June 15, 2022

Ms. Leigh Barr
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
leighp.barr@state.nm.us

Re: Submittal of the *2021 Annual Discharge Report* and the *2021 Annual Groundwater Monitoring Report* for the HollyFrontier Navajo Refining LLC, Artesia Refinery, Discharge Permit GW-028

Dear Ms. Barr:

Please find attached electronic copies of the *2021 Annual Discharge Report* and the *2021 Annual Groundwater Monitoring Report*. The *2021 Annual Groundwater Monitoring Report* was submitted in February 2022 and is included as an attachment to the *2021 Annual Discharge Report.* Together these reports fulfill the requirements of Section 2.E of Discharge Permit GW-028. If you should have any questions or comments regarding this report, please feel free to contact me at (575) 746-5487 or Jason Leik at (214) 970-8902.

Sincerely,

Kawika Tupou
Environmental Manager
HollyFrontier Navajo Refining LLC

cc: OCD: G. Wade
HF Sinclair: J. Leik
TRC: J. Speer, D. Helbert, C. Smith, S. Hoover

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC

Artesia Refinery

NMD048918817 and DP GW-028

Prepared For:

HollyFrontier Navajo Refining LLC

501 E Main Street,

Artesia, NM 88210

February 2022



HOLLYFRONTIER®

2021 Annual Groundwater Monitoring Report

NMD048918817 and DP GW-028

HollyFrontier Navajo Refining LLC
Artesia Refinery
Artesia, New Mexico

Prepared for:

HOLLYFRONTIER

HollyFrontier Navajo Refining LLC
Artesia, New Mexico

Prepared by:

TRC

TRC Environmental Corporation
Austin, Texas

TRC Project No. 425135

February 2022

TRC Lead _____

Julie Speer, Project Manager

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Kawika Tupou

Environmental Manager, HollyFrontier Navajo Refining LLC

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ACRONYMS AND ABBREVIATIONS

Notation	Description
1,2,4-TMB	1,2,4-Trimethylbenzene
1,3,5-TMB	1,3,5-Trimethylbenzene
cis-1,2,-DCE	cis-1,2,-Dicholoroethene
CGWSL	Critical Groundwater Screening Level
COC(s)	Constituent(s) of Concern
DO	Dissolved Oxygen
DRO	Diesel Range Organics
EDB	Ethylene Dibromide, 1,2-dibromoethane
EP(s)	Evaporation Pond(s)
FWGMWP	Facility- Wide Groundwater Monitoring Workplan
GRO	Gasoline Range Organics
HMI	Hydrologic Monitoring, LLC
HWB	Hazardous Waste Bureau
HFNR	HollyFrontier Navajo Refining LLC
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
MTBE	Methyl Tert-Butyl Ether
NCL	North Colony Landfarm
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NWS	National Weather Service
O&M	Operation and Maintenance
OCD	New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division
ORP	Oxidation-Reduction Potential
PCC Permit	Post-Closure Care Permit
PSH	Phase-Separated Hydrocarbons
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RO	Reverse Osmosis
SVOCs	Semi-Volatile Organic Compounds

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Notation	Description
SWMU	Solid Waste Management Units
Torkelson	Torkelson Geochemistry, Inc.
TDS	Total Dissolved Solids
TEL	Tetra Ethyl Lead
TMD	Three Mile Ditch
TPH	Total Petroleum Hydrocarbons
TRC	TRC Environmental Corporation
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

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Executive Summary

This *2021 Annual Groundwater Monitoring Report* documents groundwater monitoring and recovery activities conducted at the HollyFrontier Navajo Refining LLC (HFNR) Artesia Refinery (refinery) located at 501 East Main Street in Artesia, New Mexico. The refinery is subject to a Post-Closure Care Permit (PCC Permit) issued by the New Mexico Environment Department (NMED) in October 2003 and later modified in December 2010; as well as Discharge Permit GW-028 issued by New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD) on May 25, 2017. Both the PCC Permit and Discharge Permit require HFNR to conduct facility-wide groundwater monitoring to evaluate the presence, nature, and extent of groundwater impacts; and to remediate impacted groundwater. This report provides the results of all groundwater monitoring and remedial activities that were conducted to satisfy both the NMED PCC Permit and the OCD Discharge Permit.

The groundwater monitoring program consists of semiannual well gauging and groundwater sampling in accordance with the *2020 Facility-Wide Groundwater Monitoring Work Plan* (2020 FWGMWP) that was submitted to the NMED and OCD in June 2020 and approved with modifications on December 15, 2020. Additional sampling was conducted in 2021 in accordance with the December 28, 2018, submittal letter of the "*SWMU / AOC Group 3 Additional Corrective Action Investigation Report – Revision 2* (SWMU/AOC Group 3 Rev 2 transmittal letter) and NMED's subsequent response letter dated March 22, 2019, and in accordance with NMED's May 7, 2021, comments letter on the September 2019 report titled *Evaluation of Methyl Tert-Butyl Ether (MTBE) in Groundwater.* Remedial activities consist of recovery of phase-separated hydrocarbons (PSH) and impacted groundwater. The groundwater monitoring and remediation program covers the following refinery areas:

- The closed Tetra Ethyl Lead (TEL) Impoundment
- The closed North Colony Landfarm (NCL)
- The inactive Evaporation Ponds (EPs)
- Three Mile Ditch (TMD)
- The impacted vadose zone located beneath the refinery in the following other areas: Field East of Refinery, North Refinery, South Refinery, Reverse Osmosis (RO) Reject Fields, Cross-gradient of Refinery, and Up-gradient of Refinery

The 2021 groundwater monitoring results indicate physical and chemical groundwater conditions are generally consistent with historical data. Groundwater predominantly flows to the east beneath the refinery towards the Pecos River, and to the southeast beneath the EPs. Measurable PSH was present in wells located at or near the EPs, Field East of Refinery, North Refinery, NCL, South Refinery, and TEL areas in 2021, with a maximum measured thickness of 7.06 feet during the first semiannual event and 5.75 feet during the second semiannual event. The apparent increase in the presence and extent of PSH in the North Refinery, South Refinery, and Field East of Refinery areas during 2021 are attributable to declining groundwater elevations, and are not indicative of a new release or PSH migration. In other Refinery areas, the presence and extent of PSH in 2021 was generally consistent with historical data and

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measured PSH thicknesses are overall stable to decreasing over time despite fluctuations inversely related to groundwater elevations. Groundwater elevations generally decreased between 2017 and April 2021, with historical minimums observed in many wells with PSH during April 2021. The following constituents of concern (COCs) were detected in groundwater at concentrations in exceedance of critical groundwater screening levels (CGWSLs): total petroleum hydrocarbons (TPH) diesel range organics (DRO); select volatile organic compounds (VOCs) including target COCs benzene, toluene, ethylbenzene, xylenes, methyl tert-butyl ether (MTBE), and naphthalene; select semi-volatile organic compounds (SVOCs); select total metals including target COC arsenic; and water quality parameters chloride, fluoride, sulfate, total dissolved solids (TDS), and nitrate/nitrite. COC concentrations in groundwater are generally stable to decreasing over time despite occasional fluctuations. Certain wells that previously exhibited increasing concentration trends have exhibited stable concentration trends over the most recent sampling events.

PSH and impacted groundwater were continually recovered at the refinery from an automated system of recovery trenches and recovery wells throughout 2021. An estimated 8,596,938 gallons of groundwater and an estimated 296,048 gallons of PSH were recovered through operation of the automated recovery system in 2021. An additional estimated 168 gallons of PSH was recovered from well MW-132, which is not connected to the automated system, by pumping on a periodic basis.

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1.0 Introduction

On behalf of HollyFrontier Navajo Refining LLC (HFNR), TRC Environmental Corporation (TRC) prepared this *2021 Annual Groundwater Monitoring Report* (report) to summarize the results of groundwater monitoring and recovery activities conducted in 2021 at the Navajo Artesia Refinery (refinery) located at 501 East Main Street in Artesia, New Mexico. The location of the refinery is shown on Figure 1. The refinery has been in operation since the 1920s and processes crude oil into asphalt, fuel oil, gasoline, diesel, jet fuel, and liquefied petroleum gas.

The refinery is regulated under the Resource Conservation and Recovery Act (RCRA). In October 2003, the Secretary of the New Mexico Environment Department (NMED) issued a Post-Closure Care Permit (PCC Permit) to HFNR for the Artesia Refinery (United States Environmental Protection Agency [US EPA] ID number NMD048918817). The PCC Permit was modified and reissued in December 2010 (NMED 2010). The PCC Permit authorizes and requires HFNR (the Permittee) to conduct post-closure care at the closed tetra ethyl lead (TEL) surface impoundment and the North Colony Landfarm (NCL) and to take appropriate actions to achieve RCRA closure of the inactive Evaporation Ponds (EPs). These areas and the locations of all existing monitoring and recovery wells are shown on Figure 2.

The PCC Permit requires HFNR to maintain a groundwater monitoring program to evaluate the effectiveness of the corrective action program for groundwater and to meet the requirements of New Mexico Administrative Code (NMAC) 20.4.1.500 (incorporating 40 Code of Federal Regulations Part 264, Subpart F) during the post-closure care period. The PCC Permit also requires HFNR to recover phase-separated hydrocarbon (PSH), where present, from the shallow groundwater.

The refinery is also regulated by the New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD). The OCD issued a renewal to Discharge Permit GW-028 (OCD 2017a) on May 25, 2017, and modifications on June 29, 2017 (OCD 2017b), October 25, 2018 (OCD 2018a), and December 14, 2018 (OCD 2018b). Among other requirements, the Discharge Permit requires semiannual facility-wide groundwater monitoring and submittal of an annual report summarizing the groundwater monitoring and remediation conducted throughout each year.

This report provides the results of all groundwater monitoring and remedial activities that were conducted during 2021 to satisfy both the NMED PCC Permit and the OCD Discharge Permit. The format of this report follows specifications in Appendix E.4 of the PCC Permit.

Groundwater monitoring activities conducted in 2021 consisted of semiannual well gauging and groundwater sampling. The semiannual monitoring events were performed in accordance with the (1) 2020 Facility-Wide Groundwater Monitoring Work Plan (2020 FWGMWP; TRC 2020) that was submitted to the NMED and OCD in June 2020 and approved with modifications by the NMED on December 15, 2020 (NMED 2020); (2) the December 28, 2018, submittal letter of the "SWMU / AOC Group 3 Additional Corrective Action Investigation Report – Revision 2 (SWMU/AOC Group 3 Rev 2 transmittal letter; HFNR 2018) and NMED's subsequent response letter dated March 22, 2019 (NMED 2019); and, (3) the NMED's May 7, 2021, comments letter on the September 2019 report titled *Evaluation of Methyl Tert-Butyl Ether (MTBE) in*

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Groundwater (NMED 2021a). Remedial activities conducted in 2021 consisted of recovery of PSH and impacted groundwater and periodic gauging of recovery wells. The groundwater monitoring and remediation activities were performed in the following refinery areas of interest:

- The closed TEL Impoundment
- The closed NCL
- The inactive EPs
- Three Mile Ditch (TMD)
- The impacted vadose zone located beneath the refinery in the following other areas:
  - Field East of Refinery
  - North Refinery
  - South Refinery
  - Reverse Osmosis (RO) Reject Fields (North and South)
  - Cross-gradient of Refinery
  - Up-gradient of Refinery

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2.0 Scope of Services

Groundwater monitoring, remedial, and other associated activities performed in 2021 are summarized in this section. The first semiannual groundwater monitoring event was conducted from April 12 to April 14, 2021. The second semiannual groundwater sampling event was conducted from September 14 to September 15, 2021. Routine remedial activities were conducted throughout 2021.

The second semiannual groundwater monitoring event is generally conducted in October of each year but was conducted earlier than usual to accommodate refinery turnaround. Appropriate notifications were made to the NMED regarding the scheduling of activities.

2.1 Monitoring Well Installation, Maintenance, and Repairs

No wells were installed or abandoned in 2021. No wells were repaired or modified in 2021. The following well maintenance was performed in 2021:

- Locking J-plugs and locks were replaced on various monitoring wells as required throughout 2021.

2.2 Phase-Separated Hydrocarbon and Water Level Measurements

Synoptic fluid gauging was conducted by Hydrologic Monitoring, LLC (HMI) at the beginning of each semiannual monitoring event in accordance with the 2020 FWGMWP. Wells were gauged to determine the groundwater elevation, flow direction, and gradient, the presence or absence of PSH, and apparent PSH thickness. A decontaminated oil-water interface probe was used to measure depth to PSH (if present), depth to water, and total depth in the monitoring and recovery wells. All measurements were recorded to the nearest 0.01-foot from the surveyed datum marking on each well casing. If the survey datum mark was not visible, measurements were obtained from the northern side of each well riser. Measurements were recorded on the field data sheets for each event.

The first semiannual gauging event was conducted on April 12 and April 13, 2021. All wells were gauged within 48 hours in accordance with the 2020 FWGMWP. No rainfall was recorded at the refinery, or at a National Weather Service (NWS) gauging station located approximately 6 miles south of the refinery during the days on which gauging occurred. A total of 1.30 inches of rainfall was recorded at the NWS gauging station during the month of April 2021, all of which occurred after completion of gauging and sampling activities. A copy of the NWS data for April 2021 is provided in Appendix A.

The second semiannual gauging event was conducted on September 14 and September 15, 2021. All wells were gauged within 48 hours in accordance with the 2020 FWGMWP. No rainfall was recorded at the refinery or the NWS gauging station during the days on which gauging occurred. A total of 0.39 inches of rainfall was recorded at the NWS gauging station during the month of September 2021. According to NWS records, 0.36 inches of rainfall was recorded from September 2 to September 6, 2021, and 0.03 inches was recorded on September 17, 2021. A copy of the NWS data for September 2021 is provided in Appendix A.

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Results of the 2021 semiannual gauging events are summarized in Table 1. Potentiometric surface maps of the shallow saturated zone and valley fill zone are provided as Figures 4 through 7. PSH thickness maps are provided as Figures 8 and 9.

2.3 Groundwater Sample Collection and Handling

Semiannual groundwater sampling was conducted by HMI in accordance with the 2020 FWGMWP. No sample was collected from a well containing PSH with a measured thickness greater than or equal to (≥) 0.03 feet in accordance with the 2020 FWGMWP. The following wells were not sampled during each 2021 semiannual event due to the presence of PSH at thicknesses ≥0.03 feet:

- First semiannual event: MW-23, MW-28, MW-39, MW-40, MW-43, MW-58, MW-59, MW-60, MW-62, MW-65, MW-67, MW-85, MW-86, MW-91, MW-92, MW-94, MW-95, MW-96, MW-99, MW-107, MW-111, MW-112, MW-126A, MW-127, MW-128, MW-129, MW-131, MW-132, MW-133, MW-137, MW-138, KWB-1A, KWB-2R, KWB-4, KWB-5, KWB-6, KWB-8, KWB-10R, KWB-11A, NCL-34A, RW-1, RW-2, RW-4, RW-5R, RW-6, RW-7, RW-8, RW-12R, RW-13R, RW-14R, RW-15C, RW-19, RW-22, TEL-1, TEL-2, and TEL-3; and
- Second semiannual event: MW-23, MW-28, MW-39, MW-43, MW-58, MW-60, MW-65, MW-66, MW-67, MW-85, MW-86, MW-91, MW-92, MW-94, MW-99, MW-111, MW-112, MW-126A, MW-127, MW-128, MW-131, MW-132, MW-133, MW-137, MW-137A, MW-138, MW-138A, NCL-34A, KWB-1A, KWB-2R, KWB-4, KWB-5, KWB-6, KWB-8, KWB-10R, TEL-1, TEL-2, and TEL-3.

Groundwater was purged and sampled from monitoring and recovery wells with a peristaltic pump and dedicated tubing or a dedicated bladder pump using low-flow methods in accordance with the NMED Hazardous Waste Bureau (HWB) Position Paper “Use of Low-Flow and Other Non-Traditional Sampling Techniques for Compliance Groundwater Monitoring” (NMED 2001). Groundwater was purged and sampled from water supply wells by attaching a decontaminated or dedicated hose barb to the available spigot. The spigot was located at a point before the water supply is introduced into any storage tanks or treatment units. The method by which each well was purged and sampled is provided in Table 2.

A multi-parameter water quality meter with flow-through cell and hand-held turbidity meter were used during the purging process of monitoring and recovery wells to monitor for field water quality parameters (pH, temperature, specific conductance, oxidation-reduction potential [ORP], dissolved oxygen [DO], and turbidity) and demonstrate stabilization. Water quality parameters were recorded approximately every three minutes during purging on a groundwater sampling form. The water quality parameters, depth to water (in non-supply wells only), and a qualitative description of the water quality (e.g., turbidity, sheen, odor) were also recorded during the purging process. Copies of the groundwater sampling forms are provided in Appendix A.

Water supply wells were purged and sampled from a sampling point (i.e., tap or spigot) located at or near the well head or pump house and before the water supply is introduced into any storage tank or treatment unit. The wells were purged at the sample point to remove any standing water from the well casing and surface piping. Grab readings of geochemical

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parameters including pH, temperature, conductivity, ORP, dissolved oxygen, and turbidity were also collected during the purging process.

The purging process was considered complete and groundwater sampling commenced when at least four of the purge parameters had stabilized. The specified stabilization criteria was +/- 0.2 standard unit for pH, +/- 0.2 degree Celsius for temperature, +/- 0.2 milligrams per liter (mg/L) for DO, +/- 0.02 Siemen per meter for specific conductance, and +/- 20 millivolts for ORP. The final stabilized water quality parameters measured at each well are summarized in Table 2. In addition, other observations of relative water quality (color and odor) are included in Table 2.

Groundwater samples were collected directly from the dedicated tubing or water supply well sampling point into laboratory-provided sample containers. Care was taken to not overflow the containers and potentially remove preservatives from pre-preserved containers. Samples that were to be analyzed for dissolved metals were field-filtered by attaching a disposable 0.45 micron filter to the tubing and directing the flow through the filter into the sample container.

Sample labels were placed on each container and included the well name, sample name, date and time, sampler's initials, and analytical method(s) to be performed. Glass sample containers were placed in padded packing sleeves to prevent breakage. All samples were placed on wet ice in a shipping container. All groundwater samples collected during the 2021 semiannual events were submitted to Pace Analytical National Center for Testing & Innovation in Mount Juliet, Tennessee under appropriate chain-of-custody documentation for laboratory analyses specified in the 2020 FWGMWP. Shipping containers were sent overnight to the laboratory via Federal Express. Copies of the chain-of- custody forms are included in Appendix B with the analytical data reports.

2.4 Equipment Decontamination Procedures

The oil-water interface probes used to gauge the PSH and water levels were the only equipment that was placed within multiple wells. This equipment was decontaminated between uses at each well to prevent cross-contamination between wells. The probe and the attached measuring tape were washed in a mixture of water and non-phosphate detergent (Alconox™). The equipment was then rinsed with water. Distilled water purchased from a local store was used for washing and rinsing the equipment.

The flow-through cell and probes of the water quality meters used for low-flow purging was also decontaminated between uses at each well. Decontamination of this equipment included submersing the flow-through cell in a mixture of water and non-phosphate detergent (Alconox™), washing the cell with a soft brush, submersing the probe end of the meters in the soapy water mixture, and brushing the end of the probe with a soft brush. The equipment was then rinsed with distilled water purchased from a local store.

Dedicated tubing was used for sample collection from each well; therefore, decontamination of sample collection tubing was not required. The dedicated tubing was left in the well between sampling events, with the upper portion coiled to ensure that the lower portion did not remain in the water column. At the beginning of each sampling event, the tubing was inspected and replaced if staining or mold was observed.

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2.5 Investigation-Derived Waste

All purge water and decontamination liquids were temporarily contained. The liquids were disposed daily in the refinery process wastewater system upstream of the oil/water separator. The volumes of purge water collected at each well were recorded on the HMI groundwater sampling forms and copies of these forms are provided in Appendix A.

Solid wastes generated during sampling activities included disposable gloves, paper towels, plastic bags, and tubing. All solid waste was contained in plastic bags and placed in the refinery trash receptacles for later disposal.

2.6 Exceptions to Groundwater Monitoring Work Plan

The following exceptions to the 2020 FWGMWP occurred during the first semiannual monitoring event conducted from April 12 to April 14, 2021:

- Wells KWB-3AR and KWB-9 were not gauged or sampled, and well RA-1227 was not sampled because access was denied by the landowner. The landowner has not granted HFNR access to these wells since 2011, but HFNR continues to pursue access.
- Wells KWB-12A, MW-137A, MW-138A, RW-11-0, RW-16B, RW-17A, RW-18A, RW-20 (RW-20A or RW-20B) were not sampled because each was dry.
- Fluid levels in well MW-132 were not gauged because a PSH recovery pump installed in the well prevented measurement.
- Well MW-48 was not gauged or sampled because the surface completion was damaged and the well appeared to be bridged with surface sediment at approximately 4 feet below ground surface.
- Wells MW-93 and MW-97 were not gauged or sampled because they could not be located (likely covered or obstructed due to refinery construction activities).

The following exception to the 2020 FWGMWP occurred during the second semiannual monitoring event conducted from September 14 to September 15, 2021:

- The sampling event occurred in September 2021, rather than October 2021, due to refinery turnaround activities.
- Wells KWB-3AR was not gauged or sampled and KWB-9 was not gauged because access was denied by the landowner. The landowner has not granted HFNR access to these wells since 2011.
- Fluid levels in well MW-132 were not gauged because a PSH recovery pump installed in the well prevented measurement.
- Wells MW-48, MW-93, MW-97, MW-105, and MW-106 were not gauged or sampled because they could not be accessed due to refinery construction activities.
- Well RA-4196 was not sampled due to a mechanical issue with the in-well pump which prevented sample collection.

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3.0 Regulatory Criteria

Regulatory standards or screening levels used to evaluate the data collected for the groundwater monitoring program are based on the presumption that the shallow groundwater might be used as a source of drinking water. Use of these screening levels are conservative because the shallow groundwater is not a documented source of drinking water. The Critical Groundwater Screening Level (CGWSL) used for each constituent of concern (COC) is the lower value of either the New Mexico Water Quality Control Commission (WQCC) standard from 20.6.2.3103 NMAC (last updated in December 2018) or the Maximum Contaminant Level (MCL) from the United States Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) (USEPA 2021). For COCs where neither a WQCC standard or MCL exists, the CGWSL is the NMED Groundwater Screening Level listed in the NMED Risk Assessment Guidance for Investigations and Remediation updated in February 2019, revised in June 2019, and further updated in November 2021 (NMED 2021c). If no NMED Groundwater Screening Level value is available, then the CGWSL is the USEPA Tap Water RSL value (USEPA 2021).

Available regulatory screening levels and the applicable CGWSL for each COC is presented in Table 3. The CGWSL for each COC is also provided for comparison in the analytical data summary tables, as discussed later in this report.

The 2021 TPH diesel range organics (DRO) groundwater data, in all areas except the EPs, was screened against the groundwater screening level for “unknown oil” included in Table 6-4 of the 2021 guidance document (NMED 2021c). The 2021 TPH DRO groundwater data for the EPs was screened against the groundwater screening level for “Diesel #2/New Crankcase Oil” in Table 6-4 of the 2021 NMED guidance document, consistent with the approved investigation report for the EPs (Arcadis 2015a). The 2021 TPH gasoline range organics (GRO) groundwater data was screened against the screening value for “gasoline,” established in 2019, on Table 6-4 of the 2021 NMED guidance document (NMED 2021c).

An evaluation of background (or baseline) groundwater quality was conducted between July 2014 and June 2015 for the purpose of determining the concentrations of COCs that may be present hydraulically up- and cross-gradient of refinery operations. The evaluation was performed according to an approved work plan (Arcadis 2014) and a report summarizing the evaluation was submitted to NMED and OCD in September 2015 (Arcadis 2015b). The background groundwater investigation included statistical evaluation of COCs and calculation of upper tolerance limits, where a statistically valid set of data was available. HFNR requested to use the background groundwater evaluation to develop alternative screening standards for specific COCs where the background data set demonstrates that the COCs are present above the WQCC standards or MCLs. Alternative standards development is pending further discussion and approval from OCD and NMED and so they are not included in this report. However, it should be noted that concentrations of manganese, chloride, fluoride, sulfate, nitrate/nitrite, and TDS that exceed the screening levels using the WQCC standards or USEPA MCLs may not exceed up-gradient concentrations.

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4.0 Monitoring Results

Results of the 2021 semiannual groundwater monitoring events are summarized in this section.

4.1 Groundwater Gauging Results

Well gauging was conducted on April 12 and 13, 2021 and September 14 and 15, 2021. Depth to water measurements, depth to PSH (if present) measurements, and groundwater elevations are presented in Table 1. For wells with PSH present, the groundwater elevation was corrected for the presence of PSH (with a specific gravity of 0.8). Groundwater potentiometric surface maps based on the 2021 semiannual gauging results for the shallow saturated zone and the valley fill zone are presented in Figures 4 through 7.

The 2021 gauging results indicate groundwater predominantly flows eastward beneath the refinery towards the Pecos River, with localized variations in both the shallow saturated zone and the valley fill zone. The groundwater flow direction beneath the EPs is generally to the southeast. The 2021 gauging results are consistent with historical results, although groundwater elevations were near historical minimums in many wells during the April 2021 semiannual monitoring event. Groundwater mounding was observed around wells MW-114 and MW-115 during both semiannual gauging events, despite cessation of discharge of RO reject water to the RO Reject Fields in January 2019. Localized groundwater sinks were observed around various recovery wells during both semiannual gauging events due to active groundwater pumping at those recovery wells.

4.2 Phase-Separated Hydrocarbons

The presence of PSH and measured apparent in-well PSH thicknesses are shown on Figures 8 and 9 for the 2021 first and second semiannual events, respectively. PSH is present in the following general areas at the refinery: in a segmented area across multiple wells in the northern portion of the refinery (North Refinery Area, NCL, and the TEL Surface Impoundment) extending east through the field owned by HFNR east of the refinery (Field East of Refinery), in a segmented area across multiple wells in the southern portion of the refinery (South Refinery Area) extending east through the Field East of Refinery and Bolton Road, and one isolated area on the western end of the EPs near the former discharge point into Pond 1.

In April 2021, PSH was observed for the first time in wells MW-23, MW-40, MW-43, MW-59, MW-60, MW-62, MW-95, MW-96, MW-126A, KWB-1A, and KWB-1B. During subsequent gauging conducted as part of routine recovery system operation and maintenance activities, PSH was observed for the first time in well MW-66 on May 18, 2021, and in wells MW-41 and RW-10 on July 1, 2021.

On August 3 and August 4, 2021, PSH samples were collected for hydrocarbon fingerprint (capillary gas chromatography) analysis to evaluate the apparent new occurrence of PSH observed between April 2021 and July 2021. PSH samples were collected from each general area with new PSH occurrence from the wells with the greatest PSH thickness (wells KWB-1B, MW-23, MW-66, MW-95, and RW-10). Samples were submitted to Torkelson Geochemistry,

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Inc. (Torkelson) in Tulsa, Oklahoma for analysis and interpretation of results. A copy of the report is available in Appendix B.

The fingerprint analysis estimated the release age of the PSH collected from wells MW-23, MW-66, MW-95, and KWB-1B to be 17 years or greater. The release age of the PSH from RW-10 was estimated to be approximately 4 years. A summary of the hydrocarbon fingerprint analysis and interpretation from Torkelson is provided below:

- The KWB-1B PSH sample is a mixture of extremely weathered middle distillate, likely either diesel fuel or fuel oil and an unidentified light material such as a naphtha. Based on the degree of biodegradation, the middle distillate portion of the KWB-1B sample is estimated to have been released 19 +/- 2 years ago.
- The MW-23 PSH sample is a mixture of an unknown gasoline range material and an extremely weathered middle distillate probably either diesel fuel or fuel oil. Based on the degree of biodegradation, the middle distillate portion of the MW-23 sample is estimated to have been released 17 +/- 2 years ago.
- The MW-66 PSH sample is a mixture of extremely weathered middle distillate, likely either jet fuel or kerosene and an unidentified light material such as a naphtha. Based on the degree of biodegradation, the middle distillate portion of the MW-66 sample is estimated to have been released 19 +/- 2 years ago.
- The MW-95 PSH sample is a mixture of an unknown gasoline range material and an extremely weathered middle distillate probably either diesel fuel or fuel oil. Based on the degree of biodegradation, the middle distillate portion of the MW-95 sample is estimated to have been released 20 +/- 2 years ago.
- The RW-10 PSH sample is a moderately weathered middle distillate, probably either diesel fuel or fuel oil. Based on the degree of biodegradation, the RW-10 sample is estimated to have been released 4 +/- 2 years ago.

The results of the PSH hydrocarbon fingerprint analysis indicate that the new occurrence of PSH is not associated with a new or undiscovered release.

Plots presenting apparent in-well PSH thicknesses and groundwater elevations over time for wells that have historically contained measurable PSH are provided in Appendix C. Screened intervals, if known, are also included on the plots in accordance with the NMED request provided in an email on August 11, 2021 (NMED 2021b).

PSH thicknesses across all areas of interest are generally stable to declining over time, except in parts of the North Refinery, South Refinery, and Field East of Refinery areas as discussed further below. PSH thicknesses across the refinery generally appear to be inversely affected by fluctuations in groundwater elevations and any new occurrences of PSH or recent increases in PSH thicknesses are directly attributed to reductions in groundwater elevations, except in South Refinery Area well MW-28 as discussed further below. Groundwater elevations generally decreased across the facility during sampling events conducted between 2017 to early 2021 (April 2017, October 2017, April 2018, October 2018, April 2019, October 2019, June 2020, and October 2020, and April 2021) and were near historical lows in many wells during the April 2021

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event. Groundwater elevations generally increased between April 2021 and September 2021 but remain low compared to historical levels. The reduction in groundwater elevations from 2017 through early 2021 is consistent with the occurrence of drought conditions across New Mexico during this time.

The apparent increase in the presence and extent of PSH in the North Refinery, South Refinery, and Field East of Refinery areas during 2021, as described below, are attributable to declining groundwater elevations and are not indicative of a new release or PSH migration. Apparent in-well PSH thickness fluctuates with the water table because it relates to the hydrogeologic conditions and characteristics of the PSH and soil and is therefore a poor indicator of PSH mobility and recoverability.

The presence of PSH within each area of interest is discussed in the following subsections. PSH recovery activities and results are provided in Section 6.0.

4.2.1 North Colony Landfarm – PSH Gauging Results

PSH was detected in NCL well NCL-34A in April 2021 at a thickness greater than 2.84 feet – the PSH thickness could not be measured because groundwater was not measured above the total depth of the well. In September 2021, PSH was measured in well NCL-34A at a thickness of 2.41 feet. PSH was measured in NCL-34A from March 2011 through March 2013 (at a historical maximum of 5.87 feet in September 2011) and in October 2020 through September 2021. PSH presence and thickness in this well directly correlates with reductions in the groundwater elevation observed during these times.

4.2.2 Tetra Ethyl Lead Surface Impoundment – PSH Gauging Results

In April 2021, PSH was measured in wells TEL-1, TEL-2, and TEL-3 at thicknesses of 0.75 feet, 1.95 feet, and 4.90 feet, respectively. In September 2021, PSH was measured in wells TEL-1, TEL-2, and TEL-3 at thicknesses of 0.12 feet, 1.60 feet, and 3.39 feet, respectively. PSH has intermittently been present in these three TEL wells since at least 2010, but the apparent thicknesses measured in April 2021 were the historical maximums. PSH presence and apparent thickness in these wells correlates with reductions in groundwater elevations during those corresponding monitoring periods. Groundwater elevations have overall decreased in these wells since 2017, with historical minimums observed in April 2021.

4.2.3 Evaporation Ponds – PSH Gauging Results

PSH was measured in EP wells MW-85 and MW-86 at thicknesses of 0.55 feet and 0.03 feet in April 2021 and 0.40 feet and 0.03 feet in September 2021, respectively. These wells are located near the original discharge point in EP 1 (Pond 1). PSH thicknesses in MW-85 and MW-86 have overall decreased since 2012, despite PSH thickness fluctuations between the gauging events attributable to fluctuations in groundwater elevations.

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4.2.4 Three Mile Ditch – PSH Gauging Results

No measurable PSH was present in any wells along the TMD during either 2021 semiannual event.

4.2.5 North Refinery Area – PSH Gauging Results

PSH was measured in wells MW-23, MW-39, MW-40, MW-43, MW-59, MW-60, MW-62, MW-67, MW-91, MW-92, MW-94, MW-95, MW-96, MW-137, MW-138, RW-1, RW-2, RW-7, and RW-8 in April 2021 at thicknesses ranging from 0.06 feet in MW-96 to 7.06 feet in RW-2. In September 2021, PSH was measured in MW-23, MW-39, MW-40, MW-41, MW-43, MW-59, MW-60, MW-67, MW-91, MW-92, MW-94, MW-95, MW-137, MW-137A, MW-138, MW-138A, RW-1, RW-2, RW-7, RW-8, and RW-10 at thicknesses ranging from 0.05 feet in MW-43 to 4.54 feet in MW-40. The apparent occurrence and extent of PSH in the North Refinery Area increased in 2021, with PSH measured for the first time in wells MW-23, MW-40, MW-41, MW-43, MW-59, MW-60, MW-62, MW-95, MW-96, and RW-10. PSH thicknesses increased to historical maximums in 2021 in the following wells which have historically contained PSH: MW-91, MW-92, MW-137, MW-138, RW-1, RW-2, and RW-8. The increased apparent occurrence and thicknesses of PSH in the North Refinery Area are attributed to decreasing groundwater elevations and are not indicative of a new release or PSH migration, as follows:

- Wells with first occurrence of measurable PSH:
    - MW-23, MW-40, and MW-43: PSH was detected for the first time at measurable thicknesses in wells MW-23, MW-40, and MW-43 in April 2021 (2.98 feet, 0.25 feet, and 0.40 feet, respectively), and again in September 2021 (1.85 feet, 4.54 feet, and 0.05 feet, respectively). These wells were installed between 1982 and 1984 with only 5-feet of screen (there is no well log available for MW-40 but wells installed in this area during that time were completed with only 5-feet of screen). Indications of hydrocarbon impacts (odor and staining) were observed in the vadose and saturated zones during drilling and installation of these wells as noted on the available well logs. Groundwater elevations decreased in these wells 12.62 feet (MW-23), 13.92 feet (MW-40), and 11.16 feet (MW-43) from historical maximums in 2015 to historical minimums in April 2021. Groundwater elevations in MW-23 and MW-43 were approximately within the 5-foot screen interval for the first time in April 2021 (i.e., well screens were historically submerged). PSH has also historically been present in downgradient and cross-gradient wells.
    - MW-59, MW-60, MW-62, MW-95, and MW-96: PSH was detected for the first time at measurable thicknesses in wells MW-59, MW-60, MW-62, MW-95, and MW-96 in April 2021 (0.93 feet, 1.61 feet, 0.20 feet, 2.15 feet, and 0.06 feet, respectively). PSH was detected again in September 2021 in wells MW-59, MW-60, and MW-95 at 0.64 feet, 0.27 feet, 0.67 feet, respectively. PSH was not detected in September 2021 in wells MW-62 and MW-96. Indications of hydrocarbon impacts (odor, staining, sheen, and/or elevated organic vapor meter [OVM] readings) were observed in the vadose and saturated zones during drilling

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and installation of these wells between 2003 and 2007. Groundwater elevations decreased in these wells 14.10 feet (MW-59), 14.12 feet (MW-60), 8.49 feet (MW-62), 9.09 feet (MW-95), and 7.65 feet (MW-96) from historical maximums in 2015 to historical minimums in April 2021. Further, groundwater elevations in MW-59 were below the top of the screen interval for the first time in April 2021, as shown on the time-series plots provided in Appendix C (i.e., well screen was historically submerged). As discussed above, fingerprint analysis indicates PSH in MW-95 to have been released approximately 20 years ago, and PSH in KWB-1B (well downgradient of MW-59 and MW-60) to have been released approximately 19 years ago. PSH has also historically been present in wells downgradient and cross-gradient of wells MW-62, MW-95, and MW-96.

- MW-41 and RW-10: PSH was detected for the first time at measurable thicknesses in these wells in July 2021 (2.25 feet and 3.45 feet, respectively), and again in September 2021 (0.84 feet and 3.04 feet, respectively). MW-41 was installed in 1984 with only 5-feet of screen. No field screening data or observations of odor and staining (neither presence or lack of) were recorded on the well log for MW-41, and there is no well log available for RW-10. Groundwater elevations decreased in these wells 12.61 feet (MW-41) and 13.30 feet (RW-10) from April 2017 to April 2021. Further, groundwater elevations in MW-41 were historically above top of the screen interval prior October 2020 (i.e., well screens were historically submerged). Per HFNR's notification email to NMED dated July 30, 2021 (HFNR 2021b), the presence of PSH in MW-41 and RW-10 was first observed after the diesel release that occurred from an underground pipeline near these wells on April 20, 2021. As documented in the *April 2021 Diesel Release, Site Characterization, Assessment, and Closure Report* dated July 19, 2021, HFNR collected a sample of PSH from MW-41 and analyzed it for sulfur at the refinery laboratory (HFNR 2021a). Sulfur was measured at a concentration of 979 parts per million (ppm), which is not consistent with finished diesel like was released. Finished diesel at the refinery typically contains only 6 ppm of sulfur. As discussed above, fingerprint analysis indicates PSH in RW-10 to likely be a diesel fuel released approximately 4 years ago. HFNR continues to monitor and evaluate PSH in these wells.

- Wells with increased PSH thicknesses:
  - MW-91, MW-92, MW-137, and MW-138: PSH thicknesses in MW-91 increased to a historical maximum of 1.57 feet in April 2021 but decreased to 0.21 feet in September 2021. PSH thicknesses in wells MW-92 and MW-137 increased from April 2019 to historical maximums in April 2021 (4.05 feet and 2.18 feet, respectively), but decreased in September 2021 (0.82 feet and 0.4 feet, respectively). PSH thicknesses in MW-138 overall increased from April 2019 to a historical maximum of 3.89 feet in September 2021. Groundwater elevations measured in these wells decreased 7.37 feet (MW-91), 7.41 feet (MW-92), and 11.06 feet (MW-137) from historical maximums in October 2015 to historical minimums in April 2021; and 6.31 feet (MW-138) from a historical maximum in

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April 2016 to September 2021. The increase in PSH thicknesses in these wells directly correlates with the reduction of groundwater.

- RW-1, RW-2, and RW-8: PSH thicknesses in wells RW-1 overall increased from October 2019 to a historical maximum of 2.77 feet in September 2021. PSH thicknesses in RW-2 and RW-8 increased from October 2019 to historical maximums in April 2021 (7.06 feet and 4.12 feet, respectively), but decreased to thicknesses consistent with historical measurements in September 2021 (0.75 feet and 1.48 feet, respectively). Groundwater elevations measured at these wells decreased 10.76 feet (RW-1), 9.27 feet (RW-2), and 10.67 feet (RW-8) from historical maximums in October 2015 to historical minimums in April 2021. Active pumping in these wells also contributed to the observed decreases in groundwater elevation and increases in apparent thickness in these wells.

Groundwater elevations have decreased across all areas of the refinery between approximately 2015 and 2021, and the decrease is mostly attributable to reductions in rainfall over this time as the shallow groundwater potentiometric surface across the North Refinery, South Refinery, and Field East of Refinery areas was relatively consistent over this time. However, the reductions in groundwater and corresponding apparent increase in the occurrence and thickness of PSH in the North Refinery Area since 2019 may be exacerbated by the cessation of discharging RO reject water to the RO Reject Fields in January 2019. The range of groundwater elevation reductions measured from approximately 2015 to 2021 in wells with increasing PSH thicknesses located in the Northern Refinery Area (reduced between approximately 6 and 14 feet) was greater than those located in the Southern Refinery Area (reduced between approximately 6 and 8.5 feet).

PSH and groundwater are routinely removed from this plume by automated pumping from RW-1R, RW-2R, RW-7R, and/or RW-8R. Measurable volumes of PSH (as measured by the automated recovery system) were recovered from all these recovery wells (see Section 6.0 and Table 5 for details). The recovered PSH is pumped to Tank 49 within the refinery and then to crude tanks for processing.

4.2.6 South Refinery Area – PSH Gauging Results

PSH was measured in wells KWB-2R, KWB-4, KWB-5, KWB-6, MW-28, MW-65, MW-99, MW-107, RW-4, RW-5R, RW-6, RW-15C, and RW-19 in April 2021 at thicknesses ranging from 0.08 feet in MW-107 and RW-5R to 6.78 feet in RW-6. In September 2021, PSH was measured in wells KWB-2R, KWB-4, KWB-5, KWB-6, MW-28, MW-65, MW-66, MW-99, MW-107, RW-4, RW-5R, RW-6, RW-11-0, RW-15C, and RW-19 at thicknesses ranging from 0.09 feet in RW-11-0 to 5.75 feet in RW-5R.

PSH thicknesses have generally decreased or are stable over time in most of these wells, despite fluctuations attributed to reductions in groundwater elevation. However, the apparent occurrence and extent of PSH across the South Refinery Area increased in 2021 compared to that observed from 2016 through 2020, with PSH measured for the first time in MW-66. PSH thicknesses increased to historical maximums in 2021 in the following wells which have historically contained PSH: MW-28, MW-99, MW-107, and RW-6. The increased apparent

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occurrence and thicknesses of PSH are generally attributed to recent reductions in groundwater elevations or the combined influence of the active recovery system and are not indicative of a new release or PSH migration, as follows:

- PSH was detected for the first time in MW-66 at a measurable thickness of 0.42 feet in May 2021 (during routine recovery system operation activities), and again at a thickness of 0.24 feet in September 2021. Indications of hydrocarbon impacts (odor and staining) were observed in the vadose and saturated zones during drilling and well installation in 2005. Groundwater elevations in this well decreased 8.46 feet from a historical maximum in October 2016 to a historical minimum in May 2021. As discussed above, fingerprint analysis indicates PSH in MW-66 to have been released approximately 19 years ago.
- PSH thicknesses in MW-99 increased from June 2020 to a historical maximum of 1.61 feet in April 2021. Groundwater elevations in MW-99 decreased 7.93 feet from a historical maximum in October 2015 to a historical minimum in April 2021.
- Measurable PSH was detected in RW-11-0 in September 2021 for the first time since at least 2007. However, this well and associated recovery trench are often dry and therefore the screened interval does not allow for comprehensive evaluation of groundwater and PSH changes over time. The reoccurrence of PSH in RW-11-0 predates the startup of the Pretreatment Unit (PTU) that is currently being constructed up-gradient of RW-11-0. PSH continues to not be detected in nearby, downgradient well MW-57 (located directly across Bolton Road from RW-11-0). .
- PSH thicknesses in MW-107 overall increased from June 2020 to a historical maximum of 2.31 in September 2021. Groundwater elevations in this well decreased 7.70 feet from a historical maximum in October 2015 to September 2021.
- PSH thicknesses in recovery well RW-6 overall increased from April 2019 to a historical maximum of 6.78 feet in April 2021. PSH thicknesses decreased to 3.43 feet in September 2021. Groundwater elevations in RW-6 have decreased 6.12 feet between a historical maximum in October 2016 to September 2021. Active pumping in this well also contributes to the observed decreases in groundwater elevation and increases in apparent thickness.

PSH thicknesses in MW-28 increased during both 2021 events to a historical maximum of 1.95 feet in September 2021. PSH has intermittently been present in this well since 2008 at thicknesses of 0.02 feet or less. The increasing PSH thickness in MW-28 cannot be directly attributed to a reduction groundwater elevation as shown on the time-series plots provided in Appendix C. HFNR is currently evaluating the source of increasing PSH thickness in MW-28. MW-28 is located downgradient of Tank 401, which contains gasoline blendstock and had a floor leak discovered and reported in November 2019. The tank floor was replaced in 2020.

PSH and groundwater is routinely removed from this plume by automated pumping from RW-4R, RW-5R, RW-6R, RW-15 (RW-15 recovery trench wells A, B, D, and/or E), and/or RW-19. Measurable volumes of PSH (as measured by the automated recovery system) were recovered from recovery wells RW-4R, RW-5R, and RW-6R in 2021 (see Section 6.0 and

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Table 5 for details). The recovered PSH is pumped to Tank 49 within the refinery and then to crude tanks for processing.

4.2.7 Field East of Refinery – PSH Gauging Results

PSH was measured in wells KWB-1A, KWB-1B, KWB-8, KWB-10R, KWB-11A, MW-58, MW-111, MW-112, MW-126A, MW-127, MW-128, MW-129, MW-131, MW-132, MW-133, RW-12R, RW-13R, RW-14R, and RW-22 in April 2021, at thicknesses ranging from 0.03 feet in RW-12R to 2.59 feet in MW-112. In September 2021, PSH was measured in wells KWB-1A, KWB-1B, KWB-8, KWB-10R, MW-58, MW-111, MW-112, MW-126A, MW-127, MW-128, MW-129, MW-131, MW-132, MW-133, RW-13R, and RW-14R, at thicknesses ranging from 0.03 feet in KWB-8 and MW-133 to 2.37 feet in RW-13R.

PSH thicknesses have generally decreased or are stable over time in most of these wells, despite fluctuations attributed to changes in groundwater elevation. However, the apparent occurrence and extent across the northern portion of the Field East of the Refinery increased in 2021, with PSH measured for the first time in wells KWB-1A, KWB-1B, and MW-126A. PSH thicknesses also recently increased in wells KWB-10R, MW-58, MW-111, MW-127, MW-128, MW-129, and MW-131. These increases are attributed to recent reductions in groundwater elevations, and are not indicative of a new release or PSH migration, as follows:

- Wells with first occurrence of measurable PSH:
    - KWB-1A and KWB-1B: PSH was detected at measurable thicknesses for the first time in KWB-1A and KWB-1B in April 2021 (1.06 and 1.27 feet, respectively), and again in September 2021 (0.14 and 0.36 feet, respectively). These nested wells were installed in 1992 with the same screened intervals, but different well diameters (KWB-1A is 2-inch and KWB-1B is 4-inch). No field screening data or observations of odor and staining (neither presence or lack of) were recorded on the well logs. Groundwater elevations in KWB-1A decreased 13.99 feet from a historical maximum in November 2014 to a historical minimum in April 2021. As discussed above, fingerprint analysis indicates PSH in KWB-1B to have been released approximately 19 years ago.
    - MW-126A: PSH was detected for the first time in this well at a measurable thickness of 0.58 feet in April 2021, and again at a thickness of 0.32 feet in September 2021. This well was installed in 2014 when groundwater elevations across the refinery were historically high. Indications of hydrocarbon impacts (odor, staining, and elevated photoionization detector [PID] readings) were observed in the vadose and saturated zones during drilling and well installation. Groundwater elevations decreased 14.10 feet from a historical maximum in November 2014 to a historical minimum in April 2021. Further, as shown on the time-series plots provided in Appendix C, the groundwater elevation was measured below the top of the screen interval for the first time in April 2021 (i.e., well screen was historically submerged).

