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Subject:
2020 Annual Groundwater Report
Former Brickland Refinery Site
Sunland Park, New Mexico
Huntsman International LLC
Case No. AP-01

ENVIRONMENT

Date:
March 26, 2021

Dear Mr. von Gonten:

Contact:
Timothy D. Ratchford

On behalf of Huntsman International LLC (Huntsman), Arcadis U.S., Inc., is submitting one copy of the above-referenced report. As agreed upon on February 11, 2003, this report is being submitted on or before April 1 for the previous year. An additional copy is being provided to the District 2 office in Artesia.

Phone:
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If you have any questions regarding the enclosed report, please contact the undersigned at (225) 802-8261 or Mr. Scott Wagaman with the Huntsman facility at (281) 719-3038.

Email:
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Our ref:
30049071.300

Sincerely,

Arcadis U.S., Inc.

Timothy D. Ratchford, P.G. (LA/TX)
Associate Vice President/Regulatory Compliance Specialist

Copies:
NMOCD District 2 – Artesia
Scott Wagaman – Huntsman (electronic)

Attachment



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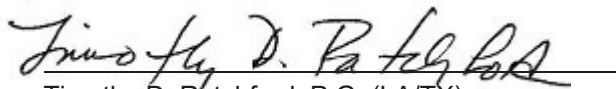
Former Brickland Refinery
Sunland Park, New Mexico

March 26, 2021

2020 ANNUAL GROUNDWATER MONITORING REPORT

**2020 ANNUAL
GROUNDWATER
MONITORING REPORT**

Former Brickland Refinery
Sunland Park, New Mexico



Timothy D. Ratchford, P.G. (LA/TX)
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March 26, 2021

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EXECUTIVE SUMMARY

This 2020 Annual Groundwater Monitoring Report documents the results of four groundwater monitoring events conducted at the former Brickland Refinery site in Sunland Park, New Mexico. The 2020 quarterly groundwater monitoring events were conducted in March (March 17-18), June (June 1-2), September (September 21-22), and December (December 18). This report contains summaries of groundwater elevation and analytical data from the 2020 groundwater monitoring events and historical records.

This monitoring program was conducted in accordance with the Groundwater Monitoring Plan included as Section 3.5 of the Stage 2 Abatement Plan approved by Mr. Bill Olson of the New Mexico Oil Conservation Division (NMOCD) in a letter dated December 17, 1998, and revised in 2006. A request was sent to NMOCD in a letter dated November 7, 2014, to modify the existing sampling performed at the site. The request was approved by Mr. Glenn von Gonten in correspondence dated April 24, 2015, and the Addendum to Abatement Plan AP-001 for the former Brickland Refinery was submitted to NMOCD on June 3, 2015. The modification to the plan requires quarterly sampling for designated wells.

In accordance with the Stage 2 Abatement Plan, quarterly sampling events include water-level and product-thickness measurements in all monitoring wells and analysis of benzene for all sampled wells. In addition, each sampling event includes analysis for polycyclic aromatic hydrocarbons (PAHs) at Monitoring Well MW-8 only.

During the 2020 monitoring events, the following samples were collected:

- Five off-site well samples (MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S).
- Five on-site well samples (MW-5, MW-8, MW-10, MW-11, and MW-17).

The laboratory-reported benzene concentrations for samples collected from MW-5 (March, June, September, and December 2020 monitoring events) and MW-8 (June, September, and December 2020 monitoring event) were above the New Mexico Water Quality Control Commission (NMWQCC) standard of 10 micrograms per liter ($\mu\text{g/L}$).

The laboratory-reported total PAHs were below the NMWQCC standard of 30 $\mu\text{g/L}$ for all samples collected at MW-8 during the March, June, September, and December 2020 monitoring events.

Historically, there appears to be a relationship between the magnitude for benzene detections reported at MW-5 and MW-8 and the seasonal river stage for the Rio Grande during the June/September sampling event. The hydrographs evaluated during 2020 show that water levels in all site monitoring wells rise concurrently with the elevated river stage, which results during June or September when water is released from Elephant Butte Dam (upstream from Sunland Park near Truth or Consequences, New Mexico) to the Rio Grande. Historically, the detections of benzene at Monitoring Wells MW-5 and MW-8 have seasonally increased at the same time as the rise in water levels. However, during 2020, it appears that only the benzene concentration at Monitoring Well MW-8 followed this trend. The benzene concentration at Monitoring Well MW-5 was highest in March as opposed to June or September. The same relationship between the magnitude for PAH detections and the river stage for the Rio Grande has existed at MW-8. This trend is mostly consistent in 2020. Even though the highest detection of PAHs occurred during the March event, the PAH concentration was higher in September compared to the

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concentrations in June and December. However, during the current monitoring period, total PAHs were not detected above the NMWQCC standard.

The hydraulic gradient beneath the former Brickland Refinery varies slightly across the site in response to river stages. In March, June, September, and December 2020, the gradient was approximately 0.003, 0.003, 0.0005, and 0.0004 foot per foot, respectively. The groundwater flow direction was generally to the southeast, parallel to the river.

During the March, June, September, and December 2020 sampling events, no measurable amount of light non-aqueous phase liquid (LNAPL) was observed in MW-10 or in any of the other monitoring wells. However, a heavy sheen was observed at Monitoring Well MW-5 and a slight sheen was observed at Monitoring Well MW-10 during the September 2020 sampling event.

Monitoring Well MW-9S was damaged sometime between March and June 2019. The damaged well is located on land owned by the International Boundary and Water Commission (IBWC). Arcadis U.S., Inc. (Arcadis) continues to work with IBWC to obtain approval to replace the well. Monitoring Well MW-9S sampling will recommence upon approval from IBWC to replace the well.

Also, Monitoring Well MW-6S was not sampled during any of the 2020 sampling events. During the March 2020 sampling event, it was noted that the well foundation had shifted and could no longer be sampled. The well is located on IBWC-owned land. Arcadis continues to work with IBWC to obtain approval to replace the well. Monitoring Well MW-6S sampling will recommence upon approval from IBWC to replace the well.

Based on the results of ongoing monitoring, the following actions are recommended:

- Continue working with IBWC for repairs and reinstallation of Monitoring Well MW-9S.
- Schedule repairs to the shifted foundation at Monitoring Well MW-6S.
- Install bollards to protect the wells accessible to the public and located on IBWC land.
- Continue LNAPL removal, if present, at MW-10 by bailing or pumping at quarterly intervals.
- Continue groundwater monitoring of benzene at MW-3S, MW-3D, MW-5, MW-6S, MW-6D, MW-8, MW-9S, MW-10, MW-11, and MW-17.
- Continue groundwater monitoring of PAHs at MW-8 to evaluate trends in groundwater concentrations.
- Continue evaluations of the relationship between river stages, elevated water-level measurements, and seasonal increases in concentrations of benzene (at MW-5 and MW-8) and PAHs (at MW-8) during future sampling events.

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1 INTRODUCTION

1.1 Background

The former Brickland Refinery site is located in Sunland Park, New Mexico, and consists of approximately 33 acres situated along the west bank of the Rio Grande (Figure 1). Huntsman International LLC (Huntsman) currently owns the site. From 1933 to 1958, the site was operated by previous owners as a petroleum refinery, producing both gasoline and jet fuel. The site was closed and the plant dismantled by the previous owners in 1958. Between 1964 and 1989, the site was leased by the previous owners to various parties to service trucks, conduct automobile salvage operations, graze livestock, and store used bricks.

Petroleum hydrocarbons have been reported in soil and groundwater at the site since the sampling program was initiated in December 1993. The distribution of petroleum hydrocarbons was investigated, and these investigations provided the basis for the Stage 2 Abatement Plan approved by Mr. Bill Olsen of the New Mexico Oil Conservation Division (NMOCD) on December 17, 1998. The Stage 2 Abatement Plan provides the methods for abating contamination of groundwater and soil in compliance with New Mexico Water Quality Control Commission (NMWQCC) regulations on prevention and abatement of water pollution (20 New Mexico Administrative Code 6.2, Subpart IV) and NMOCD requirements to protect public health and the environment with respect to wastes from the refinement of crude oil (Section 70-2-12.8 [22] New Mexico Statute Annotated 1978).

The sampling protocol was modified in 2006, and modifications were implemented during the June 2006 monitoring event. A request to modify the existing sampling performed at the site was sent to NMOCD in a letter dated November 7, 2014. The request was approved by Mr. Glenn von Gonten in correspondence dated April 24, 2015, and the Addendum to Abatement Plan AP-001 for the former Brickland Refinery was submitted to NMOCD on June 3, 2015. The revised protocol is in general accordance with applicable NMOCD, New Mexico Environment Department, and U.S. Environmental Protection Agency (USEPA) regulations, procedures, and guidelines.

Huntsman maintained a stand-alone light non-aqueous phase liquid (LNAPL) recovery system at the site (at MW-10) as part of the Stage 2 Abatement Plan. The system was installed in December 1998 and was shut down in June 2008 because no free-phase product was removed from MW-10 in 2006, 2007, or 2008.

The current groundwater monitoring program conducted as part of Abatement Plan AP-001 includes:

- Collection of water levels and groundwater samples on a quarterly basis at the locations of five off-site monitoring wells (MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S) and five on-site wells (MW-5, MW-8, MW-10, MW-11, and MW-17).
- Analyses of groundwater for benzene at all monitoring well locations.
- Analyses of groundwater for polycyclic aromatic hydrocarbons (PAHs) at MW-8 only.
- Monitoring for LNAPL at all monitoring wells.

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- Extraction of LNAPL at Recovery Well MW-10 (when present).
- Submittal of an annual groundwater monitoring report.

The site layout and monitoring well and sampling locations are shown on Figure 2.

Monitoring Well MW-9S was damaged sometime between March and June 2019. The damaged well is located on land owned by the International Boundary and Water Commission (IBWC). Arcadis U.S., Inc. (Arcadis) continues to work with IBWC to obtain approval to replace the well. Monitoring Well MW-9S sampling will recommence upon approval from IBWC to replace the well.

Also, Monitoring Well MW-6S was not sampled during any of the 2020 sampling events. During the March 2020 sampling event, it was noted that the well foundation had shifted and could no longer be sampled. The well is located on IBWC-owned land. Arcadis continues to work with IBWC to obtain approval to replace the well. Monitoring Well MW-6S sampling will recommence upon approval from IBWC to replace the well.

1.2 Scope of Services

Arcadis performed quarterly groundwater monitoring at the site in March, June, September, and December 2020. Table 1 provides a summary of the water sampling methods, purging methods, and laboratory analyses that were performed during the quarterly sampling events. The following activities were included during quarterly monitoring, as required by the Groundwater Monitoring Plan and 2015 Addendum to Stage 2 Abatement Plan as approved by NMOCD:

- Depth-to-groundwater measurements were recorded for five on-site monitoring wells and five off-site monitoring wells. Historical groundwater elevations for the monitoring wells are provided in Table 2, and groundwater elevation contour maps for the 2020 monitoring events are depicted on Figures 3, 4, 5, and 6.
- Groundwater sampling was conducted in March, June, September, and December 2020 at each of the five off-site monitoring wells (MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S) and five on-site wells (MW-5, MW-8, MW-10, MW-11, and MW-17). It should be noted that Monitoring Wells MW-6S and MW-9S were not sampled during any of the 2020 sampling events. Arcadis continues to work with IBWC to obtain approval to replace the damaged wells. Sampling of Monitoring Wells MW-6S and MW-9S will recommence upon approval from IBWC to replace the wells.
- Analytical testing for the samples included benzene in all wells sampled and PAHs for MW-8 only (using USEPA Test Methods 8260C and 8270D, respectively) during the March, June, September, and December 2020 events. The analytical results for benzene and PAHs are shown in Tables 3 and 4, respectively.
- Ten monitoring wells were monitored for the presence of LNAPL, and a summary of the LNAPL thicknesses is graphed on Figure 7 and also included in Table 5.
- Extraction system operations and maintenance reports were not prepared because the extraction system was shut down in June 2008 due to an absence of LNAPL in Recovery Well MW-10.

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2 GROUNDWATER ELEVATION, HYDRAULIC GRADIENT, AND FLOW DIRECTION

The hydraulic gradient beneath the former Brickland Refinery varies slightly across the site. This variability is in part a response to river-stage fluctuations. In March, June, September, and December 2020, the gradient was approximately 0.003, 0.003, 0.0005, and 0.0004 foot per foot, respectively. The groundwater flow direction was generally to the southeast, parallel to the river.

Historical groundwater elevations for the monitoring wells are provided in Table 2. Water levels are not listed for the well points because the well points were specifically designed to detect LNAPL at a discrete depth and the screened intervals do not correlate with the monitoring well screens. Groundwater elevation contour maps for the March, June, September, and December 2020 monitoring events are depicted on Figures 3, 4, 5, and 6, respectively.

Groundwater levels in the monitoring wells are influenced by the stage of the Rio Grande, which borders the site. Due to observed seasonal fluctuations in the river, water levels in the monitoring wells may vary as much as 2 feet over the course of a year. Monitoring of groundwater elevations since June 2003 indicates a consistent pattern of higher water elevations in the wells and the river during summer sampling events and lower water elevations during the winter sampling events.

3 LNAPL REMOVAL

3.1 LNAPL Product Thickness

The occurrence of LNAPL in MW-10 was tested with an oil/water interface meter. The potential occurrence of LNAPL in other monitoring wells was evaluated visually during gauging of water levels with an electronic water-level meter. Measurable thicknesses of LNAPL were not found in any wells during the four 2020 monitoring events. Recent and historical measurements dating back to June 2003 are graphed on Figure 7 and listed in Table 5. LNAPL thickness maps were not prepared for this report because none of the wells contained measurable amounts of LNAPL during the four events.

3.2 Removal and Disposal of LNAPL

Historically, approximately 235 gallons of LNAPL have been removed from MW-10 since December 1998, when the product recovery system was installed. LNAPL yields were no longer recovered in measurable amounts during 2006 and 2007, and the recovery system was shut down/disconnected in June 2008. Subsequently, no LNAPL was removed from MW-10 in 2008, 2009, 2010, or 2011. In 2012, manual LNAPL removal was initiated for MW-10 in response to a measurable thickness present in MW-10 as of December 2011. During the March, June, and December 2020 sampling events, no product thickness was present in MW-10; however, a sheen was observed at this location during the September 2020 sampling event.

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4 SAMPLE COLLECTION AND LABORATORY ANALYTICAL TESTING PROCEDURES

4.1 Fluid-Level Measurements and Decontamination

The interface probe was decontaminated prior to each use and between each well to prevent the introduction of external contamination or artifacts into a well. A wash and double-rinse decontamination procedure was used. The procedure consisted of washing the probe with Liquinox, a mild, non-phosphate detergent, and then rinsing twice with water.

4.2 Calibration of Multi-Probe Water Analyzer

The multi-probe analyzer was calibrated by Geotech for each sampling event prior to use at the site. Each calibration was carried out in accordance with the equipment manufacturer's procedures and recommendations.

4.3 Well Purging and Field Parameter Measurements

The monitoring wells were purged using low-flow/low-stress techniques prior to sampling. Low-flow purging involves removing small volumes of groundwater at very low pumping rates until certain field parameters have stabilized. Field parameter measurements were recorded while each well was purged through the multi-probe flow cell. The groundwater temperature, pH, specific conductance, dissolved oxygen, oxidation reduction (redox) potential, and turbidity were documented on the Water Sampling Logs provided in Appendix A. Purging of each well was continued until three consecutive readings for three field parameters (dissolved oxygen, redox potential, and turbidity) stabilized within 10 percent of one another. When stabilization was achieved, well purging was discontinued and the well was sampled. The total volume of water purged prior to sample collection was recorded on the Groundwater Sampling Log for each well. The purged water was containerized for disposal.

Approximately 3 gallons of water were removed from each well. Field data collected during the purging of each well are provided in Appendix A. Groundwater odor, color, and other physically apparent characteristics were documented. Monitoring well integrity was also documented (see the Daily Field Reports provided in Appendix A).

During the March, June, September, and December 2020 sampling events, all wells sampled were purged with peristaltic pumps. All tubing used with the peristaltic pumps was dedicated and/or replaced at each well. A combined total of approximately 24 gallons of water were purged from the sampled monitoring wells during each of the four monitoring events. The purged water collected during these monitoring events will be collected by Rhino Environmental Services for subsequent nonhazardous disposal at an approved facility.

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4.4 Groundwater Sample Collection

Samples were collected for laboratory analysis in the order of volatility of the analytical parameters (benzene first and PAHs second). All samples were labeled with the sampling location, date, time, and testing requirements on self-adhering labels provided by the laboratory.

4.4.1 Benzene

The groundwater samples were analyzed by USEPA Method 8260C for benzene in the March, June, September, and December 2020 monitoring events. Three 40-milliliter (mL) unpreserved glass vials were used as sample containers for volatile organic compounds. Water was collected from the well via tubing directly into the glass vial until a convex meniscus formed above the lip of the bottle. Once capped, the vial was checked for air bubbles (headspace) by turning it upside down, tapping the cap of the inverted bottle, and visually inspecting the bottle contents. No bubbles were observed in the vials shipped to the laboratory.

4.4.2 Polycyclic Aromatic Hydrocarbons

Samples collected from Monitoring Well MW-8 in the March, June, September, and December 2020 monitoring events were analyzed by USEPA Method 8270D for the presence of PAHs. Three 40-mL glass vials with no preservative were used as sample containers for PAHs. Water was collected from the well via tubing placed directly into the sample container until filled to the neck.

4.5 Field Quality Assurance/Quality Control (QA/QC)

The field QA/QC program includes collection of field blanks, equipment blanks, and duplicate samples. The water samples collected during the monitoring events were placed in ice-filled coolers immediately after collection and shipped to ALS Environmental (ALS) in Houston, Texas, for analysis. During the December 2020 sampling event, ALS subcontracted the benzene analysis to a local SGS laboratory to ensure holding times were met. In each event, chain-of-custody forms documenting sample identification numbers, the required analysis for each sample, collection times, and delivery times to the laboratories were completed for each set of samples. Copies of chain-of-custody forms are provided in Appendix B. Descriptions of the QA/QC samples and evaluation of QA/QC results for 2020 are presented below.

4.5.1 Field Blanks

Field blanks were used to determine potential absorption of volatile organics from ambient air into the water samples. The blanks for volatile organics were collected by filling three 40-mL glass vials with distilled water at the time of sampling. Field blanks were analyzed for benzene and/or PAHs during the March, June, September, and December 2020 sampling events. None of the constituents were detected in the field blanks collected during the four sampling events.

4.5.2 Equipment Blanks

Equipment blanks were collected on non-dedicated or new sampling equipment. During the March, June, September, and December 2020 sampling events, equipment blanks were collected for the Teflon® dipper

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and the water-level indicator. Immediately following decontamination, equipment blanks were collected by pouring distilled water over the equipment and then filling three 40-mL glass vials with water from the equipment. Equipment blanks were analyzed for benzene and/or PAHs during the March, June, September, and December 2020 sampling events. None of the constituents were detected in the equipment blanks collected during the four sampling events.

4.5.3 Duplicate Samples

Two duplicate samples were collected during each of the four 2020 monitoring events. During the March sampling event, duplicate samples were collected from Monitoring Well MW-6D (benzene) and MW-8 (PAHs). During the June, September, and December sampling events, duplicate samples were collected from Monitoring Wells MW-3D (benzene) and MW-8 (PAHs).

For the March, June, September, and December 2020 sampling events, the non-detect analytical result for benzene in the duplicate sample was consistent with the non-detect original result in MW-6D (March) and MW-3D (June, September, and December). The duplicate sample result for PAHs was within a 69 percent difference of the original MW-8 result.

5 GROUNDWATER ANALYTICAL RESULTS

5.1 Benzene

According to the Stage 2 Abatement Plan, benzene concentrations are measured quarterly during the March, June, September, and December sampling events. Benzene was reported in concentrations above the NMWQCC standard of 10 micrograms per liter ($\mu\text{g/L}$) in samples collected from Well MW-5 in March, June, September, and December 2020 and in Well MW-8 during the June, September, and December 2020 events. Laboratory results for benzene analyses are shown in Table 3, and copies of the laboratory reports are provided in Appendix B.

5.2 Polycyclic Aromatic Hydrocarbons

Samples collected from MW-8 were analyzed for PAHs in March, June, September, and December 2020. Concentrations were reported below the NMWQCC standard of 30 $\mu\text{g/L}$ for total PAHs during all four events. Laboratory results for PAH analyses are shown in Table 4, and copies of the laboratory reports are provided in Appendix B.

5.3 Trend Analyses and Seasonal Concentration Increases

Graphs showing trends for detected concentrations of benzene and PAHs are provided as Figures 8 and 9. Measurements for stages in the Rio Grande from IBWC were used to evaluate the relationship between high-river stages, water-level elevations in site monitoring wells, and detections of benzene and PAHs. These hydrographs are provided as Figures 10 through 12.

Historically, there appears to be a relationship between the magnitude for benzene detections reported at MW-5 and MW-8 and the seasonal river stage for the Rio Grande during the June/September sampling

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event. Figure 10 shows the relationship between elevated seasonal river stages and the water-level elevations measured in the monitoring wells. During 2020, water levels in all site monitoring wells rise concurrently with the elevated river stage, which results during June or September when water is released from Elephant Butte Dam (upstream from Sunland Park near Truth or Consequences, New Mexico) to the Rio Grande.

The detections of benzene at Monitoring Wells MW-5 and MW-8 seasonally increase at the same time as the rise in water levels. As shown on Figure 11, it appears that only the benzene concentration at Monitoring Well MW-8 followed this trend. The benzene concentration at Monitoring Well MW-5 was highest in March as opposed to June or September. The same relationship between the magnitude for PAH detections and river stage for the Rio Grande has existed at MW-8 (Figure 12). This trend is mostly consistent in 2020. Even though the highest detection of PAHs occurred during the March event, the PAH concentration was higher in September compared to the concentrations in June and December.

Overall, it appears that detections of benzene at Monitoring Wells MW-5 and MW-8 and PAH at MW-8 seasonally increase due to the rise in water levels into vadose zone sediments where residual concentrations are already present. Evaluations of this relationship will continue during future sampling events.

6 REMEDIATION PERFORMANCE

6.1 Bioremediation Pilot Testing

Absorbent socks were used during 2011 and the first half of 2012 as a pilot test evaluating bioremediation by enhancing natural attenuation. The absorbent socks use a patented calcium peroxide (45 to 70 percent composition) and calcium hydroxide (10 to 20 percent composition) solid granular material to react with water to release oxygen slowly, which stimulates aerobic biodegradation of groundwater contaminants. During the June 2012 sampling event, the "O-Sox" were removed from MW-5 and MW-8 and have not been replaced.

6.2 Product Recovery

During the March, June, September, and December 2020 sampling events, no measurable amount of LNAPL was observed in MW-10 or in any of the other monitoring wells. However, a heavy sheen was observed at Monitoring Well MW-5 and a slight sheen was observed at Monitoring Well MW-10 during the September 2020 sampling event.

7 CONCLUSIONS

Overall, the reported concentrations in groundwater appear to be stable or decreasing. During the 2020 reporting period, benzene concentrations from two wells (MW-5 and MW-8) exceeded NMWQCC standards. PAHs at MW-8 were reported below NMWQCC standards. Review of laboratory results shows general consistency in benzene concentrations in MW-5 and MW-8. This stable/decreasing trend will be verified with future sampling events.

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Historically, there appears to be a relationship between the magnitude for benzene detections reported at MW-5 and MW-8 and the seasonal river stage for the Rio Grande during the June/September sampling event. The hydrographs evaluated during 2020 show that water levels in all site monitoring wells rise concurrently with the elevated river stage, which results during June or September when water is released from Elephant Butte Dam (upstream from Sunland Park near Truth or Consequences, New Mexico) to the Rio Grande. Historically, the detections of benzene at Monitoring Wells MW-5 and MW-8 seasonally increase at the same time as the rise in water levels. However, during 2020, it appears that only the benzene concentration at Monitoring Well MW-8 followed this trend. The benzene concentration at Monitoring Well MW-5 was highest in March as opposed to June or September. The same relationship between the magnitude for PAH detections and the river stage for the Rio Grande has existed at MW-8. This trend is mostly consistent in 2020. Even though the highest detection of PAHs occurred during the March event, the PAH concentration was higher in September compared to the concentrations in June and December.

During the March, June, September, and December 2020 sampling events, no measurable amount of LNAPL was observed in MW-10 or in any of the other monitoring wells. However, a heavy sheen was observed at Monitoring Well MW-5 and a slight sheen was observed at Monitoring Well MW-10 during the September 2020 sampling event.

MW-9S was destroyed sometime between March and June 2019. The well destruction occurred due to a direct impact from a service vehicle used by IBWC during routine maintenance along the adjacent Rio Grande. Arcadis continues to work with IBWC to obtain approval to replace the well. Monitoring Well MW-9S sampling will recommence upon approval from IBWC to replace the well.

Also, Monitoring Well MW-6S was not sampled during any of the 2020 sampling events. During the March 2020 sampling event, it was noted that the well foundation shifted and could no longer be sampled.

8 RECOMMENDATIONS

Based upon data collected during the 2020 sampling program, the following recommendations are proposed for the remediation system and monitoring operations at the former Brickland Refinery:

- Continue working with IBWC for repairs and reinstallation of Monitoring Well MW-9S.
- Schedule repairs to the shifted foundation at Monitoring Well MW-6S.
- Continue LNAPL removal, if present, at MW-10 by bailing or pumping at quarterly intervals.
- Continue groundwater monitoring of benzene at MW-3S, MW-3D, MW-5, MW-6S, MW-6D, MW-8, MW-9S, MW-10, MW-11, and MW-17.
- Continue groundwater monitoring of PAHs at MW-8 to evaluate trends in groundwater concentrations.
- Continue evaluations of the relationship between river stages, elevated water-level measurements, and seasonal increases in concentrations of benzene (at MW-5 and MW-8) and PAHs (at MW-8) during future sampling events.

TABLES

Table 2
Monitoring Well Groundwater Elevations
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Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico



Well ID	TOC	6/18/2003	12/16/2003	6/16/2004	12/16/2004	6/15/2005	12/14/2005	6/13/2006	12/14/2006	6/13/2007	12/11/2007	6/25/2008	1/7/2009	6/30/2009	12/9/2009	6/21/2010	12/7/2010	6/28/2011	12/13/2011	6/19/2012	12/11/2012	6/11/2013	12/3/2013	6/9/2014	12/9/2014
MW-1	3730.57	3725.55	3723.69	3725.56	3723.6	3726.5	3724.01	3725.89	3724.29	3726.74	3724.57	3726.88	3724.4	3726.94	3724.20	3726.79	3724.08	3726.27	3723.93	3725.83	3724.01	3725.80	3724.07	3726.26	3723.96
MW-2	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99
MW-3S	3730.00	3724.65	3722.69	3724.61	3722.71	3725.56	3723.1	3725.02	3723.34	3725.82	3723.49	3725.99	3723.53	3725.98	3723.24	3725.88	3723.15	3725.35	3723.05	3724.86	3723.03	3724.68	3723.08	3725.27	3722.84
MW-3D	3730.00	3724.57	3722.61	3724.62	3722.64	3725.49	3723.04	3724.96	3723.29	3725.78	3723.57	3725.96	3723.5	3725.92	3723.68	3725.83	3723.07	3725.37	3722.93	3724.96	3722.91	3724.81	3723.28	3725.37	3722.74
MW-4	3728.86	3724.87	3722.88	3724.76	3722.96	3725.75	3723.37	3725.21	3723.62	3726.06	3723.77	3726.26	3723.82	3726.22	3723.52	3726.41	3723.41	3725.51	3723.26	3725.11	3723.20	3724.73	3723.34	3725.35	3723.05
MW-5	3729.70	3724.91	3722.85	3724.83	3722.98	3725.68	3723.38	3725.15	3723.65	3726.02	3723.84	3726.14	3723.85	3726.21	3723.51	3726.13	3723.54	3725.50*	3722.13*	3724.91*	3723.27	3724.66	3723.37	3725.22	3723.14
MW-6S	3730.65	3724.4	3722.38	3724.4	3722.45	3725.21	3722.9	3724.76	3722.99	3725.53	3723.13	3725.7	3723.29	3725.68	3722.99	3725.70	3722.83	3725.11	3722.69	3724.70	3722.71	3724.50	3722.61	3725.07	3722.50
MW-6D	3730.62	3724.36	3722.33	3724.38	3722.41	3725.22	3722.86	3724.74	3722.98	3725.58	3723.28	3725.76	3723.25	3725.69	3722.95	3725.62	3722.85	3725.06	3722.76	3724.67	3722.70	3724.54	3722.59	3725.19	3722.46
MW-7	3728.96	3724.76	3722.69	3724.75	3722.82	3725.53	3723.24	3725.06	3723.45	3725.92	3723.78	3726.05	3723.64	3726.39	3723.42	3725.99	3723.26	3725.43	3723.04	3724.99	3723.08	3724.73	3723.06	3725.39	3722.93
MW-8	3729.22	3724.67	3722.63	3724.62	3722.84	3725.28	3723.25	3724.91	3723.46	3725.53	3723.67	3725.79	3723.62	3725.78	3723.39	3725.53	3723.22	3725.25*	3721.89*	3724.76*	3723.05	3723.87	3723.04	3724.46	3722.89
MW-9S	3730.01	3724.04	3722.02	3723.97	3722.18	3724.85	3722.65	3724.39	3722.89	3725.4	3723.17	3725.41	3723.17	3725.41	3722.88	3725.35	3723.23	3725.16	3722.32	3724.33	3722.49	3723.98	3722.38	3724.68	3722.32
MW-9D	3730.08	Dry	Dry	Dry	Dry	Dry	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05
MW-10	3732.54	3725.67	3722.31	3724.41	3722.56	3725.24	3723.11	3724.53	3723.29	3725.83	3723.54	3732.54	3723.47	3725.82	3723.22	3725.73	3722.91	3724.87*	3722.21*	3724.34	3722.55	3724.56	3722.79	3724.88	3722.72
MW-11	3731.40	3724.51	3721.17	3724.42	3722.74	3725.24	3723.21	3724.65	3723.43	3725.77	3723.62	3725.74	3723.53	3725.76	3723.30	3725.69	3723.17	3724.95	3722.94	3724.64	3722.98	3723.80	3722.95	3724.48	3722.78
MW-12	3730.35	3725.93	3724.09	3725.9	3723.86	3726.74	3724.4	3726.24	3724.66	3727.1	3724.8	3726.95	3724.79	3727.28	3724.49	3727.08	3724.52	3726.70	3724.79	3726.21	3724.33	3726.00	3724.30	3726.54	3724.14
MW-13	3732.36	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99
MW-14	3730.46	3725.3	3722.79	3724.81	3722.88	3725.67	3723.3	3725.17	3723.55	3726.03	3723.82	3726.13	3723.77	3726.14	3723.45	3726.06	3723.58	3725.49	3723.44	3725.09	3724.84	3724.70	3724.16	3725.31	3723.01
MW-15	3738.62	3724.35	3722.38	3724.28	3722.58	3725.16	3723.04	3724.69	3723.42	3725.75	3723.57	3725.73	3723.58	3725.74	3723.26	3725.62	3723.26	3724.99	3723.15	3724.63	3722.81	3724.19	3722.74	3724.83	3722.60
MW-16	3736.78	3724.17	3722.14	3724.13	3722.34	3725	3722.78	3724.48	3723.05	3725.53	3723.29	3725.51	3723.28	3725.51	3722.99	3725.43	3722.78	3724.87	3724.76	3724.64	3724.71	3724.12	**	3724.73	3722.70
MW-17	3731.98	3724.67	3722.61	3724.67	3722.71	3725.53	3723.15	3725.06	3723.33	3725.93	3723.63	3726	3723.63	3726.02	3723.28	3726.02	3723.17	3725.40	3723.02	3724.95	3723.05	3724.80	3722.91	3725.44	3722.77

Notes:
*Oxygen-releasing compound sleeves/socks (O-Sox) were utilized to enhance natural attenuation. Water elevations may be artificially lowered due to displacement caused by the O-Sox.
**Roots on probe.
Measurements are reported in feet mean sea level.
Dry - Monitoring point was dry.
Plugged - Plugged and abandoned as of specified date.

Abbreviation:
TOC - Top of casing.

