameter | Parent Result | Spike Amount | MS Result | MS %Rec | MSD Result | MSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | <0.000385 | 0.100 | 0.0829 | 83 | 0.0729 | 73 | 70-130 | 13 | 35 | mg/kg | 04.17.19 20:03 | |
| Toluene | <0.000456 | 0.100 | 0.0826 | 83 | 0.0722 | 73 | 70-130 | 13 | 35 | mg/kg | 04.17.19 20:03 | |
| Ethylbenzene | <0.000565 | 0.100 | 0.0754 | 75 | 0.0653 | 66 | 70-130 | 14 | 35 | mg/kg | 04.17.19 20:03 | X |
| m,p-Xylenes | <0.00101 | 0.200 | 0.149 | 75 | 0.128 | 64 | 70-130 | 15 | 35 | mg/kg | 04.17.19 20:03 | X |
| o-Xylene | <0.000344 | 0.100 | 0.0756 | 76 | 0.0659 | 66 | 70-130 | 14 | 35 | mg/kg | 04.17.19 20:03 | X |

| Surrogate | MS %Rec | MS Flag | MSD %Rec | MSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 101 | | 99 | | 70-130 | % | 04.17.19 20:03 |
| 4-Bromofluorobenzene | 99 | | 95 | | 70-130 | % | 04.17.19 20:03 |

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike

Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added

LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec

Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

**Analysis Request of Chain of Custody Record**

620948



| | |
|---|---|
| **Client Name:** Marathon Oil Company | **Site Manager:** Callie Karrigan |
| **Project Name:** Aid State #008 | |
| **Project Location: (county, state)** Eddy County, New Mexico | **Project #:** 19E-00614 |
| **Invoice to:** Callie Karrigan (cnkarrigan@marathonoil.com) | |
| **Receiving Laboratory:** Xenco Midland, Texas | **Sampler Signature:** |
| **Comments:** Send results to (cnkarrigan@marathonoil.com, permian@vertex.ca, icastro@marathonoil.com) | |

**ANALYSIS REQUEST (Circle or Specify Method No.)**

| LAB # (LAB USE ONLY) | SAMPLE IDENTIFICATION | SAMPLING YEAR: DATE | SAMPLING TIME | MATRIX: WATER | MATRIX: SOIL | MATRIX: | PRESERVATIVE METHOD: HCL | PRESERVATIVE METHOD: $HNO_3$ | PRESERVATIVE METHOD: ICE | PRESERVATIVE METHOD: | PRESERVATIVE METHOD: | # CONTAINERS | FILTERED (Y/N) | BTEX 8021B BTEX 8260B | TPH TX1005 (Ext to C35) | TPH 8015M ( GRO - DRO - MRO) | PAH 8270C | Total Metals Ag As Ba Cd Cr Pb Se Hg | TCLP Metals Ag As Ba Cd Cr Pb Se Hg | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC/MS Vol. 8260B / 624 | GC/MS Semi. Vol. 8270C/625 | PCB's 8082 / 608 | NORM | PLM (Asbestos) | Chloridem (method 300) | Chloride Sulfate TDS | General Water Chemistry (see attached list) | Anion/Cation Balance | | | | | Hold |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SS19-01 | April 10 2019 | 12:00 | | X | | | | X | | | 1 | N | X | | X | | | | | | | | | | | | X | | | | | | | | |
| | SS19-02 | April 10 2019 | 12:05 | | X | | | | X | | | 1 | N | X | | X | | | | | | | | | | | | X | | | | | | | | |
| | SS19-03 | April 10 2019 | 12:10 | | X | | | | X | | | 1 | N | X | | X | | | | | | | | | | | | X | | | | | | | | |
| | SS19-04 | April 10 2019 | 12:15 | | X | | | | X | | | 1 | N | X | | X | | | | | | | | | | | | X | | | | | | | | |
| | | | | | | | | | | | | 1 | N | X | | X | | | | | | | | | | | | X | | | | | | | | |
| | | | | | | | | | | | | 1 | N | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | 1 | N | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | |
|---|---|---|---|
| Relinquished by: Jason Crabtree | Date: April 10, 2019 | Time: 3:30pm | Received by: Dennis Williams |
| Relinquished by: | Date: | Time: | Received by: Date: 4/12/19 Time: 1052 |
| Relinquished by: | Date: | Time: | Received by: Date: Time: |

**LAB USE ONLY**

Sample Temperature 0.5/0.4 -0.1 28

**REMARKS:**

- ☐ RUSH: Same Day 24 hr 48 hr 72 hr
- ☐ Rush Charges Authorized
- ☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

ORIGINAL COPY

77495129 84060

Final 1.000

Page 18 of 20


**After printing this label**:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

**Warning**: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

# XENCO Laboratories

## Prelogin/Nonconformance Report- Sample Log-In

**Client:** Marathon Oil Company

**Date/ Time Received:** 04/12/2019 11:25:42 AM

**Work Order #:** 620948

**Acceptable Temperature Range: 0 - 6 degC**
**Air and Metal samples Acceptable Range: Ambient**

**Temperature Measuring device used : R8**

| Sample Receipt Checklist | Comments |
|---|---|
| #1 *Temperature of cooler(s)? | .4 |
| #2 *Shipping container in good condition? | **Yes** |
| #3 *Samples received on ice? | **Yes** |
| #4 *Custody Seals intact on shipping container/ cooler? | **N/A** |
| #5 Custody Seals intact on sample bottles? | **N/A** |
| #6*Custody Seals Signed and dated? | **N/A** |
| #7 *Chain of Custody present? | **Yes** |
| #8 Any missing/extra samples? | **No** |
| #9 Chain of Custody signed when relinquished/ received? | **Yes** |
| #10 Chain of Custody agrees with sample labels/matrix? | **Yes** |
| #11 Container label(s) legible and intact? | **Yes** |
| #12 Samples in proper container/ bottle? | **Yes** |
| #13 Samples properly preserved? | **Yes** |
| #14 Sample container(s) intact? | **Yes** |
| #15 Sufficient sample amount for indicated test(s)? | **Yes** |
| #16 All samples received within hold time? | **Yes** |
| #17 Subcontract of sample(s)? | **N/A** |
| #18 Water VOC samples have zero headspace? | **N/A** |

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

**Checklist completed by:** Brianna Teel Date: 04/12/2019

Brianna Teel

**Checklist reviewed by:** Kalei Stout Date: 04/12/2019

Kalei Stout