January 18, 2020 Reference No.2RP5631, GHD 11202565

Mr. Mike Bratcher
New Mexico Oil Conservation Division
811 South First Street
Artesia, New Mexico 88210

VIA E-MAIL ONLY
mike.bratcher@state.nm.us

Dear Mr. Bratcher:

**Re: Site Characterization Report and Remediation Plan**
**Natural Gas Pipeline Company Indian Basin Pipeline Rupture, 2RP-5631**
**NW/4-Section 36-T17S-R27E, Eddy County, New Mexico**

## 1. Introduction

GHD Services, Inc. (GHD), on behalf of Natural Gas Pipeline Company of America LLC (NGPL), submits this Site Characterization Report and Remediation Plan to the New Mexico Oil Conservation Division (NMOCD) District 2 Office for Remediation Permit Number 2RP-5631. This Site Characterization Report and Remediation Plan provides documentation of delineation, sampling, analyses, and planned activities to remediate soil in the affected area at the NGPL Indian Basin Pipeline Rupture (Site). The Site lies in the northwest quarter of Section 36 of Township 17 South and Range 27 East in Eddy County, New Mexico. It is approximately 10 miles southeast of the town of Artesia. The release was initially reported to have occurred at 32.7895739°N latitude and 104.2383265°W longitude. The land surface is used for development and transportation of oil and gas resources. Many facilities for production of oil and gas exist in the area. The land is owned by the State of New Mexico. The regional context of the Site is shown in Figure 1.

## 2. Release Information and Response Activities

A release of approximately 70 barrels (bbl.) of condensate and used oil at the Site on August 21, 2019 when the pipeline ruptured. Reconnaissance of the area indicated that most of the affected area was impacted by fluids sprayed upward during the rupture and carried downwind to the north. Produced water or other fluids containing chlorides were not released during this incident. NGPL reported the release to the NMOCD on a Release Notification and Corrective Action C-141 form on September 4, 2019. A copy of the C-141 Release Notification is included in Appendix A. Reconnaissance of the affected area indicated its maximum length to be approximately 1120 feet and its maximum width to be approximately 650 feet. The affected area is represented on Figure 2.

**GHD Services Inc.**
2135 South Loop 250 West Midland Texas 79703 USA
**T** 432 686 0086 **F** 432 686 0186 **W** www.ghd.com

As part of NGPL's initial response activities, impacted soil from the pipeline right-of-way and surrounding area was excavated to contain the release and to ensure a safe working area for pipeline repairs. GHD provided consulting services including mapping of the affected area. GHD also collected three samples of soil for the purpose of waste characterization of soil that was excavated from the pipeline right-of-way during repair of the pipeline and soil scraped from the surrounding surface during initial response actions to contain the release.

# 3. Regulatory Framework

GHD characterized the Site according to Table 1, *Closure Criteria for Soils Impacted by a Release*, from New Mexico Administrative Code (NMAC) Title 19, Chapter 15, Part 29, Section 12 (19.15.29.12). The release falls under the jurisdiction of the New Mexico Oil Conservation Division (NMOCD) District 2 in Artesia, New Mexico. NMAC Title19, Chapter 15, Part 29, Section 11 (A), Section A requires that the responsible party submit information characterizing the release to the appropriate division district office within 90 days of discovery of the release. NMOCD has granted an extension to submit this information until February 19, 2020.

## 3.1 Site Map

The outline of the affected area is shown on Figure 2. The area shown in yellow is characterized by scattered droplets of liquid released during the incident and carried by the wind such that the ground surface and vegetation were not completely covered by released fluids and could only be seen if the surface and vegetation were closely inspected. The area colored brown on the Figure 2 was characterized by fluids that were affected by readily visible staining of the ground surface and vegetation. The area colored green on Figure 2 was affected by readily visible staining of the surface and vegetation but was scraped during initial response actions. Colored areas on Figure 2 are not intended to represent areas characterized by particular concentrations of contaminants. Approximately 100 cubic yards of such soil and vegetation was scraped up and placed in roll-off boxes. The excavated soil was sampled for waste characterization on August 30, 2019 and disposed at Republic Charter in Odessa, Texas.

## 3.2 Depth to Groundwater

The on-line databases of the New Mexico Office of the State Engineer (NMOSE) and the United States Geological Survey (USGS) National Water Information System for information were searched for information regarding the depth to water at the location of the release. Both a radius search and PLSS search of the NMOSE database were performed and found two wells were within 3000 meters of the release site. The closest well for which information regarding depth-to-water is available is Point of Diversion (POD) RA12456 POD1. It lies in the NW/4-SE/4-SE/4-Section 24-T17S-R27E and is approximately 2750 meters north of the Site. Depth-to-water in this well is 92 feet below ground surface. No other points of diversion were found by a search of the USGS National Water Information System. Data regarding this well are in Appendix B. A field check of the release area indicated that there are no wells, springs or other sources of fresh water extraction within one-half mile of the affected area. The field check also indicated that the lateral extents of the affected area is more than 200 feet from any lakebed, sinkhole, or playa lake and more than 300 feet from an occupied

residence, school, hospital, institution, church or wetland. A map showing wetlands in the vicinity is in Appendix C. The Site is greater than 1,000 feet to a freshwater well or spring and is not within a 100-year floodplain or overlying a subsurface mine. A National Flood Hazard Layer FIRMette for the Site is in Appendix D.

### 3.3 Closure Criteria

Constituent methods and limits noted in bold print in Table 1 for soil ≤50 feet below the ground surface are used to guide assessment and remediation of the area affected by this release, since the Site lies in an area of high potential for karst development. A map noting the location of the Site on the BLM Karst Map is in Appendix E. Chloride limits in Table 1 do not apply to remediation of this release, since the release did not include produced water or other fluids that contained chlorides.

**Table 1. Closure Criteria for Soils Impacted by a Release (NMAC 19.15.29.12)**

| Minimum Depth Below Any Point Within the Horizontal Boundary of the Release to Groundwater with <10,000 mg/L TDS | Constituent | Method | Limit |
|---|---|---|---|
| **High Karst Potential or Surface to Groundwater ≤50 feet** | Chloride | EPA300.0 or SM4500 Cl B | 600 mg/kg |
| | **TPH (GRO+DRO+MRO)** | **EPA SW-846 Method 8015M** | **100 mg/kg** |
| | **BTEX** | **EPA SW-846 Method 8021B or 8260B** | **50 mg/kg** |
| | **Benzene** | **EPA SW-846 Method 8021B or 8260B** | **10 mg/kg** |

## 4. Site Characterization

GHD collected nineteen soil samples at depths of 4–6 inches below ground surface (bgs) on November 12, 2019 to delineate the lateral and vertical extents of the impacted area. Soil samples were analyzed by Xenco Laboratories for TPH, BTEX, and benzene according to methods stipulated in NMAC19.15.29 and shown in Table 1. Remediation standards for TPH (GRO+DRO+MRO), BTEX, and benzene are 100 mg/kg, 50 mg/kg, and 10 mg/kg, respectively. No benzene, toluene, ethylbenzene, or total xylenes were detected in any sample collected on November 12, 2019. Results of analyses of TPH indicated that the required standard for TPH was exceeded at SS-5, SS-10, SS-13, SS-16, and SS-17. Additional samples of soil were collected from those locations at a depth of one foot bgs to delineate the plume vertically on January 15, 2020. Samples of soil at SS-20, SS-21, SS-22, and SS-23 at a depth of 6 inches bgs to delineate the plume vertically and laterally were also collected on January 15, 2020. Results of these analyses indicated that the required standards were met all locations except SS-5. Samples of soil from SS-5 at depths of 2.0 and 3.0 feet were collected on January 23, 2020. Results for samples collected at SS-5 show decreasing concentrations from surface to 12 inches bgs then increasing concentrations below 12 inches bgs. Results of these analyses indicated that the plume has been delineated vertically and laterally at all sampled locations

except SS-5, where the plume has not been delineated vertically with respect to TPH. No BTEX constituents were detected in any sample collected at the Site. All analytical results from soil are included in Table 2. Certified analytical reports are in Appendix F. A photographic log of the Site is in Appendix G.

Of note is a small pumping unit, which lies approximately 60 feet south-southwest of sampling location SS-5 and around which soil is noticeably stained. The pumping unit is marked on Figure 2 and can be seen in Photos 2 and 3. A review of historic aerial photos available on Google Earth indicate the presence of above-ground storage tanks not belonging to NGPL and discolored soil approximately 25 feet north of soil sampling location SS-5 on photos dated between July 30, 2005 and August 2, 2011, inclusive. An aerial photo from Google Earth, dated March 27, 2010, showing these tanks is included in the photo log as Photo 11. Based on this information NGPL does not believe that subsurface impact at SS-5 to be related to the rupture of the Indian Basin Pipeline.

## 5. Remediation Plan

Approximately 100 cubic yards of soil and vegetation that were visibly affected by hydrocarbon staining were scraped up and placed in roll-off boxes. It was sampled for waste characterization on August 30, 2019 and disposed at Republic Charter in Odessa, Texas.

R3mediate, an aqueous solution that is sprayed onto affected soil, will be used to reduce concentrations of TPH in the affected soil. The manufacturers of R3mediate indicate in a white paper that its designed reactive silica-based formulation initiates a high-energy redox reaction, allowing it to react to hydrocarbons and trap them within the silica cell. The process of micro-encapsulation renders hydrocarbons both insoluble and immobile. Manufacturers of R3meidate indicate that it has been demonstrated to be safe in aquatic/marine environments, as well as land-based application. Measured TPH concentrations may be effectively reduced to levels below regulatory guidelines. A copy of the white paper is in Appendix H.

R3mediate will be applied to that portion of the affected area that exceeded the closure limit for TPH. A dashed green line marks the margin of the area requiring remediation on Figure 2. Approximately 3000 cubic yards of soil requires remediation. Maximum effectiveness of the application of R3mediate occurs approximately 72 hours after an application. Application of R3mediate will be followed by collection of soil samples from locations where concentrations of TPH (GRO, DRO, and MRO) exceeded 100 mg/kg during previous sampling. When remediation has been completed and concentrations of TPH have been shown to be below 100 mg/kg, a Site Closure Report will be submitted to NMOCD to document confirmation that regulatory limits have been met after remedial activities have been concluded. NGPL does not intend to further vertically delineate or remediate hydrocarbon impact below 3 feet bgs at sampling locations SS-5. Proposed remedial work has been planned by GHD in coordination with NGPL and its subcontractors. GHD understands that NGPL has obtained appropriate regulatory agency approvals prior to implementation of the remediation plan.

If you have any questions or comments concerning this Site Characterization and Remediation Plan Report, please do not hesitate to contact our Midland office at (432) 686-0086.

Sincerely,

GHD

John Schnable, M.S.
Project Manager

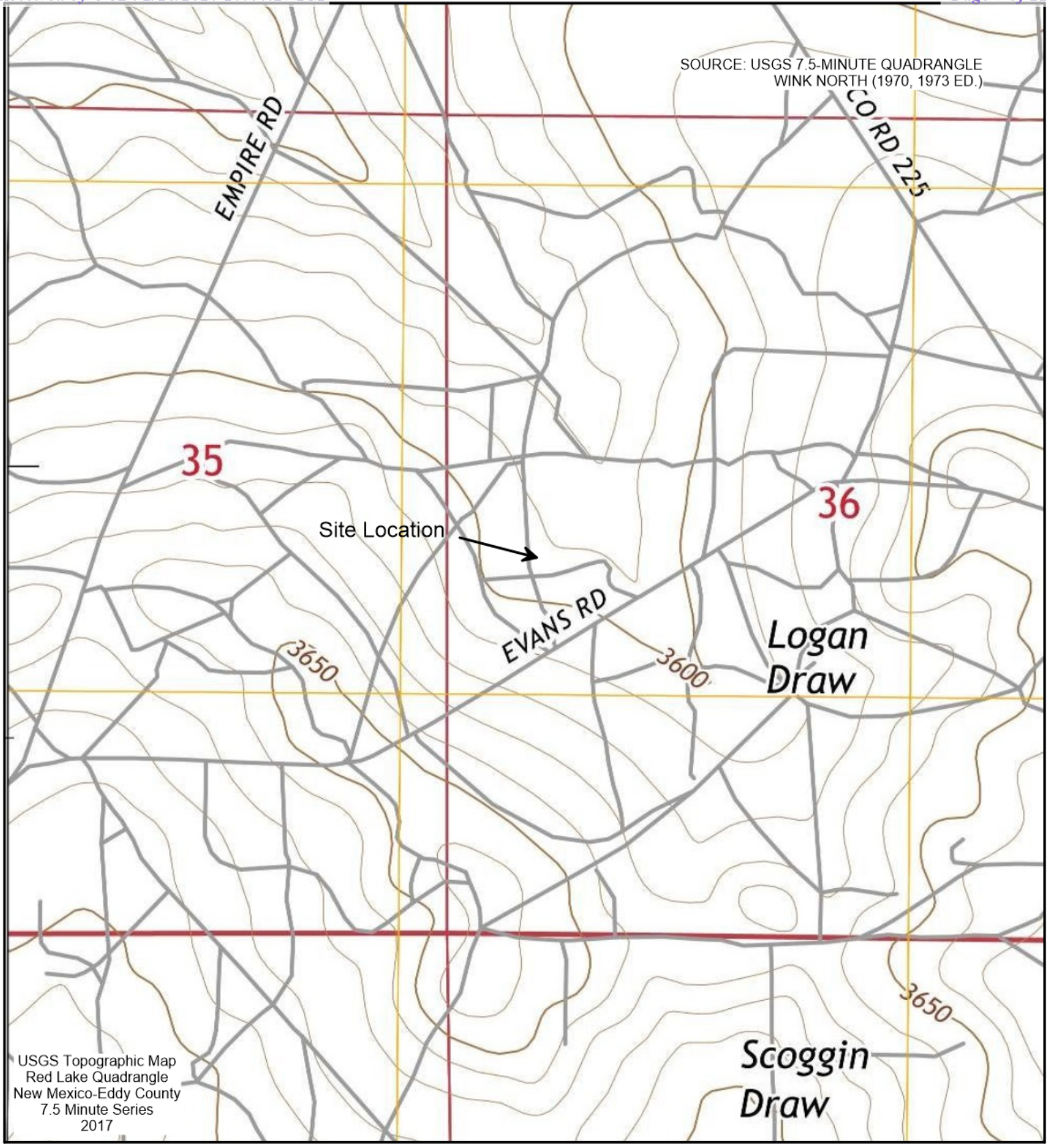
Thomas C. Larson, M.S.
Associate, Midland Operations Manager

JS/js/3

Encl. Figure 1—Project Location Map
Figure 2—Site Map
Table 2—Cumulative Analytical Results in Soil
Appendix A—Initial and Final C-141 Forms
Appendix B—NMOSE Water Well Data
Appendix C–Wetlands Map
Appendix D—National Flood Hazard FIRMette
Appendix E—BLM Karst Map
Appendix F—Analytical Reports
Appendix G—Photographic Log
Appendix H—White Paper on R3mediate

Cc: Glen Thompson—Kinder Morgan Field Environmental Services

# Figures

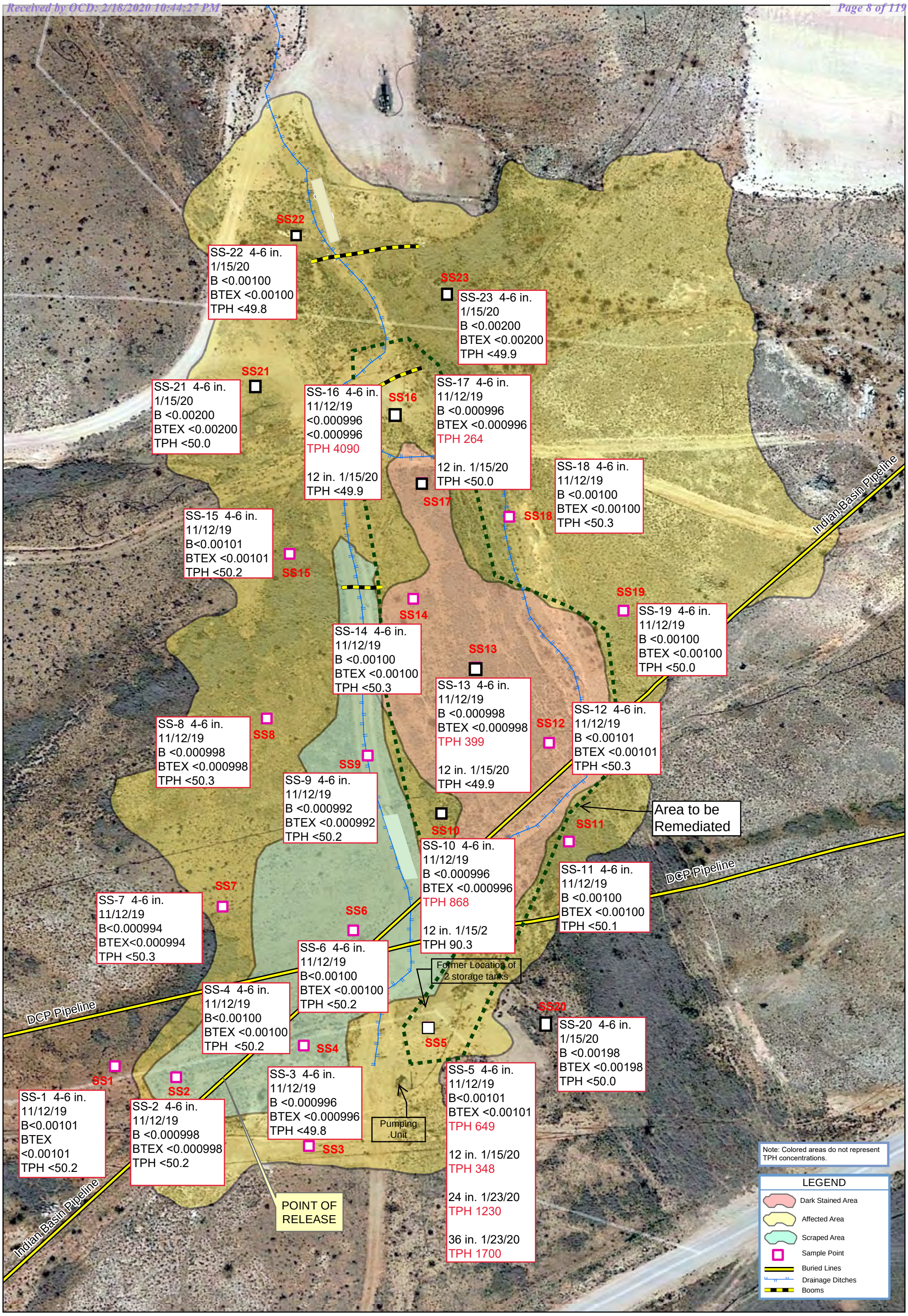



NATURAL GAS PIPELINE COMPANY OF AMERICA LLC
NGPL INDIAN BASIN PIPELINE RUPTURE
SITE CHARATERIZATION AND REMEDIATION PLAN
SITE LOCATION MAP