Table 3
Benzene Concentrations in Monitoring Wells
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Well	Date	Benzene (µg/L)
MW-3S	6/19/2003	ND
	12/17/2003	ND
	6/16/2004	ND
	12/16/2004	ND
	6/15/2005	ND
	12/16/2005	ND
	6/15/2006	ND
	12/14/2006	ND
	6/14/2007	ND
	12/17/2007	ND
	6/24/2008	<1
	1/8/2009	<1
	7/1/2009	<1
	12/10/2009	<1
	6/23/2010	<0.20
	12/7/2010	<0.20
	6/29/2011	<1
	12/14/2011	<1
	6/19/2012	<0.20
	12/11/2012	<0.20
	6/12/2013	<1
	12/4/2013	<5
	6/9/2014	<0.60
	12/10/2014	<1
	6/10/2015	<1
	9/14/2015	<1
	12/2/2015	<1
	3/7/2016	<1
	6/6/2016	<1
	9/13/2016	<1
	12/14/2016	<1
	3/7/2017	<1
	6/6/2017	<1
	9/26/2017	<1
	12/5/2017	<1
	3/6/2018	<1
	6/26/2018	<1
	9/20/2018	<1
	12/11/2018	<1
	3/5/2019	<1
	6/4/2019	<1
	9/18/2019	<1
	12/10/2019	<1
	3/17/2020	<1
	6/1/2020	<1
	9/21/2020	<1
	12/18/2020	<1
NMWQCC Standard (µg/L)		10

Table 3
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Well	Date	Benzene (µg/L)
MW-3D ⁽¹⁾	6/19/2003	ND
	12/17/2003	ND; ND
	6/16/2004	ND
	12/16/2004	ND
	6/15/2005	ND
	12/16/2005	ND
	6/15/2006	ND
	12/14/2006	ND
	6/14/2007	ND
	12/17/2007	ND
	6/24/2008	<1
	1/8/2009	<1
	7/1/2009	<1
	12/10/2009	<1
	6/23/2010	<0.20
	12/7/2010	<1
	6/29/2011	<1
	12/14/2011	<1
	6/19/2012	<0.20
	12/11/2012	<0.20
	6/12/2013	<1
	12/4/2013	<5
	6/9/2014	<0.60
	12/10/2014	<1
	6/10/2015	<1
	9/14/2015	<1
	12/2/2015	<1
	3/7/2016	<1
	6/6/2016	<1
	9/13/2016	<1
	12/14/2016	<1
	3/7/2017	<1
	6/6/2017	<1
	9/26/2017	<1
	12/5/2017	<1
	3/6/2018	<1
	6/26/2018	<1
	9/20/2018	<1
	12/11/2018	<1
	3/5/2019	<1
	6/4/2019	<1
	9/18/2019	<1
	12/10/2019	<1
	3/17/2020	<1
	6/1/2020	<1, <1
	9/21/2020	<1, <1
	12/18/2020	<1, <1
NMWQCC Standard (µg/L)		10

Table 3
Benzene Concentrations in Monitoring Wells
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Well	Date	Benzene (µg/L)
MW-5 ⁽¹⁾	6/21/2010	2,200
	6/30/2011	870
	12/13/2011	2,000
	7/20/2012	400
	12/13/2012	1,100; 910
	6/13/2013	1,200
	12/4/2013	140
	6/10/2014	420
	12/10/2014	580
	6/9/2015	1,900
	9/15/2015	73
	12/3/2015	450
	3/8/2016	460
	6/7/2016	1,200
	9/13/2016	400
	12/14/2016	510
	3/8/2017	230
	6/7/2017	920
	9/27/2017	3,500
	12/6/2017	1,600
	3/7/2018	120
	6/27/2018	2,300
	9/21/2018	1,500
	12/12/2018	120
	3/6/2019	990
	6/5/2019	1,200
	9/19/2019	910
	12/11/2019	1,900
	3/18/2020	1,700
	6/2/2020	1,000
	9/22/2020	750
	12/18/2020	959
NMWQCC Standard (µg/L)		10

Table 3
Benzene Concentrations in Monitoring Wells
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Well	Date	Benzene (µg/L)
MW-6S ⁽¹⁾	6/19/2003	ND
	12/17/2003	ND
	6/16/2004	ND; ND
	12/16/2004	ND; ND
	6/15/2005	0.8
	12/16/2005	ND
	6/15/2006	ND; ND
	12/14/2006	11 ; 6.1
	6/14/2007	ND; ND
	12/17/2007	ND; ND
	6/25/2008	<1
	1/8/2009	<1
	7/1/2009	1.7; 1.8
	12/11/2009	<10,000; <10,000
	6/24/2010	<1; <1
	12/8/2010	<0.20
	6/29/2011	0.61J; <1
	12/16/2011	<1; <1
	6/21/2012	<1; <1
	12/12/2012	<0.20
	6/12/2013	<1; <1
	12/4/2013	<10; <10
	6/10/2014	<0.60; <0.60
	12/9/2014	<1
	6/10/2015	<1; <1
	9/15/2015	<1
	12/3/2015	<1
	3/7/2016	<1
	6/6/2016	<1
	9/12/2016	<1
	12/13/2016	<1
	3/8/2017	<1
	6/7/2017	<1
	9/27/2017	<1
	12/5/2017	<1
	3/6/2018	<1
	6/26/2018	<1
	9/20/2018	<1
	12/11/2018	<1
	3/5/2019	<1
	6/4/2019	<1
	9/18/2019	<1
	12/10/2019	<1
	3/17/2020	(2)
	6/1/2020	(2)
	9/21/2020	(2)
	12/18/2020	(2)
NMWQCC Standard (µg/L)		10

Table 3
Benzene Concentrations in Monitoring Wells
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Well	Date	Benzene (µg/L)
MW-6D ⁽¹⁾	6/19/2003	ND
	12/17/2003	ND
	6/16/2004	ND
	12/16/2004	ND
	6/15/2005	ND
	12/16/2005	ND
	6/15/2006	ND
	12/14/2006	ND
	6/14/2007	ND
	12/17/2007	ND
	6/25/2008	<1
	1/8/2009	<1
	7/1/2009	<1
	12/11/2009	<1
	6/24/2010	<0.20
	12/8/2010	<1
	6/29/2011	<1
	12/16/2011	<1
	6/21/2012	<0.20
	12/12/2012	<0.20
	6/12/2013	<1
	12/4/2013	<5
	6/10/2014	<0.60
	12/9/2014	<1; <1
	6/10/2015	<1
	9/15/2015	<1
	12/3/2015	<1
	3/8/2016	<1
	6/7/2016	<1
	9/12/2016	<1
	12/13/2016	<1
	3/8/2017	<1
	6/7/2017	<1
	9/27/2017	<1
	12/5/2017	<1; <1
	3/6/2018	<1; <1
	6/26/2018	<1; <1
	9/20/2018	<1; <1
	12/11/2018	<1; <1
	3/5/2019	<1; <1
	6/4/2019	<1; <1
	9/18/2019	<1; <1
	12/10/2019	<1; <1
	3/17/2020	<1; <1
	6/1/2020	<1
	9/21/2020	<1
	12/18/2020	<1
NMWQCC Standard (µg/L)		10

Table 3
Benzene Concentrations in Monitoring Wells
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Well	Date	Benzene (µg/L)
MW-8 ⁽¹⁾	6/22/2010	6,800
	6/30/2011	460
	12/14/2011	9,900
	7/20/2012	2,700
	12/13/2012	5,500
	6/13/2013	4,700
	12/4/2013	270
	6/10/2014	3,300
	12/10/2014	1,600
	6/9/2015	5,100
	9/16/2015	2,400
	12/4/2015	970
	3/8/2016	1,300
	6/7/2016	5,000
	9/13/2016	3,800
	12/14/2016	1,100
	3/8/2017	150
	6/7/2017	2,400; 2,400
	9/27/2017	3,800
	12/6/2017	1,900
	3/7/2018	<1
	6/27/2018	<1
	9/21/2018	630
	12/12/2018	<1
	3/6/2019	<1
	6/5/2019	<1
	9/19/2019	190
	12/11/2019	<1
	3/18/2020	<1
	6/2/2020	630
	9/22/2020	720
	12/18/2020	136
NMWQCC Standard (µg/L)		10

Table 3
Benzene Concentrations in Monitoring Wells
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Well	Date	Benzene (µg/L)
MW-9S ⁽¹⁾	6/19/2003	ND; ND
	12/17/2003	ND
	6/16/2004	ND
	12/16/2004	ND
	6/15/2005	ND
	12/16/2005	ND
	6/15/2006	ND
	12/14/2006	ND
	6/14/2007	ND
	12/17/2007	ND
	6/24/2008	<1
	1/8/2009	<1
	7/2/2009	<1
	12/10/2009	<1
	6/23/2010	<0.20
	12/8/2010	<0.20
	6/29/2011	<1
	12/15/2011	<1
	6/21/2012	<0.20
	12/12/2012	<0.20
	6/12/2013	<1
	12/4/2013	<25
	6/9/2014	<0.60
	12/9/2014	<1
	6/10/2015	<1
	9/15/2015	<1
	12/3/2015	<1
	3/8/2016	<1
	6/7/2016	<1
	9/12/2016	<1
	12/13/2016	<1
	3/7/2017	<1
	6/6/2017	<1
	9/26/2017	<1
	12/5/2017	<1
	3/6/2018	<1
	6/26/2018	<1
	9/20/2018	<1
	12/11/2018	<1
	3/5/2019	<1
	6/5/2019 ⁽²⁾	NS
	9/19/2019 ⁽²⁾	NS
	12/11/2019 ⁽²⁾	NS
	3/17/2020	(2)
	6/1/2020	(2)
	9/21/2020	(2)
	12/18/2020	(2)
NMWQCC Standard (µg/L)		10

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Well	Date	Benzene (µg/L)
MW-10	6/24/2010	<0.20
	6/30/2011	<1
	12/14/2011	30
	7/20/2012	12
	12/13/2012	15
	6/13/2013	2.8
	12/5/2013	<25
	6/11/2014	<0.60
	12/11/2014	<1
	6/8/2015	23
	9/16/2015	<1
	12/4/2015	<1
	3/8/2016	<1
	6/7/2016	4.6
	9/13/2016	1.6
	12/14/2016	<1
	3/8/2017	1.1
	6/7/2017	2.1
	9/27/2017	1.5
	12/6/2017	<1
	3/7/2018	<1
	6/27/2018	<1
	9/21/2018	<1
	12/12/2018	<1
	3/6/2019	<1
	6/5/2019	<1
	9/19/2019	<1
	12/11/2019	<1
	3/18/2020	<1
	6/2/2020	<1
	9/22/2020	<1
	12/18/2020	0.65J
NMWQCC Standard (µg/L)		10

Table 3
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Well	Date	Benzene (µg/L)
MW-11	6/22/2010	<0.20
	6/28/2011	4.7
	12/15/2011	NS
	6/19/2012	NS
	12/12/2012	NS
	6/11/2013	<1
	12/3/2013	<25
	6/9/2014	<0.60
	12/11/2014	<1
	6/9/2015	1.3
	9/14/2015	<1
	12/2/2015	<1
	3/7/2016	2.5
	6/6/2016	<1
	9/12/2016	<1
	12/13/2016	<1
	3/7/2017	<1
	6/6/2017	<1
	9/26/2017	<1
	12/5/2017	<1
	3/7/2018	<1
	6/27/2018	<1
	9/21/2018	<1
	12/12/2018	<1
	3/6/2019	<1
	6/5/2019	<1
	9/19/2019	<1
	12/11/2019	<1
	3/18/2020	<1
	6/2/2020	<1
	9/22/2020	<1
	12/18/2020	<1
NMWQCC Standard (µg/L)		10

Table 3
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Well	Date	Benzene (µg/L)
MW-17 ⁽¹⁾	6/22/2010	<0.20
	6/28/2011	<1
	12/15/2011	NS
	6/19/2012	NS
	12/12/2012	NS
	6/11/2013	6.8
	12/4/2013	<25
	6/9/2014	<0.60
	12/10/2014	<1
	6/9/2015	<1
	9/14/2015	<1; <1
	12/2/2015	<1; <1
	3/7/2016	<1; <1
	6/6/2016	<1; <1
	9/12/2016	2.7; 2.5
	12/13/2016	<1; <1
	3/7/2017	1.3; <1
	6/6/2017	<1; <1
	9/26/2017	<1; <1
	12/5/2017	<1
	3/7/2018	<1
	6/27/2018	<1
	9/21/2018	<1
	12/12/2018	<1
	3/6/2019	<1
	6/4/2019	<1
	9/18/2019	<1
	12/11/2019	<1
	3/17/2020	<1
	6/1/2020	<1
	9/21/2020	<1
	12/18/2020	<1
NMWQCC Standard (µg/L)		10

Notes:

⁽¹⁾Monitoring Wells MW-3D, MW-5, MW-6S, MW-6D, MW-8, MW-9S, and MW-17 and respective duplicate samples are reported in the same cell and separated by a semicolon.

⁽²⁾Well damaged/destroyed and could not be sampled.

Results are reported in micrograms per liter (µg/L).

BOLD - Concentrations in bold type indicate levels exceed NMWQCC standards.

J - Analyte detected below quantitation limit.

Abbreviations:

ND - Not detected.

NS - Not sampled.

NMWQCC - New Mexico Water Quality Control Commission.

Table 4
Total Polycyclic Aromatic Hydrocarbon Concentrations in Monitoring Well MW-8
2020 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico



Total PAH Concentration											
Well ID	12/8/1993	3/25/1994	7/12/1994	9/28/1994	12/13/1994	3/28/1995	6/21/1995	9/1/1995	6/21/1996	6/26/1997	6/25/1998
MW-8	--	250	93	366	236	180	--	140	--	--	--

Total PAH Concentration											
Well ID	6/3/1999	6/14/2000	7/27/2001	6/27/2002	6/19/2003	6/16/2004	6/15/2005	6/14/2006	6/14/2007	6/25/2008	7/2/2009
MW-8	--	--	--	--	--	--	--	--	--	--	--

Total PAH Concentration											
Well ID	7/21/2010	6/28/2011	6/19/2012	6/11/2013	6/9/2014	6/9/2015	9/16/2015	12/4/2015	3/8/2016	6/7/2016	9/13/2016
MW-8	2.21	<0.20	--	43.33	3.279	1.67, 0.86	9.723, 10.742	9.203, 8.707	1.26, 1.63	32.62, 30.139	5.286, 6.543

Total PAH Concentration											
Well ID	12/14/2016	3/8/2017	6/7/2017	9/27/2017	12/6/2017	3/7/2018	6/27/2018	9/21/2018	12/12/2018	3/6/2019	6/5/2019
MW-8	4.857, 5.335	4.251, 4.184	20.251, 16.463	3.211, 3.208	3.654, 5.934	1.565, 1.369	8.195, 7.655	2.741, 2.27	4.269, 3.882	4.257, 2.73	9.529, 6.184

Total PAH Concentration						
Well ID	9/19/2019	12/11/2019	3/18/2020	6/1/2020	9/22/2020	12/18/2020
MW-8	2.141, 1.452	1.353, 0.896	5.806, 8.092	0.193, 0.909	4.004, 7.017	2.907, 1.652

2020 Quarterly Data Detail									
March 2020 Data Detail									
Well	Acenaphthene	Acenaphthylene	Benzo(g,h,i)perylene	Dibenz(a,h)anthracene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MW-8	0.322, 0.419	0.129, 0.134	<0.0985, <0.0981	<0.0985, <0.0981	0.225, 0.369	<0.0985, <0.0981	5.13, 7.17	<0.0985, <0.0981	<0.0985, <0.0981

June 2020 Data Detail									
Well	Acenaphthene	Acenaphthylene	Benzo(g,h,i)perylene	Dibenz(a,h)anthracene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MW-8	0.193, 0.338	<0.102, <0.103	<0.102, 0.108	<0.102, <0.103	<0.102, 0.201	<0.102, <0.103	<0.102, 0.262	<0.102, <0.103	<0.102, <0.103

September 2020 Data Detail									
Well	Acenaphthene	Acenaphthylene	Benzo(g,h,i)perylene	Dibenz(a,h)anthracene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MW-8	0.373, 0.764	0.174, 0.248	0.13, 0.142	0.159, 0.150	0.396, 0.815	0.202, 0.160	2.57, 4.62	<0.103, <0.102	<0.103, 0.118

December 2020 Data Detail									
Well	Acenaphthene	Acenaphthylene	Benzo(g,h,i)perylene	Dibenz(a,h)anthracene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MW-8	<0.100, <0.103	0.252, <0.103	<0.100, <0.103	<0.100, <0.103	0.165, 0.142	<0.100, <0.103	2.49, 1.51	<0.100, <0.103	<0.100, <0.103

Notes:
Results are reported in micrograms per liter (µg/L).
Total PAH concentration is the sum of the low-level PAH concentrations listed in the data detail section. Non-detects were not included.
Duplicate result reported following the comma.
-- Not sampled.
BOLD - Concentrations in bold type indicate levels exceed the New Mexico Water Quality Control Commission standard for PAH concentrations (30 µg/L).

Abbreviations:
PAH - Polycyclic aromatic hydrocarbon.

Table 5
LNAPL Thickness Measurements
2020 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico



Well ID	Mar-16	Jun-16	Sep-16	Dec-16	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20
MW-1	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-2	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-3S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-3D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-4	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Heavy sheen	0.05	Heavy sheen	Sheen	Heavy sheen	0.01	0.19	0.02	0.00	0.00	0.00	Heavy sheen	0.00
MW-6S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Damaged	Damaged	Damaged	Damaged
MW-6D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-7	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	0.00	Light sheen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-9S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed
MW-10	0.00	0.00	0.00	0.00	0.00	0.00	Light sheen	Light sheen	0.00	Sheen	0.00	Light sheen	0.00	0.00	Slight sheen	0.00	0.00	0.00	Slight sheen	0.00
MW-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-12	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-13	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-14	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-15	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-16	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-1	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-2	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-3	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-7	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-14	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-25	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-26S	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-26D	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-27S	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-27D	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-30	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-31	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-32	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-33	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A

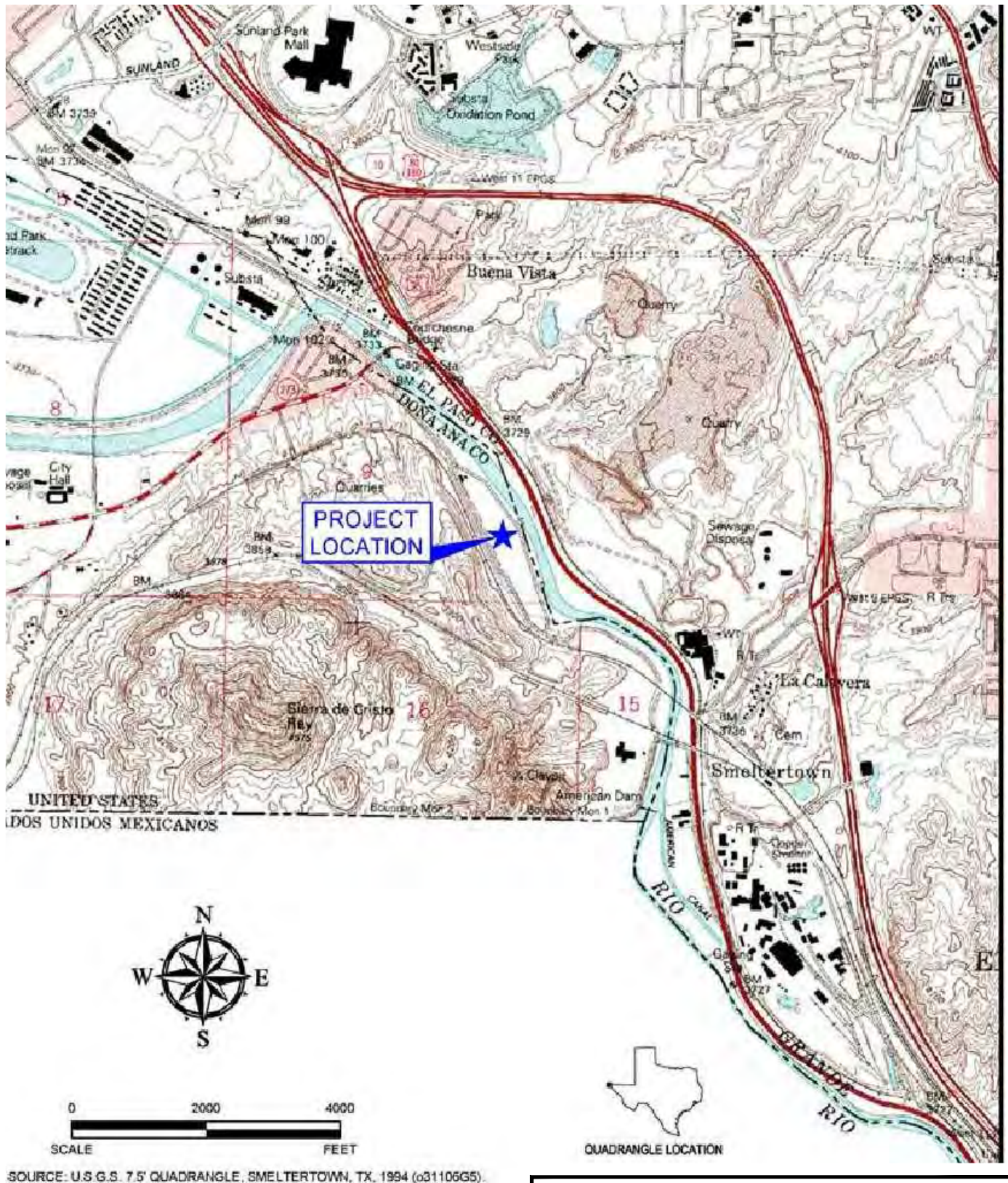
Notes:
⁽¹⁾Roots on probe.
⁽²⁾Cap could not be removed.
Measurements are reported in feet.
BOLD - Measurable amount of LNAPL observed.
Dry - Monitoring point was dry.
Sheen - Thin layer of LNAPL or oxidation observed; too thin to measure. See field notes for details.
Tar - Thickness measurement not obtainable because of presence of thick, tar-like substance in well point.
Trace - Traces of LNAPL observed; too thin to measure.

Abbreviations:
LNAPL - Light Non-Aqueous Phase Liquid.
NM - Not measured.
P&A - Plugged and abandoned.

FIGURES



DRAWN BY: S. MEN CHECKED BY: TDR PROJECT MANAGER: DRE
C:\Users\men\OneDrive - ARCADIS\Project\OneDrive\3049071\3004907-01.dwg PLOTTED: 3/22/2021 1:34 PM BY: MEN, SOTHON

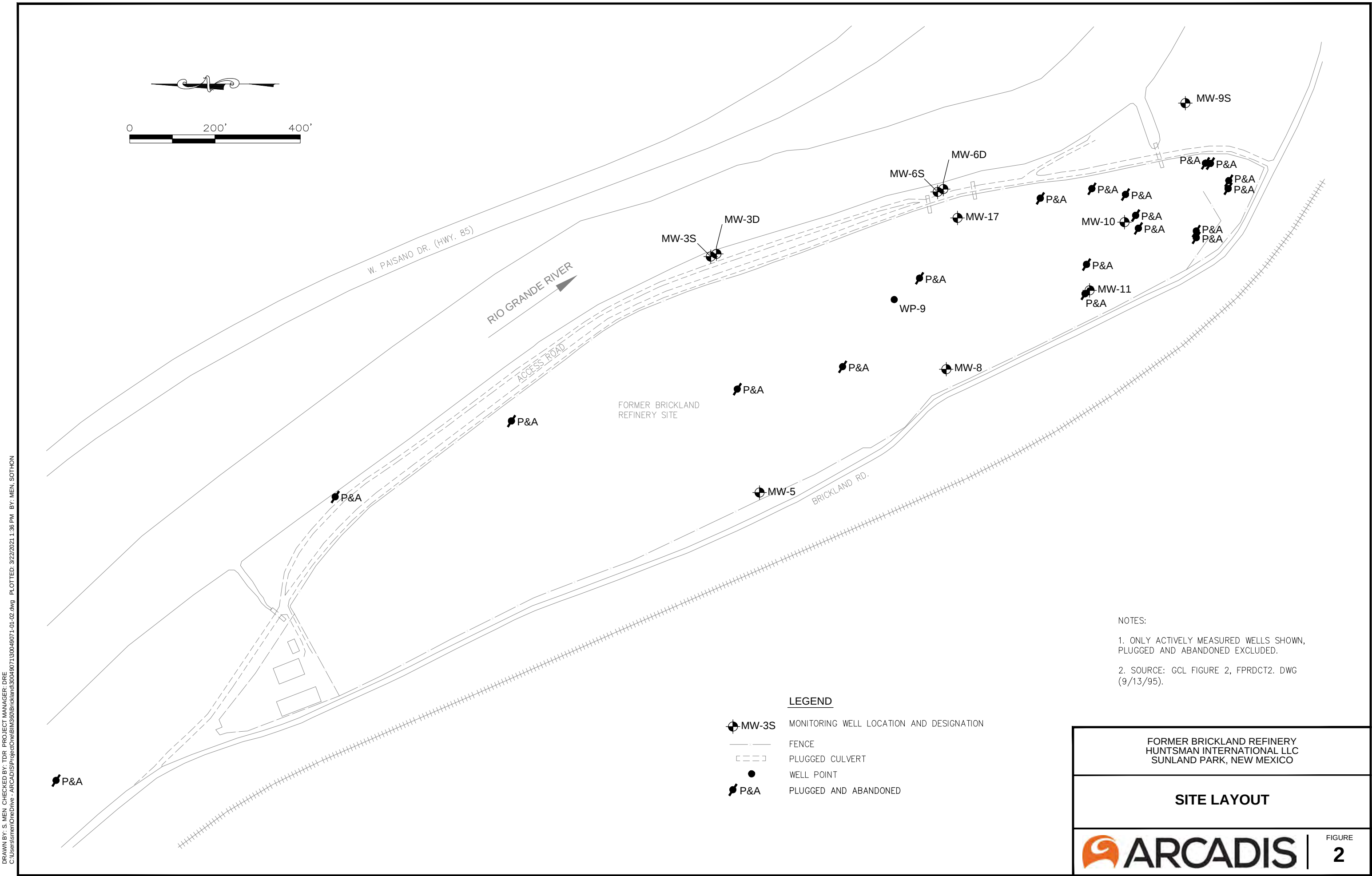


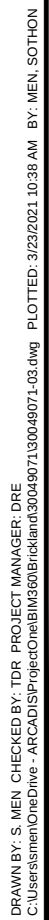
FORMER BRICKLAND REFINERY
HUNTSMAN INTERNATIONAL LLC
SUNLAND PARK, NEW MEXICO

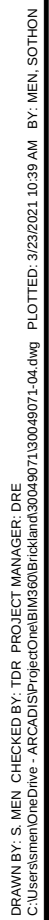
SITE LOCATION MAP



FIGURE
1









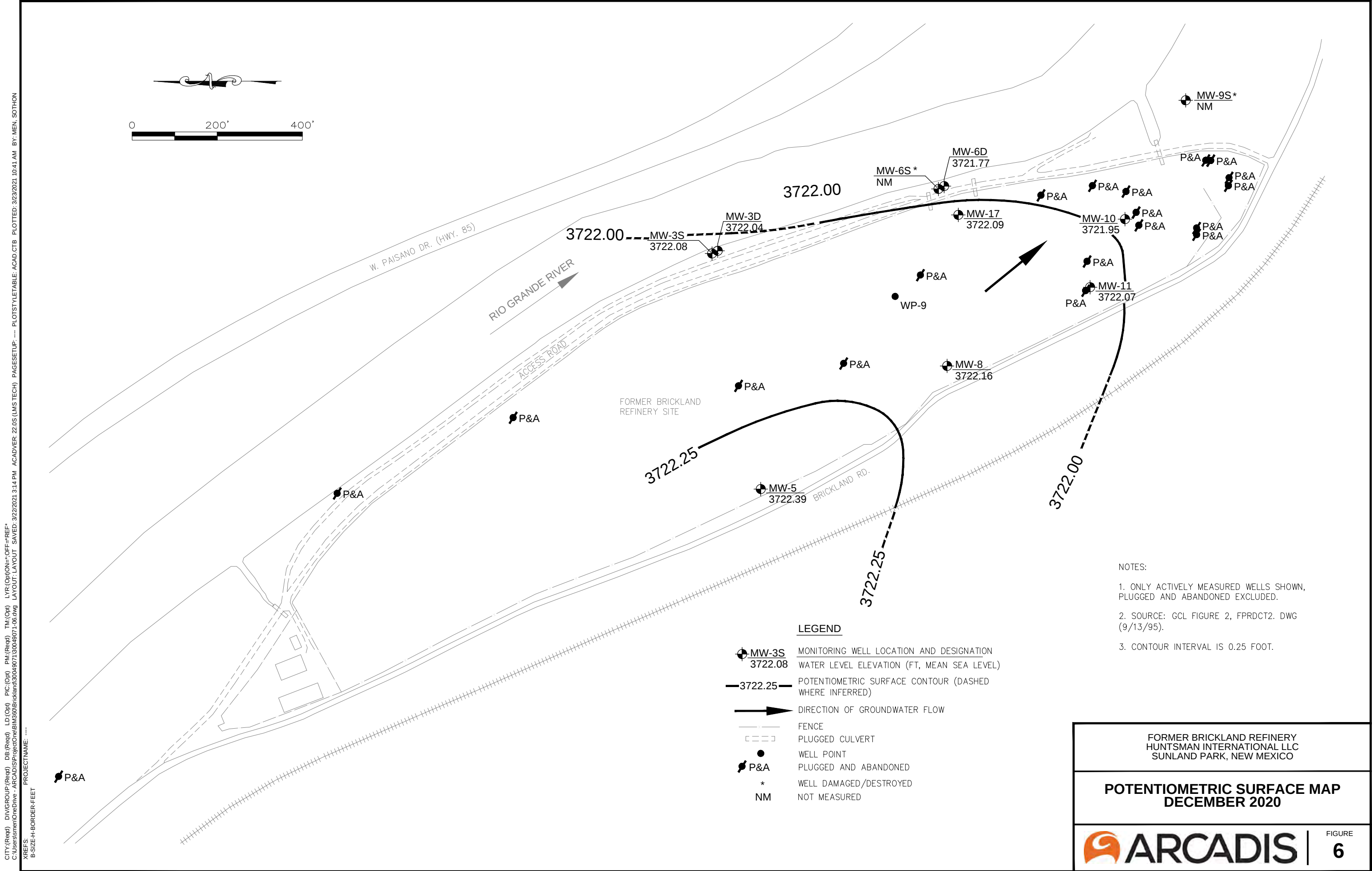
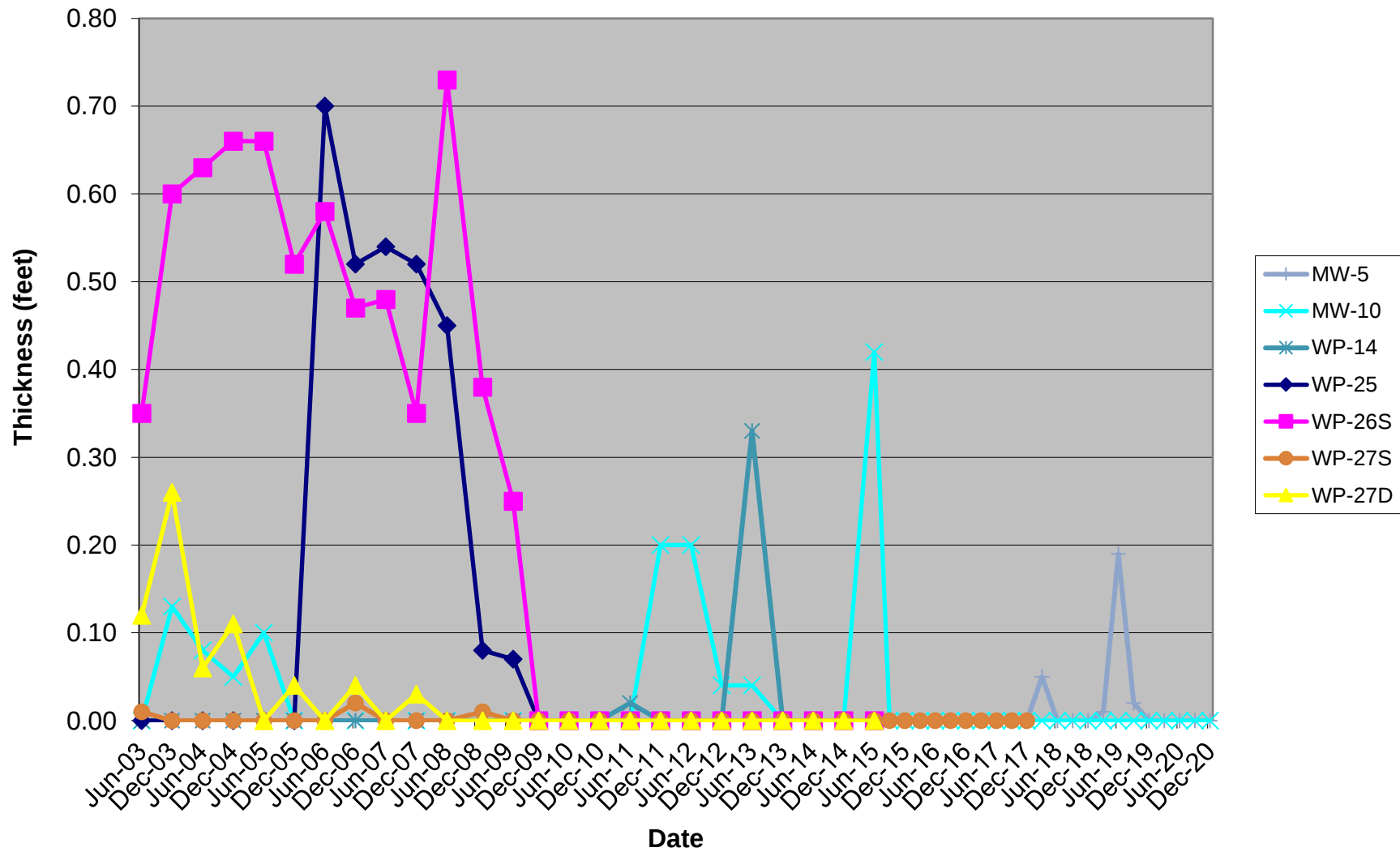


Figure 7 - Historical LNAPL Thickness



Note: WP-14, WP-25, WP-26S, WP-27S, and WP-27D were plugged and abandoned in June 2015.

Figure 8 - Quarterly Benzene Concentrations in Monitoring Wells (2014-2020)

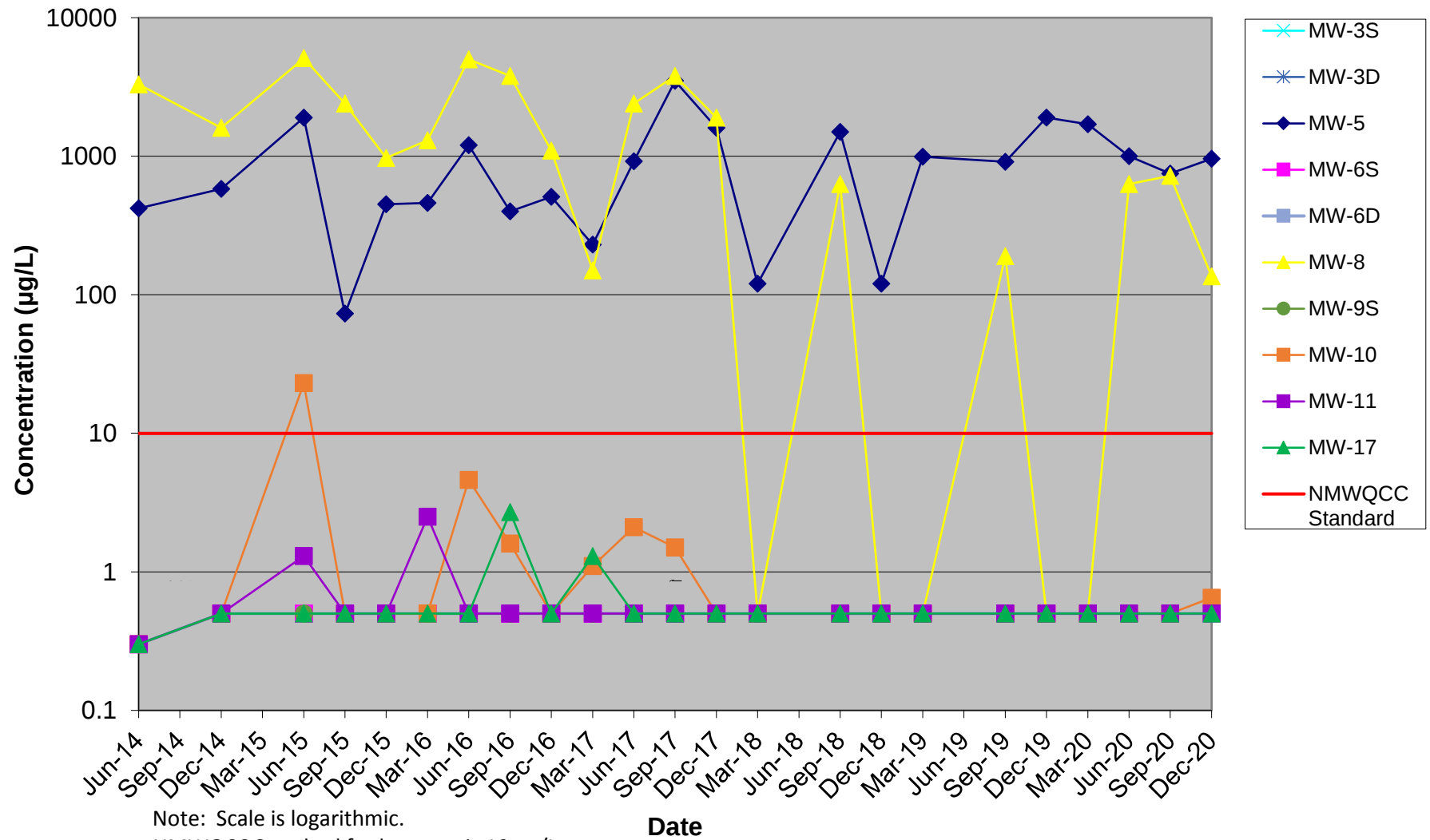
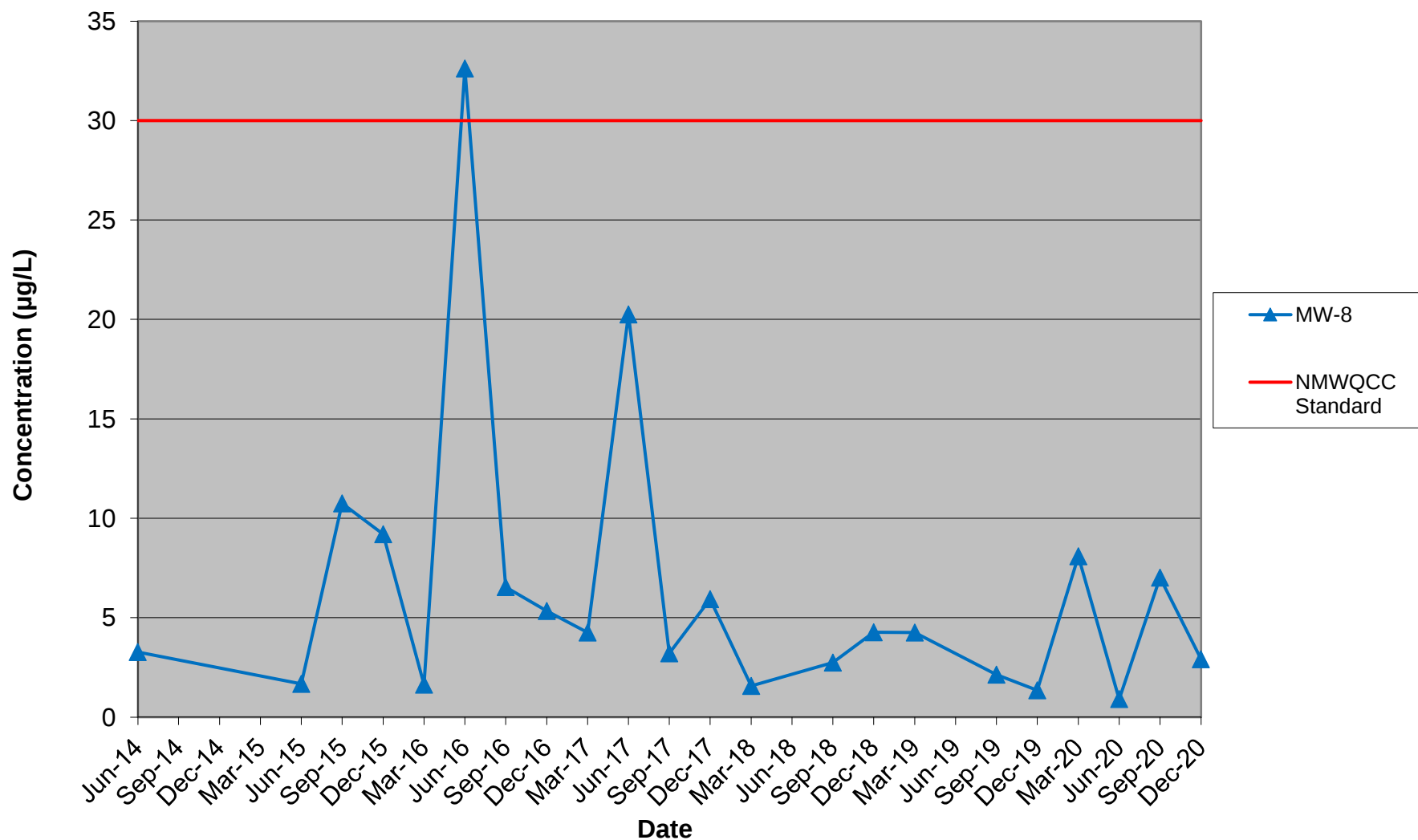


Figure 9 - Quarterly Total PAH Concentrations in Monitoring Well MW-8 (2014-2020)



Note: NMWQCC Standard for total PAH is 30 µg/L.