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- Wells with recent increases in PSH thicknesses:
    - MW-58, MW-111, MW-128, and MW-131: PSH thicknesses in these wells have overall increased during at least the four most recent monitoring events to historical maximums in April 2021 (1.41 feet, 1.14 feet, 2.30 feet, and 2.04 feet, respectively). PSH thicknesses decreased in these wells in September 2021 to 1.11 feet (MW-58), 1.03 feet (MW-111), 1.96 feet (MW-128), and 1.20 feet (MW-131). Groundwater elevations in these wells decreased 9.63 feet (MW-58), 8.94 feet (MW-111), 9.64 feet (MW-128), and 8.76 feet (MW-131) from historical maximums in November 2014 to historical minimums in April 2021. The slight reductions in PSH thicknesses measured in these wells during September 2021 directly correlates with an increase in groundwater elevations.
    - KWB-10R, MW-127, and MW-129: PSH thicknesses have overall increased in these wells during monitoring events conducted since April 2017, April 2019, and April 2018, respectively. However, PSH thicknesses decreased in these wells during both 2021 monitoring events. The overall recent increase in PSH thicknesses in these wells is attributed to reductions in groundwater over the same time.

Groundwater elevations have decreased across all areas of the refinery between approximately 2015 and 2021. The decrease is mostly attributable to reductions in rainfall over this time, as the shallow groundwater gradient across all areas of the refinery has remained relatively consistent since 2015. However, the reductions in groundwater and corresponding apparent increase in the occurrence and thickness of PSH in localized areas in the Field East of Refinery may be exacerbated by the cessation of RO discharge and agricultural watering over this time, as follows:

- Groundwater elevations decreased and PSH occurrence and thickness increased in the northern portion of the Field East of Refinery area since 2019; these trends may be exacerbated by the cessation of discharging RO reject water to the up-gradient RO Reject Fields in January 2019. The range of groundwater elevation reductions measured from approximately 2015 to 2021 in wells located in the northern portion of the Field East of Refinery area (KWB-1A, KWB-1B, and MW-126A, which reduced approximately 14 feet) was greater than wells in wells located in the southern portion of the Field East of Refinery (MW-55 and MW-111, which reduced approximately 9 feet), and wells in the eastern portion of the Southern Refinery Area (MW-66, MW-99, and MW-107, which reduced approximately 8 feet). Although cessation of RO discharge has reduced the localized mounding historically observed up-gradient of this area, dissolved-phase concentrations of target COCs have remained relatively stable in wells downgradient of this area (MW-125, MW-126B, MW-134, and MW-145), as discussed in Section 5.3.7.
- The reductions in groundwater and corresponding apparent increase in the thickness of PSH in the Field East of Refinery immediately downgradient of the facility fenceline and up-gradient of Bolton Road may be exacerbated by the lack of agricultural watering in this area since approximately 2019. The range of groundwater elevation reductions measured from approximately 2015 to 2021 in wells located in the southern portion of

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the Field East of Refinery (MW-55 and MW-111, which reduced approximately 9 feet) was greater than in up-gradient wells in the eastern portion of the Southern Refinery Area (MW-66, MW-99, and MW-107, which reduced approximately 8 feet).

PSH thicknesses fluctuate in the wells with active PSH recovery and wells located nearby. PSH and groundwater is routinely removed from this plume by automated pumping from RW-12R, RW-13R, RW-14R, RW-20, and/or RW-22. Measurable volumes of PSH (as measured by the automated recovery system) were recovered from wells RW-13R, RW-14R, and RW-22 in 2021. The recovered PSH is pumped to Tank 49 within the refinery and then to crude tanks for processing.

4.2.8 Cross-Gradient and Up-Gradient Areas – PSH Gauging Results

No measurable PSH was present in any wells located up-gradient or cross-gradient of the refinery during either 2021 semiannual event. The up-gradient wells are only gauged on an annual basis.

4.2.9 RO Reject Fields – PSH Gauging Results

No measurable PSH was present in any wells located within the North or South RO Reject Fields during either 2021 semiannual event.

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5.0 Chemical Analytical Data

The chemical laboratory analyses and results of groundwater samples collected at the refinery in 2021 are summarized in this section.

5.1 Sample Laboratory Analyses

Groundwater samples collected during the 2021 semiannual sampling events were submitted for laboratory analysis of one or more of the following COCs by the associated analytical methods in accordance with the 2020 FWGMWP:

- TPH DRO by Method 8015 Modified
- TPH GRO by Method 8015 Modified
- Volatile organic compounds (VOCs) by Method 8260
- Metals by Methods 6010/6020 or 7470 (arsenic, barium, chromium, iron, lead, manganese, and selenium in all wells that were analyzed for metals; boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium were additionally analyzed in select wells)
    - Total metals were analyzed during both the first and second semiannual events
    - Dissolved metals were analyzed during the first semiannual event (for the same list of metals as the total metal list)
- Cyanide by Method 4500
- Major cations and anions by Methods 6020 or 300 (calcium, chloride, fluoride, potassium, sodium, and sulfate)
- Nitrates/nitrites (as nitrogen) by Method 300
- Total dissolved solids (TDS) by Method 2540

The specific analytical suite for each groundwater sample was in accordance with Table 1 of the approved 2020 FWGMWP. Laboratory analytical reports are provided in Appendix B.

In accordance with the SWMU/AOC Group 3 Rev 2 transmittal letter dated December 28, 2018, and NMED's subsequent response letter dated March 22, 2019, groundwater samples collected from select wells in the vicinity of solid waste management units (SWMUs) 20 and 22 (North Refinery wells) were analyzed for semi-volatile organic chemicals (SVOCs) by EPA Method 8270. In accordance with NMED's May 7, 2021, comments letter on the September 2019 MTBE Groundwater Report (NMED 2021a), groundwater samples collected from select wells were analyzed for 1,4-dioxane by Method 8270, ethylene dibromide (or 1,2-dibromomethane, EDB) by Method 8011, and Tert-Butyl Alcohol (TBA) by Method 8260.

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5.2 Data Validation

Laboratory analytical results were reviewed and validated following the guidelines of the PCC Permit. The data validation and a discussion of any data quality exceptions are provided in Appendix D. Data qualifier flags were added to the data based on the data validation results and are summarized in tabulated form in Appendix B.

Although some data quality exceptions were noted, the analytical results are generally usable for the intended purpose.

5.3 Laboratory Analytical Results

Laboratory analytical results of all wells sampled in 2021, and during at least the three previous sampling events, are summarized in Tables 4A through 4D, as follows:

- Table 4A – GRO, DRO, and select VOCs (VOCs detected above the CGWSL in more than one well in 2021)
- Table 4B – Total Metals
- Table 4C – Water quality parameters (TDS, nitrate/nitrite, major cations, major anions) and Cyanide
- Table 4D – SVOCs (SVOCs detected above the CGWSL in at least one well from 2019 to 2021)

Analytical results of the 2021 monitoring events and the three prior sampling events are included in the tables as required by the PCC Permit. The timeframe required to provide data for the three prior sampling events varies by well because wells are sampled semiannually, annually, or biennially. Wells that are sampled on a biennial basis are sampled during odd calendar years and therefore were sampled during April 2021. For consistency of the timeframe summarized in the analytical results tables, no data prior to 2013 is included for the wells that are sampled biennially or were not sampled during this timeframe for whatever reason (e.g., PSH present at a thickness ≥0.03 feet, lack of well access, etc.). Analytical results in Tables 4A through 4D are organized by the major area of interest in which each well is located. The applicable CGWSL is provided at the top of each data table and exceedances of the CGWSL are highlighted in yellow. Analytical results of all detected COCs are summarized in tables organized by well in numeric order that are included in Appendix C.

Plots of historical concentrations of target COCs are provided in Appendix C for wells with historical exceedances of CGWSLs. These plots are organized by well within major areas of interest and include concentration plots for the following target COCs: GRO, DRO, benzene, ethylbenzene, toluene, total xylenes, methyl tert-butyl ether (MTBE), naphthalene, and arsenic.

Figures 10 through 19 present the extent of the CGWSL exceedance areas of the following target COCs for both the first and second semiannual 2021 sampling events: DRO, arsenic, benzene, naphthalene, and MTBE.

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Figures 20 through 29 depict the extent of CGWSL exceedance areas of the following water quality parameters for both the first and second semiannual 2021 events in accordance with the Discharge Permit requirements: chloride, fluoride, sulfate, TDS, and nitrate/nitrite.

The 2021 analytical results in each major area of interest are summarized in the following subsections. Analytical results were compared to CGWSLs and evaluated relative to historical results using visual and statistical techniques. Concentration trends of target COCs were visually evaluated based on the plots provided in Appendix C. Concentration trends of all COCs since 2017 (i.e., for at least four annual monitoring events) were also statistically evaluated using the Mann-Kendall Test with a calculated 95% confidence interval, which is consistent with EPA guidance for RCRA facilities (EPA 2009). Mann-Kendall "S" Statistical results were critically evaluated and any applicable increasing trends of detected COCs are described below. Any new exceedances of CGWSLs are also described below.

5.3.1 North Colony Landfarm – Analytical Results

Groundwater monitoring is ongoing beneath and near the closed NCL. Groundwater samples were collected from the NCL wells listed below during the 2021 semiannual sampling events:

- First Semiannual Event (13 wells): MW-18, MW-45, MW-53R, MW-54A, MW-54B, MW-55, MW-56, MW-108, NCL-31, NCL-32, NCL-33, NCL-44, and NCL-49.
- Second Semiannual Event (9 wells): MW-45, MW-54A, MW-55, MW-108, NCL-31, NCL-32, NCL-33, NCL-44, and NCL-49.

Groundwater samples collected from these NCL area wells were analyzed for DRO, VOCs, the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium), and water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite). In addition, the groundwater samples collected from MW-55 during both 2021 semiannual events and from MW-54A during the first semiannual event were analyzed for GRO. Groundwater samples from MW-18, MW-45, and MW-55 were analyzed for cyanide and the expanded total metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium).

Analytical results of groundwater samples collected from wells located in and near the NCL in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, NCL

In 2021, groundwater samples were collected from wells located in and near the NCL for analysis of TPH DRO and GRO. TPH results that exceeded their respective CGWSL in NCL wells are summarized in the table below:

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Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
NCL	*First Semiannual Event (April 2021)*				
	TPH-DRO	**0.0858**	13	12	17.3 (NCL-33)
	TPH-GRO	**0.0101**	2	1	0.412 (MW-55)
	Second Semiannual Event (September 2021)				
	TPH-DRO	**0.0858**	9	9	10.2 (NCL-33)
	TPH-GRO	**0.0101**	1	1	0.187 (MW-55)

As summarized above and highlighted in Table 4A, DRO and GRO were detected in exceedance of their respective CGWSLs in NCL area wells sampled during both 2021 semiannual events.

As shown in the COC concentration plots included in Appendix C, DRO concentrations in NCL wells MW-18, MW-53, MW-54A, MW-54B, MW-56, MW-108, NCL-31, NCL-34A, NCL-44 and NCL-49 have overall increased since 2011, but exhibited a stable to decreasing trend over at least the seven most recent sampling events (in all wells except MW-54B which is sampled on a biennial basis and exhibited a stable trend over the four most recent sampling events). DRO concentrations in these wells will be reviewed again in 2021. DRO concentrations in 2021 were generally consistent with historical results, with exceptions listed below.

- DRO concentrations at well MW-45 overall increased since 2011 but were stable from 2014 through April 2021. DRO concentrations at MW-45 increased from 0.967 mg/L in April 2021 to 1.98 mg/L in September 2021, which is the historical maximum for this well.
- DRO concentrations at well MW-55 overall increased since 2014 but were stable from October 2018 through June 2020. DRO concentrations at MW-55 increased from 1.34 mg/L in October 2020 to 1.81 mg/L in April 2021, which is the historical maximum for this well. DRO concentrations decreased in September 2021 to 1.41 mg/L. DRO concentrations in this well will be reviewed again in 2021.
- DRO concentrations at well NCL-32 overall decreased since October 2015. However, concentrations have exhibited an increasing trend over the last four sampling events. DRO concentrations remain below the historical maximum in this well.
- DRO concentrations at well NCL-33 have overall increased since 2011 but were stable in 2019 and 2020. DRO concentrations at NCL-33 increased from 8.54 mg/L in October 2020 to 17.3 mg/L in April 2021, which is the historical maximum reported in this well. DRO concentrations decreased in September 2021 to 10.2 mg/L. DRO concentrations in this well will be reviewed again in 2021.

GRO concentrations in MW-54B are stable. GRO concentrations in MW-55 have exhibited an overall increasing trend since April 2017 and were reported at the historical maximum of 0.635 mg/L in October 2020; however, concentrations in 2021 exhibit a decreasing trend to 0.187 mg/L in September 2021. GRO concentrations in this well will be reviewed again in 2022.

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Volatile Organic Compounds, NCL

In 2021, groundwater samples were collected from wells located in and near the NCL for analysis of VOCs. VOC results that exceeded their respective CGWSL in NCL wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
NCL	*First Semiannual Event (April 2021)*				
	Benzene	**0.00500**	13	1	0.200 (MW-108)
	MTBE	**0.100**	13	1	0.449 (MW-55)
	Second Semiannual Event (September 2021)				
	Benzene	**0.00500**	9	1	0.141 (MW-108)
	MTBE	**0.100**	9	1	0.318 (MW-55)

As summarized above and highlighted in Table 4A, benzene and MTBE were detected in exceedance of their respective CGWSLs in an NCL area well during at least one 2021 sampling event. No other VOC was detected above its respective CGWSL during either semiannual event.

The 2021 VOC results in groundwater beneath and near the NCL were generally consistent with historical results, with exceptions listed below. As shown in the COC concentration plots included in Appendix C, concentrations of target VOCs in wells located in and near the NCL are overall stable to declining, except MTBE in MW-55. MTBE concentrations in MW-55 have exhibited an overall increasing trend since April 2015; and increased from 0.299 mg/L in October 2020 to a historical maximum of 0.449 mg/L in April 2021. The reported MTBE concentration in September 2021 decreased to 0.318 mg/L. MTBE concentrations in this well will be reviewed again in 2021.

MW-55 is located approximately 550 feet, respectively, down- and cross-gradient of the NCL. MTBE concentrations in wells located in the immediate vicinity of the NCL remain stable and below the CGWSL, including wells NCL-33 and NCL-34A which are located on the down-gradient boundary of the NCL (Note: NCL-34A was not sampled in 2021 due to the presence of PSH). Therefore, the presence of MTBE in MW-55 is not associated with the NCL.

Total Metals, NCL

Groundwater samples were collected from wells located in and near the NCL for analysis of the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium). In addition, groundwater samples collected from wells MW-18, MW-45, and MW-55 were analyzed for the expanded total metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium). Total metal results that exceeded their respective CGWSL in NCL wells are summarized in the table below:

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Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
NCL	*First Semiannual Event (April 2021)*				
	Arsenic	**0.0100**	13	1	0.0211 (NCL-44)
	Boron	**0.750**	3	1	2.29 (MW-18)
	Iron	**1.00**	13	5	3.00 (NCL-33)
	Lead	**0.0150**	13	1	0.0155 (MW-45)
	Manganese	**0.200**	13	9	1.60 (NCL-32)
	Uranium	**0.0300**	3	2	0.0484 (MW-18)
	Second Semiannual Event (September 2021)				
	Arsenic	**0.0100**	9	2	0.0188 (NCL-44)
	Iron	**1.00**	9	2	3.30 (MW-45)
	Manganese	**0.200**	9	6	1.67 (NCL-32)

As summarized above and highlighted in Table 4B, arsenic, boron, iron, lead, manganese, and uranium were detected in exceedance of their respective CGWSLs in NCL wells during at least one 2021 sampling event. No other total metal was detected above its respective CGWSL during either semiannual event.

- The total metal results in groundwater beneath and near the NCL were generally consistent with or less than historical results, except as follows: Arsenic concentrations in MW-45 increased over the five most recent sampling events from 0.00373 mg/L in October 2019 to 0.00845 mg/L in September 2021, which is the historical maximum for this well. Arsenic concentrations in MW-45 remain below the CGWSL of 0.0100 mg/L.
- Uranium concentrations in MW-18 increased over the three most recent sampling events from 0.0283 mg/L in April 2019 to 0.0451 mg/L in June 2020 to 0.0484 mg/L in April 2021. Uranium has fluctuated above and below the CGWSL of 0.0300 mg/L in this well over time.
- Manganese concentrations increased in wells MW-54A and MW-55 over the six most recent sampling events. Manganese exceeded the CGWSL of 0.200 mg/L in MW-54A in September 2021 for the first time since at least April 2019. Manganese concentrations have fluctuated above and below the CGWSL across the refinery over time.
- Manganese concentrations in MW-108 increased from 0.0593 mg/L in October 2020 to 0.231 mg/L in April 2021 but decreased to 0.0665 mg/L in September 2021. The April 2021 manganese result was the first exceedance of the CGWSL in this well since at least April 2019. Manganese concentrations have fluctuated above and below the CGWSL across the refinery over time.

As shown in the COC concentration plots included in Appendix C, concentrations of target COC arsenic in wells located in and near the NCL are overall stable to declining, except in well MW-45 as discussed above.

Cyanide, NCL

Groundwater samples collected from wells MW-18 during the first 2021 semiannual event and MW-45 and MW-55 during both 2021 semiannual events were analyzed for cyanide. Cyanide

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was not detected above the method detection limit in groundwater samples collected from any NCL well during the April 2021 or September 2021 sampling events.

Water Quality Parameters, NCL

In 2021, groundwater samples were collected from wells located in and near the NCL for analysis of water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite [as nitrogen]).

No CGWSLs are applicable for calcium, potassium, or sodium. Chloride, fluoride, nitrate/nitrite, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in groundwater samples from various wells in and near the NCL, as highlighted in Table 4C. The reported concentrations of these constituents generally exhibit an overall stable trend across the NCL, with some seasonal fluctuations between the first and second semiannual events. Nitrate/nitrite concentrations in NCL-49 have overall increased over the six most recent sampling events from 5.63 mg/L in April 2019 to 13.3 mg/L in September 2021, which is above the CGWSL of 10.0 mg/L, and the historical maximum since at least 2018. Nitrate/nitrite concentrations in this well will be reviewed again in 2022.

5.3.2 Tetra Ethyl Lead Surface Impoundment – Analytical Results

Groundwater monitoring beneath the closed TEL surface impoundment is ongoing. Groundwater samples were collected from the following wells during 2021 semiannual events:

- First Semiannual Event (2 wells): MW-49 and TEL-4.
- Second Semiannual Event (2 wells): MW-49 and TEL-4.

Groundwater samples collected from these TEL area wells were analyzed for GRO, DRO, VOCs, the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium), and water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite). In addition, groundwater samples collected from MW-49 were analyzed for the expanded total metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium) and cyanide.

Analytical results of groundwater samples collected from TEL wells in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, TEL

In 2021, groundwater samples were collected from wells located in and near the TEL for analysis of TPH DRO and GRO. TPH results that exceeded their respective CGWSL in TEL wells are summarized in the table below:

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Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
TEL	*First Semiannual Event (April 2021)*				
	TPH-DRO	**0.0858**	2	2	6.87 (TEL-4 & TEL-4 FD)
	TPH-GRO	**0.0101**	2	2	2.56 (MW-49)
	Second Semiannual Event (September 2021)				
	TPH-DRO	**0.0858**	2	2	6.81 (MW-49)
	TPH-GRO	**0.0101**	2	2	2.57 (MW-49)

As summarized above and highlighted in Table 4A, DRO and GRO were detected in exceedance of their respective CGWSLs in both TEL area wells sampled during both 2021 semiannual events.

DRO and GRO concentrations in both TEL area wells have exhibited a stable to decreasing trend over at least the four most recent sampling events, as shown in the COC concentration plots included in Appendix C.

Volatile Organic Compounds, TEL

In 2021, groundwater samples were collected from wells located in and near the TEL for analysis of VOCs. VOC results that exceeded their respective CGWSL in TEL wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
TEL	*First Semiannual Event (April 2021)*				
	Benzene	**0.00500**	2	1	0.280 (MW-49)
	MTBE	**0.100**	2	1	0.257 (MW-49)
	Second Semiannual Event (September 2021)				
	Benzene	**0.00500**	2	2	0.280 (MW-49)
	MTBE	**0.100**	2	1	0.210 (MW-49)

As summarized above and highlighted in Table 4A, benzene and MTBE were detected in exceedance of their respective CGWSLs in TEL wells during both 2021 sampling events. No other VOC was detected above its respective CGWSL during either semiannual event.

The 2021 VOC results of groundwater in TEL area wells were consistent with historical results. As shown in the COC concentration plots included in Appendix C, concentrations of target VOCs in TEL area wells exhibited stable trends over time despite occasional fluctuations, with the following exceptions:

- MTBE concentrations have overall increased in MW-49 since 2013 after declining between 2009 and 2013. MTBE concentrations increased from 0.196 mg/L in October 2020 to the historical maximum of 0.257 mg/L in April 2021, and then decreased to 0.210 mg/L in September 2021. MTBE concentrations in MW-49 will be reviewed again in 2022. MW-49 is located approximately 650 feet cross- and downgradient of the TEL. MTBE concentrations in wells located immediately downgradient of the TEL (TEL-1, TEL-2, and TEL-3) are stable over time (with data through 2020), indicating the

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increasing trend of MTBE concentrations at MW-49 is not associated with the TEL. Additionally, the TEL has not received waste since 1983, which is the first year that MTBE was used at the refinery. A work plan to investigate MTBE in groundwater, titled *Evaluation of Methyl Tert-Butyl Ether (MTBE) in Groundwater*, was submitted to NMED on September 13, 2019 (Wood 2019).

- Benzene concentrations in TEL-4 have fluctuated significantly above and below the CGWSL since 2006. Benzene concentrations increased from an estimated J-flagged concentration of 0.000602 J mg/L (field duplicate) in April 2021 to 0.133 mg/L (field duplicate) in September 2021. The September 2021 result is below the historical maximum of 1.20 mg/L in November 2014.

Total Metals, TEL

Groundwater samples were collected from wells located in and near the TEL for analysis of the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium). In addition, groundwater sample collected from MW-49 were analyzed for the expanded total metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium). Total metal results that exceeded their respective CGWSL in TEL wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
TEL	*First Semiannual Event (April 2021)*				
	Arsenic	**0.0100**	2	1	0.0130 (TEL-4 FD)
	Chromium	**0.0500**	2	1	0.316 (TEL-4)
	Iron	**1.00**	2	1	1.18 (TEL-4)
	Manganese	**0.200**	2	2	1.53 (TEL-4)
	Second Semiannual Event (September 2021)				
	Chromium	**0.0500**	2	1	0.0655 (TEL-4)
	Manganese	**0.200**	2	2	1.68 (TEL-4)

FD: Field Duplicate

As summarized above and highlighted in Table 4B, chromium, and manganese were detected in exceedance of their respective CGWSLs in at least one TEL well during both 2021 sampling events. Arsenic and iron were detected above their respective CGWSL in one TEL well during the first 2021 semiannual sampling event. No other total metal was detected above its respective CGWSL during either semiannual event.

The 2021 total metal results in TEL wells were generally consistent with historical results, except arsenic and iron in TEL-4 during April 2021. Arsenic concentrations in TEL-4 increased from 0.000923 mg/L in October 2020 to 0.0130 mg/L in April 2021 (field duplicate), and then decreased in to 0.00826 mg/L in September 2021. Iron concentrations in TEL-4 increased from 0.479 mg/L in October 2020 to 1.18 mg/L in April 2021, and then decreased to 0.486 mg/L in September 2021. The arsenic and iron concentrations reported for TEL-4 in April 2021 were the only exceedances of the CGWSLs since at least April 2019. Arsenic concentrations in TEL-4 have historically fluctuated above and below the CGWSL and the April 2021 result was below the historical maximum for this well.

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Groundwater concentrations of target COC arsenic in TEL area wells are overall stable to declining, despite occasional fluctuations, as shown in the COC concentration plots included in Appendix C. Arsenic concentrations in TEL-4 overall increased since 2018, but concentrations remain below historical maximum concentrations for this well.

Cyanide, TEL

Groundwater samples collected from MW-49 during both 2021 semiannual events were analyzed for cyanide. In April 2021, cyanide was detected below the CGWSL of 0.200 mg/L, at an estimated J-flagged concentration of 0.0990 J mg/L; cyanide concentrations in September 2021 were not detected above the method detection limit.

Water Quality Parameters, TEL

Chloride, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in groundwater samples collected from TEL area wells during 2021, as highlighted in Table 4C. The reported concentrations of these constituents in 2021 were overall consistent with historical results. Fluoride and nitrate/nitrite were not detected above the CGWSL in any TEL area well, which is consistent with historical results for nitrate/nitrate. Fluoride has fluctuated above and below the CGWSL in various TEL wells. No CGWSLs are applicable for calcium, potassium, or sodium. Analytical results of these analytes in all TEL area wells were consistent with historical results.

5.3.3 Evaporation Ponds Analytical – Results

Groundwater monitoring is ongoing beneath the inactive EPs. Analytical results of groundwater samples collected from EP wells in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, EPs

In 2021, groundwater samples were collected from the following EP wells during each semiannual event for analysis of DRO and GRO, unless noted otherwise:

- First Semiannual Event (51 wells): MW-1R (DRO only), MW-2A, MW-3, MW-4A, MW-4B, MW-5A, MW-5B, MW-5C, MW-6A, MW-6B, MW-7A, MW-7B, MW-10, MW-11A, MW-11B, MW-15, MW-18A (DRO only), MW-18B, MW-22A, MW-22B, MW-70, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-78, MW-79, MW-80, MW-81, MW-82, MW-83, MW-84, MW-87, MW-88, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR, OCD-7B, OCD-8A, and OCD-8B.
- Second Semiannual Event (30 wells): MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-10, MW-18A (DRO only), MW-22A, MW-70, MW-74, MW-75, MW-76, MW-79, MW-83, MW-84, MW-87, MW-88, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR, and OCD-8A.

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TPH results that exceeded their respective CGWSL in EP wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Evaporation Ponds	*First Semiannual Event (April 2021)*				
	TPH-GRO	**0.0101**	49	35	2.56 (MW-5A)
	TPH-DRO-EP	**0.0167**	51	51	385 (MW-78)
	Second Semiannual Event (September 2021)				
	TPH-GRO	**0.0101**	29	21	3.56 (MW-74)
	TPH-DRO-EP	**0.0167**	30	30	74.6 (MW-84)

As summarized above and highlighted in Table 4A, DRO and GRO were detected in exceedance of their respective CGWSLs in EP wells sampled during both 2021 semiannual events.

As shown in the COC concentration plots included in Appendix C, DRO and GRO concentrations in EP wells are overall stable over time despite occasional fluctuations, with the following exceptions:

- DRO concentrations in EP wells MW-3, MW-4A, MW-6A, MW-6B, MW-18A, MW-18B, MW-22B, MW-73, MW-75, MW-76, MW-77, MW-81, MW-83, MW-84, and OCD-5, have overall increased since approximately 2011. However, DRO concentrations have exhibited a stable to decreasing trend over the four to twelve most recent sampling events in these wells. DRO concentrations in these wells will be reviewed again in 2022.
- DRO and GRO concentrations in MW-5C were overall stable from 2014 to 2019 but increased to historical maximums in 2021. DRO concentrations increased from 0.442 mg/L in April 2019 to 11.3 mg/L in April 2021. GRO concentrations increased from an estimated concentration of 0.0423 JB mg/L in April 2019 to 1.98 mg/L in April 2021, which is the first exceedance of GRO in this well. DRO and GRO concentrations in MW-5C will be reviewed again in 2023 (well sampled biennially).
- DRO concentrations in MW-78 were overall stable from 2015 to 2020 but increased to a historical maximum in 2021. DRO concentrations increased from 38.5 mg/L in June 2020 to 385 mg/L in April 2021. DRO concentrations in MW-78 will be reviewed again in 2022.
- DRO concentrations in well MW-2A have fluctuated over time, but exhibited a stable to decreasing trend from 2014 to 2020. DRO concentrations increased from 0.153 mg/L in October 2020 to 1.25 mg/L in April 2021, which is below the historical maximum for this well. DRO concentrations decreased to 0.181 mg/L in September 2021. DRO concentrations in MW-2A will be reviewed again in 2022.
- DRO and GRO concentrations in OCD-5 have overall increased since October 2016, but appear to be stabilizing over the five most recent sampling events. DRO and GRO concentrations in OCD-5 will be reviewed again in 2022.

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Apparent GRO concentration increases shown on the COC concentration plots included in Appendix C for EP wells MW-78, MW-84, MW-86, and MW-122 in 2020 and 2021 are attributed to elevated detection limits. GRO was not detected in these wells in 2021 above the plotted elevated detection limits of 1.57 mg/L (MW-78 and MW-122) and 3.14 mg/L (MW-84).

Volatile Organic Compounds, EPs

In 2021, groundwater samples collected from the following EP wells during each semiannual event were analyzed for VOCs:

- First Semiannual Event (51 wells): MW-1R, MW-2A, MW-3, MW-4A, MW-4B, MW-5A, MW-5B, MW-5C, MW-6A, MW-6B, MW-7A, MW-7B, MW-10, MW-11A, MW-11B, MW-15, MW-18A, MW-18B, MW-22A, MW-22B, MW-70, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-78, MW-79, MW-80, MW-81, MW-82, MW-83, MW-84, MW-87, MW-88, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR, OCD-7B, OCD-8A, and OCD-8B.
- Second Semiannual Event (2 wells): MW-7A and MW-120.

VOCs were not detected above their respective CGWSLs in the EP wells sampled during both 2021 semiannual events. The 2021 VOC results in EP wells are consistent with historical results.

Total Metals, EPs

In 2021, groundwater samples were collected from the following EP wells during each semiannual event for analysis of the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium):

- First Semiannual Event (51 wells): MW-1R, MW-2A, MW-3, MW-4A, MW-4B, MW-5A, MW-5B, MW-5C, MW-6A, MW-6B, MW-7A, MW-7B, MW-10, MW-11A, MW-11B, MW-15, MW-18A, MW-18B, MW-22A, MW-22B, MW-70, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-78, MW-79, MW-80, MW-81, MW-82, MW-83, MW-84, MW-87, MW-88, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR, OCD-7B, OCD-8A, and OCD-8B.
- Second Semiannual Event (30 wells): MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-10, MW-18A, MW-22A, MW-70, MW-74, MW-75, MW-76, MW-79, MW-83, MW-84, MW-87, MW-88, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR, and OCD-8A.

In addition, groundwater samples collected from wells MW-18A and OCD-8A were analyzed for the expanded total metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium). Total metal results that exceeded their respective CGWSL in EP wells are summarized in the table below:

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Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Evaporation Ponds	*First Semiannual Event (April 2021)*				
	Arsenic	**0.0100**	51	25	0.178 (MW-5C)
	Boron	**0.750**	2	2	1.93 (MW-18A)
	Chromium	**0.0500**	51	2	0.215 (MW-78)
	Iron	**1.00**	51	22	13.1 (OCD-7AR)
	Manganese	**0.200**	51	41	8.88 (MW-4B)
	Second Semiannual Event (September 2021)				
	Arsenic	**0.0100**	30	17	0.372 (MW-75)
	Boron	**0.750**	2	2	2.02 (MW-18A)
	Iron	**1.00**	30	16	11.8 (OCD-7AR)
	Manganese	**0.200**	30	28	3.44 (MW-123)

As summarized above and highlighted in Table 4B, arsenic, boron, chromium, iron, and manganese, were detected in exceedance of their respective CGWSLs in EP wells during at least one 2021 sampling event. No other total metal was detected above its respective CGWSL during either semiannual event.

The 2021 analytical results of total metals in groundwater samples collected from EP wells were generally consistent with historical results, with the following exceptions:

- Arsenic concentrations in MW-5C were overall stable from 2014 to 2019 but increased to a historical maximum in 2021. Arsenic concentrations increased from 0.0114 mg/L in April 2019 to 0.178 mg/L in April 2021. Arsenic concentrations in MW-5C will be reviewed again in 2023 (well sampled biennially).
- Arsenic concentrations in MW-84 increased over the five most recent sampling events from 0.0809 mg/L in April 2019 to 0.218 mg/L in September 2021.Arsenic concentrations in this well remain below the historical maximum.
- Iron concentrations have fluctuated up to two orders of magnitude in many EP wells over time. Iron concentrations in EP wells during the 2021 semiannual sampling events were generally consistent with historical results except in MW-5C, MW-7A, MW-70, MW-74, MW-75, OCD-1R, and OCD-5, which all increased to a historical maximum since at least 2019. Iron concentrations have historically exceeded the CGWSL in these wells.
- Chromium concentrations in MW-71 increased from 0.00394 mg/L in October 2020 to 0.0119 mg/L in April 2021, but decreased to 0.00277 mg/L in September 2021. Chromium concentrations in this well remain below the CGWSL of 0.0500 mg/L.
- Selenium concentrations in wells MW-22A and MW-84 increased at least an order of magnitude in September 2021 to historical maximums in these wells since at least 2019. In MW-22A, selenium increased from an estimated concentration of 0.000986 J mg/L in April 2021 to 0.0288 mg/L in September 2021. Selenium concentrations in MW-84 increased from 0.00662 mg/L in April 2021 to 0.0112 mg/L in September 2021. Selenium concentrations in these wells remain below the CGWSL of 0.0500 mg/L.

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As shown in the COC concentration plots included in Appendix C, concentrations of target COC arsenic in EP wells are overall stable despite occasional fluctuations, except in wells discussed above.

Cyanide, EPs

Groundwater samples collected from EP wells MW-18A and OCD-8A during both 2021 semiannual events were analyzed for cyanide. Cyanide was not above the method detection limit or the CGWSL in groundwater samples collected from any EP wells during either semiannual event.

Water Quality Parameters, EPs

In 2021, groundwater samples were collected from the following EP wells during each semiannual event for analysis of water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite [as nitrogen]):

- First Semiannual Event (51 wells): MW-1R, MW-2A, MW-3, MW-4A, MW-4B, MW-5A, MW-5B, MW-5C, MW-6A, MW-6B, MW-7A, MW-7B, MW-10, MW-11A, MW-11B, MW-15, MW-18A, MW-18B, MW-22A, MW-22B, MW-70, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-78, MW-79, MW-80, MW-81, MW-82, MW-83, MW-84, MW-87, MW-88, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7AR, OCD-7B, OCD-8A, and OCD-8B.
- Second Semiannual Event (25 wells): MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-10, MW-11A, MW-18A, MW-22A, MW-74, MW-75, MW-76, MW-79, MW-83, MW-84, MW-120, MW-121, MW-122, MW-123, MW-124, OCD-1R, OCD-5, OCD-6, OCD-7AR, and OCD-8A.

No CGWSLs are applicable for calcium, potassium, or sodium. Chloride, fluoride, nitrate/nitrite, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in groundwater samples from various EP wells, as highlighted in Table 4C. The reported concentrations of these constituents in 2021 were overall consistent with historical results, with the following exceptions:

- Concentrations of chloride, nitrate/nitrite, potassium, sodium, sulfate, and TDS in well MW-22A increased in September 2021. Chloride, sulfate, and TDS concentrations have been above their respective CGWSLs since at least 2019 in this well. Nitrate/nitrite concentrations remain below the CGWSL.
- Nitrate/nitrite concentrations in well MW-83 exceeded the CGWSL for the first time since at least 2019 in September 2021. Nitrate/nitrite concentrations increased from not detected above the method detection limit in October 2020 to 8.03 mg/L in April 2021 to 21.4 mg/L in September 2021. Nitrate/nitrite concentrations have also fluctuated by multiple orders of magnitude over time in other EP wells.

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5.3.4 Three Mile Ditch – Analytical Results

Groundwater monitoring is ongoing along the inactive TMD. Analytical results of groundwater samples collected from TMD wells in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, TMD

In 2021, groundwater samples were collected from the following TMD wells during each semiannual event for analysis of DRO:

- First Semiannual Event (11 wells): MW-8, MW-16, MW-20, MW-21, MW-25, MW-26, MW-27, MW-46R, MW-68, MW-71, and MW-89.
- Second Semiannual Event (2 wells): MW-21 and MW-46R.

In addition, groundwater samples collected from wells MW-8 and MW-21 were analyzed for GRO. TPH results that exceeded their respective CGWSL in TMD wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Three Mile Ditch	*First Semiannual Event (April 2021)*				
	TPH-DRO	**0.0858**	11	8	0.354 (MW-21)
	TPH-GRO	**0.0101**	2	2	0.107 (MW-8)
	Second Semiannual Event (September 2021)				
	TPH-DRO	**0.0858**	2	2	0.209 (MW-46R)
	TPH-GRO	**0.0101**	1	1	0.100 J (MW-21)

As summarized above and highlighted in Table 4A, DRO and GRO were detected in exceedance of their respective CGWSLs in TMD wells sampled in at least one 2021 semiannual event.

As shown in the COC concentration plots included in Appendix C, DRO concentrations have overall increased since 2013 in TMD wells MW-8, MW-16, MW-20, MW-21, MW-25, MW-26, MW-27, MW-46R, MW-68, and MW-89. However, DRO concentrations in all of these wells have exhibited a stable to decreasing trend over at least the six most recent sampling events except in MW-21 and MW-46R which increased during 2021, as follows:

- DRO concentrations in well MW-21 increased from 0.163 mg/L in October 2020 to 0.354 mg/L in April 2021, which is the historical maximum for this well. DRO concentrations decreased to 0.174 mg/L in September 2021.
- DRO concentrations in well MW-46R increased from 0.111 mg/L in October 2020 to 0.217 mg/L in April 2021, which is the historical maximum for this well. DRO concentrations decreased slightly to 0.209 mg/L in September 2021.

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DRO concentrations in these wells will be reviewed again in 2022.

As shown in the COC concentration plots included in Appendix C, GRO concentrations have exhibited an overall increasing trend since 2014 in TMD wells MW-8 and MW-21, but decreased in both wells in 2021. Reported GRO concentrations in 2021 decreased in well MW-8 from 0.300 mg/L in June 2020 to 0.107 mg/L in April 2021. GRO concentrations decreased in well MW-21 from a historical maximum of 0.492 mg/L in October 2020 to 0.0899 J mg/L in April 2021 and 0.100 J mg/L in September 2021. GRO concentrations in both these wells will be reviewed again in 2022.

Volatile Organic Compounds, TMD

In 2021, groundwater samples collected from the following TMD wells during each semiannual event were analyzed for VOCs:

- First Semiannual Event (13 wells): MW-8, MW-16, MW-20, MW-21, MW-25, MW-26, MW-27, MW-46R, MW-68, MW-71, MW-89, NP-1, and NP-6.
- Second Semiannual Event (3 wells): MW-21, MW-46R, and NP-1.

VOC results that exceeded their respective CGWSL in TMD wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Three Mile Ditch	*First Semiannual Event (April 2021)*				
	MTBE	**0.100**	13	2	0.104 (MW-8)
	Second Semiannual Event (October 2019)				
	MTBE	**0.100**	3	2	0.503 (NP-1)

As summarized above and highlighted in Table 4A, MTBE was detected in exceedance of its CGWSL in TMD wells during both 2021 sampling events. No other VOC was detected above its respective CGWSL during either semiannual event.

The 2021 VOC results for groundwater samples collected from TMD wells were generally consistent with historical results. As shown in the COC concentration plots included in Appendix C, concentrations of target VOCs in TMD wells are overall stable, except for MTBE in wells MW-8, MW-21, and NP-1, as discussed below:

- MTBE concentrations in MW-8 have exhibited an overall increasing trend since April 2016 and exceeded the CGWSL for the first time in June 2020. MTBE concentrations decreased slightly from 0.149 mg/L in June 2020 to 0.104 mg/L in April 2021 and remain above the CGWSL.
- MTBE concentrations in MW-21 have exhibited an overall increasing trend since October 2013 and exceeded the CGWSL for the first time in April 2021. MTBE concentrations have fluctuated in this well between October 2019 and September 2021 and may be stabilizing. MTBE concentrations decreased from a historical maximum of

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0.243 mg/L in October 2020 to 0.0948 mg/L in April 2021 (below the CGWSL) and increased to 0.191 mg/L in September 2021.

- MTBE concentrations in NP-1 have overall increased since November 2014 but have stabilized since 2017 despite apparent seasonal fluctuations.

MTBE concentrations in these wells will be reviewed again in 2022. A work plan to investigate MTBE in groundwater was submitted to NMED on September 13, 2019 (Wood 2019).

Total Metals, TMD

In 2021, groundwater samples were collected from the following TMD wells during each semiannual event for analysis of the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium):

- First Semiannual Event (11 wells): MW-8, MW-16, MW-20, MW-21, MW-25, MW-26, MW-27, MW-46R, MW-68, MW-71, and MW-89.
- Second Semiannual Event (2 wells): MW-21 and MW-46R.

In addition, the groundwater sample collected from TMD well MW-71 during the first 2021 semiannual event was analyzed for the expanded total metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium). Total metal results that exceeded their respective CGWSL in TMD wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Three Mile Ditch	*First Semiannual Event (April 2021)*				
	Arsenic	**0.0100**	11	1	0.0132 (MW-89)
	Manganese	**0.200**	11	4	2.16 (MW-25)
	Selenium	**0.0500**	11	1	0.0543 (MW-8)
	Uranium	**0.0300**	1	1	0.0666 (MW-71)
	Second Semiannual Event (October 2019)				
	Manganese	**0.200**	2	1	1.35 (MW-21)
	Selenium	**0.0500**	2	1	0.0557 (MW-21)

As summarized above and highlighted in Table 4B, manganese and selenium were detected in exceedance of their respective CGWSLs in TMD wells during both 2021 sampling events. Arsenic and uranium were detected in exceedance of their respective CGWSLs during the first 2021 sampling event. No other total metal was detected above its respective CGWSL during either semiannual event.

The 2021 analytical results of total metals in groundwater samples collected from TMD wells were generally consistent with historical results, with the following exceptions:

- Selenium concentrations in TMD wells MW-8, MW-27, and MW-68 have exhibited an overall increasing trend since 2018. Selenium concentrations in April 2021 remain below the CGWSL of 0.0500 mg/L in MW-27 (0.0173 mg/L) and MW-68 (0.0224 mg/L).

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Selenium concentrations in MW-8 decreased slightly from 0.0626 mg/L in June 2020 to 0.0543 mg/L in April 2021, but remain slightly above the CGWSL of 0.0500 mg/L.

- Selenium concentrations in MW-21 have fluctuated above and below the CGWSL over time. Selenium concentrations decreased from 0.0429 mg/L in October 2020 to 0.0340 mg/L in April 2021 and increased to 0.0557 mg/L in September 2021, which is the historical maximum for this well since at least April 2019.

Concentrations of target COC arsenic in TMD wells are overall stable, as shown in the COC concentration plots included in Appendix C.

Cyanide, TMD

Cyanide was not detected above the method detection limit or the CGWSL in the groundwater sample collected from TMD well MW-71 during the first 2021 semiannual event.

Water Quality Parameters, TMD

In 2021, groundwater samples were collected from the following TMD wells during each semiannual event for analysis of water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite [as nitrogen]):

- First Semiannual Event (12 wells): MW-8, MW-16, MW-20, MW-21, MW-25, MW-26, MW-27, MW-46R, MW-68, MW-71, MW-89, and NP-1.
- Second Semiannual Event (2 wells): MW-21 and MW-46R.

No CGWSLs are applicable for calcium, potassium, or sodium. Chloride, fluoride, nitrate/nitrite, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in groundwater samples from TMD wells, as highlighted in Table 4C. The reported concentrations of these constituents in 2021 were consistent with historical results, with the following exceptions:

- Calcium, chloride, nitrate/nitrite, potassium, sodium, and TDS concentrations in MW-8 increased over at least the four most recent sampling events. Chloride concentrations increased from 443 mg/L in April 2018 to 625 mg/L in April 2021. Nitrate/nitrite concentrations increased from 8.72 mg/L in April 2018 to 19.4 mg/L in April 2021. TDS concentrations increased from 4,040 mg/L in April 2018 to 5,790 mg/L in April 2021.

5.3.5 North Refinery Area – Analytical Results

Groundwater monitoring is ongoing in the northern portion of the active refinery (i.e., North Refinery Area). Groundwater samples were collected from the following North Refinery Area wells listed below during the 2021 semiannual sampling events:

- First Semiannual Event (9 wells): MW-29, MW-41, MW-42, MW-61, MW-62R, MW-90, MW-98, RW-9, and RW-10.
- Second Semiannual Event (6 wells): MW-29, MW-61, MW-62, MW-90, MW-96, and MW-98.

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Groundwater samples collected from these North Refinery Area wells were analyzed for DRO, GRO, VOCs, the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium), and water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite).

Analytical results of groundwater samples collected from wells located within the North Refinery Area in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, North Refinery Area

In 2021, groundwater samples were collected from North Refinery Area wells for analysis of TPH DRO and GRO. TPH results that exceeded their respective CGWSL in North Refinery Area wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
North Refinery	*First Semiannual Event (April 2021)*				
	TPH-DRO	**0.0858**	9	9	9.88 (MW-62R)
	TPH-GRO	**0.0101**	9	9	14.4 (MW-98)
	Second Semiannual Event (September 2021)				
	TPH-DRO	**0.0858**	6	6	11.3 (MW-62)
	TPH-GRO	**0.0101**	6	6	21.8 (MW-62)

As summarized above and highlighted in Table 4A, DRO and GRO were detected in exceedance of their respective CGWSLs in all North Refinery Area wells sampled during both 2021 semiannual events.

As shown in the COC concentration plots included in Appendix C, DRO concentrations in North Refinery Area wells MW-29, MW-41, MW-59, MW-67, MW-91, MW-92, MW-95, MW-96, RW-9, RW-10, and RW-17, have overall increased since approximately 2010-2014. However, DRO concentrations in these wells have exhibited a stable to decreasing trend over at least the six most recent sampling events except in MW-29, MW-41, MW-59, RW-10, as follows:

- DRO concentrations in MW-41 increased to the historical maximum in April 2019 but decreased during sampling events in June 2020 and April 2021.
- DRO concentrations in MW-29 increased from 2.28 mg/L in October 2020 to 3.66 mg/L in April 2021 to 8.12 mg/L in September 2021, which is the historical maximum for this well.
- DRO concentrations in RW-10 increased from 3.33 mg/L in June 2020 to 6.96 mg/L in April 2021, which is the historical maximum for this well.
- DRO concentrations in MW-59 increased to the historical maximum in June 2020 but was not sampled in 2021 due to the presence of PSH.

DRO concentrations in the remaining North Refinery Area wells are overall stable over time.