PROJECT NO. 11202565
FEBRUARY 13, 2020

FIGURE 1

11202565-2019 GN-MAF-SVR-001 FEB 13 2020




32.7898°N
104.2380°W

Coordinate System:
GCS WGS 1984

0 30 60
Feet

NGPL INDIAN BASIN PIPELINE RUPTURE
NW 1/4, SEC.-36, T.-17-S., R.-27-E.
EDDY COUNTY, NM

SITE MAP

11202565
February 12, 2020

FIGURE 2

GIS File: C:\Users\plorang\Documents\Projects\Kinder Morgan\KMIBFig2.mxd

# Table

**Cumulative Anaytical Results in Soil**
**Natural Gas Pipeline Company of America LP**
**NGPL Indian Basin Pipeline Rupture**
**County Road 226**
**Eddy County, NM**

| Sample Location | Sample Depth (bgs) | Sample Date | Benzene (mg/kg) | Toluene (mg/kg) | Ethyl-benzene (mg/kg) | m-Xylenes (mg/kg) | o-Xylenes (mg/kg) | Total Xylenes (mg/kg) | Total BTEX (mg/kg) | TPH Gasoline Range (mg/kg) | TPH Diesel Range (mg/kg) | TPH Motor Oil Range (mg/kg) | Total TPH (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NMOCD Closure Criteria for Soils Impacted by a Release | | | | | | | | | | |
| | | | 10 | | | | | | 50 | 100 (GRO + DRO + MRO) | | | 100 |
| SS-1 | 4-6 in. | 11/12/19 | <0.00101 | <0.00101 | <0.00101 | <0.00202 | <0.00101 | <0.00101 | <0.00101 | <50.2 | <50.2 | <50.2 | <50.2 |
| SS-2 | 4-6 in. | 11/12/19 | <0.000998 | <0.000998 | <0.000998 | <0.00200 | <0.000998 | <0.000998 | <0.000998 | <50.2 | <50.2 | <50.2 | <50.2 |
| SS-3 | 4-6 in. | 11/12/19 | <0.000996 | <0.000996 | <0.000996 | <0.00199 | <0.000996 | <0.000996 | <0.000996 | <49.8 | <49.8 | <49.8 | <49.8 |
| SS-4 | 4-6 in. | 11/12/19 | <0.00100 | <0.00100 | <0.00100 | <0.00200 | <0.00100 | <0.00100 | <0.00100 | <50.2 | <50.2 | <50.2 | <50.2 |
| SS-5 | 4-6 in. | 11/12/19 | <0.00101 | <0.00101 | <0.00101 | <0.00201 | <0.00101 | <0.00101 | <0.00101 | <50.3 | 494 | 155 | 649 |
| SS-5 | 12 in, | 1/15/20 | | | | | | | | <50.0 | 269 | 78.5 | 348 |
| SS-5 | 24 in. | 1/23/20 | | | | | | | | <50.0 | 912 | 317 | 1230 |
| SS-5 | 36 in. | 1/23/20 | | | | | | | | <49.9 | 1240 | 458 | 1700 |
| SS-6 | 4-6 in. | 11/12/19 | <0.00100 | <0.00100 | <0.00100 | <0.00200 | <0.00100 | <0.00100 | <0.00100 | <50.2 | <50.2 | <50.2 | <50.2 |
| SS-7 | 4-6 in. | 11/12/19 | <0.000994 | <0.000994 | <0.000994 | <0.00199 | <0.000994 | <0.000994 | <0.000994 | <50.3 | <50.3 | <50.3 | <50.3 |
| SS-8 | 4-6 in. | 11/12/19 | <0.000998 | <0.000998 | <0.000998 | <0.00200 | <0.000998 | <0.000998 | <0.000998 | <50.3 | <50.3 | <50.3 | <50.3 |
| SS-9 | 4-6 in. | 11/12/19 | <0.000992 | <0.000992 | <0.000992 | <0.00198 | <0.000992 | <0.000992 | <0.000992 | <50.2 | <50.2 | <50.2 | <50.2 |
| SS-10 | 4-6 in. | 11/12/19 | <0.000996 | <0.000996 | <0.000996 | <0.00199 | <0.000996 | <0.000996 | <0.000996 | <49.8 | 605 | 263 | 868 |
| SS-10 | 12 in. | 1/15/20 | | | | | | | | <49.9 | 90.3 | <49.9 | 90.3 |
| SS-11 | 4-6 in. | 11/12/19 | <0.00100 | <0.00100 | <0.00100 | <0.00200 | <0.00100 | <0.00100 | <0.00100 | <50.1 | <50.1 | <50.1 | <50.1 |
| SS-12 | 4-6 in. | 11/12/19 | <0.00101 | <0.00101 | <0.00101 | <0.00201 | <0.00101 | <0.00101 | <0.00101 | <50.3 | <50.3 | <50.3 | <50.3 |
| SS-13 | 4-6 in. | 11/12/19 | <0.000998 | <0.000998 | <0.000998 | <0.00200 | <0.000998 | <0.000998 | <0.000998 | <50.1 | 280 | 119 | 399 |
| SS-13 | 12 in. | 1/15/20 | | | | | | | | <49.9 | <49.9 | <49.9 | <49.9 |
| SS-14 | 4-6 in. | 11/12/19 | <0.00100 | <0.00100 | <0.00100 | <0.00200 | <0.00100 | <0.00100 | <0.00100 | <50.3 | <50.3 | <50.3 | <50.3 |
| SS-15 | 4-6 in. | 11/12/19 | <0.00101 | <0.00101 | <0.00101 | <0.00201 | <0.00101 | <0.00101 | <0.00101 | <50.2 | <50.2 | <50.2 | <50.2 |
| SS-16 | 4-6 in. | 11/12/19 | <0.000996 | <0.000996 | <0.000996 | <0.00199 | <0.000996 | <0.000996 | <0.000996 | <50.2 | 2910 | 1180 | 4090 |
| SS-16 | 12 in. | 1/15/20 | | | | | | | | <49.9 | <49.9 | <49.9 | <49.9 |
| SS-17 | 4-6 in. | 11/12/19 | <0.000996 | <0.000996 | <0.000996 | <0.00199 | <0.000996 | <0.000996 | <0.000996 | <50.0 | 179 | 84.8 | 264 |
| SS-17 | 12 in. | 1/15/20 | | | | | | | | <50.0 | <50.0 | <50.0 | <50.0 |

**Cumulative Anaytical Results in Soil**
**Natural Gas Pipeline Company of America LP**
**NGPL Indian Basin Pipeline Rupture**
**County Road 226**
**Eddy County, NM**

| Sample Location | Sample Depth (bgs) | Sample Date | Benzene (mg/kg) | Toluene (mg/kg) | Ethyl-benzene (mg/kg) | m-Xylenes (mg/kg) | o-Xylenes (mg/kg) | Total Xylenes (mg/kg) | Total BTEX (mg/kg) | TPH Gasoline Range (mg/kg) | TPH Diesel Range (mg/kg) | TPH Motor Oil Range (mg/kg) | Total TPH (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NMOCD Closure Criteria for Soils Impacted by a Release | | | | | | | | | | |
| | | | 10 | | | | | | 50 | 100 (GRO + DRO + MRO) | | | 100 |
| SS-18 | 4-6 in. | 11/12/19 | <0.00100 | <0.00100 | <0.00100 | <0.00200 | <0.00100 | <0.00100 | <0.00100 | <50.3 | <50.3 | <50.3 | <50.3 |
| SS-19 | 4-6 in. | 11/12/19 | <0.00100 | <0.00100 | <0.00100 | <0.00201 | <0.00100 | <0.00100 | <0.00100 | <50.0 | <50.0 | <50.0 | <50.0 |
| SS-20 | 4-6 in. | 1/15/20 | <0.00198 | <0.00198 | <0.00198 | <0.00198 | <0.00198 | <0.00198 | <0.00198 | <50.0 | <50.0 | <50.0 | <50.0 |
| SS-21 | 4-6 in. | 1/15/20 | <0.00200 | <0.00200 | <0.00200 | <0.00200 | <0.00200 | <0.00200 | <0.00200 | <50.0 | <50.0 | <50.0 | <50.0 |
| SS-22 | 4-6 in. | 1/15/20 | <0.00198 | <0.00198 | <0.00198 | <0.00198 | <0.00198 | <0.00198 | <0.00198 | <49.8 | <49.8 | <49.8 | <49.8 |
| SS-23 | 4-6 in. | 1/15/20 | <0.00200 | <0.00200 | <0.00200 | <0.00200 | <0.00200 | <0.00200 | <0.00200 | <49.9 | <49.9 | <49.9 | <49.9 |

# Appendices

# Appendix A
# C-141 Forms for Site Characterization And Remediation Plan

Form C-141
Page 3

State of New Mexico
Oil Conservation Division

| | |
|---|---|
| Incident ID | NAB1927162165 |
| District RP | 2RP-5631 |
| Facility ID | |
| Application ID | pAB1927161527 |

# Site Assessment/Characterization

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

| | |
|---|---|
| What is the shallowest depth to groundwater beneath the area affected by the release? | 92 (ft bgs) |
| Did this release impact groundwater or surface water? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 1000 feet of any other fresh water well or spring? | ☐ Yes ☒ No |
| Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 300 feet of a wetland? | ☐ Yes ☒ No |
| Are the lateral extents of the release overlying a subsurface mine? | ☐ Yes ☒ No |
| Are the lateral extents of the release overlying an unstable area such as karst geology? | ☒ Yes ☐ No |
| Are the lateral extents of the release within a 100-year floodplain? | ☐ Yes ☒ No |
| Did the release impact areas not on an exploration, development, production, or storage site? | ☒ Yes ☐ No |

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

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

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☐ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☐ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

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

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

| | |
|---|---|
| Incident ID | NAB1927162165 |
| District RP | 2RP-5631 |
| Facility ID | |
| Application ID | pAB1927161527 |

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: Glen Thompson
Title: EHS Engineer - Sr.

Signature: GD Thompson
Date: 02/14/2020

email: Glen_Thompson@kindermorgan.com
Telephone: (432) 333-5518 / (432) 413-7844

**OCD Only**

Received by: Cristina Eads
Date: 02/18/2020

Form C-141
Page 5

State of New Mexico
Oil Conservation Division

| | |
|---|---|
| Incident ID | NAB1927162165 |
| District RP | 2RP-5631 |
| Facility ID | |
| Application ID | pAB1927161527 |

# Remediation Plan

**Remediation Plan Checklist:** ***Each of the following items must be included in the plan.***

- [X] Detailed description of proposed remediation technique
- [X] Scaled sitemap with GPS coordinates showing delineation points
- [X] Estimated volume of material to be remediated
- [X] Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- [X] Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

**Deferral Requests Only:** ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

- [ ] Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- [ ] Extents of contamination must be fully delineated.
- [ ] Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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: Glen Thompson
Title: EHS Engineer - Sr.
Signature: Glen Thompson
Date: 02/14/2020
email: Glen_Thompson@kindermorgan.com
Telephone: (432) 333-5518 / (432) 413-7844

**OCD Only**

Received by: Cristina Eads
Date: 02/18/2020

- [ ] Approved
- [X] Approved with Attached Conditions of Approval
- [ ] Denied
- [ ] Deferral Approved

Signature: Cristina Eads
Date: 08/28/2020

# Appendix B
# NMOSE Water Well Data

# 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 Code | Sub-basin | County | Q 64 | Q 16 | Q 4 | Sec | Twws | Rng | X | Y | Distance | Depth Well | Depth Water | Water Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RA 04561 | | RA | ED | | 4 | 2 | 26 | 17S | 27E | 570871 | 3630142* | 1839 | 250 | | |
| RA 12456 POD1 | | RA | ED | 1 | 4 | 4 | 24 | 17S | 27E | 572348 | 3630969 | 2751 | 220 | 92 | 128 |

Average Depth to Water: **92 feet**

Minimum Depth: **92 feet**

Maximum Depth: **92 feet**

**Record Count:** 2

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

**Easting (X):** 571409 **Northing (Y):** 3628383 **Radius:** 3000

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



9/5/19 5:15 PM

WATER COLUMN/ AVERAGE DEPTH TO WATER

# New Mexico Office of the State Engineer
# Point of Diversion Summary

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

| Well Tag | POD Number | Q64 | Q16 | Q4 | Sec | Tws | Rng | X | Y |
|---|---|---|---|---|---|---|---|---|---|
| | RA 12456 POD1 | 1 | 4 | 4 | 24 | 17S | 27E | 572348 | 3630969 |

**Driller License:** 1058 **Driller Company:** KEY'S DRILLING & PUMP SERVICE

**Driller Name:** DON KUEHN III

**Drill Start Date:** 09/07/2016 **Drill Finish Date:** 09/09/2016 **Plug Date:**

**Log File Date:** 09/15/2016 **PCW Rcv Date:** **Source:** Shallow

**Pump Type:** **Pipe Discharge Size:** **Estimated Yield:** 10 GPM

**Casing Size:** 4.50 **Depth Well:** 220 feet **Depth Water:** 92 feet

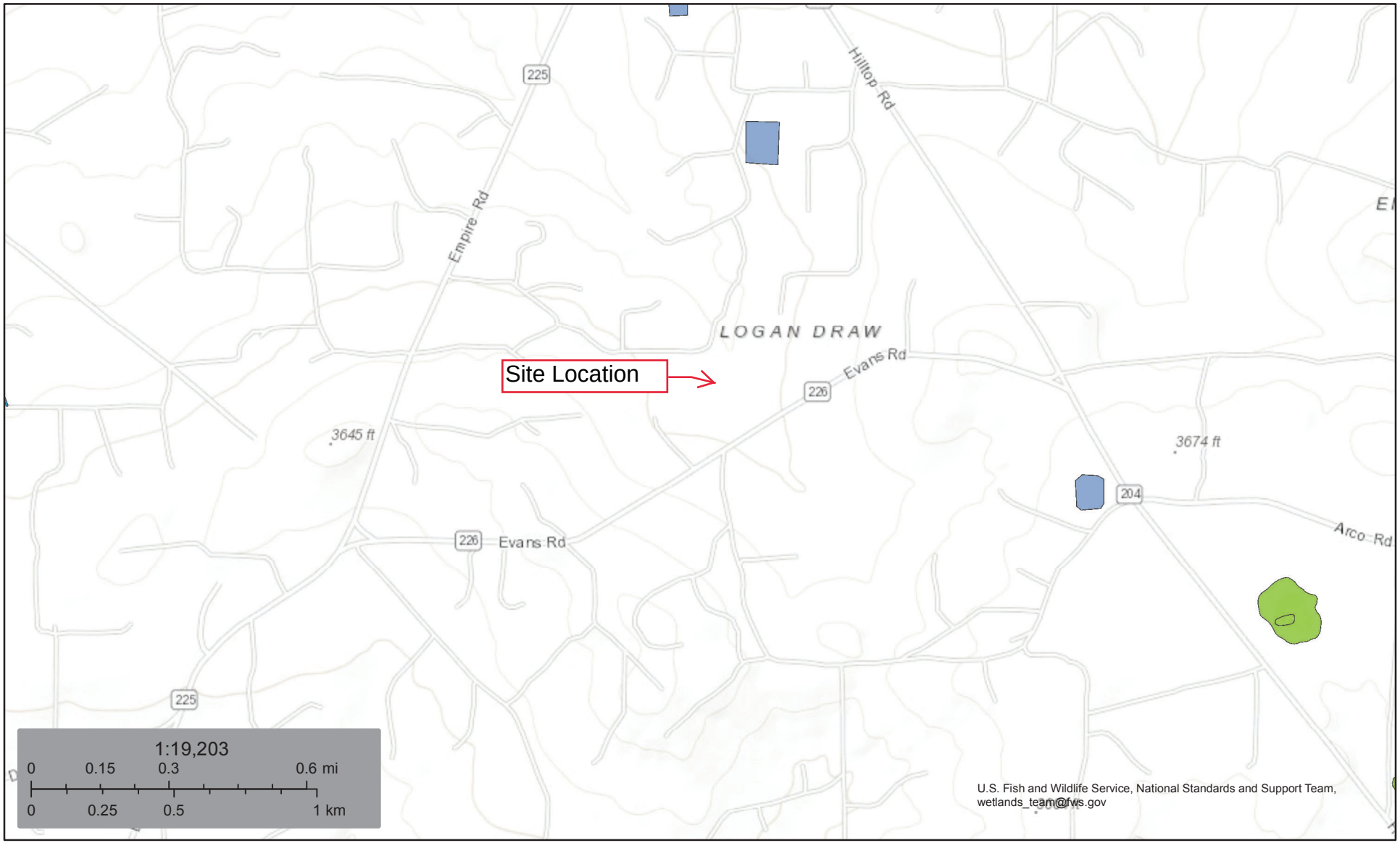
| Water Bearing Stratifications: | Top | Bottom | Description |
|---|---|---|---|
| | 90 | 110 | Sandstone/Gravel/Conglomerate |
| | 160 | 180 | Shale/Mudstone/Siltstone |
| | 180 | 200 | Sandstone/Gravel/Conglomerate |
| | 200 | 210 | Sandstone/Gravel/Conglomerate |
| | 210 | 220 | Sandstone/Gravel/Conglomerate |

| Casing Perforations: | Top | Bottom |
|---|---|---|
| | 200 | 220 |

# Appendix C
# Wetlands Map

U.S. Fish and Wildlife Service
National Wetlands Inventory

# NGPL Indian Basin Pipeline Rupture




February 13, 2020

**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.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

# Appendix D
# National Flood Hazard FIRMette

# National Flood Hazard Layer FIRMette

FEMA

32°47'37.97"N

104°14'36.42"W


104°13'58.97"W

32°47'7.73"N

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

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
- 513 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 10/30/2019 at 12:38:00 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.