The higher detection between the parent and duplicate sample is graphed.

Figure 10 - 2020 Rio Grande at El Paso, Texas, River Stage with Monitoring Well Water-Level Elevations

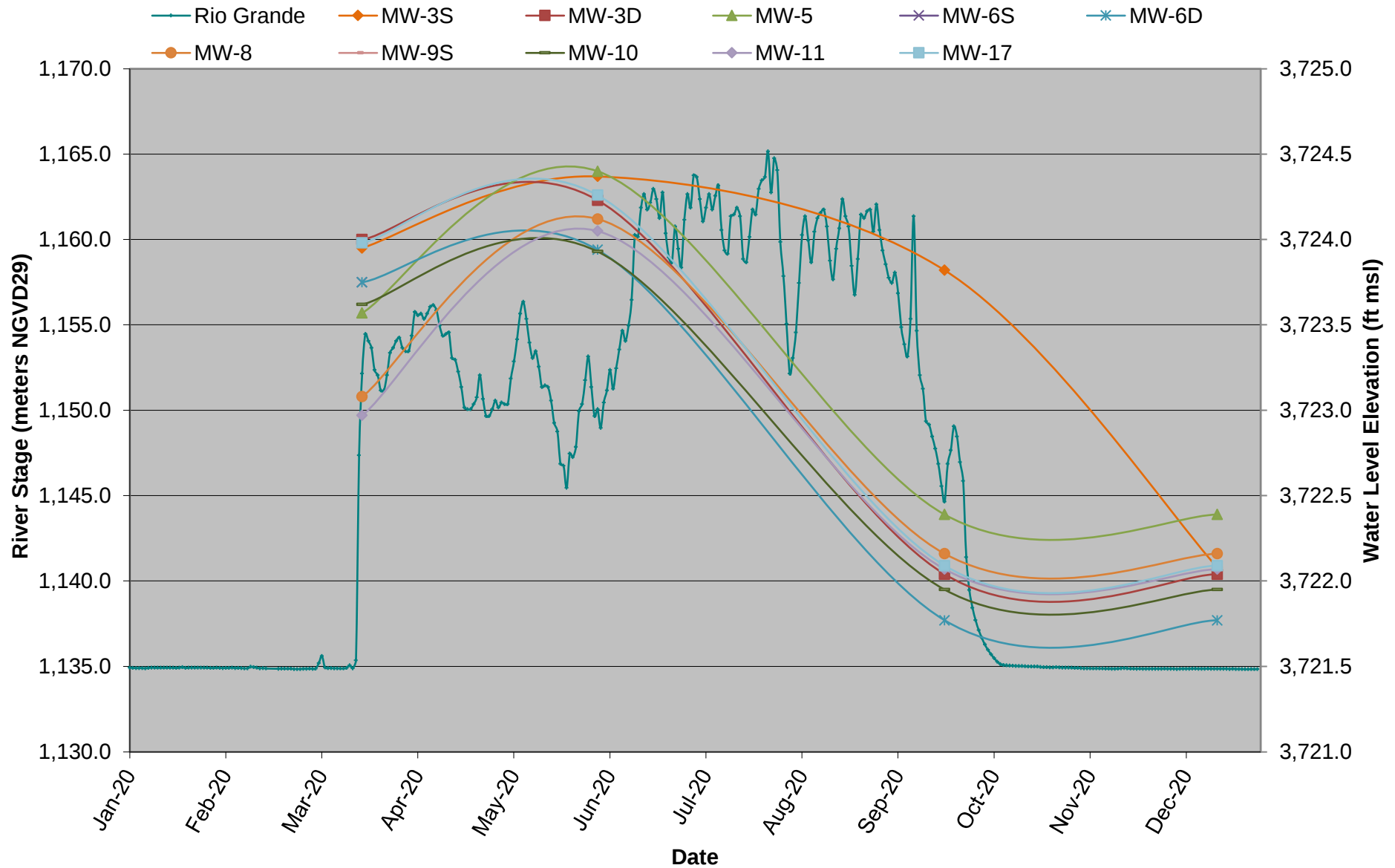


Figure 11 - 2020 Rio Grande at El Paso, Texas, River Stage with Benzene Concentrations in Monitoring Wells

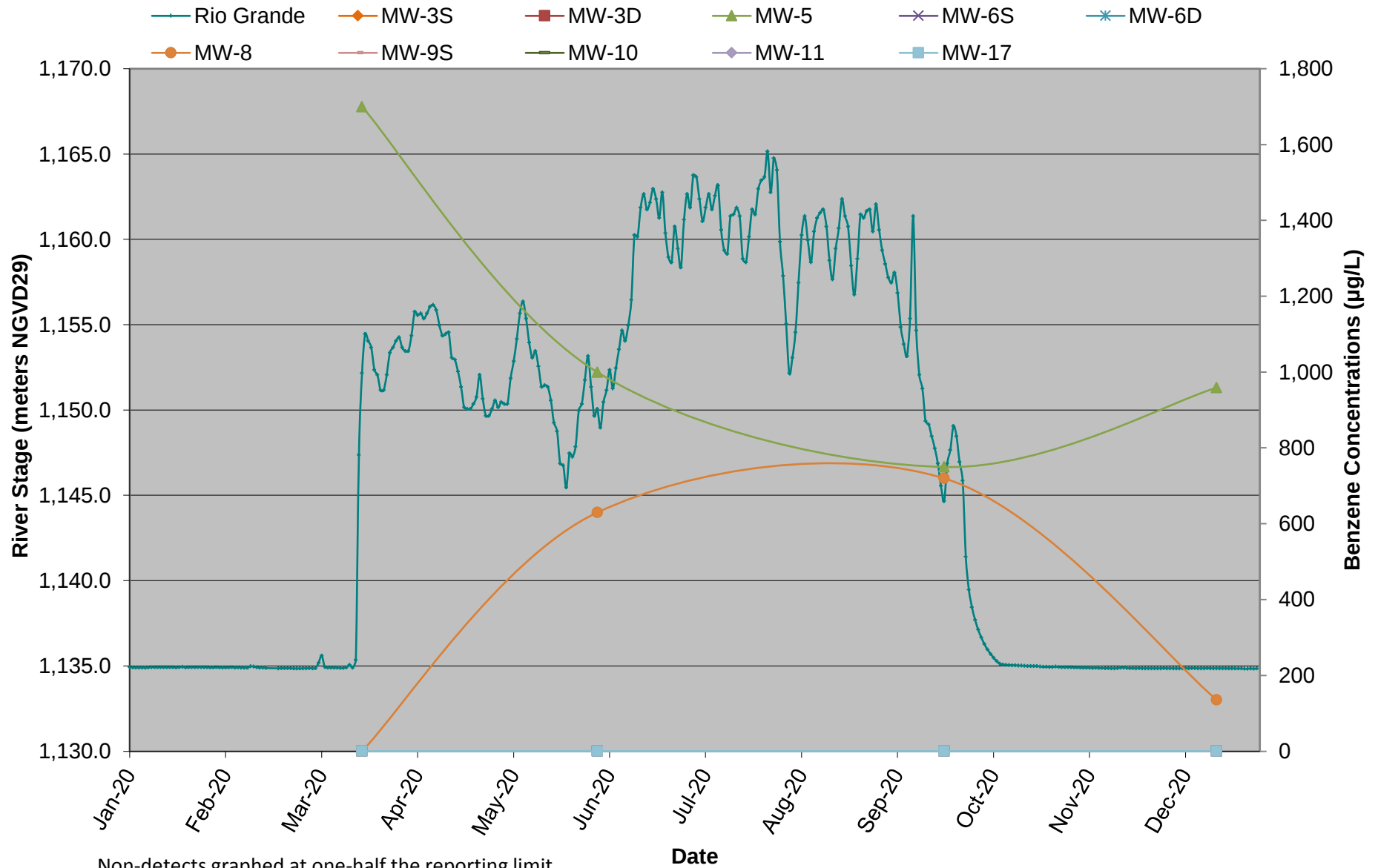
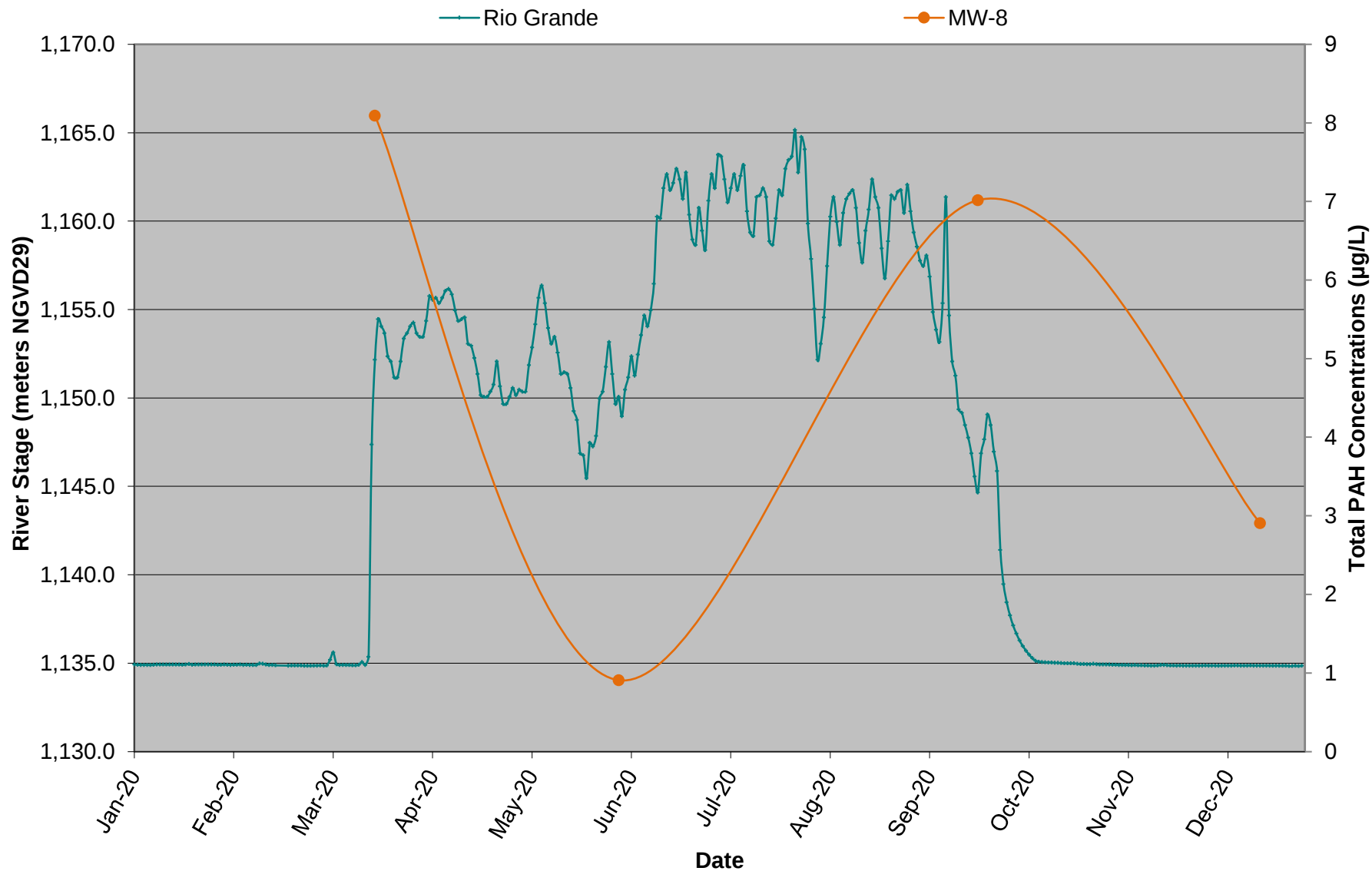


Figure 12 - 2020 Rio Grande at El Paso, Texas, River Stage with Total PAH Concentrations in Monitoring Well MW-8



APPENDIX A

Field Data



DAILY LOG

Well(s)/Boring(s)

Project Name and No.

Huntsman Brickland Refinery

Site Location

Sunland, New Mexico

Prepared by

Date/Time	Description of Activities
0820	Arrived on site. Site Check
0830	PID all wells
0945	Purged and Sampled MW-3S / MW-3D
1030 1115	Purged and sampled MW-6D
	MW-6S was unable to sample due to casing nearly broken off and blocked up. well is now "doglegged".
1100 1215	Purged and sampled MW-17
0830	Purged and Sampled MW-11
0915	Purged and Sampled MW-8
1020	Purged and Sampled MW-5
1115	Purged and Sampled MW-10
	 3.18.20

Control Number: TSM-



TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxx - dd/mm/year

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: <u>Huntsman Brickland Refinery</u>		Project Location: <u>Sunland NM</u>	
Date: <u>3-17-20</u>	Time: <u>0800</u>	Conducted by: <u>D. Dwyer</u>	Signature/Title: <u>[Signature]</u>

Issues or concerns from previous day's activities:

Task anticipated to be performed today:

☐ Additional permits/checklists attached

USE TRACK! Evaluate the hazards (h) for the tasks being performed today and rank as Low (L), Medium (M) or High (H). Use relevant JSAs, FHSB, permit or other work standard to communicate controls (c) to be used to eliminate or mitigate identified hazards.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H) h: _____ c: _____	☐ Motion (i.e., traffic, moving water) (L M H) h: _____ c: _____	☐ Mechanical (i.e., augers, motors) (L M H) h: _____ c: _____
☐ Electrical (i.e., utilities, lightning) (L M H) h: _____ c: _____	☐ Pressure (i.e., gas cyl., wells) (L M H) h: _____ c: _____	☒ Environment (i.e., heat, cold, ice) (L M H) h: <u>Cold, Rain</u> c: <u>Proper Clothing</u>
☒ Chemical (i.e., fuel, acid, paint) (L M H) h: <u>Benzene</u> c: <u>PPE, stay clear of well head</u>	☒ Biological (i.e., ticks, poison ivy) (L M H) h: <u>Snakes, Spiders, Tick</u> c: <u>Check Hand Placement</u>	☒ Radiation (i.e., alpha, sun, laser) (L M H) h: <u>Sun</u> c: <u>shade and sunscreen</u>
☐ Sound (i.e., machinery) (L M H) h: _____ c: _____	☐ Personal (i.e., alone, night) (L M H) h: _____ c: _____	☒ Driving (i.e., car, ATV, boat, dozer) (L M H) h: <u>Offroad</u> c: <u>scout ahead</u>

Comments:

☐ Refer to the attached Hazard Analysis Sheet(s) or JSA

Signature and Certification: I have read and understand the project specific HASP for this project.

Printed Name/Signature/Company	Sign In Time	Sign Out Time
<u>Dakota Dwyer / ANA</u>	<u>0800</u>	
<u>CHARLESTON SHIRLEY / ANA</u>	<u>0800</u>	

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

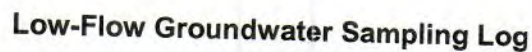
If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.888.449.7787 and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager



Field Parameter Measurements During Purging

G:\Projects\LA003185.2019 - Huntsman 2019\lowflowsampforms - Sheet1



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	3-17-20	Sampled By	
Sampling Time	1100	Recorded By	
Weather		Coded Replicate No.	

Well ID mw-3D

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	6.00	Purge Time	Start 1030 Finish 1100

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>Clear</u>	Odor <u>NA</u>	Appearance <u>Clear</u>
Parameter	Container	No.	Preservative
<u>Benzene</u>	<u>40 ml. H₂O A</u>	<u>3</u>	<u>None</u>

PID Reading 0.0

Comments FB-031720 @ ~~200~~ 1105 (3 VOA)



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	3-17-20	Sampled By	
Sampling Time	1145	Recorded By	
Weather		Coded Replicate No.	

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	6.87	Purge Time	Start 1115 Finish 1145

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>none</u>	Appearance <u>sl clear</u>
Parameter	Container	No.	Preservative
<u>Benzene</u>	<u>40ml VOA</u>	<u>3</u>	<u>none</u>

PID Reading 0.0

Comments FD-031720 @ 1200 (3 VOA)

Control Number: TSM-



TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: <i>Huntsman Brickland Refinery</i>		Project Location: <i>Sunland, NM</i>	
Date: <i>3-18-20</i>	Time: <i>0800</i>	Conducted by: <i>D. Doman</i>	Signature/Title: <i>DD</i>

Issues or concerns from previous day's activities:

Task anticipated to be performed today:

☐ Additional permits/checklists attached

USE TRACK! Evaluate the hazards (h) for the tasks being performed today and rank as Low (L), Medium (M) or High (H). Use relevant JSAs, FHSB, permit or other work standard to communicate controls (c) to be used to eliminate or mitigate identified hazards.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☐ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
h: _____	h: _____	h: _____
c: _____	c: _____	c: _____
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cyl., wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H)
h: _____	h: _____	h: Rain, Cold
c: _____	c: _____	c: Proper Clothing
☒ Chemical (i.e., fuel, acid, paint) (L M H)	☒ Biological (i.e., ticks, poison ivy) (L M H)	☒ Radiation (i.e., alpha, sun, laser) (L M H)
h: Benzene	h: Snakes Spider Ticks	h: Sun
c: Stay Clear of well head	c: Watch hand and foot placement	c: Shade and sun screen
☐ Sound (i.e., machinery) (L M H)	☐ Personal (i.e. alone, night) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)
h: _____	h: _____	h: Off road
c: _____	c: _____	c: Smart ahead

Comments:

☐ Refer to the attached Hazard Analysis Sheet(s) or JSA

Signature and Certification: I have read and understand the project specific HASP for this project.

[illegible]

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB**, I will perform **TRACK**; and then amend the hazard assessments on the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is **absolutely necessary** and then only after I have done **TRACK** and I have thoroughly controlled the hazard.

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call **WorkCare at 1.888.449.7787** and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager



Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>Clear</u>	Odor <u>none slight</u>	Appearance <u>clear to sl. char</u>
Parameter <u>Benzene</u>	Container <u>40mL VOA</u>	No. <u>3</u>	Preservative <u>none</u>
PID Reading <u>0.1</u>			

Comments



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	3.18.20	Sampled By	
Sampling Time	0915	Recorded By	
Weather		Coded Replicate No.	

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	6.14	Purge Time	Start 0915 Finish 0950

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>sl Yellow</u>	Odor <u>HC</u>	Appearance <u>sl. Clear</u>
Parameter	Container	No.	Preservative
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

PID Reading 0.7

Comments

FDO 31820	@ 1000 1200	(PAH)	03 clear	Amber
FB 031820	@ 1000 1205	1210 (PAH, Benzene)	3 clear	3 Amber
EB 031820	@ 1210 1205	(PAH, Benzene)	3 clear	3 Amber
MW-8	@ 0950	(PAH, Benzene)	3C clear	3 Amber

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	3-18-20	Sampled By	
Sampling Time	1050	Recorded By	
Weather		Coded Replicate No.	

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	6.13	Purge Time	Start 1020 Finish 1050

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color	Odor	Appearance
Parameter	Container	No.	Preservative
Benzene	40mL VOA	2	none

PID Reading	544.9
Comments	Slight sheen on water surface



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	3-18-20	Sampled By	
Sampling Time	1145	Recorded By	
Weather		Coded Replicate No.	
			Well ID MW-10

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.43	Purge Time	Start 1115 Finish 1145

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color	Odor	Appearance
Parameter	Container	No.	Preservative
Ben Zene	40 mL VOA	3	none

PID Reading 0.0

Comments

River Running

* m w - 65 - Foundation shifted, Well is now cracked and unable to sample

Cincinnati, OH
+1 513 733 5336Everett, WA
+1 425 356 2600Fort Collins, CO
+1 970 490 1511Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 2 of 2

COC ID: 221208

Houston, TX
+1 281 530 5656Middletown, PA
+1 717 944 5541Spring City, PA
+1 610 948 4903Salt Lake City, UT
+1 801 266 7700South Charleston, WV
+1 304 356 3168York, PA
+1 717 505 5280

Received by OCD: 3/31/2021 11:36:15 AM

Customer Information

Purchase Order: 30014271 LA003185 Tim Ratchford

Work Order:

Company Name: ARCADIS U.S., Inc.

Send Report To: Tim Ratchford

Address: 10352 Plaza Americana Drive

City/State/Zip: Baton Rouge, LA 70815

Phone: (225) 292-1004

Fax:

e-Mail Address: Tim.Ratchford@arcadis-us.com

Project Information

Project Name: Brickland Refinery

Project Number: 30014271 LA003185

Bill To Company: ARCADIS

Invoice Attn: Accounts Payable

Address: 630 Plaza Drive, Suite 600

City/State/Zip: Highlands Ranch CO 80129

Phone: (303) 471-3699

Fax:

e-Mail Address: Accountspayable.administration@arcadis.com

ALS Project Manager:

ALS Work Order #:

Parameter/Method Request for Analysis

A: 8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT)

B: 8270_PAH_LVI (8270 PAHs (LVI))

C:

D:

E:

F:

G:

H:

I:

J:

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MJ-10	03182020	1145	W	8	3	X										
2	FD-03182020	03182020	1200	W	8	3		X									
3	FB-03182020	03182020	1210	W	9	6	X	X									
4	EB-03182020	03182020	1205	W	8	6	X	X									
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign

DAKOTA DRAPEL
CHARLESTON SHOTLEY

Shipment Method

Required Turnaround Time: (Check Box)

☒ STD 10 Wk Days☐ 5 Wk Days☐ Other _____☐ 2 Wk Days☐ 24 Hour

Results Due Date:

Relinquished by:

Date:

Time:

Received by:

Notes:

[AGM Brickland NM]

Relinquished by:

Date:

Time:

Received by (Laboratory):

Cooler ID

Cooler Temp.

QC Package: (Check One Box Below)

Logged by (Laboratory):

Date:

Time:

Checked by (Laboratory):

☒ Level II Std QC☐ Level III Std QC/Raw Data☐ Level IV SWAB/CLP☐ Other _____☐ TRRP Checklist☐ TRRP Level IVPreservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

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Page 6 of 259

- Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

Cincinnati, OH
+1 513 733 5336Fort Collins, CO
+1 970 490 1511Everett, WA
+1 425 356 2600Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 221210

Houston, TX
+1 281 530 5656Middletown, PA
+1 717 944 5541Spring City, PA
+1 610 948 4903Salt Lake City, UT
+1 801 266 7700South Charleston,
+1 304 356 3168York, PA
+1 717 505 5280

Received by OCD: 3/31/2021 11:36:15 AM

Customer Information

Purchase Order: 30014271 LA003185 Tim Ratchford

Work Order:

Company Name: ARCADIS U.S., Inc.

Send Report To: Tim Ratchford

Address: 10352 Plaza Americana Drive

City/State/Zip: Baton Rouge, LA 70816

Phone: (225) 292-1004

Fax:

e-Mail Address: Tim.Ratchford@arcadis-us.com

Project Information

Project Name: Brickland Refinery

Project Number: 30014271 LA003185

Bill To Company: ARCADIS

Invoice Attn: Accounts Payable

Address: 630 Plaza Drive, Suite 600

City/State/Zip: Highlands Ranch CO 80129

Phone: (303) 471-3699

Fax:

e-Mail Address: Accountspayable.administration@arcadis.com

ALS Work Order #:

Parameter/Method Request for Analysis

A 8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT)

B 8270_PAH_LVI (8270 PAHs (LVI))

C

D

E

F

G

H

I

J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-35	03172020	1015	W	8	3	✓										
2	MW-3D	03172020	1100	W	8	3	✓										
3	MW-4B	03172020	1145	W	8	3	✓										
4	MW-17	03172020	1245	W	8	3	✓										
5	EB-03172020	03172020	1205	W	8	3	✓										
6	FD-03172020	03172020	1200	W	8	3	✓										
7	FB-03172020	03172020	1105	W	8	3	✓										
8	MW-11	03182020	0900	W	8	3	✓										
9	MW-8	03182020	0950	W	8	3+6	✓	✓									
10	MW-5	03182020	1050	W	8	3	✓										

Sampler(s) Please Print & Sign

DAKOTA DRAKER
CHARLESTON SHERLEY

Shipment Method

Required Turnaround Time: (Check Box)

☐ Other

Results Due Date:

☒ STD 10 Wk Days☐ 5 Wk Days☐ 2 Wk Days☐ 24 Hour

Relinquished by:

Date:

Time:

Received by:

Notes:

[AGM Brickland NM]

Relinquished by:

Date:

Time:

Received by (Laboratory):

Cooler ID

Cooler Temp.

QC Package: (Check One Box Below)

Logged by (Laboratory):

Date:

Time:

Checked by (Laboratory):

☒ Level II Std QC☐ Level III Std QC/Rev Date☐ Level IV SW48/CLP☐ Other☐ TRRP Checklist
☐ TRRP Level IVPreservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

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Page 61 of 259

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Page 1 of 1

DAILY LOG

Well(s)/Boring(s)

Project Name and No. Brickland Refinery

Site Location

Sunland Park, NM

Prepared by

S. Celis

Date/Time	Description of Activities
6/1/20 0800	Conduct Safety Tailgate meeting
0815	Group wells / PID Readings
0920	purge and sample MW-3S, sample @ 1000
1040	purge and sample MW-3N, sample @ 1040, FB, FD
1100	Initiate purge, sample MW-6S @ 1140
1150	Initiate purge, sample MW-17 @ 1230 / collect EX
1300	Clean up site, Decom, Lock-up and leave site.
	<u>SL</u>
6/02/20	
0745	Arrive on site Conduct Safety Tailgate
0750	Initiate purge and sample MW-5 @ 0830
0850	Initiate purge and sample MW-8 @ 0925 FD FB
0950	Initiate purge and sample MW-11 @ 1025
1050	Initiate purge and sample MW-10 @ 1120
1200	Clean up site, pack equipment, prep samples for shipping
1300	Drop samples off at Fed Ex

Control Number: TSM-

TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxxx - dd/mm/year



TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: <u>Brickland</u>			Project Location: <u>Sundland Park N, m</u>	
Date: <u>6/1/20</u>	Time: <u>0800</u>	Conducted by: <u>S. Ellis</u>	Signature/Title: <u>PSHLL - Staffs Geograph</u>	
Issues or concerns from previous day's activities:				

Task anticipated to be performed today:

☐ Additional permits/checklists attached *Gauging and Sampling Wells*

USE TRACK! Evaluate the hazards (h) for the tasks being performed today and rank as Low (L), Medium (M) or High (H). Use relevant JSAs, FHSB, permit or other work standard to communicate controls (c) to be used to eliminate or mitigate identified hazards.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☒ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
h: _____	h: _____	h: _____
c: _____	c: _____	c: _____
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e., gas cyl., wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H)
h: _____	h: _____	h: <u>High Heat</u>
c: _____	c: _____	c: <u>ppe cover up / sun screen</u>
☒ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
h: _____	h: _____	h: _____
c: _____	c: _____	c: _____
☐ Sound (i.e., machinery) (L M H)	☐ Personal (i.e. alone, night) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M H)
h: _____	h: _____	h: <u>Sandy Terrain</u>
c: _____	c: _____	c: _____

Comments:

☐ Refer to the attached Hazard Analysis Sheet(s) or JSA

Signature and Certification: I have read and understand the project specific HASP for this project.

[illegible]

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB**, I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call **WorkCare at 1.888.449.7787** and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	6/1/20	Sampled By	
Sampling Time	1000	Recorded By	
Weather	Sunny / Breezy	Coded Replicate No.	
			Well ID MW-38 3S

Instrument Identification

Water Quality Meter(s) HORIBA U-52

Casing Material	<u>PVC</u>	Purge Method	LOW FLOW PERISTALTIC PUMP
-----------------	------------	--------------	---------------------------

Casing Diameter	4-INCH	LOW FLOW PERISTALTIC PUMP
-----------------	--------	---------------------------

Sounded Depth (ft bmp)

Depth to Water (ft bmp) 5.63 Purge Time _____ Start 0930 Finish 1000

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>N/A</u>	Appearance <u>Clear</u>
Parameter <u>Benzene</u>	Container <u>40 ml / VOA</u>	No. <u>3</u>	Preservative <u>None</u>

PID Reading _____

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	6/01/20	Sampled By	
Sampling Time	1040	Recorded By	
Weather	Sunny / Breezy	Coded Replicate No.	
			Well ID MW-30

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.77	Purge Time	Start 1010 Finish 1050

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>n/a</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40 ml / VOA</u>	No. <u>3</u>	Preservative <u>none</u>

PID Reading _____

Comments

FB-060120	@ 1045	3	Voa
FD-060120	@ 1050	3	Voa



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	6/1/20	Sampled By	
Sampling Time	1140	Recorded By	
Weather	Sunny / Breezy	Coded Replicate No.	

Instrument Identification

Water Quality Meter(s) HORIBA U-52

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
-----------------	-----	--------------	---------------------------

Casing Diameter	4-INCH
-----------------	--------

Sounded Depth (ft bmp)

Depth to Water (ft bmp) 6.68 Purge Time _____ Start 1110 Finish 1140

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>n/a</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40 ml / VOA</u>	No. <u>3</u>	Preservative <u>none</u>

PID Reading

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	6/1/20	Sampled By	
Sampling Time	1230	Recorded By	
Weather	Sunny / Breezy	Coded Replicate No.	
			Well ID MW-17

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	7.72	Purge Time	Start 1200 Finish 1230

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>none</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40 ml / vial</u>	No. <u>3</u>	Preservative <u>none</u>

PID Reading

Comments EB-060120 Q 1235



Low-Flow Groundwater Sampling Log

Project		HUNTSMAN BRICKLAND REFINERY	
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	6/2/20	Sampled By	
Sampling Time	0830	Recorded By	
Weather	Sunny / warm	Coded Replicate No.	