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GRO analytical results in groundwater samples collected from North Refinery Area wells in 2021 were generally consistent with historical results except in MW-62 and RW-10, as follows:

- GRO concentrations in MW-62 increased from 7.35 mg/L in October 2020 to 21.8 mg/L in September2021 but remain below the historical maximum of 42.0 mg/L (November 2014).
- GRO concentrations in RW-10 increased from 0.219 mg/L in June 2020 to 0.532 mg/L April 2021 but remain below the historical maximum of 4.6 mg/L (April 2012).

GRO concentrations in these wells will be reviewed again in 2022. As shown in the COC concentration plots included in Appendix C, GRO concentrations in all other North Refinery Area wells are overall stable over time despite occasional fluctuations.

Volatile Organic Compounds, North Refinery Area

In 2021, groundwater samples were collected from North Refinery Area wells for analysis of VOCs. VOC results that exceeded their respective CGWSL in North Refinery Area wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
North Refinery	*First Semiannual Event (April 2021)*				
	Benzene	**0.00500**	9	5	1.29 (MW-61)
	Ethylbenzene	**0.700**	9	1	0.938 (MW-98)
	Total Xylenes	**0.620**	9	1	1.84 (MW-98)
	MTBE	**0.100**	9	1	0.219 (RW-9)
	Naphthalene	**0.0300**	9	2	0.294 (MW-98)
	1,2,4-TMB	**0.0560**	9	2	0.431 (MW-98)
	1,3,5-TMB	**0.0600**	9	1	0.0924 (MW-98)
	Second Semiannual Event (September 2021)				
	Benzene	**0.00500**	6	4	2.11 (MW-62)
	Ethylbenzene	**0.700**	6	1	0.773 (MW-62)
	Total Xylenes	**0.620**	6	3	2.37 (MW-62)
	MTBE	**0.100**	6	2	29.5 (MW-96)
	Naphthalene	**0.0300**	6	3	0.344 (MW-62)
	1,2,4-TMB	**0.0560**	6	3	1.20 (MW-62)
	1,3,5-TMB	**0.0600**	6	2	0.204 (MW-62)

As summarized above and highlighted in Table 4A, benzene, ethylbenzene, total xylenes, MTBE, naphthalene, 1,2,4-trimethylbenzene (1,2,4-TMB), and 1,3,5-trimethylbenzene (1,3,5-TMB) were detected in exceedance of their respective CGWSLs in North Refinery Area wells during both 2021 semiannual sampling events. No other VOC was detected above its respective CGWSL during either semiannual event.

The 2021 VOC results in groundwater samples collected from North Refinery Area wells were generally consistent with historical results with exceptions listed below:

- MTBE concentrations in well MW-29 increased from 0.00190 mg/L in April 2021 to a historical maximum of 0.0238 mg/L in September 2021, but remain an order of magnitude below the CGWSL.

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- MTBE concentrations in MW-41 have increased over the last five sampling events from 0.0038 mg/L in April 2017 to 0.0267 mg/L in April 2021, but remain below the historical maximum and CGWSL.
- In MW-61, concentrations of 1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, MTBE, naphthalene, toluene, and total xylenes have overall increased in since 2017. However, concentrations of these VOCs in 2021 remain below their respective historical maximum and have exhibited a stable trend over at least the last four sampling events, with the exception of ethylbenzene and MTBE. Ethylbenzene increased from 0.0519 mg/L in October 2020 to 0.0587 mg/L in April 2021 to 0.110 mg/L in September 2021. MTBE increased from an estimated concentration of 0.0074 J mg/L in April 2021 to an estimated concentration of 0.0286 J mg/L in September 2021, which is the historical maximum for this well but an order of magnitude below the CGWSL.
- In MW-62, concentrations of 1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, MTBE, and total xylenes increased over at least the three most recent sampling events, but all the target VOCs remain below their respective historical maximum except for MTBE and total xylenes. MTBE concentrations increased over the last five sampling events from not detected above the method detection limit in April 2019 to a historical maximum of 0.120 mg/L in September 2021, which is the first exceedance of the CGWSL (0.100 mg/L) in this well. Concentrations of total xylenes increased over the last three sampling events from 0.557 mg/L in June 2020 to a historical maximum of 2.37 mg/L in September 2021. Concentrations of total xylenes have fluctuated above and below the CGWSL (0.620 mg/L) over time.
- Benzene concentrations in MW-90 exceeded the CGWSL in September 2021 for the first time since 2016. Benzene concentrations decreased from 0.00334 mg/L in October 2020 to 0.00164 mg/L in April 2021, then increased to an estimated concentration of 0.00730 J mg/L in September 2021. This concentration is below the historical maximum of 0.029 mg/L (September 2008).
- MTBE concentrations in RW-9 increased over the four most recent sampling events from 0.00409 mg/L in April 2018 to a historical maximum of 0.219 mg/L in April 2021, which is the first exceedance of the CGWSL.
- In RW-10, concentrations of 1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, MTBE, naphthalene, toluene, and total xylenes increased in 2021 but remain below each respective CGWSL.

VOC concentrations in the above wells will be reviewed again in 2022. As shown in the COC concentration plots included in Appendix C, concentrations of target VOCs in North Refinery Area wells, except as noted above have exhibited an overall stable trend over time despite occasional fluctuations. A work plan to investigate MTBE in groundwater was submitted to NMED on September 13, 2019 (Wood 2019).

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Total Metals, North Refinery Area

In 2021, groundwater samples were collected from North Refinery Area wells for analysis of total metals. Total metal results that exceeded their respective CGWSL in North Refinery Area wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
North Refinery	*First Semiannual Event (April 2021)*				
	Arsenic	**0.0100**	9	3	0.0449 (MW-62R)
	Barium	**2.00**	9	1	3.61 (MW-62R)
	Iron	**1.00**	9	2	4.03 (MW-62R)
	Manganese	**0.2**	9	5	0.758 (MW-41)
	Second Semiannual Event (September 2021)				
	Arsenic	**0.0100**	6	2	0.104 (MW-29)
	Iron	**1.00**	6	1	25.5 (MW-29)
	Manganese	**0.200**	6	2	1.40 (MW-29)

As summarized above and highlighted in Table 4B, arsenic, barium, iron, and manganese were detected in exceedance of their respective CGWSLs in North Refinery wells during at least one 2021 semiannual sampling event. No other total metal was detected above its respective CGWSL during either semiannual event.
The 2021 analytical results of total metals in groundwater samples collected from North Refinery Area wells were generally consistent with historical results, with the following exceptions:

- Arsenic and iron concentrations in MW-29 have overall increased since April 2019. Arsenic concentrations increased from 0.0170 mg/L in October 2020 to 0.0433 mg/L in April 2021 to 0.104 mg/L in September 2021, which is the historical maximum for this well. Iron concentrations increased from 0.294 mg/L in October 2020 to 1.62 mg/L in April 2021 to 25.5 mg/L in September 2021, which is the historical maximum for this well since at least 2019. Arsenic and iron concentrations have fluctuated above and below the CGWSL over time in this well.

- Arsenic concentrations in MW-41 have overall increased since April 2017. Arsenic concentrations increased from 0.0107 mg/L in June 2020 to a historical maximum of 0.0240 mg/L in April 2021. Arsenic concentrations have fluctuated above and below the CGWSL over time in this well.

- Arsenic concentrations in MW-62 have overall increased since October 2018 and exceeded the CGWSL during the last four sampling events. Arsenic concentrations increased from 0.0451 mg/L in October 2020 to a new historical maximum of 0.0901 mg/L in September 2021. Arsenic concentrations have occasionally fluctuated above and below the CGWSL in this well over time.

- Barium and iron concentrations in MW-62R increased in April 2021 from the first sampling event conducted in October 2020 (well installed in September 2020). Barium concentrations increased from 0.129 mg/L in October 2020 to 3.61 mg/L April 2021,

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which exceeds the CGWSL (2.00 mg/L). Iron concentrations increased from 2.90 mg/L in October 2020 to 4.03 mg/L in April 2021.

- Manganese concentrations in MW-90 increased from 0.0615 mg/L in April 2019 to 0.533 mg/L in September 2021, which is the first exceedance of the CGWSL since at least April 2019. Manganese concentrations have fluctuated above and below the CGWSL across the refinery over time.

Concentrations of total metals in the above wells will be reviewed again in 2022. As shown in the COC concentration plots included in Appendix C, concentrations of target COC arsenic in North Refinery Area wells have fluctuated above and below the CGWSL over time in wells MW-23, MW-29, MW-39, MW-41, MW-42, MW-43, MW-60, MW-62, MW-67, MW-90, MW-93, RW-1, RW-2, RW-7, RW-16, and RW-17. Arsenic concentrations are overall stable to declining, despite occasional fluctuations, with the exceptions noted above.

Cyanide, North Refinery Area

No groundwater samples collected from North Refinery Area wells in 2021 were analyzed for cyanide.

Water Quality Parameters, North Refinery Area

In 2021, groundwater samples were collected from North Refinery Area wells for analysis of water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite [as nitrogen]).

No CGWSLs are applicable for calcium, potassium, or sodium. Nitrate/nitrite did not exceed the CGWSL in any of the North Refinery Area wells during both 2021 semiannual events. Chloride, fluoride, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in groundwater samples from various North Refinery Area wells, as highlighted in Table 4C. The reported concentrations of these constituents were generally consistent with historical results except chloride concentrations in wells MW-29, MW-41, MW-62, and RW-9. Chloride concentrations in these wells have increased since at least 2019 and are above the CGWSL. Water quality parameter concentrations in these wells have fluctuated over time.

5.3.6 South Refinery Area – Analytical Results

Groundwater monitoring is ongoing in the southern portion of the active refinery (i.e., South Refinery Area). Analytical results of groundwater samples collected from wells located within the South Refinery Area in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, South Refinery Area

Groundwater samples were collected from the following South Refinery Area wells during each 2021 semiannual event for analysis of DRO and GRO, unless noted otherwise:

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- First Semiannual Event (13 wells): MW-50 (DRO only), MW-52, MW-64, MW-66, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-109, MW-110, and MW-139.
- Second Semiannual Event (9 wells): MW-50 (DRO only), MW-52, MW-64, MW-101, MW-102, MW-104, MW-109, MW-110, and MW-139.

TPH results that exceeded their respective CGWSL in South Refinery Area wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
South Refinery	*First Semiannual Event (April 2021)*				
	TPH-DRO	**0.0858**	13	13	26.3 (MW-106)
	TPH-GRO	**0.0101**	12	11	100 (MW-64)
	Second Semiannual Event (September 2021)				
	TPH-DRO	**0.0858**	9	9	14.5 (MW-102)
	TPH-GRO	**0.0101**	8	7	98.2 (MW-64)

As summarized above and highlighted in Table 4A, DRO and GRO were detected in exceedance of their respective CGWSLs in South Refinery Area wells sampled during both 2021 semiannual events.

As shown in the COC concentration plots included in Appendix C, DRO concentrations in South Refinery Area wells MW-28, MW-50, MW-99, MW-101, MW-104, and MW-106 have overall increased since approximately 2011 but exhibited a stable to decreasing trend since at least 2017, except in MW-106. DRO concentrations had overall decreased in MW-106 between October 2017 and April 2021 but increased from 16.5 mg/L in April 2021 to a historical maximum of 26.3 mg/L in September 2021. DRO concentrations in these wells will be reviewed again in 2021.

As shown in the COC concentration plots included in Appendix C, GRO concentrations in South Refinery Area wells have exhibited a stable trend over time despite occasional fluctuations, except in wells MW-48 and MW-101. GRO concentrations in MW-48 exhibited an overall increasing trend between 2014 and 2018 but was stable to decreasing between April 2018 and October 2019. MW-48 has not been sampled since 2019 due to the presence of PSH at a thickness ≥0.03 feet. GRO concentrations in MW-101 increased from 0.553 mg/L in June 2020 to 5.37 mg/L in October 2020, but decreased during both 2021 semiannual events to 2.91 mg/L in April 2021 and 2.07 mg/L in September 2021.

Volatile Organic Compounds, South Refinery Area

Groundwater samples were collected from the following South Refinery Area wells during each 2021 semiannual event for analysis of VOCs:

- First Semiannual Event (14 wells): MW-50, MW-52, MW-64, MW-66, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-109, MW-110, MW-139, and RA-313.

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- Second Semiannual Event (9 wells): MW-50, MW-52, MW-64, MW-101, MW-102, MW-104, MW-109, MW-110, and MW-139.

VOC results that exceeded their respective CGWSL in North Refinery Area wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
South Refinery	*First Semiannual Event (April 2021)*				
	Benzene	**0.00500**	14	10	27.1 (MW-64)
	Toluene	**1.00**	14	1	8.88 (MW-64)
	Ethylbenzene	**0.700**	14	1	1.80 (MW-64)
	o-Xylene	**0.193**	14	1	0.928 (MW-64)
	Total Xylenes	**0.620**	14	1	4.15 (MW-64)
	MTBE	**0.100**	14	3	3.15 (MW-66)
	Naphthalene	**0.0300**	14	2	0.156 J (MW-102)
	1,2,4-TMB	**0.0560**	14	4	0.436 J (MW-64)
	1,3,5-TMB	**0.0600**	14	1	0.0967 J (MW-64)
	Second Semiannual Event (September 2021)				
	Benzene	**0.00500**	9	4	25.1 (MW-64)
	Toluene	**1.00**	9	1	9.03 (MW-64)
	Ethylbenzene	**0.700**	9	1	1.03 (MW-64)
	o-Xylene	**0.193**	9	1	0.822 (MW-64)
	Total Xylenes	**0.620**	9	1	3.06 (MW-64)
	MTBE	**0.100**	9	2	1.22 (MW-102 & MW-102 FD)
	Naphthalene	**0.0300**	9	2	0.186 J (MW-102 FD)
	1,2,4-TMB	**0.0560**	9	2	0.315 (MW-64)
	1,3,5-TMB	**0.0600**	9	1	0.0602 (MW-64)
	TBA	**0.150**	9	2	2.48 (MW-64)

FD: Field Duplicate

As summarized above and highlighted in Table 4A and Appendix C, benzene, toluene, ethylbenzene, o-xylene, total xylenes, MTBE, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TBA were detected in exceedance of their respective CGWSLs in South Refinery Area wells during at least one 2021 sampling event. No other VOC was detected above its respective CGWSL during either semiannual event.

The 2021 analytical results of VOCs in groundwater samples collected from South Refinery Area wells were generally consistent with historical results with exceptions listed below.

- In MW-66, concentrations of 1,2,4-TMB, ethylbenzene, toluene, and total xylenes increased by an order of magnitude in April 2021 but remain at least one order of magnitude below their respective CGWSL. MTBE concentrations in well MW-66 increased over the last three sampling events from 1.62 mg/L in June 2020 to 1.90 mg/L in October 2020 to 3.15 mg/L in April 2021. However, MTBE concentrations in this well have overall decreased over time from the historical maximum of 8.40 mg/L in December 2006. VOC concentrations in this well will be reviewed again in 2022. A work plan to investigate MTBE in groundwater was submitted to NMED on September 13, 2019 (Wood 2019).

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- In MW-101, concentrations of benzene, ethylbenzene, naphthalene, o-xylene, toluene, and total xylenes have overall increased since June 2020 but decreased during both 2021 semiannual events. Concentrations of these VOCs remain below their respective CGWSL except for benzene which had historically exceeded the CGWSL prior to 2017.
- Benzene concentrations in MW-109 increased from 0.690 mg/L in April 2021 to a historical maximum of 2.18 mg/L in September 2021. Benzene concentrations in this well will be reviewed again in 2022.
- Benzene in MW-110 increased from an estimated concentration of 0.000146 J mg/L in October 2020 to 0.0581 mg/L in April 2021, then decreased to 0.00427 mg/L in September 2021. Benzene concentrations have fluctuated above and below the CGWSL over time in this well and remain below the historical maximum of 0.370 mg/L (January 2011).
- Total xylenes concentrations in well MW-110 have increased over the last three sampling events from not detected above the method detection limit in October 2020 to an estimated concentration of 0.000578 J mg/L in April 2021 to 0.00315 mg/L in September 2021. However, concentrations remain below the CGWSL.
- As discussed further in Section 5.3.11, TBA exceeded the CGWSL of 0.150 mg/L in MW-64 (2.48 mg/L) and MW-102 (0.588 mg/L) in September 2021. . The September 2021 sampling event was the first semiannual sampling event where groundwater samples were analyzed for TBA and TBA concentrations did not exceed the CGWSL in any other well.

As shown in the COC concentration plots included in Appendix C, concentrations of target VOCs in South Refinery Area wells have exhibited overall stable trends over time despite occasional fluctuations, with the exceptions listed above.

Total Metals, South Refinery Area

In 2021, groundwater samples were collected from the following South Refinery Area wells during each semiannual event for analysis of the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium):

- First Semiannual Event (13 wells): MW-50, MW-52, MW-64, MW-66, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-109, MW-110, and MW-139.
- Second Semiannual Event (9 wells): MW-50, MW-52, MW-64, MW-101, MW-102, MW-104, MW-109, MW-110, and MW-139.

In addition, groundwater samples collected from South Refinery Area wells MW-52, and MW-66 were also analyzed for the expanded metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium) during at least one 2021 semiannual event. Total metals results that exceeded their respective CGWSL in South Refinery Area wells are summarized in the table below:

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Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
South Refinery	*First Semiannual Event (April 2021)*				
	Arsenic	**0.0100**	13	5	0.0507 (MW-110)
	Barium	**1.00**	13	2	8.02 (MW-102)
	Boron	**0.750**	2	1	0.765 (MW-52)
	Iron	**1.00**	13	4	3.96 (MW-50)
	Lead	**0.0150**	13	1	0.0176 (MW-66)
	Manganese	**0.200**	13	6	1.85 (MW-110)
	Second Semiannual Event (September 2021)				
	Arsenic	**0.0100**	9	3	0.0278 (MW-110)
	Boron	**0.750**	1	1	0.774 (MW-52)
	Iron	**1.00**	9	1	2.22 (MW-110)
	Manganese	**0.200**	9	3	1.54 (MW-110)
	Selenium	**0.0500**	9	1	0.120 (MW-50)

As summarized above and highlighted in Table 4B, arsenic, barium, boron, iron, lead, manganese, and selenium were detected in exceedance of their respective CGWSLs in South Refinery Area wells during at least one 2021 sampling event. No other total metal was detected above its respective CGWSL during either semiannual event.

The 2021 analytical results of total metals in groundwater in South Refinery Area wells were generally consistent with historical results, with the following exceptions:

- Arsenic concentrations in MW-50 increased from 0.00301 mg/L in October 2020 to a historical maximum of 0.0121 mg/L in April 2021, which is the only exceedance of the CGWSL (0.010 mg/L) in this well. Arsenic concentrations then decreased to 0.00292 mg/L in September 2021 which is consistent with historical results.
- Selenium concentrations in MW-50 increased from an estimated concentration of 0.000675 J mg/L in April 2021 to 0.120 mg/L in September 2021, which is the first exceedance of the CGWSL since at least 2019. Selenium concentrations in this well will be reviewed again in 2022.
- Nickel concentrations in MW-52 have increased over the five most recent sampling events from 0.00635 mg/L in April 2019 to 0.0377 mg/L in September 2021 but remain below the CGWSL of 0.0500 mg/L.
- Arsenic concentrations in MW-106 overall increased from 0.00725 mg/L in April 2019 to the historical maximum of 0.0255 mg/L in October 2020. Arsenic concentrations decreased to 0.0209 mg/L in April 2021.
- Iron concentrations have fluctuated up to an order of magnitude in South Refinery Area wells over time. Iron concentrations fluctuated above the CGWSL in wells MW-50, MW-66, and MW-105 during one 2021 sampling event. Iron has exceeded the CGWSL in these wells during at least one other sampling event conducted since 2019.

Concentrations of target COC arsenic in South Refinery Area wells are overall stable despite occasional fluctuations, as shown in the COC concentration plots included in Appendix C.

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Arsenic concentrations have fluctuated above and below the CGWSL over time in wells KWB-6, MW-28, MW-48, MW-52, MW-65, MW-66, MW-99, MW-104 through MW-107, MW-109, and MW-110.

Cyanide, South Refinery Area

Groundwater samples collected from South Refinery Area wells MW-52 during both 2021 semiannual events and MW-66 during the first 2021 semiannual event were analyzed for cyanide. Cyanide was not detected above the method detection limit or the CGWSL in groundwater samples collected from these wells.

Water Quality Parameters, South Refinery Area

In 2021, groundwater samples were collected from the following South Refinery Area wells during each semiannual event for analysis of water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite [as nitrogen]):

- First Semiannual Event (14 wells): MW-50, MW-52, MW-64, MW-66, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-109, MW-110, MW-139, and RA-313.
- Second Semiannual Event (9 wells): MW-50, MW-52, MW-64, MW-101, MW-102, MW-104, MW-109, MW-110, and MW-139.

No CGWSLs are applicable for calcium, potassium, or sodium. Chloride, fluoride, nitrate/nitrite, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in groundwater samples collected from at least one South Refinery Area well as highlighted in Table 4C. The reported concentrations of these constituents were generally consistent with historical results, with the following exceptions:

- Nitrate/nitrite concentrations in MW-50 have overall increased since 2019. Nitrate/nitrite concentrations increased from 1.53 mg/L in October 2019 to 74.6 mg/L in June 2020 to 78.5 mg/L in October 2020, then decreased to an estimated concentration of 0.0950 J mg/L in April 2021. Nitrate/nitrite concentrations then increased to 266 mg/L in September 2021, which is the historical maximum for this well since at least 2019.
- Chloride concentrations in MW-66 increased from 189 mg/L in October 2020 to 257 mg/L in April 2021, which is the first exceedance of the CGWSL (250 mg/L) since at least 2019.

5.3.7 Field East of Refinery – Analytical Results

Groundwater monitoring is ongoing in the Field East of Refinery located between the refinery and the EPs. Analytical results of groundwater samples collected from wells located within the Field East of Refinery in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

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Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, Field East of Refinery

Groundwater samples were collected from the following wells located within the Field East of Refinery during each 2021 semiannual event for analysis of DRO and GRO, unless noted otherwise:

- First Semiannual Event (16 wells): KWB-1C (DRO only), KWB-7 (DRO only), KWB-11B, KWB-12B, KWB-P4 (DRO only), MW-57, MW-113, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-145, MW-146, MW-147, and MW-148.
- Second Semiannual Event (16 wells): KWB-7 (DRO only), KWB-11A, KWB-11B, KWB-12A, KWB-12B, MW-57, MW-113, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-145, MW-146, MW-147, and MW-148.

TPH results that exceeded their respective CGWSL Field East of Refinery wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Field East of Refinery	*First Semiannual Event (April 2021)*				
	TPH-DRO	**0.0858**	16	9	1.94 (KWB-7)
	TPH-GRO	**0.0101**	13	3	4.52 (MW-113 FD)
	Second Semiannual Event (September 2021)				
	TPH-DRO	**0.0858**	16	10	6.19 (MW-113)
	TPH-GRO	**0.0101**	15	4	22.6 (MW-113)

FD: Field Duplicate

As summarized above and highlighted in Table 4A, DRO and GRO were detected in exceedance of their respective CGWSLs in Field East of Refinery wells sampled during both 2021 semiannual events.

As shown in the COC concentration plots included in Appendix C, DRO analytical results in groundwater samples collected from wells located in the Field East of Refinery in 2021 were overall consistent with historical results, with the following exceptions:

- DRO concentrations in wells KWB-1A, KWB-1C, KWB-7, KWB-11A, MW-58, and MW-113, have overall increased since approximately 2011-2013 but stabilized since approximately 2015 except in KWB-11A, MW-58, and MW-113. DRO concentrations in KWB-11A and MW-113 have fluctuated seasonally since 2015 and 2016, respectively. DRO concentrations in KWB-11A increased from 0.376 mg/L in October 2020 to 1.35 mg/L in September 2021, which is below the historical maximum for this well. DRO concentrations in MW-113 increased from 0.405 mg/L in April 2021 to a historical maximum of 6.19 mg/L in September 2021. Well MW-58 was not sampled in 2020 and 2021 due to the presence of PSH at a thickness ≥0.03 feet. DRO concentrations in these wells will be reviewed again in 2022.
- DRO concentrations in KWB-8 have overall increased during the only sampling events conducted in this well from 2016 and 2020. This well has only been sampled four times

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since installation, due to the presence of PSH presence at a thickness ≥0.03 feet, including during both 2021 sampling events.

- DRO concentrations in MW-134 have fluctuated seasonally since 2016 and increased from 0.120 mg/L in April 2021 to a historical maximum of 0.304 mg/L in September 2021. DRO concentrations in these wells will be reviewed again in 2022.

GRO analytical results in groundwater samples collected from wells located in the Field East of Refinery in 2021 were overall consistent with historical results, as shown in the COC concentration plots included in Appendix C, with the following exceptions:

- GRO concentrations in well KWB-11A have overall increased since 2013 and fluctuated since 2017. GRO concentrations in KWB-11A increased from an estimated concentration of 0.0992 J mg/L in October 2020 to a historical maximum of 0.994 mg/L in September 2021.
- GRO concentrations in well MW-113 have overall increased since 2015. GRO concentrations increased from 3.30 mg/L in October 2020 to 4.52 mg/L in April 2021 to 22.6 mg/L in September 2021, which is the historical maximum for this well. GRO concentrations in this well will be reviewed again in 2022.
- GRO concentrations in well MW-134 have overall been stable over time except two isolated increases in October 2019 and April 2021. GRO concentrations increased from not detected above the method detection limit in October 2020 to a historical maximum of 0.101 mg/L (field duplicate) in April 2021. GRO concentrations decreased to not detected above the method detection limit in September 2021, which is consistent with historical concentrations.

Volatile Organic Compounds, Field East of Refinery

Groundwater samples were collected from the following wells located in the Field East of Refinery during each 2021 semiannual event for analysis of VOCs:

- First Semiannual Event (17 wells): KWB-1C, KWB-7, KWB-11B, KWB-12B, KWB-P4, MW-57, MW-113, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-145, MW-146, MW-147, MW-148, and RA-4798.
- Second Semiannual Event (17 wells): KWB-7, KWB-11A, KWB-11B, KWB-12A, KWB-12B, MW-57, MW-113, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-145, MW-146, MW-147, MW-148, and RA-4798.

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VOC results that exceeded their respective CGWSL in Field East of Refinery wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Field East of Refinery	*First Semiannual Event (April 2021)*				
	1,2,4-TMB	**0.0560**	17	1	0.212 (KWB-7)
	Benzene	**0.00500**	17	2	1.01 (KWB-7)
	Naphthalene	**0.0300**	17	1	0.0306 (KWB-7)
	Second Semiannual Event (September 2021)				
	1,2,4-TMB	**0.0560**	17	2	0.627 (MW-113 FD)
	Benzene	**0.00500**	17	3	3.68 (MW-113 FD)
	Ethylbenzene	**0.700**	17	1	2.14 (MW-113)
	Naphthalene	**0.0300**	17	1	0.158 J (MW-113)
	Total Xylenes	**0.620**	17	1	0.877 (MW-113)

As summarized above and highlighted in Table 4A, benzene, ethylbenzene, naphthalene, 1,2,4-TMB, and total xylenes were detected in exceedance of their respective CGWSLs in Field East of Refinery wells during at least one 2021 sampling event. No other VOC was detected above its respective CGWSL during either semiannual event.

The 2021 analytical results of VOCs in groundwater samples collected from wells located in the Field East of Refinery were generally consistent with historical results with exceptions listed below.

- In KWB-7, concentrations of benzene, ethylbenzene, naphthalene, toluene, o-xylene, total xylenes, 1,2,4-TMB, and 1,3,5-TMB increased by at least an order of magnitude in April 2021 then decreased in September 2021. VOC concentrations in KWB-7 have fluctuated over time and will be reviewed again in 2022. Ethylbenzene, toluene, o-xylene, total xylenes, and 1,3,5-TMB concentrations in 2021 remain below their respective CGWSL. The following VOCs exceeded their respective CGWSL in KWB-7 during 2021:
    - Benzene concentrations have historically exceeded the CGWSL in this well and increased from 0.00789 mg/L in October 2020 to a historical maximum of 1.01 mg/L, then decreased to 0.0131 mg/L in September 2021.
    - Naphthalene concentrations increased from not detected above the method detection limit in October 2020 to a historical maximum of 0.0306 mg/L in April 2021, which is the only exceedance of the CGWSL in this well. Naphthalene concentrations then decreased to 0.0108 mg/L in September 2021, which is below the CGWSL.
    - 1,2,4-TMB concentrations increased from 0.00287 mg/L in October 2020 to 0.212 mg/L in April 2021, then decreased slightly to 0.200 mg/L in September 2021. 1,2,4-TMB concentrations have fluctuated above and below the CGWSL since at least June 2020.

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- In KWB-11A, concentrations of benzene, ethylbenzene, and total xylenes increased to historical maximums in September 2021. Benzene increased from 0.00234 mg/L in October 2020 to 0.0512 mg/L in September 2021, which is the first exceedance of the CGWSL since October 2017. Ethylbenzene and total xylenes increased from not detected above the method detection limits in October 2020 to 0.0382 mg/L and 0.0213 mg/L, respectively, which remain below their respective CGWSL. Concentrations of these VOCs will be reviewed again in 2022.
- In MW-113, concentrations of benzene, ethylbenzene, MTBE, naphthalene, toluene, total xylenes, and 1,2,4-TMB have fluctuated seasonally by at least an order of magnitude since April 2019. Concentrations of these VOCs decreased from October 2020 to April 2021 and increased in September 2021. The September 2021 results for benzene (3.68 mg/L [duplicate sample]), ethylbenzene(2.14 mg/L), MTBE (0.0630 mg/L), and naphthalene (0.158 J mg/L) were historical maximums in this well and, with the exception of MTBE, exceeded their respective CGWSL. The September 2021 ethylbenzene result was the first exceedance of the CGWSL in this well. The September 2021 result for total xylenes (0.877 mg/L) was the first CGWSL exceedance since April 2014. Benzene, naphthalene, and 1,2,4-TMB concentrations have historically fluctuated above and below their respective CGWSL. MTBE and toluene concentrations remain below their respective CGWSL. VOC concentrations in this well will be reviewed again in 2022.
- Naphthalene was detected above the method detection limit for the first time in MW-135 in September 2021 at an estimated concentration of 0.00174 J mg/L, which is an order of magnitude below the CGWSL.

As shown in the COC concentration plots included in Appendix C, concentrations of target VOCs in wells located in the Field East of Refinery have wells have exhibited stable to trends over time, with the exceptions listed above and in wells KWB-8, MW-58, MW-111, MW-128, and MW-131 which were not sampled in 2021 due to the presence of PSH at a thickness ≥0.03 feet. Target VOCs in wells KWB-8, MW-58, MW-111, MW-128, and MW-131 have generally fluctuated over time with increasing trends for at least one VOC over the three most recent sampling events conducted in each well.

Total Metals, Field East of Refinery

In 2021, groundwater samples were collected from the following wells located in the Field East of Refinery during each 2021 semiannual event for analysis of the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium):

- First Semiannual Event (15 wells): KWB-1C, KWB-7, KWB-11B, KWB-12B, MW-57, MW-113, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-145, MW-146, MW-147, and MW-148.
- Second Semiannual Event (16 wells): KWB-7, KWB-11A, KWB-11B, KWB-12A, KWB-12B, MW-57, MW-113, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-145, MW-146, MW-147, and MW-148.

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In addition, groundwater samples collected from wells KWB-7, KWB-11B, and KWB-12B during both 2021 semiannual events and wells KWB-11A and KWB-12A during the second 2021 semiannual event were analyzed for the expanded metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium). Total metals results that exceeded their respective CGWSL in Field East of Refinery wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Field East of Refinery	*First Semiannual Event (April 2021)*				
	Iron	**1.00**	15	4	15.6 (MW-130)
	Manganese	**0.200**	15	5	1.34 (KWB-7)
	Second Semiannual Event (September 2021)				
	Iron	**1.00**	16	4	4.00 (KWB-11A)
	Manganese	**0.200**	16	5	2.06 (KWB-7)

As summarized above and highlighted in Table 4B, iron and manganese were detected in exceedance of their respective CGWSLs in Field East of Refinery wells during both 2021 sampling events. No other total metal was detected above its respective CGWSL during either semiannual event.

The 2021 groundwater analytical results of total metals in wells located in the Field East of Refinery were generally consistent with historical results, with the following exceptions:

- Iron and manganese concentrations increased above the CGWSL in wells MW-130 and MW-148 for the first time between 2019 and 2021. Iron and manganese concentrations have fluctuated above and below the CGWSL across the refinery over time.
    - Iron concentrations in MW-130 increased from an estimated concentration of 0.0826 J mg/L in October 2020 to 15.6 mg/L in April 2021, then decreased to 3.73 mg/L in September 2021. The 2021 results in MW-130 were the only exceedances of the CGWSL since at least April 2019.Manganese concentrations in MW-130 increased from 0.101 mg/L in October 2020 to 0.282 mg/L in April 2021, which is the first exceedance of the CGWSL since at least 2019. Manganese concentrations then decreased to below the CGWSL in September 2021 (0.138 mg/L).
    - Iron concentrations in MW-148 increased from 0.264 mg/L in April 2021 to above the CGWSL at 2.02 mg/L in September 2021. Manganese concentrations in MW-148 increased from 0.0507 mg/L in April 2021 to above the CGWSL at 0.477 mg/L in September 2021. However, the 2021 sampling events are the only time metals have been analyzed in this new well.
- Lead concentrations in wells MW-113 and MW-130 increased by an order of magnitude in 2021 but remain below the CGWSL (0.0150 mg/L). Lead concentrations in MW-113 increased from not detected above the method detection limit in April 2021 to 0.00281 mg/L in September 2021. Lead concentrations in MW-130 increased from not detected above the method detection limit in October 2020 to 0.0137 mg/L in April 2021, then decreased to 0.00438 mg/L in September 2021.

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As shown in the COC concentration plots included in Appendix C, concentrations of target COC arsenic in wells located in the Field East of Refinery are overall stable, except in wells KWB-7, KWB-8, KWB-11A, and MW-57. Arsenic concentrations have fluctuated over time in wells KWB-7, KWB-11A, and MW-57; and increased over the only four sampling events conducted in KWB-8 (not often sampled due to PSH at a thickness ≥0.03 feet).

Cyanide, Field East of Refinery

Groundwater samples collected from wells KWB-7, KWB-11B, and KWB-12B during both 2021 semiannual events and wells KWB-11A and KWB-12A during the second 2021 semiannual event were analyzed for were analyzed for cyanide. Cyanide was detected in the parent sample, but not the duplicate sample, collected from well KWB-12B during the September 2021 sampling event at an estimated concentration of 0.00210 J mg/L, which is approximately two orders of magnitude below the CGWSL of 0.200 mg/L. Cyanide was not detected above the method detection limit or the CGWSL in groundwater samples collected from any other Field East of Refinery wells during either semiannual event.

Water Quality Parameters, Field East of Refinery

In 2021, groundwater samples were collected from the following wells located in the Field East of Refinery during each semiannual event for analysis of water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite [as nitrogen]):

- First Semiannual Event (16 wells): KWB-1C, KWB-7, KWB-11B, KWB-12B, MW-57, MW-113, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-145 through MW-148 (anions & TDS only), , and RA-4798.
- Second Semiannual Event (17 wells): KWB-7, KWB-11A, KWB-11B, KWB-12A, KWB-12B, MW-57, MW-113, MW-125, MW-126B, MW-130, MW-134, MW-135, MW-145 through MW-148 (anions & TDS only), and RA-4798.

No CGWSLs are applicable for calcium, potassium, or sodium. Chloride, fluoride, nitrate/nitrite, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in groundwater samples from at least one well within the Field East of Refinery as highlighted in Table 4C. The reported concentrations of these constituents were generally consistent with historical results, with the following exceptions:

- Fluoride concentrations increased in well MW-57 from 1.88 mg/L in April 2021 to 3.42 mg/L in September 2021.
- Fluoride concentrations in MW-147 increased from 0.791 mg/L in April 2021 to above the CGWSL at 1.80 mg/L in September 2021. However, the 2021 sampling events are the only time fluoride has been analyzed in this new well.
- Nitrate/nitrite concentrations in KWB-12A increased from 6.85 mg/L in October 2020 to 10.6 mg/L in September 2021, which is the only CGWSL exceedance since at least 2019.

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- Nitrate/nitrite concentrations in wells KWB-12B and MW-57 have overall increased since 2019. Nitrate/nitrite concentrations in KWB-12B increased from 8.05 mg/L in April 2021 to 13.8 mg/L in September 2021. Nitrate/nitrite concentrations in MW-57 increased from 7.90 mg/L in April 2021 to 13.8 mg/L in September 2021. The September 2021 nitrate/nitrite results in these wells exceed the CGWSL.

5.3.8 Areas Cross-Gradient and Up-Gradient of Refinery – Analytical Results

Groundwater monitoring is ongoing in areas both cross-gradient and up-gradient of the refinery. Cross-gradient wells KWB-13 (located south of the refinery), RA-3156 (located southeast of the refinery), and NP-5 (located northeast of the refinery); and up-gradient wells UG-1, UG-2, UG-3R, and UG-4 (all located to the west of the refinery), were sampled during the first 2021 semiannual event. Cross-gradient well MW-136 (located north of the refinery) was sampled during both 2021 semiannual events. Analytical results of groundwater samples collected from cross-gradient and up-gradient wells in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, Areas Cross-gradient and Up-gradient of Refinery

In 2021, groundwater samples were collected from the following cross-gradient and up-gradient wells during each semiannual event for analysis of DRO and GRO, unless noted otherwise:

- First Semiannual Event (7 wells): KWB-13 (DRO only), MW-136, NP-5 (DRO only), UG-1, UG-2, UG-3R, and UG-4.
- Second Semiannual Event (one well): MW-136.

TPH results that exceeded their respective CGWSL in cross-gradient and up-gradient wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Cross- & Up-Gradient	*First Semiannual Event (April 2021)*				
	TPH-DRO	**0.0858**	7	2	0.110 (MW-136)
	Second Semiannual Event (September 2021)				
	No TPH Exceedance				

As shown in Table 4A, DRO was detected at concentrations in exceedance of the CGWSL during the first 2021 semiannual event. DRO or GRO did not exceed CGWSLs during the second 2021 semiannual event. As shown in the COC concentration plots included in Appendix C, DRO and GRO concentrations in cross-gradient and up-gradient wells are generally stable over time despite occasional fluctuations, with the following exceptions:

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- DRO was detected above the CGWSL for the first time in up-gradient well UG-3R in April 2021 at an estimated concentration of 0.0931 J mg/L, which is the historical maximum for this well.
- DRO was detected above the method detection limit for the first time since April 2017 in up-gradient well UG-4 in April 2021 at an estimated concentration of 0.0643 J mg/L, which is the historical maximum for this well.
- DRO concentrations in cross-gradient well MW-136 increased from an estimated concentration of 0.0873 JB mg/L in October 2020 to 0.110 mg/L in April 2021, which is the historical maximum for this well. DRO concentrations decreased in September 2021 to an estimated concentration of 0.0432 J mg/L, which is below the CGWSL.

Volatile Organic Compounds, Areas Cross-Gradient and Up-Gradient of Refinery

In 2021, groundwater samples collected from the following cross-gradient and up-gradient wells during each semiannual event were analyzed for VOCs:

- First Semiannual Event (8 wells): KWB-13, MW-136, NP-5, RA-3156, UG-1, UG-2, UG-3R, and UG-4.
- Second Semiannual Event (one well): MW-136.

No VOCs were detected above their respective CGWSL during either 2021 semiannual event, as shown in Table 4A. The 2021 VOC results for groundwater samples collected from cross-gradient and up-gradient wells were consistent with historical results, except MTBE in cross-gradient well MW-136. MTBE concentrations increased from an estimated concentration of 0.000122 J mg/L in October 2020 to an estimated concentration of 0.000430 J mg/L in April 2021 to an estimated concentration of 0.000624 J mg/l in September 2021, which is the historical maximum for this well but three orders of magnitude below the CGWSL.

Total Metals, Areas Cross-Gradient and Up-Gradient of Refinery

In 2021, groundwater samples were collected from the following cross-gradient and up-gradient wells during each semiannual event for analysis of the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium) and the expanded metals list (boron, cadmium, cobalt, mercury, nickel, uranium, and vanadium), unless noted otherwise:

- First Semiannual Event (7 wells): KWB-13, MW-136, NP-5 (standard list only), UG-1, UG-2, UG-3R, and UG-4.
- Second Semiannual Event (one well): MW-136

Total metal results that exceeded their respective CGWSL in cross-gradient and up-gradient wells are summarized in the table below:

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Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
Cross- & Up-Gradient	*First Semiannual Event (April 2021)*				
	Boron	**0.750**	6	1	0.983 (UG-4)
	Iron	**1.00**	7	1	10.8 (KWB-13)
	Uranium	**0.0300**	6	3	0.0459 (MW-136)
	Second Semiannual Event (September 2021)				
	Uranium	**0.0300**	1	1	0.0396 (MW-136)

As summarized above and highlighted in Table 4B, boron, iron, and uranium were detected in exceedance of their respective CGWSLs in cross-gradient and up-gradient wells during at least one 2021 sampling event. No other total metal was detected above its respective CGWSL during either semiannual event.

The 2021 analytical results of total metals in groundwater samples collected from cross-gradient and up-gradient wells were generally consistent with historical results, with the following exceptions:

- In cross-gradient well KWB-13, concentrations of arsenic, barium, cobalt, iron, lead, manganese, nickel, and vanadium increased over the four most recent sampling events conducted since April 2018. However, concentrations of all these metals except for iron remain below their respective CGWSL. Iron concentrations have historically exceeded the CGWSL in this well and have fluctuated across the facility.
- Uranium concentrations in UG-1 have increased slightly over the four most recent sampling events from 0.0263 mg/L in April 2018 to 0.0388 mg/L in April 2021. Uranium has exceeded the CGWSL of 0.0300 mg/L for the last three sampling events (April 2019, June 2020, and April 2021) in this well.

As shown in the COC concentration plots included in Appendix C, concentrations of target COC arsenic in cross-gradient and up-gradient wells are overall stable despite occasional fluctuations.

Cyanide, Areas Cross-Gradient and Up-Gradient of Refinery

Cyanide was detected at an estimated concentration of 0.00321 J mg/L in up-gradient well UG-2 in April 2021. Cyanide was not detected above the CGWSL in groundwater samples collected from any other cross-gradient or up-gradient well during either 2021 semiannual event.

Water Quality Parameters, Areas Cross-Gradient and Up-Gradient of Refinery

In 2021, groundwater samples were collected from the following cross-gradient and up-gradient wells during each semiannual event for analysis of water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite [as nitrogen]):

- First Semiannual Event (8 wells): KWB-13, MW-136, NP-5, RA-3156, UG-1, UG-2, UG-3R, and UG-4.
- Second Semiannual Event (one well): MW-136.

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No CGWSLs are applicable for calcium, potassium, or sodium. Chloride, fluoride, nitrate/nitrite, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in cross-gradient and up-gradient wells, as highlighted in Table 4C. The reported concentrations of these constituents in 2021 were consistent with historical results.

5.3.9 RO Reject Fields – Analytical Results

The reject water from HFNR's RO system was historically discharged to agricultural fields located north of the refinery in accordance with the Discharge Permit, but discharge ceased in January 2019. These areas are referred to as the North and South RO Reject Fields. Groundwater samples were collected from the following six wells during both 2021 semiannual events:

- North RO Reject Field wells (3 wells): MW-117, MW-118, and MW-119.
- South RO Reject Field wells (3 wells): MW-114, MW-115, and MW-116.

Groundwater samples collected from these wells were all analyzed for GRO, DRO, the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium), and water quality parameters (calcium, chloride, fluoride, potassium, sodium, sulfate, TDS, and nitrate/nitrite).

Analytical results of groundwater samples collected from RO Reject Field wells in 2021 indicate COCs are present in groundwater above their respective CGWSLs, as highlighted in Tables 4A through 4C and discussed in the following subsections.

Total Petroleum Hydrocarbons – Diesel Range Organics and Gasoline Range Organics, RO Reject Discharge Fields

In 2021, groundwater samples were collected from wells located in and near the RO Reject Discharge Fields for analysis of TPH DRO and GRO. TPH results that exceeded their respective CGWSL in RO Reject Field wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max. Concentration mg/L (Well)
North & South RO Fields	*First Semiannual Event (April 2021)*				
	TPH-DRO	**0.0858**	6	5	0.736 (MW-114)
	Second Semiannual Event (September 2021)				
	TPH-DRO	**0.0858**	6	4	0.502 (MW-114)
	TPH-GRO	**0.0101**	6	2	0.0655 J (MW-114)

As summarized above and highlighted in Table 4A, DRO and GRO were detected in exceedance of the CGWSL in RO Reject Field wells sampled during at least one 2021 semiannual events.

As shown in the COC concentration plots included in Appendix C, DRO and GRO concentrations in RO Reject Field wells increased over at least one 2021 semiannual sampling event, as follows:

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- DRO concentrations in North RO Reject Field well MW-117 increased from an estimated concentration of 0.0997 JB mg/L (DRO detected in the associated laboratory method blank) in October 2020 to 0.211 mg/L in April 2021 and then decreased slightly to 0.146 mg/L in September 2021. The DRO results in MW-117 during the 2021 events were less than the historical maximum.
- DRO concentrations in South RO Reject Field wells MW-114, MW-115, and MW-116 increased to the historical maximum in April 2021 then decreased in September 2021. DRO concentrations in MW-114 increased from 0.663 mg/L in October 2020 to the historical maximum 0.736 mg/L in April 2021 and decreased to 0.502 mg/L in September 2021. DRO concentrations in MW-115 increased from 0.222 B mg/L in October 2020 to the historical maximum of 0.313 mg/L in April 2021 and decreased to 0.173 mg/L in September 2021. DRO concentrations in MW-116 increased from 0.127 B mg/L in October 2020 to the historical maximum of 0.231 mg/L in April 2021 and decreased to 0.214 mg/L in September 2021.
- GRO concentrations in North RO Reject Field well MW-117 increased from not detected above the method detection limit in April 2021 to an estimated concentration of 0.0573 J mg/L in September 2021, which is below the historical maximum concentration of 0.0967 JB mg/L (October 2019).
- GRO concentrations in South RO Reject Field well MW-114 increased from not detected above the method detection limit in April 2021 to an estimated concentration of 0.0655 J mg/L in September 2021, which is below the historical maximum concentration of 0.0705 JB mg/L (October 2019).