# Appendix E
# BLM Karst Map

Lincoln

Roosevelt

Chaves

Otero

Eddy

Lea

LOW

HIGH

MEDIUM

LOW

2RP-5631

MEDIUM

HIGH

HIGH

LOW

MEDIUM

HIGH

CRIT

CRIT HIGH

MEDIUM

CRIT

HIGH

HIGH

BLM Karst Potential Map

# Appendix F
# Analytical Reports

# Certificate of Analysis Summary 642994

## GHD Services, INC- Midland, Midland, TX

## Project Name: Indian Basin Pipeline

**Project Id:** 11202565
**Contact:** John Schnable
**Project Location:** Eddy County

**Date Received in Lab:** Wed 11.13.2019 09:28
**Report Date:** 11.14.2019 11:24
**Project Manager:** Debbie Simmons

| *Analysis Requested* | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Lab Id:*** | 642994-001 | | 642994-002 | | 642994-003 | | 642994-004 | | 642994-005 | | 642994-006 | |
| | ***Field Id:*** | SS-1 | | SS-2 | | SS-3 | | SS-4 | | SS-5 | | SS-6 | |
| | ***Depth:*** | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | |
| | ***Matrix:*** | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | ***Sampled:*** | 11.12.2019 13:03 | | 11.12.2019 12:50 | | 11.12.2019 12:42 | | 11.12.2019 12:36 | | 11.12.2019 12:29 | | 11.12.2019 12:05 | |
| **BTEX by EPA 8021B** | ***Extracted:*** | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | |
| | ***Analyzed:*** | 11.13.2019 13:55 | | 11.13.2019 14:14 | | 11.13.2019 14:33 | | 11.13.2019 14:53 | | 11.13.2019 15:12 | | 11.13.2019 15:31 | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL |
| Benzene | | <0.00101 | 0.00101 | <0.000998 | 0.000998 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.00100 | 0.00100 |
| Toluene | | <0.00101 | 0.00101 | <0.000998 | 0.000998 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.00100 | 0.00100 |
| Ethylbenzene | | <0.00101 | 0.00101 | <0.000998 | 0.000998 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.00100 | 0.00100 |
| m,p-Xylenes | | <0.00202 | 0.00202 | <0.00200 | 0.00200 | <0.00199 | 0.00199 | <0.00200 | 0.00200 | <0.00201 | 0.00201 | <0.00200 | 0.00200 |
| o-Xylene | | <0.00101 | 0.00101 | <0.000998 | 0.000998 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.00100 | 0.00100 |
| Total Xylenes | | <0.00101 | 0.00101 | <0.000998 | 0.000998 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.00100 | 0.00100 |
| Total BTEX | | <0.00101 | 0.00101 | <0.000998 | 0.000998 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.00100 | 0.00100 |
| **TPH By SW8015 Mod SUB: T104704400-19-19** | ***Extracted:*** | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | |
| | ***Analyzed:*** | 11.13.2019 18:03 | | 11.13.2019 19:06 | | 11.13.2019 19:27 | | 11.13.2019 19:47 | | 11.13.2019 20:09 | | 11.13.2019 20:30 | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL |
| Gasoline Range Hydrocarbons (GRO) | | <50.2 | 50.2 | <50.2 | 50.2 | <49.8 | 49.8 | <50.2 | 50.2 | <50.3 | 50.3 | <50.2 | 50.2 |
| Diesel Range Organics (DRO) | | <50.2 | 50.2 | <50.2 | 50.2 | <49.8 | 49.8 | <50.2 | 50.2 | 494 | 50.3 | <50.2 | 50.2 |
| Motor Oil Range Hydrocarbons (MRO) | | <50.2 | 50.2 | <50.2 | 50.2 | <49.8 | 49.8 | <50.2 | 50.2 | 155 | 50.3 | <50.2 | 50.2 |
| Total TPH | | <50.2 | 50.2 | <50.2 | 50.2 | <49.8 | 49.8 | <50.2 | 50.2 | 649 | 50.3 | <50.2 | 50.2 |



Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Debbie Simmons
Project Manager

# Certificate of Analysis Summary 642994

## GHD Services, INC- Midland, Midland, TX

## Project Name: Indian Basin Pipeline

**Project Id:** 11202565
**Contact:** John Schnable
**Project Location:** Eddy County

**Date Received in Lab:** Wed 11.13.2019 09:28
**Report Date:** 11.14.2019 11:24
**Project Manager:** Debbie Simmons

| *Analysis Requested* | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Lab Id:*** | 642994-007 | | 642994-008 | | 642994-009 | | 642994-010 | | 642994-011 | | 642994-012 | |
| | ***Field Id:*** | SS-7 | | SS-8 | | SS-9 | | SS-10 | | SS-11 | | SS-12 | |
| | ***Depth:*** | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | |
| | ***Matrix:*** | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | ***Sampled:*** | 11.12.2019 11:50 | | 11.12.2019 11:25 | | 11.12.2019 11:15 | | 11.12.2019 11:30 | | 11.12.2019 12:15 | | 11.12.2019 11:35 | |
| **BTEX by EPA 8021B** | ***Extracted:*** | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | |
| | ***Analyzed:*** | 11.13.2019 15:50 | | 11.13.2019 16:08 | | 11.13.2019 16:27 | | 11.13.2019 16:46 | | 11.13.2019 17:51 | | 11.13.2019 18:10 | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL |
| Benzene | | <0.000994 | 0.000994 | <0.000998 | 0.000998 | <0.000992 | 0.000992 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 |
| Toluene | | <0.000994 | 0.000994 | <0.000998 | 0.000998 | <0.000992 | 0.000992 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 |
| Ethylbenzene | | <0.000994 | 0.000994 | <0.000998 | 0.000998 | <0.000992 | 0.000992 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 |
| m,p-Xylenes | | <0.00199 | 0.00199 | <0.00200 | 0.00200 | <0.00198 | 0.00198 | <0.00199 | 0.00199 | <0.00200 | 0.00200 | <0.00201 | 0.00201 |
| o-Xylene | | <0.000994 | 0.000994 | <0.000998 | 0.000998 | <0.000992 | 0.000992 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 |
| Total Xylenes | | <0.000994 | 0.000994 | <0.000998 | 0.000998 | <0.000992 | 0.000992 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 |
| Total BTEX | | <0.000994 | 0.000994 | <0.000998 | 0.000998 | <0.000992 | 0.000992 | <0.000996 | 0.000996 | <0.00100 | 0.00100 | <0.00101 | 0.00101 |
| **TPH By SW8015 Mod SUB: T104704400-19-19** | ***Extracted:*** | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | |
| | ***Analyzed:*** | 11.13.2019 20:50 | | 11.13.2019 21:11 | | 11.13.2019 21:32 | | 11.13.2019 21:53 | | 11.13.2019 22:36 | | 11.13.2019 22:57 | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL |
| Gasoline Range Hydrocarbons (GRO) | | <50.3 | 50.3 | <50.3 | 50.3 | <50.2 | 50.2 | <49.8 | 49.8 | <50.1 | 50.1 | <50.3 | 50.3 |
| Diesel Range Organics (DRO) | | <50.3 | 50.3 | <50.3 | 50.3 | <50.2 | 50.2 | 605 | 49.8 | <50.1 | 50.1 | <50.3 | 50.3 |
| Motor Oil Range Hydrocarbons (MRO) | | <50.3 | 50.3 | <50.3 | 50.3 | <50.2 | 50.2 | 263 | 49.8 | <50.1 | 50.1 | <50.3 | 50.3 |
| Total TPH | | <50.3 | 50.3 | <50.3 | 50.3 | <50.2 | 50.2 | 868 | 49.8 | <50.1 | 50.1 | <50.3 | 50.3 |





Debbie Simmons
Project Manager

# Certificate of Analysis Summary 642994

## GHD Services, INC- Midland, Midland, TX

## Project Name: Indian Basin Pipeline

**Project Id:** 11202565
**Contact:** John Schnable
**Project Location:** Eddy County

**Date Received in Lab:** Wed 11.13.2019 09:28
**Report Date:** 11.14.2019 11:24
**Project Manager:** Debbie Simmons

| *Analysis Requested* | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Lab Id:*** | 642994-013 | | 642994-014 | | 642994-015 | | 642994-016 | | 642994-017 | | 642994-018 | |
| | ***Field Id:*** | SS-13 | | SS-14 | | SS-15 | | SS-16 | | SS-17 | | SS-18 | |
| | ***Depth:*** | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | | 4-6 In | |
| | ***Matrix:*** | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | ***Sampled:*** | 11.12.2019 11:09 | | 11.12.2019 11:05 | | 11.12.2019 11:00 | | 11.12.2019 10:05 | | 11.12.2019 10:30 | | 11.12.2019 10:35 | |
| **BTEX by EPA 8021B** | ***Extracted:*** | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | | 11.13.2019 10:11 | |
| | ***Analyzed:*** | 11.13.2019 18:29 | | 11.13.2019 18:48 | | 11.13.2019 19:07 | | 11.13.2019 19:26 | | 11.13.2019 19:45 | | 11.13.2019 20:04 | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL |
| Benzene | | <0.000998 | 0.000998 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.000996 | 0.000996 | <0.000996 | 0.000996 | <0.00100 | 0.00100 |
| Toluene | | <0.000998 | 0.000998 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.000996 | 0.000996 | <0.000996 | 0.000996 | <0.00100 | 0.00100 |
| Ethylbenzene | | <0.000998 | 0.000998 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.000996 | 0.000996 | <0.000996 | 0.000996 | <0.00100 | 0.00100 |
| m,p-Xylenes | | <0.00200 | 0.00200 | <0.00200 | 0.00200 | <0.00201 | 0.00201 | <0.00199 | 0.00199 | <0.00199 | 0.00199 | <0.00200 | 0.00200 |
| o-Xylene | | <0.000998 | 0.000998 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.000996 | 0.000996 | <0.000996 | 0.000996 | <0.00100 | 0.00100 |
| Total Xylenes | | <0.000998 | 0.000998 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.000996 | 0.000996 | <0.000996 | 0.000996 | <0.00100 | 0.00100 |
| Total BTEX | | <0.000998 | 0.000998 | <0.00100 | 0.00100 | <0.00101 | 0.00101 | <0.000996 | 0.000996 | <0.000996 | 0.000996 | <0.00100 | 0.00100 |
| **TPH By SW8015 Mod SUB: T104704400-19-19** | ***Extracted:*** | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | | 11.13.2019 16:00 | |
| | ***Analyzed:*** | 11.13.2019 23:18 | | 11.13.2019 23:39 | | 11.14.2019 00:00 | | 11.14.2019 00:21 | | 11.14.2019 00:42 | | 11.14.2019 01:02 | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL |
| Gasoline Range Hydrocarbons (GRO) | | <50.1 | 50.1 | <50.3 | 50.3 | <50.2 | 50.2 | <50.2 | 50.2 | <50.0 | 50.0 | <50.3 | 50.3 |
| Diesel Range Organics (DRO) | | 280 | 50.1 | <50.3 | 50.3 | <50.2 | 50.2 | 2910 | 50.2 | 179 | 50.0 | <50.3 | 50.3 |
| Motor Oil Range Hydrocarbons (MRO) | | 119 | 50.1 | <50.3 | 50.3 | <50.2 | 50.2 | 1180 | 50.2 | 84.8 | 50.0 | <50.3 | 50.3 |
| Total TPH | | 399 | 50.1 | <50.3 | 50.3 | <50.2 | 50.2 | 4090 | 50.2 | 264 | 50.0 | <50.3 | 50.3 |





Debbie Simmons
Project Manager

# Certificate of Analysis Summary 642994

## GHD Services, INC- Midland, Midland, TX

### Project Name: Indian Basin Pipeline

**Project Id:** 11202565
**Contact:** John Schnable
**Project Location:** Eddy County

**Date Received in Lab:** Wed 11.13.2019 09:28
**Report Date:** 11.14.2019 11:24
**Project Manager:** Debbie Simmons

| *Analysis Requested* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | ***Lab Id:*** | 642994-019 | | | | | |
| | ***Field Id:*** | SS-19 | | | | | |
| | ***Depth:*** | 4-6 In | | | | | |
| | ***Matrix:*** | SOIL | | | | | |
| | ***Sampled:*** | 11.12.2019 10:40 | | | | | |
| **BTEX by EPA 8021B** | ***Extracted:*** | 11.13.2019 10:11 | | | | | |
| | ***Analyzed:*** | 11.13.2019 20:24 | | | | | |
| | ***Units/RL:*** | mg/kg RL | | | | | |
| Benzene | | <0.00100 0.00100 | | | | | |
| Toluene | | <0.00100 0.00100 | | | | | |
| Ethylbenzene | | <0.00100 0.00100 | | | | | |
| m,p-Xylenes | | <0.00201 0.00201 | | | | | |
| o-Xylene | | <0.00100 0.00100 | | | | | |
| Total Xylenes | | <0.00100 0.00100 | | | | | |
| Total BTEX | | <0.00100 0.00100 | | | | | |
| **TPH By SW8015 Mod SUB: T104704400-19-19** | ***Extracted:*** | 11.13.2019 16:00 | | | | | |
| | ***Analyzed:*** | 11.14.2019 01:23 | | | | | |
| | ***Units/RL:*** | mg/kg RL | | | | | |
| Gasoline Range Hydrocarbons (GRO) | | <50.0 50.0 | | | | | |
| Diesel Range Organics (DRO) | | <50.0 50.0 | | | | | |
| Motor Oil Range Hydrocarbons (MRO) | | <50.0 50.0 | | | | | |
| Total TPH | | <50.0 50.0 | | | | | |



Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Debbie Simmons
Project Manager

# Analytical Report 642994

## for

## GHD Services, INC- Midland

**Project Manager: John Schnable**

**Indian Basin Pipeline**

**11202565**

**11.14.2019**

Collected By: Client

**1089 N Canal Street**
**Carlsbad, NM 88220**

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2019-058), North Carolina (681), Arkansas (19-037-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)

11.14.2019

Project Manager: **John Schnable**
**GHD Services, INC- Midland**
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **642994**
**Indian Basin Pipeline**
Project Address: Eddy County

**John Schnable**:

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) 642994. 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. 642994 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,

Debbie Simmons

**Debbie Simmons**
Project Manager

*A Small Business and Minority Company*

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

# Certificate of Analysis Summary 649258

## GHD Services, INC- Midland, Midland, TX

### Project Name: Indian Basin

**Project Id:** 11202565
**Contact:** John Schnable
**Project Location:** Artesia, NM

**Date Received in Lab:** Thu 01.16.2020 10:05
**Report Date:** 01.17.2020 15:41
**Project Manager:** Debbie Simmons

| *Analysis Requested* | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Lab Id:*** | 649258-001 | | 649258-002 | | 649258-003 | | 649258-004 | | 649258-005 | | 649258-006 | |
| | ***Field Id:*** | SS-5 @ 1' | | SS-10 @ 1' | | SS-20 @ 6" | | SS-13 @ 1' | | SS-21 @ 6" | | SS-17 @ 1' | |
| | ***Depth:*** | 1- ft | | 1- ft | | 6- In | | 1- ft | | 6- In | | 1- ft | |
| | ***Matrix:*** | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | ***Sampled:*** | 01.15.2020 12:15 | | 01.15.2020 12:30 | | 01.15.2020 13:00 | | 01.15.2020 13:20 | | 01.15.2020 13:40 | | 01.15.2020 13:50 | |
| **BTEX by EPA 8021B** | ***Extracted:*** | | | | | 01.16.2020 16:30 | | | | 01.16.2020 16:30 | | | |
| | ***Analyzed:*** | | | | | 01.16.2020 21:41 | | | | 01.16.2020 22:01 | | | |
| | ***Units/RL:*** | | | | | mg/kg | RL | | | mg/kg | RL | | |
| Benzene | | | | | | <0.00198 | 0.00198 | | | <0.00200 | 0.00200 | | |
| Toluene | | | | | | <0.00198 | 0.00198 | | | <0.00200 | 0.00200 | | |
| Ethylbenzene | | | | | | <0.00198 | 0.00198 | | | <0.00200 | 0.00200 | | |
| m,p-Xylenes | | | | | | <0.00396 | 0.00396 | | | <0.00399 | 0.00399 | | |
| o-Xylene | | | | | | <0.00198 | 0.00198 | | | <0.00200 | 0.00200 | | |
| Total Xylenes | | | | | | <0.00198 | 0.00198 | | | <0.00200 | 0.00200 | | |
| Total BTEX | | | | | | <0.00198 | 0.00198 | | | <0.00200 | 0.00200 | | |
| **TPH By SW8015 Mod** | ***Extracted:*** | 01.16.2020 16:00 | | 01.16.2020 16:00 | | 01.16.2020 16:00 | | 01.16.2020 16:00 | | 01.16.2020 16:00 | | 01.16.2020 16:00 | |
| | ***Analyzed:*** | 01.17.2020 01:51 | | 01.17.2020 02:12 | | 01.17.2020 02:33 | | 01.17.2020 02:54 | | 01.17.2020 03:15 | | 01.17.2020 03:37 | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL | mg/kg | RL |
| Gasoline Range Hydrocarbons (GRO) | | <50.0 | 50.0 | <49.9 | 49.9 | <50.0 | 50.0 | <49.9 | 49.9 | <50.0 | 50.0 | <50.0 | 50.0 |
| Diesel Range Organics (DRO) | | 269 | 50.0 | 90.3 | 49.9 | <50.0 | 50.0 | <49.9 | 49.9 | <50.0 | 50.0 | <50.0 | 50.0 |
| Motor Oil Range Hydrocarbons (MRO) | | 78.5 | 50.0 | <49.9 | 49.9 | <50.0 | 50.0 | <49.9 | 49.9 | <50.0 | 50.0 | <50.0 | 50.0 |
| Total TPH | | 348 | 50.0 | 90.3 | 49.9 | <50.0 | 50.0 | <49.9 | 49.9 | <50.0 | 50.0 | <50.0 | 50.0 |



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Debbie Simmons
Project Manager

# Certificate of Analysis Summary 649258

## GHD Services, INC- Midland, Midland, TX

## Project Name: Indian Basin

**Project Id:** 11202565
**Contact:** John Schnable
**Project Location:** Artesia, NM

**Date Received in Lab:** Thu 01.16.2020 10:05
**Report Date:** 01.17.2020 15:41
**Project Manager:** Debbie Simmons

| *Analysis Requested* | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Lab Id:*** | 649258-007 | | 649258-008 | | 649258-009 | | | | | | |
| | ***Field Id:*** | SS-22 @ 6" | | SS-23 @ 6" | | SS-16 @ 1' | | | | | | |
| | ***Depth:*** | 6- In | | 6- In | | 1- ft | | | | | | |
| | ***Matrix:*** | SOIL | | SOIL | | SOIL | | | | | | |
| | ***Sampled:*** | 01.15.2020 14:00 | | 01.15.2020 14:10 | | 01.15.2020 14:20 | | | | | | |
| **BTEX by EPA 8021B** | ***Extracted:*** | 01.16.2020 16:30 | | 01.16.2020 16:30 | | | | | | | | |
| | ***Analyzed:*** | 01.16.2020 22:21 | | 01.16.2020 22:41 | | | | | | | | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | | | | | | | |
| Benzene | | <0.00198 | 0.00198 | <0.00200 | 0.00200 | | | | | | | |
| Toluene | | <0.00198 | 0.00198 | <0.00200 | 0.00200 | | | | | | | |
| Ethylbenzene | | <0.00198 | 0.00198 | <0.00200 | 0.00200 | | | | | | | |
| m,p-Xylenes | | <0.00397 | 0.00397 | <0.00399 | 0.00399 | | | | | | | |
| o-Xylene | | <0.00198 | 0.00198 | <0.00200 | 0.00200 | | | | | | | |
| Total Xylenes | | <0.00198 | 0.00198 | <0.00200 | 0.00200 | | | | | | | |
| Total BTEX | | <0.00198 | 0.00198 | <0.00200 | 0.00200 | | | | | | | |
| **TPH By SW8015 Mod** | ***Extracted:*** | 01.16.2020 16:00 | | 01.16.2020 16:00 | | 01.16.2020 16:00 | | | | | | |
| | ***Analyzed:*** | 01.17.2020 03:58 | | 01.17.2020 04:20 | | 01.17.2020 04:41 | | | | | | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | mg/kg | RL | | | | | |
| Gasoline Range Hydrocarbons (GRO) | | <49.8 | 49.8 | <49.9 | 49.9 | <49.9 | 49.9 | | | | | |
| Diesel Range Organics (DRO) | | <49.8 | 49.8 | <49.9 | 49.9 | <49.9 | 49.9 | | | | | |
| Motor Oil Range Hydrocarbons (MRO) | | <49.8 | 49.8 | <49.9 | 49.9 | <49.9 | 49.9 | | | | | |
| Total TPH | | <49.8 | 49.8 | <49.9 | 49.9 | <49.9 | 49.9 | | | | | |



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Debbie Simmons
Project Manager

# Analytical Report 649258

## for

## GHD Services, INC- Midland

**Project Manager: John Schnable**

**Indian Basin**

**11202565**

**01.17.2020**

Collected By: Client

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

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2019-058), North Carolina (681), Arkansas (19-037-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)

01.17.2020

Project Manager: **John Schnable**
**GHD Services, INC- Midland**
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **649258**
**Indian Basin**
Project Address: Artesia, NM

**John Schnable**:

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) 649258. 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. 649258 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,