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.3	Purge Time	Start 0800 Finish 0830

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>Dark initially</u>	Odor _____	Appearance _____
Parameter <u>Benzene</u>	Container <u>40 mL VOA</u>	No. <u>3</u>	Preservative _____
_____	_____	_____	_____
_____	_____	_____	_____

PID Reading _____

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	6/2/20	Sampled By	
Sampling Time	0925	Recorded By	
Weather	Sunny / warm	Coded Replicate No.	
			Well ID MW-8

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.10	Purge Time	Start 0855 Finish 0925

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color	Odor	Appearance
Parameter	Container	No.	Preservative

PID Reading

Comments

FD-060220	(PAH)	3	Amber
FB-060220 @ 0935	(PAH, Ben)	3 clear	3 Amber
EB-060220 @ 0930	(PAH, Ben)	3 clear	3 Amber
MW-8 @ 0925	(PAH, Ben)	3 clear	3 Amber



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	06/02/20	Sampled By	
Sampling Time	1025	Recorded By	
Weather	Sunny / warm	Coded Replicate No.	
			Well ID MW-11

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	7.35	Purge Time	Start 0955 Finish 1025

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color	Odor	Appearance
Parameter	Container	No.	Preservative
Benzene	40 mL / VOA	3	none

PID Reading _____

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM
Date	06/02/20	Sampled By	
Sampling Time	11:20	Recorded By	
Weather	Sunny / warm	Coded Replicate No.	
			Well ID MW-10

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.61	Purge Time	Start 1050 Finish 1120

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>none</u>	Odor <u>Slight HC</u>	Appearance <u>Low turb</u>
Parameter	Container	No.	Preservative
<u>Benzene</u>	<u>40 mL / VOA</u>	<u>3</u>	<u>none</u>

PID Reading

Comments _____

Cincinnati, OH
+1 513 733 5336Everett, WA
+1 425 356 2600Fort Collins, CO
+1 970 490 1511Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 216971

Houston, TX
+1 281 530 5656Middletown, PA
+1 717 944 5541Spring City, PA
+1 610 948 4903Salt Lake City, UT
+1 801 266 7700South Charleston, WV
+1 304 356 3168York, PA
+1 717 505 5280

Received by OCD: 3/31/2021 11:36:15 AM

Customer Information		Project Information		Parameter/Method Request for Analysis														
Purchase Order	30049071 Task 250	Project Name	30049071 Brickland Refinery 2Q2020	A	8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT													
Work Order		Project Number	30049071 Task 250	B	8270_PAH_LVI (8270 PAHs (LVI))													
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C														
Send Report To	Tim Ratchford	Invoice Attn	Accounts Payable	D														
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E														
				F														
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G														
Phone	(225) 292-1004	Phone	(303) 471-3699	H														
Fax		Fax		I														
e-Mail Address	Tim.Ratchford@arcadis-us.com	e-Mail Address	Accounts.payable.administration@arcadis.com	J														
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold	
1	MW-35	6/1/20	1000	W	8	3	X											
2	MW-3D	6/1/20	1040	W	8	3	X											
3	FB-060120	6/1/20	1045	W	8	3	X											
4	FD-060120	6/1/20		W	8	3	X											
5	MW-6D	6/1/20	1140	W	8	3	X											
6	MW-17	6/1/20	1230	W	8	3	X											
7	FB-060120	6/1/20	1235	W	8	3	X											
8	MW-5	6/2/20	0830	W	8	3	X											
9	MW-8	6/2/20	0915	W	8	6	X	X										
10	EB-060220	6/2/20	0930	W	8	6	X	X										
Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)				Other				Results Due Date:						
D. M. G. S. T. O. N.		Fed Ex		☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour														
Relinquished by:	Date:	Time:	Received by:				Notes: [AGM Brickland NM]											
Sergio Celis	6/2/20	1300																
Relinquished by:	Date:	Time:	Received by (Laboratory):				Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)									
									☒ Level II Std QC ☐ TRRP Checklist ☐ Level III Std QC/Range Date ☐ TRRP Level IV ☐ Level IV SWAB/CLP ☐ Other									
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):															
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035																		

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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Chain of Custody Form

Page 2 of 2

COC ID: 216973

Houston, TX
+1 281 530 5656

Middletown, PA
+1 717 944 5541

Spring City, PA
+1 610 948 4903

Salt Lake City, UT
+1 801 266 7700

South Charleston, WV
+1 304 356 3168

York, PA
+1 717 505 5280

Received by OGD: 3/31/2021 11:36:15 AM

Customer Information		Project Information		Parameter/Method Request for Analysis														
Purchase Order	30049071 Task 250	Project Name	30049071 Brickland Refinery 2Q2020	A	8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT													
Work Order		Project Number	30049071 Task 250	B	8270_PAH_LVI (8270 PAHs (LVI))													
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C														
Send Report To	Tim Ratchford	Invoice Attn	Accounts Payable	D														
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E														
				F														
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G														
Phone	(225) 292-1004	Phone	(303) 471-3699	H														
Fax		Fax		I														
e-Mail Address	Tim.Ratchford@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadis	J														
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold	
1	FB-060220	6/2/20	0935	W	8	6	X	X										
2	FD-060220	6/2/20	-	W	8	3		X										
3	MW-11	6/2/20	1025	W	8	3	X											
4	MW-10	6/2/20	1120	W	8	3	X											
5																		
6																		
7																		
8																		
9																		
10																		
Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)				Results Due Date:										
D. Ratchford		Fed Ex		☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour														
Relinquished by:		Date:	Time:	Received by:			Notes:											
Sergio Celis		6/2/20	1300				[AGM Brickland NM]											
Relinquished by:		Date:	Time:	Received by (Laboratory):			Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)									
									☒ Level II Std QC ☐ TRRP Checklist									
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):					☐ Level III Std QC/Row Date ☐ TRRP Level IV									
									☐ Level IV SWAB/CLP									
									☐ Other									
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035																		

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DAILY LOG

Project Name and No.

(Huntsman) Brickland Refinery

Site Location

Sunland Park, NM

Prepared by

D. Solon

Date/Time	Description of Activities
09/21/20/0730	Arrived at site - Conducted Safety Brief
0750-0819	Gauged WELLS / PID Readings
0830	Purge & sample MW-35 - Sampled @ 0915
0925	Purge & sample MW-3D - Sampled @ 1000 FB, FD
1020	Purge & sample MW-6 D - Sampled @ 1055
1115	Purge & sample MW-17 - Sampled @ 1150 EB
1245	Decon, cleaned site - Departed
1330	Purchased 2 BBLs for Decon H2O Disposal
1400	Daily Log Prep COC Prep for continued Sampling
09/22/20	
0750	ARRIVED on site - Conducta Conducted Safety Brief
0805	Purge & sample MW-5 sample @ 840
0900	Purge & sample MW-8 sample @ 0935 FD, EB (PAH Benzene)
1000	Purge & sample MW-11 - Sample @ 1035
1050	Purge & sample MW-10 - Sample @ 1125
1140-1230	Purged Pumped Purge Water into 2 new BBLs for disposal
1245	Perimeter check of site
1300	Cleaned up site, Packed equipment, Prep
133	samples for shipping
1330	Drop samples off at FedEx

Control Number: TSM- 5285051



TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxx - dd/mm/year

TAILGATE HEALTH & SAFETY MEETING FORM				
Project Name: <u>Huntsman (Brickland Rd)</u>		Project Location: <u>Sunland Park, n.m.</u>		
Date: <u>9-21-2020</u>	Time: <u>19730</u>	Conducted by: <u>D. Solon</u>	Signature/Title: <u>D. Solon / Field Sup</u>	
Issues or concerns from previous day's activities: <u>NA</u>				
Task anticipated to be performed today: <u>Well Gauging / Well Sampling</u>				
The following was used to communicate H&S information in this briefing (check all that apply): ☐ HASP (including THA) ☐ JSAs (specify JSA #s): _____ ☐ Permits (specify type or #): _____ ☐ Traffic Safety Plan ☐ FSHB (specify sections): _____ ☒ H&S Standard (specify number): _____ ☐ H&S checklist (specify type): _____ ☐ Activity specific hazard analysis: Activity: _____ Hazard Types (unmitigated ranking H-High, M-Medium, L-Low): Biological ☒ Chemical ☐ Driving ☒ Electrical ☐ Environmental ☒ Gravity ☐ Mechanical ☐ Motion ☐ Personal Safety ☐ Pressure ☐ Radiation ☐ Sound ☐		PPE Required (if not using JSA or Permit with PPE requirements): ☒ Hard hat ☒ Safety glasses ☐ Face shield ☐ Safety goggles ☒ Steel/composite toe boots ☒ Traffic vest (specify II or III): _____ ☐ Life Vest (specify type): _____ ☐ Protective Suit (specify type): _____ ☒ Protective gloves (specify type): <u>will needed</u> ☐ Other (specify): _____		
Controls required to be used: <u>Watch for slips Trips & Falls / Keep Hydrated</u>				
Signature and Certification: I have read and understand the project specific HASP for this project.				
SSE Employee*	Non-Life Threatening Injury or Illness Call WorkCare 1-888-449-7787		I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment. I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments. If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed. I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns. In the event of an injury, employees will call WorkCare at 1.888.449-7787 and then notify the field supervisor. Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager	
	Printed Name/Signature/Company	Sign In Time		Sign Out Time
	<u>Doug Solon / DPM Solon / ARCADIS</u>	<u>0735</u>		
	<u>Dakota Draper / DDP / Arcadis</u>	<u>0735</u>		

*Short Service Employee (SSE) working for Arcadis <1 year.

Control Number: TSM- 5285051



TSM + project number plus date as follows: XXXXXXXX.XXXX.XXXXX - dd/mm/year

TAILGATE HEALTH & SAFETY MEETING FORM				
Project Name: <u>Huntsman (Brickland Ref)</u>		Project Location: <u>Sealand Park Area NM</u>		
Date: <u>09/22/20</u>	Time: _____	Conducted by: <u>P. Solon</u>	Signature/Title: <u>P. Solon / Field Sup</u>	
Issues or concerns from previous day's activities: _____				
Task anticipated to be performed today: <u>well sampling</u>				
The following was used to communicate H&S information in this briefing (check all that apply): ☐ HASP (including THA) ☐ JSAs (specify JSA #s): _____ ☐ Permits (specify type or #): _____ ☐ Traffic Safety Plan ☐ FHSB (specify sections): _____ ☒ H&S Standard (specify number): _____ ☐ H&S checklist (specify type): _____ ☐ Activity specific hazard analysis: Activity: _____ Hazard Types (unmitigated ranking H-High, M-Medium, L-Low): Biological ☒ Chemical ☐ Driving ☒ Electrical ☐ Environmental ☒ Gravity ☐ Mechanical ☐ Motion ☐ Personal Safety ☒ Pressure ☐ Radiation ☐ Sound ☐ Controls required to be used: <u>Watch for Trips, slips & Falls. / Keep Hydrated / watch for snakes</u>		PPE Required (If not using JSA or Permit with PPE requirements): ☒ Hard hat ☒ Safety glasses ☐ Face shield ☐ Safety goggles ☒ Steel/composite toe boots ☒ Traffic vest (specify II or III): _____ ☐ Life Vest (specify type): _____ ☐ Protective Suit (specify type): _____ ☒ Protective gloves (specify type): <u>When needed</u> ☐ Other (specify): _____		
Signature and Certification: I have read and understand the project specific HASP for this project.				
SSE Employee*	Non-Life Threatening Injury or Illness Call WorkCare 1-888-449-7787		I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment. I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments. If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed. I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns. In the event of an injury, employees will call WorkCare at 1.888.449-7787 and then notify the field supervisor. Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager	
	Printed Name/Signature/Company	Sign In Time		Sign Out Time
	<u>Doug Solon / DM Solon / ARCADIS</u>	<u>0750</u>		
	<u>Dakota Draper / TD / Arcadis</u>	<u>0750</u>		

*Short Service Employee (SSE) working for Arcadis <1 year.

file stamp

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185.2019	Site Location	SUNLAND PARK, NM Well ID <u>mw-35</u>
Date	<u>09/21/20</u>	Sampled By	<u>D. Solon / D. Draper</u>
Sampling Time	<u>0915</u>	Recorded By	<u>D Solon</u>
Weather	<u>68° Clear</u>	Coded Replicate No.	

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC PUMP
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	6.18		
Depth to Water (ft bmp)		Purge Time	Start 0840 Finish 0915

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>NA</u>	Appearance <u>clear</u>
Parameter	Container <u>40ml/100A</u>	No. <u>3</u>	Preservative <u>none</u>
<u>Benzene</u>			

PID Reading 0.02 ppm

Comments _____



Depth to Water (ft bmp) _____ Purge Time _____ Start 0925 Finish 1000

3 uov



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185	Site Location	SUNLAND PARK, NM
Date	09/21/20	Sampled By	D. Solon / W. Draper
Sampling Time	10:58	Recorded By	D. Solon
Weather	74° clear	Coded Replicate No.	
Well ID	mw-61D		

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	7.22		
Depth to Water (ft bmp)		Purge Time	Start 1020 Finish 1055

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>n/A</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40 ml / vial</u>	No. <u>3</u>	Preservative <u>None</u>

PID Reading .01 ppm

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA 003185	Site Location	SUNLAND PARK, NM
Date	9/21/20	Sampled By	D. Sofen / D. Daper
Sampling Time	11:50	Recorded By	D. Sofen
Weather	77° clear	Coded Replicate No.	
			Well ID MW-17

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	8.28		
Depth to Water (ft bmp)		Purge Time	Start 11:15 Finish 11:50

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>-</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40ml / VOA</u>	No. <u>3</u>	Preservative <u>None</u>

PID Reading 0.0 ppm
Comments EB092120 ② 1155 3 VOA's Equipment Blank



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185	Site Location	SUNLAND PARK, NM Well ID MW-5
Date	9/22/20	Sampled By	D. Solon / D. Draper
Sampling Time	0840	Recorded By	D. Solon
Weather	64 Sunny	Coded Replicate No.	

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.69	Purge Time	Start 805 Finish 840

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>light pink</u>	Odor <u>strong</u>	Appearance <u>sl. Dark</u>
Parameter	Container	No.	Preservative
<u>Benzene</u>	<u>40ml/10A</u>	<u>3</u>	<u>none</u>

PID Reading 1124.0 ppm

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA 003185	Site Location	SUNLAND PARK, NM
Date	09/22/20	Sampled By	D. Solon / D. Daper
Sampling Time	0935	Recorded By	D. Solon
Weather	64 Sunny	Coded Replicate No.	
Well ID	MW-8		

Instrument Identification

Water Quality Meter(s) **HORIBA U-52**

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
-----------------	-----	--------------	----------------------

Casing Diameter 4-INCH

Sounded Depth (ft bmp)

Depth to Water (ft bmp) 5.32 Purge Time _____ Start 900 Finish 0933

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>Pale / yellow</u>	Odor <u>Slight HC</u>	Appearance <u>Clear / sl yellow</u>
Parameter	Container	No.	Preservative

Parameter	Container	No.	Preservative
			None

PID Reading 4.60 ppm

Comments	FD 092220	(PAH)	3 Amber	Field Nap
0940 FB 092220	(PAH, Benzene)	3 clear	3 Amber	Field Blank
0945 FB 092220	(PAH, Benzene)	3 clear	3 Amber	Field Blank

0935 MW-8 (PAH, Benzene) 3 clear 3 Amber



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA003185	Site Location	SUNLAND PARK, NM
Date	09/22/20	Sampled By	D. Solon / D. Draper
Sampling Time	1035	Recorded By	D. Solon
Weather	70 Sunny	Coded Replicate No.	
	13		

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	7.68	Purge Time	Start 1000 Finish 1035

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>-</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40 ml / 100A</u>	No. <u>3</u>	Preservative <u>none</u>
PID Reading <u>0.0</u>			

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	LA 003185	Site Location	SUNLAND PARK, NM
Date	09/22/20	Sampled By	D. Solon / D. Draper
Sampling Time	1125	Recorded By	P. Solon
Weather	75° Sunny	Coded Replicate No.	
Well ID	MW-10		

Instrument Identification

Water Quality Meter(s)	HORIZA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.94	Purge Time	Start 1050 Finish 1125

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>none</u>	Odor <u>slight HC</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40ml/100A</u>	No. <u>3</u>	Preservative <u>none</u>

PID Reading 000ppm

Comments

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+1 513 733 5336Everett, WA
+1 425 356 2600Fort Collins, CO
+1 970 490 1511Holland, MI
+1 616 399 6070

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Page ____ of ____

COC ID: 228183

Houston, TX
+1 281 530 5656Middletown, PA
+1 717 944 5541Spring City, PA
+1 610 948 4903Salt Lake City, UT
+1 801 266 7700South Charleston, W
+1 304 356 3168York, PA
+1 717 505 5280

Customer Information		Project Information		ALS Project Manager:													ALS Work Order #:	
Purchase Order		Project Name		Parameter/Method Request for Analysis														
Work Order	30049071 Task 250	Project Number	30049071 Brickland Refinery 3Q2020	A	8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT													
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	B	8270_PAH_LVI (8270 PAHs (LVI))													
Send Report To	Tim Ratchford	Invoice Attn	Accounts Payable	C														
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	D														
				E														
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	F														
Phone	(225) 292-1004	Phone	(303) 471-3693	G														
Fax		Fax		H														
e-Mail Address	Tim.Ratchford@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadis	I														
				J														

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-35	9/21/20	0915	W	8	3	X										
2	MW-30	9/21/20	1060	W	8	3	X										
3	FB 092120	9/21/20	1005	W	8	3	X										
4	FD 092120	9/21/20	—	W	8	3	X										
5	MW-6D	9/21/20	1055	W	8	3	X										
6	MW-17	9/21/20	1150	W	8	3	X										
7	EB 092120	9/21/20	1155	W	8	3	X										
8	MW-5	9/22/20	0840	W	8	3	X										
9	MW-8	9/22/20	0935	W	8	6	X	X									
10	FD 092220	9/22/20	—	W	8	3		X									

Sampler(s) Please Print & Sign D. Solon		Shipment Method Fed EX		Required Turnaround Time: (Check Box) ☒ STD 1G Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour				Results Due Date:		
Relinquished by: D. Solon	Date: 9/22/20	Time: 1245	Received by:		Notes: [AGM Brickland NM]					
Relinquished by:	Date:	Time:	Received by (Laboratory):		Cooler ID		Cooler Temp.		QC Package: (Check One Box Below)	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):						☒ Level II Std QC ☐ TRRP Checklist ☐ Level III Std QC/Raw Data ☐ TRRP Level IV ☐ Level IV S/M-B/C/LP ☐ Other	

Preservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

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Fort Collins, CO
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Holland, MI
+1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 228182

Houston, TX
+1 281 530 5656

Middletown, PA
+1 717 944 5541

Spring City, PA
+1 610 948 4903

Salt Lake City, UT
+1 801 266 7700

South Charleston, WV
+1 304 356 3168

York, PA
+1 717 505 5280

Customer Information							ALS Project Manager:		ALS Work Order #:													
Project Information							Parameter/Method Request for Analysis															
Purchase Order	30049071 Task 250						Project Name	30049071 Brickland Refinery 3Q2020						A 8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT								
Work Order							Project Number	30049071 Task 250						B 8270_PAH_LVI (8270 PAHs (LVI))								
Company Name	ARCADIS U.S., Inc.						Bill To Company	ARCADIS						C								
Send Report To	Tim Ratchford						Invoice Attn	Accounts Payable						D								
Address	10352 Plaza Americana Drive						Address	630 Plaza Drive, Suite 600						E								
City/State/Zip	Baton Rouge, LA 70816						City/State/Zip	Highlands Ranch CO 80129						F								
Phone	(225) 292-1004						Phone	(303) 471-3699						G								
Fax							Fax							H								
e-Mail Address	Tim.Ratchford@arcadis-us.com						e-Mail Address	Accounts.payable.administration@arcadis-us.com						I								
No.	Sample Description						Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	FB 092220						9/22/20	0945	W	8	6	X	X									
2	FB 092220						9/22/20	0940	W	8	6	X	X									
3	MW-11						9/22/20	1035	W	8	3	X										
4	MW-10						9/22/20	1125	W	8	3	X										
5																						
6																						
7																						
8																						
9																						
10																						

Sampler(s) Please Print & Sign				Shipment Method		Required Turnaround Time: (Check Box)				Results Due Date:	
D. Solon Dong Solon				FEDEX		☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour					
Relinquished by:		Date:	Time:	Received by:		Notes:					
D. Solon		9/22/20	1246			[AGM Brickland NM]					
Relinquished by:		Date:	Time:	Received by (Laboratory):		Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)			
								☒ Level II Std QC ☐ TRRP Checklist			
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):				☐ Level III Std QC/Raw Data ☐ TRRP Level IV			
								☐ Level IV SW846/CLP ☐ Other			

Preservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
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Prepared by

Huntsman Brickland Refinery 30049071
Sunland Park, Nm
S. Celis

Released to Imaging: 4/19/2021 2:53:44 PM

[illegible]



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number		Site Location	SUNLAND PARK, NM Well ID MW-35
Date	12/18/20	Sampled By	S. Celis, J. Placencia
Sampling Time	0850	Recorded By	S.C.
Weather	46° Cloudy	Coded Replicate No.	

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	7.92		
Depth to Water (ft bmp)		Purge Time	Start 0815 Finish 0850

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>NA</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40ml / VOA</u>	No. <u>3</u>	Preservative <u>none</u>
PID Reading <u>01</u>			

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number		Site Location	SUNLAND PARK, NM
Date	12/18/20	Sampled By	S.C., J.P.
Sampling Time		Recorded By	S.C.
Weather	46° Cloudy	Coded Replicate No.	
			Well ID MU-3A

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	7.96		
Depth to Water (ft bmp)		Purge Time	Start 0855 Finish 0930

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>clear</u>	Odor <u>NA</u>	Appearance <u>clear</u>
Parameter	Container	No.	Preservative

PID Reading	Comments
101	EB 121820 @ 0935 3 vOA Field Blank
	EB 121820 — 3 vOA Field Dump



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number		Site Location	SUNLAND PARK, NM
Date	12/18/20	Sampled By	S.C., J.P.
Sampling Time	1030	Recorded By	S.C.
Weather	46° Cloudy	Coded Replicate No.	
			Well ID MW-4A

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	8.85		
Depth to Water (ft bmp)		Purge Time	Start 0955 Finish 1030

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color	Odor	Appearance
Parameter	Container	No.	Preservative
Benzene	40ml VOA	3	none
PID Reading			
.02			

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number		Site Location	SUNLAND PARK, NM
Date	12/18/20	Sampled By	S.C., J.P.
Sampling Time		Recorded By	S.C.
Weather	54° cloudy	Coded Replicate No.	
		Well ID	MW-17

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	9.89		
Depth to Water (ft bmp)		Purge Time	Start 1040 Finish 1115

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color	Odor	Appearance
Parameter	Container	No.	Preservative
Benzene	40ml / VOA	3	none
PID Reading	0.0		
Comments	EB 121820 @ 1120 3 VOAs clear		



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number		Site Location	SUNLAND PARK, NM
Date	12/18/20	Sampled By	S.C., J.P.
Sampling Time		Recorded By	S.C.
Weather	59° Cloudy	Coded Replicate No.	
			Well ID MW-5

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	7.31		
Depth to Water (ft bmp)		Purge Time	Start 1135 Finish 1210

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>pink / yellowish</u>	Odor <u>Strong</u>	Appearance <u>clear</u>
Parameter <u>Benzene</u>	Container <u>40ml / vial clear</u>	No. <u>3</u>	Preservative <u>none</u>
PID Reading <u>588.6</u>			

Comments _____



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number		Site Location	SUNLAND PARK, NM
Date	12/18/20	Sampled By	S.C., J.P.
Sampling Time		Recorded By	S.C.
Weather	60° cloudy	Coded Replicate No.	
			Well ID MW-8

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	7.06		
Depth to Water (ft bmp)		Purge Time	Start 1230 Finish 1305

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition	Color <u>Pale / yellow</u>	Odor <u>Slight HC</u>	Appearance <u>Clear</u>
Parameter	Container	No.	Preservative
_____	_____	_____	_____
_____	_____	_____	_____

PID Reading	4-4		
Comments	1305 MW-8	3 clear	3 Amber
	1310 FB-2-121820	3 clear	3 Amber
	1315 EB-2-121820	3 clear	3 Amber
	FD-2-121820	3 Amber	



Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	Site Location	SUNLAND PARK, NM	Well ID MW-11
Date 12/18/20	Sampled By	S.C., J.P.	
Sampling Time 1410	Recorded By	SC	
Weather 65° Cloudy	Coded Replicate No.		

Instrument Identification

Water Quality Meter(s)	HORIBA U-52		
Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	4-INCH		
Sounded Depth (ft bmp)	9.33		
Depth to Water (ft bmp)		Purge Time	Start 1335 Finish

Field Parameter Measurements During Purging

Collected Sample Condition	Color	Clear/yell	Odor	N/A	Appearance	Clear
Parameter	Container	40ml/VOA	No.	3	Preservative	none
PID Reading	0.0					
Comments						



Low-Flow Groundwater Sampling Log

HUNTSMAN BRICKLAND REFINERY		Well ID
Project	Site Location	MW-10
Project Number	SUNLAND PARK, NM	
Date	Sampled By	
Sampling Time	Recorded By	
Weather	Coded Replicate No.	

Instrument Identification

Water Quality Meter(s)		HORIBA U-52		LOW FLOW PERISTALTIC	
Casing Material	PVC	Purge Method			
Casing Diameter	4-INCH				
Sounded Depth (ft bmp)	10.59				
Depth to Water (ft bmp)		Purge Time	Start 1430	Finish	

Field Parameter Measurements During Purging

[illegible]

Collected Sample Condition

Color	none / pale yellow	Color	NA / slight HC	Appearance	clear
				Preservative	

Parameter

Container

No.

Preservative

PID Reading

Comments

Cincinnati, OH
+1 513 733 5336Everett, WA
+1 425 356 2600Fort Collins, CO
+1 970 490 1511Holland, MI
+1 616 399 6070

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Page 1 of 2

COC ID: 232440

Houston, TX
+1 281 530 5656Middletown, PA
+1 717 944 5541Spring City, PA
+1 610 948 4903Salt Lake City, UT
+1 801 266 7700South Charleston, WV
+1 304 356 3168York, PA
+1 717 505 5280

ALS Project Manager:

ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	30049071 Task 250	Project Name	30049071 Brickland Refinery 4Q2020	A	8260_LL_W (8260 Benzene (*Unpreserved*)-7 day HT
Work Order		Project Number	30049071 Task 250	B	8270_PAH_LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70815	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadis-us.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-35	12/18/20	0850	W	8	3	X										
2	MW-3D	12/18/20	0930	W	8	3	X										
3	FB 121820	12/18/20	0935	W	8	3	X										
4	FD 121820	12/18/20	—	W	8	3	X										
5	MW-6D	12/18/20	1030	W	8	3	X										
6	MW-17	12/18/20	1115	W	8	3	X										
7	EB 121820	12/18/20	1120	W	8	3	X										
8	MW-5	12/18/20	1210	W	8	3	X										
9	MW-8	12/18/20	1305	W	8	6	X	X									
10	FD-2-121820	12/18/20	—	W	8	3		X									

Sampler(s) Please Print & Sign <i>Sergio Celis</i>		Shipment Method <i>FED EX</i>		Required Turnaround Time: (Check Box) ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour				Results Due Date:		
Relinquished by: <i>APL</i>	Date: 12/18/20	Time: 17:00	Received by:		Notes: [AGM Brickland NM]					
Relinquished by:	Date:	Time:	Received by (Laboratory):		Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)			
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):				☒ Level II Std QC ☐ Level III Std QC/Flow Date ☐ Level IV SW/8/C/LP ☐ Other			
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035										

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+1 513 733 5336

Fort Collins, CO
+1 970 490 1511

Everett, WA
+1 425 356 2600

Holland, MI
+1 616 399 6070

Chain of Custody Form

Houston, TX
+1 281 530 5656

Spring City, PA
+1 610 948 4903

Middletown, PA
+1 717 944 5541

Salt Lake City, UT
+1 801 266 7700

South Charleston, WV
+1 304 356 3168

York, PA
+1 717 505 5280

Page 2 of 2

COC ID: **232441**

ALS Project Manager:

ALS Work Order #:

Customer Information

Project Information

Parameter/Method Request for Analysis

Purchase Order	30049071 Task 250	Project Name	30049071 Brickland Refinery 4Q2020	A	8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT
Work Order		Project Number	30049071 Task 250	B	8270_PAH_LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadi	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	EB-2-121820	12/18/20	1315	W	8	6	X	X									
2	FB-2-121820	12/18/20	1310	W	8	6	X	X									
3	MW-11	12/18/20	1410	W	8	3	X										
4	MW-10	12/18/20	1505	W	8	3	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>Sergio Ceballos</i>		Shipment Method <i>FED EX</i>		Required Turnaround Time: (Check Box) ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour				Results Due Date:									
Relinquished by: <i>[Signature]</i>	Date: <i>12/18/20</i>	Time: <i>17:00</i>	Received by:		Notes: <i>[AGM Brickland NM]</i>												
Relinquished by:	Date:	Time:	Received by (Laboratory):		Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)										
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):				☒ Level II Std QC	☐ TRRP Checklist									
							☐ Level III Std QC/Raw Data	☐ TRRP Level IV									
							☐ Level IV SW/4B/CLP										
							☐ Other										
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035																	

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Ajax Environmental
10801 Hammerly Blvd., Suite 148
Houston, TX 77043

Certification of Calibration

Zero Reading

MFG: GasCo

Lot #: 305-401959890-1 Expiration: 11/10/24

Instrument S/N: A1132

Model: MiniRae Lite

Span Reading

Span Concentration 100 ppm Isobutylene

Zero Reading 0.0 ppm

Span Reading 99.9 ppm

Calibrated by: Nick Taylor

Signature: 

Date completed: December 15, 2020

APPENDIX B

Laboratory Analytical Reports



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 26, 2020

Tim Ratchford
ARCADIS U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge, LA 70816

Work Order: **HS20030870**

Laboratory Results for: **Brickland Refinery 30014271**

Dear Tim,

ALS Environmental received 14 sample(s) on Mar 19, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Dane J. Wacasey

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Work Order: HS20030870

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20030870-01	MW-3S	Water		17-Mar-2020 10:15	19-Mar-2020 08:50	☐
HS20030870-02	MW-3D	Water		17-Mar-2020 11:00	19-Mar-2020 08:50	☐
HS20030870-03	MW-6D	Water		17-Mar-2020 11:45	19-Mar-2020 08:50	☐
HS20030870-04	MW-17	Water		17-Mar-2020 12:45	19-Mar-2020 08:50	☐
HS20030870-05	EB-03172020	Water		17-Mar-2020 12:05	19-Mar-2020 08:50	☐
HS20030870-06	FD-03172020	Water		17-Mar-2020 12:00	19-Mar-2020 08:50	☐
HS20030870-07	FB-03172020	Water		17-Mar-2020 11:05	19-Mar-2020 08:50	☐
HS20030870-08	MW-11	Water		18-Mar-2020 09:00	19-Mar-2020 08:50	☐
HS20030870-09	MW-8	Water		18-Mar-2020 09:50	19-Mar-2020 08:50	☐
HS20030870-10	MW-5	Water		18-Mar-2020 10:50	19-Mar-2020 08:50	☐
HS20030870-11	MW-10	Water		18-Mar-2020 11:45	19-Mar-2020 08:50	☐
HS20030870-12	FD-03182020	Water		18-Mar-2020 12:00	19-Mar-2020 08:50	☐
HS20030870-13	FB-03182020	Water		18-Mar-2020 12:10	19-Mar-2020 08:50	☐
HS20030870-14	EB-03182020	Water		18-Mar-2020 12:05	19-Mar-2020 08:50	☐

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Work Order: HS20030870

CASE NARRATIVE

GCMS Semivolatiles by Method SW8270

Batch ID: 151912

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R358636

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Sample ID: MW-3S
Collection Date: 17-Mar-2020 10:15

ANALYTICAL REPORT

WorkOrder:HS20030870
Lab ID:HS20030870-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 09:04
Surr: 1,2-Dichloroethane-d4	98.9		70-126	%REC	1	20-Mar-2020 09:04
Surr: 4-Bromofluorobenzene	96.3		81-113	%REC	1	20-Mar-2020 09:04
Surr: Dibromofluoromethane	97.5		77-123	%REC	1	20-Mar-2020 09:04
Surr: Toluene-d8	101		82-127	%REC	1	20-Mar-2020 09:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Sample ID: MW-3D
Collection Date: 17-Mar-2020 11:00

ANALYTICAL REPORT

WorkOrder:HS20030870
Lab ID:HS20030870-02
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 10:13
Surr: 1,2-Dichloroethane-d4	101		70-126	%REC	1	20-Mar-2020 10:13
Surr: 4-Bromofluorobenzene	95.6		81-113	%REC	1	20-Mar-2020 10:13
Surr: Dibromofluoromethane	99.3		77-123	%REC	1	20-Mar-2020 10:13
Surr: Toluene-d8	102		82-127	%REC	1	20-Mar-2020 10:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Sample ID: MW-6D
Collection Date: 17-Mar-2020 11:45

ANALYTICAL REPORT

WorkOrder:HS20030870
Lab ID:HS20030870-03
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 10:36
Surr: 1,2-Dichloroethane-d4	101		70-126	%REC	1	20-Mar-2020 10:36
Surr: 4-Bromofluorobenzene	97.0		81-113	%REC	1	20-Mar-2020 10:36
Surr: Dibromofluoromethane	96.9		77-123	%REC	1	20-Mar-2020 10:36
Surr: Toluene-d8	101		82-127	%REC	1	20-Mar-2020 10:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Sample ID: MW-17
Collection Date: 17-Mar-2020 12:45

ANALYTICAL REPORT

WorkOrder:HS20030870
Lab ID:HS20030870-04
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 10:59
Surr: 1,2-Dichloroethane-d4	101		70-126	%REC	1	20-Mar-2020 10:59
Surr: 4-Bromofluorobenzene	97.6		81-113	%REC	1	20-Mar-2020 10:59
Surr: Dibromofluoromethane	98.8		77-123	%REC	1	20-Mar-2020 10:59
Surr: Toluene-d8	101		82-127	%REC	1	20-Mar-2020 10:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
 Project: Brickland Refinery 30014271
 Sample ID: EB-03172020
 Collection Date: 17-Mar-2020 12:05

ANALYTICAL REPORT

WorkOrder:HS20030870
 Lab ID:HS20030870-05
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 07:09
Surr: 1,2-Dichloroethane-d4	98.8		70-126	%REC	1	20-Mar-2020 07:09
Surr: 4-Bromofluorobenzene	96.3		81-113	%REC	1	20-Mar-2020 07:09
Surr: Dibromofluoromethane	98.4		77-123	%REC	1	20-Mar-2020 07:09
Surr: Toluene-d8	101		82-127	%REC	1	20-Mar-2020 07:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Sample ID: FD-03172020
Collection Date: 17-Mar-2020 12:00

ANALYTICAL REPORT

WorkOrder:HS20030870
Lab ID:HS20030870-06
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 11:21
Surr: 1,2-Dichloroethane-d4	100		70-126	%REC	1	20-Mar-2020 11:21
Surr: 4-Bromofluorobenzene	97.9		81-113	%REC	1	20-Mar-2020 11:21
Surr: Dibromofluoromethane	98.0		77-123	%REC	1	20-Mar-2020 11:21
Surr: Toluene-d8	101		82-127	%REC	1	20-Mar-2020 11:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Sample ID: FB-03172020
Collection Date: 17-Mar-2020 11:05

ANALYTICAL REPORT

WorkOrder:HS20030870
Lab ID:HS20030870-07
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 07:32
Surr: 1,2-Dichloroethane-d4	98.6		70-126	%REC	1	20-Mar-2020 07:32
Surr: 4-Bromofluorobenzene	97.0		81-113	%REC	1	20-Mar-2020 07:32
Surr: Dibromofluoromethane	98.2		77-123	%REC	1	20-Mar-2020 07:32
Surr: Toluene-d8	100		82-127	%REC	1	20-Mar-2020 07:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Sample ID: MW-11
Collection Date: 18-Mar-2020 09:00

ANALYTICAL REPORT

WorkOrder:HS20030870
Lab ID:HS20030870-08
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 11:44
Surr: 1,2-Dichloroethane-d4	100		70-126	%REC	1	20-Mar-2020 11:44
Surr: 4-Bromofluorobenzene	96.6		81-113	%REC	1	20-Mar-2020 11:44
Surr: Dibromofluoromethane	99.4		77-123	%REC	1	20-Mar-2020 11:44
Surr: Toluene-d8	101		82-127	%REC	1	20-Mar-2020 11:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
 Project: Brickland Refinery 30014271
 Sample ID: MW-8
 Collection Date: 18-Mar-2020 09:50

ANALYTICAL REPORT

WorkOrder:HS20030870
 Lab ID:HS20030870-09
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260				Analyst: AKP
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 12:07
Surr: 1,2-Dichloroethane-d4	108		70-126	%REC	1	20-Mar-2020 12:07
Surr: 4-Bromofluorobenzene	99.8		81-113	%REC	1	20-Mar-2020 12:07
Surr: Dibromofluoromethane	97.2		77-123	%REC	1	20-Mar-2020 12:07
Surr: Toluene-d8	99.9		82-127	%REC	1	20-Mar-2020 12:07
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 20-Mar-2020		Analyst: LG
Acenaphthene	0.000322		0.0000985	mg/L	1	25-Mar-2020 03:55
Acenaphthylene	0.000129		0.0000985	mg/L	1	25-Mar-2020 03:55
Anthracene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Benz(a)anthracene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Benzo(a)pyrene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Benzo(b)fluoranthene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Benzo(g,h,i)perylene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Benzo(k)fluoranthene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Chrysene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Dibenz(a,h)anthracene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Fluoranthene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Fluorene	0.000225		0.0000985	mg/L	1	25-Mar-2020 03:55
Indeno(1,2,3-cd)pyrene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Naphthalene	0.00513		0.0000985	mg/L	1	25-Mar-2020 03:55
Phenanthrene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Pyrene	< 0.0000985		0.0000985	mg/L	1	25-Mar-2020 03:55
Surr: 2-Fluorobiphenyl	73.9		32-130	%REC	1	25-Mar-2020 03:55
Surr: 4-Terphenyl-d14	48.9		40-135	%REC	1	25-Mar-2020 03:55
Surr: Nitrobenzene-d5	126		45-142	%REC	1	25-Mar-2020 03:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
 Project: Brickland Refinery 30014271
 Sample ID: MW-5
 Collection Date: 18-Mar-2020 10:50