Volatile Organic Compounds, RO Reject Discharge Fields

VOCs were not detected above their respective CGWSLs in the six RO Reject Field wells sampled during both 2021 semiannual events. The 2021 VOC results in RO Reject Field wells are consistent with historical results, with the following exceptions:

- MTBE concentrations in North RO Field well MW-117 have overall increased from not detected above the method detection limit in October 2019 to 0.00284 mg/L in April 2021 to 0.0580 mg/L in September 2021, which is the historical maximum for this well. However, MTBE concentrations remain an order of magnitude below the CGWSL in this well.
- MTBE concentrations in South RO Field wells MW-114 and MW-115 have overall increased from October 2019 to historical maximums in September 2021. However, MTBE concentrations remain an order of magnitude below the CGWSL in these wells. In well MW-114, MTBE increased from not detected above the method detection limit in October 2019 to 0.0101 mg/L in April 2021 and 0.0120 mg/L in September 2021, which is the historical maximum for this well. In well MW-115, MTBE increased from not detected above the method detection limit in October 2019 to 0.0113 mg/L in April 2021 and 0.0228 mg/L in September 2021, which is the historical maximum for this well. A

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work plan to investigate MTBE in groundwater was submitted to NMED on September 13, 2019 (Wood 2019).

Total Metals, RO Reject Discharge Fields

Groundwater samples were collected from wells located in the North and South RO Reject Fields for analysis of the standard total metals list (arsenic, barium, chromium, iron, lead, manganese, and selenium). Total metal results that exceeded their respective CGWSL in North and South RO Reject Field wells are summarized in the table below:

Area	Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Maximum Concentration mg/L (Well)
North & South RO Fields	*First Semiannual Event (April 2021)*				
	Manganese	**0.200**	6	1	0.834 (MW-114)
	Second Semiannual Event (September 2021)				
	Manganese	**0.200**	6	1	0.842 (MW-114)

As summarized above and highlighted in Table 4B, manganese was detected in exceedance of its CGWSLs in RO Reject Field wells in one well during both 2021 semiannual events. No other total metal was detected above its respective CGWSL during either semiannual event.

The 2021 analytical results of total metals in groundwater samples collected from RO Reject Field wells were consistent with historical results. Concentrations of target COC arsenic in RO Reject Field wells are overall stable, as shown in the COC concentration plots included in Appendix C.

Cyanide, RO Reject Discharge Fields

Groundwater samples collected from RO Reject Field wells in 2021 were not analyzed for cyanide.

Water Quality Parameters, RO Reject Discharge Fields

Chloride, fluoride, sulfate, and TDS were detected at concentrations in exceedance of their respective CGWSLs in groundwater samples collected from some RO Reject Field wells, as highlighted in Table 4C. No CGWSLs are applicable for calcium, potassium, or sodium. The reported concentrations of these constituents in 2021 were generally consistent with historical results with the exception of nitrate/nitrite in well MW-117. Nitrate/nitrite concentrations have overall increased from an estimated concentrations of 0.0740 mg/L in April 2013 to 5.55 mg/L in April 2021 and then decreased to 1.76 mg/L in September 2021.

5.3.10 Semi Volatile Organic Compounds

Groundwater samples from select wells in the vicinity of SWMUs 20 and 22 (North Refinery and TEL wells) were analyzed for SVOCs by EPA Method 8270 in accordance with the SWMU/AOC Group 3 Rev 2 transmittal letter dated December 28, 2018 (HFNR 2018), and NMED's subsequent response letter dated March 22, 2019 (NMED 2019), and as proposed in the *2021*

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Facility-Wide Groundwater Monitoring Work Plan (2021 FWGMWP) that was submitted to the NMED and OCD in June 2021 (TRC 2021).

The two rounds of SVOC analysis required by the SWMU/AOC Group 3 Rev 2 transmittal letter dated December 28, 2018 (HFNR 2018), and NMED's subsequent response letter dated March 22, 2019 (NMED 2019), were scheduled to be completed during the 2019 and 2020 semiannual events. Due to the presence of PSH at thicknesses ≥0.03 feet or well inaccessibility, the two required rounds of groundwater samples were not collected from the following wells in 2019 or 2020: MW-97, MW-137 (one round collected in April 2019), MW-138 (one round collected in April 2019), and RW-2R. Groundwater samples were not collected for SVOC analysis from wells MW-137, MW-138, and RW-2R during either 2021 semiannual event due to the presence of PSH at a thickness ≥0.03 feet. Well MW-97 (sampled annually) could not be located to gauge or sample during the first 2021 semiannual event due to construction in the area.

In 2021, groundwater samples collected from wells MW-23, MW-43, MW-61, MW-62, and MW-93 were scheduled to be analyzed for SVOCs as proposed in the 2021 FWGMWP based on results reported during the two required rounds of sampling conducted in 2019 and 2020. Groundwater samples were not collected from well MW-23 and MW-43 during either 2021 semiannual event due to the presence of PSH at a thickness ≥0.03 feet.

Groundwater samples were collected from wells listed below during 2021 for analysis of SVOCs. No groundwater samples were collected for SVOC analysis during the first 2021 semiannual event. Groundwater samples were collected from the following wells during the second 2021 semiannual event for analysis of SVOCs:

- Second Semiannual Event (two wells): MW-61 and MW-62.

SVOC results that exceeded their respective CGWLs in 2021 are summarized below:

Analyte	CGWSL (mg/L)	No. Wells Sampled	No. Wells > CGWSL	Max Concentration mg/L (Well)
Second Semiannual Event (October 2021)				
Bis(2-ethylhexyl)phthalate	**0.00600**	2	1	0.00884 (MW-61)
1-Methylnaphthalene	**0.0300**	2	2	0.0984 (MW-62)
2-Methylnaphthalene	**0.0300**	2	1	0.0537 (MW-62)
Naphthalene	**0.0300**	2	2	0.157 (MW-62)

Bis(2-ethylhexyl)phthalate, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene (by Method 8270) were detected in exceedance of their respective CGWSLs during the second 2021 semiannual sampling event, as summarized above and highlighted in Table 4D. No other SVOC was detected above its respective CGWSL.

Table 4D shows all SVOCs that have been detected above their respective CGWSL during semiannual sampling events conducted from 2019 through 2021. In addition to the analytes listed above, dibenzofuran, and phenol were detected in exceedance of their respective CGWSLs in at least one well in 2019 or 2020. All SVOC results are summarized in Appendix B.

SVOC sampling will be conducted in 2022 at wells MW-23, MW-43, MW-61, MW-62, MW-93, MW-97, MW-137, and MW-138 if PSH is not present at thicknesses ≥0.03 feet.

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1,4-Dioxane Analysis

In accordance with NMED's May 7, 2021, comments letter (NMED 2021a) on the September 2019 report titled *Evaluation of Methyl Tert-Butyl Ether (MTBE) in Groundwater* (MTBE Groundwater Report [Wood 2019]), groundwater samples collected from wells with any historical detection of chlorinated solvents since 2010 are to be sampled for 1,4-dioxane by Method 8270 for two consecutive sampling events. For wells that are sampled on a semiannual basis, the first required 1,4-dioxane sampling event was completed during the second semiannual monitoring event of 2021. Groundwater samples were collected from the following wells during the second 2021 semiannual event for analysis of 1,4-dioxane:

- Second Semiannual Event (30 wells): KWB-11A, KWB-11B, MW-21, MW-29, MW-45, MW-49, MW-50, MW-54A, MW-61, MW-62, MW-90, MW-101, MW-102, MW-104, MW-108, MW-109, MW-110, MW-113, MW-114, MW-117, MW-120, MW-126B, MW-134, MW-135, MW-139, NCL-31, NCL-49, NP-1, RA-4798, and TEL-4

Groundwater samples were not collected from wells KWB-2R, KWB-6, KWB-10R, MW-23, MW-28, MW-39, MW-43, MW-60, MW-67, MW-91, MW-92, MW-94, MW-111, MW-127, MW-138 due to the presence of PSH at a thickness ≥0.03 feet. A groundwater sample was not collected from well RA-4196 due to a mechanical issue with the in-well pump which prevented sample collection. Well MW-106 was not gauged or sampled because it could not be accessed due to refinery construction activities.

As shown in Appendix B, concentrations of 1,4-dioxane were not detected above the CGWSL in any well during the second 2021 semiannual event. An evaluation of 1,4-dioxane results and recommendations for inclusion of 1,4-dioxane to the facility-wide groundwater monitoring program will be made in a future FWGMWP update, after completion of the two required sampling events in all wells.

5.3.11 Tert-Butyl Alcohol (TBA) Analysis

In accordance with NMED's May 7, 2021, comments letter (NMED 2021a) on the September 2019 MTBE Groundwater Report, in response to the Refinery's planned pilot test to enhance biodegradation of hydrocarbon constituents under sulfate reducing conditions, groundwater samples collected from all wells where VOCs are currently analyzed are to be sampled for tert-butyl alcohol (TBA) by Method 8260 for four consecutive sampling events.

The first of the required TBA sampling events was completed during the September 2021 semiannual monitoring event. As highlighted in Table 4A and discussed in Section 5.3.6 above, TBA results exceeded the CGWSL of 0.150 mg/L during the second 2021 semiannual event in South Refinery Area wells MW-64 (2.48 mg/L) and MW-102 (0.588 mg/L). TBA concentrations did not exceed the CGWSL in any other well. An evaluation of TBA results and recommendations for inclusion of EDB to the facility-wide groundwater monitoring program will be made in a future FWGMWP update, after completion of four required sampling events in all wells.

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5.3.12 Ethylene Dibromide (EDB)

In accordance with NMED's May 7, 2021, comments letter on the September 2019 MTBE Groundwater Report (NMED 2021a), groundwater samples collected from wells with any historical detection of 1,2-dichloroethane (EDC) since 2010 are to be analyzed for EDB by Method 8011 for two consecutive sampling events for these wells. For wells that are sampled on a semiannual basis, the first of the required EDB sampling events was completed during the September 2021 semiannual monitoring event. EDB analysis was scheduled to be completed at the following wells in September 2021: KWB-6, KWB-11A, KWB-11B, MW-50, MW-60, MW-62, MW-102, MW-108, MW-111, MW-113, MW-114, MW-126B, MW-127, NP-1, RA-4196, and RA-4798. Groundwater samples were not collected from wells KWB-6, MW-60, MW-111, and MW-127 due to the presence of PSH at a thickness ≥0.03 feet or greater. A groundwater sample was not collected from well RA-4196 due to a mechanical issue with the in-well pump which prevented sample collection. The required EDB sampling in these wells will be completed during subsequent monitoring events. Groundwater samples were collected from the following wells during the second 2021 semiannual event for analysis of EDB:

- Second Semiannual Event (11 wells): KWB-11A, KWB-11B, MW-50, MW-62, MW-102, MW-108, MW-113, MW-114, MW-126B, NP-1, and RA-4798.

As shown in the analytical summary tables in Appendix B, EDB was not detected in any well above the method detection limit.

An evaluation of EDB results and recommendations for inclusion of EDB to the facility-wide groundwater monitoring program will be made in a future FWGMWP update, after completion of two required sampling events in all wells.

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6.0 Remediation System Monitoring

The PCC Permit and Discharge Permit both require recovery of PSH present in the shallow groundwater within and adjacent to the refinery. PSH and impacted groundwater are continually recovered at the refinery from a system of recovery trenches and recovery wells. Additionally, PSH is manually recovered from wells not connected to the recovery system on a periodic basis. A summary of the recovery system, manual recovery activities, and recovery results are summarized in this section.

6.1 Recovery System

The system described below only includes the recovery wells/trenches that have infrastructure installed (RW-1, RW-2, RW-4, RW-5, RW-6, RW-7, RW-8, RW-12). Recovery trenches associated with wells RW-9, RW-16, RW-17, and RW-18 have not been observed to contain measurable PSH and thus have never been included in a recovery system. Recovery trench associated with well RW-10 contained measurable PSH for the first time in 2021 and no infrastructure has since been installed. RW-11 was not included in the upgraded system installation in 2012 because it had not contained measurable PSH since at least 2007 and was often dry. Measurable PSH was present in RW-11 during 2021 for the first time since at least 2007 and the recovery trench will be reevaluated for upgrade in 2022.

The recovery system consists of automated pumping of PSH and groundwater from recovery wells using dedicated groundwater and PSH pumps (both types of fluid pumps installed in each well). Pumps are installed, operated, and removed from each well based on PSH thicknesses and observed recovery during operation and maintenance (O&M) activities. The pumps are typically operated automatically, with remote data sensing and recording. Recovered PSH is pumped into centralized holding tanks, then pumped to Tank 49, associated with the wastewater treatment system, which then transfers the product to crude tank(s) (Tank 1225 or 437) for processing within the refinery. Recovered groundwater is pumped to the nearest process wastewater sump and directed to the process wastewater treatment system. Thus, recovered PSH is recycled into the refinery process while groundwater is treated to remove residual hydrocarbons.

O&M of the recovery system was conducted throughout 2021 on an approximate weekly basis. O&M activities included gauging recovery wells RW-1R, RW-2R, RW-4R, RW-5R, RW-6R, RW-7R, RW-8R, RW-12R, RW-13R, RW-14R, RW-15, RW-19, RW-20, and RW-22 to assess the effectiveness of the recovery system and to determine in which wells to install and operate PSH and groundwater pumps. Recovery system gauging results measured during 2021 O&M activities area summarized in Appendix E. Measurable PSH was not observed in wells RW-12R, RW-15, RW-19, and RW-20 at quantities great enough for recovery by the automated system during 2021.

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6.2 Additional Recovery

A solar-powered PSH recovery pump (Magnum Spill Buster™) was installed and maintained in well MW-132 to recover PSH. Approximately 168 gallons (4 barrels) were recovered from MW-132 in 2021.

6.3 Estimated Volume of Fluids Recovered

Volumes of groundwater and PSH recovered by the recovery system during 2021 are summarized in Table 5 and additional recovery details are provided in Appendix E. An estimated 8,596,938 gallons of groundwater and an estimated 296,048 gallons of PSH were recovered through operation of the automated recovery system in 2021. The majority of recovered PSH during 2021 was from RW-1R (47,580 gallons), RW-6R (50,857 gallons), RW-14R (67,868 gallons), , and RW-22 (45,619 gallons). Significant volumes of PSH (greater than 5,000 gallons) were also recovered from wells RW-2R, RW-4R, RW-7R, RW-8R, and RW-13R. As shown on Table 5, PSH recovery was limited during the fourth quarter of 2021 due to a blockage in the PSH recovery line into Tank 49.

An estimated 168 gallons of PSH were recovered from MW-132 in 2021.

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7.0 Conclusions

Conclusions based on the results of groundwater monitoring and remedial activities conducted during 2021 and comparison to historical results are discussed below.

Groundwater flow direction was generally consistent with previous monitoring events with flow predominantly east beneath the refinery and southeast beneath the EPs towards the Pecos River. Localized groundwater sinks are occasionally observed around various recovery wells due to active pumping of groundwater. Mounding at the RO reject fields continues despite cessation of discharge of RO reject water to the RO Reject Fields in January 2019.

The presence and distribution of PSH were generally consistent with previous monitoring results, except in portions of the North Refinery, South Refinery, and Field East of Refinery areas. PSH was measured for the first time in North Refinery Area wells MW-23, MW-40, MW-41, MW-43, MW-59, MW-60, MW-62, MW-95, MW-96, and RW-10; South Refinery well MW-66; and Field East of Refinery wells KWB-1A, KWB-1B, and MW-126A. PSH thicknesses across all areas of interest are overall stable to declining over time, except in North Refinery Area wells MW-91, MW-92, MW-137, MW-138, RW-1, RW-2, and RW-8; South Refinery wells MW-28, MW-99, MW-107, and RW-6; and Field East of Refinery wells KWB-10R, MW-58, MW-111, MW-127, MW-128, MW-129, and MW-131The apparent increase in the presence and extent of PSH in the North Refinery, South Refinery, and Field East of Refinery areas during 2021 are attributed to reductions in groundwater elevations and are not indicative of a new release or PSH migration. PSH thicknesses are inversely affected by fluctuations in groundwater elevations, which have generally decreased between 2017 and 2021. Historical minimum groundwater elevations were observed in April 2021 in most of the wells with new PSH occurrence or increasing PSH thicknesses.

Concentrations of COCs in groundwater have generally remained stable over time, although increasing trends were noted in select wells in specific areas of interest. The limited number of increasing COC concentration trends observed since approximately 2011-2014 have generally exhibited stabilizing trends over the most recent sampling events. During 2021 and previous years, the following COCs were detected in groundwater at concentrations in exceedance of their respective CGWSL:

- TPH GRO and DRO;
- Select VOCs including target COCs benzene, toluene, ethylbenzene, xylenes, MTBE, and naphthalene;
- Select total metals including target COC arsenic; and
- Water quality parameters chloride, fluoride, sulfate, TDS, and nitrate/nitrite.

SVOCs were also detected in groundwater at concentrations in exceedance of their respective CGWLS in samples collected from select wells in the vicinity of SWMUs 20 and 22 (North Refinery wells). SVOC analysis was conducted in 2021 in accordance with the SWMU/AOC Group 3 Rev 2 transmittal letter dated December 28, 2018, and NMED's subsequent response letter dated March 22, 2019, and as proposed in the 2021 FWGMWP. Additional groundwater

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analysis (1,4-dioxane, EDB by Method 8011, and TBA) was conducted in accordance with NMED's May 7, 2021, comments letter on the September 2019 report titled *Evaluation of Methyl Tert-Butyl Ether (MTBE) in Groundwater.* 1,4-Dioxane was not detected in groundwater above the CGWSL, EDB was not detected in groundwater above the method detection limit, and TBA was detected above CGWSL in two wells.

It should be noted that many of the concentrations of inorganic COCs (manganese, chloride, fluoride, nitrate/nitrite, sulfate, and TDS) depicted as "exceedances" in this report may actually be similar to and reflective of groundwater concentrations up-gradientup-gradient of the refinery, as detailed in the background evaluation that was submitted to NMED and OCD in September 2015 (Arcadis 2015b).

The PSH and groundwater recovery system operated throughout 2021, but portions of the PSH recovery system were inoperable during the fourth quarter. An estimated 8,596,938 gallons of groundwater and an estimated 296,048 gallons of PSH were recovered through operation of the automated recovery system in 2021. An additional estimated 168 gallons of PSH was recovered from well MW-132 by periodic pumping.

According to the requirements of the updated PCC Permit, an updated FWGMWP will be submitted in June 2022.

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8.0 References

Arcadis 2014. Background Groundwater Evaluation Work Plan, NMD048918817 and DP GW-028. July 2014.

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Arcadis 2015b. Background Groundwater Investigation Report, RCRA Permit NMD048918817, OCD Discharge Permit GW-028. September 2015.

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EPA 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, Office of Resource Conservation and Recovery Program Implementation and Information Division. EPA 530-R-09-007. March 2009.

HFNR 2018. Submittal of the SWMU / AOC Group 3 Additional Corrective Action Investigation Report – Revision 2 and Response to Comments to the August 16, 2018 Letter of Disapproval, HollyFrontier Navajo Refining LLC – Artesia, NM Refinery, EPA ID No. NMD048918817, HWB-NRC-14-004. December 28, 2018.

HFNR 2021a. *April 2021 Diesel Release, Site Characterization, Assessment, and Closure Report*, HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico. July 19, 2021.

HFNR 2021b. HFNR Artesia Refinery GW Monitoring - New PSH in 2021. Email to Leona Tsinnajinnie of NMED and Teresa McDill of OCD from Jason Leik of HFNR. July 30, 2021.

NMED 2001. Use of Low-Flow and Other Non-Traditional Sampling Techniques for Compliance Groundwater Monitoring. NMED Hazardous Waste Bureau Position Paper.

NMED 2010. Navajo Refining Company, Artesia Refinery, Post-Closure Care Permit. December 2010.

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NMED 2021c. Risk Assessment Guidance for Site Investigations and Remediation. November 2021.

OCD 2017a. Discharge Permit (GW-028), Navajo Refining Company - Artesia Refinery. May 2017.

OCD, 2017b. HollyFrontier Navajo Refining LLC, Artesia Refinery (GW-028) Discharge Permit Modification. June 29, 2017.

OCD, 2018a. HollyFrontier Navajo Refining LLC, Artesia Refinery (GW-028) Discharge Permit Modification. October 25, 2018.

OCD, 2018b. Discharge Permit (GW-28) Navajo Refining LLC, Modification Extension Request E-Mail of December 13, 2018, Eddy County, New Mexico. December 14, 2018.

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TRC 2021. 2021 Facility-Wide Groundwater Monitoring Work Plan - HollyFrontier Navajo Refining LLC, Artesia Refinery. June 2021.USEPA 2021. Regional Screening Level (RSL) Summary Table. November 2021.

Wood 2019. Evaluation of Methyl Tert-Butyl Ether (MTBE) in Groundwater. September 13, 2019.

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S. Department of Commerce
ational Oceanic & Atmospheric Administration
ational Environmental Satellite, Data, and Information Service
urrent Location: Elev: 3366 ft. Lat: 32.7547° N Lon: -104.3835° W
ation: **ARTESIA 6 S, NM US USC00290600**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 01/06/2022

National Centers for Environmental Informati
151 Patton Aven
Asheville, North Carolina 288

Observation Time Temperature: 0730 Observation Time Precipitation: 07

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2021	09	01	95	64	68	0.00		0.0		0.0	67.1	0.25	5	75	75			
2021	09	02	94	68	69	0.11		0.0		0.0	113.1	0.21	5	76	75			
2021	09	03	90	67	69	0.00		0.0		0.0	78.3	0.14	5	75	75			
2021	09	04	94	67	70	0.00		0.0		0.0	85.7	0.17	5	75	75			
2021	09	05	95	67	67	0.00		0.0		0.0	92.0	0.21	5	75	75			
2021	09	06	83	61	62	0.25		0.0		0.0	41.0	0.19	5	76	75			
2021	09	07	92	60	64	0.00		0.0		0.0	72.1	0.24	5	76	75			
2021	09	08	97	64	68	0.00		0.0		0.0	73.9	0.15	5	75	75			
2021	09	09	93	61	64	0.00		0.0		0.0	110.0	0.33	5	76	75			
2021	09	10	96	57	59	0.00		0.0		0.0	106.9	0.30	5	76	75			
2021	09	11	98	52	56	0.00		0.0		0.0	93.8	0.26	5	77	74			
2021	09	12	96	50	50	0.00		0.0		0.0	80.8	0.12	5	74	74			
2021	09	13	91	50	52	0.00		0.0		0.0	92.0	0.37	5	75	74			
2021	09	14	91	52	56	0.00		0.0		0.0	87.0	0.14	5	73	73			
2021	09	15	95	55	64	0.00		0.0		0.0	126.8	0.21	5	74	73			
2021	09	16	90	60	61	0.00		0.0		0.0	108.7	0.20	5	74	73			
2021	09	17	94	55	56	0.03		0.0		0.0	136.7	0.24	5	73	72			
2021	09	18	100	56	61	0.00		0.0		0.0	172.7	0.34	5	75	71			
2021	09	19	92	56	56	0.00		0.0		0.0	37.9	0.14	5	74	73			
2021	09	20	97	56	65	0.00		0.0		0.0	116.2	0.29	5	74	74			
2021	09	21	97	62	63	0.00		0.0		0.0	103.1	0.36	5	74	74			
2021	09	22	81	45	46	0.00		0.0		0.0	93.2	0.12	5	74	72			
2021	09	23	81	46	50	0.00		0.0		0.0	183.9	0.38	5	74	71			
2021	09	24	90	50	60	0.00		0.0		0.0	165.9	0.15	5	74	70			
2021	09	25	91	56	57	0.00		0.0		0.0	67.7	0.16	5	75	70			
2021	09	26	86	56	60	0.00		0.0		0.0	70.8	0.20	5	71	71			
2021	09	27	88	59	64	0.00		0.0		0.0	141.1	0.24	5	71	71			
2021	09	28	87	56	59	0.00		0.0		0.0	103.8	0.23	5	70	70			
2021	09	29	86	53	56	0.00		0.0		0.0	170.3	0.25	5	70	70			
2021	09	30	87	51	64	0.00		0.0		0.0	80.2	0.15	5	70	70			
		Summary	92	57		0.39		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests. "At Obs." = Temperature at time of observation

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

HMI Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

September 23, 2021

Ms. Julie Speer, P.G.
Sr. Project Manager
TRC
505 East Huntland Drive, Suite 250
Austin, Texas 78752

Subject: September 2021 (Fall) Groundwater Monitoring Event
Sitewide Gauging – September 14-15, 2021
Groundwater Sampling – September 14-15, 2021
Navajo Refining Company, Artesia, New Mexico

Dear Ms. Speer:

This document summarizes groundwater monitoring field activities conducted by Hydrologic Monitoring, LLC (HMI) on behalf of TRC at the Navajo Refining Company, Artesia Refinery, Artesia, New Mexico.

Contents

Field Activities Narrative
Table 1: (Gauging Data, GW Field Parameters, Well Inspections, & Analytical Program)
Groundwater Sampling SOP Memo
Job Hazard Analysis (JHA) form
Groundwater Sampling Forms, followed by Field Instrument Calibration Log
(three (3) emails - forms in order of field-strategy, Table 1)
Chain-of-Custody Forms

Field Activities Narrative

1. HMI conducted *Fall 2021* groundwater monitoring event in September 2021 ("SA" designation only, in Table 1). Sitewide gauging and groundwater sampling was conducted September 14-15, 2021.

2. Groundwater sampling was conducted in accordance with the Site Sampling and Analysis Plan, EPA guidance, and the attached Memorandum - Low-Flow Groundwater Monitoring Standard Operating Procedures, Navajo Refining Co. - Artesia, New Mexico. Per regulatory request, if measured LNAPL thickness was *less than* 0.03 feet, in any well scheduled for groundwater sampling, LNAPL was removed, and the well was sampled. If LNAPL thickness was equal to, or greater than 0.03 feet, in any well scheduled for sampling, the well was not sampled. Gauging data, groundwater field parameters, and well inspection information is summarized in Table 1. Samples were shipped Priority Overnight FedEx, per Pace National, Mt. Juliet, TN. The groundwater sampling process is documented on the attached groundwater sampling forms.

3. Field QA/QC Sampling (per Refinery Area):

   Evaporation Ponds
   Duplicates:
   Dup-EP-01 at MW-7A
   Dup-EP-02 at MW-22A
   Dup-EP-03 at MW-3
   Equipment Blanks:
   EB-EP-01 collected over decontaminated gauging probe after sampling MW-74
   EB-EP-02 collected over decontaminated gauging probe after sampling MW-124
   EB-EP-03 collected over decontaminated gauging probe after sampling MW-5A
   EB-EP-04 collected over decontaminated gauging probe after sampling MW-79
   Trip Blank-EP-01
   Trip Blank-EP-02
   Trip Blank-EP-03

   NCL
   Duplicate:
   Dup-NCL-01 at NCL-49
   Equipment Blank:
   EB-NCL-01 collected over decontaminated gauging probe after sampling NCL-49
   Trip Blank-NCL-01

   TMD
   Trip Blank-TMD-01

   TEL
   Duplicate:
   Dup-TEL-01 at TEL-4

Equipment Blank:
EB-TEL-01 collected over decontaminated gauging probe after sampling TEL-4
Trip Blank-TEL-01

REST ("rest" of the site)
Duplicates:
Dup-REST-01 at MW-113
Dup-REST-02 at MW-102
Dup-REST-03 at MW-134
Dup-REST-04 at MW-146
Dup-REST-05 at KWB-12B
Equipment Blanks:
EB-REST-01 collected over decontaminated gauging probe after sampling MW-113
EB-REST-02 collected over decontaminated gauging probe after sampling MW-102
EB-REST-03 collected over decontaminated gauging probe after sampling MW-134
EB-REST-04 collected over decontaminated gauging probe after sampling MW-146
EB-REST-05 collected over decontaminated gauging probe after sampling KWB-12B
Trip Blank-REST-01
Trip Blank-REST-02
Trip Blank-REST-03
Trip Blank-REST-04

4. Notes:

HMI's daily JHA forms to be included in deliverables package. Email to TRC "Estimated Field Hours" table, pre-event, and followup with "Actual Field Hours" table, post-event.

Wells not located 2H21 (at-grade wells covered during recent construction activities; gravel spreading…etc.; reported to Navajo during event, September 14-15, 2021):

MW-48 - pre-2H21, MW-48 was found damaged/destroyed…sediment-filled, and no cap (HMI placed a cap on the well for safety only; the well was determined to be filled with sediment to approx. 4 ft-bgs). As described to Navajo in 2H21, now the area of MW-48 seemed to be scraped by heavy equipment, and MW-48 is now completely gone.

MW-93 – covered by construction-related gravel; reported to Navajo, September 2021

MW-97 – covered by construction-related gravel; reported to Navajo, September 2021

MW-105 – covered by construction-related gravel; reported to Navajo, September 2021

MW-106 – covered by construction-related gravel; reported to Navajo, September 2021

Per 1H21 note - irrigation wells may experience upcoming changes, per TRC (TBD, replacements, etc.), with possible renewed well-access on the Joy farm property upcoming.

Training modules: "24HFNAV HOLLYFRONTIER SITE SPECIFIC ORIENTATION ARTESIA-NM", and additional "LPS" module – both @ HASC, annually (HMI's December-cycle). HMI's DISA 2-yr backgound check/drug/alcohol requirements approved by safety-trailer personnel 2019, 2021, 2023, etc., as reported through HASC system; HMI maintains access qualifications.
Per Navajo, purgewater is disposed in the pad sump (inside, then to the left, after Main Gate-entrance). Alternately, North Bundle Pad sump (fenced area of drums, etc.), notifying FCC control room prior to entrance.
Sitewide well/gate lock combinations: "2-0-1-3" (and less often "2-0-0-2").
With suggested telephone notification, FedEx pickup from locked Artesia Refinery shed (35-25-39 lock combination), no earlier than approximately 14:00 daily, located across from Artesia Wool Co (access shed-area from inside the Refinery).
North side of Hwy 82, east of site, gate with cable and combination lock (8810).
POTW bldg, check-in as needed, to borrow a key or get gate unlocked.
HMI borrows Navajo key sets for "Evaporation Ponds" & "TEL" at permitting; returning upon event completion.
Navajo's Mr. Randy Dade, Richard Orosco, for daily safety review & permit-issue per team member (commonly ~ 10-pers HMI team).
HMI reports well inspections on the well sampling forms. Well inspection - items of concern (i.e., "Issues") are highlighted in yellow color (Table 1).

HMI appreciates the opportunity to assist TRC with this project. If you have any questions or would like additional information please feel free to call us at 713.464.5206.

Sincerely,

HYDROLOGIC MONITORING

Scott C. Ude

STATE OF TEXAS
SCOTT C. UDE
GEOLOGY
353
LICENSED
PROFESSIONAL GEOSCIENTIST

Scott C. Ude, P.G.

The seal appearing on this document was authorized by Scott C. Ude, P.G. 353 on September 23, 2021.

Attachments

cc: Dana Helbert, P.G., TRC-Austin

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Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label	PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC: Purge Parameters	General Sampling Frequency	(Analysis per COC)
										Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																				
MW-6A	Monitoring	MDB				1	EP	14-Sep	915	NP	12.99	0.00	19.04			7.25	18.4	4,990	1.0	-169.4	5.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-6B	Monitoring	MDB				2	EP	14-Sep	920	NP	12.90	0.00	52.28			6.84	19.5	5,840	1.0	-120.1	2.4	Clear	Yes	Yes	Yes	Yes		SA	B	B	x
MW-85	Monitoring	MDB		1		3	EP	14-Sep	1725	10.50	10.90	0.40	20.34			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-86	Monitoring	MDB		2		4	EP	14-Sep	1715	10.27	10.30	0.03	19.21			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-120	Monitoring	MDB				5	EP	14-Sep	925	NP	12.90	0.00	28.00	14-Sep	950	7.14	24.4	9,060	1.9	-111.0	5.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-121	Monitoring	MDB				6	EP	14-Sep	1010	NP	12.63	0.00	27.31	14-Sep	1035	7.15	24.4	7,090	1.9	33.8	7.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-84	Monitoring	MDB				7	EP	14-Sep	1625	NP	9.21	0.00	20.56	14-Sep	1650	7.01	28.9	11,690	1.7	-146.5	8.4	Clear, yellow tint	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-122	Monitoring	MDB				8	EP	14-Sep	1150	NP	10.84	0.00	23.32	14-Sep	1215	7.17	28.3	6,020	2.1	-87.8	22.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-81	Monitoring	MDB				9	EP	14-Sep	1050	NP	11.17	0.00	18.62			7.02	17.2	7,040	2.4	43.0	3.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-80	Monitoring	MDB				10	EP	14-Sep	1055	NP	9.24	0.00	19.69			6.59	16.8	6,650	1.3	32.1	8.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-79	Monitoring	MDB				11	EP	14-Sep	1100	NP	10.27	0.00	19.24	14-Sep	1125	7.03	26.4	8,410	2.0	59.1	3.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-82	Monitoring	MDB				12	EP	14-Sep	1710	NP	9.93	0.00	20.02			6.99	20.2	8,160	1.3	20.4	7.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-74	Monitoring	MDB				13	EP	14-Sep	1510	NP	9.35	0.00	20.19	14-Sep	1535	6.96	28.8	11,780	1.7	-62.9	15.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-73	Monitoring	MDB				14	EP	14-Sep	1605	NP	9.18	0.00	19.60			7.51	16.9	13,540	1.4	-39.7	12.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-2A	Monitoring	MDB				15	EP	14-Sep	1235	NP	10.70	0.00	17.30	14-Sep	1300	6.93	28.5	14,740	1.8	30.4	4.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-2B	Monitoring	MDB				16	EP	14-Sep	1315	NP	11.38	0.00	52.00			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program		
MW-72	Monitoring	MDB				17	EP	14-Sep	1325	NP	7.41	0.00	13.93			7.80	18.1	11,790	0.9	6.9	3.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
OCD-6	Monitoring	MDB				18	EP	14-Sep	1335	NP	10.86	0.00	26.69	14-Sep	1400	6.95	29.0	17,570	1.8	-90.0	8.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
OCD-7AR	Monitoring	MDB				19	EP	14-Sep	1415	NP	9.64	0.00	21.28	14-Sep	1440	7.04	28.6	14,570	1.7	-141.1	24.6	Clr, red particles	Yes	Yes	Yes	Yes		SA	SA	SA	x
OCD-7B	Monitoring	MDB				20	EP	14-Sep	1455	NP	9.69	0.00	56.85			7.70	20.2	6,400	1.1	-127.7	6.5	Clear	Yes	Yes	Yes	Yes		SA	B	B	x
OCD-7C	Monitoring	MDB				21	EP	14-Sep	1500	NP	9.38	0.00	71.95			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program		
RW-#15C	Recovery	MDB		3		22	REST	14-Sep	855	19.03	19.14	0.11	22.30			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-48	Monitoring	MDB		*		23	REST	14-Sep	845	*	*	*	32.00	* Well unlocated; formerly blocked @ 4.74' (sediment-filled); found with no cap									Issue	Issue	Issue	Issue	Y	SA	SA	SA	x	(Covered by const. soil, 9-21)
MW-130	Monitoring	MDB				24	REST	14-Sep	800	NP	22.95	0.00	45.00	14-Sep	825	6.71	24.2	3,020	3.0	130.1	112.0	Cloudy, white tint	Yes	Yes	Yes	Yes		SA	SA	SA	x
KWB-4	Monitoring	MDB		4		25	REST	14-Sep	900	26.73	29.87	3.14	41.75			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
RW-19	Recovery [d]	MDB		5		26	REST	14-Sep	905	27.58	28.04	0.46	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-76	Monitoring	SCD				27	EP	14-Sep	1645	NP	11.35	0.00	20.33	14-Sep	1710	6.86	25.1	6,150	1.5	-194.6	5.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-77	Monitoring	SCD				28	EP	14-Sep	1730	NP	9.57	0.00	20.52			6.94	19.7	7,490	2.1	-33.1	6.0	Clr, gold tint, odor	Yes	Yes	Yes	Yes		SA	A	A	x
MW-78	Monitoring	SCD				29	EP	14-Sep	1735	NP	9.66	0.00	19.57			7.11	19.9	4,160	1.9	55.2	6.0	Clear, gold tint	Yes	Yes	Yes	Yes		SA	A	A	x
MW-75	Monitoring	SCD				30	EP	14-Sep	1740	NP	9.79	0.00	23.74	14-Sep	1805	7.03	25.1	7,310	1.4	-138.9	7.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-83	Monitoring	SCD				31	EP	14-Sep	1600	NP	9.61	0.00	19.91	14-Sep	1625	6.88	25.8	6,180	1.8	-126.0	6.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-3	Monitoring	SCD				32	EP	14-Sep	1510	NP	11.74	0.00	22.10	14-Sep	1535	7.04	25.6	7,200	2.0	-27.1	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x

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Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-88	Monitoring	SCD				33	EP	14-Sep	1155	NP	9.30	0.00	20.31	14-Sep	1220	7.13	23.8	7,960	1.8	-68.5	6.5	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-22A	Monitoring	SCD				34	EP	14-Sep	1235	NP	8.57	0.00	22.65	14-Sep	1300	7.04	24.4	20,400	1.9	-58.2	6.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-22B	Monitoring	SCD				35	EP	14-Sep	1325	NP	8.35	0.00	54.66			7.05	17.1	6,470	1.1	-96.2	5.0	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-10	Monitoring	SCD				36	EP	14-Sep	1335	NP	6.03	0.00	18.45	14-Sep	1400	7.03	23.7	7,030	1.8	-78.7	4.0	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-123	Monitoring	SCD				37	EP	14-Sep	1420	NP	6.56	0.00	25.71	14-Sep	1445	7.04	22.9	6,910	1.5	-139.4	6.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-4A	Monitoring	SCD				38	EP	14-Sep	1100	NP	11.88	0.00	16.55	14-Sep	1125	7.19	23.3	7,120	2.0	-141.5	5.8	Clr, black particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-4B	Monitoring	SCD				39	EP	14-Sep	1145	NP	11.65	0.00	72.37			7.16	19.7	5,040	2.9	-139.9	6.9	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-5A	Monitoring	SCD				40	EP	14-Sep	955	NP	8.25	0.00	20.15	14-Sep	1020	7.12	23.7	12,240	2.2	-164.2	5.4	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-5B	Monitoring	SCD				41	EP	14-Sep	1045	NP	8.96	0.00	53.54			7.13	19.5	7,560	1.0	-100.0	4.3	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-5C	Monitoring	SCD				42	EP	14-Sep	1050	NP	9.18	0.00	71.64			7.27	19.4	3,820	1.3	-70.0	6.2	Clr, white particles	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-7A	Monitoring	SCD				43	EP	14-Sep	855	NP	9.53	0.00	18.65	14-Sep	920	7.17	23.5	8,880	2.2	-77.6	6.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-7B	Monitoring	SCD				44	EP	14-Sep	945	NP	9.30	0.00	52.56			7.49	18.9	7,770	1.3	-90.8	6.5	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
OCD-8A	Monitoring	SCD				45	EP	14-Sep	810	NP	8.56	0.00	20.74	14-Sep	835	6.94	22.3	17,920	2.3	-138.5	5.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-8B	Monitoring	SCD				46	EP	14-Sep	805	NP	9.17	0.00	56.65			6.96	17.7	9,250	1.3	-59.5	7.4	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
KWB-P4	Monitoring	BRH				47	REST	14-Sep	1715	NP	5.89	0.00	30.26			7.14	21.6	6,730	1.3	-44.9	3.7	Clear	Yes	Yes	Yes	Yes		B	B	B	x				
MW-25	Monitoring	BRH				48	TMD	14-Sep	1630	NP	14.10	0.00	28.18			7.49	18.7	4,460	1.5	89.6	2.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
NP-8	Monitoring	BRH				49	TMD	14-Sep	1625	NP	13.05	0.00	>14.95	(blockage)		Not in sampling program							Yes	Issue	Yes	Yes		SA	Not in sampling program							
MW-1R	Monitoring	BRH				50	EP	14-Sep	1635	NP	11.31	0.00	20.63			7.40	21.0	6,070	1.2	-108.7	4.4	Clear	Yes	Issue	Yes	Yes		SA	A	A	x				
MW-15	Monitoring	BRH				51	EP	14-Sep	1640	NP	12.43	0.00	21.70			7.57	19.8	7,070	1.8	47.9	5.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
OCD-1R	Monitoring	BRH				52	EP	14-Sep	1545	NP	12.08	0.00	23.74	14-Sep	1610	7.41	24.4	7,750	1.4	-69.5	5.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-2A	Monitoring	BRH				53	EP	14-Sep	1155	NP	12.42	0.00	27.56	14-Sep	1220	7.67	24.0	6,710	1.5	-46.8	4.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-2B	Monitoring	BRH				54	EP	14-Sep	1230	NP	12.03	0.00	50.38			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
OCD-3	Monitoring	BRH				55	EP	14-Sep	1240	NP	12.72	0.00	25.20	14-Sep	1305	7.73	23.8	5,410	1.6	97.4	5.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-4	Monitoring	BRH				56	EP	14-Sep	1320	NP	12.30	0.00	25.41	14-Sep	1345	7.50	23.8	17,420	1.3	-9.8	6.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-11A	Monitoring	BRH				57	EP	14-Sep	1445	NP	9.66	0.00	22.01	14-Sep	1510	7.24	24.0	26,900	1.4	-57.4	5.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-11B	Monitoring	BRH				58	EP	14-Sep	1520	NP	9.66	0.00	47.30			7.02	21.5	21,300	1.1	-73.7	6.1	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
OCD-5	Monitoring	BRH				59	EP	14-Sep	1405	NP	10.42	0.00	25.41	14-Sep	1430	7.39	23.6	17,790	1.5	-86.4	36.4	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-87	Monitoring	BRH				60	EP	14-Sep	815	NP	8.73	0.00	20.39	14-Sep	840	6.97	22.5	15,880	1.6	22.6	5.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-18A	Monitoring	BRH				61	EP	14-Sep	900	NP	10.50	0.00	22.58	14-Sep	925	7.42	22.8	20,600	1.3	-187.4	3.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-18B	Monitoring	BRH				62	EP	14-Sep	940	NP	10.52	0.00	50.59			7.23	18.2	5,910	1.4	3.5	3.1	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-18T	Monitoring	BRH				63	EP	14-Sep	945	NP	10.62	0.00	50.57			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
MW-70	Monitoring	BRH				64	EP	14-Sep	955	NP	8.80	0.00	22.05	14-Sep	1020	7.36	23.6	8,160	1.3	-100.3	14.3	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				

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Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-124	Monitoring	BRH				65	EP	14-Sep	1045	NP	9.44	0.00	22.00	14-Sep	1110	7.63	22.9	12,960	1.6	-78.0	7.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-52	Monitoring	BRH/MDB				66	REST	14-Sep	1725	NP	20.98	0.00	34.67	15-Sep	950	7.01	22.4	2,570	1.7	-206.4	6.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-109	Monitoring	BRH/RJM				67	REST	14-Sep	1730	NP	19.03	0.00	29.48	15-Sep	830	7.40	22.7	3,320	1.6	-349.2	5.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-110	Monitoring	BRH/RJM				68	REST	14-Sep	1735	NP	15.71	0.00	29.74	15-Sep	910	7.30	23.0	1,551	1.3	-251.6	8.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-13	Monitoring	BRH				69	EP	15-Sep	1045	NP	12.88	0.00	21.10			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river						
MW-69	Monitoring	BRH				70	EP	15-Sep	1038	NP	11.29	0.00	22.51			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river						
MW-12	Monitoring	BRH				71	EP	15-Sep	1030	NP	10.69	0.00	17.93			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river						
MW-24	Monitoring	BRH				72	EP	15-Sep	1115	NP	12.34	0.00	23.51			Not in sampling program							Yes	Yes	Issue	Yes		SA	No sampling due to location E. of river						
MW-14	Monitoring	BRH				73	EP	15-Sep	1122	NP	>11.81	0.00	>11.81	(blockage)		Not in sampling program							Yes	Issue	Yes	Yes		SA	No sampling due to location N. of river						
RW-12	Recovery [d]					Field E of Refinery				Not in gauging program						Not in sampling program												-	-	-	-	-	-	-	-
RW-12R	Recovery [d]	BTB				74	REST	14-Sep	1602	NP	18.89	0.00	NM			In 1H21...No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-113	Monitoring	BTB/GDS				75	REST	14-Sep	1505	NP	18.74	0.00	37.80	14-Sep	1530	6.48	23.9	3,800	2.1	-331.4	6.7	Clear, odor	Yes	Yes	Yes	Yes		SA	SA	SA	x				
KWB-8	Monitoring	BTB		6		76	REST	14-Sep	1450	13.15	13.18	0.03	35.80			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
RW-22	Recovery [d]	BTB				77	REST	14-Sep	1500	NP	12.74	0.00	NM			In 1H21...No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-20A	Recovery [d]	BTB			1	78	REST	14-Sep	1508	Dry	Dry	NM	21.98			(Historical LNAPL - Top of fmr recov. pump @ 20.65 ft-toc							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-20B	Recovery [d]	BTB				79	REST	14-Sep	1511	NP	19.78	0.00	NM			(Historical LNAPL)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-13	Recovery [d]					Field E of Refinery				Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-
RW-13R	Recovery [d]	BTB		7		80	REST	14-Sep	1608	17.98	20.35	2.37	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-14	Recovery [d]					Field E of Refinery				Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-
RW-14R	Recovery [d]	BTB		8		81	REST	14-Sep	1620	16.20	16.49	0.29	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-133	Monitoring	BTB		9		82	REST	14-Sep	1505	16.93	16.96	0.03	37.64			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-134	Monitoring	BTB/GDS				83	REST	14-Sep	1716	NP	17.61	0.00	32.95	15-Sep	840	6.55	19.7	7,040	1.2	64.3	7.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
RA-4798	Irrigation	BTB				84	REST	14-Sep	No gauge @ irrigation well					14-Sep	1745	7.21	22.6	2,436	3.9	-13.2	2.9	Clear	NA	NA	NA	Yes		NA	SA	SA	x				
RA-4196	Irrigation	BTB				85	REST	14-Sep	No gauge @ irrigation well							Electrical pump-outage; landowner to contact electrician, per 1H21							NA	NA	NA	Yes		NA	SA	SA	x				
RA-1227	Irrigation	BTB				86	REST									Removed from program by Navajo, 4-13-15												NA							
RA-3156	Irrigation	BTB				87	REST	14-Sep	No gauge @ irrig well (not used, per Chase Farms)							7.28	21.9	3,520	5.6	6.0	>200	Cloudy	NA	NA	NA	Yes		NA	A	A	x				
RA-313	Irrigation	BTB				88	REST	14-Sep	No gauge @ irrigation well							8.34	23.8	1,661	3.9	125.6	1.4	Clear	NA	NA	NA	Yes		NA	A	A	x				
KWB-7	Monitoring	BTB				89	REST	14-Sep	1410	NP	11.99	0.00	34.83	14-Sep	1435	6.74	21.8	3,800	0.9	-263.5	1.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-20	Monitoring	BTB				91	TMD	14-Sep	1632	NP	15.12	0.00	26.66			6.82	20.7	4,430	3.5	97.6	1.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
NP-3	Monitoring	BTB				92	TMD	14-Sep	1645	NP	16.72	0.00	21.59			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program						
NP-4	Monitoring	BTB				93	TMD	14-Sep	1655	NP	33.24	0.00	36.98			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program						
NP-2	Monitoring	BTB				94	TMD	14-Sep	1700	NP	17.72	0.00	21.49			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program						