Debbie Simmons

**Debbie Simmons**
Project Manager

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# Sample Cross Reference 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| Sample Id | Matrix | Date Collected | Sample Depth | Lab Sample Id |
|---|---|---|---|---|
| SS-5 @ 1' | S | 01.15.2020 12:15 | 1 ft | 649258-001 |
| SS-10 @ 1' | S | 01.15.2020 12:30 | 1 ft | 649258-002 |
| SS-20 @ 6" | S | 01.15.2020 13:00 | 6 In | 649258-003 |
| SS-13 @ 1' | S | 01.15.2020 13:20 | 1 ft | 649258-004 |
| SS-21 @ 6" | S | 01.15.2020 13:40 | 6 In | 649258-005 |
| SS-17 @ 1' | S | 01.15.2020 13:50 | 1 ft | 649258-006 |
| SS-22 @ 6" | S | 01.15.2020 14:00 | 6 In | 649258-007 |
| SS-23 @ 6" | S | 01.15.2020 14:10 | 6 In | 649258-008 |
| SS-16 @ 1' | S | 01.15.2020 14:20 | 1 ft | 649258-009 |

# CASE NARRATIVE

***Client Name: GHD Services, INC- Midland***

***Project Name: Indian Basin***

Project ID: *11202565*
Work Order Number(s): *649258*

Report Date: *01.17.2020*
Date Received: *01.16.2020*

**Sample receipt non conformances and comments:**

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

None

**Analytical non conformances and comments:**

Batch: LBA-3113575 BTEX by EPA 8021B

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

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-5 @ 1'** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-001 | Date Collected: | 01.15.2020 12:15 | Sample Depth: | 1 ft |
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.0 | 50.0 | mg/kg | 01.17.2020 01:51 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **269** | 50.0 | mg/kg | 01.17.2020 01:51 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **78.5** | 50.0 | mg/kg | 01.17.2020 01:51 | | 1 |
| **Total TPH** | PHC635 | **348** | 50.0 | mg/kg | 01.17.2020 01:51 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 120 | % | 70-135 | 01.17.2020 01:51 | |
| o-Terphenyl | 84-15-1 | 114 | % | 70-135 | 01.17.2020 01:51 | |

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-10 @ 1'** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-002 | Date Collected: | 01.15.2020 12:30 | Sample Depth: | 1 ft |
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <49.9 | 49.9 | mg/kg | 01.17.2020 02:12 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **90.3** | 49.9 | mg/kg | 01.17.2020 02:12 | | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <49.9 | 49.9 | mg/kg | 01.17.2020 02:12 | U | 1 |
| **Total TPH** | PHC635 | **90.3** | 49.9 | mg/kg | 01.17.2020 02:12 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 114 | % | 70-135 | 01.17.2020 02:12 | |
| o-Terphenyl | 84-15-1 | 113 | % | 70-135 | 01.17.2020 02:12 | |

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-20 @ 6"** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-003 | Date Collected: | 01.15.2020 13:00 | Sample Depth: | 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.0 | 50.0 | mg/kg | 01.17.2020 02:33 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.0 | 50.0 | mg/kg | 01.17.2020 02:33 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.0 | 50.0 | mg/kg | 01.17.2020 02:33 | U | 1 |
| Total TPH | PHC635 | <50.0 | 50.0 | mg/kg | 01.17.2020 02:33 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 122 | % | 70-135 | 01.17.2020 02:33 | |
| o-Terphenyl | 84-15-1 | 117 | % | 70-135 | 01.17.2020 02:33 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | ALJ | | | % Moisture: | |
| Analyst: | ALJ | Date Prep: | 01.16.2020 16:30 | Basis: | Wet Weight |
| Seq Number: | 3113575 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 21:41 | U | 1 |
| Toluene | 108-88-3 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 21:41 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 21:41 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00396 | 0.00396 | mg/kg | 01.16.2020 21:41 | U | 1 |
| o-Xylene | 95-47-6 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 21:41 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 21:41 | U | 1 |
| Total BTEX | | <0.00198 | 0.00198 | mg/kg | 01.16.2020 21:41 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 71 | % | 70-130 | 01.16.2020 21:41 | |
| 1,4-Difluorobenzene | 540-36-3 | 108 | % | 70-130 | 01.16.2020 21:41 | |

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-13 @ 1'** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-004 | Date Collected: | 01.15.2020 13:20 | Sample Depth: | 1 ft |
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <49.9 | 49.9 | mg/kg | 01.17.2020 02:54 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <49.9 | 49.9 | mg/kg | 01.17.2020 02:54 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <49.9 | 49.9 | mg/kg | 01.17.2020 02:54 | U | 1 |
| Total TPH | PHC635 | <49.9 | 49.9 | mg/kg | 01.17.2020 02:54 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 122 | % | 70-135 | 01.17.2020 02:54 | |
| o-Terphenyl | 84-15-1 | 120 | % | 70-135 | 01.17.2020 02:54 | |

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-21 @ 6"** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-005 | Date Collected: | 01.15.2020 13:40 | Sample Depth: | 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.0 | 50.0 | mg/kg | 01.17.2020 03:15 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.0 | 50.0 | mg/kg | 01.17.2020 03:15 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.0 | 50.0 | mg/kg | 01.17.2020 03:15 | U | 1 |
| Total TPH | PHC635 | <50.0 | 50.0 | mg/kg | 01.17.2020 03:15 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 114 | % | 70-135 | 01.17.2020 03:15 | |
| o-Terphenyl | 84-15-1 | 113 | % | 70-135 | 01.17.2020 03:15 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | ALJ | | | % Moisture: | |
| Analyst: | ALJ | Date Prep: | 01.16.2020 16:30 | Basis: | Wet Weight |
| Seq Number: | 3113575 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:01 | U | 1 |
| Toluene | 108-88-3 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:01 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:01 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00399 | 0.00399 | mg/kg | 01.16.2020 22:01 | U | 1 |
| o-Xylene | 95-47-6 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:01 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:01 | U | 1 |
| Total BTEX | | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:01 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 540-36-3 | 110 | % | 70-130 | 01.16.2020 22:01 | |
| 4-Bromofluorobenzene | 460-00-4 | 79 | % | 70-130 | 01.16.2020 22:01 | |

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-17 @ 1'** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-006 | Date Collected: | 01.15.2020 13:50 | Sample Depth: | 1 ft |
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.0 | 50.0 | mg/kg | 01.17.2020 03:37 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.0 | 50.0 | mg/kg | 01.17.2020 03:37 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.0 | 50.0 | mg/kg | 01.17.2020 03:37 | U | 1 |
| Total TPH | PHC635 | <50.0 | 50.0 | mg/kg | 01.17.2020 03:37 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 115 | % | 70-135 | 01.17.2020 03:37 | |
| o-Terphenyl | 84-15-1 | 115 | % | 70-135 | 01.17.2020 03:37 | |

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-22 @ 6"** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-007 | Date Collected: | 01.15.2020 14:00 | Sample Depth: | 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <49.8 | 49.8 | mg/kg | 01.17.2020 03:58 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <49.8 | 49.8 | mg/kg | 01.17.2020 03:58 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <49.8 | 49.8 | mg/kg | 01.17.2020 03:58 | U | 1 |
| Total TPH | PHC635 | <49.8 | 49.8 | mg/kg | 01.17.2020 03:58 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 109 | % | 70-135 | 01.17.2020 03:58 | |
| o-Terphenyl | 84-15-1 | 112 | % | 70-135 | 01.17.2020 03:58 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | ALJ | | | % Moisture: | |
| Analyst: | ALJ | Date Prep: | 01.16.2020 16:30 | Basis: | Wet Weight |
| Seq Number: | 3113575 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 22:21 | U | 1 |
| Toluene | 108-88-3 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 22:21 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 22:21 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00397 | 0.00397 | mg/kg | 01.16.2020 22:21 | U | 1 |
| o-Xylene | 95-47-6 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 22:21 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00198 | 0.00198 | mg/kg | 01.16.2020 22:21 | U | 1 |
| Total BTEX | | <0.00198 | 0.00198 | mg/kg | 01.16.2020 22:21 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 540-36-3 | 109 | % | 70-130 | 01.16.2020 22:21 | |
| 4-Bromofluorobenzene | 460-00-4 | 80 | % | 70-130 | 01.16.2020 22:21 | |

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-23 @ 6"** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-008 | Date Collected: | 01.15.2020 14:10 | Sample Depth: | 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <49.9 | 49.9 | mg/kg | 01.17.2020 04:20 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <49.9 | 49.9 | mg/kg | 01.17.2020 04:20 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <49.9 | 49.9 | mg/kg | 01.17.2020 04:20 | U | 1 |
| Total TPH | PHC635 | <49.9 | 49.9 | mg/kg | 01.17.2020 04:20 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 113 | % | 70-135 | 01.17.2020 04:20 | |
| o-Terphenyl | 84-15-1 | 111 | % | 70-135 | 01.17.2020 04:20 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | ALJ | | | % Moisture: | |
| Analyst: | ALJ | Date Prep: | 01.16.2020 16:30 | Basis: | Wet Weight |
| Seq Number: | 3113575 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:41 | U | 1 |
| Toluene | 108-88-3 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:41 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:41 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00399 | 0.00399 | mg/kg | 01.16.2020 22:41 | U | 1 |
| o-Xylene | 95-47-6 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:41 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:41 | U | 1 |
| Total BTEX | | <0.00200 | 0.00200 | mg/kg | 01.16.2020 22:41 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 75 | % | 70-130 | 01.16.2020 22:41 | |
| 1,4-Difluorobenzene | 540-36-3 | 111 | % | 70-130 | 01.16.2020 22:41 | |

# Certificate of Analytical Results 649258

## GHD Services, INC- Midland, Midland, TX

Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-16 @ 1'** | Matrix: | Soil | Date Received: | 01.16.2020 10:05 |
| Lab Sample Id: | 649258-009 | Date Collected: | 01.15.2020 14:20 | Sample Depth: | 1 ft |
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.16.2020 16:00 | Basis: | Wet Weight |
| Seq Number: | 3113634 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <49.9 | 49.9 | mg/kg | 01.17.2020 04:41 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <49.9 | 49.9 | mg/kg | 01.17.2020 04:41 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <49.9 | 49.9 | mg/kg | 01.17.2020 04:41 | U | 1 |
| Total TPH | PHC635 | <49.9 | 49.9 | mg/kg | 01.17.2020 04:41 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 116 | % | 70-135 | 01.17.2020 04:41 | |
| o-Terphenyl | 84-15-1 | 113 | % | 70-135 | 01.17.2020 04:41 | |

# 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. **ND** Not Detected.

**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 649258

## GHD Services, INC- Midland

Indian Basin

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3113634 — Matrix: Solid — Date Prep: 01.16.2020
MB Sample Id: 7694553-1-BLK — LCS Sample Id: 7694553-1-BKS — LCSD Sample Id: 7694553-1-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) | <15.0 | 1000 | 1140 | 114 | 1100 | 110 | 70-135 | 4 | 20 | mg/kg | 01.16.2020 20:34 | |
| Diesel Range Organics (DRO) | <15.0 | 1000 | 1030 | 103 | 1010 | 101 | 70-135 | 2 | 20 | mg/kg | 01.16.2020 20:34 | |

| Surrogate | MB %Rec | MB Flag | LCS %Rec | LCS Flag | LCSD %Rec | LCSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 112 | | 126 | | 121 | | 70-135 | % | 01.16.2020 20:34 |
| o-Terphenyl | 118 | | 121 | | 121 | | 70-135 | % | 01.16.2020 20:34 |

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3113634 — Matrix: Solid — Date Prep: 01.16.2020
MB Sample Id: 7694553-1-BLK

| Parameter | MB Result | Units | Analysis Date | Flag |
|---|---|---|---|---|
| Motor Oil Range Hydrocarbons (MRO) | <50.0 | mg/kg | 01.16.2020 20:13 | |

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3113634 — Matrix: Soil — Date Prep: 01.16.2020
Parent Sample Id: 648785-002 — MS Sample Id: 648785-002 S — MSD Sample Id: 648785-002 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) | 15.5 | 997 | 876 | 86 | 761 | 75 | 70-135 | 14 | 20 | mg/kg | 01.16.2020 21:38 | |
| Diesel Range Organics (DRO) | 18.1 | 997 | 888 | 87 | 761 | 74 | 70-135 | 15 | 20 | mg/kg | 01.16.2020 21:38 | |

| Surrogate | MS %Rec | MS Flag | MSD %Rec | MSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 93 | | 71 | | 70-135 | % | 01.16.2020 21:38 |
| o-Terphenyl | 111 | | 92 | | 70-135 | % | 01.16.2020 21:38 |

**Analytical Method:** BTEX by EPA 8021B — Prep Method: SW5030B
Seq Number: 3113575 — Matrix: Solid — Date Prep: 01.16.2020
MB Sample Id: 7694593-1-BLK — LCS Sample Id: 7694593-1-BKS — LCSD Sample Id: 7694593-1-BSD

| Parameter | MB Result | Spike Amount | LCS Result | LCS %Rec | LCSD Result | LCSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | <0.000386 | 0.100 | 0.106 | 106 | 0.112 | 112 | 70-130 | 6 | 35 | mg/kg | 01.16.2020 19:01 | |
| Toluene | <0.000457 | 0.100 | 0.0974 | 97 | 0.102 | 102 | 70-130 | 5 | 35 | mg/kg | 01.16.2020 19:01 | |
| Ethylbenzene | <0.000566 | 0.100 | 0.0910 | 91 | 0.0950 | 95 | 70-130 | 4 | 35 | mg/kg | 01.16.2020 19:01 | |
| m,p-Xylenes | <0.00102 | 0.200 | 0.178 | 89 | 0.187 | 94 | 70-130 | 5 | 35 | mg/kg | 01.16.2020 19:01 | |
| o-Xylene | <0.000345 | 0.100 | 0.0890 | 89 | 0.0932 | 93 | 70-130 | 5 | 35 | mg/kg | 01.16.2020 19:01 | |

| Surrogate | MB %Rec | MB Flag | LCS %Rec | LCS Flag | LCSD %Rec | LCSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 103 | | 111 | | 109 | | 70-130 | % | 01.16.2020 19:01 |
| 4-Bromofluorobenzene | 74 | | 94 | | 89 | | 70-130 | % | 01.16.2020 19:01 |

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 649258

## GHD Services, INC- Midland

Indian Basin

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

Seq Number: 3113575 Matrix: Soil Date Prep: 01.16.2020

Parent Sample Id: 648641-001 MS Sample Id: 648641-001 S MSD Sample Id: 648641-001 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 | 0.0882 | 88 | 0.0927 | 93 | 70-130 | 5 | 35 | mg/kg | 01.16.2020 19:42 | |
| Toluene | 0.000855 | 0.100 | 0.0781 | 77 | 0.0835 | 83 | 70-130 | 7 | 35 | mg/kg | 01.16.2020 19:42 | |
| Ethylbenzene | <0.000565 | 0.100 | 0.0731 | 73 | 0.0776 | 78 | 70-130 | 6 | 35 | mg/kg | 01.16.2020 19:42 | |
| m,p-Xylenes | <0.00101 | 0.200 | 0.142 | 71 | 0.151 | 76 | 70-130 | 6 | 35 | mg/kg | 01.16.2020 19:42 | |
| o-Xylene | 0.000437 | 0.100 | 0.0707 | 70 | 0.0759 | 76 | 70-130 | 7 | 35 | mg/kg | 01.16.2020 19:42 | |

| Surrogate | MS %Rec | MS Flag | MSD %Rec | MSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 104 | | 110 | | 70-130 | % | 01.16.2020 19:42 |
| 4-Bromofluorobenzene | 85 | | 89 | | 70-130 | % | 01.16.2020 19:42 |

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

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# CHAIN OF CUSTODY

Page 1 Of 1

Xenco Quote # | Xenco Job # 609758

## Client / Reporting Information

Company Name / Branch: GHD/Midland

Company Address: 2135 s loop 250 w Midland, Tx 79703

Email: john.schnable@ghd.com | Phone No: 432-686-0086

Project Contact: John Schnable Chris Knight

Samplers's Name: Ryan Livingston Joe Mireles

## Project Information

Project Name/Number: Indian Basin/ 11202565

Project Location: Artesia, NM

Invoice To: Chris Knight

## Analytical Information

## Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

| No. | Field ID / Point of Collection | Collection: Sample Depth | Date | Time | Matrix | # of bottles | Number of preserved bottles: HCl | NaOH/Zn Acetate | HNO3 | H2SO4 | NaOH | NaHSO4 | MEOH | NONE | BTEX EPA8021B | TPH (GRO,DRO,MRO) BY SW8015 mod. | Field Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SS-5 @ 1' | 1' | 1/15/20 | 1215 | S | 1 | | | | | | | | X | | X | |
| 2 | SS-10 @ 1' | 1' | 1/15/20 | 1230 | S | 1 | | | | | | | | X | | X | |
| 3 | SS-20 @ 6" | 6" | 1/15/20 | 13:00 | S | 2 | | | | | | | | X | X | X | |
| 4 | SS-13 @ 1' | 1' | 1/15/20 | 13:20 | S | 1 | | | | | | | | X | | X | |
| 5 | SS-21 @ 6" | 6" | 1/15/20 | 13:40 | S | 2 | | | | | | | | X | X | X | |
| 6 | SS-17 @ 1' | 1' | 1/15/20 | 13:50 | S | 1 | | | | | | | | X | | X | |
| 7 | SS-22 @ 6" | 6" | 1/15/20 | 14:00 | S | 2 | | | | | | | | X | X | X | |
| 8 | SS-23 @ 6" | 6" | 1/15/20 | 14:10 | S | 2 | | | | | | | | X | X | X | |
| 9 | SS-16 @ 1' | 1' | 1/15/20 | 1420 | S | 1 | | | | | | | | X | | X | |
| 10 | | | | | | | | | | | | | | | | | |

Turnaround Time ( Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [X] Next Day EMERGENCY
- [ ] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes:

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

| | Relinquished by: | Date Time: | Received By: | Relinquished By: | Date Time: | Received By: |
|---|---|---|---|---|---|---|
| 1 | Joe Mireles | 1/16/20 1105 | | | | |
| 3 | | | | | | |
| 5 | | | | Custody Seal # | Preserved where applicable | On Ice / Cooler Temp. / Thermo. Corr. Factor |

Notice: Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the Client if such loses are due to circumstances beyond the control of Xenco. A minimum charge of $75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at $5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.