ANALYTICAL REPORT

WorkOrder:HS20030870
 Lab ID:HS20030870-10
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	1.7		0.050	mg/L	50	20-Mar-2020 14:04
Surr: 1,2-Dichloroethane-d4	95.8		70-126	%REC	50	20-Mar-2020 14:04
Surr: 4-Bromofluorobenzene	97.3		81-113	%REC	50	20-Mar-2020 14:04
Surr: Dibromofluoromethane	96.3		77-123	%REC	50	20-Mar-2020 14:04
Surr: Toluene-d8	100		82-127	%REC	50	20-Mar-2020 14:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
Sample ID: MW-10
Collection Date: 18-Mar-2020 11:45

ANALYTICAL REPORT

WorkOrder:HS20030870
Lab ID:HS20030870-11
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 12:30
Surr: 1,2-Dichloroethane-d4	99.3		70-126	%REC	1	20-Mar-2020 12:30
Surr: 4-Bromofluorobenzene	98.1		81-113	%REC	1	20-Mar-2020 12:30
Surr: Dibromofluoromethane	98.0		77-123	%REC	1	20-Mar-2020 12:30
Surr: Toluene-d8	101		82-127	%REC	1	20-Mar-2020 12:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
 Project: Brickland Refinery 30014271
 Sample ID: FD-03182020
 Collection Date: 18-Mar-2020 12:00

ANALYTICAL REPORT

WorkOrder:HS20030870
 Lab ID:HS20030870-12
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 20-Mar-2020	Analyst: LG	
Acenaphthene	0.000419		0.0000981	mg/L	1	25-Mar-2020 04:15
Acenaphthylene	0.000134		0.0000981	mg/L	1	25-Mar-2020 04:15
Anthracene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Benz(a)anthracene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Benzo(a)pyrene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Benzo(b)fluoranthene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Benzo(g,h,i)perylene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Benzo(k)fluoranthene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Chrysene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Dibenz(a,h)anthracene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Fluoranthene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Fluorene	0.000369		0.0000981	mg/L	1	25-Mar-2020 04:15
Indeno(1,2,3-cd)pyrene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Naphthalene	0.00717		0.0000981	mg/L	1	25-Mar-2020 04:15
Phenanthrene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Pyrene	< 0.0000981		0.0000981	mg/L	1	25-Mar-2020 04:15
Surr: 2-Fluorobiphenyl	93.3		32-130	%REC	1	25-Mar-2020 04:15
Surr: 4-Terphenyl-d14	45.0		40-135	%REC	1	25-Mar-2020 04:15
Surr: Nitrobenzene-d5	87.5		45-142	%REC	1	25-Mar-2020 04:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
 Project: Brickland Refinery 30014271
 Sample ID: FB-03182020
 Collection Date: 18-Mar-2020 12:10

ANALYTICAL REPORT

WorkOrder:HS20030870
 Lab ID:HS20030870-13
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260				Analyst: AKP
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 07:55
Surr: 1,2-Dichloroethane-d4	98.4		70-126	%REC	1	20-Mar-2020 07:55
Surr: 4-Bromofluorobenzene	96.6		81-113	%REC	1	20-Mar-2020 07:55
Surr: Dibromofluoromethane	97.6		77-123	%REC	1	20-Mar-2020 07:55
Surr: Toluene-d8	99.2		82-127	%REC	1	20-Mar-2020 07:55
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 20-Mar-2020		Analyst: LG
Acenaphthene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Acenaphthylene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Anthracene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Benz(a)anthracene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Benzo(a)pyrene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Benzo(b)fluoranthene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Benzo(g,h,i)perylene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Benzo(k)fluoranthene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Chrysene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Dibenz(a,h)anthracene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Fluoranthene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Fluorene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Indeno(1,2,3-cd)pyrene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Naphthalene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Phenanthrene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Pyrene	< 0.0000988		0.0000988	mg/L	1	25-Mar-2020 04:35
Surr: 2-Fluorobiphenyl	106		32-130	%REC	1	25-Mar-2020 04:35
Surr: 4-Terphenyl-d14	101		40-135	%REC	1	25-Mar-2020 04:35
Surr: Nitrobenzene-d5	98.7		45-142	%REC	1	25-Mar-2020 04:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
 Project: Brickland Refinery 30014271
 Sample ID: EB-03182020
 Collection Date: 18-Mar-2020 12:05

ANALYTICAL REPORT

WorkOrder:HS20030870
 Lab ID:HS20030870-14
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260				Analyst: AKP
Benzene	< 0.0010		0.0010	mg/L	1	20-Mar-2020 08:18
Surr: 1,2-Dichloroethane-d4	97.1		70-126	%REC	1	20-Mar-2020 08:18
Surr: 4-Bromofluorobenzene	96.2		81-113	%REC	1	20-Mar-2020 08:18
Surr: Dibromofluoromethane	98.6		77-123	%REC	1	20-Mar-2020 08:18
Surr: Toluene-d8	100		82-127	%REC	1	20-Mar-2020 08:18
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 20-Mar-2020		Analyst: LG
Acenaphthene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Acenaphthylene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Anthracene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Benz(a)anthracene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Benzo(a)pyrene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Benzo(b)fluoranthene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Benzo(g,h,i)perylene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Benzo(k)fluoranthene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Chrysene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Dibenz(a,h)anthracene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Fluoranthene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Fluorene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Indeno(1,2,3-cd)pyrene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Naphthalene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Phenanthrene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Pyrene	< 0.0000984		0.0000984	mg/L	1	25-Mar-2020 04:54
Surr: 2-Fluorobiphenyl	91.3		32-130	%REC	1	25-Mar-2020 04:54
Surr: 4-Terphenyl-d14	108		40-135	%REC	1	25-Mar-2020 04:54
Surr: Nitrobenzene-d5	103		45-142	%REC	1	25-Mar-2020 04:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 26-Mar-20

Weight / Prep Log

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

Batch ID: 151912	Start Date: 20 Mar 2020 09:03	End Date:
Method: SW3511		Prep Code: 3511_PAH

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20030870-09		33.49 (mL)	2 (mL)	0.05972
HS20030870-12		33.64 (mL)	2 (mL)	0.05945
HS20030870-13		33.39 (mL)	2 (mL)	0.0599
HS20030870-14		33.53 (mL)	2 (mL)	0.05965

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 151912 (0)		Test Name : LOW-LEVEL PAHS - 8270D			Matrix: Water	
HS20030870-09	MW-8	18 Mar 2020 09:50		20 Mar 2020 09:03	25 Mar 2020 03:55	1
HS20030870-12	FD-03182020	18 Mar 2020 12:00		20 Mar 2020 09:03	25 Mar 2020 04:15	1
HS20030870-13	FB-03182020	18 Mar 2020 12:10		20 Mar 2020 09:03	25 Mar 2020 04:35	1
HS20030870-14	EB-03182020	18 Mar 2020 12:05		20 Mar 2020 09:03	25 Mar 2020 04:54	1
Batch ID: R358636 (0)		Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Water	
HS20030870-01	MW-3S	17 Mar 2020 10:15			20 Mar 2020 09:04	1
HS20030870-02	MW-3D	17 Mar 2020 11:00			20 Mar 2020 10:13	1
HS20030870-03	MW-6D	17 Mar 2020 11:45			20 Mar 2020 10:36	1
HS20030870-04	MW-17	17 Mar 2020 12:45			20 Mar 2020 10:59	1
HS20030870-05	EB-03172020	17 Mar 2020 12:05			20 Mar 2020 07:09	1
HS20030870-06	FD-03172020	17 Mar 2020 12:00			20 Mar 2020 11:21	1
HS20030870-07	FB-03172020	17 Mar 2020 11:05			20 Mar 2020 07:32	1
HS20030870-08	MW-11	18 Mar 2020 09:00			20 Mar 2020 11:44	1
HS20030870-09	MW-8	18 Mar 2020 09:50			20 Mar 2020 12:07	1
HS20030870-10	MW-5	18 Mar 2020 10:50			20 Mar 2020 14:04	50
HS20030870-11	MW-10	18 Mar 2020 11:45			20 Mar 2020 12:30	1
HS20030870-13	FB-03182020	18 Mar 2020 12:10			20 Mar 2020 07:55	1
HS20030870-14	EB-03182020	18 Mar 2020 12:05			20 Mar 2020 08:18	1

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

QC BATCH REPORT

Batch ID: 151912 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
MBLK	Sample ID: MBLK-151912	Units: ug/L		Analysis Date: 24-Mar-2020 21:20					
Client ID:	Run ID: SV-6_358877	SeqNo: 5529561		PrepDate: 20-Mar-2020		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	< 0.100	0.100							
Acenaphthylene	< 0.100	0.100							
Anthracene	< 0.100	0.100							
Benz(a)anthracene	< 0.100	0.100							
Benzo(a)pyrene	< 0.100	0.100							
Benzo(b)fluoranthene	< 0.100	0.100							
Benzo(g,h,i)perylene	< 0.100	0.100							
Benzo(k)fluoranthene	< 0.100	0.100							
Chrysene	< 0.100	0.100							
Dibenz(a,h)anthracene	< 0.100	0.100							
Fluoranthene	< 0.100	0.100							
Fluorene	< 0.100	0.100							
Indeno(1,2,3-cd)pyrene	< 0.100	0.100							
Naphthalene	< 0.100	0.100							
Phenanthrene	< 0.100	0.100							
Pyrene	< 0.100	0.100							
Surr: 2-Fluorobiphenyl	3.074	0.100	3.03	0	101	32 - 130			
Surr: 4-Terphenyl-d14	3.106	0.100	3.03	0	103	40 - 135			
Surr: Nitrobenzene-d5	3.876	0.100	3.03	0	128	45 - 142			

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

QC BATCH REPORT

Batch ID: 151912 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
LCS		Sample ID: LCS-151912		Units: ug/L		Analysis Date: 24-Mar-2020 21:40			
Client ID:		Run ID: SV-6_358877		SeqNo: 5529562		PrepDate: 20-Mar-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	3.51	0.100	3.03	0	116	40 - 140			
Acenaphthylene	3.786	0.100	3.03	0	125	40 - 140			
Anthracene	3.737	0.100	3.03	0	123	40 - 140			
Benz(a)anthracene	3.856	0.100	3.03	0	127	40 - 140			
Benzo(a)pyrene	3.457	0.100	3.03	0	114	40 - 140			
Benzo(b)fluoranthene	3.643	0.100	3.03	0	120	40 - 140			
Benzo(g,h,i)perylene	3.346	0.100	3.03	0	110	40 - 140			
Benzo(k)fluoranthene	4.032	0.100	3.03	0	133	40 - 140			
Chrysene	3.864	0.100	3.03	0	128	40 - 140			
Dibenz(a,h)anthracene	3.592	0.100	3.03	0	119	40 - 140			
Fluoranthene	3.505	0.100	3.03	0	116	40 - 140			
Fluorene	3.643	0.100	3.03	0	120	40 - 140			
Indeno(1,2,3-cd)pyrene	3.082	0.100	3.03	0	102	40 - 140			
Naphthalene	3.594	0.100	3.03	0	119	40 - 140			
Phenanthrene	3.764	0.100	3.03	0	124	40 - 140			
Pyrene	4.032	0.100	3.03	0	133	40 - 140			
Surr: 2-Fluorobiphenyl	3.035	0.100	3.03	0	100	32 - 130			
Surr: 4-Terphenyl-d14	3.129	0.100	3.03	0	103	40 - 135			
Surr: Nitrobenzene-d5	3.567	0.100	3.03	0	118	45 - 142			

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

QC BATCH REPORT

Batch ID: 151912 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
LCSD		Sample ID: LCSD-151912		Units: ug/L		Analysis Date: 24-Mar-2020 22:00			
Client ID:		Run ID: SV-6_358877		SeqNo: 5529563		PrepDate: 20-Mar-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	3.551	0.100	3.03	0	117	40 - 140	3.51	1.17	25
Acenaphthylene	3.896	0.100	3.03	0	129	40 - 140	3.786	2.85	25
Anthracene	3.677	0.100	3.03	0	121	40 - 140	3.737	1.62	25
Benz(a)anthracene	3.913	0.100	3.03	0	129	40 - 140	3.856	1.47	25
Benzo(a)pyrene	3.757	0.100	3.03	0	124	40 - 140	3.457	8.31	25
Benzo(b)fluoranthene	3.777	0.100	3.03	0	125	40 - 140	3.643	3.63	25
Benzo(g,h,i)perylene	3.435	0.100	3.03	0	113	40 - 140	3.346	2.62	25
Benzo(k)fluoranthene	4.223	0.100	3.03	0	139	40 - 140	4.032	4.62	25
Chrysene	3.882	0.100	3.03	0	128	40 - 140	3.864	0.468	25
Dibenz(a,h)anthracene	3.729	0.100	3.03	0	123	40 - 140	3.592	3.74	25
Fluoranthene	3.463	0.100	3.03	0	114	40 - 140	3.505	1.19	25
Fluorene	3.752	0.100	3.03	0	124	40 - 140	3.643	2.95	25
Indeno(1,2,3-cd)pyrene	3.179	0.100	3.03	0	105	40 - 140	3.082	3.09	25
Naphthalene	3.547	0.100	3.03	0	117	40 - 140	3.594	1.34	25
Phenanthrene	3.678	0.100	3.03	0	121	40 - 140	3.764	2.3	25
Pyrene	4	0.100	3.03	0	132	40 - 140	4.032	0.803	25
Surr: 2-Fluorobiphenyl	3.201	0.100	3.03	0	106	32 - 130	3.035	5.33	25
Surr: 4-Terphenyl-d14	3.172	0.100	3.03	0	105	40 - 135	3.129	1.38	25
Surr: Nitrobenzene-d5	3.926	0.100	3.03	0	130	45 - 142	3.567	9.59	25

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

QC BATCH REPORT

Batch ID: 151912 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
MS		Sample ID: HS20030786-01MS		Units: ug/L		Analysis Date: 24-Mar-2020 23:58			
Client ID:		Run ID: SV-6_358877		SeqNo: 5530161		PrepDate: 20-Mar-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	3.206	0.0965	2.925	0	110	40 - 140			
Acenaphthylene	3.508	0.0965	2.925	0	120	40 - 140			
Anthracene	3.089	0.0965	2.925	0.1242	101	40 - 140			
Benz(a)anthracene	1.454	0.0965	2.925	0	49.7	40 - 140			
Benzo(a)pyrene	1.301	0.0965	2.925	0	44.5	40 - 140			
Benzo(b)fluoranthene	1.188	0.0965	2.925	0	40.6	40 - 140			
Benzo(g,h,i)perylene	1.182	0.0965	2.925	0	40.4	40 - 140			
Benzo(k)fluoranthene	1.253	0.0965	2.925	0	42.8	40 - 140			
Chrysene	1.307	0.0965	2.925	0	44.7	40 - 140			
Dibenz(a,h)anthracene	1.372	0.0965	2.925	0	46.9	40 - 140			
Fluoranthene	2.647	0.0965	2.925	0	90.5	40 - 140			
Fluorene	3.132	0.0965	2.925	0	107	40 - 140			
Indeno(1,2,3-cd)pyrene	1.195	0.0965	2.925	0	40.8	40 - 140			
Naphthalene	3.15	0.0965	2.925	0	108	40 - 140			
Phenanthrene	3.139	0.0965	2.925	0.07535	105	40 - 140			
Pyrene	1.579	0.0965	2.925	0	54.0	40 - 140			
Surr: 2-Fluorobiphenyl	2.869	0.0965	2.925	0	98.1	32 - 130			
Surr: 4-Terphenyl-d14	1.218	0.0965	2.925	0	41.6	40 - 135			
Surr: Nitrobenzene-d5	3.355	0.0965	2.925	0	115	45 - 142			

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

QC BATCH REPORT

Batch ID: 151912 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
MSD		Sample ID: HS20030786-01MSD		Units: ug/L		Analysis Date: 25-Mar-2020 00:18			
Client ID:		Run ID: SV-6_358877		SeqNo: 5530162		PrepDate: 20-Mar-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	2.653	0.0974	2.951	0	89.9	40 - 140	3.206	18.8	25
Acenaphthylene	3.023	0.0974	2.951	0	102	40 - 140	3.508	14.8	25
Anthracene	2.674	0.0974	2.951	0.1242	86.4	40 - 140	3.089	14.4	25
Benz(a)anthracene	1.275	0.0974	2.951	0	43.2	40 - 140	1.454	13.1	25
Benzo(a)pyrene	1.227	0.0974	2.951	0	41.6	40 - 140	1.301	5.89	25
Benzo(b)fluoranthene	1.321	0.0974	2.951	0	44.7	40 - 140	1.188	10.5	25
Benzo(g,h,i)perylene	1.267	0.0974	2.951	0	42.9	40 - 140	1.182	7.01	25
Benzo(k)fluoranthene	1.199	0.0974	2.951	0	40.6	40 - 140	1.253	4.37	25
Chrysene	1.259	0.0974	2.951	0	42.7	40 - 140	1.307	3.72	25
Dibenz(a,h)anthracene	1.186	0.0974	2.951	0	40.2	40 - 140	1.372	14.5	25
Fluoranthene	2.289	0.0974	2.951	0	77.6	40 - 140	2.647	14.5	25
Fluorene	2.601	0.0974	2.951	0	88.1	40 - 140	3.132	18.5	25
Indeno(1,2,3-cd)pyrene	1.2	0.0974	2.951	0	40.7	40 - 140	1.195	0.425	25
Naphthalene	2.782	0.0974	2.951	0	94.3	40 - 140	3.15	12.4	25
Phenanthrene	2.726	0.0974	2.951	0.07535	89.8	40 - 140	3.139	14.1	25
Pyrene	1.637	0.0974	2.951	0	55.5	40 - 140	1.579	3.61	25
Surr: 2-Fluorobiphenyl	2.47	0.0974	2.951	0	83.7	32 - 130	2.869	15	25
Surr: 4-Terphenyl-d14	1.458	0.0974	2.951	0	49.4	40 - 135	1.218	17.9	25
Surr: Nitrobenzene-d5	2.859	0.0974	2.951	0	96.9	45 - 142	3.355	16	25
The following samples were analyzed in this batch:									
HS20030870-09			HS20030870-12			HS20030870-13			HS20030870-14

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

QC BATCH REPORT

Batch ID: R358636 (0)		Instrument: VOA2		Method: LOW LEVEL VOLATILES BY SW8260C					
MBLK	Sample ID: VBLKW-200319	Units: ug/L		Analysis Date: 20-Mar-2020 06:23					
Client ID:	Run ID: VOA2_358636	SeqNo: 5523781		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	< 1.0	1.0							
Surr: 1,2-Dichloroethane-d4	48.59	1.0	50	0	97.2	70 - 123			
Surr: 4-Bromofluorobenzene	47.28	1.0	50	0	94.6	82 - 115			
Surr: Dibromofluoromethane	49.19	1.0	50	0	98.4	73 - 126			
Surr: Toluene-d8	51.08	1.0	50	0	102	81 - 120			
LCS	Sample ID: VLCSW-200319	Units: ug/L		Analysis Date: 20-Mar-2020 05:37					
Client ID:	Run ID: VOA2_358636	SeqNo: 5523780		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	20.45	1.0	20	0	102	74 - 120			
Surr: 1,2-Dichloroethane-d4	51.38	1.0	50	0	103	70 - 130			
Surr: 4-Bromofluorobenzene	48.91	1.0	50	0	97.8	82 - 115			
Surr: Dibromofluoromethane	48.62	1.0	50	0	97.2	73 - 126			
Surr: Toluene-d8	49.63	1.0	50	0	99.3	81 - 120			
MS	Sample ID: HS20030870-01MS	Units: ug/L		Analysis Date: 20-Mar-2020 09:27					
Client ID: MW-3S	Run ID: VOA2_358636	SeqNo: 5523789		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	19.58	1.0	20	0	97.9	70 - 127			
Surr: 1,2-Dichloroethane-d4	51.39	1.0	50	0	103	70 - 126			
Surr: 4-Bromofluorobenzene	48.85	1.0	50	0	97.7	81 - 113			
Surr: Dibromofluoromethane	48.52	1.0	50	0	97.0	77 - 123			
Surr: Toluene-d8	50.04	1.0	50	0	100	82 - 127			

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

QC BATCH REPORT

Batch ID: R358636 (0)		Instrument: VOA2		Method: LOW LEVEL VOLATILES BY SW8260C					
MSD		Sample ID: HS20030870-01MSD		Units: ug/L		Analysis Date: 20-Mar-2020 09:50			
Client ID: MW-3S		Run ID: VOA2_358636		SeqNo: 5523790		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	19.88	1.0	20	0	99.4	70 - 127	19.58	1.56	20
Surr: 1,2-Dichloroethane-d4	51.15	1.0	50	0	102	70 - 126	51.39	0.457	20
Surr: 4-Bromofluorobenzene	48.59	1.0	50	0	97.2	81 - 113	48.85	0.536	20
Surr: Dibromofluoromethane	48.41	1.0	50	0	96.8	77 - 123	48.52	0.229	20
Surr: Toluene-d8	50.04	1.0	50	0	100	82 - 127	50.04	0.00878	20
The following samples were analyzed in this batch:									
		HS20030870-01	HS20030870-02		HS20030870-03		HS20030870-04		
		HS20030870-05	HS20030870-06		HS20030870-07		HS20030870-08		
		HS20030870-09	HS20030870-10		HS20030870-11		HS20030870-13		
		HS20030870-14							

ALS Houston, US

Date: 26-Mar-20

Client: ARCADIS U.S., Inc.
Project: Brickland Refinery 30014271
WorkOrder: HS20030870

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US

Date: 26-Mar-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US

Date: 26-Mar-20

Sample Receipt Checklist

Client Name: Arcadis-Baton Rouge
Work Order: HS20030870

Date/Time Received: **19-Mar-2020 08:50**
Received by: **AC**

Checklist completed by: Paresh M. Giga 19-Mar-2020
eSignature Date

Reviewed by: Dane J. Wacasey 20-Mar-2020
eSignature Date

Matrices: **Water**Carrier name: **FedEx**

Shipping container/cooler in good condition?
Custody seals intact on shipping container/cooler?
Custody seals intact on sample bottles?
VOA/TX1005/TX1006 Solids in hermetically sealed vials?
Chain of custody present?
Chain of custody signed when relinquished and received?
Samplers name present on COC?
Chain of custody agrees with sample labels?
Samples in proper container/bottle?
Sample containers intact?
Sufficient sample volume for indicated test?
All samples received within holding time?
Container/Temp Blank temperature in compliance?
Temperature(s)/Thermometer(s):

Yes ☒	No ☐	Not Present ☐
Yes ☒	No ☐	Not Present ☐
Yes ☐	No ☐	Not Present ☒
Yes ☐	No ☐	Not Present ☒
Yes ☒	No ☐	2 Page(s)
Yes ☒	No ☐	COC IDs:221208/221210
Yes ☒	No ☐	
Yes ☒	No ☐	
Yes ☒	No ☐	
Yes ☒	No ☐	
Yes ☒	No ☐	
Yes ☒	No ☐	

Cooler(s)/Kit(s):

1.2°C uc/c IR25
45493
3/19/2020 16:00

Water - VOA vials have zero headspace?

Yes ☒ No ☐ No VOA vials submitted ☐

Water - pH acceptable upon receipt?

Yes ☐ No ☐ N/A ☒

pH adjusted?

Yes ☐ No ☐ N/A ☒

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:


 Cincinnati, OH
+1 513 733 5336

 Everett, WA
+1 425 356 2600

 Fort Collins, CO
+1 970 490 1511

 Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 221210

 Houston, TX
+1 281 530 5656

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 Spring City, PA
+1 610 948 4903

 Salt Lake City, UT
+1 801 266 7700

 South Charleston, WV
+1 304 356 3168

 York, PA
+1 717 505 5280

Customer Information				ALS Project Manager:			ALS Work Order #:												
Project Information				Parameter/Method Request for Analysis															
Purchase Order	30014271 LA003185 Tim Ratchford	Project Name	Brickland Refinery	A	8260 LL W (8260 Benzene ("Unpreserved") 7 day HT)														
Work Order		Project Number	30014271 LA003185	B	8270 PAHs LVI (8270 PAHs (LVI))														
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C															
Send Report To	Tim Ratchford	Invoice Attn	Accounts Payable	D															
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 300	E															
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	F															
Phone	(225) 292-1004	Phone	(303) 471-3650	G															
Fax		Fax		H															
e-Mail Address	tim.ratchford@arcadis-us.com	e-Mail Address	AccountsPayable.administration@arcadis	I															

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WATER	3/1/2021	10:00	W	A	2											
2	WATER	3/1/2021	10:00	W	A	2											
3	WATER	3/1/2021	10:00	W	A	2											
4	WATER	3/1/2021	10:00	W	A	2											
5	WATER	3/1/2021	10:00	W	A	2											
6	WATER	3/1/2021	10:00	W	A	2											
7	WATER	3/1/2021	10:00	W	A	2											
8	WATER	3/1/2021	10:00	W	A	2											
9	WATER	3/1/2021	10:00	W	A	2											
10	WATER	3/1/2021	10:00	W	A	2											

Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)				Results Due Date:	
Signature: [Signature] Date: 3/1/2021 Time: 10:00		Signature: [Signature] Date: 3/1/2021 Time: 10:00		☒ 24 Hrs ☐ 48 Hrs ☐ 72 Hrs ☐ Other				Date:	
Relinquished by:		Received by:		Notes: [AGM Brickland NW]					
Relinquished by:		Received by (Laboratory):		Cooler ID		Cooler Temp.		QC Package: (Check One Box Below)	
Signature: [Signature] Date: 3/19/2020 Time: 08:50		Signature: AC Date: 3/19/2020 Time: 08:50		45493		1.2		☒ Low Temperature ☐ Ambient Temperature ☐ High Temperature	
Logged by (Laboratory):		Checked by (Laboratory):				IR#25			
						CFCO			

Preservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

- Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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Chain of Custody Form

Page 2 of 2

COC ID: 221208

 Houston, TX
+1 281 530 5656

 Middletown, PA
+1 717 944 5541

 Spring City, PA
+1 610 948 4903

 Salt Lake City, UT
+1 801 266 7700

 South Charleston, WV
+1 304 356 3168

 York, PA
+1 717 505 5280

Customer Information				Project Information				ALS Project Manager:												ALS Work Order #:			
Parameter/Method Request for Analysis																							
Purchase Order	30014271 LA003185 Tim Ratchford			Project Name	Brickland Refinery			A	8260 LL W (8260 Benzene (Unpreserved)-7 day HT														
Work Order				Project Number	30014271 LA003185			B	8270 PAH LVI (8270 PAHs (LVI))														
Company Name	ARCADIS U.S., Inc.			Bill To Company	ARCADIS			C															
Send Report To	Tim Ratchford			Invoice Attn	Accounts Payable			D															
Address	10362 Plaza Americana Drive			Address	630 Plaza Drive, Suite 600			E															
City/State/Zip	Baton Rouge, LA 70816			City/State/Zip	Highlands Ranch CO 80129			F															
Phone	(225) 292-1004			Phone	(303) 471-3659			G															
Fax				Fax				H															
e-Mail Address	Tim.Ratchford@arcadis-us.com			e-Mail Address	Accounts.payable.administration@arcadis.com			I															
HS20030870 ARCADIS U.S., Inc. Brickland Refinery 30014271																							
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold						
1	LL W	03/19/2020	11:45	W	S	3	X																
2	PAH LVI	03/19/2020	12:00	W	S	3		X															
3	PAH LVI	03/19/2020	12:00	W	S	4	X	X															
4	PAH LVI	03/19/2020	12:00	W	S	4	X	X															
5																							
6																							
7																							
8																							
9																							
10																							
Sampler(s) Please Print & Sign BRIAN A. SHAFER LABORATORY MANAGER				Shipment Method		Required Turnaround Time: (Check Box) ☒ 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ Other				Results Due Date:													
Relinquished by:		Date:	Time:	Received by:		Notes: (AGM Brickland NM)																	
Relinquished by:		Date:	Time:	Received by (Laboratory):		Cooler ID: Cooler Temp. QC Package: (Check One Box Below)																	
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):		☒ Unpreserved ☐ Preserved (HCL) ☐ Preserved (HNO3) ☐ Preserved (H2SO4)																	
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4°C 9-5035																							

- Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
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 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CU		STUDY SEAL Date: <u>3-19-20</u> Time: <u>1500</u> Company: <u>Ares</u> Date: <u>3/19/20</u>
	Date: <u>3-19-20</u>		
	Time: <u>1500</u>		
	Company: <u>Ares</u>		

ORIGIN ID:ELPA (325) 347-4617
 DAKOTA DRAPER
 ARCADIS
 401 E MAIN DR STE 400
 EL PASO, TX 79901
 UNITED STATES US

SHIP DATE: 18MAR20
 ACTWGT: 29.00 LB
 CAD: 6997260/SSFO2101
 DIMS: 24x14x13 IN
 BILL THIRD PARTY

TO **CLIENT SERVICES**
ALS ENVIRONMENTAL HOUSTON LAB
 10450 STANCLIFF RD STE 210

HOUSTON TX 77099

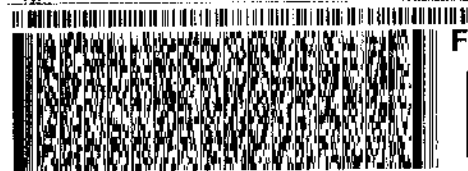
(281) 630-5856

INVT

PSL

REF:

DEPT:



TRK# 3912 1354 4056
 0201

THU 19 MAR 10:30A

PRIORITY OVERNIGHT

AHS

77099

TX-US IAH

NH SGRA





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June 12, 2020

Tim Ratchford
ARCADIS U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge, LA 70816

Work Order: **HS20060138**

Laboratory Results for: **30049071 Brickland Refinery 2Q2020**

Dear Tim,

ALS Environmental received 14 sample(s) on Jun 03, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Dane J. Wacasey

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Work Order: HS20060138

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20060138-01	MW-3S	Water		01-Jun-2020 10:00	03-Jun-2020 09:05	☐
HS20060138-02	MW-3D	Water		01-Jun-2020 10:40	03-Jun-2020 09:05	☐
HS20060138-03	FB-060120	Water		01-Jun-2020 10:45	03-Jun-2020 09:05	☐
HS20060138-04	FD-060120	Water		01-Jun-2020 00:00	03-Jun-2020 09:05	☐
HS20060138-05	MW-6D	Water		01-Jun-2020 11:40	03-Jun-2020 09:05	☐
HS20060138-06	MW-17	Water		01-Jun-2020 12:30	03-Jun-2020 09:05	☐
HS20060138-07	EB-060120	Water		01-Jun-2020 12:35	03-Jun-2020 09:05	☐
HS20060138-08	MW-5	Water		02-Jun-2020 08:30	03-Jun-2020 09:05	☐
HS20060138-09	MW-8	Water		02-Jun-2020 09:25	03-Jun-2020 09:05	☐
HS20060138-10	EB-060220	Water		02-Jun-2020 09:30	03-Jun-2020 09:05	☐
HS20060138-11	FB-060220	Water		02-Jun-2020 09:35	03-Jun-2020 09:05	☐
HS20060138-12	FD-060220	Water		02-Jun-2020 00:00	03-Jun-2020 09:05	☐
HS20060138-13	MW-11	Water		02-Jun-2020 10:25	03-Jun-2020 09:05	☐
HS20060138-14	MW-10	Water		02-Jun-2020 11:20	03-Jun-2020 09:05	☐

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Work Order: HS20060138

CASE NARRATIVE

GCMS Semivolatiles by Method SW8270**Batch ID: 154285****Sample ID: LCSD-154285**

- LCS/LCSD RPD recovered above the RPD limit. *Surr: Nitrobenzene-d5*

GCMS Volatiles by Method SW8260**Batch ID: R362727****Sample ID: FB-060120 (HS20060138-03)**

- Surrogate 4-Bromofluorobenzene is outside recovery limits. Associated analytes are not reported.