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Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)															PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
NP-1	Monitoring	BTB				95	TMD	14-Sep	1721	NP	15.64	0.00	21.88	15-Sep	955	6.38	21.7	6,440	1.3	82.1	1.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
NP-6	Monitoring	BTB				96	TMD	14-Sep	1615	NP	11.08	0.00	20.35			6.53	18.1	5,350	2.2	471.1	3.4	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-8	Monitoring	BTB				97	TMD	14-Sep	1626	NP	12.69	0.00	23.30			6.70	18.0	5,410	2.0	92.6	2.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-21	Monitoring	BTB/GDS				98	TMD	14-Sep	1733	NP	12.20	0.00	25.12	15-Sep	1045	6.60	21.6	8,440	1.4	84.8	1.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-9	Monitoring	BTB				99	TMD	14-Sep	1621	NP	13.20	0.00	22.25			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
MW-71	Monitoring	BTB				100	TMD	14-Sep	1610	NP	12.84	0.00	21.67			6.85	18.6	6,560	2.1	115.1	1.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-68	Monitoring	BTB				101	TMD	14-Sep	1555	NP	15.74	0.00	26.52			6.79	18.6	3,100	4.0	85.3	2.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-27	Monitoring	BTB				102	TMD	14-Sep	1515	NP	16.43	0.00	30.28			6.92	20.9	2,210	1.5	113.0	3.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-89	Monitoring	BTB				103	TMD	14-Sep	1519	NP	10.07	0.00	20.28			6.93	18.8	3,040	1.2	63.2	5.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-16	Monitoring	BTB				104	TMD	14-Sep	1530	NP	8.18	0.00	21.24			7.05	18.2	4,550	2.0	90.7	3.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-26	Monitoring	BTB				105	TMD	14-Sep	1540	NP	9.72	0.00	27.58			7.01	18.8	6,720	1.0	99.1	2.0	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
KWB-11A	Monitoring	BTB				106	REST	14-Sep	1135	NP	11.89	0.00	42.27	14-Sep	1200	6.54	21.5	3,870	3.0	-132.5	2.4	Clear	Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
KWB-11B	Monitoring	BTB				107	REST	14-Sep	1220	NP	12.84	0.00	72.45	14-Sep	1245	6.79	22.1	3,560	0.8	22.7	4.1	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	x				
KWB-3AR	Monitoring	BTB				108	REST									Removed from program by Navajo, 4-13-15 (farmer Jack Joy, 575-365-6042)																			
MW-115	Monitoring	BTB				109	REST	14-Sep	1035	NP	14.96	0.00	27.50	14-Sep	1100	6.65	20.9	4,710	2.0	114.8	1.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-114	Monitoring	BTB				110	REST	14-Sep	950	NP	14.96	0.00	38.25	14-Sep	1015	6.60	22.8	3,270	2.4	98.3	2.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-125	Monitoring	BTB				111	REST	14-Sep	905	NP	18.01	0.00	28.31	14-Sep	930	6.67	20.5	4,470	1.8	92.6	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-117	Monitoring	GDS/OJD				112	REST	14-Sep	1325	NP	13.18	0.00	27.22	14-Sep	1350	6.47	24.0	4,160	2.0	51.9	8.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-118	Monitoring	GDS/OJD				113	REST	14-Sep	1240	NP	17.49	0.00	28.29	14-Sep	1305	6.63	25.3	4,570	2.9	69.4	9.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
NP-9	Monitoring	GDS				114	TMD	14-Sep	1230	NP	15.91	0.00	25.65			Not in sampling program							Yes	Yes	Needs lock	Yes		SA	Not in sampling program							
MW-119	Monitoring	GDS				115	REST	14-Sep	1150	NP	14.10	0.00	28.11	14-Sep	1215	6.72	23.5	4,480	1.8	17.3	10.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
NP-5	Monitoring	GDS				116	REST	14-Sep	917	NP	14.23	0.00	25.09			6.87	19.0	6,430	2.2	141.7	19.9	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-136	Monitoring	GDS				117	REST	14-Sep	825	NP	17.77	0.00	27.90	14-Sep	855	6.56	21.2	5,200	1.3	129.3	15.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-126A	Monitoring	GDS		10		118	REST	14-Sep	1017	19.19	19.51	0.32	37.51			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-126B	Monitoring	GDS				119	REST	14-Sep	935	NP	19.15	0.00	51.43	14-Sep	1000	6.42	20.9	5,910	1.1	146.5	9.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-127	Monitoring	GDS		11		120	REST	14-Sep	1028	22.18	23.05	0.87	53.21			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-129	Monitoring	GDS		12		121	REST	14-Sep	1036	23.87	23.92	0.05	50.78			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
KWB-1A	Monitoring	GDS		13		123	REST	14-Sep	1130	16.45	16.59	0.14	33.50			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
KWB-1B	Monitoring	GDS		14		124	REST	14-Sep	1136	18.14	18.50	0.36	33.92			Not in sampling program							Yes	Yes	Yes	Yes	Y	SA	Not in sampling program							
KWB-1C	Monitoring	GDS				125	REST	14-Sep	1141	NP	18.81	0.00	52.71			6.60	20.0	5,660	1.1	141.6	23.2	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
KWB-10R	Monitoring	GDS		15		126	REST	14-Sep	1152	18.12	19.48	1.36	29.46			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-131	Monitoring	GDS		16		127	REST	14-Sep	1042	26.05	27.25	1.20	53.35			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				

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Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label	PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC: Purge Parameters	General Sampling Frequency	(Analysis per COC)
							Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																									
KWB-5	Monitoring	GDS/OJD		17		128	REST	14-Sep	805	26.44	27.60	1.16	37.68			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-111	Monitoring	GDS/OJD		18		129	REST	14-Sep	810	27.58	28.61	1.03	40.83			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
KWB-6	Monitoring	GDS		19		130	REST	14-Sep	1110	24.35	25.50	1.15	36.44			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-112	Monitoring	GDS		20		131	REST	14-Sep	1050	23.10	24.51	1.41	37.54			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-132	Monitoring	GDS		21		132	REST	14-Sep	1101	>21.00	>21.00	NM	42.66			Navajo skimmer pump in well; no sampling (historical LNAPL)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-57	Monitoring	GDS/OJD				133	REST	14-Sep	1030	NP	17.41	0.00	34.32	14-Sep	1055	6.82	22.7	5,970	3.1	59.9	12.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
RW-#11-0[e]	Recovery [d]	GDS		22		134	REST	14-Sep	1135	19.92	20.01	0.09	22.20			In 1H21, No sampling (Well dry)							Yes	Yes	Issue	Yes	Y	SA	A	A	x
KWB-9	Monitoring	GDS				135	REST			(Historically-obstructed @ 15.11')						Removed from program by Navajo, 4-26-16 (farmer Jack Joy, 575-365-6042)														
KWB-12A	Monitoring	GDS/OJD				136	REST	14-Sep	935	NP	19.79	0.00	25.03	14-Sep	1000	6.50	23.6	4,040	3.0	63.1	8.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
KWB-12B	Monitoring	GDS/OJD				137	REST	14-Sep	840	NP	19.70	0.00	39.39	14-Sep	905	6.71	22.7	3,570	3.3	23.1	5.8	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	x
KWB-2R	Monitoring	GDS/OJD		23		138	REST	14-Sep	820	25.52	25.65	0.13	39.39			No sampling (LNAPL 0.03' or greater)							Issue	Issue	Issue	Issue	Y	SA	SA	SA	x
MW-58	Monitoring	GDS/OJD		24		139	REST	14-Sep	825	24.21	25.32	1.11	33.06			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
KWB-13	Monitoring	GDS				140	REST	14-Sep	1210	NP	28.71	0.00	33.10			6.66	20.4	4,570	4.8	209.6	>200	Cloudy, tan	Yes	Yes	Yes	Yes		SA	A	A	x
MW-103	Monitoring	SCU				141	REST	14-Sep	1245	NP	17.70	0.00	25.22			6.97	27.3	13,140	1.3	-288.9	23.6	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-104	Monitoring	SCU				142	REST	14-Sep	1250	NP	15.17	0.00	21.97	14-Sep	1315	6.85	31.7	2,110	1.8	-336.0	1.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-64	Monitoring	SCU				143	REST	14-Sep	1330	NP	20.75	0.00	34.08	14-Sep	1400	6.65	37.3	2,490	2.4	-337.2	19.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-65	Monitoring	SCU		25		144	REST	15-Sep	840	18.21	18.95	0.74	28.78			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
RW-5	Recovery [d]						S Refinery			Not in gauging program						Not in sampling program											Y				
RW-5R	Recovery [d]	SCU		26		145	REST	15-Sep	830	19.60	25.35	5.75	35.30			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-102	Monitoring	SCU				146	REST	14-Sep	1440	NP	15.62	0.00	26.45	14-Sep	15.05	6.64	28.2	2,390	1.9	-329.6	5.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
RW-4	Recovery [d]	SCU		27		147	REST	15-Sep	815	18.46	19.03	0.57	36.62			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
RW-6	Recovery [d]	SCU		28		148	REST	15-Sep	822	18.12	21.55	3.43	34.90			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-99	Monitoring	SCU		29		149	REST	15-Sep	855	20.70	21.19	0.49	27.80			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-66	Monitoring	SCU		30		150	REST	15-Sep	1005	19.52	19.76	0.24	29.80			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-28	Monitoring	SCU		31		151	REST	15-Sep	915	20.00	21.95	1.95	27.82			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-59	Monitoring	SCU		32		152	REST	15-Sep	945	15.96	16.60	0.64	32.72			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-60	Monitoring	SCU		33		153	REST	15-Sep	950	17.38	17.65	0.27	37.78			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-107	Monitoring	SCU		34		154	REST	15-Sep	925	16.19	18.50	2.31	19.05			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-128	Monitoring	SCU		35		155	REST	15-Sep	930	18.29	20.25	1.96	35.35			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-116	Monitoring	SCU				156	REST	15-Sep	1000	NP	14.60	0.00	27.63	15-Sep	1025	7.25	22.5	3,780	1.1	-262.3	5.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-46R	Monitoring	SCU				157	TMD	15-Sep	1015	NP	11.73	0.00	19.36	15-Sep	1045	6.69	24.7	2,970	2.0	-40.3	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
RW-#18A	Recovery	GDS to SCU				157.05	REST	14-Sep	820	NP	15.16	0.00	17.78			In 1H21, No sampling (Well dry)							Yes	Yes	Yes	Yes		SA	A	A	x

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Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label	PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC: Purge Parameters	General Sampling Frequency	(Analysis per COC)
							Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																									
MW-145	Monitoring	SCU				157.1	REST	14-Sep	1105	NP	17.92	0.00	32.10	14-Sep	1130	6.72	24.9	4,760	1.9	107.3	6.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-146	Monitoring	SCU				157.2	REST	14-Sep	955	NP	21.68	0.00	33.40	14-Sep	1020	6.82	24.2	4,830	1.7	108.0	6.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-135	Monitoring	GDS to SCU				157.25	REST	14-Sep	1630	NP	30.31	0.00	65.55	14-Sep	1655	6.85	18.9	8,410	3.1	34.6	16.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-147	Monitoring	SCU				157.3	REST	14-Sep	830	NP	29.84	0.00	39.83	14-Sep	855	6.55	20.9	5,840	6.6	125.3	32.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-148	Monitoring	SCU				157.4	REST	14-Sep	915	NP	35.94	0.00	40.38	14-Sep	930	6.93	22.1	3,740	6.2	106.0	95.0	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	x
UG-3R	Monitoring	SCU				158	REST	14-Sep	Do not address 2H21				38.58			6.97	23.1	2,620	5.1	109.0	3.4	Clear	Yes	Yes	Yes	Yes		A	A	A	x
UG-4	Monitoring	SCU				159	REST	14-Sep	Do not address 2H21				39.24			6.80	23.0	3,800	3.0	108.9	23.6	Clear	Yes	Yes	Yes	Yes		A	A	A	x
UG-1	Monitoring	SCU				160	REST	14-Sep	Do not address 2H21				24.08			6.89	25.6	3,210	5.2	109.9	10.3	Clear	Yes	Yes	Yes	Yes		A	A	A	x
UG-2	Monitoring	SCU				161	REST	14-Sep	Do not address 2H21				29.28			6.90	28.7	2,360	4.9	98.0	3.7	Clear	Yes	Yes	Yes	Yes		A	A	A	x
MW-101	Monitoring	TAB/RJM				162	REST	15-Sep	900	NP	17.16	0.00	22.15	15-Sep	925	7.15	24.8	1,896	1.2	-332.7	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-105	Monitoring	TAB				163	REST	14-Sep	Not located				17.20	* Covered by construction-related gravel; unable to locate; reported to Navajo														SA	SA	SA	x
RW-2	Recovery [d]	TAB		36		164	REST	14-Sep	1335	17.95	18.70	0.75	36.13			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-61	Monitoring	TAB				165	REST	14-Sep	1120	NP	12.73	0.00	29.30	14-Sep	1155	7.02	26.1	2,660	1.2	-423.0	3.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-62	Monitoring	TAB/OJD				166	REST	14-Sep	1215	NP	15.92	0.00	29.50	14-Sep	1240	6.65	27.7	3,200	2.9	-402.6	2.6	Clear	Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-62R	Monitoring	TAB/OJD				166.1	REST	14-Sep	1300	NP	15.61	0.00	24.51	14-Sep	1325	6.76	25.9	2,610	1.8	-363.8	1.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-93	Monitoring	TAB		*		167	REST	14-Sep	Not located			*	20.23	* Covered by construction-related gravel; unable to locate; reported to Navajo									Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-43	Monitoring	TAB/RJM		37		168	REST	14-Sep	1450	10.80	10.85	0.05	19.67			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-137	Monitoring	TAB/RJM		38		169	REST	14-Sep	1440	11.70	12.10	0.40	29.60			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-137A	Monitoring	TAB/RJM		39		169.1	REST	14-Sep	1430	11.84	12.44	0.60	14.88			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-138	Monitoring	TAB/RJM		40		170	REST	14-Sep	1420	12.72	16.61	3.89	24.81			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-138A	Monitoring	TAB/RJM		41		170.1	REST	14-Sep	1410	12.62	12.79	0.17	15.03			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-23	Monitoring	TAB/OJD		42		171	REST	14-Sep	1355	16.16	18.01	1.85	23.10			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
TEL-4	Monitoring	TAB				172	TEL	14-Sep	800	NP	13.06	0.00	27.27	14-Sep	825	6.46	22.4	3,930	1.6	-281.9	4.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
TEL-3	Monitoring	TAB		43		173	TEL	14-Sep	900	13.52	16.91	3.39	27.19			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
TEL-2	Monitoring	TAB		44		174	TEL	14-Sep	915	14.58	16.18	1.60	27.20			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
TEL-1	Monitoring	TAB		45		175	TEL	14-Sep	930	13.95	14.07	0.12	27.00			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-39	Monitoring	TAB/RJM		46		176	REST	14-Sep	1630	14.48	14.65	0.17	25.44			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-98	Monitoring	TAB				177	REST	14-Sep	1030	NP	12.81	0.00	25.60	14-Sep	1055	6.76	26.0	3,140	1.3	-414.9	1.6	Clear, odor	Yes	Yes	Yes	Yes		SA	SA	SA	x
RW-10	Recovery [d]	TAB		47		178	REST	14-Sep	940	13.95	16.99	3.04	22.49			In 1H21, No LNAPL							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-40	Monitoring	TAB		48		179	REST	14-Sep	1640	12.24	16.78	4.54	24.75			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-41	Monitoring	TAB/RJM		49		180	REST	14-Sep	1600	12.05	12.89	0.84	21.56			6.67	21.3	5,420	3.1	-323.8	6.2	Clear	Yes	Yes	Yes	Yes	Y	SA	A	A	x

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Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label	PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC: Purge Parameters	General Sampling Frequency	(Analysis per COC)
										Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																				
RW-9	Recovery [d]	TAB/RJM				181	REST	14-Sep	1620	NP	14.36	0.00	21.83			6.86	21.7	4,150	1.0	-368.7	5.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-42	Monitoring	TAB				182	REST	14-Sep	1550	NP	14.66	0.00	24.32			6.53	21.0	3,170	1.6	-340.1	3.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-29	Monitoring	TAB				183	REST	14-Sep	1650	NP	19.74	0.00	24.22	15-Sep	1025	6.71	27.5	5,840	2.3	-170.0	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
RW-#16B	Recovery	TAB/RJM				184	REST	14-Sep	1540	NP	15.72	0.00	17.70	In 1H21, No sampling (Well dry)									Yes	Yes	Yes	Yes		SA	A	A	x
MW-30	Monitoring	TAB				185	REST	14-Sep	1510	NP	14.20	0.00	23.50	Not in sampling program									Yes	Yes	Yes	Yes		SA	Not in sampling program		
MW-56	Monitoring	TAB				186	NCL	14-Sep	1530	NP	14.83	0.00	26.50			6.93	19.8	2,460	1.6	-300.4	1.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-49	Monitoring	TAB/RJM				187	TEL	14-Sep	1650	NP	12.46	0.00	33.07	15-Sep	840	6.74	26.5	3,040	2.7	-336.7	6.9	Clear, odor	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-106	Monitoring	TAB/RJM				188	REST	15-Sep	Not located				22.80	* Covered by construction-related gravel; unable to locate; reported to Navajo									Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-45	Monitoring	TAB				189	NCL	15-Sep	905	NP	9.83	0.00	15.05	15-Sep	930	6.96	26.5	5,080	2.1	-146.7	3.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-139	Monitoring	RJM/BTA				190	REST	14-Sep	1535	NP	13.33	0.00	29.60	14-Sep	1600	6.92	25.5	2,830	1.1	-254.9	3.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-50	Monitoring	RJM/BTA				191	REST	14-Sep	915	NP	13.50	0.00	28.22	14-Sep	940	6.80	24.1	8,140	1.7	-15.1	5.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-97	Monitoring	RJM/BTA		*		192	REST	14-Sep	Not located			*	21.20	* Covered by construction-related gravel; unable to locate; reported to Navajo									Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-92	Monitoring	RJM/BTA		50		193	REST	14-Sep	830	13.48	14.30	0.82	22.60			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
RW-1	Recovery [d]	RJM/BTA		51		194	REST	14-Sep	810	15.13	17.90	2.77	35.39			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-91	Monitoring	RJM/BTA		52		195	REST	14-Sep	755	13.13	13.34	0.21	25.35			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-90	Monitoring	RJM/BTA				196	REST	14-Sep	1035	NP	12.61	0.00	22.80	14-Sep	1100	6.77	26.8	3,470	1.5	-362.3	8.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-96	Monitoring	RJM/BTA				197	REST	14-Sep	1135	NP	13.04	0.00	25.57	14-Sep	1200	6.80	25.6	2,140	1.6	-373.4	4.2	Clear	Yes	Yes	Issue	Yes	Y	SA	SA	SA	x
MW-94	Monitoring	RJM/BTA		53		198	REST	14-Sep	815	15.50	18.03	2.53	23.45			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
RW-8	Recovery [d]	RJM/BTA		54		199	REST	14-Sep	805	14.20	15.68	1.48	37.22			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-67	Monitoring	RJM/BTA		55		200	REST	14-Sep	755	12.54	13.15	0.61	27.30			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-95	Monitoring	RJM/BTA		56		201	REST	14-Sep	1330	15.15	15.82	0.67	25.37			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
RW-7	Recovery [d]	RJM/BTA		57		202	REST	14-Sep	825	16.46	16.99	0.53	37.00			In 1H21, No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
NCL-34A	Monitoring	RJM/BTA		58		203	NCL	14-Sep	835	13.80	16.21	2.41	19.26			No sampling (LNAPL 0.03' or greater)							Yes	Yes	No lock	Yes	Y	SA	SA	SA	x
NCL-33	Monitoring	RJM/BTA				204	NCL	14-Sep	1005	NP	12.22	0.00	19.60	14-Sep	1030	6.56	21.5	4,060	1.1	-33.0	9.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
NCL-44	Monitoring	RJM/BTA				205	NCL	14-Sep	925	NP	12.14	0.00	21.34	14-Sep	950	6.69	20.4	2,610	1.2	-108.8	6.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
NCL-32	Monitoring	RJM/BTA				206	NCL	14-Sep	845	NP	12.33	0.00	20.04	14-Sep	910	6.72	19.3	2,710	1.0	28.0	14.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-108	Monitoring	RJM/BTA				207	NCL	14-Sep	1235	NP	16.10	0.00	27.74	14-Sep	1300	6.94	25.6	1,981	0.8	-362.3	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
NCL-31	Monitoring	RJM/BTA				208	NCL	14-Sep	1105	NP	12.52	0.00	20.16	14-Sep	1130	7.14	21.5	1,840	1.0	-122.7	14.0	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	x
MW-19	Monitoring	RJM/BTA				209	NCL	14-Sep	1055	NP	12.89	0.00	22.08	Not in sampling program									Yes	Yes	Yes	Yes		SA	Not in sampling program		
MW-55	Monitoring	RJM/BTA				210	NCL	14-Sep	1355	NP	13.95	0.00	26.85	14-Sep	1420	6.89	25.8	2,950	2.0	-27.2	6.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
RW-#17A	Recovery	RJM/BTA				211	REST	14-Sep	1455	NP	13.86	0.00	16.01	In 1H21, No sampling (Well dry)									Yes	Yes	Yes	Yes		SA	A	A	x
MW-18	Monitoring	RJM/BTA				212	NCL	14-Sep	1045	NP	14.13	0.00	22.20			6.69	20.8	2,560	1.7	70.5	5.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	x

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Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-54A	Monitoring	RJM/BTA				213	NCL	14-Sep	1340	NP	14.84	0.00	31.30	14-Sep	1405	6.67	24.4	2,510	1.1	-63.2	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-54B	Monitoring	RJM/BTA				214	NCL	14-Sep	1330	NP	14.89	0.00	46.80			6.54	21.8	1,870	1.6	3.1	5.9	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
NCL-49	Monitoring	RJM/BTA				215	NCL	14-Sep	1215	NP	18.13	0.00	32.18	14-Sep	1240	7.09	21.4	3,140	1.4	55.4	8.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-53R	Monitoring	RJM/BTA				216	NCL	14-Sep	1200	NP	12.63	0.00	24.05			6.83	22.2	2,000	1.8	46.7	20.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
KWB-P3	Monitoring					Field E of Refinery				Not in gauging program						Not in sampling program											Not included in monitoring program due to distance from impacts							

Notes:

Abbreviations:

A = Annual (Mar/Apr event)
B = Biennial (starts Mar/Apr 2011)
BR = Bolton Road
DRO = Diesel Range Organics
E = East
EP = Evaporation Ponds
ft bgs = ft below ground surface
ft btoc = ft below top of casing
ft MSL = ft Mean Sea Level
GRO = Gasoline Range Organics
HR = Haldeman Road
in = inches
N = North
NA = Not accessible
NAPI = North API Separator
NCL = North Colony Landfarm
NE = Northeast
NW = Northwest
OCD = Oil Conservation District
PSH = Phase Separated Hydrocarbon
ROW = right of way
RR = Richey Road
S = South
SA = Semi-annual (Mar/Apr and Sep/Oct events)
SE = Southeast
SW = Southwest
TMD = Three Mile Ditch
TEL = Tetra Ethyl Lead Impoundment
UG = Upgradient
US285 = U.S. Highway 285
US82 = U.S. Highway 82
VOC = Volatile Organic Compounds
W = West
Y = Yes

= Well with recently gauged LNAPL (light nonaqueous phase liquid)

Note - groundwater samples are not collected from any well with LNAPL measured 0.03-ft thick, or greater

At wells scheduled for groundwater sampling (having LNAPL <0.03-ft, LNAPL will be removed, and well will be sampled

Groundwater analytical methods can include:

1. Purge parameters to be measured and recorded in the field will include pH, temp, spec. cond., diss. oxy., and oxidation-reduction potential.
2. DRO by Method 8015Mod.
3. GRO by Method 8015Mod.
4. VOCs by Method 8260, to include methyl tert butyl ether (MTBE).
5. Total metals by Method 6010/6020 and/or 7470. Specific metals shown in heading, abbreviations from periodic chart (incl B, Cd, Co, U, per 3-7-16 State request).
6. Dissolved metals - same list as total metals but only analyzed during April event (field filtered by HMI)
7. Cyanide by Method SM4500.
8. Cations/anions to include Calcium, Potassium, and Sodium by Method 6010 or 6020 and Sulfate, Chloride and Fluoride by Method 300.
9. Nitrates/Nitrites as Nitrogen by Method 300.
10. Total Dissolved Solids by Method 2540C.

"-" indicates parameter not required.

Recovery trenches 11, 15, 16, 17 and 18 have multiple vertical "wells". Gauging & sampling points are: RW #11-0, RW #15C, RW #16B, RW #17A and RW #18A.

HMI Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

M E M O R A N D U M

Groundwater Monitoring Standard Operating Procedures
Navajo Refining LLC – Artesia, New Mexico

HMI conducts low-flow groundwater sampling in accordance with the site Sampling and Analysis Plan and EPA guidance (including Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling; REV No. 4, September 19, 2017, and Yeskis & Zavala, 2002, EPA/542:S-02/00, Groundwater Sampling Guidelines for Superfund and RCRA Project Managers).

Groundwater Sampling Methodology

HMI conducts low-flow groundwater sampling using a peristaltic pump and dedicated polyethylene tubing at wells with requisite depths-to-water. At a limited number of wells with depths-to-water greater than peristaltic range, low-flow groundwater sampling is conducted using dedicated or non-dedicated bladder pumps. In 2016, at no cost to TRC, HMI installed HMI-owned bladder pumps in a limited number of wells (approximately four). At such time that HMI no longer conducts routine groundwater monitoring at the site, it respectfully requests the opportunity to recover these dedicated bladder pumps. Sample intakes are set at midscreen, when possible (generally at least two feet from the base of the well). Sample intake depths are permanently marked, ensuring future sampling events consistently monitor the targeted water-bearing interval. During sampling with a peristaltic pump, the sample tube is attached to the pump using a one-foot section of dedicated, flexible silicone tubing (item #5703, Geotech Environmental Equipment, Inc.). A two-foot segment of polyethylene tubing connects the silicone tubing in the pump to the flow-through cell, using a disposable segment of silicone tubing. Purging commences through a sealed flow-through cell at EPA-recommended purge rates (generally 0.1 to 0.2 liters/minute), while well drawdown is monitored. Groundwater field parameter readings are measured at 0.5-liter intervals (generally an equivalent of one cell-volume "turnover"). Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential are monitored inside the cell. Turbidity is monitored outside the cell. Groundwater field instrumentation is calibrated and recorded daily in accordance with manufacturer specifications.

Purging continues until a requisite volume of groundwater is purged (generally a minimum of 3,000 ml or six flow-through cell volumes), and field parameters have stabilized in accordance with EPA guidance:

Water Quality Parameters (Stabilization Parameters in Accordance with EPA (2002), Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, Yeskis & Zavala, EPA/542:S-02/001)

• pH	+/- 0.1 units;
• Temperature	-
• Conductivity	+/- 3%
• Dissolved Oxygen	+/- 0.3 mg/L
• ORP	+/- 10%
• Turbidity	10%

Immediately prior to sampling, the input tubing to the flow-through cell is disconnected from the disposable silicone receiving tubing on the input barb on the flow-through cell, and groundwater samples are collected directly into lab-supplied containers. Groundwater samples are placed in iced coolers, and remain in HMI's custody until shipped to ESC Lab Sciences via FedEx-overnight. Peristaltic tubes and/or dedicated bladder pumps may be dedicated in respective wells. Alternatively, dedicated tubing may be retrieved, bagged, labeled, and stored in tubs maintained at HMI. Wells with very limited water column thicknesses may be sampled with disposable bailers. Active recovery well and irrigation wells are sampled using sample ports. The purging and sampling process is documented on groundwater sampling field forms.

Cross-Contamination Prevention Program

Dedicated peristaltic tubing and dedicated bladder pumps are used as possible, to minimize any potential cross-contamination issues during the groundwater monitoring process. Remaining non-dedicated equipment (e.g., electronic gauging probes or non-dedicated bladder pumps, etc.) is properly decontaminated prior to use and between wells. The decontamination procedure may include a combination of chemical and mechanical decontamination. For example, scrubbing with ethyl alcohol (isopropanol) as warranted, followed by scrubbing using an Alconox-water solution, and distilled water rinse. The decontamination procedure for non-dedicated bladder pumps consists of cycling an Alconox-water solution through the pump bladder. Distilled water is cycled through the pump bladder, followed by decontaminating the exterior body of the pump, using the methods outlined above.

HMI Deliverables

HMI provides field documentation of groundwater monitoring activities in a deliverables package that includes a brief narrative, summary table (with gauging data, field parameters, well inspection data, and required analytical scope), groundwater sampling forms, field instrument calibration log, and chain-of-custody forms (by Refinery "Area"), and a groundwater sampling SOP memo.

HMI Groundwater

HYDROLOGIC MONITORING
JOB HAZARD ANALYSIS

4/12/21	4/13/21	4/14/21	9/14/21	9/15/21
Activity: Groundwater Sampling	**Date:**			
Artesia GW	**Project:**			
Description of the work: Collect fluid level information and water samples from monitoring wells. NOTE: All site workers have STOP WORK Authorization at any time site conditions change and/or become unsafe	Steve Ude **Site Supervisor:** TABarry **Attendees Signatures:** TABarry, BWyatt, RZimbro, B.Gallegos, GLuck, RMonroe, RDO, JSalazar	Steve Ude TABarry RZimbro, B.Gallegos, RDO, GLuck	Steve Ude Scott Dr Mark, BWyatt, RZimbro, B.Gallegos, GLuck, RMonroe, TABarry, DIz	Steve Ude Scott Dr Mark, BWyatt, RZimbro, B.Gallegos, GLuck, RMonroe, TABarry, DL

Work Activity Sequence	Potential Health and Safety Hazards	Hazard Controls
• General Hazards	• Accidents due to lack of training	• All workers will complete Safety Council Basic Plus Training and all site-specific training. • All workers will complete OSHA 40-hr HAZWOPER training with yearly updates. • Workers will be trained prior to performing new activities. • Tailgate safety meetings will be held daily.
	• Head Injury	• ANSI-approved hard hats will be worn at all times, in the manner they were designed (brim forward, no modifications no ball caps, etc.) Bump hats and Cowboy hard hats are not permitted.
	• Hearing Damage	• Workers will wear hearing protection whenever voices must be raised above normal conversational speech or when noise levels exceed 85 decibels due to loud noise sources such as working near heavy equipment.
	• Hand Injury	• Leather gloves will be worn when handling

Work Activity Sequence	Potential Health and Safety Hazards	Hazard Controls
		sharp, rough, or slippery surfaces. • Appropriate gloves for chemicals will be worn per project HASP.
	• Injuries resulting from manual lifting	• Workers will be instructed in safe lifting techniques (keep back straight, bend at knees, keep load close to body, lift smoothly, and do not twist at the waist. • Split heavy loads into smaller loads when possible. • Stretch before doing task • Make sure the path of travel is clear prior to the lift.
	• Foot Injury	• Workers will wear sturdy leather safety-toed boots that reach the ankle at all times. • For wet conditions or for chemical hazards proper water resistant overboots or chemical resistant safety-toed boots must be worn.
	• Eye Injury	• Workers will wear protective eyewear with sideshields that meet ANSI Z-87 at all times. If the worker wears prescription eyeglasses they must meet the same criteria or wear ANSI Z-87 safety over glasses. • Workers must have immediate access to Chemical monogoggles. Retaining rings are not permitted.
	• Slips, trips, and falls	• Walking/working surfaces will be kept free of clutter, debris, and congestion to the greatest extent possible. • Personnel should be aware of wet/muddy surfaces and use caution. Use caution when traversing uneven ground.
	• Injuries associated with insects, snakes, spiders, alligators, and poisonous plants	• Workers will wear snake chaps, leggings or sturdy rubber knee high boots when walking in uncleared, grassy areas. • Workers will avoid walking in areas where snakes or alligators may hide. Always look ahead where you are walking for signs of either. Use caution when moving or lifting objects that could be used for cover. Never reach under or behind objects, or into other areas where snakes or alligators may hide. • Workers will use insect repellant for all types of biting / stinging insects. Use care when opening wells to avoid bites and / or stings. • Workers will always use the buddy system and have a means of contacting emergency

Work Activity Sequence	Potential Health and Safety Hazards	Hazard Controls
		aid if needed by cell phone or Radio. • Workers will immediately wash any areas that were exposed to poisonous plants.
	• Chemical Exposure	• MSDS will be kept onsite in a location that all workers can access. • All workers must know where the emergency rally point is located when an evacuation alarm sounds in the plant. • Workers will sign in and out when they arrive and leave the work area.
	• Heat Stress	• All workers will take routine breaks in a cool, shaded area. • Workers will drink plenty of water throughout the day. • Workers will decrease intake of coffee and caffeinated soft drinks during working hours.
	• Vehicle accidents	• All vehicles must be inspected for safe operation onsite. • Vehicle operators must have a valid driver's license and will be instructed in safe operations while on the site. • Seat belts will be worn by all occupants. • When backing, use the buddy system or get out and look at position of objects. • All vehicles must contain a fire extinguisher, first aid kit, evacuation map, and route to hospital (map/directions). • Drivers will observe and not exceed posted plant speed limits. • Cell phone use is prohibited in a moving vehicle (drivers only) - hands free device not permitted. • Use caution at railroad crossings. • Watch for pedestrians walking into driving lanes.
	• Injury due to inclement weather	• Outdoor work will cease during extreme weather conditions, such as electrical storms, high wind, rain, and dangerous temperatures. • All equipment will be shut down when lightning is visible. • Workers will seek shelter indoors when possible or stay in vehicles.
• Groundwater Sampling	• Collect Measurements and Samples	• All site workers will wear proper PPE to prevent exposure to groundwater.

Work Activity Sequence	Potential Health and Safety Hazards	Hazard Controls
	• Using peristaltic pumps	• All workers using peristaltic pumps should inspect the power cord for damage before and after each use.
	• Fire extinguishers	• Fire extinguishers should be on hand and inspected.
	• Lifting	• All workers should use proper lifting techniques when lifting objects. Mechanical assistance may be used to lift objects weighing over 50 pounds.
	• Drive All Terrain Vehicles	• All workers that will drive All-Terrain Vehicles (ATVs) will follow site specific policies regarding use and operation of ATVs. • In addition, conditions of ATV use will be addressed on Safe Work Permit(s). • All workers will be trained in operating the ATV. • The maximum speed limit is 5 miles per hour. • Read owners manual prior to operating • ATVs are not made for multiple riders. Never carry anyone else on the ATV. • Stay seated at all times while ATV is in motion. • Do not operate the ATV on streets, highways or paved roads. • Driver must have a valid driver's license. • Driver exercise caution when loading and unloading ATV.

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(1)

Initials: MPB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	915	ND	12.99	0.00	19.04	14.1	Yes	Yes	Yes	Yes		Weather: Sunny 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								F) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-6A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6B
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AMB (2)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	920	NP	12.90	0.00	52.28	47.3	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-6B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-85
Event: 2421
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(3)

Initials: MH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1725	10.50	10.90	0.40	20.34	NS (2' off bottom of sump)	Yes	Yes	Yes	Yes		Weather: Clear 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled due to presence of LNAPL						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-85			Not Sampled					Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-86
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(4)

Initials: JMOR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1715	10.27	10.30	0.03	19.21	17.21	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not	Sampled	due to	presence			B) ded bladder pump
			2.0			of LNAPL					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-86			Not	Sampled				Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-120
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MWDS (5)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9.14.21	925	NP	12.90	0.00	28.00	17.5	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9.14.21	930	13.17	0.5	7.11	24.9	8840	3.11	-78.7	7.6	Clear	*Low-flow groundwater sample:*
	932	13.17	1.0	7.17	24.7	8960	2.9	-94.0	7.1		(A) peristaltic pump w/ ded tubing
	935	13.17	1.5	7.13	24.6	9000	2.8	-100.4	6.8		B) ded bladder pump
	937	13.17	2.0	7.13	24.5	9010	2.5	-104.9	6.3		C) non-ded bladder pump; or
	940	13.17	2.5	7.13	24.5	9020	2.3	-108.1	5.9		*Standard groundwater sample:*
	942	13.17	3.0	7.13	24.5	9040	2.0	-109.1	5.8		D) bailer due to limited column; or
	945	13.17	3.5	7.14	24.5	9050	1.9	-110.2	5.1		E) recovery well cycling sample
	947	13.17	4.0	7.14	24.4	9060	1.9	-111.0	5.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9.14.21	950	MW-120	13.17	7.14	24.4	9060	1.9	-111.0	5.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-12)
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(6)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1010	NP	12.63	0.00	27.31	17.5	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1015	12.75	0.5	7.20	25.0	7540	3.9	-4.9	13.1	Clear	*Low flow groundwater sample:*
	1017	12.82	1.0	7.17	24.8	7370	2.7	8.0	12.6		(A) peristaltic pump w/ ded tubing
	1020	12.86	1.5	7.16	24.7	7260	2.4	11.4	10.7		B) ded bladder pump
	1022	12.87	2.0	7.15	24.6	7190	2.2	16.8	9.8		C) non-ded bladder pump; or
	1025	12.88	2.5	7.15	24.5	7160	2.1	21.6	8.6		*Standard groundwater sample:*
	1027	12.89	3.0	7.15	24.5	7130	2.0	24.4	8.4		D) bailer due to limited column; or
	1030	12.90	3.5	7.15	24.4	7110	2.0	27.6	7.6		E) recovery well cycling sample
	1032	12.91	4.0	7.15	24.4	7090	1.9	33.8	7.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
9-14-21	1035	MW-12)	12.91	7.15	24.4	7090	1.9	33.8	7.2	Per COC	Per COC	
						(7090)						

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample.

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-84
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB (7)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1625	NP	9.21	0.00	20.56	15.2	Yes	Yes	Yes	Yes		Weather: Sunny 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1630	9.31	0.5	7.02	29.6	11760	3.1	-138.8	19.1	Clear/yellow tint	*Low-flow groundwater sample:*
"	1632	9.34	1.0	7.01	29.4	11780	2.0	-140.6	17.8	"	(A) peristaltic pump w/ ded tubing
"	1635	9.36	1.5	7.01	29.2	11760	1.9	-142.3	15.6	"	B) ded bladder pump
"	1637	9.38	2.0	7.01	29.1	11730	1.7	-144.5	11.7	"	C) non-ded bladder pump; or
"	1640	9.40	2.5	7.01	29.0	11710	1.7	-145.3	10.2	"	*Standerd groundwater sample:*
"	1642	9.41	3.0	7.01	29.0	11700	1.7	-145.8	9.6	"	D) bailer due to limited column; or
"	1645	9.43	3.5	7.01	28.9	11700	1.7	-146.1	9.0	"	E) recovery well cycling sample
↓	1647	9.44	4.0	7.01	28.9	11690	1.7	-146.5	8.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
9-14-21	1650	MW-84	9.44	7.01	28.9	11690	1.7	-146.5	8.4	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-122
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB (8)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1150	NP	10.84	0.00	23.32	18.4	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1155	11.44	0.5	7.21	28.7	6230	3.6	-60.4	31.8	Clear	*Low-flow groundwater sample:*
	1157	11.56	1.0	7.20	28.6	6180	3.0	-66.7	29.9		(A) peristaltic pump w/ ded tubing
	1200	11.62	1.5	7.20	28.6	6140	2.6	-70.9	28.4		B) ded bladder pump
	1202	11.67	2.0	7.19	28.5	6100	2.4	-77.0	26.1		C) non-ded bladder pump; or
	1205	11.71	2.5	7.18	28.4	6070	2.2	-80.4	25.7		*Standard groundwater sample:*
	1207	11.75	3.0	7.17	28.4	6030	2.2	-85.2	23.4		D) bailer due to limited column; or
	1210	11.78	3.5	7.17	28.3	6020	2.1	-86.4	22.8		E) recovery well cycling sample
	1212	11.81	4.0	7.17	28.3	6020	2.1	-87.8	22.1		F) irrigation well grab sample

Well Sampling Record

Data	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1215	MW-122	11.81	7.17	28.3	6020	2.1	-87.8	22.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-81
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDA (9)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-14-21	1050	NP	11.17	0.00	18.62	13.7	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-81								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-80
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(10)

Initials: MJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1055	NP	9.74	0.00	19.69	14.7	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-80								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ EB-EP-04

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-79
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDR (11)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1100	NP	10.27	0.00	19.24	15.0	Yes	Yes	Yes	Yes		Weather: Sunny, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1105	10.48	0.5	7.07	27.8	8510	2.7	75.5	5.5	Clear	*Low-flow groundwater sample:*
	1107	10.48	1.0	7.04	27.5	8450	2.4	72.3	5.2		(A) peristaltic pump w/ ded tubing
	1110	10.51	1.5	7.04	27.1	8420	2.2	68.4	5.1		B) ded bladder pump
	1112	10.54	2.0	7.03	26.8	8420	2.1	65.7	4.7		C) non-ded bladder pump; or
	1115	10.57	2.5	7.03	26.6	8410	2.0	63.8	4.2		*Standard groundwater sample:*
	1117	10.59	3.0	7.03	26.5	8410	2.0	61.8	3.7		D) bailer due to limited column; or
	1120	10.61	3.5	7.03	26.4	8410	2.0	60.1	3.5		E) recovery well cycling sample
	1122	10.63	4.0	7.03	26.4	8410	2.0	59.1	3.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1125	MW-79	10.63	7.03	26.4	8410	2.0	59.1	3.1	Per COC	Per COC	Lab: Pace National, Mt. Juliat, TN
	1140	EB-EP-04	NA							Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-82
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(12)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
3-14-21	1710	NP	9.93	0.00	20.02	15.0	Yes	Yes	Yes	Yes		Weather: Clear 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-82								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ EB-EP-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-74
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in	PVC ✓
Upright ✓	4-in ✓	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

(13)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1510	NP	9.35	0.00	20.19	14.8	Yes	Yes	Yes	Yes		Weather: Clear, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1515	9.46	0.5	6.99	29.4	12230	3.1	-60.9	34.6	Clear	*Low-flow groundwater sample:*
	1517	9.49	1.0	6.97	29.3	12070	2.3	-62.3	30.7		(A) peristaltic pump w/ ded tubing
	1520	9.50	1.5	6.98	29.2	11940	2.1	-62.4	25.9		B) ded bladder pump
	1522	9.50	2.0	6.97	29.1	11870	2.0	-62.5	21.7		C) non-ded bladder pump; or
	1525	9.50	2.5	6.97	29.0	11818	1.8	-62.8	18.2		*Standard groundwater sample:*
	1527	9.50	3.0	6.96	28.9	11800	1.7	-62.7	16.7		D) bailer due to limited column; or
	1530	9.51	3.5	6.96	28.8	11790	1.7	-62.8	16.0		E) recovery well cycling sample
	1532	9.51	4.0	6.96	28.8	11780	1.7	-62.9	15.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1535	MW-74	9.51	6.96	28.8	11780	1.7	-62.9	15.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	1550	EB-EP-01	NA	—	—	—	—	—	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-73
Event: 2421
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2 in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(14)

Initials: MW

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-19-21	1605	NP	9.18 (9.13)	0.00	19.60	14.6	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-73								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

15

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1235	NP	10.70	0.00	17.30	15.0	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1240	10.83	0.5	6.96	29.3	12850	3.4	65.3	13.7	Clear	*Low-flow groundwater sample:*
	1242	10.89	1.0	6.94	29.0	13680	2.6	60.1	10.6		(A) peristaltic pump w/ ded tubing
	1245	10.95	1.5	6.94	28.8	14150	2.0	53.5	8.4		B) ded bladder pump
	1247	10.99	2.0	6.94	28.7	14370	1.9	50.7	6.7		C) non-ded bladder pump; or
	1250	11.03	2.5	6.93	28.6	14460	1.9	44.0	5.9		*Standard groundwater sample:*
	1252	11.06	3.0	6.93	28.6	14600	1.8	40.3	5.5		D) bailer due to limited column; or
	1255	11.08	3.5	6.93	28.6	14660	1.8	38.0	5.1		E) recovery well cycling sample
↓	1257	11.10	4.0	6.93	28.5	14740	1.8	30.4	4.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
9-14-21	1300	MW-2A	11.10	6.93	28.5	14740	1.8	30.4	4.7	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2B
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB (16)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1315	NP	11.38	0.00	52.00	NS	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non ded bladder pump; or
			2.5								Standard groundwater sample:
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-2B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-72
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(17)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/14/21	1325	NP	7.41	0.00	13.93	11.9	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-72								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-6
Event: 2421
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(18)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1335	ND	10.86	0.00	26.69	21.6	Yes	Yes	Yes	Yes		Weather: Sunny 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1340	11.01	0.5	6.95	29.5	17580	2.4	-87.1	22.7	Clear	*Low-flow groundwater sample:*
	1342	11.01	1.0	6.95	29.3	17510	2.0	-89.3	20.3		(A) peristaltic pump w/ ded tubing
	1345	11.01	1.5	6.96	29.2	17540	1.8	-90.7	16.6		B) ded bladder pump
	1347	11.01	2.0	6.96	29.1	17560	1.8	-90.3	12.7		C) non-ded bladder pump; or
	1350	11.01	2.5	6.96	29.0	17560	1.8	-90.8	10.9		*Standard groundwater sample:*
	1352	11.01	3.0	6.96	29.0	17560	1.8	-90.5	9.6		D) bailer due to limited column; or
	1355	11.01	3.5	6.96	29.0	17570	1.8	-90.2	8.8		E) recovery well cycling sample
	1357	11.01	4.0	6.95	29.0	17570	1.8	-90.0	8.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1400	OCD-6	11.01	6.95	29.0	17570	1.8	-90.0	8.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
						(17,570)		(-90.0)				

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7AR
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(19)

Initials: MAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1415	NP	9.64	0.00	21.28	16.0	Yes	Yes	Yes	Yes		Weather: Sunny 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1420	9.89	0.5	7.12	29.6	15200	2.5	-130.3	37.6	Clear w/ red particles	*Low-flow groundwater sample:*
	1422	9.91	1.0	7.11	29.4	15060	2.2	-134.6	33.4		(A) peristaltic pump w/ ded tubing
	1425	9.94	1.5	7.09	29.0	14920	2.0	-136.2	30.7		B) ded bladder pump
	1427	9.97	2.0	7.02	28.9	14870	1.9	-137.7	28.4		C) non-ded bladder pump; or
	1430	9.99	2.5	7.04	28.8	14800	1.9	-138.0	26.9		*Standard groundwater sample:*
	1432	10.01	3.0	7.04	28.7	14700	1.8	-139.1	25.9		D) bailer due to limited column; or
	1435	10.03	3.5	7.04	28.7	14600	1.8	-140.6	25.0		E) recovery well cycling sample
	1437	10.05	4.0	7.04	28.6	14570	1.7	-141.1	24.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1440	OCD-7AR	10.05	7.04	28.6	14570	1.7	-141.1	24.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7B
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MVB (20)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1455	NP	9.69	0.00	56.85	51.9	Yes	Yes	Yes	Yes		Weather: Sunny, 98s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		OCD-7B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7C
Event: 2nd
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MOB (21)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/4/25	1500	NP	9.38	0.00	71.95	NS	Yes	Yes	Yes	Yes		Weather: Sunny 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		OCD-7C								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Annually- bagged tube + guidance device