# XENCO Laboratories

## Prelogin/Nonconformance Report- Sample Log-In

**Client:** GHD Services, INC- Midland

**Date/ Time Received:** 01.16.2020 10.05.00 AM

**Work Order #:** 649258

**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)? | 1.6 |
| #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: 01.16.2020

Brianna Teel

**Checklist reviewed by:** Debbie Simmons Date: 01.16.2020

Debbie Simmons

# Sample Cross Reference 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

| Sample Id | Matrix | Date Collected | Sample Depth | Lab Sample Id |
|---|---|---|---|---|
| SS-1 | S | 11.12.2019 13:03 | 4 - 6 In | 642994-001 |
| SS-2 | S | 11.12.2019 12:50 | 4 - 6 In | 642994-002 |
| SS-3 | S | 11.12.2019 12:42 | 4 - 6 In | 642994-003 |
| SS-4 | S | 11.12.2019 12:36 | 4 - 6 In | 642994-004 |
| SS-5 | S | 11.12.2019 12:29 | 4 - 6 In | 642994-005 |
| SS-6 | S | 11.12.2019 12:05 | 4 - 6 In | 642994-006 |
| SS-7 | S | 11.12.2019 11:50 | 4 - 6 In | 642994-007 |
| SS-8 | S | 11.12.2019 11:25 | 4 - 6 In | 642994-008 |
| SS-9 | S | 11.12.2019 11:15 | 4 - 6 In | 642994-009 |
| SS-10 | S | 11.12.2019 11:30 | 4 - 6 In | 642994-010 |
| SS-11 | S | 11.12.2019 12:15 | 4 - 6 In | 642994-011 |
| SS-12 | S | 11.12.2019 11:35 | 4 - 6 In | 642994-012 |
| SS-13 | S | 11.12.2019 11:09 | 4 - 6 In | 642994-013 |
| SS-14 | S | 11.12.2019 11:05 | 4 - 6 In | 642994-014 |
| SS-15 | S | 11.12.2019 11:00 | 4 - 6 In | 642994-015 |
| SS-16 | S | 11.12.2019 10:05 | 4 - 6 In | 642994-016 |
| SS-17 | S | 11.12.2019 10:30 | 4 - 6 In | 642994-017 |
| SS-18 | S | 11.12.2019 10:35 | 4 - 6 In | 642994-018 |
| SS-19 | S | 11.12.2019 10:40 | 4 - 6 In | 642994-019 |

# CASE NARRATIVE

***Client Name: GHD Services, INC- Midland***

***Project Name: Indian Basin Pipeline***

Project ID: *11202565*
Work Order Number(s): *642994*

Report Date: *11.14.2019*
Date Received: *11.13.2019*

**Sample receipt non conformances and comments:**

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

None

**Analytical non conformances and comments:**

Batch: LBA-3107412 BTEX by EPA 8021B

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

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-1** | Matrix: | Soil | Date Received: | 11.13.2019 09:28 |
| Lab Sample Id: | 642994-001 | Date Collected: | 11.12.2019 13:03 | Sample Depth: | 4 - 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 11.13.2019 16:00 | Basis: | Wet Weight |
| Seq Number: | 3107395 | | | SUB: | T104704400-19-19 |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.2 | 50.2 | mg/kg | 11.13.2019 18:03 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.2 | 50.2 | mg/kg | 11.13.2019 18:03 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.2 | 50.2 | mg/kg | 11.13.2019 18:03 | U | 1 |
| Total TPH | PHC635 | <50.2 | 50.2 | mg/kg | 11.13.2019 18:03 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 124 | % | 70-135 | 11.13.2019 18:03 | |
| o-Terphenyl | 84-15-1 | 115 | % | 70-135 | 11.13.2019 18:03 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | MAB | | | % Moisture: | |
| Analyst: | MAB | Date Prep: | 11.13.2019 10:11 | Basis: | Wet Weight |
| Seq Number: | 3107412 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 13:55 | U | 1 |
| Toluene | 108-88-3 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 13:55 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 13:55 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00202 | 0.00202 | mg/kg | 11.13.2019 13:55 | U | 1 |
| o-Xylene | 95-47-6 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 13:55 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 13:55 | U | 1 |
| Total BTEX | | <0.00101 | 0.00101 | mg/kg | 11.13.2019 13:55 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 114 | % | 70-130 | 11.13.2019 13:55 | |
| 1,4-Difluorobenzene | 540-36-3 | 104 | % | 70-130 | 11.13.2019 13:55 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-2** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-002 Date Collected: 11.12.2019 12:50 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.2 | 50.2 | mg/kg | 11.13.2019 19:06 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.2 | 50.2 | mg/kg | 11.13.2019 19:06 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.2 | 50.2 | mg/kg | 11.13.2019 19:06 | U | 1 |
| Total TPH | PHC635 | <50.2 | 50.2 | mg/kg | 11.13.2019 19:06 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 117 | % | 70-135 | 11.13.2019 19:06 | |
| o-Terphenyl | 84-15-1 | 110 | % | 70-135 | 11.13.2019 19:06 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 14:14 | U | 1 |
| Toluene | 108-88-3 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 14:14 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 14:14 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00200 | 0.00200 | mg/kg | 11.13.2019 14:14 | U | 1 |
| o-Xylene | 95-47-6 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 14:14 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 14:14 | U | 1 |
| Total BTEX | | <0.000998 | 0.000998 | mg/kg | 11.13.2019 14:14 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 118 | % | 70-130 | 11.13.2019 14:14 | |
| 1,4-Difluorobenzene | 540-36-3 | 106 | % | 70-130 | 11.13.2019 14:14 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-3** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-003 Date Collected: 11.12.2019 12:42 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <49.8 | 49.8 | mg/kg | 11.13.2019 19:27 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <49.8 | 49.8 | mg/kg | 11.13.2019 19:27 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <49.8 | 49.8 | mg/kg | 11.13.2019 19:27 | U | 1 |
| Total TPH | PHC635 | <49.8 | 49.8 | mg/kg | 11.13.2019 19:27 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 118 | % | 70-135 | 11.13.2019 19:27 | |
| o-Terphenyl | 84-15-1 | 113 | % | 70-135 | 11.13.2019 19:27 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 14:33 | U | 1 |
| Toluene | 108-88-3 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 14:33 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 14:33 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00199 | 0.00199 | mg/kg | 11.13.2019 14:33 | U | 1 |
| o-Xylene | 95-47-6 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 14:33 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 14:33 | U | 1 |
| Total BTEX | | <0.000996 | 0.000996 | mg/kg | 11.13.2019 14:33 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 119 | % | 70-130 | 11.13.2019 14:33 | |
| 1,4-Difluorobenzene | 540-36-3 | 103 | % | 70-130 | 11.13.2019 14:33 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-4** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-004 Date Collected: 11.12.2019 12:36 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.2 | 50.2 | mg/kg | 11.13.2019 19:47 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.2 | 50.2 | mg/kg | 11.13.2019 19:47 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.2 | 50.2 | mg/kg | 11.13.2019 19:47 | U | 1 |
| Total TPH | PHC635 | <50.2 | 50.2 | mg/kg | 11.13.2019 19:47 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 122 | % | 70-135 | 11.13.2019 19:47 | |
| o-Terphenyl | 84-15-1 | 116 | % | 70-135 | 11.13.2019 19:47 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 14:53 | U | 1 |
| Toluene | 108-88-3 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 14:53 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 14:53 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00200 | 0.00200 | mg/kg | 11.13.2019 14:53 | U | 1 |
| o-Xylene | 95-47-6 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 14:53 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 14:53 | U | 1 |
| Total BTEX | | <0.00100 | 0.00100 | mg/kg | 11.13.2019 14:53 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 117 | % | 70-130 | 11.13.2019 14:53 | |
| 1,4-Difluorobenzene | 540-36-3 | 104 | % | 70-130 | 11.13.2019 14:53 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-5** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-005 Date Collected: 11.12.2019 12:29 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.3 | 50.3 | mg/kg | 11.13.2019 20:09 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **494** | 50.3 | mg/kg | 11.13.2019 20:09 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **155** | 50.3 | mg/kg | 11.13.2019 20:09 | | 1 |
| **Total TPH** | PHC635 | **649** | 50.3 | mg/kg | 11.13.2019 20:09 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 123 | % | 70-135 | 11.13.2019 20:09 | |
| o-Terphenyl | 84-15-1 | 105 | % | 70-135 | 11.13.2019 20:09 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 15:12 | U | 1 |
| Toluene | 108-88-3 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 15:12 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 15:12 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00201 | 0.00201 | mg/kg | 11.13.2019 15:12 | U | 1 |
| o-Xylene | 95-47-6 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 15:12 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 15:12 | U | 1 |
| Total BTEX | | <0.00101 | 0.00101 | mg/kg | 11.13.2019 15:12 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 101 | % | 70-130 | 11.13.2019 15:12 | |
| 1,4-Difluorobenzene | 540-36-3 | 105 | % | 70-130 | 11.13.2019 15:12 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-6** | Matrix: | Soil | Date Received: | 11.13.2019 09:28 |
| Lab Sample Id: | 642994-006 | Date Collected: | 11.12.2019 12:05 | Sample Depth: | 4 - 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 11.13.2019 16:00 | Basis: | Wet Weight |
| Seq Number: | 3107395 | | | SUB: | T104704400-19-19 |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.2 | 50.2 | mg/kg | 11.13.2019 20:30 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.2 | 50.2 | mg/kg | 11.13.2019 20:30 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.2 | 50.2 | mg/kg | 11.13.2019 20:30 | U | 1 |
| Total TPH | PHC635 | <50.2 | 50.2 | mg/kg | 11.13.2019 20:30 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 127 | % | 70-135 | 11.13.2019 20:30 | |
| o-Terphenyl | 84-15-1 | 118 | % | 70-135 | 11.13.2019 20:30 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | MAB | | | % Moisture: | |
| Analyst: | MAB | Date Prep: | 11.13.2019 10:11 | Basis: | Wet Weight |
| Seq Number: | 3107412 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 15:31 | U | 1 |
| Toluene | 108-88-3 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 15:31 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 15:31 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00200 | 0.00200 | mg/kg | 11.13.2019 15:31 | U | 1 |
| o-Xylene | 95-47-6 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 15:31 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 15:31 | U | 1 |
| Total BTEX | | <0.00100 | 0.00100 | mg/kg | 11.13.2019 15:31 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 118 | % | 70-130 | 11.13.2019 15:31 | |
| 1,4-Difluorobenzene | 540-36-3 | 107 | % | 70-130 | 11.13.2019 15:31 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | SS-7 | Matrix: | Soil | Date Received: | 11.13.2019 09:28 |
| Lab Sample Id: | 642994-007 | Date Collected: | 11.12.2019 11:50 | Sample Depth: | 4 - 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 11.13.2019 16:00 | Basis: | Wet Weight |
| Seq Number: | 3107395 | | | SUB: | T104704400-19-19 |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.3 | 50.3 | mg/kg | 11.13.2019 20:50 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.3 | 50.3 | mg/kg | 11.13.2019 20:50 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.3 | 50.3 | mg/kg | 11.13.2019 20:50 | U | 1 |
| Total TPH | PHC635 | <50.3 | 50.3 | mg/kg | 11.13.2019 20:50 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 119 | % | 70-135 | 11.13.2019 20:50 | |
| o-Terphenyl | 84-15-1 | 111 | % | 70-135 | 11.13.2019 20:50 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | MAB | | | % Moisture: | |
| Analyst: | MAB | Date Prep: | 11.13.2019 10:11 | Basis: | Wet Weight |
| Seq Number: | 3107412 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000994 | 0.000994 | mg/kg | 11.13.2019 15:50 | U | 1 |
| Toluene | 108-88-3 | <0.000994 | 0.000994 | mg/kg | 11.13.2019 15:50 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000994 | 0.000994 | mg/kg | 11.13.2019 15:50 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00199 | 0.00199 | mg/kg | 11.13.2019 15:50 | U | 1 |
| o-Xylene | 95-47-6 | <0.000994 | 0.000994 | mg/kg | 11.13.2019 15:50 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000994 | 0.000994 | mg/kg | 11.13.2019 15:50 | U | 1 |
| Total BTEX | | <0.000994 | 0.000994 | mg/kg | 11.13.2019 15:50 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 116 | % | 70-130 | 11.13.2019 15:50 | |
| 1,4-Difluorobenzene | 540-36-3 | 106 | % | 70-130 | 11.13.2019 15:50 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-8** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-008 Date Collected: 11.12.2019 11:25 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.3 | 50.3 | mg/kg | 11.13.2019 21:11 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.3 | 50.3 | mg/kg | 11.13.2019 21:11 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.3 | 50.3 | mg/kg | 11.13.2019 21:11 | U | 1 |
| Total TPH | PHC635 | <50.3 | 50.3 | mg/kg | 11.13.2019 21:11 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 119 | % | 70-135 | 11.13.2019 21:11 | |
| o-Terphenyl | 84-15-1 | 109 | % | 70-135 | 11.13.2019 21:11 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 16:08 | U | 1 |
| Toluene | 108-88-3 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 16:08 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 16:08 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00200 | 0.00200 | mg/kg | 11.13.2019 16:08 | U | 1 |
| o-Xylene | 95-47-6 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 16:08 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 16:08 | U | 1 |
| Total BTEX | | <0.000998 | 0.000998 | mg/kg | 11.13.2019 16:08 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 99 | % | 70-130 | 11.13.2019 16:08 | |
| 1,4-Difluorobenzene | 540-36-3 | 87 | % | 70-130 | 11.13.2019 16:08 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-9** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-009 Date Collected: 11.12.2019 11:15 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.2 | 50.2 | mg/kg | 11.13.2019 21:32 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.2 | 50.2 | mg/kg | 11.13.2019 21:32 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.2 | 50.2 | mg/kg | 11.13.2019 21:32 | U | 1 |
| Total TPH | PHC635 | <50.2 | 50.2 | mg/kg | 11.13.2019 21:32 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 119 | % | 70-135 | 11.13.2019 21:32 | |
| o-Terphenyl | 84-15-1 | 108 | % | 70-135 | 11.13.2019 21:32 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000992 | 0.000992 | mg/kg | 11.13.2019 16:27 | U | 1 |
| Toluene | 108-88-3 | <0.000992 | 0.000992 | mg/kg | 11.13.2019 16:27 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000992 | 0.000992 | mg/kg | 11.13.2019 16:27 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00198 | 0.00198 | mg/kg | 11.13.2019 16:27 | U | 1 |
| o-Xylene | 95-47-6 | <0.000992 | 0.000992 | mg/kg | 11.13.2019 16:27 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000992 | 0.000992 | mg/kg | 11.13.2019 16:27 | U | 1 |
| Total BTEX | | <0.000992 | 0.000992 | mg/kg | 11.13.2019 16:27 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 99 | % | 70-130 | 11.13.2019 16:27 | |
| 1,4-Difluorobenzene | 540-36-3 | 89 | % | 70-130 | 11.13.2019 16:27 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-10** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-010 Date Collected: 11.12.2019 11:30 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <49.8 | 49.8 | mg/kg | 11.13.2019 21:53 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **605** | 49.8 | mg/kg | 11.13.2019 21:53 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **263** | 49.8 | mg/kg | 11.13.2019 21:53 | | 1 |
| **Total TPH** | PHC635 | **868** | 49.8 | mg/kg | 11.13.2019 21:53 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 120 | % | 70-135 | 11.13.2019 21:53 | |
| o-Terphenyl | 84-15-1 | 108 | % | 70-135 | 11.13.2019 21:53 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 16:46 | U | 1 |
| Toluene | 108-88-3 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 16:46 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 16:46 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00199 | 0.00199 | mg/kg | 11.13.2019 16:46 | U | 1 |
| o-Xylene | 95-47-6 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 16:46 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 16:46 | U | 1 |
| Total BTEX | | <0.000996 | 0.000996 | mg/kg | 11.13.2019 16:46 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 106 | % | 70-130 | 11.13.2019 16:46 | |
| 1,4-Difluorobenzene | 540-36-3 | 91 | % | 70-130 | 11.13.2019 16:46 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-11** | Matrix: | Soil | Date Received: | 11.13.2019 09:28 |
| Lab Sample Id: | 642994-011 | Date Collected: | 11.12.2019 12:15 | Sample Depth: | 4 - 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 11.13.2019 16:00 | Basis: | Wet Weight |
| Seq Number: | 3107395 | | | SUB: | T104704400-19-19 |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.1 | 50.1 | mg/kg | 11.13.2019 22:36 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.1 | 50.1 | mg/kg | 11.13.2019 22:36 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.1 | 50.1 | mg/kg | 11.13.2019 22:36 | U | 1 |
| Total TPH | PHC635 | <50.1 | 50.1 | mg/kg | 11.13.2019 22:36 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 119 | % | 70-135 | 11.13.2019 22:36 | |
| o-Terphenyl | 84-15-1 | 111 | % | 70-135 | 11.13.2019 22:36 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | MAB | | | % Moisture: | |
| Analyst: | MAB | Date Prep: | 11.13.2019 10:11 | Basis: | Wet Weight |
| Seq Number: | 3107412 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 17:51 | U | 1 |
| Toluene | 108-88-3 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 17:51 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 17:51 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00200 | 0.00200 | mg/kg | 11.13.2019 17:51 | U | 1 |
| o-Xylene | 95-47-6 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 17:51 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 17:51 | U | 1 |
| Total BTEX | | <0.00100 | 0.00100 | mg/kg | 11.13.2019 17:51 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 540-36-3 | 90 | % | 70-130 | 11.13.2019 17:51 | |
| 4-Bromofluorobenzene | 460-00-4 | 105 | % | 70-130 | 11.13.2019 17:51 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-12** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-012 Date Collected: 11.12.2019 11:35 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.3 | 50.3 | mg/kg | 11.13.2019 22:57 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.3 | 50.3 | mg/kg | 11.13.2019 22:57 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.3 | 50.3 | mg/kg | 11.13.2019 22:57 | U | 1 |
| Total TPH | PHC635 | <50.3 | 50.3 | mg/kg | 11.13.2019 22:57 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 119 | % | 70-135 | 11.13.2019 22:57 | |
| o-Terphenyl | 84-15-1 | 113 | % | 70-135 | 11.13.2019 22:57 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 18:10 | U | 1 |
| Toluene | 108-88-3 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 18:10 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 18:10 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00201 | 0.00201 | mg/kg | 11.13.2019 18:10 | U | 1 |
| o-Xylene | 95-47-6 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 18:10 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 18:10 | U | 1 |
| Total BTEX | | <0.00101 | 0.00101 | mg/kg | 11.13.2019 18:10 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 102 | % | 70-130 | 11.13.2019 18:10 | |
| 1,4-Difluorobenzene | 540-36-3 | 82 | % | 70-130 | 11.13.2019 18:10 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-13** | Matrix: | Soil | Date Received: | 11.13.2019 09:28 |
| Lab Sample Id: | 642994-013 | Date Collected: | 11.12.2019 11:09 | Sample Depth: | 4 - 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 11.13.2019 16:00 | Basis: | Wet Weight |
| Seq Number: | 3107395 | | | SUB: | T104704400-19-19 |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.1 | 50.1 | mg/kg | 11.13.2019 23:18 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **280** | 50.1 | mg/kg | 11.13.2019 23:18 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **119** | 50.1 | mg/kg | 11.13.2019 23:18 | | 1 |
| **Total TPH** | PHC635 | **399** | 50.1 | mg/kg | 11.13.2019 23:18 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 122 | % | 70-135 | 11.13.2019 23:18 | |
| o-Terphenyl | 84-15-1 | 110 | % | 70-135 | 11.13.2019 23:18 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | MAB | | | % Moisture: | |
| Analyst: | MAB | Date Prep: | 11.13.2019 10:11 | Basis: | Wet Weight |
| Seq Number: | 3107412 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 18:29 | U | 1 |
| Toluene | 108-88-3 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 18:29 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 18:29 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00200 | 0.00200 | mg/kg | 11.13.2019 18:29 | U | 1 |
| o-Xylene | 95-47-6 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 18:29 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000998 | 0.000998 | mg/kg | 11.13.2019 18:29 | U | 1 |
| Total BTEX | | <0.000998 | 0.000998 | mg/kg | 11.13.2019 18:29 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 88 | % | 70-130 | 11.13.2019 18:29 | |
| 1,4-Difluorobenzene | 540-36-3 | 86 | % | 70-130 | 11.13.2019 18:29 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-14** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-014 Date Collected: 11.12.2019 11:05 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.3 | 50.3 | mg/kg | 11.13.2019 23:39 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.3 | 50.3 | mg/kg | 11.13.2019 23:39 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.3 | 50.3 | mg/kg | 11.13.2019 23:39 | U | 1 |
| Total TPH | PHC635 | <50.3 | 50.3 | mg/kg | 11.13.2019 23:39 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 117 | % | 70-135 | 11.13.2019 23:39 | |
| o-Terphenyl | 84-15-1 | 110 | % | 70-135 | 11.13.2019 23:39 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 18:48 | U | 1 |
| Toluene | 108-88-3 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 18:48 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 18:48 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00200 | 0.00200 | mg/kg | 11.13.2019 18:48 | U | 1 |
| o-Xylene | 95-47-6 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 18:48 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 18:48 | U | 1 |
| Total BTEX | | <0.00100 | 0.00100 | mg/kg | 11.13.2019 18:48 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 540-36-3 | 105 | % | 70-130 | 11.13.2019 18:48 | |
| 4-Bromofluorobenzene | 460-00-4 | 120 | % | 70-130 | 11.13.2019 18:48 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-15** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-015 Date Collected: 11.12.2019 11:00 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.2 | 50.2 | mg/kg | 11.14.2019 00:00 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.2 | 50.2 | mg/kg | 11.14.2019 00:00 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.2 | 50.2 | mg/kg | 11.14.2019 00:00 | U | 1 |
| Total TPH | PHC635 | <50.2 | 50.2 | mg/kg | 11.14.2019 00:00 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 113 | % | 70-135 | 11.14.2019 00:00 | |
| o-Terphenyl | 84-15-1 | 104 | % | 70-135 | 11.14.2019 00:00 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 19:07 | U | 1 |
| Toluene | 108-88-3 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 19:07 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 19:07 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00201 | 0.00201 | mg/kg | 11.13.2019 19:07 | U | 1 |
| o-Xylene | 95-47-6 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 19:07 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00101 | 0.00101 | mg/kg | 11.13.2019 19:07 | U | 1 |
| Total BTEX | | <0.00101 | 0.00101 | mg/kg | 11.13.2019 19:07 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 112 | % | 70-130 | 11.13.2019 19:07 | |
| 1,4-Difluorobenzene | 540-36-3 | 100 | % | 70-130 | 11.13.2019 19:07 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-16** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-016 Date Collected: 11.12.2019 10:05 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.2 | 50.2 | mg/kg | 11.14.2019 00:21 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **2910** | 50.2 | mg/kg | 11.14.2019 00:21 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **1180** | 50.2 | mg/kg | 11.14.2019 00:21 | | 1 |
| **Total TPH** | PHC635 | **4090** | 50.2 | mg/kg | 11.14.2019 00:21 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 130 | % | 70-135 | 11.14.2019 00:21 | |
| o-Terphenyl | 84-15-1 | 109 | % | 70-135 | 11.14.2019 00:21 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:26 | U | 1 |
| Toluene | 108-88-3 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:26 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:26 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00199 | 0.00199 | mg/kg | 11.13.2019 19:26 | U | 1 |
| o-Xylene | 95-47-6 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:26 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:26 | U | 1 |
| Total BTEX | | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:26 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 104 | % | 70-130 | 11.13.2019 19:26 | |
| 1,4-Difluorobenzene | 540-36-3 | 97 | % | 70-130 | 11.13.2019 19:26 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-17** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-017 Date Collected: 11.12.2019 10:30 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.0 | 50.0 | mg/kg | 11.14.2019 00:42 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **179** | 50.0 | mg/kg | 11.14.2019 00:42 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **84.8** | 50.0 | mg/kg | 11.14.2019 00:42 | | 1 |
| **Total TPH** | PHC635 | **264** | 50.0 | mg/kg | 11.14.2019 00:42 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 119 | % | 70-135 | 11.14.2019 00:42 | |
| o-Terphenyl | 84-15-1 | 109 | % | 70-135 | 11.14.2019 00:42 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:45 | U | 1 |
| Toluene | 108-88-3 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:45 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:45 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00199 | 0.00199 | mg/kg | 11.13.2019 19:45 | U | 1 |
| o-Xylene | 95-47-6 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:45 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:45 | U | 1 |
| Total BTEX | | <0.000996 | 0.000996 | mg/kg | 11.13.2019 19:45 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 540-36-3 | 105 | % | 70-130 | 11.13.2019 19:45 | |
| 4-Bromofluorobenzene | 460-00-4 | 116 | % | 70-130 | 11.13.2019 19:45 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS-18** | Matrix: | Soil | Date Received: | 11.13.2019 09:28 |
| Lab Sample Id: | 642994-018 | Date Collected: | 11.12.2019 10:35 | Sample Depth: | 4 - 6 In |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 11.13.2019 16:00 | Basis: | Wet Weight |
| Seq Number: | 3107395 | | | SUB: | T104704400-19-19 |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.3 | 50.3 | mg/kg | 11.14.2019 01:02 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.3 | 50.3 | mg/kg | 11.14.2019 01:02 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.3 | 50.3 | mg/kg | 11.14.2019 01:02 | U | 1 |
| Total TPH | PHC635 | <50.3 | 50.3 | mg/kg | 11.14.2019 01:02 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 119 | % | 70-135 | 11.14.2019 01:02 | |
| o-Terphenyl | 84-15-1 | 109 | % | 70-135 | 11.14.2019 01:02 | |