Sample ID: MW-11 (HS20060138-13)

- Surrogate 4-Bromofluorobenzene is outside recovery limits. Associated analytes are not reported.
-

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Sample ID: MW-3S
Collection Date: 01-Jun-2020 10:00

ANALYTICAL REPORT

WorkOrder:HS20060138
Lab ID:HS20060138-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 13:47
Surr: 1,2-Dichloroethane-d4	112		70-126	%REC	1	04-Jun-2020 13:47
Surr: 4-Bromofluorobenzene	102		81-113	%REC	1	04-Jun-2020 13:47
Surr: Dibromofluoromethane	106		77-123	%REC	1	04-Jun-2020 13:47
Surr: Toluene-d8	101		82-127	%REC	1	04-Jun-2020 13:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Sample ID: MW-3D
Collection Date: 01-Jun-2020 10:40

ANALYTICAL REPORT

WorkOrder:HS20060138
Lab ID:HS20060138-02
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 16:01
Surr: 1,2-Dichloroethane-d4	109		70-126	%REC	1	04-Jun-2020 16:01
Surr: 4-Bromofluorobenzene	104		81-113	%REC	1	04-Jun-2020 16:01
Surr: Dibromofluoromethane	104		77-123	%REC	1	04-Jun-2020 16:01
Surr: Toluene-d8	102		82-127	%REC	1	04-Jun-2020 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Sample ID: FB-060120
Collection Date: 01-Jun-2020 10:45

ANALYTICAL REPORT

WorkOrder:HS20060138
Lab ID:HS20060138-03
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 12:28
Surr: 1,2-Dichloroethane-d4	101		70-126	%REC	1	04-Jun-2020 12:28
Surr: 4-Bromofluorobenzene	69.4	S	81-113	%REC	1	04-Jun-2020 12:28
Surr: Dibromofluoromethane	105		77-123	%REC	1	04-Jun-2020 12:28
Surr: Toluene-d8	99.8		82-127	%REC	1	04-Jun-2020 12:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 Sample ID: FD-060120
 Collection Date: 01-Jun-2020 00:00

ANALYTICAL REPORT

WorkOrder:HS20060138
 Lab ID:HS20060138-04
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 19:36
Surr: 1,2-Dichloroethane-d4	110		70-126	%REC	1	04-Jun-2020 19:36
Surr: 4-Bromofluorobenzene	101		81-113	%REC	1	04-Jun-2020 19:36
Surr: Dibromofluoromethane	106		77-123	%REC	1	04-Jun-2020 19:36
Surr: Toluene-d8	98.0		82-127	%REC	1	04-Jun-2020 19:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Sample ID: MW-6D
Collection Date: 01-Jun-2020 11:40

ANALYTICAL REPORT

WorkOrder:HS20060138
Lab ID:HS20060138-05
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 16:27
Surr: 1,2-Dichloroethane-d4	114		70-126	%REC	1	04-Jun-2020 16:27
Surr: 4-Bromofluorobenzene	99.5		81-113	%REC	1	04-Jun-2020 16:27
Surr: Dibromofluoromethane	107		77-123	%REC	1	04-Jun-2020 16:27
Surr: Toluene-d8	99.2		82-127	%REC	1	04-Jun-2020 16:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Sample ID: MW-17
Collection Date: 01-Jun-2020 12:30

ANALYTICAL REPORT

WorkOrder:HS20060138
Lab ID:HS20060138-06
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 16:54
Surr: 1,2-Dichloroethane-d4	112		70-126	%REC	1	04-Jun-2020 16:54
Surr: 4-Bromofluorobenzene	103		81-113	%REC	1	04-Jun-2020 16:54
Surr: Dibromofluoromethane	104		77-123	%REC	1	04-Jun-2020 16:54
Surr: Toluene-d8	100		82-127	%REC	1	04-Jun-2020 16:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 Sample ID: EB-060120
 Collection Date: 01-Jun-2020 12:35

ANALYTICAL REPORT

WorkOrder:HS20060138
 Lab ID:HS20060138-07
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 17:21
Surr: 1,2-Dichloroethane-d4	109		70-126	%REC	1	04-Jun-2020 17:21
Surr: 4-Bromofluorobenzene	99.6		81-113	%REC	1	04-Jun-2020 17:21
Surr: Dibromofluoromethane	102		77-123	%REC	1	04-Jun-2020 17:21
Surr: Toluene-d8	100		82-127	%REC	1	04-Jun-2020 17:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 Sample ID: MW-5
 Collection Date: 02-Jun-2020 08:30

ANALYTICAL REPORT

WorkOrder:HS20060138
 Lab ID:HS20060138-08
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260				Analyst: AKP
Benzene	1.0		0.050	mg/L	50	04-Jun-2020 21:21
Surr: 1,2-Dichloroethane-d4	110		70-126	%REC	50	04-Jun-2020 21:21
Surr: 4-Bromofluorobenzene	105		81-113	%REC	50	04-Jun-2020 21:21
Surr: Dibromofluoromethane	102		77-123	%REC	50	04-Jun-2020 21:21
Surr: Toluene-d8	100		82-127	%REC	50	04-Jun-2020 21:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 Sample ID: MW-8
 Collection Date: 02-Jun-2020 09:25

ANALYTICAL REPORT

WorkOrder:HS20060138
 Lab ID:HS20060138-09
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	0.63		0.025	mg/L	25	04-Jun-2020 20:55
Surr: 1,2-Dichloroethane-d4	112		70-126	%REC	25	04-Jun-2020 20:55
Surr: 4-Bromofluorobenzene	111		81-113	%REC	25	04-Jun-2020 20:55
Surr: Dibromofluoromethane	103		77-123	%REC	25	04-Jun-2020 20:55
Surr: Toluene-d8	102		82-127	%REC	25	04-Jun-2020 20:55
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 09-Jun-2020 Analyst: ACN		
Acenaphthene	0.000193		0.000102	mg/L	1	11-Jun-2020 16:49
Acenaphthylene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Anthracene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Benz(a)anthracene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Benzo(a)pyrene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Benzo(b)fluoranthene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Benzo(g,h,i)perylene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Benzo(k)fluoranthene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Chrysene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Dibenz(a,h)anthracene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Fluoranthene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Fluorene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Indeno(1,2,3-cd)pyrene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Naphthalene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Phenanthrene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Pyrene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 16:49
Surr: 2-Fluorobiphenyl	58.1		32-130	%REC	1	11-Jun-2020 16:49
Surr: 4-Terphenyl-d14	84.5		40-135	%REC	1	11-Jun-2020 16:49
Surr: Nitrobenzene-d5	54.3		45-142	%REC	1	11-Jun-2020 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 Sample ID: EB-060220
 Collection Date: 02-Jun-2020 09:30

ANALYTICAL REPORT

WorkOrder:HS20060138
 Lab ID:HS20060138-10
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 12:54
Surr: 1,2-Dichloroethane-d4	105		70-126	%REC	1	04-Jun-2020 12:54
Surr: 4-Bromofluorobenzene	101		81-113	%REC	1	04-Jun-2020 12:54
Surr: Dibromofluoromethane	100		77-123	%REC	1	04-Jun-2020 12:54
Surr: Toluene-d8	97.9		82-127	%REC	1	04-Jun-2020 12:54
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 09-Jun-2020 Analyst: ACN		
Acenaphthene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Acenaphthylene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Anthracene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Benz(a)anthracene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Benzo(a)pyrene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Benzo(b)fluoranthene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Benzo(g,h,i)perylene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Benzo(k)fluoranthene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Chrysene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Dibenz(a,h)anthracene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Fluoranthene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Fluorene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Indeno(1,2,3-cd)pyrene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Naphthalene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Phenanthrene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Pyrene	< 0.000102		0.000102	mg/L	1	11-Jun-2020 17:09
Surr: 2-Fluorobiphenyl	82.6		32-130	%REC	1	11-Jun-2020 17:09
Surr: 4-Terphenyl-d14	89.8		40-135	%REC	1	11-Jun-2020 17:09
Surr: Nitrobenzene-d5	51.0		45-142	%REC	1	11-Jun-2020 17:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 Sample ID: FB-060220
 Collection Date: 02-Jun-2020 09:35

ANALYTICAL REPORT

WorkOrder:HS20060138
 Lab ID:HS20060138-11
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 13:20
Surr: 1,2-Dichloroethane-d4	109		70-126	%REC	1	04-Jun-2020 13:20
Surr: 4-Bromofluorobenzene	101		81-113	%REC	1	04-Jun-2020 13:20
Surr: Dibromofluoromethane	106		77-123	%REC	1	04-Jun-2020 13:20
Surr: Toluene-d8	97.3		82-127	%REC	1	04-Jun-2020 13:20
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 09-Jun-2020 Analyst: ACN		
Acenaphthene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Acenaphthylene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Anthracene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Benz(a)anthracene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Benzo(a)pyrene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Benzo(b)fluoranthene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Benzo(g,h,i)perylene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Benzo(k)fluoranthene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Chrysene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Dibenz(a,h)anthracene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Fluoranthene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Fluorene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Indeno(1,2,3-cd)pyrene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Naphthalene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Phenanthrene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Pyrene	< 0.000115		0.000115	mg/L	1	11-Jun-2020 17:28
Surr: 2-Fluorobiphenyl	87.1		32-130	%REC	1	11-Jun-2020 17:28
Surr: 4-Terphenyl-d14	87.4		40-135	%REC	1	11-Jun-2020 17:28
Surr: Nitrobenzene-d5	57.6		45-142	%REC	1	11-Jun-2020 17:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 Sample ID: FD-060220
 Collection Date: 02-Jun-2020 00:00

ANALYTICAL REPORT

WorkOrder:HS20060138
 Lab ID:HS20060138-12
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 09-Jun-2020	Analyst: ACN	
Acenaphthene	0.000338		0.000103	mg/L	1	11-Jun-2020 17:48
Acenaphthylene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Anthracene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Benz(a)anthracene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Benzo(a)pyrene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Benzo(b)fluoranthene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Benzo(g,h,i)perylene	0.000108		0.000103	mg/L	1	11-Jun-2020 17:48
Benzo(k)fluoranthene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Chrysene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Dibenz(a,h)anthracene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Fluoranthene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Fluorene	0.000201		0.000103	mg/L	1	11-Jun-2020 17:48
Indeno(1,2,3-cd)pyrene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Naphthalene	0.000262		0.000103	mg/L	1	11-Jun-2020 17:48
Phenanthrene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Pyrene	< 0.000103		0.000103	mg/L	1	11-Jun-2020 17:48
Surr: 2-Fluorobiphenyl	69.7		32-130	%REC	1	11-Jun-2020 17:48
Surr: 4-Terphenyl-d14	81.2		40-135	%REC	1	11-Jun-2020 17:48
Surr: Nitrobenzene-d5	56.3		45-142	%REC	1	11-Jun-2020 17:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Sample ID: MW-11
Collection Date: 02-Jun-2020 10:25

ANALYTICAL REPORT

WorkOrder:HS20060138
Lab ID:HS20060138-13
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 17:48
Surr: 1,2-Dichloroethane-d4	111		70-126	%REC	1	04-Jun-2020 17:48
Surr: 4-Bromofluorobenzene	125	S	81-113	%REC	1	04-Jun-2020 17:48
Surr: Dibromofluoromethane	105		77-123	%REC	1	04-Jun-2020 17:48
Surr: Toluene-d8	101		82-127	%REC	1	04-Jun-2020 17:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
Sample ID: MW-10
Collection Date: 02-Jun-2020 11:20

ANALYTICAL REPORT

WorkOrder:HS20060138
Lab ID:HS20060138-14
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	04-Jun-2020 18:15
Surr: 1,2-Dichloroethane-d4	110		70-126	%REC	1	04-Jun-2020 18:15
Surr: 4-Bromofluorobenzene	100		81-113	%REC	1	04-Jun-2020 18:15
Surr: Dibromofluoromethane	104		77-123	%REC	1	04-Jun-2020 18:15
Surr: Toluene-d8	99.1		82-127	%REC	1	04-Jun-2020 18:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 12-Jun-20

Weight / Prep Log

Client: ARCADIS U.S., Inc.

Project: 30049071 Brickland Refinery 2Q2020

WorkOrder: HS20060138

Batch ID: 154285

Start Date: 09 Jun 2020 09:00

End Date: 09 Jun 2020 17:00

Method: SW3511

Prep Code: 3511_PAH

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20060138-09		32.45 (mL)	2 (mL)	0.06163
HS20060138-10		32.42 (mL)	2 (mL)	0.06169
HS20060138-11		28.64 (mL)	2 (mL)	0.06983
HS20060138-12		31.91 (mL)	2 (mL)	0.06268

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
WorkOrder: HS20060138

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 154285 (0)		Test Name : LOW-LEVEL PAHS - 8270D			Matrix: Water	
HS20060138-09	MW-8	02 Jun 2020 09:25		09 Jun 2020 09:00	11 Jun 2020 16:49	1
HS20060138-10	EB-060220	02 Jun 2020 09:30		09 Jun 2020 09:00	11 Jun 2020 17:09	1
HS20060138-11	FB-060220	02 Jun 2020 09:35		09 Jun 2020 09:00	11 Jun 2020 17:28	1
HS20060138-12	FD-060220	02 Jun 2020 00:00		09 Jun 2020 09:00	11 Jun 2020 17:48	1
Batch ID: R362727 (0)		Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Water	
HS20060138-01	MW-3S	01 Jun 2020 10:00			04 Jun 2020 13:47	1
HS20060138-02	MW-3D	01 Jun 2020 10:40			04 Jun 2020 16:01	1
HS20060138-03	FB-060120	01 Jun 2020 10:45			04 Jun 2020 12:28	1
HS20060138-04	FD-060120	01 Jun 2020 00:00			04 Jun 2020 19:36	1
HS20060138-05	MW-6D	01 Jun 2020 11:40			04 Jun 2020 16:27	1
HS20060138-06	MW-17	01 Jun 2020 12:30			04 Jun 2020 16:54	1
HS20060138-07	EB-060120	01 Jun 2020 12:35			04 Jun 2020 17:21	1
HS20060138-08	MW-5	02 Jun 2020 08:30			04 Jun 2020 21:21	50
HS20060138-09	MW-8	02 Jun 2020 09:25			04 Jun 2020 20:55	25
HS20060138-10	EB-060220	02 Jun 2020 09:30			04 Jun 2020 12:54	1
HS20060138-11	FB-060220	02 Jun 2020 09:35			04 Jun 2020 13:20	1
HS20060138-13	MW-11	02 Jun 2020 10:25			04 Jun 2020 17:48	1
HS20060138-14	MW-10	02 Jun 2020 11:20			04 Jun 2020 18:15	1

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
WorkOrder: HS20060138

QC BATCH REPORT

Batch ID: 154285 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D						
MBLK	Sample ID: MBLK-154285	Units: ug/L		Analysis Date: 11-Jun-2020 11:58						
Client ID:	Run ID: SV-6_363168	SeqNo: 5617708		PrepDate: 09-Jun-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	< 0.100	0.100								
Acenaphthylene	< 0.100	0.100								
Anthracene	< 0.100	0.100								
Benz(a)anthracene	< 0.100	0.100								
Benzo(a)pyrene	< 0.100	0.100								
Benzo(b)fluoranthene	< 0.100	0.100								
Benzo(g,h,i)perylene	< 0.100	0.100								
Benzo(k)fluoranthene	< 0.100	0.100								
Chrysene	< 0.100	0.100								
Dibenz(a,h)anthracene	< 0.100	0.100								
Fluoranthene	< 0.100	0.100								
Fluorene	< 0.100	0.100								
Indeno(1,2,3-cd)pyrene	< 0.100	0.100								
Naphthalene	< 0.100	0.100								
Phenanthrene	< 0.100	0.100								
Pyrene	< 0.100	0.100								
Surr: 2-Fluorobiphenyl	1.147	0.100	3.03	0	37.9	32 - 130				
Surr: 4-Terphenyl-d14	1.409	0.100	3.03	0	46.5	40 - 135				
Surr: Nitrobenzene-d5	1.534	0.100	3.03	0	50.6	45 - 142				

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 WorkOrder: HS20060138

QC BATCH REPORT

Batch ID: 154285 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
LCS		Sample ID: LCS-154285		Units: ug/L		Analysis Date: 11-Jun-2020 12:17			
Client ID:		Run ID: SV-6_363168		SeqNo: 5617709		PrepDate: 09-Jun-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	2.582	0.100	3.03	0	85.2	40 - 140			
Acenaphthylene	2.738	0.100	3.03	0	90.4	40 - 140			
Anthracene	2.706	0.100	3.03	0	89.3	40 - 140			
Benz(a)anthracene	2.527	0.100	3.03	0	83.4	40 - 140			
Benzo(a)pyrene	2.584	0.100	3.03	0	85.3	40 - 140			
Benzo(b)fluoranthene	2.465	0.100	3.03	0	81.4	40 - 140			
Benzo(g,h,i)perylene	3.38	0.100	3.03	0	112	40 - 140			
Benzo(k)fluoranthene	3.314	0.100	3.03	0	109	40 - 140			
Chrysene	3.08	0.100	3.03	0	102	40 - 140			
Dibenz(a,h)anthracene	2.782	0.100	3.03	0	91.8	40 - 140			
Fluoranthene	2.729	0.100	3.03	0	90.1	40 - 140			
Fluorene	2.364	0.100	3.03	0	78.0	40 - 140			
Indeno(1,2,3-cd)pyrene	2.88	0.100	3.03	0	95.1	40 - 140			
Naphthalene	3.03	0.100	3.03	0	100	40 - 140			
Phenanthrene	2.963	0.100	3.03	0	97.8	40 - 140			
Pyrene	2.935	0.100	3.03	0	96.9	40 - 140			
Surr: 2-Fluorobiphenyl	1.177	0.100	3.03	0	38.8	32 - 130			
Surr: 4-Terphenyl-d14	1.314	0.100	3.03	0	43.4	40 - 135			
Surr: Nitrobenzene-d5	1.419	0.100	3.03	0	46.8	45 - 142			

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 WorkOrder: HS20060138

QC BATCH REPORT

Batch ID: 154285 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
LCSD		Sample ID: LCSD-154285		Units: ug/L		Analysis Date: 11-Jun-2020 12:37			
Client ID:		Run ID: SV-6_363168		SeqNo: 5617710		PrepDate: 09-Jun-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	3.283	0.100	3.03	0	108	40 - 140	2.582	23.9	25
Acenaphthylene	3.503	0.100	3.03	0	116	40 - 140	2.738	24.5	25
Anthracene	2.91	0.100	3.03	0	96.0	40 - 140	2.706	7.26	25
Benz(a)anthracene	2.486	0.100	3.03	0	82.0	40 - 140	2.527	1.62	25
Benzo(a)pyrene	2.652	0.100	3.03	0	87.5	40 - 140	2.584	2.59	25
Benzo(b)fluoranthene	2.465	0.100	3.03	0	81.3	40 - 140	2.465	0.00246	25
Benzo(g,h,i)perylene	2.852	0.100	3.03	0	94.1	40 - 140	3.38	17	25
Benzo(k)fluoranthene	3.196	0.100	3.03	0	105	40 - 140	3.314	3.63	25
Chrysene	2.94	0.100	3.03	0	97.0	40 - 140	3.08	4.67	25
Dibenz(a,h)anthracene	2.676	0.100	3.03	0	88.3	40 - 140	2.782	3.88	25
Fluoranthene	2.625	0.100	3.03	0	86.6	40 - 140	2.729	3.89	25
Fluorene	3.036	0.100	3.03	0	100	40 - 140	2.364	24.9	25
Indeno(1,2,3-cd)pyrene	2.616	0.100	3.03	0	86.3	40 - 140	2.88	9.63	25
Naphthalene	3.071	0.100	3.03	0	101	40 - 140	3.03	1.35	25
Phenanthrene	2.862	0.100	3.03	0	94.5	40 - 140	2.963	3.46	25
Pyrene	2.878	0.100	3.03	0	95.0	40 - 140	2.935	1.96	25
Surr: 2-Fluorobiphenyl	1.304	0.100	3.03	0	43.0	32 - 130	1.177	10.2	25
Surr: 4-Terphenyl-d14	1.332	0.100	3.03	0	44.0	40 - 135	1.314	1.33	25
Surr: Nitrobenzene-d5	2.352	0.100	3.03	0	77.6	45 - 142	1.419	49.5	25 R
The following samples were analyzed in this batch:									
HS20060138-09		HS20060138-10		HS20060138-11		HS20060138-12			

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 2Q2020
 WorkOrder: HS20060138

QC BATCH REPORT

Batch ID: R362727 (0)		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C					
MBLK	Sample ID: VBLKW-200604	Units: ug/L		Analysis Date: 04-Jun-2020 11:36					
Client ID:	Run ID: VOA4_362727	SeqNo: 5608023		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	< 1.0	1.0							
Surr: 1,2-Dichloroethane-d4	53.64	1.0	50	0	107	70 - 123			
Surr: 4-Bromofluorobenzene	49.45	1.0	50	0	98.9	82 - 115			
Surr: Dibromofluoromethane	51.76	1.0	50	0	104	73 - 126			
Surr: Toluene-d8	49.43	1.0	50	0	98.9	81 - 120			

LCS	Sample ID: VLCSW-200604	Units: ug/L		Analysis Date: 04-Jun-2020 10:44					
Client ID:	Run ID: VOA4_362727	SeqNo: 5608022		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.59	1.0	20	0	92.9	74 - 120			
Surr: 1,2-Dichloroethane-d4	53.13	1.0	50	0	106	70 - 130			
Surr: 4-Bromofluorobenzene	51.62	1.0	50	0	103	82 - 115			
Surr: Dibromofluoromethane	50.32	1.0	50	0	101	73 - 126			
Surr: Toluene-d8	48.74	1.0	50	0	97.5	81 - 120			

MS	Sample ID: HS20060138-01MS	Units: ug/L		Analysis Date: 04-Jun-2020 14:40					
Client ID: MW-3S	Run ID: VOA4_362727	SeqNo: 5608030		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.64	1.0	20	0	93.2	70 - 127			
Surr: 1,2-Dichloroethane-d4	53.7	1.0	50	0	107	70 - 126			
Surr: 4-Bromofluorobenzene	50.24	1.0	50	0	100	81 - 113			
Surr: Dibromofluoromethane	52.39	1.0	50	0	105	77 - 123			
Surr: Toluene-d8	49.19	1.0	50	0	98.4	82 - 127			

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
WorkOrder: HS20060138

QC BATCH REPORT

Batch ID: R362727 (0)		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C					
MSD	Sample ID: HS20060138-01MSD	Units: ug/L			Analysis Date: 04-Jun-2020 15:07				
Client ID: MW-3S	Run ID: VOA4_362727		SeqNo: 5608031		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.6	1.0	20	0	93.0	70 - 127	18.64	0.208	20
Surr: 1,2-Dichloroethane-d4	52.96	1.0	50	0	106	70 - 126	53.7	1.37	20
Surr: 4-Bromofluorobenzene	50.5	1.0	50	0	101	81 - 113	50.24	0.516	20
Surr: Dibromofluoromethane	51.32	1.0	50	0	103	77 - 123	52.39	2.07	20
Surr: Toluene-d8	49.46	1.0	50	0	98.9	82 - 127	49.19	0.552	20
The following samples were analyzed in this batch:		HS20060138-01		HS20060138-02		HS20060138-03		HS20060138-04	
		HS20060138-05		HS20060138-06		HS20060138-07		HS20060138-08	
		HS20060138-09		HS20060138-10		HS20060138-11		HS20060138-13	
		HS20060138-14							

ALS Houston, US

Date: 12-Jun-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 2Q2020
WorkOrder: HS20060138

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US

Date: 12-Jun-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2019-2020	31-Jul-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
Oklahoma	2019-141	31-Aug-2020
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US

Date: 12-Jun-20

Sample Receipt Checklist

Work Order ID: HS20060138

Date/Time Received: 03-Jun-2020 09:05

Client Name: Arcadis-Baton Rouge

Received by: Paresh M. Giga

Completed By: /S/ Bernadette A. Fini

03-Jun-2020 16:41

Reviewed by: /S/ Dane J. Wacasey

04-Jun-2020 15:11

eSignature

Date/Time

eSignature

Date/Time

Matrices: WaterCarrier name: FedEx Priority Overnight

Shipping container/cooler in good condition?

Yes ☒No ☐Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☐No ☐Not Present ☒

Custody seals intact on sample bottles?

Yes ☐No ☐Not Present ☒

VOA/TX1005/TX1006 Solids in hermetically sealed vials?

Yes ☐No ☐Not Present ☒

Chain of custody present?

Yes ☒No ☐

2 Page(s)

Chain of custody signed when relinquished and received?

Yes ☒No ☐

COC IDs:216971,216973

Samplers name present on COC?

Yes ☒No ☐

Chain of custody agrees with sample labels?

Yes ☒No ☐

Samples in proper container/bottle?

Yes ☒No ☐

Sample containers intact?

Yes ☒No ☐

Sufficient sample volume for indicated test?

Yes ☒No ☐

All samples received within holding time?

Yes ☒No ☐

Container/Temp Blank temperature in compliance?

Yes ☒No ☐

Temperature(s)/Thermometer(s):

0.9°C uc/c

IR25

Cooler(s)/Kit(s):

45969

Date/Time sample(s) sent to storage:

6-3-2020 17:15

Water - VOA vials have zero headspace?

Yes ☒No ☐No VOA vials submitted ☐

Water - pH acceptable upon receipt?

Yes ☐No ☐N/A ☒

pH adjusted?

Yes ☐No ☐N/A ☒

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:

Cincinnati, OH
+1 513 733 5336Everett, WA
+1 425 356 2600Fort Collins, CO
+1 970 490 1511Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 216971

Houston, TX
+1 281 530 5656Middletown, PA
+1 717 944 5541Spring City, PA
+1 610 948 4903Salt Lake City, UT
+1 801 266 7700South Charleston, WV
+1 304 356 3168York, PA
+1 717 505 5280

Customer Information		Project Information		Parameter/Method Request for Analysis														
Purchase Order	30049071 Task 250	Project Name	30049071 Brickland Refinery 202020	A 8260_LL_W (8260 Benzene ('Unpreserved')-7 day HT)														
Work Order		Project Number	30049071 Task 250	B 8270_PAH_LVI (8270 PAHs (LVI))														
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C														
Send Report To	Tim Ratchford	Invoice Attn	Accounts Payable	D														
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E														
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	F														
Phone	(225) 292-1004	Phone	(303) 471-3598	G														
Fax		Fax		H														
e-Mail Address	Tim.Ratchford@arcadis-us.com	e-Mail Address	Accounts.payable.administration@arcad	I														
				HS20060138 ARCADIS U.S., Inc. Brickland Refinery 30049071 														
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold	
1	MW-3S	6/1/20	1000	W	8	3	X											
2	MW-3D	6/1/20	1040	W	8	3	X											
3	FB-060120	6/1/20	1045	W	8	3	X											
4	FD-060120	6/1/20	—	W	8	3	X											
5	MW-6D	6/1/20	1140	W	8	3	X											
6	MW-17	6/1/20	1230	W	8	3	X											
7	EB-060120	6/1/20	1235	W	8	3	X											
8	MW-5	6/2/20	0830	W	8	3	X											
9	MW-8	6/2/20	0905	W	8	6	X	X										
10	EB-060220	6/2/20	0930	W	8	6	X	X										
Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)				Results Due Date:										
<i>DMG</i>		Fed Ex		☒ STD 10-14 Days ☐ 5-7 Days ☐ 2-3 Days ☐ 24 Hour														
Relinquished by:		Date:	Time:	Received by:		Notes:												
<i>Sergio Celis</i>		6/2/20	1300	<i>[Signature]</i>		[AGM Brickland NM]												
Relinquished by:		Date:	Time:	Received by (Laboratory):		QC Package: (Check One Box Below)												
—				<i>[Signature]</i>		☒ Level II QCLP ☐ Level III QCLP ☐ Level IV SW-846 QCLP ☐ Other												
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):		Cooler ID: 45969, Cooler Temp: 4.00, 4.25												
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035																		

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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+1 513 733 5336Fort Collins, CO
+1 970 490 1511Everett, WA
+1 425 356 2600Holland, MI
+1 616 399 6070

Chain of Custody Form

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COC ID: 216973

Houston, TX
+1 281 530 5656Spring City, PA
+1 610 948 4903South Charleston, WV
+1 304 356 3168Middletown, PA
+1 717 944 5541Salt Lake City, UT
+1 801 266 7700York, PA
+1 717 505 5280

Customer Information		Project Information		Parameter/Method Request for Analysis														
Purchase Order	30049071 Task 250	Project Name	30049071 Brickland Refinery 2Q2020	HS20060138 ARCADIS U.S., Inc. Brickland Refinery 30049071 														
Work Order		Project Number	30049071 Task 250															
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS															
Send Report To	Tim Ratchford	Invoice Attn	Accounts Payable															
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600															
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129															
Phone	(225) 292-1004	Phone	(303) 471-3699															
Fax		Fax																
e-Mail Address	Tim.Ratchford@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcad															
No.	Sample Description	Date	Time														Matrix	Pres.
1	FB-060220	6/2/20	0935	W	8	6	X	X										
2	FA-060220	6/2/20	—	W	8	3		X										
3	MW-11	6/2/20	1025	W	8	3	X											
4	MW-10	6/2/20	1120	W	8	3	X											
5																		
6																		
7																		
8																		
9																		
10																		
Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)				Results Due Date:										
Dr. Sofia		Fed Ex		☒ STD 10 Wk (Evs) ☐ 5 Wk (Evs) ☐ 2 Wk (Evs) ☐ 24 Hour														
Relinquished by: Sergio Celis		Date: 6/2/20	Time: 1300	Received by:		Received by (Laboratory):		Notes: [AGM Brickland NM]										
Relinquished by:		Date:	Time:	Received by:		Received by (Laboratory):												
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):		Checked by (Laboratory):												
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035																		

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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 ALS 10450 Stanciliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By:
	Date: 6-3-20	Time: 12:30	SM
	Name: D. S. O. L.		Date: 06/03/20
	Company: ARCADIS		

45969

0 9 2021

 ALS 10450 Stanciliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By:
	Date: 6-3-20	Time: 12:30	SM
	Name: D. S. O. L.		Date: 06/03/20
	Company: ARCADIS		

ORIGIN ID: ELPA (915) 393-4402
 SERGIO CELIS
 ARCADIS
 401 E MAIN DR STE 400
 EL PASO, TX 79901
 UNITED STATES US

SHIP DATE: 02JUN20
 ACTWGT: 39.60 LB
 CRD: 6890689/SSP02110
 DIMS: 23x14x14 IN
 BILL THIRD PARTY

TO CLIENT SERVICES
 ALS ENVIRONMENTAL HOUSTON LAB
 10450 STANCLIFF RD STE 210
 HOUSTON TX 77099

(281) 530-5656
 DEF: 45969


 TRK# 8079 4000 9425
 0215

 WED - 03 JUN 10:30A
 PRIORITY OVERNIGHT

NH SGRA

 AHS
 77099
 TX-US IAH




10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

September 28, 2020

Tim Ratchford
ARCADIS U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge, LA 70816

Work Order: **HS20091066**

Laboratory Results for: **30049071 Brickland Refinery 3Q2020**

Dear Tim Ratchford,

ALS Environmental received 14 sample(s) on Sep 23, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DANE.WACASEY

Dane J. Wacasey

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Work Order: HS20091066

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20091066-01	MW-3S	Water		21-Sep-2020 09:15	23-Sep-2020 09:50	☐
HS20091066-02	MW-3D	Water		21-Sep-2020 10:00	23-Sep-2020 09:50	☐
HS20091066-03	FB 092120	Water		21-Sep-2020 10:05	23-Sep-2020 09:50	☐
HS20091066-04	FD 092120	Water		21-Sep-2020 00:00	23-Sep-2020 09:50	☐
HS20091066-05	MW-6D	Water		21-Sep-2020 10:55	23-Sep-2020 09:50	☐
HS20091066-06	MW-17	Water		21-Sep-2020 11:50	23-Sep-2020 09:50	☐
HS20091066-07	EB 092120	Water		21-Sep-2020 11:55	23-Sep-2020 09:50	☐
HS20091066-08	MW-5	Water		22-Sep-2020 08:40	23-Sep-2020 09:50	☐
HS20091066-09	MW-8	Water		22-Sep-2020 09:35	23-Sep-2020 09:50	☐
HS20091066-10	FD 092220	Water		22-Sep-2020 00:00	23-Sep-2020 09:50	☐
HS20091066-11	EB 092220	Water		22-Sep-2020 09:45	23-Sep-2020 09:50	☐
HS20091066-12	FB 092220	Water		22-Sep-2020 09:40	23-Sep-2020 09:50	☐
HS20091066-13	MW-11	Water		22-Sep-2020 10:35	23-Sep-2020 09:50	☐
HS20091066-14	MW-10	Water		22-Sep-2020 11:25	23-Sep-2020 09:50	☐

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Work Order: HS20091066

CASE NARRATIVE

GCMS Semivolatiles by Method SW8270

Batch ID: 157764

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R369245

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Sample ID: MW-3S
Collection Date: 21-Sep-2020 09:15

ANALYTICAL REPORT

WorkOrder:HS20091066
Lab ID:HS20091066-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 14:36
Surr: 1,2-Dichloroethane-d4	113		70-126	%REC	1	24-Sep-2020 14:36
Surr: 4-Bromofluorobenzene	97.8		81-113	%REC	1	24-Sep-2020 14:36
Surr: Dibromofluoromethane	97.7		77-123	%REC	1	24-Sep-2020 14:36
Surr: Toluene-d8	98.8		82-127	%REC	1	24-Sep-2020 14:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Sample ID: MW-3D
Collection Date: 21-Sep-2020 10:00

ANALYTICAL REPORT

WorkOrder:HS20091066
Lab ID:HS20091066-02
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 14:57
Surr: 1,2-Dichloroethane-d4	118		70-126	%REC	1	24-Sep-2020 14:57
Surr: 4-Bromofluorobenzene	99.8		81-113	%REC	1	24-Sep-2020 14:57
Surr: Dibromofluoromethane	102		77-123	%REC	1	24-Sep-2020 14:57
Surr: Toluene-d8	102		82-127	%REC	1	24-Sep-2020 14:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Sample ID: FB 092120
Collection Date: 21-Sep-2020 10:05

ANALYTICAL REPORT

WorkOrder:HS20091066
Lab ID:HS20091066-03
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 13:12
Surr: 1,2-Dichloroethane-d4	106		70-126	%REC	1	24-Sep-2020 13:12
Surr: 4-Bromofluorobenzene	99.4		81-113	%REC	1	24-Sep-2020 13:12
Surr: Dibromofluoromethane	95.8		77-123	%REC	1	24-Sep-2020 13:12
Surr: Toluene-d8	98.2		82-127	%REC	1	24-Sep-2020 13:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Sample ID: FD 092120
Collection Date: 21-Sep-2020 00:00

ANALYTICAL REPORT

WorkOrder:HS20091066
Lab ID:HS20091066-04
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 15:18
Surr: 1,2-Dichloroethane-d4	110		70-126	%REC	1	24-Sep-2020 15:18
Surr: 4-Bromofluorobenzene	103		81-113	%REC	1	24-Sep-2020 15:18
Surr: Dibromofluoromethane	101		77-123	%REC	1	24-Sep-2020 15:18
Surr: Toluene-d8	99.8		82-127	%REC	1	24-Sep-2020 15:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Sample ID: MW-6D
Collection Date: 21-Sep-2020 10:55

ANALYTICAL REPORT

WorkOrder:HS20091066
Lab ID:HS20091066-05
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 15:40
Surr: 1,2-Dichloroethane-d4	109		70-126	%REC	1	24-Sep-2020 15:40
Surr: 4-Bromofluorobenzene	99.7		81-113	%REC	1	24-Sep-2020 15:40
Surr: Dibromofluoromethane	97.6		77-123	%REC	1	24-Sep-2020 15:40
Surr: Toluene-d8	100		82-127	%REC	1	24-Sep-2020 15:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Sample ID: MW-17
Collection Date: 21-Sep-2020 11:50

ANALYTICAL REPORT

WorkOrder:HS20091066
Lab ID:HS20091066-06
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 16:01
Surr: 1,2-Dichloroethane-d4	112		70-126	%REC	1	24-Sep-2020 16:01
Surr: 4-Bromofluorobenzene	103		81-113	%REC	1	24-Sep-2020 16:01
Surr: Dibromofluoromethane	99.5		77-123	%REC	1	24-Sep-2020 16:01
Surr: Toluene-d8	101		82-127	%REC	1	24-Sep-2020 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Sample ID: EB 092120
Collection Date: 21-Sep-2020 11:55

ANALYTICAL REPORT

WorkOrder:HS20091066
Lab ID:HS20091066-07
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 13:32
Surr: 1,2-Dichloroethane-d4	106		70-126	%REC	1	24-Sep-2020 13:32
Surr: 4-Bromofluorobenzene	99.4		81-113	%REC	1	24-Sep-2020 13:32
Surr: Dibromofluoromethane	94.2		77-123	%REC	1	24-Sep-2020 13:32
Surr: Toluene-d8	100		82-127	%REC	1	24-Sep-2020 13:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 3Q2020
 Sample ID: MW-5
 Collection Date: 22-Sep-2020 08:40

ANALYTICAL REPORT

WorkOrder:HS20091066
 Lab ID:HS20091066-08
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	0.75		0.050	mg/L	50	24-Sep-2020 20:35
Surr: 1,2-Dichloroethane-d4	112		70-126	%REC	50	24-Sep-2020 20:35
Surr: 4-Bromofluorobenzene	99.0		81-113	%REC	50	24-Sep-2020 20:35
Surr: Dibromofluoromethane	97.9		77-123	%REC	50	24-Sep-2020 20:35
Surr: Toluene-d8	99.2		82-127	%REC	50	24-Sep-2020 20:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 3Q2020
 Sample ID: MW-8
 Collection Date: 22-Sep-2020 09:35

ANALYTICAL REPORT

WorkOrder:HS20091066
 Lab ID:HS20091066-09
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	0.72		0.025	mg/L	25	24-Sep-2020 20:14
Surr: 1,2-Dichloroethane-d4	109		70-126	%REC	25	24-Sep-2020 20:14
Surr: 4-Bromofluorobenzene	99.9		81-113	%REC	25	24-Sep-2020 20:14
Surr: Dibromofluoromethane	94.8		77-123	%REC	25	24-Sep-2020 20:14
Surr: Toluene-d8	98.3		82-127	%REC	25	24-Sep-2020 20:14
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 24-Sep-2020 Analyst: ACN		
Acenaphthene	0.000373		0.000103	mg/L	1	25-Sep-2020 14:03
Acenaphthylene	0.000174		0.000103	mg/L	1	25-Sep-2020 14:03
Anthracene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Benz(a)anthracene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Benzo(a)pyrene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Benzo(b)fluoranthene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Benzo(g,h,i)perylene	0.000130		0.000103	mg/L	1	25-Sep-2020 14:03
Benzo(k)fluoranthene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Chrysene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Dibenz(a,h)anthracene	0.000159		0.000103	mg/L	1	25-Sep-2020 14:03
Fluoranthene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Fluorene	0.000396		0.000103	mg/L	1	25-Sep-2020 14:03
Indeno(1,2,3-cd)pyrene	0.000202		0.000103	mg/L	1	25-Sep-2020 14:03
Naphthalene	0.00257		0.000103	mg/L	1	25-Sep-2020 14:03
Phenanthrene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Pyrene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:03
Surr: 2-Fluorobiphenyl	79.4		32-130	%REC	1	25-Sep-2020 14:03
Surr: 4-Terphenyl-d14	68.5		40-135	%REC	1	25-Sep-2020 14:03
Surr: Nitrobenzene-d5	84.5		45-142	%REC	1	25-Sep-2020 14:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 3Q2020
 Sample ID: FD 092220
 Collection Date: 22-Sep-2020 00:00