Monitoring Well Purging and Sampling Record (Tool Co. locks gate by 5:00 PM)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#15C
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in	PVC ✓
Upright __	4-in __	SS
Vault ✓	Other ✓	Other

Hydrologic Monitoring
for TRC
Houston, Texas

(22)

Initials: MeB

Well Inspection Information

Gauge only

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9.14.21	855	19.03	19.14	0.11	22.30	20.0	Yes	Yes	Yes	Yes		Weather: Sunny 60's

Well Purging Record

* Area Covered in dirt

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-#15C								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-48
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in	SS __
Vault __	Other __	Other __

(Well destroyed 4-13-21 + BURIED pre-2H21 !!)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: M.D.M

(23)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	845	NM	NM	NM	32.00	26.9	Issue	Issue	Issue	Issue		Weather: Sunny 80's

Well Purging Record

Historically destroyed @ 4:74; well cap was missing along with ext-grade plate

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Unable to locate. Searched for well						B) ded bladder pump
			2.0		with shovel and probe. Area Covered						C) non-ded bladder pump; or
			2.5		with dirt and rocks. Historically						*Standard groundwater sample:*
			3.0		well casing was full of dirt.						D) bailer due to limited column; or
			3.5		Likely well buried.						E) recovery well cycling sample
			4.0								F) irrigation well grab sample
					Randy Dade notified 9/14/21						

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-48								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-130
Event: 2021
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(24)

Initials: MDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	800	NP	22.95	0.00	45.00	37.5	Yes	Yes	Yes	Yes		Weather: Sunny 60's

Well Purging Record

* Bladder pump installed 9/14/21 (4 mins)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (l)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	805	23.01	0.5	6.51	24.8	3000	3.0	127.2	171	Cloudy light brown	Low-flow groundwater sample:
	807	23.01	1.0	6.57	24.5	3010	4.4	129.3	164	↓	A) peristaltic pump w/ ded tubing
	810	23.03	1.5	6.60	24.3	3010	4.2	126.1	156		(B) ded bladder pump
	812	23.03	2.0	6.64	24.3	3020	3.6	126.8	147		C) non-ded bladder pump; or
	815	23.03	2.5	6.67	24.2	3020	3.3	127.3	129		Standard groundwater sample:
	817	23.03	3.0	6.71	24.2	3020	3.1	127.2	115		D) bailer due to limited column; or
	820	23.03	3.5	6.71	24.2	3020	3.1	128.2	113		E) recovery well cycling sample
↓	822	23.03	4.0	6.71	24.2	3020	3.0	130.1	112	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
9-14-21	825	MW-130	23.03	6.71	24.2	3020	3.0	130.1	112	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater then, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-4
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(25)

Initials: mph

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	900	26.33	29.87	3.54	41.75'	31.7	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

* No Sock in well 2H21 vs. Sock in well 1421

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			Not Sampled due to LNAPL					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-4								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Gauge to top of 1-in galvanized pipe)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-19
Event: 2112
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC __
Upright __	4-in __	SS __
Vault ✓	Other ✓	Other ✓

Hydrologic Monitoring
for TRC
Houston, Texas

(26)

Well Inspection Information Gauge Only

Initials: MMB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	905	27.58	28.04	0.46	NM	10' off base as needed	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-19								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-76
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade ___	2-in ___	PVC ✓
Upright ✓	4-in ✓	SS ___
Vault ___	Other	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (27)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1645	NP	11.35	0.00	20.33	16.0	Yes	Yes	Yes	Yes		Weather: Clear - 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1650	11.40	0.5	6.99	25.9	6310	2.3	-170.2	8.7	Clear/colorless	*Low-flow groundwater sample:*
	1652	11.40	1.0	6.97	25.7	6250	1.9	-175.3	8.0		(A) peristaltic pump w/ ded tubing
	1655	11.40	1.5	6.94	25.5	6200	1.7	-181.5	7.5		B) ded bladder pump
	1657	11.40	2.0	6.91	25.3	6190	1.6	-184.9	7.1		C) non-ded bladder pump; or
	1700	11.40	2.5	6.89	25.2	6170	1.6	-189.2	6.8		*Standard groundwater sample:*
	1702	11.40	3.0	6.87	25.1	6160	1.5	-191.5	6.5		D) bailer due to limited column; or
	1705	11.40	3.5	6.87	25.1	6160	1.5	-193.2	6.0		E) recovery well cycling sample
	1707	11.40	4.0	6.86	25.1	6150	1.5	-194.6	5.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: Pace National, ML Joliet, TN
9/14/21	1710	MW-76	11.40	6.86	25.1	6150	1.5	-194.6	5.4	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-77
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in	PVC ✓
Upright ✓	4-in ✓	SS ...
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (28)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1730	NP	9.57	0.00	20.52	15.2	Yes	Yes	Yes	Yes		Weather: Clear 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-77								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-78
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2 In __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

29

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1735	NP	9.66	0.00	19.57	14.6	Yes	Yes	Yes	Yes		Weather: Clear 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-78								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03"; if LNAPL thickness is measured at 0.01" or 0.02", remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-75
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (30)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1740	NP	9.79	0.00	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Clear - 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1745	9.82	0.5	7.19	26.2	7450	2.1	-121.8	10.1	colorless/ clear	*Low-flow groundwater sample:*
	1747	9.83	1.0	7.08	25.7	7390	1.8	-128.9	9.7		(A) peristaltic pump w/ ded tubing
	1750	9.83	1.5	7.05	25.5	7350	1.6	-132.5	9.5		B) ded bladder pump
	1752	9.83	2.0	7.04	25.3	7330	1.5	-135.1	8.9		C) non-ded bladder pump; or
	1755	9.83	2.5	7.04	25.2	7320	1.5	-136.2	8.2		*Standard groundwater sample:*
	1757	9.83	3.0	7.03	25.2	7320	1.4	-137.9	7.9		D) bailer due to limited column; or
	1800	9.83	3.5	7.03	25.2	7310	1.4	-138.2	7.5		E) recovery well cycling sample
↓	1802	9.83	4.0	7.03	25.1	7310	1.4	-138.9	7.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1805	MW-75	9.83	7.03	25.1	7310	1.4	-138.9	7.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-83
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in ___	PVC ✓
Upright ✓	4-in ✓	SS ___
Vault ___	Other ___	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

(31)

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1600	NP	9.61	0.00	19.91	15.6	Yes	Yes	Yes	Yes		Weather: Clear - 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1605	9.70	0.5	6.99	26.5	6350	2.5	-112.5	9.5	clear/colorless	*Low-flow groundwater sample:*
	1607	9.75	1.0	6.96	26.2	6330	2.1	-115.3	8.9		(A) peristaltic pump w/ ded tubing
	1610	9.76	1.5	6.93	26.0	6270	2.0	-118.9	8.2		B) ded bladder pump
	1612	9.76	2.0	6.90	25.9	6220	1.9	-121.5	7.5		C) non-ded bladder pump; or
	1615	9.76	2.5	6.89	25.9	6200	1.9	-122.3	7.1		*Standard groundwater sample:*
	1617	9.76	3.0	6.89	25.8	6190	1.8	-124.1	6.7		D) bailer due to limited column; or
	1620	9.76	3.5	6.88	25.8	6180	1.8	-125.0	6.5		E) recovery well cycling sample
	1622	9.76	4.0	6.88	25.8	6180	1.8	-126.0	6.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1625	MW-83	9.76	6.88	25.8	6180	1.8	-126.0	6.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup-EP-03

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-3
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

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Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1510	NP	11.79	0.00	22.10	18.1	Yes	Yes	Yes	Yes		Weather: Clear 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1515	11.79	0.5	7.21	26.4	7400	3.1	-42.9	7.5	colorless/clear	*Low-flow groundwater sample:*
	1517	11.80	1.0	7.12	25.9	7280	2.5	-39.5	7.0		(A) peristaltic pump w/ ded tubing
	1520	11.80	1.5	7.08	25.8	7220	2.3	-35.1	6.5		B) ded bladder pump
	1522	11.80	2.0	7.06	25.7	7210	2.2	-32.9	6.3		C) non-ded bladder pump; or
	1525	11.80	2.5	7.05	25.7	7210	2.1	-30.5	5.9		*Standard groundwater sample:*
	1527	11.80	3.0	7.05	25.6	7200	2.1	-29.3	5.4		D) bailer due to limited column; or
	1530	11.80	3.5	7.04	25.6	7200	2.0	-28.7	5.2		E) recovery well cycling sample
	1532	11.80	4.0	7.04	25.6	7200	2.0	-27.1	5.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1535	MW-3	11.80	7.04	25.6	7200	2.0	-27.1	5.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	1300	Dup-EP-03	11.80	7.04	25.6	7200	2.0	-27.1	5.1	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-88
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in	PVC ✓
Upright ✓	4-in ✓	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

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Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1155	NP	9.30	0.00	20.31	14.8	Yes	Yes	Yes	Yes		Weather: Clear 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1200	9.35	0.5	7.30	24.2	7870	2.5	-55.9	9.5	clear/colorless w/	*Low-flow groundwater sample:*
	1202	9.36	1.0	7.24	24.1	7830	2.2	-58.3	8.9	orange particles	(A) peristaltic pump w/ ded tubing
	1205	9.36	1.5	7.20	24.0	7800	2.0	-61.5	8.3		B) ded bladder pump
	1207	9.36	2.0	7.17	23.9	7980	1.9	-63.8	8.0		C) non ded bladder pump; or
	1210	9.36	2.5	7.15	23.9	7970	1.9	-65.9	7.6		*Standard groundwater sample:*
	1212	9.36	3.0	7.14	23.9	7970	1.8	-66.2	7.3		D) bailer due to limited column; or
	1215	9.36	3.5	7.14	23.8	7960	1.8	-66.5	6.9		E) recovery well cycling sample
	1217	9.36	4.0	7.13	23.8	7960	1.8	-68.5	6.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1220	MW-88	9.36	7.13	23.8	7960	1.8	-68.5	6.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup-EP-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCO (34)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1235	NP	8.57	0.00	22.65	17.4	Yes	Yes	Yes	Yes		Weather: Clear - 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1240	8.63	0.5	7.15	25.1	19,500	2.8	-79.5	8.9	colorless / clear	*Low-flow groundwater sample:*
	1242	8.69	1.0	7.10	24.6	19,900	2.3	-70.2	8.0		(A) peristaltic pump w/ ded tubing
	1245	8.72	1.5	7.08	24.4	19,900	2.1	-65.9	7.5		B) ded bladder pump
	1247	8.73	2.0	7.06	24.3	20,100	2.0	-63.2	7.2		C) non-ded bladder pump; or
	1250	8.74	2.5	7.05	24.3	20,300	2.0	-61.9	6.9		*Standard groundwater sample:*
	1252	8.74	3.0	7.05	24.4	20,300	1.9	-60.2	6.5		D) bailer due to limited column; or
	1255	8.75	3.5	7.04	24.4	20,300	1.9	-59.5	6.3		E) recovery well cycling sample
↓	1257	8.75	4.0	7.04	24.4	20,400	1.9	-58.2	6.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1300	MW-22A	8.75	7.04	24.4	20,400	1.9	-58.2	6.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓	1200	Dup-EP-02	8.75	7.04	24.4	20,400	1.9	-58.2	6.0	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22B
Event: 2Hz1
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (35)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1325	NP	8.35	0.00	54.66	49.7	Yes	Yes	Yes	Yes		Weather: Clear 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-22B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-10
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(36)

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1335	NP	6.03	0.00	18.45	13.3	Yes	Yes	Yes	Yes		Weather: Clear 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1340	6.04	0.5	7.23	24.5	7670	2.6	-98.3	7.5	clear/colorless w/	*Low-flow groundwater sample:*
	1342	6.05	1.0	7.15	24.2	7100	2.3	-91.5	6.9	orange particles	(A) peristaltic pump w/ dad tubing
	1345	6.05	1.5	7.09	23.9	7070	2.1	-85.3	6.3		B) ded bladder pump
	1347	6.05	2.0	7.06	23.8	7050	2.0	-83.1	6.0		C) non-ded bladder pump; or
	1350	6.05	2.5	7.05	23.8	7040	1.9	-81.2	5.4		*Standard groundwater sample:*
	1352	6.05	3.0	7.04	23.7	7040	1.9	-80.5	5.2		D) bailer due to limited column; or
	1355	6.05	3.5	7.04	23.7	7030	1.8	-79.3	4.9		E) recovery well cycling sample
↓	1357	6.05	4.0	7.03	23.7	7030	1.8	-78.7	4.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
9/14/21	1400	MW-10	6.05	7.03	23.7	7030	1.8	-78.7	4.4	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-123
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCS (37)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1420	NP	6.56	0.00	25.71	25.0	Yes	Yes	Yes	Yes		Weather: Clear 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1425	6.57	0.5	7.22	23.8	7080	2.9	-156.4	9.4	clear/colorless	*Low-flow groundwater sample:*
	1427	6.57	1.0	7.13	23.4	7030	2.2	-150.9	8.7		(A) peristaltic pump w/ ded tubing
	1430	6.57	1.5	7.10	23.2	6990	1.9	-146.3	8.3		B) ded bladder pump
	1432	6.57	2.0	7.07	23.0	6960	1.7	-142.0	7.5		C) non-ded bladder pump; or
	1435	6.57	2.5	7.05	23.0	6940	1.6	-140.3	7.1		*Standard groundwater sample:*
	1437	6.57	3.0	7.04	22.9	6930	1.6	-140.0	6.8		D) bailer due to limited column; or
	1440	6.57	3.5	7.04	22.9	6920	1.5	-139.9	6.3		E) recovery well cycling sample
	1442	6.57	4.0	7.04	22.9	6910	1.5	-139.4	6.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1445	MW-123	6.57	7.04	22.9	6910	1.5	-139.4	6.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (38)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1100	NP	11.88	0.00	16.55	Well Base	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1105	11.89	0.5	7.32	23.8	7650	2.7	-120.3	8.9	Clear/colorless w/	*Low-flow groundwater sample:*
	1107	11.89	1.0	7.26	23.5	7260	2.4	-128.3	8.1	black particles	(A) peristaltic pump w/ ded tubing
	1110	11.89	1.5	7.23	23.4	7200	2.2	-132.8	7.5		B) ded bladder pump
	1112	11.89	2.0	7.21	23.4	7180	2.1	-135.1	7.1		C) non-ded bladder pump; or
	1115	11.89	2.5	7.20	23.4	7150	2.1	-137.2	6.9		*Standard groundwater sample:*
	1117	11.89	3.0	7.20	23.3	7130	2.0	-139.1	6.2		D) bailer due to limited column; or
	1120	11.89	3.5	7.19	23.3	7120	2.0	-140.2	6.0		E) recovery well cycling sample
↓	1122	11.89	4.0	7.19	23.3	7120	2.0	-141.5	5.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1125	MW-4A	11.89	7.19	23.3	7120	2.0	-141.5	5.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4B
Event: 2021
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (39)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1145	NP	11.65	0.00	72.37	67.4	Yes	yes	yes	yes		Weather: clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9		MW-4B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

+ EB-EP-03

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

(40)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	955	NP	8.25	0.00	20.15	14.8	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1000	8.30	0.5	7.16	24.2	12,376	3.1	-135.6	9.5	clear / colorless w/	Low-flow groundwater sample:
↓	1002	8.30	1.0	7.15	24.1	12,330	2.7	-141.2	8.2	orange particles	(A) peristaltic pump w/ ded tubing
	1005	8.30	1.5	7.14	24.1	12,290	2.5	-149.7	7.5	↓	B) ded bladder pump
	1007	8.30	2.0	7.14	24.0	12,270	2.4	-153.8	7.0		C) non-ded bladder pump; or
	1010	8.30	2.5	7.13	23.8	12,250	2.3	-159.6	6.8		Standard groundwater sample:
	1012	8.30	3.0	7.13	23.8	12,250	2.2	-162.5	6.3		D) bailer due to limited column; or
	1015	8.30	3.5	7.12	23.8	12,240	2.2	-163.8	5.9		E) recovery well cycling sample
↓	1017	8.30	4.0	7.12	23.7	12,240	2.2	-164.2	5.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1020	MW-5A	8.30	7.12	23.7	12,240	2.2	-164.2	5.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓	1035	EB-EP-03	NA	—	—	—	—	—	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5B
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (41)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1045	NP	8.96	0.00	53.54	48.5	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-5B								Per COC	Per COC	Lab: Pace National, ML Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03; if LNAPL thickness is measured at 0.01" or 0.02", remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5C
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (42)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1050	NP	9.18	0.00	71.64	66.6	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-5C								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Dup-EP-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(43)

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	855	NP	9.53	0.00	18.65	13.6	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	900	9.62	0.5	7.38	24.5	9570	3.1	-56.5	9.3	clear/colorless	*Low-flow groundwater sample:*
	902	9.63	1.0	7.28	24.1	9160	2.6	-62.0	8.5		(A) peristaltic pump w/ ded tubing
	905	9.63	1.5	7.23	23.7	8920	2.4	-68.1	8.1		B) ded bladder pump
	907	9.63	2.0	7.21	23.6	8900	2.3	-72.2	7.5		C) non-ded bladder pump; or
	910	9.63	2.5	7.19	23.6	8900	2.3	-76.3	7.1		*Standard groundwater sample:*
	912	9.63	3.0	7.18	23.6	8890	2.2	-76.9	6.8		D) bailer due to limited column; or
	915	9.63	3.5	7.16	23.5	8890	2.2	-77.2	6.5		E) recovery well cycling sample
↓	917	9.63	4.0	7.17	23.5	8880	2.2	-77.6	6.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
9/14/21	920	MW-7A	9.63	7.17	23.5	8880	2.2	-77.6	6.0	Per COC	Per COC	
↓												
↓	900	Dup-EP-01	9.63	7.17	23.5	8880	2.2	-77.6	6.0	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7B
Event: 2021
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (44)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	945	NP	9.30	0.00	52.56	47.6	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-7B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Trip Blank - EP-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(45)

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	810	NP	8.56	0.00	20.74	16.4	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	815	8.62	0.5	6.57	22.7	17,820	3.0	-114.0	8.6	clear/colorless	*Low-flow groundwater sample:*
	817	8.71	1.0	6.73	22.5	17,870	2.7	-119.9	7.5		(A) peristaltic pump w/ ded tubing
	820	8.78	1.5	6.82	22.4	17,890	2.5	-124.4	7.0		B) ded bladder pump
	822	8.83	2.0	6.87	22.4	17,905	2.4	-129.3	6.8		C) non-ded bladder pump; or
	825	8.85	2.5	6.90	22.4	17,910	2.4	-132.5	6.1		*Standard groundwater sample:*
	827	8.86	3.0	6.92	22.3	17,910	2.3	-135.6	6.0		D) bailer due to limited column; or
	830	8.87	3.5	6.93	22.3	17,920	2.3	-137.1	5.7		E) recovery well cycling sample
	832	8.87	4.0	6.94	22.3	17,920	2.3	-138.5	5.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	835	OCD-8A	8.87	6.94	22.3	17,920	2.3	-138.5	5.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8B
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SED (46)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	805	NP	9.17	0.00	56.65	51.7	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		OCD-8B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-P4
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (47)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1715	NP	5.89	0.00	30.26	22.8	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-P4								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-25
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BAH (48)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1630	NP	14.10	0.00	28.18	23.2	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-25								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-8
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (49)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1625	NP	13.05	0.00	214.95	NS	Yes	Issue	Yes	Yes		Weather: Sunny, 90s
					(blockage)							

*Blockage @ 14.95' TOC

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
										Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-1R
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

(50)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1635	NP	11.31	0.00	20.63	15.6	Yes	Issue	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Bent casing lid makes closure difficult. well still locks & is functional

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: Pace National, Mt. Juliet, TN
		MW-1R								Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-15
Event: 2021
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas
(51)

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1640	NP	12.43	0.00	21.70	17.7	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-15								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record ✓ + Trip Blank ~ EP-03

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-1R
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (52)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Lahe:	Other	
9-14-21	1545	NP	12.03	0.00	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1550	12.34	0.5	7.88	26.3	10410	2.3	-86.2	9.7	colorless, clear	*Low-flow groundwater sample:*
	1553	12.34	1.0	7.74	25.4	9430	2.0	-83.9	8.5		(A) peristaltic pump w/ ded tubing
	1555	12.34	1.5	7.60	25.0	8760	1.7	-80.7	7.2		B) ded bladder pump
	1558	12.34	2.0	7.51	24.8	8120	1.6	-77.8	6.6		C) non-ded bladder pump; or
	1600	12.34	2.5	7.48	24.6	7870	1.5	-75.4	6.1		*Standard groundwater sample:*
	1603	12.34	3.0	7.45	24.5	7790	1.4	-72.9	5.8		D) baller due to limited column; or
	1605	12-34	3.5	7.43	24.4	7760	1.4	-70.6	5.4		E) recovery well cycling sample
	1608	12.34	4.0	7.41	24.4	7750	1.4	-69.5	5.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1610	OCD-1R	12.34	7.41	24.4	7750	1.4	-69.5	5.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 2A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (53)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1155	NP	12.42	0.00	27.56	22.3	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1200	12.61	0.5	8.16	26.3	7210	2.3	-66.9	9.8	colorless, clear	*Low-flow groundwater sample:*
	1203	12.61	1.0	7.98	25.1	7020	2.0	-63.0	9.0		(A) peristaltic pump w/ ded tubing
	1205	12.61	1.5	7.90	24.7	6870	1.8	-57.7	7.7		B) ded bladder pump
	1208	12.61	2.0	7.83	24.4	6790	1.7	-54.2	6.4		C) non-ded bladder pump; or
	1210	12.61	2.5	7.77	24.2	6740	1.6	-51.3	5.7		*Standard groundwater sample:*
	1213	12.61	3.0	7.71	24.1	6720	1.6	-49.9	5.3		D) bailer due to limited column; or
	1215	12.61	3.5	7.69	24.0	6710	1.5	-48.2	4.9		E) recovery well cycling sample
	1218	12.61	4.0	7.67	24.0	6710	1.5	-46.8	4.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1220	OCD-2A	12.61	7.67	24.0	6710	1.5	-46.8	4.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2B
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

(54)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1230	ND	12.03	0.00	50.38	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		OCD-2B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-3
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BEH (55)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1240	NP	12.72	0.00	25.20	20.2	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1245	12.88	0.5	8.20	25.9	5560	2.5	81.2	10.8	colorless, clear	*Low-flow groundwater sample:*
↓	1248	12.89	1.0	8.01	24.7	5510	2.0	83.5	9.0	↓	(A) peristaltic pump w/ ded tubing
	1250	12.89	1.5	7.89	24.2	5480	1.8	87.0	7.9		B) ded bladder pump
	1253	12.89	2.0	7.84	24.0	5450	1.7	89.9	7.2		C) non-ded bladder pump; or
	1255	12.89	2.5	7.80	23.9	5430	1.7	91.6	6.4		*Standard groundwater sample:*
	1258	12.89	3.0	7.77	23.8	5420	1.6	93.5	6.1		D) baller due to limited column; or
	1300	12.89	3.5	7.75	23.8	5420	1.6	95.2	5.8		E) recovery well cycling sample
↓	1303	12.89	4.0	7.73	23.8	5410	1.6	97.4	5.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1305	OCD-3	12.89	7.73	23.8	5410	1.6	97.4	5.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico.

Well: OCD-4
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (56)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1320	NP	12.30	0.00	25.41	20.1	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1325	12.44	0.5	7.81	25.7	16410	2.4	-16.9	11.3	colorless, clear	*Low-flow groundwater sample:*
	1328	12.44	1.0	7.74	24.6	16980	1.8	-13.8	10.2		(A) peristaltic pump w/ ded tubing
	1330	12.44	1.5	7.68	24.0	17130	1.6	-10.5	9.6		B) ded bladder pump
	1333	12.44	2.0	7.63	23.8	17290	1.5	-9.6	9.1		C) non-ded bladder pump; or
	1335	12.44	2.5	7.57	23.8	17370	1.4	-8.1	7.3		*Standard groundwater sample:*
	1338	12.44	3.0	7.54	23.7	17400	1.4	-8.4	6.7		D) bailer due to limited column; or
	1340	12.44	3.5	7.52	23.7	17410	1.3	-9.2	6.4		E) recovery well cycling sample
	1343	12.44	4.0	7.50	23.8	17420	1.3	-9.8	6.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
9-14-21	1345	OCD-4	12.44	7.50	23.8	17420	1.3	-9.8	6.2	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BPH (57)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1445	NP	9.66	0.00	22.01	17.0	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1450	9.84	0.5	7.66	26.2	26,300	2.3	-46.5	9.1	colorless, clear	*Low-flow groundwater sample:*
	1453	9.84	1.0	7.53	25.1	26,500	1.9	-49.2	8.4		(A) peristaltic pump w/ ded tubing
	1455	9.84	1.5	7.41	24.6	26,700	1.7	-51.7	7.9		B) ded bladder pump
	1458	9.84	2.0	7.35	24.2	26,800	1.6	-53.0	7.3		C) non-ded bladder pump; or
	1500	9.84	2.5	7.30	24.1	26,800	1.6	-53.8	6.8		*Standard groundwater sample:*
	1503	9.84	3.0	7.27	24.1	26,900	1.5	-55.2	6.4		D) bailer due to limited column; or
	1505	9.84	3.5	7.25	24.0	26,900	1.5	-56.1	6.1		E) recovery well cycling sample
	1508	9.84	4.0	7.24	24.0	26,900	1.4	-57.4	5.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1510	MW-11A	9.84	7.24	24.0	26,900	1.4	-57.4	5.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11B
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

58

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1520	NP	9.66	0.00	47.30	42.3	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-11B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-5
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(59)

Initials: BFH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1405	NP	10.42	0.00	25.41	20.6	Yes	Yes	Yes	Yes		Weather: Sunny, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1410	10.44	0.5	7.86	25.0	17530	2.2	-103.6	71.0	colorless, clear w/	*Low-flow groundwater sample:*
↓	1413	10.44	1.0	7.75	24.5	17640	1.9	-101.2	57.0	orange algae	(A) peristaltic pump w/ ded tubing
↓	1415	10.44	1.5	7.65	24.0	17710	1.7	-99.6	48.5	particles	B) ded bladder pump
↓	1418	10.44	2.0	7.51	23.9	17740	1.6	-96.1	42.9	↓	C) non-ded bladder pump; or
↓	1420	10.44	2.5	7.46	23.8	17760	1.6	-93.5	40.7	↓	*Standard groundwater sample:*
↓	1423	10.44	3.0	7.42	23.7	17780	1.5	-90.8	38.5	↓	D) bailer due to limited column; or
↓	1425	10.44	3.5	7.40	23.7	17790	1.5	-88.7	37.2	↓	E) recovery well cycling sample
↓	1428	10.44	4.0	7.39	23.6	17790	1.5	-86.4	36.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1430	OCD-5	10.44	7.39	23.6	17790	1.5	-86.4	36.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-87
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (60)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	815	NP	8.73	0.00	20.39	15.1	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	820	8.89	0.5	6.40	22.9	16160	2.8	68.7	9.1	colorless, clear	*Low-flow groundwater sample:*
	823	8.93	1.0	6.58	22.7	16010	2.1	52.5	8.4		(A) peristaltic pump w/ ded tubing
	825	8.97	1.5	6.72	22.6	15970	1.9	40.9	7.7		B) ded bladder pump
	828	9.00	2.0	6.81	22.6	15940	1.8	32.6	7.0		C) non-ded bladder pump; or
	830	9.03	2.5	6.88	22.5	15920	1.7	27.8	6.5		*Standard groundwater sample:*
	833	9.06	3.0	6.92	22.5	15900	1.7	25.0	6.1		D) bailer due to limited column; or
	835	9.09	3.5	6.95	22.5	15890	1.6	23.9	5.9		E) recovery well cycling sample
	838	9.12	4.0	6.97	22.5	15880	1.6	22.6	5.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	840	MW-87	9.12	6.97	22.5	15880	1.6	22.6	5.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18A
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (61)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	900	NP	10.50	0.00	22.58	17.9	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	905	10.71	0.5	7.58	23.9	20400	2.5	-158.7	8.4	colorless, clear	*Low-flow groundwater sample:*
↓	908	10.78	1.0	7.52	23.2	20300	1.8	-175.3	7.1	↓	(A) peristaltic pump w/ ded tubing
	910	10.84	1.5	7.49	23.0	20300	1.6	-180.9	6.0		B) ded bladder pump
	913	10.89	2.0	7.47	22.9	20400	1.6	-183.2	5.4		C) non-ded bladder pump; or
	915	10.92	2.5	7.45	22.8	20500	1.5	-185.0	4.9		*Standard groundwater sample:*
	918	10.95	3.0	7.44	22.8	20500	1.4	-186.1	4.3		D) bailer due to limited column; or
	920	10.98	3.5	7.43	22.8	20600	1.4	-186.9	3.8		E) recovery well cycling sample
↓	923	11.01	4.0	7.42	22.8	20600	1.3	-187.4	3.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	925	MW-18A	11.01	7.42	22.8	20600	1.3	-187.4	3.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18B
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (62)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	940	NP	10.52	0.00	50.59	45.6	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-18B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Gauge only

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18T
Event: 2Q21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(63)

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	945	NP	10.62	0.00	50.57	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-18T								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-70
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

(64)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	955	NP	8.80	0.00	22.05	16.8	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1000	8.86	0.5	7.85	25.4	8630	2.4	-116.2	31.9	colorless, clear w/	*Low-flow groundwater sample:*
	1003	8.86	1.0	7.69	24.5	8410	1.8	-113.9	24.2	orange algae	(A) peristaltic pump w/ ded tubing
	1005	8.86	1.5	7.58	24.0	8290	1.6	-109.7	24.6	particles	B) ded bladder pump
	1008	8.86	2.0	7.49	23.8	8220	1.5	-106.4	19.8	↓	C) non-ded bladder pump; or
	1010	8.86	2.5	7.43	23.7	8180	1.5	-104.2	16.7		*Standard groundwater sample:*
	1013	8.86	3.0	7.40	23.6	8180	1.4	-102.9	15.0		D) bailer due to limited column; or
	1015	8.86	3.5	7.38	23.6	8170	1.4	-101.7	14.7		E) recovery well cycling sample
↓	1018	8.86	4.0	7.36	23.6	8160	1.3	-100.3	14.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1020	MW-70	8.86	7.36	23.6	8160	1.3	-100.3	14.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ EB-EP-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-124
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (65)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1045	NP	9.44	0.00	22.00	17.0	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1050	9.50	0.5	7.88	24.9	12610	2.4	-87.6	21.6	colorless, clear	*Low-flow groundwater sample:*
	1053	9.50	1.0	7.81	24.3	12790	2.0	-84.9	17.8		(A) peristaltic pump w/ ded tubing
	1056	9.50	1.5	7.76	23.7	12860	1.8	-81.3	12.7		B) ded bladder pump
	1059	9.50	2.0	7.73	23.4	12900	1.7	-79.8	10.6		C) non-ded bladder pump; or
	1100	9.50	2.5	7.70	23.2	12920	1.7	-74.9	9.9		*Standard groundwater sample:*
	1103	9.50	3.0	7.67	23.0	12940	1.7	-75.8	8.5		D) bailer due to limited column; or
	1105	9.50	3.5	7.65	22.9	12950	1.6	-77.4	7.9		E) recovery well cycling sample
	1108	9.50	4.0	7.63	22.9	12960	1.6	-78.0	7.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1110	MW-124	9.50	7.63	22.9	12960	1.6	-78.0	7.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	1125	EB-EP-02	NA							Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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Driveway near bldg. A/C unit

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-52
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BSH (66)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1725	NP	20.98	0.00	34.67	29.5	Yes	Yes	Yes	Yes		Weather: Pt. cloudy, 70s
9-15-21	925	NP	20.99	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (l)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-15-21	930	21.03	0.5	7.52	22.6	2180	3.1	-193.9	9.8	colorless, clear	*Low-flow groundwater sample:*
	933	21.03	1.0	7.35	22.5	2360	2.4	-196.4	9.0		(A) peristaltic pump w/ ded tubing
	935	21.03	1.5	7.22	22.4	2450	2.0	-199.3	8.4		B) ded bladder pump
	938	21.03	2.0	7.16	22.4	2510	1.9	-201.0	7.2		C) non-ded bladder pump; or
	940	21.03	2.5	7.09	22.4	2530	1.8	-202.8	6.9		*Standard groundwater sample:*
	943	21.03	3.0	7.05	22.4	2550	1.8	-203.7	6.5		D) bailer due to limited column; or
	945	21.03	3.5	7.03	22.4	2560	1.7	-205.1	6.3		E) recovery well cycling sample
↓	948	21.03	4.0	7.01	22.4	2570	1.7	-206.4	6.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-15-21	950	MW-52	21.03	7.01	22.4	2570	1.7	-206.4	6.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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E. side of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-109
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (67)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1730	NP	19.03	0.00	29.48	25.5	Yes	Yes	Yes	Yes		Weather: Pt-cloudy, 70s
9-15-21	805	NP	19.04	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-15-21	810	19.14	0.5	7.78	22.8	3560	2.9	-332.4	9.8	colorless, clear,	*Low-flow groundwater sample:*
	813	19.20	1.0	7.64	22.8	3490	2.2	-336.9	8.6	NC odor	(A) peristaltic pump w/ ded tubing
	815	19.25	1.5	7.56	22.8	3420	2.0	-340.1	7.4		B) ded bladder pump
	818	19.29	2.0	7.51	22.8	3380	1.8	-343.7	7.0		C) non-ded bladder pump; or
	820	19.32	2.5	7.47	22.7	3350	1.7	-345.8	6.5		*Standard groundwater sample:*
	823	19.34	3.0	7.44	22.7	3340	1.6	-347.5	6.1		D) baller due to limited column; or
	825	19.36	3.5	7.42	22.7	3330	1.6	-348.6	5.9		E) recovery well cycling sample
	828	19.38	4.0	7.40	22.7	3320	1.6	-349.2	5.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-15-21	830	MW-109	19.38	7.40	22.7	3320	1.6	-349.2	5.6	Per COC	Per COC	Lab: Pace National Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW - 110
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRT (68)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1735	NP	15.71	0.00	29.74	24.7	Yes	Yes	Yes	Yes		Weather: Pt. cloudy, 70s
9-15-21	845	NP	15.73	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-15-21	850	15.82	0.5	7.69	23.3	1638	2.5	-238.6	19.1	colorless, clear	*Low-flow groundwater sample:*
	853	15.87	1.0	7.55	23.2	1582	2.0	-240.2	12.7		(A) peristaltic pump w/ ded tubing
	855	15.91	1.5	7.44	23.0	1570	1.7	-242.9	10.8		B) ded bladder pump
	858	15.93	2.0	7.38	23.0	1564	1.6	-245.8	9.6		C) non-ded bladder pump; or
	900	15.95	2.5	7.35	22.9	1559	1.5	-247.0	9.3		*Standard groundwater sample:*
	903	15.96	3.0	7.32	22.9	1556	1.4	-249.1	9.0		D) bailer due to limited column; or
	905	15.96	3.5	7.31	23.0	1553	1.4	-250.3	8.6		E) recovery well cycling sample
	908	15.96	4.0	7.30	23.0	1551	1.3	-251.6	8.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-15-21	910	MW-110	15.96	7.30	23.0	1551	1.3	-251.6	8.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-13
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Located N. of river

Hydrologic Monitoring
for TRC
Houston, Texas

(69)

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-15-21	1045	NP	12.88	0.00	21.10	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 72s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-13								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-69
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Located N. of river

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

(70)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-15-21	1038	NP	11.29	0.00	22.51	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-69								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-12
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Located N. of river

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (71)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-15-21	1030	NP	10.69	0.00	17.93	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-12								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-24
Event: 2H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Located E. of river

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

(72)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-15-21	1115	NP	12.34	0.00	23.51	NS	Yes	Yes	Issue	Yes		Weather: Sunny, 70s
									↳ Broken hasp/hinge			

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-24								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-14
Event: 2H21
Area of Concern: EP

Completion	Casing Diam	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Located N. of river

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (73)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-15-21	1122	NP	>11.81	0.00	>11.81	NS	Yes	Issue	Yes	Yes		Weather: Sunny, 70s

↳ Blockage @ 11.81' TOC

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-14								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube; Sample via part if RW is active

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-12R
Event: 2H21
Area of Concern: REST Above-grade

Completion	Casing Diam.	Casing Material
At-Grade __	2 in	PVC ✓
Upright __	4-In __	SS __
✓ Vault	✓ Other 12-in	Other __

(RW recently off due to water rights issue)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Gauge only

Initials: BT (74)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1602	NP	18.39	0.00	NM	Typ of Pump (if pump not operating)	yes	yes	yes	yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								or (E) recovery well cycling sample, if recovery pump on
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-12R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup-REST-01
+ EB-REST-01

Navajo Refining Company — **Well:** MW-113
Artesia Refinery — **Event:** 2H21
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

* INSTALLED Ded. bladder pump in well during 2H21 event

Hydrologic Monitoring for TRC Houston, Texas

Initials: GAS

(75)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1505	NP	18.74	0.00	37.80	32.8	Yes	Yes	Yes	Yes		Weather: Sunny, 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1510	18.75	0.5	6.58	24.3	3350	1.1	-263.6	82.1	Sl. Cloudy / odor	Low-flow groundwater sample:
	1513	18.75	1.0	6.56	23.6	3760	1.6	-301.5	37.1		(A) peristaltic pump w/ ded tubing
	1515	18.75	1.5	6.50	23.7	3800	1.9	-310.4	20.6		(B) ded bladder pump
	1517	18.75	2.0	6.53	23.7	3820	2.4	-314.2	10.6	Clear/odor	C) non-ded bladder pump; or
	1520	18.75	2.5	6.53	23.7	3820	2.3	-319.2	8.7		Standard groundwater sample:
	1523	18.75	3.0	6.50	23.8	3790	2.2	-336.9	8.0		D) bailer due to limited column; or
	1525	18.75	3.5	6.50	23.9	3800	2.2	-327.4	6.7		E) recovery well cycling sample
↓	1527	18.75	4.0	6.48	23.9	3800	2.1	-331.4	6.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1530	MW-113	18.75	6.48	23.9	3800	2.1	-331.4	6.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	1200	Dup-REST-01	18.75	6.48	23.9	3800	2.1	-331.4	6.7	Per COC	Per COC	
↓	1550	EB-REST-01	NA						→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-8
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BD (76)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1450	13.15	13.18	0.03	35.80	30.8	Yes	Yes	Yes	YES		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not sampled due to							(A) peristaltic pump w/ ded tubing
			1.5	presence of LNAPL ≥ 0.03							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: Pace National, Mt. Juliet, TN
		KWB-8								Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-22
Event: 2H21
Area of Concern: REST

Completion: At-Grade __ Above-grade Vault ✓ Upright __
Casing Diam.: 2-in __ 4-in __ Other 12-in
Casing Material: PVC ✓ SS __ Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (77)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
1500	1500	NP	13.74	0.00	NM	Sample port Yes	Yes	Yes	Yes	Yes		Weather: Sunny 80's
9/14/21						if RW active						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: Pace National, Mt. Juliet, TN
		RW-22								Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Gauge only

Monitoring Well Purging and Sampling Record (Historical LNAPL)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-20A
Event: 2H21
Area of Concern: REST

Completion: At-Grade __ / Upright __ / Vault ✓ Other 6-in Other __
Casing Diam.: 2-in __ / 4-in __ / Other __
Casing Material: PVC ✓ / SS __ / Other __

metal roof canopy
- RW-20A
- Vault
- RW-20B

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

(78)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1508	Dry	Dry	0.00	NM *	Sample Port	Yes	Yes	Yes	Yes		Weather: Sunny 80's
9/15/21												

* Likely well base @ 21.98' per Navajo

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		Dry						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: Pace National, Mt. Juliet, TN
		RW-20A								Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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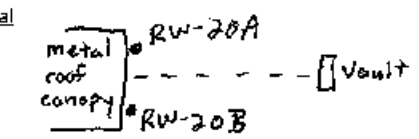
Gauge only

Monitoring Well Purging and Sampling Record (Historical LNAPL)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-20B
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other 6-in	Other __



Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (79)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1511	NP	19.78	0.00	NM	Sample Port	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-20B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged / labeled tube stored inside above-grade vault

Monitoring Well Purging and Sampling Record (Historical LNAPL)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-13R
Event: 2H21
Area of Concern: REST Above-grade Gauge only

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other 12-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (80)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1608	17.98	20.35	2.37	NM	30.0	Yes	Yes	Yes	Yes		Weather Sunny 80's
						or Sample	part if RW is active					

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								or (E) recovery well cycling sample if RW is active
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-13R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-14R
Event: 2H21
Area of Concern: REST

Completion: At-Grade __ Upright __ Above-grade Vault ✓
Casing Diam.: 2-in __ 4-in __ Other (2-in) ✓
Casing Material: PVC ✓ SS __ Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS (81)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1620	16.20	16.49	0.29	NM	Sample Port	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-14R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-133
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in ___	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BCB (82)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1505	16.93	16.96	0.03	37.64	27.9	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not	Sampled	due to	presence	of	LNAPL		(A) peristaltic pump w/ ded tubing
			1.5	being	≥ 0.03						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-133								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup-REST-03
+ EB-REST-03

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-134
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other

+Trip Blank-REST-01

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MS (83)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1716	NP	17.61	0.00	32.95	28.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's
9/15/21	815	NP	17.63	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/15/21	820	17.64	0.5	7.00	20.2	7120	2.6	58.2	26.9	Clear	*Low-flow groundwater sample:*
	823	17.64	1.0	6.80	19.8	7100	1.5	63.7	19.2		(A) peristaltic pump w/ ded tubing
	825	17.64	1.5	6.70	19.7	7090	1.4	65.2	13.7		B) ded bladder pump
	827	17.64	2.0	6.70	19.7	7080	1.4	65.4	10.0		C) non-ded bladder pump; or
	830	17.64	2.5	6.67	19.7	7080	1.3	65.5	8.7		*Standard groundwater sample:*
	833	17.64	3.0	6.61	19.7	7050	1.3	65.3	7.9		D) bailer due to limited column; or
	835	17.64	3.5	6.56	19.7	7040	1.3	64.8	7.3		E) recovery well cycling sample
	837	17.64	4.0	6.55	19.7	7040	1.2	64.3	7.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/15/21	840	MW-134	17.64	6.55	19.7	7040	1.2	64.3	7.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	860	DUP-REST-03	17.64	6.55	19.7	7040	1.2	64.3	7.4	Per COC	Per COC	
	900	EB-REST-03	NA						→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4798
Event: 2H21
Area of Concern: REST

Irrigation well
Inside green, block bldg.
No purge; sample port (faucet)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS (84)

Well Inspection Information (Screen: 840-850)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1745	NM	NM	NM	NM	NM	NA	NA	NA	Yes		Weather Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		No purge; active water well w/ sample port						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5							Colorless, clear	*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1745	RA-4798	NM	7.21	22.6	2436	3.9	-13.2	2.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4196
Event: 2H21
Area of Concern: REST

Irrigation well
Inside green, block bldg.
No purge; Sample port (faucet)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Screen: 280-292)

Initials: (85)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1755	NM	NM	NM	NM	NM	NA	NA	NA	Yes		Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		No purge; active water well w/ Sample port						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		Not Sampled Upon arrival,						*Standard groundwater sample:*
			3.0		Same as last event. Pump						D) bailer due to limited column; or
			3.5		is shorted out & no power.						E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RA-4196								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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DO NOT ADDRESS
Removed from Program by Navajo, 4-13-15

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-1227
Event: 2M21
Area of Concern: REST

Irrigation well
Removed from Program

Hydrologic Monitoring
for TRC
Houston, Texas

(86)

Well Inspection Information (Screen: 194-246)

Initials:

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		DO NOT ADDRESS						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
	RA-1227									Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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NOT ADDRESSED 2H21

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-3156
Event: 2H21
Area of Concern: REST

Irrigation well, must be turned on by Chase Farms; unused, per landowner (see below)

Hydrologic Monitoring for TRC
Houston, Texas

Initials: (87)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	—	NM	NM	NM	NM	NA	NA	NA	NA	Yes		Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5			Inactive water well w/ sample port					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5			Chase Farms' Chris Kuykendahl will turn					*Standard groundwater sample:*
			3.0			well on, for annual gw sampling only.					D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0			Per Chris, this irrigation well is not					(F) irrigation well grab sample
						used, due to slightly-elevated SC.					
						Well is purged 50-100 gal in preparation for sample collection					

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RA-3156								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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E. of MW-101; across street

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-313
Event: 2H21
Area of Concern: REST

NOT ADDRESSED 2H21

[Irrigation and water-supply purpose, per Navajo]

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Screen: 904-1157)

Initials: (88)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/19/21		NM	NM	NM	NM	NA	NA	NA	NA	Yes		Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		No purge; active water well w/ sample port						B) ded bladder pump
			2.0		(By Tank 465)						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RA-313								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Pecan Grove)

Monitoring Well Purging and Sampling Record

* (Blockage at 11.45 Removed a saturated sock+string to clear obstruction.