| | | | | | |
|---|---|---|---|---|---|
| Analytical Method: | BTEX by EPA 8021B | | | Prep Method: | SW5030B |
| Tech: | MAB | | | % Moisture: | |
| Analyst: | MAB | Date Prep: | 11.13.2019 10:11 | Basis: | Wet Weight |
| Seq Number: | 3107412 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:04 | U | 1 |
| Toluene | 108-88-3 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:04 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:04 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00200 | 0.00200 | mg/kg | 11.13.2019 20:04 | U | 1 |
| o-Xylene | 95-47-6 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:04 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:04 | U | 1 |
| Total BTEX | | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:04 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene | 460-00-4 | 118 | % | 70-130 | 11.13.2019 20:04 | |
| 1,4-Difluorobenzene | 540-36-3 | 106 | % | 70-130 | 11.13.2019 20:04 | |

# Certificate of Analytical Results 642994

## GHD Services, INC- Midland, Midland, TX

Indian Basin Pipeline

Sample Id: **SS-19** Matrix: Soil Date Received:11.13.2019 09:28
Lab Sample Id: 642994-019 Date Collected: 11.12.2019 10:40 Sample Depth: 4 - 6 In

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 11.13.2019 16:00 Basis: Wet Weight
Seq Number: 3107395 SUB: T104704400-19-19

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.0 | 50.0 | mg/kg | 11.14.2019 01:23 | U | 1 |
| Diesel Range Organics (DRO) | C10C28DRO | <50.0 | 50.0 | mg/kg | 11.14.2019 01:23 | U | 1 |
| Motor Oil Range Hydrocarbons (MRO) | PHCG2835 | <50.0 | 50.0 | mg/kg | 11.14.2019 01:23 | U | 1 |
| Total TPH | PHC635 | <50.0 | 50.0 | mg/kg | 11.14.2019 01:23 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 117 | % | 70-135 | 11.14.2019 01:23 | |
| o-Terphenyl | 84-15-1 | 108 | % | 70-135 | 11.14.2019 01:23 | |

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
Tech: MAB % Moisture:
Analyst: MAB Date Prep: 11.13.2019 10:11 Basis: Wet Weight
Seq Number: 3107412

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Benzene | 71-43-2 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:24 | U | 1 |
| Toluene | 108-88-3 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:24 | U | 1 |
| Ethylbenzene | 100-41-4 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:24 | U | 1 |
| m,p-Xylenes | 179601-23-1 | <0.00201 | 0.00201 | mg/kg | 11.13.2019 20:24 | U | 1 |
| o-Xylene | 95-47-6 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:24 | U | 1 |
| Total Xylenes | 1330-20-7 | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:24 | U | 1 |
| Total BTEX | | <0.00100 | 0.00100 | mg/kg | 11.13.2019 20:24 | U | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 540-36-3 | 101 | % | 70-130 | 11.13.2019 20:24 | |
| 4-Bromofluorobenzene | 460-00-4 | 119 | % | 70-130 | 11.13.2019 20:24 | |

# 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 642994



## GHD Services, INC- Midland

Indian Basin Pipeline

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3107395 — Matrix: Solid — Date Prep: 11.13.2019
MB Sample Id: 7690273-1-BLK — LCS Sample Id: 7690273-1-BKS — LCSD Sample Id: 7690273-1-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) | <15.0 | 1000 | 1170 | 117 | 1120 | 112 | 70-135 | 4 | 20 | mg/kg | 11.13.2019 17:21 | |
| Diesel Range Organics (DRO) | <15.0 | 1000 | 1150 | 115 | 1080 | 108 | 70-135 | 6 | 20 | mg/kg | 11.13.2019 17:21 | |

| Surrogate | MB %Rec | MB Flag | LCS %Rec | LCS Flag | LCSD %Rec | LCSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 116 | | 116 | | 112 | | 70-135 | % | 11.13.2019 17:21 |
| o-Terphenyl | 111 | | 106 | | 103 | | 70-135 | % | 11.13.2019 17:21 |

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3107395 — Matrix: Solid — Date Prep: 11.13.2019
MB Sample Id: 7690273-1-BLK

| Parameter | MB Result | Units | Analysis Date | Flag |
|---|---|---|---|---|
| Motor Oil Range Hydrocarbons (MRO) | <50.0 | mg/kg | 11.13.2019 17:01 | |

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3107395 — Matrix: Soil — Date Prep: 11.13.2019
Parent Sample Id: 642994-001 — MS Sample Id: 642994-001 S — MSD Sample Id: 642994-001 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) | <15.0 | 997 | 1180 | 118 | 1190 | 119 | 70-135 | 1 | 20 | mg/kg | 11.13.2019 18:24 | |
| Diesel Range Organics (DRO) | <15.0 | 997 | 1190 | 119 | 1200 | 120 | 70-135 | 1 | 20 | mg/kg | 11.13.2019 18:24 | |

| Surrogate | MS %Rec | MS Flag | MSD %Rec | MSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 128 | | 121 | | 70-135 | % | 11.13.2019 18:24 |
| o-Terphenyl | 115 | | 122 | | 70-135 | % | 11.13.2019 18:24 |

**Analytical Method:** BTEX by EPA 8021B — Prep Method: SW5030B
Seq Number: 3107412 — Matrix: Solid — Date Prep: 11.13.2019
MB Sample Id: 7690297-1-BLK — LCS Sample Id: 7690297-1-BKS — LCSD Sample Id: 7690297-1-BSD

| Parameter | MB Result | Spike Amount | LCS Result | LCS %Rec | LCSD Result | LCSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | <0.00100 | 0.100 | 0.0925 | 93 | 0.0938 | 94 | 70-130 | 1 | 35 | mg/kg | 11.13.2019 12:13 | |
| Toluene | <0.00100 | 0.100 | 0.0940 | 94 | 0.0943 | 94 | 70-130 | 0 | 35 | mg/kg | 11.13.2019 12:13 | |
| Ethylbenzene | <0.00100 | 0.100 | 0.0948 | 95 | 0.0942 | 94 | 71-129 | 1 | 35 | mg/kg | 11.13.2019 12:13 | |
| m,p-Xylenes | <0.00200 | 0.200 | 0.203 | 102 | 0.200 | 100 | 70-135 | 1 | 35 | mg/kg | 11.13.2019 12:13 | |
| o-Xylene | <0.00100 | 0.100 | 0.102 | 102 | 0.102 | 102 | 71-133 | 0 | 35 | mg/kg | 11.13.2019 12:13 | |

| Surrogate | MB %Rec | MB Flag | LCS %Rec | LCS Flag | LCSD %Rec | LCSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 100 | | 102 | | 102 | | 70-130 | % | 11.13.2019 12:13 |
| 4-Bromofluorobenzene | 108 | | 116 | | 117 | | 70-130 | % | 11.13.2019 12:13 |

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 642994



## GHD Services, INC- Midland

Indian Basin Pipeline

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

Seq Number: 3107412 Matrix: Soil Date Prep: 11.13.2019

Parent Sample Id: 642994-001 MS Sample Id: 642994-001 S MSD Sample Id: 642994-001 SD

| Parameter | Parent Result | Spike Amount | MS Result | MS %Rec | MSD Result | MSD %Rec | Limits | %RPD | RPD Limit | Units | Analysis Date | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | <0.00101 | 0.101 | 0.0922 | 91 | 0.0925 | 93 | 70-130 | 0 | 35 | mg/kg | 11.13.2019 12:51 | |
| Toluene | <0.00101 | 0.101 | 0.0902 | 89 | 0.0907 | 91 | 70-130 | 1 | 35 | mg/kg | 11.13.2019 12:51 | |
| Ethylbenzene | <0.00101 | 0.101 | 0.0863 | 85 | 0.0885 | 89 | 71-129 | 3 | 35 | mg/kg | 11.13.2019 12:51 | |
| m,p-Xylenes | <0.00202 | 0.202 | 0.183 | 91 | 0.187 | 94 | 70-135 | 2 | 35 | mg/kg | 11.13.2019 12:51 | |
| o-Xylene | <0.00101 | 0.101 | 0.0925 | 92 | 0.0948 | 95 | 71-133 | 2 | 35 | mg/kg | 11.13.2019 12:51 | |

| Surrogate | MS %Rec | MS Flag | MSD %Rec | MSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene | 105 | | 106 | | 70-130 | % | 11.13.2019 12:51 |
| 4-Bromofluorobenzene | 120 | | 121 | | 70-130 | % | 11.13.2019 12:51 |

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

# Chain of Custody

Houston,TX (281) 240-4200 Dallas,TX (214) 902-0300 San Antonio,TX (210) 509-3334
Midland,TX (432) 704-5440 EL Paso,TX (915) 585-3443 Lubbock,TX (806) 794-1296 Crasibad, NM (432) 704-5440
Phoenix,AZ (480) 355-0900 Atlanta,GA (770) 449-8800 Tampa,FL (813) 620-2000 West Palm Beach, FL (561) 689-6701
www.xenco.com

Work Order No: 602994

Page 1 of 2

| | | | |
|---|---|---|---|
| Project Manager: | John Schnable | Bill to: (if different) | GHD Services, Inc. |
| Company Name: | GHD Services, Inc | Company Name: | |
| Address: | 2135 S Loop 250 W | Address: | |
| City, State ZIP: | Midland Tx 79703 | City, State ZIP: | |
| Phone: | 432 203 8668 | Email: | John.Schnable@ghd.com |

**Work Order Comments**

Program: UST/PST ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐
State of Project:
Reporting:Level II ☐ Level III ☐ PST/UST ☐ TRRP ☐ Level IV ☐
Deliverables: EDD ☐ ADaPT ☐ Other:

| | | | |
|---|---|---|---|
| Project Name: | Indian Basin Pipeline | Turn Around | |
| Project Number: | 11202565 | Routine ☐ | |
| Project Location | Eddy County | Rush: 24hr | |
| Sampler's Name: | Joshua Pigg | Due Date: | |
| PO #: | | Quote #: | |

| SAMPLE RECEIPT | | | |
|---|---|---|---|
| Temp Blank: | Yes No | Wet Ice: | Yes No |
| Temperature (°C): | | Thermometer ID | SOP #9 |
| Received Intact: | Yes No | | |
| Cooler Custody Seals: | Yes No N/A | Correction Factor: | |
| Sample Custody Seals: | Yes No N/A | Total Containers: | |

**Preservative Codes**

MeOH: Me
None: NO
HNO3: HN
H2S04: H2
HCL: HL
NaOH: Na
Zn Acetate+ NaOH: Zn

TAT starts the day recevied by the lab, if received by 4:00pm

| Lab ID | Sample Identification | Matrix | Date Sampled | Time Sampled | Depth | Number of Containers | Pres. Code | TPH 8015M [GRO, DRO, MRO] | BTEX 8021B | Sample Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | SS-1 | Soil | 11-12-19 | 1303 | 4"-6" | | | X | X | |
| | SS-2 | | | 1250 | | | | X | X | |
| | SS-3 | | | 1242 | | | | X | X | |
| | SS-4 | | | 1236 | | | | X | X | |
| | SS-5 | | | 1229 | | | | X | X | |
| | SS-6 | | | 1205 | | | | X | X | |
| | SS-7 | | | 1150 | | | | X | X | |
| | SS-8 | | | 1125 | | | | X | X | |
| | SS-9 | | | 1115 | | | | X | X | |
| | SS-10 | | | 1130 | | | | X | X | |

**ANALYSIS REQUEST**

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Tl Sn U V Zn

*Circle Method(s) and Metal(s) to be analyzed*

TCLP / SPLP 6010: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Tl U

1631 / 245.1 / 7470 / 7471 : Hg



| Relinquished by: (Signature) | Received by: (Signature) | Date/Time | Relinquished by: (Signature) | Received by: (Signature) | Date/Time |
|---|---|---|---|---|---|
| | | 11-13-19 / 9:28 | 2 | | |
| | | | 4 | | |
| | | | 6 | | |

Revised Date 022619 Rev. 2019.1

# Chain of Custody

XENCO LABORATORIES

Houston,TX (281) 240-4200 Dallas,TX (214) 902-0300 San Antonio,TX (210) 509-3334
Midland,TX (432) 704-5440 EL Paso,TX (915) 585-3443 Lubbock,TX (806) 794-1296 Crasbad, NM (432) 704-5440
Phoenix,AZ (480) 355-0900 Atlanta,GA (770) 449-8800 Tampa,FL (813) 620-2000 West Palm Beach, FL (561) 689-6701

Work Order No: 642994

www.xenco.com Page 2 of 2

| | | | |
|---|---|---|---|
| Project Manager: | John Schnable | Bill to: (if different) | |
| Company Name: | GHD Services, Inc. | Company Name: | |
| Address: | 2135 S Loop 250 W | Address: | |
| City, State ZIP: | Midland Tx 79703 | City, State ZIP: | |
| Phone: | 432 203 8668 | Email: | John.Schnable@ghd.com |

**Work Order Comments**

Program: UST/PST ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐
State of Project:
Reporting:Level II ☐ Level III ☐ PST/UST ☐ TRRP ☐ Level IV ☐
Deliverables: EDD ☐ ADaPT ☐ Other:

| | | | |
|---|---|---|---|
| Project Name: | Indian Basin Pipeline | Turn Around | |
| Project Number: | 11202565 | Routine ☐ | |
| Project Location | Eddy County | Rush: 24 hr | |
| Sampler's Name: | Joshua Pigg | Due Date: | |
| PO #: | | Quote #: | |

| SAMPLE RECEIPT | | | |
|---|---|---|---|
| Temp Blank: | (Yes) No | Wet Ice: | (Yes) No |
| Temperature (°C): | 5.8 | Thermometer ID | |
| Received Intact: | (Yes) No | T-NM-009 | |
| Cooler Custody Seals: | Yes (No) N/A | Correction Factor: | -0.2 |
| Sample Custody Seals: | Yes (No) N/A | Total Containers: | 19 |