ANALYTICAL REPORT

WorkOrder:HS20091066
 Lab ID:HS20091066-10
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D		Method:SW8270			Prep:SW3511 / 24-Sep-2020	Analyst: ACN
Acenaphthene	0.000764		0.000102	mg/L	1	25-Sep-2020 14:23
Acenaphthylene	0.000248		0.000102	mg/L	1	25-Sep-2020 14:23
Anthracene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 14:23
Benz(a)anthracene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 14:23
Benzo(a)pyrene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 14:23
Benzo(b)fluoranthene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 14:23
Benzo(g,h,i)perylene	0.000142		0.000102	mg/L	1	25-Sep-2020 14:23
Benzo(k)fluoranthene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 14:23
Chrysene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 14:23
Dibenz(a,h)anthracene	0.000150		0.000102	mg/L	1	25-Sep-2020 14:23
Fluoranthene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 14:23
Fluorene	0.000815		0.000102	mg/L	1	25-Sep-2020 14:23
Indeno(1,2,3-cd)pyrene	0.000160		0.000102	mg/L	1	25-Sep-2020 14:23
Naphthalene	0.00462		0.000102	mg/L	1	25-Sep-2020 14:23
Phenanthrene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 14:23
Pyrene	0.000118		0.000102	mg/L	1	25-Sep-2020 14:23
Surr: 2-Fluorobiphenyl	118		32-130	%REC	1	25-Sep-2020 14:23
Surr: 4-Terphenyl-d14	119		40-135	%REC	1	25-Sep-2020 14:23
Surr: Nitrobenzene-d5	126		45-142	%REC	1	25-Sep-2020 14:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 3Q2020
 Sample ID: EB 092220
 Collection Date: 22-Sep-2020 09:45

ANALYTICAL REPORT

WorkOrder:HS20091066
 Lab ID:HS20091066-11
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 13:53
Surr: 1,2-Dichloroethane-d4	106		70-126	%REC	1	24-Sep-2020 13:53
Surr: 4-Bromofluorobenzene	101		81-113	%REC	1	24-Sep-2020 13:53
Surr: Dibromofluoromethane	97.3		77-123	%REC	1	24-Sep-2020 13:53
Surr: Toluene-d8	99.7		82-127	%REC	1	24-Sep-2020 13:53
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 24-Sep-2020 Analyst: ACN		
Acenaphthene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Acenaphthylene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Anthracene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Benz(a)anthracene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Benzo(a)pyrene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Benzo(b)fluoranthene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Benzo(g,h,i)perylene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Benzo(k)fluoranthene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Chrysene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Dibenz(a,h)anthracene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Fluoranthene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Fluorene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Indeno(1,2,3-cd)pyrene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Naphthalene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Phenanthrene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Pyrene	< 0.000103		0.000103	mg/L	1	25-Sep-2020 14:42
Surr: 2-Fluorobiphenyl	103		32-130	%REC	1	25-Sep-2020 14:42
Surr: 4-Terphenyl-d14	84.7		40-135	%REC	1	25-Sep-2020 14:42
Surr: Nitrobenzene-d5	81.1		45-142	%REC	1	25-Sep-2020 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 3Q2020
 Sample ID: FB 092220
 Collection Date: 22-Sep-2020 09:40

ANALYTICAL REPORT

WorkOrder:HS20091066
 Lab ID:HS20091066-12
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 14:15
Surr: 1,2-Dichloroethane-d4	108		70-126	%REC	1	24-Sep-2020 14:15
Surr: 4-Bromofluorobenzene	99.9		81-113	%REC	1	24-Sep-2020 14:15
Surr: Dibromofluoromethane	95.2		77-123	%REC	1	24-Sep-2020 14:15
Surr: Toluene-d8	98.0		82-127	%REC	1	24-Sep-2020 14:15
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 24-Sep-2020 Analyst: ACN		
Acenaphthene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Acenaphthylene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Anthracene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Benz(a)anthracene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Benzo(a)pyrene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Benzo(b)fluoranthene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Benzo(g,h,i)perylene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Benzo(k)fluoranthene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Chrysene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Dibenz(a,h)anthracene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Fluoranthene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Fluorene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Indeno(1,2,3-cd)pyrene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Naphthalene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Phenanthrene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Pyrene	< 0.000102		0.000102	mg/L	1	25-Sep-2020 15:02
Surr: 2-Fluorobiphenyl	123		32-130	%REC	1	25-Sep-2020 15:02
Surr: 4-Terphenyl-d14	76.9		40-135	%REC	1	25-Sep-2020 15:02
Surr: Nitrobenzene-d5	76.7		45-142	%REC	1	25-Sep-2020 15:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 3Q2020
 Sample ID: MW-11
 Collection Date: 22-Sep-2020 10:35

ANALYTICAL REPORT

WorkOrder:HS20091066
 Lab ID:HS20091066-13
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 16:22
Surr: 1,2-Dichloroethane-d4	109		70-126	%REC	1	24-Sep-2020 16:22
Surr: 4-Bromofluorobenzene	103		81-113	%REC	1	24-Sep-2020 16:22
Surr: Dibromofluoromethane	96.1		77-123	%REC	1	24-Sep-2020 16:22
Surr: Toluene-d8	103		82-127	%REC	1	24-Sep-2020 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
Sample ID: MW-10
Collection Date: 22-Sep-2020 11:25

ANALYTICAL REPORT

WorkOrder:HS20091066
Lab ID:HS20091066-14
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260		Analyst: AKP		
Benzene	< 0.0010		0.0010	mg/L	1	24-Sep-2020 16:44
Surr: 1,2-Dichloroethane-d4	109		70-126	%REC	1	24-Sep-2020 16:44
Surr: 4-Bromofluorobenzene	102		81-113	%REC	1	24-Sep-2020 16:44
Surr: Dibromofluoromethane	98.0		77-123	%REC	1	24-Sep-2020 16:44
Surr: Toluene-d8	104		82-127	%REC	1	24-Sep-2020 16:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 28-Sep-20

Weight / Prep Log

Client: ARCADIS U.S., Inc.

Project: 30049071 Brickland Refinery 3Q2020

WorkOrder: HS20091066

Batch ID: 157764

Start Date: 24 Sep 2020 11:20

End Date:

Method: SW3511

Prep Code: 3511_PAH

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20091066-09	1	31.9 (mL)	2 (mL)	0.0627
HS20091066-10	1	32.4 (mL)	2 (mL)	0.06173
HS20091066-11	1	32.17 (mL)	2 (mL)	0.06217
HS20091066-12	1	32.31 (mL)	2 (mL)	0.0619

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
WorkOrder: HS20091066

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 157764 (0)		Test Name : LOW-LEVEL PAHS - 8270D			Matrix: Water	
HS20091066-09	MW-8	22 Sep 2020 09:35		24 Sep 2020 11:20	25 Sep 2020 14:03	1
HS20091066-10	FD 092220	22 Sep 2020 00:00		24 Sep 2020 11:20	25 Sep 2020 14:23	1
HS20091066-11	EB 092220	22 Sep 2020 09:45		24 Sep 2020 11:20	25 Sep 2020 14:42	1
HS20091066-12	FB 092220	22 Sep 2020 09:40		24 Sep 2020 11:20	25 Sep 2020 15:02	1
Batch ID: R369245 (0)		Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Water	
HS20091066-01	MW-3S	21 Sep 2020 09:15			24 Sep 2020 14:36	1
HS20091066-02	MW-3D	21 Sep 2020 10:00			24 Sep 2020 14:57	1
HS20091066-03	FB 092120	21 Sep 2020 10:05			24 Sep 2020 13:12	1
HS20091066-04	FD 092120	21 Sep 2020 00:00			24 Sep 2020 15:18	1
HS20091066-05	MW-6D	21 Sep 2020 10:55			24 Sep 2020 15:40	1
HS20091066-06	MW-17	21 Sep 2020 11:50			24 Sep 2020 16:01	1
HS20091066-07	EB 092120	21 Sep 2020 11:55			24 Sep 2020 13:32	1
HS20091066-08	MW-5	22 Sep 2020 08:40			24 Sep 2020 20:35	50
HS20091066-09	MW-8	22 Sep 2020 09:35			24 Sep 2020 20:14	25
HS20091066-11	EB 092220	22 Sep 2020 09:45			24 Sep 2020 13:53	1
HS20091066-12	FB 092220	22 Sep 2020 09:40			24 Sep 2020 14:15	1
HS20091066-13	MW-11	22 Sep 2020 10:35			24 Sep 2020 16:22	1
HS20091066-14	MW-10	22 Sep 2020 11:25			24 Sep 2020 16:44	1

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
WorkOrder: HS20091066

QC BATCH REPORT

Batch ID: 157764 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D						
MBLK	Sample ID: MBLK-157764	Units: ug/L		Analysis Date: 25-Sep-2020 11:06						
Client ID:	Run ID: SV-6_369287	SeqNo: 5753592		PrepDate: 24-Sep-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	< 0.100	0.100								
Acenaphthylene	< 0.100	0.100								
Anthracene	< 0.100	0.100								
Benz(a)anthracene	< 0.100	0.100								
Benzo(a)pyrene	< 0.100	0.100								
Benzo(b)fluoranthene	< 0.100	0.100								
Benzo(g,h,i)perylene	< 0.100	0.100								
Benzo(k)fluoranthene	< 0.100	0.100								
Chrysene	< 0.100	0.100								
Dibenz(a,h)anthracene	< 0.100	0.100								
Fluoranthene	< 0.100	0.100								
Fluorene	< 0.100	0.100								
Indeno(1,2,3-cd)pyrene	< 0.100	0.100								
Naphthalene	< 0.100	0.100								
Phenanthrene	< 0.100	0.100								
Pyrene	< 0.100	0.100								
Surr: 2-Fluorobiphenyl	3.427	0.100	3.03	0	113	32 - 130				
Surr: 4-Terphenyl-d14	2.837	0.100	3.03	0	93.6	40 - 135				
Surr: Nitrobenzene-d5	3.591	0.100	3.03	0	119	45 - 142				

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
WorkOrder: HS20091066

QC BATCH REPORT

Batch ID: 157764 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
LCS		Sample ID: LCS-157764		Units: ug/L		Analysis Date: 25-Sep-2020 11:26			
Client ID:		Run ID: SV-6_369287		SeqNo: 5753593		PrepDate: 24-Sep-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	3.543	0.100	3.03	0	117	40 - 140			
Acenaphthylene	3.54	0.100	3.03	0	117	40 - 140			
Anthracene	3.587	0.100	3.03	0	118	40 - 140			
Benz(a)anthracene	2.688	0.100	3.03	0	88.7	40 - 140			
Benzo(a)pyrene	2.033	0.100	3.03	0	67.1	40 - 140			
Benzo(b)fluoranthene	1.953	0.100	3.03	0	64.5	40 - 140			
Benzo(g,h,i)perylene	1.883	0.100	3.03	0	62.1	40 - 140			
Benzo(k)fluoranthene	2.272	0.100	3.03	0	75.0	40 - 140			
Chrysene	3.049	0.100	3.03	0	101	40 - 140			
Dibenz(a,h)anthracene	2.059	0.100	3.03	0	68.0	40 - 140			
Fluoranthene	3.024	0.100	3.03	0	99.8	40 - 140			
Fluorene	3.613	0.100	3.03	0	119	40 - 140			
Indeno(1,2,3-cd)pyrene	2.573	0.100	3.03	0	84.9	40 - 140			
Naphthalene	3.16	0.100	3.03	0	104	40 - 140			
Phenanthrene	3.029	0.100	3.03	0	100.0	40 - 140			
Pyrene	2.704	0.100	3.03	0	89.2	40 - 140			
Surr: 2-Fluorobiphenyl	3.147	0.100	3.03	0	104	32 - 130			
Surr: 4-Terphenyl-d14	2.283	0.100	3.03	0	75.3	40 - 135			
Surr: Nitrobenzene-d5	2.445	0.100	3.03	0	80.7	45 - 142			

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 3Q2020
 WorkOrder: HS20091066

QC BATCH REPORT

Batch ID: 157764 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
LCSD		Sample ID: LCSD-157764		Units: ug/L		Analysis Date: 25-Sep-2020 11:45			
Client ID:		Run ID: SV-6_369287		SeqNo: 5753594		PrepDate: 24-Sep-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Acenaphthene	3.41	0.100	3.03	0	113	40 - 140	3.543	3.82	25
Acenaphthylene	3.639	0.100	3.03	0	120	40 - 140	3.54	2.75	25
Anthracene	3.027	0.100	3.03	0	99.9	40 - 140	3.587	16.9	25
Benz(a)anthracene	2.655	0.100	3.03	0	87.6	40 - 140	2.688	1.21	25
Benzo(a)pyrene	2.26	0.100	3.03	0	74.6	40 - 140	2.033	10.6	25
Benzo(b)fluoranthene	2.054	0.100	3.03	0	67.8	40 - 140	1.953	5.06	25
Benzo(g,h,i)perylene	2.22	0.100	3.03	0	73.3	40 - 140	1.883	16.4	25
Benzo(k)fluoranthene	2.523	0.100	3.03	0	83.3	40 - 140	2.272	10.5	25
Chrysene	3.091	0.100	3.03	0	102	40 - 140	3.049	1.35	25
Dibenz(a,h)anthracene	2.241	0.100	3.03	0	74.0	40 - 140	2.059	8.45	25
Fluoranthene	3.328	0.100	3.03	0	110	40 - 140	3.024	9.58	25
Fluorene	3.602	0.100	3.03	0	119	40 - 140	3.613	0.323	25
Indeno(1,2,3-cd)pyrene	2.879	0.100	3.03	0	95.0	40 - 140	2.573	11.2	25
Naphthalene	2.928	0.100	3.03	0	96.6	40 - 140	3.16	7.65	25
Phenanthrene	2.954	0.100	3.03	0	97.5	40 - 140	3.029	2.52	25
Pyrene	2.563	0.100	3.03	0	84.6	40 - 140	2.704	5.33	25
Surr: 2-Fluorobiphenyl	3.228	0.100	3.03	0	107	32 - 130	3.147	2.52	25
Surr: 4-Terphenyl-d14	2.255	0.100	3.03	0	74.4	40 - 135	2.283	1.23	25
Surr: Nitrobenzene-d5	2.167	0.100	3.03	0	71.5	45 - 142	2.445	12.1	25
The following samples were analyzed in this batch:									
HS20091066-09		HS20091066-10		HS20091066-11		HS20091066-12			

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
WorkOrder: HS20091066

QC BATCH REPORT

Batch ID: R369245 (0)		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C					
MBLK	Sample ID: VBLKW-200924	Units: ug/L		Analysis Date: 24-Sep-2020 12:29					
Client ID:	Run ID: VOA4_369245	SeqNo: 5753038		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	< 1.0	1.0							
Surr: 1,2-Dichloroethane-d4	53.01	1.0	50	0	106	70 - 123			
Surr: 4-Bromofluorobenzene	48.62	1.0	50	0	97.2	82 - 115			
Surr: Dibromofluoromethane	46.76	1.0	50	0	93.5	73 - 126			
Surr: Toluene-d8	50.35	1.0	50	0	101	81 - 120			

LCS	Sample ID: VLCSW-200924	Units: ug/L		Analysis Date: 24-Sep-2020 11:48					
Client ID:	Run ID: VOA4_369245	SeqNo: 5753037		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	19.66	1.0	20	0	98.3	74 - 120			
Surr: 1,2-Dichloroethane-d4	52.28	1.0	50	0	105	70 - 130			
Surr: 4-Bromofluorobenzene	50.99	1.0	50	0	102	82 - 115			
Surr: Dibromofluoromethane	47.94	1.0	50	0	95.9	73 - 126			
Surr: Toluene-d8	50.96	1.0	50	0	102	81 - 120			

MS	Sample ID: HS20091066-01MS	Units: ug/L		Analysis Date: 24-Sep-2020 17:05					
Client ID: MW-3S	Run ID: VOA4_369245	SeqNo: 5753051		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.34	1.0	20	0	91.7	70 - 127			
Surr: 1,2-Dichloroethane-d4	54.63	1.0	50	0	109	70 - 126			
Surr: 4-Bromofluorobenzene	52.16	1.0	50	0	104	81 - 113			
Surr: Dibromofluoromethane	49.39	1.0	50	0	98.8	77 - 123			
Surr: Toluene-d8	50.43	1.0	50	0	101	82 - 127			

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
WorkOrder: HS20091066

QC BATCH REPORT

Batch ID: R369245 (0)		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C					
MSD		Sample ID: HS20091066-01MSD		Units: ug/L		Analysis Date: 24-Sep-2020 17:26			
Client ID: MW-3S		Run ID: VOA4_369245		SeqNo: 5753052		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.41	1.0	20	0	92.0	70 - 127	18.34	0.353	20
Surr: 1,2-Dichloroethane-d4	53.43	1.0	50	0	107	70 - 126	54.63	2.23	20
Surr: 4-Bromofluorobenzene	52.61	1.0	50	0	105	81 - 113	52.16	0.857	20
Surr: Dibromofluoromethane	49.03	1.0	50	0	98.1	77 - 123	49.39	0.722	20
Surr: Toluene-d8	51.7	1.0	50	0	103	82 - 127	50.43	2.48	20
The following samples were analyzed in this batch:									
		HS20091066-01		HS20091066-02		HS20091066-03		HS20091066-04	
		HS20091066-05		HS20091066-06		HS20091066-07		HS20091066-08	
		HS20091066-09		HS20091066-11		HS20091066-12		HS20091066-13	
		HS20091066-14							

ALS Houston, US

Date: 28-Sep-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 3Q2020
WorkOrder: HS20091066

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US

Date: 28-Sep-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
Maryland	343, 2019-2020	30-Sep-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US

Date: 28-Sep-20

Sample Receipt Checklist

Work Order ID: HS20091066

Date/Time Received: 23-Sep-2020 09:50

Client Name: Arcadis-Baton Rouge

Received by: Donald Gilmore

Completed By: /S/ Jared R. Makan	23-Sep-2020 19:43	Reviewed by: /S/ Dane J. Wacasey	24-Sep-2020 19:43
eSignature	Date/Time	eSignature	Date/Time

Matrices: WaterCarrier name: FedEx Priority Overnight

Shipping container/cooler in good condition?	Yes ☒	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☒	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☒
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☒
Chain of custody present?	Yes ☒	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	COC IDs:228183, 228182
Samplers name present on COC?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☒	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☐	No ☒	
Sufficient sample volume for indicated test?	Yes ☒	No ☐	
All samples received within holding time?	Yes ☒	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☒	No ☐	
Temperature(s)/Thermometer(s):	1.5°C/1.5°C UC/C IR31		
Cooler(s)/Kit(s):	44144		
Date/Time sample(s) sent to storage:	09/23/2020 19:45		
Water - VOA vials have zero headspace?	Yes ☒	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☒
pH adjusted?	Yes ☐	No ☐	N/A ☒
pH adjusted by:			

Login Notes: One vial for FD 092120 received broken. Ample volume remains for analysis.
 EB 092220 collection time differs: COC = 09:45, Vials = 09:40. Logged in per COC.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH
+1 513 733 5336Everett, WA
+1 425 356 2600Fort Collins, CO
+1 970 490 1511Holland, MI
+1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 228183

HS20091066

ARCADIS U.S., Inc.

30049071 Brickland Refinery 3Q2020



Customer Information				Project Information				ALS Project Manager:												
Purchase Order	30049071 Task 250			Project Name	30049071 Brickland Refinery 3Q2020			A	8260_LL_W (8260 Benzene (*Unpreserved*)-7 day HT)											
Work Order				Project Number	30049071 Task 250			B	8270_PAH_LVI (8270 PAHs (LVI))											
Company Name	ARCADIS U.S., Inc.			Bill To Company	ARCADIS			C												
Send Report To	Tim Ratchford			Invoice Attn	Accounts Payable			D												
Address	10352 Plaza Americana Drive			Address	630 Plaza Drive, Suite 600			E												
City/State/Zip	Baton Rouge, LA 70816			City/State/Zip	Highlands Ranch CO 80129			F												
Phone	(225) 292-1004			Phone	(303) 471-3699			G												
Fax				Fax				H												
e-Mail Address	Tim.Ratchford@arcadis-us.com			e-Mail Address	Accountspayable.administration@arcadis-us.com			I												
No.	Sample Description		Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold		
1	MW-35		9/21/20	0915	W	8	3	X												
2	MW-30		9/21/20	1000	W	8	3	X												
3	FB 092120		9/21/20	1005	W	8	3	X												
4	FD 092120		9/21/20	—	W	8	3	X												
5	MW-6D		9/21/20	1055	W	8	3	X												
6	MW-17		9/21/20	1150	W	8	3	X												
7	EB 092120		9/21/20	1155	W	8	3	X												
8	MW-5		9/22/20	0840	W	8	3	X												
9	MW-8		9/22/20	0935	W	8	6	X	X											
10	FD 092220		9/22/20	—	W	8	3		X											
Sampler(s) Please Print & Sign				Shipment Method		Required Turnaround Time: (Check Box)				Other				Results Due Date:						
D. Solon				Fed EX		☒ STD 10 Wk Days				☐ 5 Wk Days				☐ 2 Wk Days ☐ 24 Hour						
Relinquished by: <i>D. Solon</i>				Date: 9/22/20 Time: 1245		Received by: <i>[Signature]</i>				Notes: [AGM Brickland NM]										
Relinquished by: <i>[Signature]</i>				Date: Time:		Received by (Laboratory):				Cooler ID				Cooler Temp.						
Logged by (Laboratory):				Date: Time:		Checked by (Laboratory):				44144				1.5						
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035												QC Package: (Check One Box Below)								
												☒ Level II Std QC				☐ TRRP Checklist				
												☐ Level III Std QC/Raw Data				☐ TRRP Level IV				
												☐ Level IV SIAB-6/CLP								
												☐ Other								

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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+1 513 733 5336Everett, WA
+1 425 356 2600Fort Collins, CO
+1 970 490 1511Holland, MI
+1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 228182

HS20091066

IV

ARCADIS U.S., Inc.

30049071 Brickland Refinery 3Q2020



Customer Information				Project Information				ALS Project Manager:												
Purchase Order	30049071 Task 250			Project Name	30049071 Brickland Refinery 3Q2020			A	8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT)											
Work Order				Project Number	30049071 Task 250			B	8270_PAH_LVI (8270 PAHs (LVI))											
Company Name	ARCADIS U.S., Inc.			Bill To Company	ARCADIS			C												
Send Report To	Tim Ratchford			Invoice Attn	Accounts Payable			D												
Address	10352 Plaza Americana Drive			Address	630 Plaza Drive, Suite 600			E												
City/State/Zip	Baton Rouge, LA 70816			City/State/Zip	Highlands Ranch CO 80129			F												
Phone	(225) 292-1004			Phone	(303) 471-3699			G												
Fax				Fax				H												
e-Mail Address	Tim.Ratchford@arcadis-us.com			e-Mail Address	Accountspayable.administration@arcad			I												
								J												

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	FB 092220	9/22/20	0945	W	8	6	X	X									
2	FB 092220	9/22/20	0940	W	8	6	X	X									
3	MW-11	9/22/20	1035	W	8	3	X										
4	MW-10	9/22/20	1125	W	8	3	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign				Shipment Method		Required Turnaround Time: (Check Box)				Results Due Date:			
D. Solon Doug Solon				FEDEX		☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour							
Relinquished by:		Date:	Time:	Received by:		Notes:							
D. Solon		9/22/20	1246			[AGM Brickland NM]							
Relinquished by:		Date:	Time:	Received by (Laboratory):									
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):									
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035													

- Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5856 Fax. +1 281 530 5887	CUSTODY SEAL Date: <u>9-23-20</u> Time: <u>1346</u> Name: <u>D. Salas</u> Company: <u>ARCADIS</u>		Seal Broken By: <u>53</u> Date: <u>9/23/20</u>
	44144		
	44144 SEP 23 2020		



Must Deliver Next Business Day
Time and Temperature Sensitive!

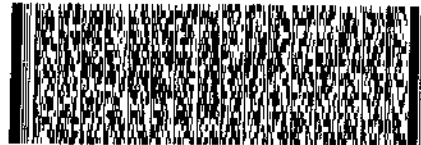
44144

ORIGIN ID: SGRA (915) 603-1015
 GARRETT FERGUSON
 ARCADIS U.S., INC.
 401 E MAIN STREET
 SUITE 400
 EL PASO, TX 799011358
 UNITED STATES US

SHIP DATE: 16SEP20
 ACTWT: 1.00 LB N/A
 CAD: 300130/CAFE3211
 DIMS: 26x14x14 IN

TO CLIENT SERVICES
 ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099
 (281) 630-5858
 REF: BRICKLAND - BO 73834 - DW

RMA: III III III



FedEx
Express



FedEx
TRK# 1891 8880 3710
0221

WED - 23 SEP 10:30A
PRIORITY OVERNIGHT

NH SGRA

77099
TX-US IAH



4212021 01/22 56016/1545/8766



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 30, 2020

Brooke Fontenot
ARCADIS U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge, LA 70816

Work Order: **HS20121002**

Laboratory Results for: **30049071 Brickland Refinery 4Q2020**

Dear Brooke Fontenot,

ALS Environmental received 14 sample(s) on Dec 19, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Dane J. Wacasey

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Work Order: HS20121002

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20121002-01	MW-3S	Water		18-Dec-2020 08:50	19-Dec-2020 08:29	☐
HS20121002-02	MW-3D	Water		18-Dec-2020 09:30	19-Dec-2020 08:29	☐
HS20121002-03	FB121820	Water		18-Dec-2020 09:35	19-Dec-2020 08:29	☐
HS20121002-04	FD121820	Water		18-Dec-2020 00:00	19-Dec-2020 08:29	☐
HS20121002-05	MW-6D	Water		18-Dec-2020 10:30	19-Dec-2020 08:29	☐
HS20121002-06	MW-17	Water		18-Dec-2020 11:15	19-Dec-2020 08:29	☐
HS20121002-07	EB121820	Water		18-Dec-2020 11:20	19-Dec-2020 08:29	☐
HS20121002-08	MW-5	Water		18-Dec-2020 12:10	19-Dec-2020 08:29	☐
HS20121002-09	MW-8	Water		18-Dec-2020 13:05	19-Dec-2020 08:29	☐
HS20121002-10	FD-2-121820	Water		18-Dec-2020 00:00	19-Dec-2020 08:29	☐
HS20121002-11	EB-2-121820	Water		18-Dec-2020 13:15	19-Dec-2020 08:29	☐
HS20121002-12	FB-2-121820	Water		18-Dec-2020 13:10	19-Dec-2020 08:29	☐
HS20121002-13	MW-11	Water		18-Dec-2020 14:10	19-Dec-2020 08:29	☐
HS20121002-14	MW-10	Water		18-Dec-2020 15:05	19-Dec-2020 08:29	☐

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Work Order: HS20121002

CASE NARRATIVE

Work Order Comments

- The analysis for Benzene was subcontracted to SGS Laboratories, Inc. in Houston, TX. The final report is appended.

GCMS Semivolatiles by Method SW8270

Batch ID: 160937

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Sample ID: MW-3S
Collection Date: 18-Dec-2020 08:50

ANALYTICAL REPORT

WorkOrder:HS20121002
Lab ID:HS20121002-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Sample ID: MW-3D
Collection Date: 18-Dec-2020 09:30

ANALYTICAL REPORT

WorkOrder:HS20121002
Lab ID:HS20121002-02
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Sample ID: FB121820
Collection Date: 18-Dec-2020 09:35

ANALYTICAL REPORT

WorkOrder:HS20121002
Lab ID:HS20121002-03
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client:	ARCADIS U.S., Inc.	ANALYTICAL REPORT
Project:	30049071 Brickland Refinery 4Q2020	WorkOrder:HS20121002
Sample ID:	FD121820	Lab ID:HS20121002-04
Collection Date:	18-Dec-2020 00:00	Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client:	ARCADIS U.S., Inc.	ANALYTICAL REPORT
Project:	30049071 Brickland Refinery 4Q2020	WorkOrder:HS20121002
Sample ID:	MW-6D	Lab ID:HS20121002-05
Collection Date:	18-Dec-2020 10:30	Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Sample ID: MW-17
Collection Date: 18-Dec-2020 11:15

ANALYTICAL REPORT

WorkOrder:HS20121002
Lab ID:HS20121002-06
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Sample ID: EB121820
Collection Date: 18-Dec-2020 11:20

ANALYTICAL REPORT

WorkOrder:HS20121002
Lab ID:HS20121002-07
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Sample ID: MW-5
Collection Date: 18-Dec-2020 12:10

ANALYTICAL REPORT

WorkOrder:HS20121002
Lab ID:HS20121002-08
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 4Q2020
 Sample ID: MW-8
 Collection Date: 18-Dec-2020 13:05

ANALYTICAL REPORT

WorkOrder:HS20121002
 Lab ID:HS20121002-09
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 22-Dec-2020		Analyst: ACN
Acenaphthene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Acenaphthylene	0.000252		0.000100	mg/L	1	28-Dec-2020 21:45
Anthracene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Benz(a)anthracene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Benzo(a)pyrene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Benzo(b)fluoranthene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Benzo(g,h,i)perylene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Benzo(k)fluoranthene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Chrysene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Dibenz(a,h)anthracene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Fluoranthene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Fluorene	0.000165		0.000100	mg/L	1	28-Dec-2020 21:45
Indeno(1,2,3-cd)pyrene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Naphthalene	0.00249		0.000100	mg/L	1	28-Dec-2020 21:45
Phenanthrene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Pyrene	< 0.000100		0.000100	mg/L	1	28-Dec-2020 21:45
Surr: 2-Fluorobiphenyl	90.5		32-130	%REC	1	28-Dec-2020 21:45
Surr: 4-Terphenyl-d14	81.6		40-135	%REC	1	28-Dec-2020 21:45
Surr: Nitrobenzene-d5	120		45-142	%REC	1	28-Dec-2020 21:45
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT		Analyst: SUB		
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 4Q2020
 Sample ID: FD-2-121820
 Collection Date: 18-Dec-2020 00:00

ANALYTICAL REPORT

WorkOrder:HS20121002
 Lab ID:HS20121002-10
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 22-Dec-2020		Analyst: ACN
Acenaphthene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Acenaphthylene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Anthracene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Benz(a)anthracene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Benzo(a)pyrene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Benzo(b)fluoranthene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Benzo(g,h,i)perylene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Benzo(k)fluoranthene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Chrysene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Dibenz(a,h)anthracene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Fluoranthene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Fluorene	0.000142		0.000103	mg/L	1	28-Dec-2020 22:05
Indeno(1,2,3-cd)pyrene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Naphthalene	0.00151		0.000103	mg/L	1	28-Dec-2020 22:05
Phenanthrene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Pyrene	< 0.000103		0.000103	mg/L	1	28-Dec-2020 22:05
Surr: 2-Fluorobiphenyl	85.0		32-130	%REC	1	28-Dec-2020 22:05
Surr: 4-Terphenyl-d14	77.7		40-135	%REC	1	28-Dec-2020 22:05
Surr: Nitrobenzene-d5	109		45-142	%REC	1	28-Dec-2020 22:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 4Q2020
 Sample ID: EB-2-121820
 Collection Date: 18-Dec-2020 13:15

ANALYTICAL REPORT

WorkOrder:HS20121002
 Lab ID:HS20121002-11
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 22-Dec-2020		Analyst: ACN
Acenaphthene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Acenaphthylene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Anthracene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Benz(a)anthracene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Benzo(a)pyrene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Benzo(b)fluoranthene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Benzo(g,h,i)perylene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Benzo(k)fluoranthene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Chrysene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Dibenz(a,h)anthracene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Fluoranthene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Fluorene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Indeno(1,2,3-cd)pyrene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Naphthalene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Phenanthrene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Pyrene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:24
Surr: 2-Fluorobiphenyl	92.0		32-130	%REC	1	28-Dec-2020 22:24
Surr: 4-Terphenyl-d14	98.5		40-135	%REC	1	28-Dec-2020 22:24
Surr: Nitrobenzene-d5	109		45-142	%REC	1	28-Dec-2020 22:24
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT		Analyst: SUB		
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
 Project: 30049071 Brickland Refinery 4Q2020
 Sample ID: FB-2-121820
 Collection Date: 18-Dec-2020 13:10

ANALYTICAL REPORT

WorkOrder:HS20121002
 Lab ID:HS20121002-12
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D		Method:SW8270		Prep:SW3511 / 22-Dec-2020		Analyst: ACN
Acenaphthene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Acenaphthylene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Anthracene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Benz(a)anthracene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Benzo(a)pyrene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Benzo(b)fluoranthene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Benzo(g,h,i)perylene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Benzo(k)fluoranthene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Chrysene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Dibenz(a,h)anthracene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Fluoranthene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Fluorene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Indeno(1,2,3-cd)pyrene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Naphthalene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Phenanthrene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Pyrene	< 0.000104		0.000104	mg/L	1	28-Dec-2020 22:44
Surr: 2-Fluorobiphenyl	99.7		32-130	%REC	1	28-Dec-2020 22:44
Surr: 4-Terphenyl-d14	96.2		40-135	%REC	1	28-Dec-2020 22:44
Surr: Nitrobenzene-d5	105		45-142	%REC	1	28-Dec-2020 22:44
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT		Analyst: SUB		
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
Sample ID: MW-11
Collection Date: 18-Dec-2020 14:10

ANALYTICAL REPORT

WorkOrder:HS20121002
Lab ID:HS20121002-13
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Client:	ARCADIS U.S., Inc.	ANALYTICAL REPORT
Project:	30049071 Brickland Refinery 4Q2020	WorkOrder:HS20121002
Sample ID:	MW-10	Lab ID:HS20121002-14
Collection Date:	18-Dec-2020 15:05	Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS -VOC ANALYSIS		Method:SUBCONTRACT				Analyst: SUB
Subcontracted Analyses	See Attached			NA	1	30-Dec-2020 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 30-Dec-20

Weight / Prep Log

Client: ARCADIS U.S., Inc.