* called GDS to bring fishing gear

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-7
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other __	Other __

Hydrologic Monitoring for TRC
Houston, Texas

Initials: BB (89)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	* Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1410	NP	11.99	0.00	34.83	30.6	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1415	12.01	0.5	6.89	23.9	3,790	2.4	-198.4	7.8	Colorless, clear	*Low-flow groundwater sample:*
	1418	12.01	1.0	6.81	22.6	3,810	1.7	-224.7	6.2	" (Strong HC odor) "	A) peristaltic pump w/ ded tubing
	1420	12.01	1.5	6.78	22.2	3,820	1.4	-246.7	3.3	" " "	B) ded bladder pump
	1423	12.01	2.0	6.76	22.0	3,820	1.2	-253.8	2.4	" " "	C) non-ded bladder pump; or
	1425	12.01	2.5	6.75	21.9	3,820	1.1	-256.7	1.9	" " "	*Standard groundwater sample:*
	1428	12.01	3.0	6.75	21.8	3,810	1.0	-259.4	1.7	" " "	D) bailer due to limited column; or
	1430	12.01	3.5	6.74	21.8	3,810	0.9	-261.3	1.6	" " "	E) recovery well cycling sample
	1433	12.01	4.0	6.74	21.8	3,800	0.9	-263.5	1.6	" " "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1435	KWB-7	12.01	6.74	21.8	3,800	0.9	-263.5	1.6	Per COC	Per COC	Lab: Pace National, ML Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-20
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS (91)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/17/24	1632	NP	15.12	0.00	26.66	21.9	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-20								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-3
Event: 2Q21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

(92)

Initials: BD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1645	NP	16.72	0.00	21.59	NS	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-3								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-4
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (93)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1155	NP	33.24	0.00	36.98	NS	yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer ded to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-4								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

(Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-2
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(94)

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1700	NP	17.72	0.00	21.49	NS	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-2								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-1
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GJ (95)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1721	NP	15.64	0.00	21.88	19.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's
9/15/21	930	NP	15.61	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/15/21	935	15.62	0.5	6.69	23.7	6480	3.3	84.6	5-8	clear	*Low-flow groundwater sample:*
	937	15.62	1.0	6.46	22.1	6510	1.7	86.1	2.4		(A) peristaltic pump w/ ded tubing
	940	15.62	1.5	6.41	21.8	6510	1.4	86.4	1.7		B) ded bladder pump
	943	15.62	2.0	6.40	21.5	6520	1.3	86.8	1.2		C) non-ded bladder pump; or
	945	15.62	2.5	6.39	21.5	6490	1.3	84.4	1.6		*Standard groundwater sample:*
	947	15.62	3.0	6.39	21.6	6480	1.4	83.1	2.1		D) bailer due to limited column; or
	950	15.62	3.5	6.38	21.7	6440	1.3	82.6	1.5		E) recovery well cycling sample
	953	15.62	4.0	6.38	21.7	6440	1.3	82.1	1.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/15/21	955	NP-1	15.62	6.38	21.7	6440	1.3	82.1	1.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-6
Event: 2H21
Area of Concern: TMD

Completion: At-Grade ___ Upright ✓ Vault ___
Casing Diam.: 2-in ✓ 4-in ___ Other ___
Casing Material: PVC ✓ SS ___ Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS (96)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/25	1615	NP	11.08	0.00	20.35	18.0	Yes	Yes	Yes	Yes		Weather: Sunny 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-6								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-8
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RB (97)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1626	NP	12.69	0.00	23.30	18.3	Yes	Yes	Yes	Yes		Weather: Sunny 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-8								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

+ Trip Blank - TMD-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-21
Event: 2021
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GBS (98)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1733	NP	12.20	0.00	25.12	19.9	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's
9/15/21	1020	NP	12.20									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/15/21	1025	12.24	0.5	6.86	23.1	8250	3.0	87.4	3.0	Clear	*Low-flow groundwater sample:*
	1027	12.25	1.0	6.75	22.2	8390	2.0	88.1	1.9		(A) peristaltic pump w/ ded tubing
	1030	12.25	1.5	6.70	21.8	8420	1.7	88.0	1.2		B) ded bladder pump
	1033	12.25	2.0	6.68	21.6	8430	1.6	87.5	1.5		C) non-ded bladder pump; or
	1035	12.25	2.5	6.62	21.5	8440	1.5	86.4	1.3		*Standard groundwater sample:*
	1037	12.25	3.0	6.62	21.6	8430	1.5	85.7	1.1		D) bailer due to limited column; or
	1040	12.25	3.5	6.61	21.6	8440	1.4	85.3	1.2		E) recovery well cycling sample
	1043	12.25	4.0	6.60	21.6	8440	1.4	84.8	1.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/15/21	1045	MW-21	12.25	6.60	21.6	8440	1.4	84.8	1.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if I NAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove I NAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-9
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJ (99)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPl Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1621	NP	13.20	0.00	22.25	NS	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-9								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-71
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ (100)

Well Inspection Information

Date	Time	Depth to NAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	* Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1610	NP	12.84	0.00	21.67	20.7	Yes	Yes	Yes	Yes	X	Weather Sunny 80s
											Cracked flat	

* (Lowered to well base, permanently)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump: or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-71								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-68
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: [illegible] (101)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1553	NP	15.74	0.00	26.52	25.5	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-68								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-27
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-In __	SS
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BD (102)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1515	NP	16.43	0.00	30.28	25.0	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (l)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-27								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-89
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (103)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1519	NP	10.07	0.00	20.28	15.2	Yes	Yes	Yes	Yes		Weather: Sunny 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (N)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-89								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-16
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RG (104)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1530	NF	8.18	0.00	21.24	16.2	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-16								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-26
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS (105)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/25	1540	NP	9.72	0.00	27.58	22.6	Yes	Yes	Yes	Yes		Weather Sunny 90's

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-26								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Pecan grove access from 82 gate)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11A
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (106)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1135	NP	11.89	0.00	42.27	37.0	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1140	11.95	0.5	6.58	23.9	4060	4.8	-128.1	4.9	Colorless, clear	*Low-flow groundwater sample:*
	1143	11.95	1.0	6.55	22.4	3910	3.9	-129.3	4.1	" "	(A) peristaltic pump w/ ded tubing
	1145	11.95	1.5	6.55	21.9	3900	3.6	-130.1	3.3	" "	B) ded bladder pump
	1148	11.95	2.0	6.54	21.7	3,890	3.4	-130.8	3.1	" "	C) non-ded bladder pump; or
	1150	11.95	2.5	6.54	21.6	3,890	3.2	-131.2	2.9	" "	*Standard groundwater sample:*
	1153	11.95	3.0	6.54	21.5	3,880	3.1	-131.7	2.7	" "	D) bailer due to limited column; or
	1155	11.95	3.5	6.55	21.5	3,870	3.1	-132.1	2.5	" "	E) recovery well cycling sample
	1158	11.95	4.0	6.54	21.5	3,870	3.0	-132.5	2.4	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1200	KWB-11A	11.95	6.54	21.5	3,870	3.0	-132.5	2.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Pecan grove access from 82 gate)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11B
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BT (107)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1220	NP	12.84	0.00	72.45	62.2	Yes	Yes	Yes	Yes	*	Weather: Sunny 80's

Well Purging Record

* same as last event severely cracked pad

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1225	13.03	0.5	6.89	23.4	3600	1.9	-58.6	12.3	Colorless, clear	*Low-flow groundwater sample:*
	1228	13.09	1.0	6.84	22.5	3590	1.4	-31.6	9.8	" "	(A) peristaltic pump w/ ded tubing
	1230	13.14	1.5	6.82	22.3	3,580	1.2	+08.4	7.7	" "	B) ded bladder pump
	1233	13.15	2.0	6.81	22.2	3,580	1.1	18.2	6.1	" "	C) non-ded bladder pump; or
	1235	13.15	2.5	6.81	22.2	3,570	1.0	21.6	5.3	" "	*Standard groundwater sample:*
	1238	13.15	3.0	6.80	22.1	3,570	0.9	22.0	4.8	" "	D) bailer due to limited column; or
	1240	13.15	3.5	6.79	22.1	3,570	0.9	22.4	4.3	" "	E) recovery well cycling sample
↓	1243	13.15	4.0	6.79	22.1	3,560	0.8	22.7	4.1	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1245	KWB-11B	13.15	6.79	22.1	3,560	0.8	22.7	4.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Removed from Program by Navajo, 4-13-15

Monitoring Well Purging and Sampling Record (former Jack Joy 575-365-6042)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-3AR
Event: 2021
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

(108)

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		DO NOT ADDRESS						A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
										Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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ATV - S. Ro Field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-115
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BM (109)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	1035	NP	14.96	0.00	27.50	19.8	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	1040	14.99	0.5	6.87	22.1	4,650	2.9	121.6	2.4	Colorless, Clear	*Low-flow groundwater sample:*
	1043	15.00	1.0	6.74	21.7	4,670	2.8	119.8	2.1	" "	(A) peristaltic pump w/ ded tubing
	1045	15.00	1.5	6.71	21.4	4,680	2.6	117.2	1.7	" "	B) ded bladder pump
	1048	15.00	2.0	6.70	21.2	4,690	2.4	116.9	1.5	" "	C) non-ded bladder pump; or
	1050	15.00	2.5	6.68	21.1	4,690	2.2	116.1	1.3	" "	*Standard groundwater sample:*
	1053	15.00	3.0	6.68	21.0	4,700	2.1	115.7	1.2	" "	D) bailer due to limited column; or
	1055	15.00	3.5	6.67	21.0	4,710	2.0	115.3	1.2	" "	E) recovery well cycling sample
	1058	15.00	4.0	6.65	20.9	4,710	2.0	114.8	1.1	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1100	MW-115	15.00	6.65	20.9	4,710	2.0	114.8	1.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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ATV - S. RO Field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-114
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (110)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	950	NP	14.96	0.00	38.25	30.5	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	955	14.98	0.5	6.86	23.2	3,280	5.1	99.8	5.2	Colorless, clear	*Low-flow groundwater sample:*
	958	14.98	1.0	6.71	23.0	3,330	4.2	91.7	3.8	" "	(A) peristaltic pump w/ ded tubing
	1000	14.98	1.5	6.67	23.0	3,290	3.6	94.3	3.0	" "	B) ded bladder pump
	1003	14.98	2.0	6.65	22.9	3,280	3.1	95.8	2.6	" "	C) non-ded bladder pump; or
	1005	14.98	2.5	6.63	22.9	3,280	2.7	96.2	2.3	" "	*Standard groundwater sample:*
	1008	14.98	3.0	6.62	22.9	3,270	2.5	97.1	2.1	" "	D) bailer due to limited column; or
	1010	14.98	3.5	6.61	22.8	3,270	2.4	97.7	2.0	" "	E) recovery well cycling sample
	1013	14.98	4.0	6.60	22.8	3,270	2.4	98.3	2.0	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1015	MW-114	14.98	6.60	22.8	3,270	2.4	98.3	2.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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ATV - S. RO Field (mesquite !!)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-125
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (III)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	905	NP	18.01	0.00	28.31	23.5	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	910	18.07	0.5	6.89	21.4	4,650	4.6	86.2	9.1	colorless, clear	*Low-flow groundwater sample:*
	913	18.08	1.0	6.78	20.9	4,590	3.1	88.4	6.3	" "	(A) peristaltic pump w/ ded tubing
	915	18.08	1.5	6.73	20.8	4,540	2.5	89.2	5.2	" "	B) ded bladder pump
	918	18.08	2.0	6.71	20.7	4,510	2.2	90.8	4.4	" "	C) non-ded bladder pump; or
	920	18.08	2.5	6.69	20.6	4,490	2.0	91.3	3.9	" "	*Standard groundwater sample:*
	923	18.08	3.0	6.68	20.6	4,480	1.9	91.9	3.7	" "	D) bailer due to limited column; or
	925	18.08	3.5	6.67	20.5	4,470	1.8	92.4	3.7	" "	E) recovery well cycling sample
	928	18.08	4.0	6.67	20.5	4,470	1.8	92.6	3.6	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	930	MW-125	18.08	6.67	20.5	4,470	1.8	92.6	3.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-117
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OSD (112)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1325	NP	13.18	0.00	27.22	19.7	yes	yes	yes	yes		Weather: Sunny 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1330	13.19	0.5	6.75	24.9	4290	3.1	43.5	30.2	Colorless / Clear	*Low-flow groundwater sample:*
	1333	13.19	1.0	6.70	24.7	4230	2.8	45.6	21.7		(A) peristaltic pump w/ ded tubing
	1335	13.19	1.5	6.63	24.6	4210	2.5	46.2	17.3		B) ded bladder pump
	1338	13.19	2.0	6.60	24.5	4200	2.3	47.1	13.6		C) non-ded bladder pump; or
	1340	13.19	2.5	6.57	24.3	4180	2.2	48.8	10.7		*Standard groundwater sample:*
	1343	13.19	3.0	6.53	24.2	4170	2.1	49.3	9.5		D) bailer due to limited column; or
	1345	13.19	3.5	6.50	24.1	4160	2.1	50.7	9.1		E) recovery well cycling sample
	1348	13.19	4.0	6.47	24.0	4160	2.0	51.9	8.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1350	MW-117	13.19	6.47	24.0	4160	2.0	51.9	8.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-118
Event: 2N21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OJD (113)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1240	NP	17.49	0.00	28.29	21.0	yes	yes	yes	yes		Weather: Sunny 80's

Well Purging Record *DTW Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1245	17.55	0.5	6.92	23.8	4720	4.1	29.8	23.0	colorless/clear	*Low-flow groundwater sample:*
	1248	17.59	1.0	6.83	24.2	4650	3.6	36.1	20.7		(A) peristaltic pump w/ ded tubing
	1250	17.63	1.5	6.80	24.5	4630	3.3	42.6	15.1		B) ded bladder pump
	1253	17.68	2.0	6.75	24.7	4610	3.2	49.3	13.4		C) non-ded bladder pump; or
	1255	17.72	2.5	6.72	24.8	4600	3.1	53.7	12.5		*Standard groundwater sample:*
	1258	17.78	3.0	6.70	24.9	4590	3.0	59.1	10.8		D) bailer due to limited column; or
	1300	17.80	3.5	6.68	25.1	4580	2.9	64.7	9.8		E) recovery well cycling sample
	1303	17.85	4.0	6.63	25.3	4570	2.9	69.4	9.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1305	MW-118	17.85	6.63	25.3	4570	2.9	69.4	9.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03". If LNAPL thickness is measured at 0.01" or 0.02", remove LNAPL, and collect groundwater sample.

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Gauge only

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-9
Event: 2H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: DSD (114)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1230	NP	15.91	0.00	25.65	NS	yes	yes	yes *	yes		Weather: Sunny 80s

*Needs Lock

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-9								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-119
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials 050 (115)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	1150	NP	14.10	0.00	28.11	20.8	yes	yes	yes	yes		Weather: Sunny 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1155	14.14	0.5	6.99	22.4	4630	2.5	35.2	42.1	Colorless/Clear	*Low-flow groundwater sample:*
	1158	14.14	1.0	6.91	22.5	4580	2.3	31.7	30.7		(A) peristaltic pump w/ ded tubing
	1200	14.14	1.5	6.87	22.8	4530	2.1	28.6	22.3		B) ded bladder pump
	1203	14.14	2.0	6.83	22.9	4510	2.0	25.7	15.6		C) non-ded bladder pump; or
	1205	14.14	2.5	6.81	23.1	4500	2.0	23.1	13.4		*Standard groundwater sample:*
	1208	14.14	3.0	6.78	23.2	4490	1.9	20.7	12.1		D) bailer due to limited column; or
	1210	14.14	3.5	6.75	23.4	4480	1.9	18.1	11.5		E) recovery well cycling sample
	1213	14.14	4.0	6.72	23.5	4480	1.8	17.3	10.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1215	MW-119	14.14	6.72	23.5	4480	1.8	17.3	10.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-5
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Located inside locked gate. Security 575-746-5438 to have gate unlocked

Hydrologic Monitoring for TRC
Houston, Texas

Initials: GD

(116)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/14/21	917	NP	14.23	0.00	25.09	20.0	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-5								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-136
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDJ (117)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	825	NP	17.77	0.00	27.90	23.0	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	838	17.80	0.5	6.71	21.3	5240	2.7	127.0	35.8	Sl. cloudy	*Low-flow groundwater sample:*
	835	17.80	1.0	6.67	21.2	5250	2.2	126.7	27.1	↓	(A) peristaltic pump w/ ded tubing
	838	17.80	1.5	6.60	21.2	5210	1.8	128.4	22.2	clear	B) ded bladder pump
	840	17.80	2.0	6.59	21.2	5230	1.6	126.6	21.1		C) non-ded bladder pump; or
	843	17.80	2.5	6.59	21.2	5230	1.5	128.7	20.4		*Standard groundwater sample:*
	845	17.80	3.0	6.57	21.2	5220	1.4	129.1	19.2		D) bailer due to limited column; or
	847	17.80	3.5	6.56	21.2	5200	1.4	128.8	17.4		E) recovery well cycling sample
↓	850	17.80	4.0	6.56	21.2	5200	1.3	129.3	15.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt Juliet, TN
9/14/21	855	MW-136	17.80	6.56	21.2	5200	1.3	129.3	15.9	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126A
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (118)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9/4/21	1017	19.19	19.51	0.32	37.51	29.5	Yes	Yes	Yes	Yes		Weather: Sunny, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/4/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5			Not Sampled due to LNAPL					*Standard groundwater sample:*
			3.0			thickness ≥ 0.03'					D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-126A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126B
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (119)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	935	NP	19.15	0.00	51.43	48.4	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21	940	19.25	0.5	6.72	22.1	5720	2.0	139.7	15.4	Clear	*Low-flow groundwater sample:*
	943	19.25	1.0	6.58	21.5	5790	1.2	142.5	12.6		(A) peristaltic pump w/ ded tubing
	945	19.25	1.5	6.52	21.3	5790	1.3	144.4	10.0		B) ded bladder pump
	947	19.25	2.0	6.46	21.2	5820	1.2	146.0	11.1		C) non-ded bladder pump; or
	950	19.25	2.5	6.44	21.1	5840	1.2	146.3	10.0		*Standard groundwater sample:*
	953	19.25	3.0	6.43	21.0	5840	1.2	146.3	9.7		D) bailer due to limited column; or
	955	19.25	3.5	6.42	20.8	5880	1.1	146.3	9.9		E) recovery well cycling sample
↓	957	19.25	4.0	6.42	20.9	5910	1.1	146.5	9.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9/14/21	1000	MW-126B	19.25	6.42	20.9	5910	1.1	146.5	9.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-127
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: LAS (120)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1028	22.18	23.05	0.87	53.21	38.4	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		NOT	Sampled	Due	to			*Standard groundwater sample:*
			3.0		LNAPL	thickness	≥ 0.03'				D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-127								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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(Recompleted at-grade prior to 11/20)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-129
Event: 2H21
Area of Concern: REST
Gauge only

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (121)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1036	23.87	23.92	0.05	50.78	NA	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
						(5' off base if sampled)						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-129								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1A
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDJ (123)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1130	16.45	16.59	0.14	33.50	25.8	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		Not sampled due to well						C) non-ded bladder pump; or
			2.5			having LNAPL		thickness			*Standard groundwater sample:*
			3.0			≥ 0.03'					D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-1A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Gauge only

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1B
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

(124)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1136	18.14	18.50	0.36	33.92	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-1B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 1C
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDJ (125)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1141	NP	18.81	0.00	52.71	42.7	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-1C								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Located ~25' N. of original KWB-10 pad)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-10R
Event: 2H21
Area of Concern: RFST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (126)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1152	18.12	19.48	1.36	29.46	22.0	Yes	Yes	Yes	Yes		Weather: Sunny, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		Not sampled due to well						C) non-ded bladder pump; or
			2.5		having LNAPL thickness						*Standard groundwater sample:*
			3.0		≥ 0.03'						D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
		KWB-10R								Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-131
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

127

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1042	26.05	27.25	1.20	53.35	38.1	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ded tubing
			1.5								B) ded bladder pump
			2.0		Not	Sampled	Due to	LNAPL			C) non-ded bladder pump; or
			2.5			Thickness	0.03'				*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-131								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-5
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OSO (128)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
9-14-21	805	26.44	27.60	1.16	37.68	30.7 (if sampled)	yes	yes	yes	yes		Weather: Sunny 70's

Well Purging Record

* no Bladder Pump in well.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity
			0.5							
			1.0			Not Sampled Due to				
			1.5			LNAPL 7.03				
			2.0							
			2.5							
			3.0							
			3.5							
			4.0							

Low-flow groundwater sample:
A) peristaltic pump w/ ded tubing
(B) ded bladder pump
C) non-ded bladder pump; or
Standard groundwater sample:
D) bailer due to limited column; or
E) recovery well cycling sample
F) irrigation well grab sample

ded bladder pump removed by Navajo and misplaced 4/21; HMI did not reinstall due to constant LNAPL present

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-5								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-111
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: DSD (129)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	810	27.58	28.61	1.03	40.83	35.8	yes	yes	yes	yes		Weather: Sunny 70's

Well Purging Record

*No Bladder Pump in Well

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		Not Sampled Due to LNAPL						A) peristaltic pump w/ ded tubing
			1.5		20.03'						(B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample
										ded bladder pump removed by Navajo	
										and misplaced 4/21 ; Item did not	
										retrieval due to confirmed LNAPL present	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-111								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-6
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GOS (130)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1110	24.35	25.50	1.15	36.44	27.4	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			NOT SAMPLED Due to					C) non-ded bladder pump; or
			2.5			well having LNAPL					*Standard groundwater sample:*
			3.0			thickness ≥ 0.03'					D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-6								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-112
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CDS (131)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/24	1050	23.10	24.51	1.41	37.54	32.5	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/24			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		NOT SAMPLED DUE TO well						*Standard groundwater sample:*
			3.0		having LNAPL Thickness						D) bailer due to limited column; or
			3.5		≥ 0.03'						E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-112								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-132
Event: 2121
Area of Concern: 2EST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CDS (132)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9/14/21	1101	721.00	721.00	NM	42.66	NA	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

* TOP OF NAVAJO'S LNAPL SKIMMER Pump

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9/14/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT SAMPLED; HISTORIC LNAPL PRESENT						C) non-ded bladder pump, or
			2.5								*Standard groundwater sample:*
			3.0		NAVAJO LNAPL SKIMMER Pump						D) bailer due to limited column; or
			3.5		IN STALLED IN WELL						E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample ID.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-132								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Located inside yellow vault; furthest South

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-57
Event: 2H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OJD (133)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-14-21	1030	NP	17.31	0.00	34.32	32.8	yes	yes	yes	yes		Weather: Sunny 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
9-14-21	1035	17.52	0.5	6.63	24.3	5370	4.1	27.4	27.8	colorless/clear	*Low-flow groundwater sample:*
	1038	17.53	1.0	6.67	23.8	5730	3.8	35.1	23.1		A) peristaltic pump w/ ded tubing
	1040	17.59	1.5	6.68	23.5	5820	3.5	39.4	18.1		(B) ded bladder pump
	1043	17.63	2.0	6.70	23.3	5850	3.3	43.1	15.4		C) non-ded bladder pump; or
	1045	17.67	2.5	6.73	23.1	5900	3.2	47.3	13.1		*Standard groundwater sample:*
	1048	17.72	3.0	6.75	23.2	5930	3.2	52.1	14.6		D) bailer due to limited column; or
	1050	17.79	3.5	6.79	22.9	5950	3.1	55.6	13.5		E) recovery well cycling sample
	1053	17.87	4.0	6.82	22.7	5970	3.1	59.9	12.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
9-14-21	1055	MW-57	17.87	6.82	22.7	5970	3.1	59.9	12.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Table 1 - Well Information and Gauging Data

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Cross-Gradient	KWB-13	Shallow	669077.00	524892.42	3366.02	3365.67	Unknown	Unknown	04/13/21	--	29.75	3,335.92	--
									09/14/21	--	28.71	3,336.96	--
	NP-5	Shallow	675512.24	524698.19	3,346.31	3,349.29	3,336.06	10.25 to 20	04/13/21	--	19.92	3,329.37	--
									09/14/21	--	14.23	3,335.06	--
	MW-136	Shallow	675343.45	522975.40	3,358.62	3,360.83	3,348.62	10 to 25	04/13/21	--	18.36	3,342.47	--
									09/14/21	--	17.77	3,343.06	--
Evaporation Ponds	MW-1R	Shallow	675135.17	538636.78	3,310.49	3,314.20	3,302.49	8 to 23	04/13/21	--	11.77	3,302.43	--
									09/14/21	--	11.31	3,302.89	--
	MW-2A	Shallow	675979.09	540803.91	3,310.55	3,312.97	Unknown	Unknown	04/13/21	--	11.16	3,301.81	--
									09/14/21	--	10.70	3,302.27	--
	MW-2B	Valley Fill	675969.73	540801.44	3,309.94	3,312.49	3,271.44	38.5 to 48	04/13/21	--	11.96	3,300.53	--
									09/14/21	--	11.38	3,301.11	--
	MW-3	Shallow	674443.34	540503.24	3,309.20	3,312.26	Unknown	Unknown	04/13/21	--	12.32	3,299.94	--
									09/14/21	--	11.74	3,300.52	--
	MW-4A	Shallow	674083.00	540529.44	3,308.63	3,312.20	Unknown	Unknown	04/13/21	--	12.47	3,299.73	--
									09/14/21	--	11.88	3,300.32	--
	MW-4B	Valley Fill	674089.71	540541.34	3,308.73	3,312.01	3,248.48	60.25 to 70	04/13/21	--	12.24	3,299.77	--
									09/14/21	--	11.65	3,300.36	--
	MW-5A	Shallow	674272.84	541759.78	3,306.59	3,308.62	Unknown	Unknown	04/13/21	--	9.39	3,299.23	--
									09/14/21	--	8.25	3,300.37	--
	MW-5B	Valley Fill	674272.33	541739.12	3,306.71	3,308.95	3,265.21	41.5 to 50.5	04/13/21	--	9.60	3,299.35	--
									09/14/21	--	8.96	3,299.99	--
	MW-5C	Valley Fill	674279.57	541728.80	3,306.55	3,309.28	3,247.30	59.25 to 68.75	04/13/21	--	9.81	3,299.47	--
									09/14/21	--	9.18	3,300.10	--
	MW-6A	Shallow	674427.07	539833.47	3,310.40	3,313.46	Unknown	Unknown	04/13/21	--	13.58	3,299.88	--
									09/14/21	--	12.99	3,300.47	--
	MW-6B	Valley Fill	674418.57	539834.04	3,310.09	3,313.35	3,270.59	39.5 to 49	04/13/21	--	13.50	3,299.85	--
									09/14/21	--	12.90	3,300.45	--
	MW-7A	Shallow	674447.64	542716.01	3,304.61	3,308.01	Unknown	Unknown	04/13/21	--	10.17	3,297.84	--
									09/14/21	--	9.53	3,298.48	--
	MW-7B	Valley Fill	674455.63	542715.61	3,306.05	3,307.87	3,266.55	39.5 to 49	04/13/21	--	9.95	3,297.92	--
									09/14/21	--	9.30	3,298.57	--
	MW-10	Shallow	672121.15	541540.05	3,304.12	3,304.76	3,304.12	0 to 19.4	04/13/21	--	6.45	3,298.31	--
									09/14/21	--	6.03	3,298.73	--
	MW-11A	Shallow	677317.73	543675.36	3,308.42	3,310.76	3,302.92	5.5 to 20	04/13/21	--	10.33	3,300.43	--
									09/14/21	--	9.66	3,301.10	--

Table 1 - Well Information and Gauging Data

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Evaporation Ponds	MW-11B	Valley Fill	677305.72	543685.50	3,308.34	3,310.76	3,272.84	35.5 to 45	04/13/21	--	10.31	3,300.45	--
									09/14/21	--	9.66	3,301.10	--
	MW-12	Shallow	676952.63	541505.50	3,310.37	3,312.73	3,303.87	6.5 to 16	04/13/21	--	10.98	3,301.75	--
									09/15/21	--	10.69	3,302.04	--
	MW-13	Shallow	674951.80	539762.62	3,311.95	3,314.24	3,302.45	9.5 to 19	04/13/21	--	13.34	3,300.90	--
									09/15/21	--	12.88	3,301.36	--
	MW-14	Shallow	676122.48	543280.49	3,309.44	3,311.84	3,303.94	5.5 to 20	04/13/21	--	>11.81 [4]	-- [4]	--
									09/15/21	--	>11.81 [4]	-- [4]	--
	MW-15	Shallow	674731.39	539003.75	3,310.97	3,313.72	3,301.97	9 to 19	04/13/21	--	12.97	3,300.75	--
									09/14/21	--	12.43	3,301.29	--
	MW-18A	Shallow	672548.16	543447.78	3,306.33	3,308.58	3,296.33	10 to 20	04/13/21	--	10.99	3,297.59	--
									09/14/21	--	10.50	3,298.08	--
	MW-18B	Valley Fill	672557.96	543458.22	3,306.23	3,308.74	3,269.23	37 to 47	04/13/21	--	10.99	3,297.75	--
									09/14/21	--	10.52	3,298.22	--
	MW-18T	Valley Fill	672559.79	543449.75	3,306.30	3,308.55	3,269.30	37 to 47	04/13/21	--	11.10	3,297.45	--
									09/14/21	--	10.62	3,297.93	--
	MW-22A	Shallow	672866.82	541801.63	3,305.24	3,307.62	3,299.74	5.5 to 20.5	04/13/21	--	9.02	3,298.60	--
									09/14/21	--	8.57	3,299.05	--
	MW-22B	Valley Fill	672866.58	541786.97	3,305.08	3,307.63	3,262.78	42.3 to 52	04/13/21	--	8.87	3,298.76	--
									09/14/21	--	8.35	3,299.28	--
	MW-24	Shallow	676498.23	544101.56	3,310.33	3,312.85	3,295.33	15 to 20	04/13/21	--	12.66	3,300.19	--
									09/15/21	--	12.34	3,300.51	--
	MW-69	Shallow	675962.29	540401.29	3,311.40	3,313.86	3,306.40	5 to 20	04/13/21	--	11.74	3,302.12	--
									09/15/21	--	11.29	3,302.57	--
	MW-70	Shallow	670892.66	542787.60	3,303.84	3,306.30	3,298.84	5 to 20	04/13/21	--	9.15	3,297.15	--
									09/14/21	--	8.80	3,297.50	--
	MW-72	Shallow	676691.27	542662.31	3,306.40	3,308.45	3,304.40	2 to 12	04/13/21	--	8.12	3,300.33	--
									09/14/21	--	7.41	3,301.04	--
	MW-73	Shallow	675910.20	542130.56	3,308.02	3,310.18	3,306.02	2 to 17	04/13/21	--	10.13	3,300.05	--
									09/14/21	--	9.18	3,301.00	--
	MW-74	Shallow	675059.14	541546.30	3,307.78	3,310.03	3,305.78	2 to 17	04/13/21	--	10.10	3,299.93	--
									09/14/21	--	9.35	3,300.68	--
	MW-75	Shallow	674622.31	541132.78	3,307.80	3,310.21	3,304.80	3 to 18	04/13/21	--	10.41	3,299.80	--
									09/14/21	--	9.79	3,300.42	--
	MW-76	Shallow	674482.47	541053.83	3,309.70	3,311.84	3,306.70	3 to 18	04/13/21	--	11.99	3,299.85	--
									09/14/21	--	11.35	3,300.49	--

Table 1 - Well Information and Gauging Data

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Evaporation Ponds	MW-77	Shallow	674529.89	541104.86	3,307.97	3,310.07	3,304.97	3 to 18	04/13/21	--	10.23	3,299.84	--
									09/14/21	--	9.57	3,300.50	--
	MW-78	Shallow	674529.23	541073.45	3,307.94	3,310.14	3,305.94	2 to 17	04/13/21	--	10.29	3,299.85	--
									09/14/21	--	9.66	3,300.48	--
	MW-79	Shallow	675349.67	540906.08	3,309.08	3,311.43	3,307.08	2 to 17	04/13/21	--	11.00	3,300.43	--
									09/14/21	--	10.27	3,301.16	--
	MW-80	Shallow	675371.74	540646.46	3,310.27	3,310.79	3,308.27	2 to 17	04/13/21	--	9.83	3,300.96	--
									09/14/21	--	9.24	3,301.55	--
	MW-81	Shallow	675252.80	540544.47	3,310.19	3,312.34	3,308.19	2 to 17	04/13/21	--	11.83	3,300.51	--
									09/14/21	--	11.17	3,301.17	--
	MW-82	Shallow	675035.42	540806.88	3,308.64	3,310.75	3,306.64	2 to 17	04/13/21	--	10.59	3,300.16	--
									09/14/21	--	9.93	3,300.82	--
	MW-83	Shallow	674524.97	540832.80	3,307.93	3,310.19	3,305.93	2 to 17	04/13/21	--	10.26	3,299.93	--
									09/14/21	--	9.61	3,300.58	--
	MW-84	Shallow	674798.43	540109.13	3,309.83	3,311.59	3,307.83	2 to 17	04/13/21	--	11.03	3,300.56	--
									09/14/21	--	9.21	3,302.38	--
	MW-85	Shallow	674566.12	539805.49	3,308.99	3,311.09	3,305.99	3 to 18	04/13/21	10.81	11.36	3,300.17	0.55
									09/14/21	10.50	10.90	3,300.51	0.40
	MW-86	Shallow	674645.96	539671.17	3,308.98	3,311.06	3,306.98	2 to 17	04/13/21	10.83	10.86	3,300.22	0.03
									09/14/21	10.27	10.30	3,300.78	0.03
	MW-87	Shallow	673379.98	543280.45	3,305.42	3,307.64	3,303.42	2 to 17	04/13/21	--	9.42	3,298.22	--
									09/14/21	--	8.73	3,298.91	--
	MW-88	Shallow	672899.14	540832.09	3,306.43	3,308.68	3,303.43	3 to 18	04/13/21	--	9.79	3,298.89	--
									09/14/21	--	9.30	3,299.38	--
	MW-120	Shallow	674678.95	539555.77	3,310.66	3,313.55	3,300.66	10 to 25	04/13/21	--	13.48	3,300.07	--
									09/14/21	--	12.90	3,300.65	--
	MW-121	Shallow	674851.38	539923.70	3,311.77	3,314.68	3,301.77	10 to 25	04/13/21	--	13.56	3,301.12	--
									09/14/21	--	12.63	3,302.05	--
	MW-122	Shallow	675231.06	540401.60	3,308.78	3,311.69	3,298.78	10 to 20	04/12/21	--	11.48	3,300.21	--
									09/14/21	--	10.84	3,300.85	--
	MW-123	Shallow	671352.15	541523.94	3,302.78	3,303.98	3,292.78	10 to 25	04/13/21	--	6.93	3,297.05	--
									09/14/21	--	6.56	3,297.42	--
	MW-124	Shallow	669844.77	542735.51	3,302.99	3,305.84	3,297.99	5 to 20	04/13/21	--	9.74	3,296.10	--
									09/14/21	--	9.44	3,296.40	--
	OCD-1R	Shallow	676741.31	541568.00	3,310.69	3,314.27	Unknown	Unknown	04/13/21	--	12.53	3,301.74	--
									09/14/21	--	12.08	3,302.19	--

Table 1 - Well Information and Gauging Data

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Evaporation Ponds	OCD-2A	Shallow	677036.12	542157.14	3,310.83	3,314.16	3,302.33	8.5 to 23.5	04/13/21	--	12.82	3,301.34	--
									09/14/21	--	12.42	3,301.74	--
	OCD-2B	Valley Fill	677034.65	542167.57	3,310.66	3,313.07	3,272.16	38.5 to 48	04/13/21	--	12.40	3,300.67	--
									09/14/21	--	12.03	3,301.04	--
	OCD-3	Shallow	677516.31	543024.47	3,310.88	3,314.29	3,304.38	6.5 to 21.5	04/13/21	--	13.19	3,301.10	--
									09/14/21	--	12.72	3,301.57	--
	OCD-4	Shallow	678099.52	543893.55	3,310.10	3,313.70	3,303.60	6.5 to 21.5	04/13/21	--	12.74	3,300.96	--
									09/14/21	--	12.30	3,301.40	--
	OCD-5	Shallow	677081.54	544295.35	3,308.71	3,311.34	Unknown	Unknown	04/13/21	--	10.95	3,300.39	--
									09/14/21	--	10.42	3,300.92	--
	OCD-6	Shallow	676538.82	543540.03	3,307.20	3,311.36	3,299.20	8 to 23	04/13/21	--	11.42	3,299.94	--
									09/14/21	--	10.86	3,300.50	--
	OCD-7AR	Shallow	676169.74	543071.88	3,308.86	3,310.03	3,303.36	5.5 to 19.5	04/13/21	--	10.44	3,299.59	--
									09/14/21	--	9.64	3,300.39	--
	OCD-7B	Valley Fill	676157.36	543081.99	3,307.57	3,310.26	3,264.07	43.5 to 52.5	04/13/21	--	10.26	3,300.00	--
									09/14/21	--	9.69	3,300.57	--
	OCD-7C	Valley Fill	676155.95	543069.21	3,307.74	3,310.10	3,247.49	60.25 to 69.75	04/13/21	--	10.01	3,300.09	--
									09/14/21	--	9.38	3,300.72	--
	OCD-8A	Shallow	674976.41	543376.95	3,306.26	3,308.79	3,303.26	3 to 18	04/13/21	--	9.66	3,299.13	--
									09/14/21	--	8.56	3,300.23	--
	OCD-8B	Valley Fill	674992.24	543375.06	3,306.11	3,309.19	3,262.61	43.5 to 53	04/13/21	--	9.80	3,299.39	--
									09/14/21	--	9.17	3,300.02	--
Field East of Refinery	KWB-1A	Shallow	672969.12	526181.36	3,351.25	3,353.46	3,333.25	18 to 32	04/13/21	19.75	20.81	3,333.50	1.06
									09/14/21	16.45	16.59	3,336.98	0.14
	KWB-1B	Shallow	672968.90	526191.02	3,351.14	3,352.83	3,333.14	18 to 32	04/13/21	21.40	22.67	3,331.18	1.27
									09/14/21	18.14	18.50	3,334.62	0.36
	KWB-1C	Valley Fill	672968.22	526202.95	3,351.18	3,351.38	3,320.68	30.5 to 49.5	04/13/21	--	22.28	3,329.10	--
									09/14/21	--	18.81	3,332.57	--
	KWB-7	Shallow	671266.72	529055.47	3,343.00	3,346.16	3,325.00	18 to 32	04/13/21	--	19.59	3,326.57	--
									09/14/21	--	11.99	3,334.17	--
	KWB-8	Shallow	671000.57	527874.87	3,347.90	3,350.41	3,332.90	15 to 34	04/13/21	26.93	28.29	3,323.21	1.36
									09/14/21	13.15	13.18	3,337.25	0.03
	KWB-10R	Shallow	671756.34	526206.06	3,351.23	3,350.97	3,342.23	9 to 29	04/13/21	20.79	23.19	3,329.70	2.40
									09/14/21	18.12	19.48	3,332.58	1.36
	KWB-11A	Shallow	670643.67	529043.46	3,346.13	3,348.72	3,316.13	30 to 39.5	04/13/21	26.61	26.68	3,322.10	0.07
									09/14/21	--	11.89	3,336.83	--

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Field East of Refinery	KWB-11B	Valley Fill	670653.84	529044.06	3,345.91	3,348.03	3,295.91	50 to 69.5	04/13/21	--	27.28	3,320.75	--
									09/14/21	--	12.84	3,335.19	--
	KWB-12A	Shallow	669074.44	527590.88	3,352.01	3,351.81	3,336.51	15.5 to 24.5	04/13/21	--	DRY	--	--
									09/14/21	--	19.79	3,332.02	--
	KWB-12B	Valley Fill	669064.18	527590.12	3,351.84	3,351.63	3,326.34	25.5 to 39.5	04/13/21	--	28.31	3,323.32	--
									09/14/21	--	19.70	3,331.93	--
	KWB-P4	Shallow	670970.10	537416.92	3,305.76	3,305.39	Unknown	Unknown	04/13/21	--	6.17	3,299.22	--
									09/14/21	--	5.89	3,299.50	--
	MW-57	Shallow	669935.59	527579.02	3,350.95	3,350.91	3,340.95	10 to 30	04/13/21	--	25.81	3,325.10	--
									09/14/21	--	17.41	3,333.50	--
	MW-58	Shallow	670207.27	525197.99	3,362.56	3,362.22	3,349.56	13 to 28	04/13/21	25.08	26.49	3,336.86	1.41
									09/14/21	24.21	25.32	3,337.79	1.11
	MW-111	Shallow	670494.22	525254.30	3,362.52	3,365.51	3,337.52	25 to 40	04/13/21	28.60	29.74	3,336.68	1.14
									09/14/21	27.58	28.61	3,337.72	1.03
	MW-112	Shallow	670890.64	526198.73	3,355.38	3,358.38	3,330.38	25 to 35	04/13/21	25.13	27.72	3,332.73	2.59
									09/14/21	23.10	24.51	3,335.00	1.41
	MW-113	Shallow	670693.80	527483.95	3,350.06	3,352.93	3,330.06	20 to 35	04/13/21	--	27.25	3,325.68	--
									09/14/21	--	18.74	3,334.19	--
	MW-125	Shallow	673288.01	524663.00	3,355.60	3,358.81	3,340.60	15 to 25	04/13/21	--	21.74	3,337.07	--
									09/14/21	--	18.01	3,340.80	--
	MW-126A	Shallow	672845.69	525458.24	3,353.60	3,356.60	3,334.60	19 to 34	04/13/21	22.71	23.29	3,333.77	0.58
									09/14/21	19.19	19.51	3,337.35	0.32
	MW-126B	Valley Fill	672843.26	525464.41	3,353.60	3,356.67	3,313.60	40 to 50	04/13/21	--	22.71	3,333.96	--
									09/14/21	--	19.15	3,337.52	--
	MW-127	Shallow	672184.21	525464.20	3,355.50	3,358.39	3,335.50	20 to 50	04/13/21	24.61	26.03	3,333.50	1.42
									09/14/21	22.18	23.05	3,336.04	0.87
	MW-128	Shallow	671846.09	524917.06	3,358.80	3,358.77	3,343.80	15 to 35	04/13/21	20.48	22.78	3,337.83	2.30
									09/15/21	18.29	20.25	3,340.09	1.96
	MW-129	Shallow	671184.95	524876.21	3,363.10	3,362.91	3,343.10	20 to 50	04/13/21	25.10	25.98	3,337.63	0.88
									09/14/21	23.87	23.92	3,339.03	0.05
	MW-130	Shallow	670331.35	524029.44	3,370.20	3,369.86	3,340.20	30 to 45	04/13/21	--	24.32	3,345.54	--
									09/14/21	--	22.95	3,346.91	--
	MW-131	Shallow	671104.83	525228.77	3,360.40	3,363.49	3,340.40	20 to 50	04/13/21	27.31	29.35	3,335.77	2.04
									09/14/21	26.05	27.25	3,337.20	1.20
	MW-132	Shallow	670346.80	526629.79	3,354.30	3,357.12	3,339.30	15 to 40	04/13/21	>22.85 [5]	>22.85 [5]	NM [5]	>0.00
									09/14/21	>21.00 [5]	>21.00 [5]	NM [5]	>0.00

Table 1 - Well Information and Gauging Data

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Field East of Refinery	MW-133	Shallow	672005.89	527446.73	3,343.40	3,349.45	3,328.40	15 to 35	04/13/21	22.24	22.53	3,327.15	0.29
									09/14/21	16.93	16.96	3,332.51	0.03
	MW-134	Shallow	673271.80	527263.99	3,343.10	3,346.23	3,323.10	20 to 30	04/13/21	--	20.87	3,325.36	--
									09/14/21	--	17.61	3,328.62	--
	MW-135	Shallow	671758.72	530211.23	3,338.00	3,337.65	3,303.00	35 to 65	04/13/21	--	34.59	3,303.06	--
									09/14/21	--	30.31	3,307.34	--
	RW-12R	Shallow	670542.50	527519.20	3,350.58	3,351.54	3,335.58	15 to 35	04/13/21	28.06	28.09	3,323.47	0.03
									09/14/21	--	18.89	3,332.65	--
	RW-13R	Shallow	671049.37	527506.74	3,349.60	3,351.54	3,334.60	15 to 35	04/13/21	25.98	27.26	3,325.30	1.28
									09/14/21	17.98	20.35	3,333.09	2.37
	RW-14R	Shallow	671592.73	527504.45	3,347.39	3,349.37	3,332.39	15 to 35	04/13/21	24.63	27.09	3,324.25	2.46
									09/14/21	16.20	16.49	3,333.11	0.29
	RW-18A	Shallow	673750.19	526188.64	3,349.04	3,350.84	Unknown	Unknown	04/13/21	--	DRY	--	--
									09/14/21	--	15.16	3,335.68	--
	RW-20A	Shallow	671032.06	527790.95	3,347.75	3,348.44	Unknown	Unknown	04/13/21	--	DRY	--	--
									09/14/21	--	DRY	--	--
	RW-20B	Shallow	671032.06	527790.95	3,347.75	3,348.44	Unknown	Unknown	04/13/21	--	DRY	--	--
									09/14/21	--	19.78	3,328.66	--
	RW-22	Shallow	671009.70	527889.44	3,347.17	3,349.21	3,335.67	11.5 to 39	04/13/21	28.78	28.89	3,320.41	0.11
									09/14/21	--	12.74	3,336.47	--
	MW-145	Shallow	672914.54	527283.92	3,343.94	3,347.07	3,334.94	9 to 29	04/13/21	--	21.24	3,325.83	--
									09/14/21	--	17.92	3,329.15	--
	MW-146	Shallow	673173.05	527636.61	3,340.34	3,343.09	3,330.34	10 to 30	04/13/21	--	24.73	3,318.36	--
									09/14/21	--	21.68	3,321.41	--
	MW-147	Shallow	671265.08	530212.28	3,339.85	3,339.48	3,329.85	20 to 40	04/13/21	--	34.23	3,305.25	--
									09/14/21	--	29.84	3,309.64	--
	MW-148	Shallow	670534.37	530218.56	3,342.79	3,342.59	3,332.79	20 to 40	04/13/21	--	37.45	3,305.14	--
									09/14/21	--	35.94	3,306.65	--
North Refinery	MW-23	Shallow	672851.25	522821.05	3,365.09	3,368.38	3,350.09	15 to 20	04/13/21	19.30	22.28	3,348.48	2.98
									09/14/21	16.16	18.01	3,351.85	1.85
	MW-29	Shallow	673481.15	523544.65	3,359.79	3,360.64	3,350.04	9.75 to 19.25	04/13/21	--	23.59	3,337.05	--
									09/14/21	--	19.74	3,340.90	--
	MW-30	Shallow	674124.92	523550.16	3,359.14	3,361.98	Unknown	Unknown	04/13/21	--	18.40	3,343.58	--
									09/14/21	--	14.20	3,347.78	--
	MW-39	Shallow	673039.50	523422.93	3,357.94	3,358.79	3,343.94	14 to 24	04/13/21	18.30	18.40	3,340.47	0.10
									09/14/21	14.48	14.65	3,344.28	0.17