**Preservative Codes**

MeOH: Me
None: NO
HNO3: HN
H2S04: H2
HCL: HL
NaOH: Na
Zn Acetate+ NaOH: Zn

TAT starts the day recevied by the lab, if received by 4:00pm

| Lab ID | Sample Identification | Matrix | Date Sampled | Time Sampled | Depth | Number of Containers | Pres. Code | TPH 8015 (GRO, DRO, MRO) | BTEX 8021B | Sample Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | SS-11 | Soil | 11-12-19 | 1215 | 4"-6" | | | X | X | |
| | SS-12 | | | 1135 | | | | X | X | |
| | SS-13 | | | 1109 | | | | X | X | |
| | SS-14 | | | 1105 | | | | X | X | |
| | SS-15 | | | 1100 | | | | X | X | |
| | SS-16 | | | 1005 | | | | X | X | |
| | SS-17 | | | 1030 | | | | X | X | |
| | SS-18 | | | 1035 | | | | X | X | |
| | SS-19 | | | 1040 | | | | X | X | |

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Tl Sn U V Zn

*Circle Method(s) and Metal(s) to be analyzed*

TCLP / SPLP 6010: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Tl U 1631 / 245.1 / 7470 / 7471 : Hg

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of $75.00 will be applied to each project and a charge of $5 for each sample submitted to Xenco, but not analyzed. These terms will be enforced unless previously negotiated.

| Relinquished by: (Signature) | Received by: (Signature) | Date/Time | Relinquished by: (Signature) | Received by: (Signature) | Date/Time |
|---|---|---|---|---|---|
| | | 11-13-19 9:28 | 2 | | |
| | | | 4 | | |
| | | | 6 | | |

Revised Date 022619 Rev. 2019.1

# Inter-Office Shipment





**IOS Number** **52150**

Date/Time: 11/13/19 12:27
Lab# From: **Carlsbad**
Lab# To: **Midland**

Created by: Elizabeth Mcclellan
Delivery Priority:
Air Bill No.:

Please send report to: Debbie Simmons
Address: 1089 N Canal Street
E-Mail: debbie.simmons@xenco.com

| Sample Id | Matrix | Client Sample Id | Sample Collection | Method | Method Name | Lab Due | HT Due | PM | Analytes | Sign |
|---|---|---|---|---|---|---|---|---|---|---|
| 642994-001 | S | SS-1 | 11/12/19 13:03 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-002 | S | SS-2 | 11/12/19 12:50 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-003 | S | SS-3 | 11/12/19 12:42 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-004 | S | SS-4 | 11/12/19 12:36 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-005 | S | SS-5 | 11/12/19 12:29 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-006 | S | SS-6 | 11/12/19 12:05 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-007 | S | SS-7 | 11/12/19 11:50 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-008 | S | SS-8 | 11/12/19 11:25 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-009 | S | SS-9 | 11/12/19 11:15 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-010 | S | SS-10 | 11/12/19 11:30 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-011 | S | SS-11 | 11/12/19 12:15 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-012 | S | SS-12 | 11/12/19 11:35 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-013 | S | SS-13 | 11/12/19 11:09 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-014 | S | SS-14 | 11/12/19 11:05 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-015 | S | SS-15 | 11/12/19 11:00 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-016 | S | SS-16 | 11/12/19 10:05 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-017 | S | SS-17 | 11/12/19 10:30 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-018 | S | SS-18 | 11/12/19 10:35 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |
| 642994-019 | S | SS-19 | 11/12/19 10:40 | SW8015MOD_NM | TPH By SW8015 Mod | 11/14/19 | 11/26/19 | DES | PHCC10C28 PHCC28C35 | |

**Inter Office Shipment or Sample Comments:**

Relinquished By: Elizabeth McClellan

Date Relinquished: 11/13/2019

Received By: Brianna Teel

Date Received: 11/13/2019 16:00

Cooler Temperature: 0.6

# XENCO Laboratories

## Inter Office Report- Sample Receipt Checklist

**Sent To:** Midland

**IOS #:** 52150

**Acceptable Temperature Range: 0 - 6 degC**
**Air and Metal samples Acceptable Range: Ambient**
**Temperature Measuring device used : R8**

**Sent By:** Elizabeth McClellan **Date Sent:** 11/13/2019 12:27 PM

**Received By:** Brianna Teel **Date Received:** 11/13/2019 04:00 PM

| Sample Receipt Checklist | | Comments |
|---|---|---|
| #1 *Temperature of cooler(s)? | .6 | |
| #2 *Shipping container in good condition? | **Yes** | |
| #3 *Samples received with appropriate temperature? | **Yes** | |
| #4 *Custody Seals intact on shipping container/ cooler? | **Yes** | |
| #5 *Custody Seals Signed and dated for Containers/coolers | **Yes** | |
| #6 *IOS present? | **Yes** | |
| #7 Any missing/extra samples? | **No** | |
| #8 IOS agrees with sample label(s)/matrix? | **Yes** | |
| #9 Sample matrix/ properties agree with IOS? | **Yes** | |
| #10 Samples in proper container/ bottle? | **Yes** | |
| #11 Samples properly preserved? | **Yes** | |
| #12 Sample container(s) intact? | **Yes** | |
| #13 Sufficient sample amount for indicated test(s)? | **Yes** | |
| #14 All samples received within hold time? | **Yes** | |

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

**NonConformance:**

**Corrective Action Taken:**

**Nonconformance Documentation**

**Contact:** _____ **Contacted by :** _____ **Date:** _____

**Checklist reviewed by:** Brianna Teel Date: 11/13/2019

Brianna Teel

# XENCO Laboratories

## Prelogin/Nonconformance Report- Sample Log-In

**Client:** GHD Services, INC- Midland

**Date/ Time Received:** 11.13.2019 09.28.00 AM

**Work Order #:** 642994

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

**Temperature Measuring device used : T-NM-007**

| Sample Receipt Checklist | | Comments |
|---|---|---|
| #1 *Temperature of cooler(s)? | 5.8 | |
| #2 *Shipping container in good condition? | **Yes** | |
| #3 *Samples received on ice? | **Yes** | |
| #4 *Custody Seals intact on shipping container/ cooler? | **Yes** | |
| #5 Custody Seals intact on sample bottles? | **Yes** | |
| #6*Custody Seals Signed and dated? | **Yes** | |
| #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)? | **Yes** | TPH Subbed to Xenco Midland. |
| #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:** Elizabeth McClellan Date: 11.13.2019

**Checklist reviewed by:** Debbie Simmons Date: 11.14.2019

Debbie Simmons

# Certificate of Analysis Summary 650213

## GHD Services, INC- Midland, Midland, TX

## Project Name: KM Indian Basin

**Project Id:** 11202565
**Contact:** John Schnable
**Project Location:** Artesia, NM

**Date Received in Lab:** Fri 01.24.2020 12:22
**Report Date:** 01.29.2020 15:04
**Project Manager:** Debbie Simmons

| *Analysis Requested* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ***Lab Id:*** | 650213-001 | | 650213-002 | | | | | |
| | ***Field Id:*** | SS5-2ft | | SS5-3ft | | | | | |
| | ***Depth:*** | 2- ft | | 3- ft | | | | | |
| | ***Matrix:*** | SOIL | | SOIL | | | | | |
| | ***Sampled:*** | 01.23.2020 11:00 | | 01.23.2020 11:05 | | | | | |
| **TPH By SW8015 Mod** | ***Extracted:*** | 01.25.2020 12:00 | | 01.28.2020 15:00 | | | | | |
| | ***Analyzed:*** | 01.26.2020 09:20 | | 01.29.2020 06:05 | | | | | |
| | ***Units/RL:*** | mg/kg | RL | mg/kg | RL | | | | |
| Gasoline Range Hydrocarbons (GRO) | | <50.0 | 50.0 | <49.9 | 49.9 | | | | |
| Diesel Range Organics (DRO) | | 912 | 50.0 | 1240 | 49.9 | | | | |
| Motor Oil Range Hydrocarbons (MRO) | | 317 | 50.0 | 458 | 49.9 | | | | |
| Total TPH | | 1230 | 50.0 | 1700 | 49.9 | | | | |



Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Debbie Simmons
Project Manager

# Analytical Report 650213

## for

## GHD Services, INC- Midland

**Project Manager: John Schnable**

**KM Indian Basin**

**11202565**

**01.29.2020**

Collected By: Client

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

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2019-058), North Carolina (681), Arkansas (19-037-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)

01.29.2020

Project Manager: **John Schnable**
**GHD Services, INC- Midland**
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **650213**
**KM Indian Basin**
Project Address: Artesia, NM

**John Schnable**:

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) 650213. 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. 650213 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,

Debbie Simmons

**Debbie Simmons**
Project Manager

*A Small Business and Minority Company*

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

# Sample Cross Reference 650213

## GHD Services, INC- Midland, Midland, TX

KM Indian Basin

| Sample Id | Matrix | Date Collected | Sample Depth | Lab Sample Id |
|---|---|---|---|---|
| SS5-2ft | S | 01.23.2020 11:00 | 2 ft | 650213-001 |
| SS5-3ft | S | 01.23.2020 11:05 | 3 ft | 650213-002 |

# CASE NARRATIVE

***Client Name: GHD Services, INC- Midland***

***Project Name: KM Indian Basin***

Project ID: *11202565*
Work Order Number(s): *650213*

Report Date: *01.29.2020*
Date Received: *01.24.2020*

**Sample receipt non conformances and comments:**

01.27.20 @ 4:20: per John Schnable remove SS 5 - 3 ft from hold and analyze for TPH on a 24 hour TAT. Report revised 01.29.20 to include these results.

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

None

# Certificate of Analytical Results 650213

## GHD Services, INC- Midland, Midland, TX

KM Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS5-2ft** | Matrix: | Soil | Date Received: | 01.24.2020 12:22 |
| Lab Sample Id: | 650213-001 | Date Collected: | 01.23.2020 11:00 | Sample Depth: | 2 ft |
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.25.2020 12:00 | Basis: | Wet Weight |
| Seq Number: | 3114508 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <50.0 | 50.0 | mg/kg | 01.26.2020 09:20 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **912** | 50.0 | mg/kg | 01.26.2020 09:20 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **317** | 50.0 | mg/kg | 01.26.2020 09:20 | | 1 |
| **Total TPH** | PHC635 | **1230** | 50.0 | mg/kg | 01.26.2020 09:20 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 118 | % | 70-135 | 01.26.2020 09:20 | |
| o-Terphenyl | 84-15-1 | 104 | % | 70-135 | 01.26.2020 09:20 | |

# Certificate of Analytical Results 650213

## GHD Services, INC- Midland, Midland, TX

KM Indian Basin

| | | | | | |
|---|---|---|---|---|---|
| Sample Id: | **SS5-3ft** | Matrix: | Soil | Date Received: | 01.24.2020 12:22 |
| Lab Sample Id: | 650213-002 | Date Collected: | 01.23.2020 11:05 | Sample Depth: | 3 ft |
| Analytical Method: | TPH By SW8015 Mod | | | Prep Method: | SW8015P |
| Tech: | DVM | | | % Moisture: | |
| Analyst: | ARM | Date Prep: | 01.28.2020 15:00 | Basis: | Wet Weight |
| Seq Number: | 3114788 | | | | |

| Parameter | Cas Number | Result | RL | Units | Analysis Date | Flag | Dil |
|---|---|---|---|---|---|---|---|
| Gasoline Range Hydrocarbons (GRO) | PHC610 | <49.9 | 49.9 | mg/kg | 01.29.2020 06:05 | U | 1 |
| **Diesel Range Organics (DRO)** | C10C28DRO | **1240** | 49.9 | mg/kg | 01.29.2020 06:05 | | 1 |
| **Motor Oil Range Hydrocarbons (MRO)** | PHCG2835 | **458** | 49.9 | mg/kg | 01.29.2020 06:05 | | 1 |
| **Total TPH** | PHC635 | **1700** | 49.9 | mg/kg | 01.29.2020 06:05 | | 1 |

| Surrogate | Cas Number | % Recovery | Units | Limits | Analysis Date | Flag |
|---|---|---|---|---|---|---|
| 1-Chlorooctane | 111-85-3 | 85 | % | 70-135 | 01.29.2020 06:05 | |
| o-Terphenyl | 84-15-1 | 87 | % | 70-135 | 01.29.2020 06:05 | |

# 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. **ND** Not Detected.

**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 650213



## GHD Services, INC- Midland

KM Indian Basin

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3114508 — Matrix: Solid — Date Prep: 01.25.2020
MB Sample Id: 7695229-1-BLK — LCS Sample Id: 7695229-1-BKS — LCSD Sample Id: 7695229-1-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) | <50.0 | 1000 | 1060 | 106 | 1050 | 105 | 70-135 | 1 | 20 | mg/kg | 01.25.2020 21:21 | |
| Diesel Range Organics (DRO) | <15.0 | 1000 | 1180 | 118 | 1180 | 118 | 70-135 | 0 | 20 | mg/kg | 01.25.2020 21:21 | |

| Surrogate | MB %Rec | MB Flag | LCS %Rec | LCS Flag | LCSD %Rec | LCSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 122 | | 123 | | 122 | | 70-135 | % | 01.25.2020 21:21 |
| o-Terphenyl | 130 | | 125 | | 113 | | 70-135 | % | 01.25.2020 21:21 |

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3114788 — Matrix: Solid — Date Prep: 01.28.2020
MB Sample Id: 7695382-1-BLK — LCS Sample Id: 7695382-1-BKS — LCSD Sample Id: 7695382-1-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) | <15.0 | 1000 | 1080 | 108 | 943 | 94 | 70-135 | 14 | 20 | mg/kg | 01.28.2020 22:26 | |
| Diesel Range Organics (DRO) | <15.0 | 1000 | 1050 | 105 | 919 | 92 | 70-135 | 13 | 20 | mg/kg | 01.28.2020 22:26 | |

| Surrogate | MB %Rec | MB Flag | LCS %Rec | LCS Flag | LCSD %Rec | LCSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 93 | | 123 | | 108 | | 70-135 | % | 01.28.2020 22:26 |
| o-Terphenyl | 96 | | 119 | | 106 | | 70-135 | % | 01.28.2020 22:26 |

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3114508 — Matrix: Solid — Date Prep: 01.25.2020
MB Sample Id: 7695229-1-BLK

| Parameter | MB Result | Units | Analysis Date | Flag |
|---|---|---|---|---|
| Motor Oil Range Hydrocarbons (MRO) | <50.0 | mg/kg | 01.25.2020 21:00 | |

**Analytical Method:** TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3114788 — Matrix: Solid — Date Prep: 01.28.2020
MB Sample Id: 7695382-1-BLK

| Parameter | MB Result | Units | Analysis Date | Flag |
|---|---|---|---|---|
| Motor Oil Range Hydrocarbons (MRO) | <50.0 | mg/kg | 01.28.2020 22:08 | |

MS/MSD Percent Recovery [D] = 100*(C-A) / B
Relative Percent Difference RPD = 200* | (C-E) / (C+E) |
LCS/LCSD Recovery [D] = 100 * (C) / [B]
Log Difference 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

# QC Summary 650213

## GHD Services, INC- Midland

KM Indian Basin

**Analytical Method:** **TPH By SW8015 Mod** Prep Method: SW8015P
Seq Number: 3114508 Matrix: Soil Date Prep: 01.25.2020
Parent Sample Id: 649846-001 MS Sample Id: 649846-001 S MSD Sample Id: 649846-001 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) | 23.8 | 997 | 1070 | 105 | 996 | 97 | 70-135 | 7 | 20 | mg/kg | 01.25.2020 22:24 | |
| Diesel Range Organics (DRO) | <15.0 | 997 | 1140 | 114 | 1130 | 113 | 70-135 | 1 | 20 | mg/kg | 01.25.2020 22:24 | |

| Surrogate | MS %Rec | MS Flag | MSD %Rec | MSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 128 | | 122 | | 70-135 | % | 01.25.2020 22:24 |
| o-Terphenyl | 126 | | 111 | | 70-135 | % | 01.25.2020 22:24 |

**Analytical Method:** **TPH By SW8015 Mod** Prep Method: SW8015P
Seq Number: 3114788 Matrix: Soil Date Prep: 01.28.2020
Parent Sample Id: 650474-001 MS Sample Id: 650474-001 S MSD Sample Id: 650474-001 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) | <15.0 | 997 | 870 | 87 | 878 | 88 | 70-135 | 1 | 20 | mg/kg | 01.28.2020 23:24 | |
| Diesel Range Organics (DRO) | <15.0 | 997 | 861 | 86 | 865 | 87 | 70-135 | 0 | 20 | mg/kg | 01.28.2020 23:24 | |

| Surrogate | MS %Rec | MS Flag | MSD %Rec | MSD Flag | Limits | Units | Analysis Date |
|---|---|---|---|---|---|---|---|
| 1-Chlorooctane | 97 | | 96 | | 70-135 | % | 01.28.2020 23:24 |
| o-Terphenyl | 80 | | 88 | | 70-135 | % | 01.28.2020 23:24 |

MS/MSD Percent Recovery [D] = 100*(C-A) / B
Relative Percent Difference RPD = 200* | (C-E) / (C+E) |
LCS/LCSD Recovery [D] = 100 * (C) / [B]
Log Difference 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

# CHAIN OF CUSTODY

Page 1 Of 1

XENCO LABORATORIES

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Stafford,Texas (281-240-4200)

Dallas Texas (214-902-0300)

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Odessa, Texas (432-563-1800)

Norcross, Georgia (770-449-8800)

Lakeland, Florida (863-646-8526)

Tampa, Florida (813-620-2000)

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Xenco Quote #

Xenco Job # 105213

**Client / Reporting Information**

Company Name / Branch: GHD / Midland

Company Address: 2135 S. Loop 250 West, Midland, TX 79703

Email: john.schnable@ghd.com

Phone No: 432-686-0086

Project Contact: John Schnable

Samplers's Name Glenn Quinney

**Project Information**

Project Name/Number: KM Indian Basin/ 11202565

Project Location: Artesia NM

Invoice To: Christopher Knight <Christopher.Knight@ghd.com>

PO Number:

**Analytical Information**

**Matrix Codes**

S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
W = Wipe
O = Oil
WW= Waste Water
A = Air

| No. | Field ID / Point of Collection | Collection: Sample Depth | Collection: Date | Collection: Time | Matrix | # of bottles | Number of preserved bottles: HCl | NaOH/Zn Acetate | HNO3 | H2SO4 | NaOH | NaHSO4 | MEOH | NONE | TPH SW8015 Mod | | | | | | | | | | Field Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SS 5 - 2ft | 2ft | 1/23/2020 | 1100 | S | 1 | | | | | | | | x | X | | | | | | | | | | |
| 2 | SS 5 - 3ft | 3ft | 1/23/2020 | 1105 | S | 1 | | | | | | | | x | x | | | | | | | | | | Hold pending above results |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | |

**Turnaround Time ( Business days)**

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [x] Next Day EMERGENCY
- [ ] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

**Data Deliverable Information**

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

**Notes:**

Contact John Schnable if any Questions

Report SDL/ Flag estimated concentrations

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by Sampler: 1 | Date Time: 1/24/20 | Received By: 1 | Relinquished By: 2 | Date Time: | Received By: 2 |
| Relinquished by: 3 | Date Time: | Received By: 3 1220 | Relinquished By: 4 | Date Time: | Received By: 4 |
| Relinquished by: 5 | Date Time: | Received By: 5 | Custody Seal # | Preserved where applicable | On Ice: Y Cooler Temp. 1.6 Thermo. Corr. Factor 0 |

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to XENCO Laboratories and its affiliates, subcontractors and assigns XENCO's standard terms and conditions of service unless previously negotiated under a fully executed client contract.