Project: 30049071 Brickland Refinery 4Q2020

WorkOrder: HS20121002

Batch ID: 160937

Start Date: 22 Dec 2020 08:14

End Date:

Method: SW3511

Prep Code: 3511_PAH

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20121002-09	2	32.92 (mL)	2 (mL)	0.06075
HS20121002-10	1	32.15 (mL)	2 (mL)	0.06221
HS20121002-11	1	31.78 (mL)	2 (mL)	0.06293
HS20121002-12	1	31.84 (mL)	2 (mL)	0.06281

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
WorkOrder: HS20121002

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 160937 (0)		Test Name : LOW-LEVEL PAHS - 8270D			Matrix: Water	
HS20121002-09	MW-8	18 Dec 2020 13:05		22 Dec 2020 08:14	28 Dec 2020 21:45	1
HS20121002-10	FD-2-121820	18 Dec 2020 00:00		22 Dec 2020 08:14	28 Dec 2020 22:05	1
HS20121002-11	EB-2-121820	18 Dec 2020 13:15		22 Dec 2020 08:14	28 Dec 2020 22:24	1
HS20121002-12	FB-2-121820	18 Dec 2020 13:10		22 Dec 2020 08:14	28 Dec 2020 22:44	1
Batch ID: R375640 (0)		Test Name : SUBCONTRACT ANALYSIS -VOC ANALYSIS			Matrix: Water	
HS20121002-01	MW-3S	18 Dec 2020 08:50			30 Dec 2020 15:15	1
HS20121002-02	MW-3D	18 Dec 2020 09:30			30 Dec 2020 15:15	1
HS20121002-03	FB121820	18 Dec 2020 09:35			30 Dec 2020 15:15	1
HS20121002-04	FD121820	18 Dec 2020 00:00			30 Dec 2020 15:15	1
HS20121002-05	MW-6D	18 Dec 2020 10:30			30 Dec 2020 15:15	1
HS20121002-06	MW-17	18 Dec 2020 11:15			30 Dec 2020 15:15	1
HS20121002-07	EB121820	18 Dec 2020 11:20			30 Dec 2020 15:15	1
HS20121002-08	MW-5	18 Dec 2020 12:10			30 Dec 2020 15:15	1
HS20121002-09	MW-8	18 Dec 2020 13:05			30 Dec 2020 15:15	1
HS20121002-11	EB-2-121820	18 Dec 2020 13:15			30 Dec 2020 15:15	1
HS20121002-12	FB-2-121820	18 Dec 2020 13:10			30 Dec 2020 15:15	1
HS20121002-13	MW-11	18 Dec 2020 14:10			30 Dec 2020 15:15	1
HS20121002-14	MW-10	18 Dec 2020 15:05			30 Dec 2020 15:15	1

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
WorkOrder: HS20121002

QC BATCH REPORT

Batch ID: 160937 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D						
MBLK	Sample ID: MBLK-160937	Units: ug/L		Analysis Date: 28-Dec-2020 17:11						
Client ID:	Run ID: SV-6_375456	SeqNo: 5901682		PrepDate: 22-Dec-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	< 0.100	0.100								
Acenaphthylene	< 0.100	0.100								
Anthracene	< 0.100	0.100								
Benz(a)anthracene	< 0.100	0.100								
Benzo(a)pyrene	< 0.100	0.100								
Benzo(b)fluoranthene	< 0.100	0.100								
Benzo(g,h,i)perylene	< 0.100	0.100								
Benzo(k)fluoranthene	< 0.100	0.100								
Chrysene	< 0.100	0.100								
Dibenz(a,h)anthracene	< 0.100	0.100								
Fluoranthene	< 0.100	0.100								
Fluorene	< 0.100	0.100								
Indeno(1,2,3-cd)pyrene	< 0.100	0.100								
Naphthalene	< 0.100	0.100								
Phenanthrene	< 0.100	0.100								
Pyrene	< 0.100	0.100								
Surr: 2-Fluorobiphenyl	3.298	0.100	3.03	0	109	32 - 130				
Surr: 4-Terphenyl-d14	3.144	0.100	3.03	0	104	40 - 135				
Surr: Nitrobenzene-d5	3.889	0.100	3.03	0	128	45 - 142				

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
WorkOrder: HS20121002

QC BATCH REPORT

Batch ID: 160937 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D						
LCS		Sample ID: LCS-160937		Units: ug/L		Analysis Date: 28-Dec-2020 17:31				
Client ID:		Run ID: SV-6_375456		SeqNo: 5901683		PrepDate: 22-Dec-2020		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	3.26	0.100	3.03	0	108	40 - 140				
Acenaphthylene	3.153	0.100	3.03	0	104	40 - 140				
Anthracene	3.038	0.100	3.03	0	100	40 - 140				
Benz(a)anthracene	3.038	0.100	3.03	0	100	40 - 140				
Benzo(a)pyrene	3.184	0.100	3.03	0	105	40 - 140				
Benzo(b)fluoranthene	3.354	0.100	3.03	0	111	40 - 140				
Benzo(g,h,i)perylene	2.769	0.100	3.03	0	91.4	40 - 140				
Benzo(k)fluoranthene	3.313	0.100	3.03	0	109	40 - 140				
Chrysene	2.996	0.100	3.03	0	98.9	40 - 140				
Dibenz(a,h)anthracene	3.022	0.100	3.03	0	99.7	40 - 140				
Fluoranthene	3.052	0.100	3.03	0	101	40 - 140				
Fluorene	3.278	0.100	3.03	0	108	40 - 140				
Indeno(1,2,3-cd)pyrene	3.701	0.100	3.03	0	122	40 - 140				
Naphthalene	3.309	0.100	3.03	0	109	40 - 140				
Phenanthrene	3.173	0.100	3.03	0	105	40 - 140				
Pyrene	3.063	0.100	3.03	0	101	40 - 140				
Surr: 2-Fluorobiphenyl	2.898	0.100	3.03	0	95.6	32 - 130				
Surr: 4-Terphenyl-d14	2.756	0.100	3.03	0	91.0	40 - 135				
Surr: Nitrobenzene-d5	3.365	0.100	3.03	0	111	45 - 142				

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
WorkOrder: HS20121002

QC BATCH REPORT

Batch ID: 160937 (0)		Instrument: SV-6		Method: LOW-LEVEL PAHS - 8270D					
LCSD		Sample ID: LCSD-160937		Units: ug/L		Analysis Date: 28-Dec-2020 17:50			
Client ID:		Run ID: SV-6_375456		SeqNo: 5901684		PrepDate: 22-Dec-2020		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Acenaphthene	3.343	0.100	3.03	0	110	40 - 140	3.26	2.52	25
Acenaphthylene	3.215	0.100	3.03	0	106	40 - 140	3.153	1.93	25
Anthracene	3.024	0.100	3.03	0	99.8	40 - 140	3.038	0.46	25
Benz(a)anthracene	3.085	0.100	3.03	0	102	40 - 140	3.038	1.54	25
Benzo(a)pyrene	3.214	0.100	3.03	0	106	40 - 140	3.184	0.936	25
Benzo(b)fluoranthene	3.107	0.100	3.03	0	103	40 - 140	3.354	7.65	25
Benzo(g,h,i)perylene	2.764	0.100	3.03	0	91.2	40 - 140	2.769	0.193	25
Benzo(k)fluoranthene	3.494	0.100	3.03	0	115	40 - 140	3.313	5.31	25
Chrysene	3.125	0.100	3.03	0	103	40 - 140	2.996	4.21	25
Dibenz(a,h)anthracene	3.076	0.100	3.03	0	102	40 - 140	3.022	1.78	25
Fluoranthene	3.008	0.100	3.03	0	99.3	40 - 140	3.052	1.46	25
Fluorene	3.324	0.100	3.03	0	110	40 - 140	3.278	1.4	25
Indeno(1,2,3-cd)pyrene	3.731	0.100	3.03	0	123	40 - 140	3.701	0.83	25
Naphthalene	3.288	0.100	3.03	0	109	40 - 140	3.309	0.615	25
Phenanthrene	3.121	0.100	3.03	0	103	40 - 140	3.173	1.64	25
Pyrene	3.205	0.100	3.03	0	106	40 - 140	3.063	4.53	25
Surr: 2-Fluorobiphenyl	2.943	0.100	3.03	0	97.1	32 - 130	2.898	1.55	25
Surr: 4-Terphenyl-d14	2.87	0.100	3.03	0	94.7	40 - 135	2.756	4.05	25
Surr: Nitrobenzene-d5	3.317	0.100	3.03	0	109	45 - 142	3.365	1.43	25
The following samples were analyzed in this batch:									
HS20121002-09		HS20121002-10		HS20121002-11		HS20121002-12			

ALS Houston, US

Date: 30-Dec-20

Client: ARCADIS U.S., Inc.
Project: 30049071 Brickland Refinery 4Q2020
WorkOrder: HS20121002

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US

Date: 30-Dec-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US

Date: 30-Dec-20

Sample Receipt Checklist

Work Order ID: HS20121002

Date/Time Received: 19-Dec-2020 08:29

Client Name: Arcadis-Baton Rouge

Received by: Paresh M. Giga

Completed By: /S/ Paresh M. Giga	19-Dec-2020 09:11	Reviewed by: /S/ Dane J. Wacasey	28-Dec-2020 16:50
eSignature	Date/Time	eSignature	Date/Time

Matrices: WaterCarrier name: FedEx First Overnight

Shipping container/cooler in good condition?	Yes ☒	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☒	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☒
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☒
Chain of custody present?	Yes ☒	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	COC IDs:232440/232441
Samplers name present on COC?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
Sufficient sample volume for indicated test?	Yes ☒	No ☐	
All samples received within holding time?	Yes ☒	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☒	No ☐	
Temperature(s)/Thermometer(s):	0.2°C U/C IR31		
Cooler(s)/Kit(s):	23858		
Date/Time sample(s) sent to storage:	12/19/2020 09:25		
Water - VOA vials have zero headspace?	Yes ☒	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☒
pH adjusted?	Yes ☐	No ☐	N/A ☒
pH adjusted by:			

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:

Cincinnati, OH
+1 513 733 5336Fort Collins, CO
+1 970 490 1511Everett, WA
+1 425 356 2600Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 232440

Houston, TX
+1 281 530 5656Spring City, PA
+1 610 948 4903Middletown, PA
+1 717 944 5541Salt Lake City, UT
+1 801 266 7700

Customer Information		Project Information		ALS Project Manager:		ALS Work Order #:		Parameter/Method Request for Analysis											
Purchase Order	30049071 Task 250	Project Name	30049071 Brickland Refinery 4Q2020					8260_LL_W (8260 Benzene (*Unpreserved*)-7 day HT)											
Work Order		Project Number	30049071 Task 250					8270_PAH_LVI (8270 PAHs (LVI))											
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS																
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable																
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600																
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129																
Phone	(225) 292-1004	Phone	(303) 471-3693																
Fax		Fax																	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accounts.payable.administration@arcadis																

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-35	12/18/20	0850	W	8	3	X										
2	MW-3D	12/18/20	0930	W	8	3	X										
3	FB 121820	12/18/20	0935	W	8	3	X										
4	FD 121820	12/18/20	—	W	8	3	X										
5	MW-6D	12/18/20	1030	W	8	3	X										
6	MW-17	12/18/20	1115	W	8	3	X										
7	EB 121820	12/18/20	1120	W	8	3	X										
8	MW-5	12/18/20	1210	W	8	3	X										
9	MW-8	12/18/20	1305	W	8	6	X	X									
10	FD-2-121820	12/18/20	—	W	8	3	X	X									

Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)		Results Due Date:	
Sergio Celis		FED EX		☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour			
Relinquished by:	Date: 12/18/20 Time: 17:00	Received by:	Date: 12/19/2020 Time: 08:29	Notes: [AGM Brickland NM]			
Relinquished by:	Date: Time:	Received by (Laboratory):	Date: Time:	Cooler ID		Cooler Temp.	
Logged by (Laboratory):	Date: Time:	Checked by (Laboratory):	Date: Time:	23258		0.2°	
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035				QC Package: (Check One Box Below)		☒ Level II Std OC ☐ Level III Std QC/Faw Date ☐ Level IV SWAB/6CLP ☐ Other	

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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Cincinnati, OH
+1 513 733 5336Fort Collins, CO
+1 970 490 1511Everett, WA
+1 425 356 2600Holland, MI
+1 616 399 6070

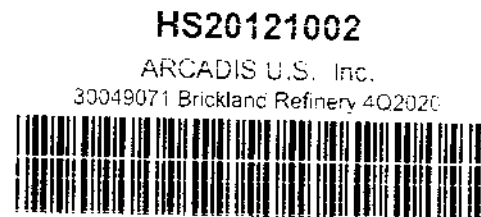
Chain of Custody Form

Page 2 of 2

COC ID: 232441

Houston, TX
+1 281 530 5656Spring City, PA
+1 610 948 4903Middletown, PA
+1 717 944 5541Salt Lake City, UT
+1 801 266 7700SHORT
HOLDING
TIME

Customer Information		Project Information		ALS Project Manager:		ALS Work Order #:	
Purchase Order	30049071 Task 250	Project Name	30049071 Brickland Refinery 4Q2020A	Parameter/Method Request for Analysis			
Work Order		Project Number	30049071 Task 250	8260_LL_W (8260 Benz ene ("Unpreserved")-7 day HT			
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	8270_PAH_LVI (8270 PAHs (LVI))			
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable				
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600				
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129				
Phone	(225) 292-1004	Phone	(303) 471-3699				
Fax		Fax					
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcad				



No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	EB-2-121820	12/18/20	1315	W	8	6	X	X									
2	FB-2-121820	12/18/20	1310	W	8	6	X	X									
3	MW-11	12/18/20	1410	W	8	3	X										
4	MW-10	12/18/20	1805	W	8	3	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>Sergio Celis</i>		Shipment Method FEDEX		Required Turnaround Time: (Check Box) ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour		Results Due Date:	
Relinquished by: <i>PRLL</i>		Date: 12/18/20	Time: 17:00	Received by: <i>[Signature]</i>		Notes: [AGM, Brickland NM]	
Relinquished by:		Date:	Time:	Received by (Laboratory):		Cooler ID	
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):		Cooler Temp.	
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035				QC Package: (Check One Box Below) ☒ Level I Std Qc ☐ TRRP Checklist ☐ Level III Std Qc/Flow Date ☐ TRRP Level IV ☐ Level IV SWAB/BCLP ☐ Other			

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

AL		Date: 12/19/20	
10450 Standliff Rd., Suite 210		Name: [blank]	
Houston, Texas 77099		Company: [blank]	
Tel. +1 281 530 5856		Date: 12/19/20	
Fax. +1 281 530 5887		[blank]	

ORIGIN ID:ELPA (915) 747-3910	SHIP DATE: 18DEC20
SEASIO CELIS	ACTWGT: 38.00 LB
ARCADIS NA	CAD: 6990689/SF02121
401 N MAIN ST	DIMS: 25x16x14 IN
EL PASO, TX 79901	BILL THIRD PARTY
UNITED STATES US	

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF RD STE 210
HOUSTON TX 77099

(281) 530-6856 REF: DEPT: 23858-

FedEx
Express
E

TRK# 7816 6721 8040
SATURDAY 9:30A
FIRST OVERNIGHT
AHS
77099
TX-US IAH

XO SGRA



Houston, TX

12/30/20

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report**Technical Report for**

ALS

HS20121002

SGS Job Number: TD63477

Sampling Date: 12/18/20



Report to:

ALS Houston
 10450 Stancliff Road Suite 210
 Houston, TX 77099
 Dane.Wacasey@alsglobal.com; Jumoke.Lawal@alsglobal.com
 ATTN: Dane Wacasey

Total number of pages in report: 35



Test results contained within this data package meet the requirements
 of the National Environmental Laboratory Accreditation Program
 and/or state specific certification programs as applicable.

John Watson
 Technical Director

Client Service contact: Electa Brown 713-271-4700

Certifications: TX (T104704220-20-35) AR (20-023-0) AZ (AZ0769) FL (E87628)
 KS (E-10366) LA (85695/04004) NJ (TX010) OK (2010-077)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.
 Test results relate only to samples analyzed.

Sections:

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SGS North America Inc.

Sample Summary

ALS

Job No: TD63477

HS20121002

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
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This report contains results reported as ND = Not detected. The following applies:

Organics ND = Not detected above the MDL

TD63477-1	12/18/20	08:50	12/22/20	AQ	Water	HS20121002-01 MW-3S
TD63477-2	12/18/20	09:30	12/22/20	AQ	Water	HS20121002-02 MW-3D
TD63477-3	12/18/20	09:35	12/22/20	AQ	Field Blank Water	HS20121002-03 FB121820
TD63477-4	12/18/20	00:00	12/22/20	AQ	Water	HS20121002-04 FD121820
TD63477-5	12/18/20	10:30	12/22/20	AQ	Water	HS20121002-05 MW-6D
TD63477-6	12/18/20	11:15	12/22/20	AQ	Water	HS20121002-06 MW-17
TD63477-7	12/18/20	11:20	12/22/20	AQ	Equipment Blank	HS20121002-07 EB121820
TD63477-8	12/18/20	12:10	12/22/20	AQ	Water	HS20121002-08 MW-5
TD63477-9	12/18/20	13:05	12/22/20	AQ	Water	HS20121002-09 MW-8
TD63477-10	12/18/20	13:15	12/22/20	AQ	Water	HS20121002-11 EB-2-121820
TD63477-11	12/18/20	13:10	12/22/20	AQ	Water	HS20121002-12 FB-2-121820
TD63477-12	12/18/20	14:10	12/22/20	AQ	Water	HS20121002-13 MW-11



SGS North America Inc.

Sample Summary
(continued)

ALS

Job No: TD63477

HS20121002

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TD63477-13	12/18/20	15:05	12/22/20	AQ	Water	HS20121002-14 MW-10



Summary of Hits

Page 1 of 2

Job Number: TD63477
Account: ALS
Project: HS20121002
Collected: 12/18/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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TD63477-1 HS20121002-01 MW-3S

No hits reported in this sample.

TD63477-2 HS20121002-02 MW-3D

No hits reported in this sample.

TD63477-3 HS20121002-03 FB121820

No hits reported in this sample.

TD63477-4 HS20121002-04 FD121820

No hits reported in this sample.

TD63477-5 HS20121002-05 MW-6D

No hits reported in this sample.

TD63477-6 HS20121002-06 MW-17

No hits reported in this sample.

TD63477-7 HS20121002-07 EB121820

No hits reported in this sample.

TD63477-8 HS20121002-08 MW-5

Benzene	0.959	0.050	0.015	mg/l	SW846 8260C
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TD63477-9 HS20121002-09 MW-8

Benzene	0.136	0.010	0.0030	mg/l	SW846 8260C
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TD63477-10 HS20121002-11 EB-2-121820

No hits reported in this sample.

TD63477-11 HS20121002-12 FB-2-121820

No hits reported in this sample.

Summary of Hits

Job Number: TD63477
Account: ALS
Project: HS20121002
Collected: 12/18/20

2

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

TD63477-12 HS20121002-13 MW-11

No hits reported in this sample.

TD63477-13 HS20121002-14 MW-10

Benzene	0.00065 J	0.0010	0.00030	mg/l	SW846 8260C
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Houston, TX

Section 3



Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-01 MW-3S	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-1	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E0083427.D	1	12/22/20 18:20	FI	n/a	n/a	VE3778
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		72-122%
17060-07-0	1,2-Dichloroethane-D4	99%		68-124%
2037-26-5	Toluene-D8	100%		80-119%
460-00-4	4-Bromofluorobenzene	98%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-02 MW-3D	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-2	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E0083428.D	1	12/22/20 18:45	FI	n/a	n/a	VE3778
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		72-122%
17060-07-0	1,2-Dichloroethane-D4	102%		68-124%
2037-26-5	Toluene-D8	99%		80-119%
460-00-4	4-Bromofluorobenzene	97%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-03 FB121820	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-3	Date Received:	12/22/20
Matrix:	AQ - Field Blank Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E0083429.D	1	12/22/20 19:09	FI	n/a	n/a	VE3778
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		72-122%
17060-07-0	1,2-Dichloroethane-D4	101%		68-124%
2037-26-5	Toluene-D8	99%		80-119%
460-00-4	4-Bromofluorobenzene	97%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-04 FD121820	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-4	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495377.D	1	12/22/20 18:00	ZQ	n/a	n/a	VR2697
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		72-122%
17060-07-0	1,2-Dichloroethane-D4	101%		68-124%
2037-26-5	Toluene-D8	97%		80-119%
460-00-4	4-Bromofluorobenzene	101%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-05 MW-6D	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-5	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495384.D	1	12/22/20 21:02	ZQ	n/a	n/a	VR2697
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		72-122%
17060-07-0	1,2-Dichloroethane-D4	102%		68-124%
2037-26-5	Toluene-D8	100%		80-119%
460-00-4	4-Bromofluorobenzene	99%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-06 MW-17	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-6	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495385.D	1	12/22/20 21:27	ZQ	n/a	n/a	VR2697
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		72-122%
17060-07-0	1,2-Dichloroethane-D4	101%		68-124%
2037-26-5	Toluene-D8	99%		80-119%
460-00-4	4-Bromofluorobenzene	100%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID: HS20121002-07 EB121820**Lab Sample ID:** TD63477-7**Date Sampled:** 12/18/20**Matrix:** AQ - Equipment Blank**Date Received:** 12/22/20**Method:** SW846 8260C**Percent Solids:** n/a**Project:** HS20121002

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495386.D	1	12/22/20 21:53	ZQ	n/a	n/a	VR2697
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		72-122%
17060-07-0	1,2-Dichloroethane-D4	104%		68-124%
2037-26-5	Toluene-D8	98%		80-119%
460-00-4	4-Bromofluorobenzene	99%		72-126%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-08 MW-5	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-8	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495390.D	50	12/22/20 23:37	ZQ	n/a	n/a	VR2697
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.959	0.050	0.015	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		72-122%
17060-07-0	1,2-Dichloroethane-D4	100%		68-124%
2037-26-5	Toluene-D8	98%		80-119%
460-00-4	4-Bromofluorobenzene	98%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-09 MW-8	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-9	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495405.D	10	12/23/20 10:11	FI	n/a	n/a	VR2698
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.136	0.010	0.0030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		72-122%
17060-07-0	1,2-Dichloroethane-D4	103%		68-124%
2037-26-5	Toluene-D8	97%		80-119%
460-00-4	4-Bromofluorobenzene	99%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-11 EB-2-121820	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-10	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495402.D	1	12/23/20 08:53	FI	n/a	n/a	VR2698
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		72-122%
17060-07-0	1,2-Dichloroethane-D4	101%		68-124%
2037-26-5	Toluene-D8	98%		80-119%
460-00-4	4-Bromofluorobenzene	100%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-12 FB-2-121820	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-11	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495403.D	1	12/23/20 09:19	FI	n/a	n/a	VR2698
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	90%		72-122%
17060-07-0	1,2-Dichloroethane-D4	99%		68-124%
2037-26-5	Toluene-D8	99%		80-119%
460-00-4	4-Bromofluorobenzene	99%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-13 MW-11	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-12	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495387.D	1	12/22/20 22:19	ZQ	n/a	n/a	VR2697
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0010	0.00030	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		72-122%
17060-07-0	1,2-Dichloroethane-D4	104%		68-124%
2037-26-5	Toluene-D8	97%		80-119%
460-00-4	4-Bromofluorobenzene	98%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	HS20121002-14 MW-10	Date Sampled:	12/18/20
Lab Sample ID:	TD63477-13	Date Received:	12/22/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C		
Project:	HS20121002		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R03495388.D	1	12/22/20 22:45	ZQ	n/a	n/a	VR2697
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.00065	0.0010	0.00030	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		72-122%
17060-07-0	1,2-Dichloroethane-D4	103%		68-124%
2037-26-5	Toluene-D8	98%		80-119%
460-00-4	4-Bromofluorobenzene	98%		72-126%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound



Houston, TX

Section 4

4

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



10450 Standliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

TD63477

COC ID: 15371

SAMPLING STATE: New Mexico

SUBCONTRACT TO:

SGS Accutest Inc
10165 Harwin Drive #150
Houston, TX 77036

Phone: +1 713 271 4700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Dane J. Wacasey
Address: 10450 Standliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Dane.Wacasey@alsglobal.com
Alternate Contact: Jumo M. Lawal
Email: jumo.m.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Standliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20121002
TSR: Henry Pellitre

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS20121002-01 MW-3S 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 08:50	29 Dec 2020
2. HS20121002-02 MW-3D 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 09:30	29 Dec 2020
3. HS20121002-03 FB121820 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 09:35	29 Dec 2020
4. HS20121002-04 FD121820 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 00:00	29 Dec 2020
5. HS20121002-05 MW-6D 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 10:30	29 Dec 2020
6. HS20121002-06 MW-17 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 11:15	29 Dec 2020
7. HS20121002-07 EB121820 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 11:20	29 Dec 2020
8. HS20121002-08 MW-5 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 12:10	29 Dec 2020
9. HS20121002-09 MW-8 8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD	Water	18 Dec 2020 13:05	29 Dec 2020

RIGHT SOLUTIONS | RIGHT PARTNER

21 Dec 2020

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TD63477: Chain of Custody

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Subcontract Chain of Custody

SAMPLING STATE: New Mexico COC ID: 15371

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD			29 Dec 2020
10. HS20121002-11	EB-2-121820	Water	18 Dec 2020 13:15
8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD			29 Dec 2020
11. HS20121002-12	FB-2-121820	Water	18 Dec 2020 13:10
8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD			29 Dec 2020
12. HS20121002-13	MW-11	Water	18 Dec 2020 14:10
8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD			29 Dec 2020
13. HS20121002-14	MW-10	Water	18 Dec 2020 15:05
8260 Benzene only; Level II PQL (0.001 mg/L); Std xls EDD			29 Dec 2020

Comments: *Expires 12/25/20* - 8260 Benzene only PQL=0.001 mg/L; Standard Level II PDF and standard Excel EDD

Send report and EDD to the emails shown above.

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

Relinquished By: DD

Date/Time: 12-22-20 08:15

Received By: Joylla

Date/Time: 12/22/20 8:15

Cooler ID(s): _____

Temperature(s): _____

12/22/2020

Page 2 of 2

TD63477: Chain of Custody

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SGS Sample Receipt Summary

Job Number: TD63477 Client: ALS Project: _____
Date / Time Received: 12/22/2020 8:15:00 AM Delv Method: CLIENT Airbill #'s: _____
of Coolers: 1 Therm ID: IR-4; Temp Adjustment Factor: 0;

Cooler Temps (Initial/Adjusted): #1: (1.6/1.6);

Test Strip Lot #s:	pH 1-12:	<u>10D0391</u>	pH 12+:	_____	Other: (Specify)	_____			
Cooler Information	Y	or	N	N/A	Sample Information	Y	or	N	N/A
1. Custody Seals Present:	☒		☐	☐	1. Sample labels present on bottles:	☒		☐	
2. Custody Seals Intact:	☒		☐		2. Samples preserved properly:	☒		☐	
3. Temp criteria achieved:	☒		☐		3. Sufficient volume recvd for analysis:	☒		☐	
4. Cooler temp verification:					4. Condition of sample:			<u>Intact</u>	
3. Cooler media:	<u>Ice (Bag)</u>				5. Sample recvd within HT:	☒		☐	
Trip Blank Information	Y	or	N	N/A	6. Dates/Times/IDs on COC match Sample Label	☒		☐	
1. Trip Blank present / cooler:	☐		☐	☒	7. Container labeling complete:	☒		☐	
2. Trip Blank listed on COC:	☐		☐	☒	8. Analysis requested is clear:	☒		☐	
3. Type Of TB Received	W	or	S	N/A	9. VOCs headspace free:	☒		☐	☐
	☐		☐	☐	10. Bottles received for unspecified tests	☐		☒	
Misc. Information					11. COC Present:	☒		☐	
Number of terracores:	_____			Number of Lab Filtered Metals:	12. Special Instructions (compositing/filtering) clear:	☐		☐	☒
Number of 5035 Field Kits:	_____				13. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☐
Residual Chlorine Test Strip Lot #:	_____				14. % Solids Jar received?	☐		☐	☐
					15. Residual Chlorine Present?	☐		☐	☐

Comments

TD63477: Chain of Custody
Page 3 of 5

Sample Receipt Log

Job #: TD63477

Date / Time Received: 12/22/2020 8:15:00 AM

Initials: BELINDG

Client: ALS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TD63477-1	40ml	1	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-1	40ml	2	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-1	40ml	3	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-2	40ml	1	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-2	40ml	2	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-2	40ml	3	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-3	40ml	1	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-3	40ml	2	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-3	40ml	3	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-4	40ml	1	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-4	40ml	2	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-4	40ml	3	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-5	40ml	1	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-5	40ml	2	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-5	40ml	3	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-6	40ml	1	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-6	40ml	2	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-6	40ml	3	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-7	40ml	1	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-7	40ml	2	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-7	40ml	3	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-8	40ml	1	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6

TD63477: Chain of Custody

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Sample Receipt Log

Job #: TD63477

Date / Time Received: 12/22/2020 8:15:00 AM

Initials: BELINDG

Client: ALS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TD63477-8	40ml	2	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-8	40ml	3	VR279	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-9	40ml	1	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-9	40ml	2	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-9	40ml	3	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-10	40ml	1	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-10	40ml	2	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-10	40ml	3	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-11	40ml	1	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-11	40ml	2	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-11	40ml	3	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-12	40ml	1	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-12	40ml	2	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-12	40ml	3	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-13	40ml	1	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-13	40ml	2	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6
1	TD63477-13	40ml	3	VR278	N/P	Note #2 - Preservative check not applicable.	IR-4	1.6	0	1.6

TD63477: Chain of Custody

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Houston, TX

Section 5

MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Page 1 of 1

Job Number: TD63477
Account: ELABTXHO ALS
Project: HS20121002

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VE3778-MB	E0083410.D	1	12/22/20	FI	n/a	n/a	VE3778

The QC reported here applies to the following samples: Method: SW846 8260C

TD63477-1, TD63477-2, TD63477-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	98% 72-122%
17060-07-0	1,2-Dichloroethane-D4	96% 68-124%
2037-26-5	Toluene-D8	100% 80-119%
460-00-4	4-Bromofluorobenzene	96% 72-126%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

Method Blank Summary

Page 1 of 1

Job Number: TD63477
Account: ELABTXHO ALS
Project: HS20121002

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VR2697-MB	R03495370.D	1	12/22/20	ZQ	n/a	n/a	VR2697

The QC reported here applies to the following samples:**Method:** SW846 8260C

TD63477-4, TD63477-5, TD63477-6, TD63477-7, TD63477-8, TD63477-12, TD63477-13

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	102% 72-122%
17060-07-0	1,2-Dichloroethane-D4	99% 68-124%
2037-26-5	Toluene-D8	98% 80-119%
460-00-4	4-Bromofluorobenzene	102% 72-126%

Method Blank Summary

Page 1 of 1

Job Number: TD63477
Account: ELABTXHO ALS
Project: HS20121002

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VR2698-MB	R03495400.D	1	12/23/20	FI	n/a	n/a	VR2698

The QC reported here applies to the following samples:**Method:** SW846 8260C

TD63477-9, TD63477-10, TD63477-11

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	86% 72-122%
17060-07-0	1,2-Dichloroethane-D4	91% 68-124%
2037-26-5	Toluene-D8	100% 80-119%
460-00-4	4-Bromofluorobenzene	101% 72-126%

Blank Spike Summary

Page 1 of 1

Job Number: TD63477
Account: ELABTXHO ALS
Project: HS20121002

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VR2697-BS	R03495368.D	1	12/22/20	ZQ	n/a	n/a	VR2697

The QC reported here applies to the following samples: Method: SW846 8260C

TD63477-4, TD63477-5, TD63477-6, TD63477-7, TD63477-8, TD63477-12, TD63477-13

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	25.6	102	68-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	108%	72-122%
17060-07-0	1,2-Dichloroethane-D4	96%	68-124%
2037-26-5	Toluene-D8	98%	80-119%
460-00-4	4-Bromofluorobenzene	100%	72-126%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: TD63477
Account: ELABTXHO ALS
Project: HS20121002

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VR2698-BS	R03495398.D	1	12/23/20	FI	n/a	n/a	VR2698

The QC reported here applies to the following samples:**Method:** SW846 8260C

TD63477-9, TD63477-10, TD63477-11

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	26.3	105	68-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	97%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	68-124%
2037-26-5	Toluene-D8	98%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

Job Number: TD63477
Account: ELABTXHO ALS
Project: HS20121002

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VE3778-BS	E0083406.D	1	12/22/20	FI	n/a	n/a	VE3778
VE3778-BSD ^a	E0083407.D	1	12/22/20	FI	n/a	n/a	VE3778

The QC reported here applies to the following samples:

Method: SW846 8260C

TD63477-1, TD63477-2, TD63477-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	25	24.8	99	25.7	103	4	68-119/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	97%	97%	72-122%
17060-07-0	1,2-Dichloroethane-D4	95%	95%	68-124%
2037-26-5	Toluene-D8	98%	99%	80-119%
460-00-4	4-Bromofluorobenzene	100%	98%	72-126%

(a) Insufficient sample available for MS/MSD. AZ:Q9

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: TD63477

Account: ELABTXHO ALS

Project: HS20121002

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TD63478-9MS	R03495375.D	100	12/22/20	ZQ	n/a	n/a	VR2697
TD63478-9MSD	R03495376.D	100	12/22/20	ZQ	n/a	n/a	VR2697
TD63478-9	R03495373.D	10	12/22/20	ZQ	n/a	n/a	VR2697
TD63478-9	R03495374.D	100	12/22/20	ZQ	n/a	n/a	VR2697

The QC reported here applies to the following samples:

Method: SW846 8260C

TD63477-4, TD63477-5, TD63477-6, TD63477-7, TD63477-8, TD63477-12, TD63477-13

CAS No.	Compound	TD63478-9		Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD		Limits Rec/RPD
		ug/l	Q						%	RPD	
71-43-2	Benzene	8.7	J	2500	2710	108	2500	2670	106	1	68-119/12

CAS No.	Surrogate Recoveries	MS	MSD	TD63478-9	TD63478-9	Limits
1868-53-7	Dibromofluoromethane	108%	108%	107%	106%	72-122%
17060-07-0	1,2-Dichloroethane-D4	96%	97%	99%	98%	68-124%
2037-26-5	Toluene-D8	100%	101%	98%	98%	80-119%
460-00-4	4-Bromofluorobenzene	99%	101%	99%	102%	72-126%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: TD63477

Account: ELABTXHO ALS

Project: HS20121002

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TD63477-9MS	R03495408.D	10	12/23/20	FI	n/a	n/a	VR2698
TD63477-9MSD	R03495409.D	10	12/23/20	FI	n/a	n/a	VR2698
TD63477-9	R03495405.D	10	12/23/20	FI	n/a	n/a	VR2698

The QC reported here applies to the following samples:

Method: SW846 8260C

TD63477-9, TD63477-10, TD63477-11

CAS No.	Compound	TD63477-9 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	136	250	387	100	250	391	102	1	68-119/12

CAS No.	Surrogate Recoveries	MS	MSD	TD63477-9	Limits
1868-53-7	Dibromofluoromethane	95%	95%	94%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	93%	103%	68-124%
2037-26-5	Toluene-D8	100%	101%	97%	80-119%
460-00-4	4-Bromofluorobenzene	99%	100%	99%	72-126%

* = Outside of Control Limits.



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District I

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

District II

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

District III

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

District IV

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

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

COMMENTS

Action 22442

COMMENTS

Operator:	HUNTSMAN POLYMERS CORP	P.O. Box 3986	Odessa, TX79760	OGRID:	195202	Action Number:	22442	Action Type:	GROUND WATER ABATEMENT
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Created By	Comment	Comment Date
bbillings	Some concern with dissolved benzene and nearness to Rio Grande, need some well replacement/rehab	04/19/2021

District I

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

District II

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

District III

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

District IV

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

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

CONDITIONS

Action 22442

CONDITIONS OF APPROVAL

Operator:	HUNTSMAN POLYMERS CORP	P.O. Box 3986	Odessa, TX79760	OGRID:	195202	Action Number:	22442	Action Type:	GROUND WATER ABATEMENT
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OCD Reviewer	Condition
bbillings	Okay on repair and/or replacement of wells mentioned in report and reshoot elevations of TOC to 1/100th of a foot. To be done as soon as can be arranged. Continue with sampling aspects as indicated in report, and assessment of seasonal and river stage impacts on data stream. Also NOTE that 5.0 ug/l is current dissolved benzene standard in groundwater.
bbillings	Please provide operator contact NAME/Email/Telephone