# XENCO Laboratories

## Prelogin/Nonconformance Report- Sample Log-In

**Client:** GHD Services, INC- Midland

**Date/ Time Received:** 01.24.2020 12.22.00 PM

**Work Order #:** 650213

**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)? | 1.6 |
| #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: 01.24.2020

Brianna Teel

**Checklist reviewed by:** Debbie Simmons Date: 01.27.2020

Debbie Simmons

# Appendix G
# Photographic Log


Photo 1. East view of eastern end of excavation to remove damaged pipeline. Note the pumping unit in the upper right corner of the photo.

Photo 2. A pumping unit approximately 60 feet south-southwest of sampling location SS-5. Note stained soil around the pumping unit.

## Site Photographs


Photo 3. South view of western end of excavation to remove damaged pipeline.


Photo 4. West view of southern end of scraped area.

## Site Photographs


Photo 5. North view of scraped area.


Photo 6. North view showing eastern margin of scraped area and western boundary of darkly stained area.

## Site Photographs


Photo 7. Southwest view of darkly stained area showing its eastern margin. Release point is in background.


Photo 8. North view of southern-most boom across drainage path.

## Site Photographs


Photo 9. North view of middle boom across drainage path.


Photo 10. North view of northern-most boom across drainage path.

## Site Photographs


Photo 11. An aerial photo from Google Earth dated March 27, 2010 showing the small pumping unit that remains approximately 60 feet south-southwest of sampling location SS-5 and two above-ground storage tanks whose previous locations were approximately 25 feet north of SS-5. Note stained soil in the vicinity of the two tanks.

# Appendix H
# White Paper on R3mediate

**21ST CENTURY IN-SITU SOLUTION FOR HYDROCARBON SPILLS**

# R3MEDIATE™

ROB ROACH, M.S.
BUSINESS DEVELOPMENT
R3 INDUSTRIAL CLEANING SERVICES, LLC


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R3 INDUSTRIAL CLEANING SERVICES, LLC

**WWW.R3MEDIATE.COM**

# BACKGROUND & LITERATURE REVIEW

Hazardous wastes, toxic spills, contaminated water, contaminated soil, and pollutants are but a few of the environmental problems we face today all over the world. Since the late 1970's, great concern was expressed over the disposal of hazardous or toxic wastes. Common pollutants in soil and in water include asbestos, polychlorinated biphenyls ("PCB'), chlorinated hydrocarbons, petroleum products, pesticides, herbicides, and heavy metals. Most of these pollutants are man-made and have relatively long half-lives. Development and dissemination of such sophisticated and sensitive equipment as gas chromatographs, coupled with flame ionization and electron capture detectors, have allowed detection of pollutants with unheard of precision and accuracy (Rosenfeld & Feng, 2011).

Asbestos was used extensively prior to the 1980's to insulate structural steel and heating ducts, as a fibrous material in acoustical ceilings, in various applications on space heating and cooling units, in roofing papers, and in vinyl tiles adhesives (Dahlgren, 2016). Asbestos can be analyzed and identified rapidly and inexpensively by microscopic analysis. Removal of the asbestos from a contaminated site is possible, but the task is invariably expensive. Further, it is never the best solution if the job is not properly done.

PCB’s are widely used as insulation in electrical equipment, such as transformers and capacitors. If an electrical equipment contains PCB's, the equipment, its support platform, and the soil under and around the area most likely will contain these pollutants. The polymers are, to a certain extent, fire resistant. When they are burned, however, some toxic dioxin is formed as a by-product of the combustion, along with phosgene and hydrochloric acid. The toxic dioxin produced is the toxin reported in "Agent Orange.” PCB's biodegrade very slowly. Their very low vapor pressure precludes their loss to the atmosphere. Thus, cleanup of PCB's is particularly expensive

since incineration is the normal method of decontamination of removed material (Zhao, et.al., 2015).

Chlorinated hydrocarbons have been widely used for at least five decades. These materials are used in paint thinners, paint strippers, degreasers, and 'dry cleaning' solvents. Chlorinated hydrocarbons generally include dichloromethane, chloroform, carbon tetrachloride, dichloroethanes, and others. Carbon tetrachloride is very toxic and when burned forms phosgene and hydrochloric acid. Chlorinated hydrocarbons have relatively high vapor pressure, and their density is greater than that of water. These solvents are very likely to enter soil and groundwater. These materials enter the soil rapidly and move downward as liquid. Decontamination soil containing this class of pollutants is usually done by excavation and gas extraction. (Ma, et.al., 2015) At one time, the decontamination was done by volatilization to atmosphere. Now, this old method is not considered acceptable in in most areas.

Petroleum hydrocarbon pollutants are common in virtually every area used by man. Petroleum products include crude oil, crude condensate, motor fuels, standard solvents, kerosene, and paint thinners. Benzene, a constituent of gasoline, is carcinogenic. A prevalent risk today is from leaking tanks. There is usually very little opportunity for degradation deep in the soil column or in an underground water column (Chapelle, Bradley, Lovley, O'Neill, & Landmeyer, 2002).

Pesticides and herbicides have been in general use since the early 1940's. They were used on farm crops, for right-of-way control, for forest management, and even for decorative management in houses and gardens. Pesticides are not only toxic but degrade slowly. Cleanup of these pollutants is exceedingly expensive (Fenster, et.al, 2006).

The most common heavy metal pollutants include lead, chromium, and mercury. Lead has been widely used in car batteries and paints. These heavy metals do not degrade because they are basic elements. Some, such as mercury, are, however, capable of biotransformation from inorganic to organic forms (Rajpert, Schaffer, & Lenz, 2018). One of the techniques to decontaminate such pollutants is adjustment of the pH. Oxidation and reduction actions are also used to decontaminate these pollutants.

Although not considered a pollutant, forest fires, oil-field fires and other fires are likewise hazardous. They are hazardous not only because of the damage they cause to the properties and materials, but also because of the gases generated by them (Schweizer, Cisneros, Traina, Ghezzehei, & Shaw, 2017).

**HISTORICAL EX-SITU LIMITATIONS**

For large scale decontamination of soil pollutants, one of the ways currently used is to excavate the soil, spread the soil out on a polyethylene film sheet, then allow the low boiling hydrocarbons to be released into the air. Afterward, the soil must be taken to a hazardous waste landfill or even transported to an incinerator where the remaining pollutants are burnt. In burning this soil, gases, some toxic, are released to the air. Even after this costly procedure, the remainder still may have to be deposited into a hazardous waste landfill.

Biological treatment of wastes has also been tried. In this method, the pollutants are exposed to some microorganisms. The method will fail, however, if the annual rainfall is high and the erosion potential is not minimal. Difficulties also arise when the technique is applied in a careless manner. It is thus clear that there is an urgent need for an effective pollution remedial composition.

The five commonly used techniques utilized in the process of remediating hydrocarbon contamination (microbes, hydrogen peroxide, persulfate, permanganate, and ozone as $O_3$) have limitations to their effective use in certain "in situ" applications. These include altering the soil pH, soil temperatures, microbe cannibalism, and additional aquatic life threats. R3MEDIATE works differently to avoid these typical threats.

**R3MEDIATE SCIENCE**

Rather than creating additional process problems and environmental threats, R3MEDIATE uses a combined approach, utilizing a uniquely designed reactive silica-based formulation to initiate a high- energy redox reaction, allowing it to react to hydrocarbon and trap the hydrocarbon within the silica cell. This "micro-encapsulation" renders the hydrocarbon both insoluble and immobile. Consequently, R3MEDIATE has been demonstrated to be safe in aquatic/marine environments, as well as land-based applications. Measured total petroleum hydrocarbon (TPH) concentrations may be effectively reduced to at or under regulatory guidelines, when applied correctly.

**EPA APPROVED METHODOLOGY**

In formal remediation projects, the United States Environmental Protection Agency (USEPA) has accepted and issued guidelines for clean-up technologies using chemical oxidation (USEPA, 2004). The overall issue is to identify what is being treated, the site factors, Chemical oxidation design, permitting issues, and a written performance monitoring plan. Over twenty years ago the USEPA reported chemical oxidation is an "innovative" technology to combat and treat hazardous waste in water, sediment and soil (USEPA, 1998).

Chemical oxidation involves reduction oxidation or REDOX reactions. In REDOX hazardous substances are converted to non-hazardous, less toxic and inert. The USEPA reports

stabilization agents include soluble silicates and allows for in-situ remediation techniques and processes (USEPA, 2006).

## INDEPENDENT STUDY OF SILICA ENCAPSULATION

Recent studies have evaluated the effectiveness of hydrocarbon remediation by a silica encapsulation (SE) technique. Medjor, Akpoveta, and Medjor (2018) conclude SE method are better remediation technologies than other chemical methods such as the Fenton Oxidative since it does not emit greenhouse gases. Other important observations related to the performance of silica encapsulation technology are: 1). Encapsulation is by silica, an economic and environmentally safe material whose physical and chemical characteristics resemble soil, provides a metal and hydrocarbon impermeable coating of the soil-sorbent mixture therefore exposure to the environment poses no threat to the environment. 2). Remediation is accomplished within a short period of time and with minimal environmental disturbance. 3). SE is effective in the acidic environment. 4). SE can be used to remediate the environment contaminated by both hydrocarbons and metals; and, 5). The silica coating is stable over a broad pH range; contaminants cannot be released even when the environment is subjected to harsh acidic and basic conditions.

## PROPRIETARY PATENT ANALYTICAL FINDINGS

| | PPM CONTROL | PPM TREATED | RESULT |
|---|---|---|---|
| **ENDOSULFAN RESIDUALS** | **54,410** | **95** | **-99.825%** |
| **BENZENE RESIDUALS** | **38477** | **3556** | **-90.758%** |
| **ETHYLENE GLYCOL RESIDUALS** | **37** | **0.1** | **-99.729%** |
| **TRICHLOROETHANE RESIDUALS** | **173** | **12** | **-93.063%** |

| | | | |
|---|---|---|---|
| **BENZENE** | **.008** | **.0004** | **-95.000%** |
| **TOLULENE** | **.03** | **.004** | **-86.667%** |
| **ETHLYBENZENE** | **.01** | **.001** | **-90.000%** |
| **M,P-XYLENE** | **.027** | **.004** | **-85.185%** |
| **0-XYLENE** | **.017** | **.003** | **-82.353%** |

**R3MEDIATE FOR HYDROCARBON CONTAMINATED SOIL**

Confidential client field trials and customer testimonials indicate R3MEDIATE effectively brings total petroleum hydrocarbons to at or under regulatory applications, when applied correctly. Base R3MEDIATE will effectively treat hard surfaces such as piping, rock and gravel as well as soil contaminated with substances up to the C6 level of the hydrocarbon chain. For hydrocarbons beyond C-7 and beyond; a proprietary formula is added to base R3MEDIATE to allow the hydrocarbon to be effectively reduced and allow for effective and efficient micro-encapsulation.

# FIELD CASES

**WYOMING CALICHE PAD SITE (JULY 2019)**

Client called with hydrocarbon release around wellhead and sporadic spot releases on pad. R3 Technicians arrived on location and observed black, oily, dirt around wellhead (Fig. 1) and spot releases or older oily releases around open area of the pad site (Fig. 3). The pad site was well-packed, caliche, and in good condition and well-maintained, excluding the oil releases mentioned.

R3 Technicians conducted tailgate safety meeting and proceeded to train third-party applicators and the client on R3MEDIATE processes and chemistry. Applicators began

R3MEDIATE application and process. Figure 2 displays results seventy-two (72) hours post treatment while Figure 4 shows results a mere six (6) hours post treatment.

**MIDSTREAM GAS PROCESSING PLANT (WEST TEXAS REGION, JULY 2019)**

Client operates a gas processing plant in West Texas. The problem involved a hydrocarbon release causing significant hydrocarbon staining to the piping, soil, and gravel at the site (Fig. 5). R3 Technicians arrived and began a full-service R3MEDIATE Treatment after the required client safety orientation. After twenty-four (24) hours the surfaces display significant improvement with vast redox and subsequent micro-encapsulation of hydrocarbons occurring (Fig. 6).

**FIELD SERVICE MIDSTREAM CLIENT (OKLAHOMA, JUNE 2019)**

Client is a midstream client requiring field service secondary to a hydrocarbon release on soil and vegetation in Oklahoma (Fig. 7). R3 Technicians arrived on location and conducted required client safety orientation.

R3 Technicians began the R3MEDIATE application and process. Figure 8 details results only five (5) hours into the process. Significant redox reaction and encapsulation is present as evidence of the soil restoring to light brown from its original black, oily, sheen. Client placed additional order of the R3MEDIATE the same day as treatment for self-service within their processing plant. Corporate wide the client continues to order both full-service and self-service R3MEDIATE.

# CONCLUSION AND RECOMMENDATIONS

Chemical oxidation, which involves oxygen reduction or “redox reactions” are an approved in-situ remediation technology by the United States Environmental Protection Agency (USEPA,

1998, 2004 & 2006). R3MEDIATE uses a combined approach, utilizing a uniquely designed reactive silica-based formulation to initiate a high- energy redox reaction, allowing it to react to hydrocarbons and trap the hydrocarbon within the silica cell. This “micro-encapsulation” renders the hydrocarbon both insoluble and immobile. R3MEDIATE is safe, non-toxic, and safe in aquatic environments.

R3MEDIATE mitigates several limitations present in commonly used in-situ hydrocarbon remediation. When compared to ex-situ alternatives R3MEDIATE defers a significant amount of capital and also enhances safety conditions by eliminating personnel required, heavy equipment, and significant lease traffic.

For companies and service providers seeking innovative solutions; R3MEDIATE is recommended for good environmental stewardship via housekeeping scheduling, revolving preventative maintenance schedules and turnaround job tasks. With regard to formal remediation jobs; R3MEDIATE may be utilized as part of a formal work plan including site closure.

For technical and/or regulatory assistance; it is recommended utilizing R3 Industrial Cleaning Services, LLC third-party provider. R3’s third-party provider is a professional, contract research organization comprised of a highly diversified interdisciplinary team of solely P.E. (professional engineer), M.S. (masters) and Ph.D. (doctoral) degreed scientists. Their scope of expertise in a support role extends broadly for R3 Clients in both domestic and international markets.

## R3MEDIATE SOIL-BASED APPLICATION PROCESS

The preferred method of application of R3MEDIATE is spraying. It can be applied with a power spraying system or even with garden type sprayers to effectively treat organic hydrocarbon

contamination. Spray the product on the contaminated soils in atomized form. A fine mist spray nozzle is recommended to get a better distribution of chemical in contact with the oil. This also increases the presence of oxygen in the chemical processes which enhances its effectiveness.

Alternatively, oxygen can be brought into the process by the addition of aeration or by adding hydrogen peroxide to the formulation. For best results, agitation of the soil after spraying with product will:

a). Help promote direct contact with all of the contaminated soil, and

b). Increase the exposure to oxygen. In non-porous and/or heavily contaminated soils, it will be necessary to rake or till the soil to the level of the depth of contamination.

Rain water will continue the activation of the R3MEDIATE by helping disperse the product throughout the soil and by the introduction of additional oxygen. Clay soil, being much denser and less porous than sandy type soils, will require more R3MEDIATE and more agitation than sandy soils to ensure complete contact of all of the contamination with R3MEDIATE.

As with any type of chemicals or processes used to remediate oil spills, follow-up testing such as for TPH levels will be required to positively determine the final results. However, as a quick indicator that the product is working, you can see a visible change in the contaminated area within a relatively short period of time (usually 24 to 72 hours) by a significant change of color of the treated area. For typical medium to heavy grade dark colored oil spills, the color will change from a dark black color to a light to medium brown color silicate, or sand like residue. Odors from the hydrocarbons will no longer be noticeable. Depending upon the level of contamination, it may be necessary to apply a second treatment.

Soil type, moisture content, temperature, as well as types and ages of the hydrocarbon contamination, will help determine the concentration and application rates, as well as time frame that the product works.

For heavy clay soils that are saturated with hydrocarbons and where the soil is dry; spray directly onto contaminated soil. Application rate will vary between 1.5 US gallons to 5 US gallons of R3MEDIATE per cubic yard of contaminated material, depending on the temperature, moisture level of the soil, type, and amount of contamination.

For sandy soils that are saturated with hydrocarbons and where the sand is dry; R3MEDIATE application rates will vary from 1 US Gallon to 3 US Gallons.

Mechanical agitation will be required to the depth of contamination in order to expose all the contamination to R3MEDIATE and to introduce oxygen to the process. This will assure the greatest effectiveness of the product.

**R3MEDIATE HARD SURFACE APPLICATION PROCESS**

For metal skids, piping, concrete, rock, and gravel the preferred application method is spraying. This enhances the action of oxygen in the chemical processes. Alternatively, oxygen can be brought into the process by the addition of aeration or by adding hydrogen peroxide to the formulation.

For oil dispersed on concrete or asphalt, i.e. parking lots or drive through service businesses, R3MEDIATE should be sprayed over the stained areas. For an initial application on outdoor hard surfaces that are laden with oil or other hydrocarbons, apply R3MEDIATE directly to the contaminated area.

If outdoors, do not apply if there is a chance of rain within 2 hours of application. R3MEDIATE needs time for the redox reaction to work. Allow the treated surface to sit until you see a white, flaky residue (Can be as little as 30 minutes on hot surfaces or very windy conditions). The surface will turn white indicating that the product is working. Agitation of R3MEDIATE and the hydrocarbons will assure complete contact when treating loose gravel or rocks. Once the surface turns predominantly white, the surface can be rinsed, or power washed as the hydrocarbons have been converted into a non-toxic compound.

# FIGURES

FIG. 1 – HYDROCARBON RELEASE AROUND WELLHEAD ON A CALICHE PAD SITE IN WYOMING (R3ICS, LLC. 2019 JULY).

FIG. 2 – SEVENTY-TWO (72) HOURS POST TREATMENT WITH R3MEDIATE. NO DIG & HAUL. NO NEW SOIL. WELLHEAD ON A CALICHE PAD SITE IN WYOMING (R3ICS, LLC. 2019 JULY)

FIG. 3 – HYDROCARBON RELEASE ON OPEN AREA OF CALICHE PAD SITE IN WYOMING (R3ICS, LLC. 2019 JULY)

FIG. 4 – SIX (6) HOURS POST TREATMENT WITH R3MEDIATE. NO DIG & HAUL. NO NEW SOIL. HYDROCARBON RELEASE ON OPEN AREA OF CALICHE PAD SITE IN WYOMING (R3ICS, LLC. 2019 JULY)

FIG. 5 – WEST TEXAS GAS PROCESSING PLANT. HYDROCARBON RELEASE WITH SOIL, PIPE & GRAVEL STAINING. (R3ICS, LLC 2019 JULY)

FIG. 6 – TWENTY-FOUR (24) HOURS POST TREATMENT WITH R3MEDIATE. WEST TEXAS GAS PROCESSING PLANT. HYDROCARBON RELEASE WITH SOIL, PIPE & GRAVEL STAINING. (R3ICS, LLC 2019 JULY)

FIG. 7 – FIELD SERVICE MIDSTREAM CLIENT OKLAHOMA. PRE-TREATMENT HYDROCARBON RELEASE ON SOIL AND VEGATATION. (R3ICS, LLC. 2019 JUNE)

FIG. 8- FIVE (5) HOURS POST-TREATMENT FIELD SERVICE MIDSTREAM CLIENT OKLAHOMA. HYDROCARBON RELEASE ON SOIL AND VEGATATION. (R3ICS, LLC. 2019 JUNE)

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