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Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
North Refinery	MW-40	Shallow	673161.12	523489.02	3,356.56	3,356.93	Unknown	Unknown	04/13/21	16.87	17.12	3,340.01	0.25
									09/14/21	12.24	16.78	3,343.78	4.54
	MW-41	Shallow	673379.87	523374.64	3,356.38	3,356.58	3,342.38	14 to 19	04/13/21	--	16.02	3,340.56	--
									09/14/21	12.05	12.89	3,344.36	0.84
	MW-42	Shallow	673480.27	523263.53	3,355.64	3,358.44	Unknown	Unknown	04/13/21	--	18.43	3,340.01	--
									09/14/21	--	14.66	3,343.78	--
	MW-43	Shallow	673115.86	522950.40	3,363.38	3,365.49	3,347.88	15.5 to 20.5	04/13/21	17.30	17.70	3,348.11	0.40
									09/14/21	10.80	10.85	3,354.68	0.05
	MW-59	Shallow	672814.66	523854.12	3,359.44	3,362.43	3,344.44	15 to 30	04/13/21	19.50	20.43	3,342.74	0.93
									09/15/21	15.96	16.60	3,346.34	0.64
	MW-60	Shallow	672849.58	524143.12	3,359.26	3,361.98	3,344.26	15 to 30	04/13/21	20.59	22.20	3,341.07	1.61
									09/15/21	17.38	17.65	3,344.55	0.27
	MW-61	Shallow	672453.76	522578.38	3,369.45	3,369.47	3,355.45	14 to 29	04/13/21	--	14.89	3,354.58	--
									09/14/21	--	12.73	3,356.74	--
	MW-62	Shallow	672650.76	522696.50	3,368.35	3,368.81	3,354.35	14 to 29	04/13/21	18.83	19.03	3,349.94	0.20
									09/14/21	--	15.92	3,352.89	--
	MW-62R	Shallow	672656.02	522699.19	Unknown	3,368.53	Unknown	5 to 25	04/13/21	--	18.50	3,350.03	--
									09/14/21	--	15.61	3,352.92	--
	MW-67	Shallow	673224.88	522342.43	3,365.59	3,365.45	3,353.59	12 to 27	04/13/21	15.86	17.68	3,349.23	1.82
									09/14/21	12.54	13.15	3,352.79	0.61
	MW-90	Shallow	672909.28	521960.18	3,367.13	3,369.42	3,362.13	5 to 20	04/13/21	--	15.39	3,354.03	--
									09/14/21	--	12.61	3,356.81	--
	MW-91	Shallow	672945.86	522167.26	3,365.72	3,367.73	3,358.72	7 to 22	04/13/21	15.18	16.75	3,352.24	1.57
									09/14/21	13.13	13.34	3,354.56	0.21
	MW-92	Shallow	672766.10	522167.26	3,366.75	3,368.72	3,361.75	5 to 20	04/13/21	15.73	19.78	3,352.18	4.05
									09/14/21	13.48	14.30	3,355.08	0.82
	MW-93	Shallow	672897.25	522446.83	3,364.22	3,363.79	3,359.22	5 to 20	04/13/21	--	-- [3]	-- [3]	--
									09/14/21	--	-- [3]	-- [3]	--
	MW-94	Shallow	673510.54	522336.27	3,365.82	3,367.97	3,360.82	5 to 20	04/13/21	18.56	22.22	3,348.68	3.66
									09/14/21	15.50	18.03	3,351.96	2.53
	MW-95	Shallow	673084.72	522308.89	3,366.48	3,368.70	3,359.48	7 to 22	04/13/21	18.23	20.38	3,350.04	2.15
									09/14/21	15.15	15.82	3,353.42	0.67
	MW-96	Shallow	673143.60	521917.50	3,366.83	3,368.92	3,359.83	7 to 22	04/13/21	16.12	16.18	3,352.79	0.06
									09/14/21	--	13.04	3,355.88	--
	MW-97	Shallow	672660.45	522295.96	3,366.38	3,365.92	3,358.38	8 to 23	04/13/21	--	-- [3]	-- [3]	--
									09/14/21	--	-- [3]	-- [3]	--

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Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
North Refinery	MW-98	Shallow	672517.05	523220.39	3,358.96	3,361.36	3,345.96	13 to 23	04/13/21	--	15.30	3,346.06	--
									09/14/21	--	12.81	3,348.55	--
	MW-137	Shallow	672923.48	522924.27	3,363.15	3,364.83	3,353.15	10 to 30	04/13/21	14.82	17.00	3,349.57	2.18
									09/14/21	11.70	12.10	3,353.05	0.40
	MW-137A	Shallow	672872.20	523039.47	Unknown	3,363.45	Unknown	5.5 to 15.5	04/13/21	--	DRY	--	--
									09/14/21	11.84	12.44	3,351.49	0.60
	MW-138	Shallow	672876.52	523041.05	3,364.73	3,363.24	3,354.73	10 to 25	04/13/21	16.40	18.75	3,346.37	2.35
									09/14/21	12.72	16.61	3,349.74	3.89
	MW-138A	Shallow	672924.49	522916.09	Unknown	3,364.56	Unknown	5.5 to 15.5	04/13/21	--	DRY	--	--
									09/14/21	12.62	12.79	3351.90	0.17
	RW-1	Shallow	672825.27	522204.68	3,365.29	3,367.03	Unknown	Unknown	04/13/21	18.33	20.24	3,348.32	1.91
									09/14/21	15.13	17.90	3,351.35	2.77
	RW-2	Shallow	672781.86	522337.29	3,368.17	3,368.17	Unknown	Unknown	04/13/21	17.28	24.34	3,349.48	7.06
									09/14/21	17.95	18.70	3,350.07	0.75
	RW-7	Shallow	673579.35	522098.94	3,365.03	3,367.09	Unknown	Unknown	04/13/21	19.29	21.53	3,347.35	2.24
									09/14/21	16.46	16.99	3,350.52	0.53
	RW-8	Shallow	673266.20	522321.21	3,364.89	3,368.10	Unknown	Unknown	04/13/21	18.19	22.31	3,349.09	4.12
									09/14/21	14.20	15.68	3,353.60	1.48
	RW-9	Shallow	673423.49	523371.16	3,356.30	3,359.51	Unknown	Unknown	04/13/21	--	18.12	3,341.39	--
									09/14/21	--	14.36	3,345.15	--
	RW-10	Shallow	673076.17	523469.29	3,356.12	3,360.61	Unknown	Unknown	04/13/21	--	18.29	3,342.32	--
									09/14/21	13.95	16.99	3,346.05	3.04
	RW-16B	Shallow	673876.71	523156.09	3,357.20	3,360.97	Unknown	Unknown	04/13/21	--	DRY	--	--
									09/14/21	--	15.72	3,345.25	--
	RW-17A	Shallow	673978.33	522723.59	3,362.76	3,364.72	Unknown	Unknown	04/13/21	--	DRY	--	--
									09/14/21	--	13.86	3,350.86	--
North RO Reject Field	MW-117	Shallow	674301.52	522979.73	3,360.07	3,363.01	3,350.07	10 to 25	04/13/21	--	16.33	3,346.68	--
									09/14/21	--	13.18	3,349.83	--
	MW-118	Shallow	674819.18	523375.94	3,359.62	3,361.95	3,349.62	10 to 25	04/13/21	--	19.95	3,342.00	--
									09/14/21	--	17.49	3,344.46	--
	MW-119	Shallow	674860.11	524575.80	3,353.83	3,356.11	3,343.83	10 to 25	04/13/21	--	19.71	3,336.40	--
									09/14/21	--	14.10	3,342.01	--
NCL	MW-18	Shallow	674172.45	522318.86	3,358.54	3,361.02	3,343.54	15 to 19	04/13/21	--	16.92	3,344.10	--
									09/14/21	--	14.13	3,346.89	--
	MW-19	Shallow	673597.29	521670.75	3,366.00	3,368.00	3,361.00	5 to 19.5	04/13/21	--	15.58	3,352.42	--
									09/14/21	--	12.89	3,355.11	--

Table 1 - Well Information and Gauging Data

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
NCL	MW-45	Shallow	674247.07	523663.75	3,351.32	3,351.51	3,340.82	10.5 to 15.5	04/13/21	--	13.88	3,337.63	--
									09/15/21	--	9.83	3,341.68	--
	MW-53R	Shallow	673615.99	521463.00	3,368.87	3,368.75	3,354.87	14 to 24	04/13/21	--	15.18	3,353.57	--
									09/14/21	--	12.63	3,356.12	--
	MW-54A	Shallow	674138.65	522110.51	3,363.55	3,366.49	3,350.85	12.7 to 27.7	04/13/21	--	17.65	3,348.84	--
									09/14/21	--	14.84	3,351.65	--
	MW-54B	Valley Fill	674148.44	522118.80	3,363.47	3,366.47	3,329.67	33.8 to 43.8	04/13/21	--	17.69	3,348.78	--
									09/14/21	--	14.89	3,351.58	--
	MW-55	Shallow	674091.95	522766.46	3,361.90	3,364.77	3,348.20	13.7 to 23.7	04/13/21	--	17.03	3,347.74	--
									09/14/21	--	13.95	3,350.82	--
	MW-56	Shallow	674160.38	523450.14	3,354.84	3,357.44	3,341.44	13.4 to 23.4	04/13/21	--	19.02	3,338.42	--
									09/14/21	--	14.83	3,342.61	--
	MW-108	Shallow	673659.33	521910.16	3,366.25	3,369.11	3,357.25	9 to 24	04/13/21	--	18.84	3,350.27	--
									09/14/21	--	16.10	3,353.01	--
	NCL-31	Shallow	673629.51	521669.01	3,366.21	3,367.54	3,353.21	13 to 18	04/13/21	--	15.14	3,352.40	--
									09/14/21	--	12.52	3,355.02	--
	NCL-32	Shallow	673984.83	521808.14	3,364.96	3,364.91	3,347.96	17 to 22	04/13/21	--	14.54	3,350.37	--
									09/14/21	--	12.33	3,352.58	--
	NCL-33	Shallow	673967.20	522245.18	3,364.26	3,363.97	3,351.26	13 to 18	04/13/21	--	15.22	3,348.75	--
									09/14/21	--	12.22	3,351.75	--
	NCL-34A	Shallow	673885.52	522235.08	3,364.82	3,365.49	3,348.82	16 to 21	04/13/21	16.42	-- [6]	--	>2.84 [6]
									09/14/21	13.80	16.21	3,351.21	2.41
	NCL-44	Shallow	673986.41	522062.11	3,364.01	3,364.45	Unknown	Unknown	04/13/21	--	14.93	3,349.52	--
									09/14/21	--	12.14	3,352.31	--
	NCL-49	Shallow	674099.16	521648.40	3,368.26	3,371.13	3,351.46	16.8 to 17.8	04/13/21	--	20.26	3,350.87	--
									09/14/21	--	18.13	3,353.00	--
South Refinery	KWB-2R	Shallow	670207.24	524897.59	3,364.56	3,364.32	Unknown	Unknown	04/13/21	26.36	26.52	3,337.93	0.16
									09/14/21	25.52	25.65	3,338.77	0.13
	KWB-4	Shallow	670616.38	524572.44	3,368.36	3,370.25	3,348.36	20 to 39	04/13/21	27.84	31.31	3,341.72	3.47
									09/14/21	26.73	29.87	3,342.89	3.14
	KWB-5	Shallow	670729.55	525244.51	3,362.60	3,364.72	3,337.90	24.7 to 38.7	04/13/21	27.40	29.31	3,336.94	1.91
									09/14/21	26.44	27.60	3,338.05	1.16
	KWB-6	Shallow	670449.36	526158.70	3,358.02	3,360.30	3,340.52	17.5 to 36.5	04/13/21	26.07	28.65	3,333.71	2.58
									09/14/21	24.35	25.50	3,335.72	1.15

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
South Refinery	MW-28	Shallow	671508.38	524521.56	3,366.79	3,370.27	3,341.79	25 to 30	04/13/21	22.12	23.10	3,347.95	0.98
									09/15/21	20.00	21.95	3,349.88	1.95
	MW-48	Shallow	670689.39	524080.35	3,363.04	3,362.97	Unknown	Unknown	04/13/21	--	-- [4]	-- [4]	--
									09/14/21	--	-- [3]	-- [3]	--
	MW-50	Shallow	671502.45	521857.84	3,368.91	3,371.05	Unknown	Unknown	04/13/21	--	15.42	3,355.63	--
									09/14/21	--	13.50	3,357.55	--
	MW-52	Shallow	670165.24	523370.99	3,368.36	3,368.30	Unknown	Unknown	04/13/21	--	22.59	3,345.71	--
									09/14/21	--	20.98	3,347.32	--
	MW-64	Shallow	670716.03	523338.61	3,365.56	3,369.52	3,350.56	15 to 30	04/13/21	--	22.46	3,347.06	--
									09/14/21	--	20.75	3,348.77	--
	MW-65	Shallow	670949.22	523711.75	3,363.84	3,363.60	3,349.34	14.5 to 29.5	04/13/21	19.83	20.10	3,343.72	0.27
									09/15/21	18.21	18.95	3,345.24	0.74
	MW-66	Shallow	671247.57	524560.06	3,363.66	3,363.46	3,349.06	14.6 to 29.6	04/13/21	--	21.12	3,342.34	--
									09/15/21	19.52	19.76	3,343.89	0.24
	MW-99	Shallow	671652.52	524579.74	3,365.11	3,364.51	3,353.11	12 to 27	04/13/21	21.52	23.13	3,342.67	1.61
									09/15/21	20.70	21.19	3,343.71	0.49
	MW-101	Shallow	671627.36	523504.79	3,362.98	3,366.15	3,354.98	8 to 23	04/13/21	--	17.15	3,349.00	--
									09/15/21	--	17.16	3,348.99	--
	MW-102	Shallow	671176.70	522937.01	3,365.51	3,367.64	3,353.51	12 to 27	04/13/21	--	17.44	3,350.20	--
									09/14/21	--	15.62	3,352.02	--
	MW-103	Shallow	670472.55	522607.80	3,370.89	3,372.47	3,363.89	7 to 22	04/13/21	--	18.49	3,353.98	--
									09/14/21	--	17.70	3,354.77	--
	MW-104	Shallow	670450.35	522729.44	3,369.41	3,371.43	3,366.41	3 to 18	04/13/21	--	13.22	3,358.21	--
									09/14/21	--	15.17	3,356.26	--
	MW-105	Shallow	671924.44	522454.93	3,365.20	3,364.99	3,357.20	8 to 18	04/13/21	--	10.95	3,354.04	--
									09/14/21	--	-- [3]	-- [3]	--
	MW-106	Shallow	672207.14	523454.55	3,359.29	3,358.98	3,359.29	0 to 11	04/13/21	--	12.97	3,346.01	--
									09/14/21	--	-- [3]	-- [3]	--
	MW-107	Shallow	671961.38	524600.45	3,359.63	3,359.44	3,347.63	12 to 22	04/13/21	18.72	18.80	3,340.70	0.08
									09/15/21	16.19	18.50	3,342.79	2.31
	MW-109	Shallow	670174.25	523065.52	3,368.27	3,368.09	3,353.27	15 to 29.5	04/13/21	--	20.34	3,347.75	--
									09/14/21	--	19.03	3,349.06	--
	MW-110	Shallow	670174.33	522796.69	3,368.46	3,368.03	3,353.46	15 to 29.5	04/13/21	--	16.70	3,351.33	--
									09/14/21	--	15.71	3,352.32	--
	MW-139	Shallow	670687.2	522149.2	3374.32	3374.05	3,364.32	10 to 30	04/13/21	--	14.69	3,359.36	--
									09/14/21	--	13.33	3,360.72	--

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
South Refinery	RW-4	Shallow	671378.27	523010.47	3,364.41	3,364.86	Unknown	Unknown	04/13/21	15.99	16.50	3,348.77	0.51
									09/15/21	18.46	19.03	3,346.29	0.57
	RW-5R	Shallow	671258.01	523662.01	3,362.79	3,368.56	3,349.79	13 to 33	04/13/21	20.09	20.17	3,348.45	0.08
									09/15/21	19.60	25.35	3,347.81	5.75
	RW-6	Shallow	670969.39	522843.22	3,366.03	3,368.36	Unknown	Unknown	04/13/21	17.12	23.90	3,349.88	6.78
									09/15/21	18.12	21.55	3,349.55	3.43
	RW-11-0	Shallow	669938.15	527541.66	3,351.48	3,353.95	Unknown	Unknown	04/13/21	--	DRY	--	--
									09/14/21	19.92	20.01	3,334.01	0.09
	RW-15C	Shallow	670820.45	524123.41	3,362.65	3,361.41	Unknown	Unknown	04/13/21	20.45	20.72	3,340.91	0.27
									09/14/21	19.03	19.14	3,342.36	0.11
	RW-19	Shallow	670611.43	524592.99	3,367.09	3,369.11	3,356.09	11 to 46	04/13/21	28.75	28.85	3,340.34	0.10
									09/14/21	27.58	28.04	3,341.44	0.46
South RO Reject Field	MW-114	Shallow	673082.16	523818.86	3,358.62	3,361.68	3,338.62	20 to 35	04/13/21	--	18.88	3,342.80	--
									09/14/21	--	14.96	3,346.72	--
	MW-115	Shallow	673997.34	523932.93	3,356.48	3,359.31	3,346.48	10 to 25	04/13/21	--	19.04	3,340.27	--
									09/14/21	--	14.96	3,344.35	--
	MW-116	Shallow	673966.06	525339.63	3,350.99	3,353.77	3,340.99	10 to 25	04/13/21	--	19.17	3,334.60	--
									09/15/21	--	14.60	3,339.17	--
TEL	MW-49	Shallow	672051.80	523610.79	3,359.73	3,359.63	Unknown	Unknown	04/13/21	--	15.32	3,344.31	--
									09/14/21	--	12.46	3,347.17	--
	TEL-1	Shallow	672966.33	523412.82	3,356.79	3,358.23	3,343.79	13 to 23	04/13/21	17.70	18.45	3,340.38	0.75
									09/14/21	13.95	14.07	3,344.26	0.12
	TEL-2	Shallow	672885.90	523419.29	3,356.80	3,359.12	3,343.80	13 to 23	04/13/21	18.30	20.25	3,340.43	1.95
									09/14/21	14.58	16.18	3,344.22	1.60
	TEL-3	Shallow	672796.06	523459.33	3,356.43	3,358.33	3,343.43	13 to 23	04/13/21	17.20	22.10	3,340.15	4.90
									09/14/21	13.52	16.91	3,344.13	3.39
	TEL-4	Shallow	672715.99	523181.18	3,358.21	3,360.24	3,345.21	13 to 23	04/13/21	--	16.37	3,343.87	--
									09/14/21	--	13.06	3,347.18	--
TMD	MW-8	Shallow	673215.93	529055.18	3,334.81	3,336.42	Unknown	Unknown	04/13/21	--	17.99	3,318.43	--
									09/14/21	--	12.69	3,323.73	--
	MW-9	Shallow	673169.56	529232.03	3,334.50	3,336.20	Unknown	Unknown	04/13/21	--	18.68	3,317.52	--
									09/14/21	--	13.20	3,323.00	--
	MW-16	Shallow	675613.35	534389.17	3,313.50	3,316.12	3,305.00	8.5 to 19	04/13/21	--	9.92	3,306.20	--
									09/14/21	--	8.18	3,307.94	--
	MW-20	Shallow	673800.56	527834.67	3,338.43	3,340.91	3,328.93	9.5 to 23.5	04/13/21	--	19.28	3,321.63	--
									09/14/21	--	15.12	3,325.79	--

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Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
TMD	MW-21	Shallow	673180.38	529150.62	3,334.65	3,337.31	3,327.15	7.5 to 22	04/13/21	--	17.23	3,320.08	--
									09/14/21	--	12.20	3,325.11	--
	MW-25	Shallow	675386.30	537955.86	3,310.35	3,312.29	3,294.60	15.75 to 25.25	04/13/21	--	14.55	3,297.74	--
									09/14/21	--	14.10	3,298.19	--
	MW-26	Shallow	676229.18	535348.61	3,312.08	3,314.87	3,296.83	15.25 to 24.25	04/13/21	--	13.47	3,301.40	--
									09/14/21	--	9.72	3,305.15	--
	MW-27	Shallow	674495.64	532942.65	3,319.46	3,320.85	3,301.21	18.25 to 27.75	04/13/21	--	20.89	3,299.96	--
									09/14/21	--	16.43	3,304.42	--
	MW-46R	Shallow	674223.03	524920.28	3,350.41	3,350.11	3,346.91	3.5 to 18.5	04/13/21	--	16.59	3,333.52	--
									09/15/21	--	11.73	3,338.38	--
	MW-68	Shallow	674301.02	531466.90	3,325.81	3,328.21	3,311.06	14.75 to 24.5	04/13/21	--	25.50	3,302.71	--
									09/14/21	--	15.74	3,312.47	--
	MW-71	Shallow	673016.80	529560.41	3,332.99	3,335.29	3,323.24	9.75 to 19.5	04/13/21	--	19.13	3,316.16	--
									09/14/21	--	12.84	3,322.45	--
	MW-89	Shallow	675221.56	533835.00	3,316.38	3,318.32	3,314.38	2 to 17	04/13/21	--	12.44	3,305.88	--
									09/14/21	--	10.07	3,308.25	--
	NP-1	Shallow	672992.73	528035.04	3,339.69	3,342.40	3,330.19	9.5 to 19	04/13/21	--	19.29	3,323.11	--
									09/14/21	--	15.64	3,326.76	--
	NP-2	Shallow	673571.19	527611.64	3,340.58	3,342.77	3,331.08	9.5 to 18.5	04/13/21	--	21.15	3,321.62	--
									09/14/21	--	17.72	3,325.05	--
	NP-3	Shallow	673990.66	528019.54	3,340.40	3,342.93	3,330.90	9.5 to 18.5	04/13/21	--	21.27	3,321.66	--
									09/14/21	--	16.72	3,326.21	--
	NP-4	Shallow	674337.35	528351.85	3,343.24	3,345.73	3,318.74	24.5 to 33.5	04/13/21	--	33.97	3,311.76	--
									09/14/21	--	33.24	3,312.49	--
	NP-6	Shallow	672945.23	529083.91	3,336.31	3,338.05	3,327.56	8.75 to 18.75	04/13/21	--	16.68	3,321.37	--
									09/14/21	--	11.08	3,326.97	--
	NP-8	Shallow	675399.60	538245.49	3,310.53	3,314.67	Unknown	Unknown	04/13/21	--	14.66	3,300.01	--
									09/14/21	--	13.05	3,301.62	--
	NP-9	Shallow	674767.14	523571.69	3,357.86	3,360.62	Unknown	Unknown	04/13/21	--	19.24	3,341.38	--
									09/14/21	--	15.91	3,344.71	--

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Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Up-Gradient	UG-1	Shallow	672453.27	520746.73	3,373.02	3,372.94	3,365.02	8 to 23	04/13/21	--	14.25	3,358.69	--
									--	--	--	--	--
	UG-2	Shallow	670726.77	520942.36	3,380.30	3,380.41	3,365.30	15 to 30	04/13/21	--	18.00	3,362.41	--
									--	--	--	--	--
	UG-3R	Shallow	671992.70	519424.77	3,384.62	3,384.08	3,367.62	17 to 37	04/13/21	--	24.03	3,360.05	--
									--	--		--	--
	UG-4	Shallow	674087.85	520541.74	3,377.78	3,377.36	3,358.28	19.5 to 39.5	04/13/21	--	21.00	3,356.36	--
									--	--	--	--	--

Notes:

[1] Wells screened in the shallow water-bearing zone are typically screened at depths ranging between 5 and 35 ft bgs. The shallow water-bearing zone varies between confined and unconfined conditions. Wells screened in the valley fill zone are typically screened at depths ranging between 35 and 70 ft bgs. The clay lens separating the shallow and valley fill zones is discontinuous in some locations resulting in connectivity between the two zones.

[2] Water elevations corrected for PSH, if present, using a specific gravity of 0.8.

[3] Well not accessable due to construction activities.

[4] Obstruction in well preventing measurement.

[5] Not measured due to pump interference.

[6] Only PSH present in well.

Definitions:

ft = feet

-- = not applicable

amsl = above mean sea level

bgs = below ground surface

btoc = below top of casing

NCL = North Colony Landfarm

TEL = Tetra Ethyl Lead Surface Impoundment

unknown = screen interval not readily availble

TMD = Three Mile Ditch

PSH = phase separated hydrocarbons

RO = Reverse Osmosis

NM = not measured

TMD = Three Mile Ditch

TOC = Top of Casing

Table 2 - Well Purging and Water Quality Field Measurement Data

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (umho/cm)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
Cross-Gradient	KWB-13	Bladder	4/13/21	1210	20.4	4,570	0.457	4.8	6.66	209.6	Cloudy, tan
	RA-3156	Grab	4/14/21	830	21.9	3,520	0.352	5.6	7.28	6.0	Cloudy
	NP-5	Low Flow	4/13/21	1005	19.0	6,430	0.643	2.2	6.87	141.7	Clear
	MW-136	Low Flow	4/13/21	1100	19.4	4,810	0.481	1.6	6.76	157.9	Clear
			9/14/21	855	21.2	5,200	0.520	1.3	6.56	129.3	Clear
Evaporation Ponds	MW-1R	Low Flow	4/14/21	1340	21.0	6,070	0.607	1.2	7.40	-108.7	Clear
	MW-2A	Low Flow	4/13/21	1530	18.4	12,180	1.218	1.5	7.65	-18.9	Clear
			9/14/21	1300	28.5	14,740	1.474	1.8	6.93	30.4	Clear
	MW-3	Low Flow	4/14/21	1120	18.3	6,050	0.605	2.4	7.07	-15.8	Clear
			9/14/21	1535	25.6	7,200	0.720	2.0	7.04	-27.1	Clear
	MW-4A	Low Flow	4/13/21	1455	19.8	6,220	0.622	2.3	7.16	-138.5	Clear, black particles
			9/14/21	1125	23.3	7,120	0.712	2.0	7.19	-141.5	Clear, black particles
	MW-4B	Low Flow	4/13/21	1540	19.7	5,040	0.504	2.9	7.16	-139.9	Clear
	MW-5A	Low Flow	4/13/21	1225	19.6	11,030	1.103	2.0	7.14	-134.1	Clear, orange particles
			9/14/21	1020	23.7	12,240	1.224	2.2	7.12	-164.2	Clear, orange particles
	MW-5B	Low Flow	4/13/21	1320	19.5	7,560	0.756	1.0	7.13	-100.0	Clear
	MW-5C	Low Flow	4/13/21	1405	19.4	3,820	0.382	1.3	7.27	-70.0	Clear, white particles
	MW-6A	Low Flow	4/13/21	910	18.4	4,990	0.499	1.0	7.25	-169.4	Clear
	MW-6B	Low Flow	4/13/21	955	19.5	5,840	0.584	1.0	6.84	-120.1	Clear
	MW-7A	Low Flow	4/13/21	1115	19.1	8,300	0.830	1.4	7.27	-83.4	Clear
			9/14/21	920	23.5	8,880	0.888	2.2	7.17	-77.6	Clear
	MW-7B	Low Flow	4/13/21	1030	18.9	7,770	0.777	1.3	7.49	-90.8	Clear
	MW-10	Low Flow	4/13/21	1720	19.2	6,370	0.637	2.2	7.10	-89.2	Clear, orange particles
			9/14/21	1400	23.7	7,030	0.703	1.8	7.03	-78.7	Clear, orange particles
	MW-11A	Low Flow	4/14/21	1205	21.8	26,800	2.680	1.3	7.10	10.3	Clear
			9/14/21	1510	24.0	26,900	2.690	1.4	7.24	-57.4	Clear
	MW-11B	Low Flow	4/14/21	1125	21.5	21,300	2.130	1.1	7.02	-73.7	Clear
	MW-15	Low Flow	4/14/21	1345	19.8	7,070	0.707	1.8	7.57	47.9	Clear
	MW-18A	Low Flow	4/13/21	1045	17.8	21,700	2.170	1.4	7.29	23.3	Clear
			9/14/21	925	22.8	20,600	2.060	1.3	7.42	-187.4	Clear
	MW-18B	Low Flow	4/13/21	1125	18.2	5,910	0.591	1.4	7.23	3.5	Clear
	MW-22A	Low Flow	4/14/21	825	17.2	15,330	1.533	2.0	7.04	-46.2	Clear
			9/14/21	1300	24.4	20,400	2.040	1.9	7.04	-58.2	Clear
	MW-22B	Low Flow	4/14/21	935	17.1	6,470	0.647	1.1	7.05	-96.2	Clear
	MW-70	Low Flow	4/13/21	1210	17.8	7,410	0.741	1.2	7.24	-25.2	Clear, orange particles
			9/14/21	1020	23.6	8,160	0.816	1.3	7.36	-100.3	Clear, orange particles
	MW-72	Low Flow	4/13/21	1445	18.1	11,790	1.179	0.9	7.80	6.9	Clear

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Table 2 - Well Purging and Water Quality Field Measurement Data

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (umho/cm)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
Evaporation Ponds	MW-73	Low Flow	4/13/21	1130	16.9	13,540	1.354	1.4	7.51	-39.7	Clear
	MW-74	Low Flow	4/13/21	1040	17.7	11,470	1.147	0.8	6.90	-45.4	Clear
			9/14/21	1535	28.8	11,780	1.178	1.7	6.96	-62.9	Clear
	MW-75	Low Flow	4/14/21	1540	20.7	7,430	0.743	1.0	7.10	-150.2	Clear
			9/14/21	1805	25.1	7,310	0.731	1.4	7.03	-138.9	Clear
	MW-76	Low Flow	4/14/21	1315	19.5	6,070	0.607	1.8	6.83	-203.5	Clear
			9/14/21	1710	25.1	6,150	0.615	1.5	6.86	-194.6	Clear
	MW-77	Low Flow	4/14/21	1405	19.7	7,490	0.749	2.1	6.94	-33.1	Clear, gold tint, odor
	MW-78	Low Flow	4/14/21	1450	19.9	4,160	0.416	1.9	7.11	55.2	Clear, gold tint
	MW-79	Low Flow	4/14/21	825	16.2	9,210	0.921	1.9	7.29	6.2	Clear
			9/14/21	1125	26.4	8,410	0.841	2.0	7.03	59.1	Clear
	MW-80	Low Flow	4/14/21	915	16.8	6,650	0.665	1.3	6.59	32.1	Clear
	MW-81	Low Flow	4/14/21	1000	17.2	7,040	0.704	2.4	7.02	43.0	Clear
	MW-82	Low Flow	4/14/21	1025	20.2	8,160	0.816	1.3	6.99	20.4	Clear
	MW-83	Low Flow	4/14/21	1230	18.7	5,800	0.580	1.8	6.94	-132.8	Clear
			9/14/21	1625	25.8	6,180	0.618	1.8	6.88	-126.0	Clear
	MW-84	Low Flow	4/14/21	1130	19.2	11,170	1.117	1.2	7.06	-1.3	Clear, yellow tint
			9/14/21	1650	28.9	11,690	1.169	1.7	7.01	-146.5	Clear, yellow tint
	MW-87	Low Flow	4/13/21	1000	19.0	17,150	1.715	1.8	7.04	-118.8	Clear
			9/14/21	840	22.5	15,880	1.588	1.6	6.97	22.6	Clear
	MW-88	Low Flow	4/13/21	1610	20.5	6,280	0.628	1.8	7.06	-67.9	Clear, orange particles
			9/14/21	1220	23.8	7,960	0.796	1.8	7.13	-68.5	Clear, orange particles
	MW-120	Low Flow	4/14/21	1215	18.8	9,080	0.908	1.3	7.36	-120.5	Clear
			9/14/21	950	24.4	9,060	0.906	1.9	7.14	-111.0	Clear
	MW-121	Low Flow	4/14/21	1250	18.2	7,040	0.704	1.8	7.49	2.6	Clear, orange particles
			9/14/21	1035	24.4	7,090	0.709	1.9	7.15	33.8	Clear
	MW-122	Low Flow	4/13/21	1630	19.1	6,070	0.607	2.1	7.43	18.2	Clear
			9/14/21	1215	28.3	6,020	0.602	2.1	7.17	-87.8	Clear
	MW-123	Low Flow	4/14/21	1025	18.7	6,570	0.657	1.9	6.97	-138.1	Clear
			9/14/21	1445	22.9	6,910	0.691	1.5	7.04	-139.4	Clear
	MW-124	Low Flow	4/13/21	1255	17.8	13,230	1.323	1.6	7.15	-50.9	Clear, orange particles
			9/14/21	1110	22.9	12,960	1.296	1.6	7.63	-78.0	Clear
	OCD-1R	Low Flow	4/14/21	1250	22.0	6,090	0.609	1.3	7.34	22.8	Clear
			9/14/21	1610	24.4	7,750	0.775	1.4	7.41	-69.5	Clear
	OCD-2A	Low Flow	4/14/21	1040	21.1	5,830	0.583	1.7	7.44	37.9	Clear
			9/14/21	1220	24.0	6,710	0.671	1.5	7.67	-46.8	Clear

Table 2 - Well Purging and Water Quality Field Measurement Data

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (umho/cm)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
Evaporation Ponds	OCD-3	Low Flow	4/14/21	955	21.4	4,430	0.443	1.7	7.57	35.9	Clear
			9/14/21	1305	23.8	5,410	0.541	1.6	7.73	97.4	Clear
	OCD-4	Low Flow	4/14/21	910	20.0	17,640	1.764	1.6	7.31	-17.2	Clear
			9/14/21	1345	23.8	17,420	1.742	1.3	7.50	-9.8	Clear
	OCD-5	Low Flow	4/14/21	825	17.8	16,570	1.657	1.4	7.13	-90.4	Clear, orange particles
			9/14/21	1430	23.6	17,790	1.779	1.5	7.39	-86.4	Clear, orange particles
	OCD-6	Low Flow	4/13/21	1400	18.8	17,590	1.759	1.0	7.49	-19.1	Clear
			9/14/21	1400	29.0	17,570	1.757	1.8	6.95	-90.0	Clear
	OCD-7AR	Low Flow	4/13/21	1220	19.5	14,430	1.443	1.1	7.39	-134.2	Clear, red particles
			9/14/21	1440	28.6	14,570	1.457	1.7	7.04	-141.1	Clear, red particles
	OCD-7B	Low Flow	4/13/21	1310	20.2	6,400	0.640	1.1	7.70	-127.7	Clear
	OCD-8A	Low Flow	4/13/21	945	18.0	15,170	1.517	1.7	7.03	-112.2	Clear
			9/14/21	835	22.3	17,920	1.792	2.3	6.94	-138.5	Clear
	OCD-8B	Low Flow	4/13/21	855	17.7	9,250	0.925	1.3	6.96	-59.5	Clear
Field East of Refinery	KWB-1C	Low Flow	4/13/21	1415	20.0	5,660	0.566	1.1	6.60	141.6	Clear
	KWB-7	Low Flow	4/14/21	1220	18.9	3,050	0.305	1.6	6.75	-203.1	Clear
			9/14/21	1435	21.8	3,800	0.380	0.9	6.74	-263.5	Clear
	KWB-11A	Low Flow	9/14/21	1200	21.5	3,870	0.387	3.0	6.54	-132.5	Clear
	KWB-11B	Low Flow	4/13/21	1010	18.9	3,262	0.326	1.2	6.89	112.9	Clear
			9/14/21	1245	22.1	3,560	0.356	0.8	6.79	22.7	Clear
	KWB-12A	Low Flow	9/14/21	1000	23.6	4,040	0.404	3.0	6.50	63.1	Clear
	KWB-12B	Bladder	4/13/21	1005	19.3	3,030	0.303	3.8	6.31	117.8	Clear
			9/14/21	905	22.7	3,570	0.357	3.3	6.71	23.1	Clear
	KWB-P4	Low Flow	4/14/21	1430	21.6	6,730	0.673	1.3	7.14	-44.9	Clear
	MW-57	Bladder	4/13/21	1115	19.8	3,150	0.315	3.8	6.41	98.7	Clear
			9/14/21	1055	22.7	5,970	0.597	3.1	6.82	59.9	Clear
	MW-113	Low Flow	4/14/21	1225	22.1	2,820	0.282	1.4	6.61	-92.1	Clear, odor
		Bladder	9/14/21	1530	23.9	3,800	0.380	2.1	6.48	-331.4	Clear, odor
	MW-125	Low Flow	4/14/21	1425	20.1	4,360	0.436	2.3	6.72	80.3	Clear
			9/14/21	930	20.5	4,470	0.447	1.8	6.67	92.6	Clear
	MW-126B	Low Flow	4/13/21	905	18.1	5,260	0.526	1.8	6.46	122.4	Clear
			9/14/21	1000	20.9	5,910	0.591	1.1	6.42	146.5	Clear
	MW-130	Low Flow	4/14/21	1520	23.6	3,300	0.330	2.8	7.09	68.7	Sl. Cloudy, white tint
		Bladder	9/14/21	825	24.2	3,020	0.302	3.0	6.71	130.1	Cloudy, white tint
	MW-134	Low Flow	4/14/21	1120	19.9	4,340	0.434	2.0	6.75	92.1	Clear
			9/15/21	840	19.7	7,040	0.704	1.2	6.55	64.3	Clear

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2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (umho/cm)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water [2]
Field East of Refinery	MW-135	Bladder	4/13/21	1635	18.3	7,280	0.728	3.7	6.68	189.9	Clear
			9/14/21	1655	18.9	8,410	0.841	3.1	6.85	34.6	Clear
	MW-145	Low Flow	4/13/21	1200	21.2	4,820	0.482	2.1	6.83	157.0	Clear
			9/14/21	1130	24.9	4,760	0.476	1.9	6.72	107.3	Clear
	MW-146	Low Flow	4/13/21	1115	21.5	4,880	0.488	2.0	6.93	101.9	Clear
			9/14/21	1020	24.2	4,830	0.483	1.7	6.82	108.0	Clear
	MW-147	Bladder	4/13/21	910	19.6	5,330	0.533	5.4	6.90	130.6	Sl. Cloudy
			9/14/21	855	20.9	5,840	0.584	6.6	6.55	125.3	Clear
	MW-148	Bladder	4/13/21	1020	21.0	4,180	0.418	5.0	7.05	103.7	Cloudy
			9/14/21	930	22.1	3,740	0.374	6.2	6.93	106.0	Sl. Cloudy
	RA-4798	Grab	4/14/21	1305	20.8	2,198	0.220	3.1	7.17	-14.6	Clear
			9/14/21	1745	22.6	2,436	0.244	3.9	7.21	-13.2	Clear
North Refinery	MW-29	Low Flow	4/14/21	1225	21.9	4,000	0.400	1.8	7.08	-128.3	Clear
			9/15/21	1025	27.5	5,840	0.584	2.3	6.71	-170.0	Clear
	MW-41	Low Flow	4/14/21	1000	21.3	5,420	0.542	3.1	6.67	-323.8	Clear
	MW-42	Low Flow	4/14/21	1325	21.0	3,170	0.317	1.6	6.53	-340.1	Clear
	MW-61	Low Flow	4/14/21	1235	21.8	2,040	0.204	1.2	6.74	-406.4	Clear
			9/14/21	1155	26.1	2,660	0.266	1.2	7.02	-423.0	Clear
	MW-62	Low Flow	9/14/21	1240	27.7	3,200	0.320	2.9	6.65	-402.6	Clear
	MW-62R	Low Flow	4/14/21	1025	21.7	1,460	0.146	1.8	6.60	-307.7	Clear
			9/14/21	1325	25.9	2,610	0.261	1.8	6.76	-363.8	Clear
	MW-90	Low Flow	4/13/21	1100	22.1	3,040	0.304	1.0	6.97	-364.3	Clear
			9/14/21	1100	26.8	3,470	0.347	1.5	6.77	-362.3	Clear
	MW-96	Low Flow	9/14/21	1200	25.6	2,140	0.214	1.6	6.80	-373.4	Clear
	MW-98	Low Flow	4/13/21	1255	21.7	2,650	0.265	1.1	6.60	-403.1	Clear, odor
			9/14/21	1055	26.0	3,140	0.314	1.3	6.76	-414.9	Clear, odor
	RW-9	Low Flow	4/14/21	1100	21.7	4,150	0.415	1.0	6.86	-368.7	Clear
	RW-10	Low Flow	4/13/21	1105	20.5	2,400	0.240	0.6	7.00	-351.8	Clear, odor, light sheen
North RO Reject Field	MW-117	Low Flow	4/13/21	1405	19.1	3,630	0.363	1.8	6.41	70.8	Clear
			9/14/21	1350	24.0	4,160	0.416	2.0	6.47	51.9	Clear
	MW-118	Low Flow	4/13/21	1320	19.1	3,830	0.383	3.5	6.60	76.1	Clear
			9/14/21	1305	25.3	4,570	0.457	2.9	6.63	69.4	Clear
	MW-119	Low Flow	4/13/21	1230	18.8	3,790	0.379	1.9	6.48	63.1	Clear
			9/14/21	1215	23.5	4,480	0.448	1.8	6.72	17.3	Clear

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (umho/cm)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
NCL	MW-18	Low Flow	4/13/21	1305	20.8	2,560	0.256	1.7	6.69	70.5	Clear
	MW-45	Low Flow	4/14/21	1420	21.0	3,560	0.356	1.1	7.02	-239.6	Clear
			9/15/21	930	26.5	5,080	0.508	2.1	6.96	-146.7	Clear
	MW-53R	Low Flow	4/13/21	1450	22.2	2,000	0.200	1.8	6.83	46.7	Clear
	MW-54A	Low Flow	4/13/21	1525	22.2	2,290	0.229	1.8	6.76	57.6	Clear
			9/14/21	1405	24.4	2,510	0.251	1.1	6.67	-63.2	Clear
	MW-54B	Low Flow	4/13/21	1615	21.8	1,870	0.187	1.6	6.54	3.1	Clear
	MW-55	Low Flow	4/13/21	1300	22.2	3,120	0.312	1.7	6.76	-32.8	Clear
			9/14/21	1420	25.8	2,950	0.295	2.0	6.89	-27.2	Clear
	MW-56	Low Flow	4/14/21	915	19.8	2,460	0.246	1.6	6.93	-300.4	Clear
	MW-108	Low Flow	4/13/21	1500	22.7	1,875	0.188	0.8	6.98	-393.3	Clear, slight odor
			9/14/21	1300	25.6	1,981	0.198	0.8	6.94	-362.3	Clear
	NCL-31	Low Flow	4/13/21	1225	20.7	2,220	0.222	1.4	6.92	-184.8	Clear
			9/14/21	1130	21.5	1,840	0.184	1.0	7.14	-122.7	Clear
	NCL-32	Low Flow	4/13/21	955	20.4	2,700	0.270	1.5	6.78	82.1	Clear
			9/14/21	910	19.3	2,710	0.271	1.0	6.72	28.0	Clear
	NCL-33	Low Flow	4/13/21	1130	21.0	4,200	0.420	1.5	6.47	-41.2	Clear
			9/14/21	1030	21.5	4,060	0.406	1.1	6.56	-33.0	Clear
	NCL-44	Low Flow	4/13/21	1050	21.1	2,550	0.255	1.6	6.60	-126.4	Clear
			9/14/21	950	20.4	2,610	0.261	1.2	6.69	-108.8	Clear
	NCL-49	Low Flow	4/13/21	1400	22.1	3,080	0.308	2.9	6.85	58.4	Clear
			9/14/21	1240	21.4	3,140	0.314	1.4	7.09	55.4	Clear
South Refinery	MW-50	Low Flow	4/13/21	1000	22.7	4,380	0.438	1.1	6.90	-73.2	Clear
			9/14/21	940	24.1	8,140	0.814	1.7	6.80	-15.1	Clear
	MW-52	Low Flow	4/14/21	1530	20.8	3,240	0.324	1.5	6.88	84.8	Clear
			9/15/21	950	22.4	2,570	0.257	1.7	7.01	-206.4	Clear
	MW-64	Low Flow	4/13/21	1500	27.5	2,710	0.271	1.6	6.84	-297.8	Clear
			9/14/21	1400	37.3	2,490	0.249	2.4	6.65	-337.2	Clear
	MW-66	Low Flow	4/14/21	1535	23.9	2,070	0.207	1.7	6.73	-124.3	Sl. Cloudy
	MW-101	Low Flow	4/14/21	1320	21.9	1,884	0.188	1.5	6.93	-318.3	Clear
			9/15/21	925	24.8	1,896	0.190	1.2	7.15	-332.7	Clear
	MW-102	Low Flow	4/14/21	1630	25.0	2,300	0.230	1.4	6.75	-286.3	Clear
			9/14/21	15.05	28.2	2,390	0.239	1.9	6.64	-329.6	Clear
	MW-103	Low Flow	4/13/21	1410	27.3	13,140	1.314	1.3	6.97	-288.9	Clear
	MW-104	Low Flow	4/13/21	1300	22.1	2,050	0.205	1.2	7.04	-299.9	Clear
			9/14/21	1315	31.7	2,110	0.211	1.8	6.85	-336.0	Clear

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Table 2 - Well Purging and Water Quality Field Measurement Data

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (umho/cm)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
South Refinery	MW-105	Low Flow	4/14/21	825	19.3	1,989	0.199	1.6	6.46	-343.0	Clear
	MW-106	Low Flow	4/13/21	1155	23.6	2,730	0.273	1.9	6.52	-407.9	Clear, odor
	MW-109	Low Flow	4/14/21	1520	22.7	2,690	0.269	1.0	7.24	-363.4	Clear
			9/15/21	830	22.7	3,320	0.332	1.6	7.40	-349.2	Clear
	MW-110	Low Flow	4/14/21	1425	22.4	1,728	0.173	0.9	7.22	-196.3	Sl. Cloudy
			9/15/21	910	23.0	1,551	0.155	1.3	7.30	-251.6	Clear
	MW-139	Low Flow	4/13/21	1630	21.2	3,490	0.349	1.2	7.04	-250.3	Clear
			9/14/21	1600	25.5	2,830	0.283	1.1	6.92	-254.9	Clear
	RA-313	Grab	4/14/21	1335	23.8	1,661	0.166	3.9	8.34	125.6	Clear
South RO Reject Field	MW-114	Low Flow	4/14/21	1515	22.0	3,360	0.336	1.6	6.62	90.1	Clear
			9/14/21	1015	22.8	3,270	0.327	2.4	6.60	98.3	Clear
	MW-115	Low Flow	4/14/21	1610	19.5	4,340	0.434	1.9	6.74	89.7	Clear
			9/14/21	1100	20.9	4,710	0.471	2.0	6.65	114.8	Clear
	MW-116	Low Flow	4/14/21	1525	19.0	3,040	0.304	1.5	6.87	-110.9	Clear
			9/15/21	1025	22.5	3,780	0.378	1.1	7.25	-262.3	Clear
TEL	MW-49	Low Flow	4/14/21	900	21.2	2,790	0.279	2.7	6.88	-347.2	Clear
			9/15/21	840	26.5	3,040	0.304	2.7	6.74	-336.7	Clear, odor
TEL	TEL-4	Low Flow	4/13/21	840	20.2	3,000	0.300	1.0	6.28	-184.0	Clear
			9/14/21	825	22.4	3,930	0.393	1.6	6.46	-281.9	Clear
TMD	MW-8	Low Flow	4/14/21	950	18.0	5,410	0.541	2.0	6.70	92.6	Clear
	MW-16	Low Flow	4/13/21	1525	18.2	4,550	0.455	2.0	7.05	90.7	Clear
	MW-20	Low Flow	4/14/21	1035	20.7	4,430	0.443	3.5	6.82	97.6	Clear
	MW-21	Low Flow	4/14/21	905	17.9	5,310	0.531	2.8	6.80	126.1	Clear
			9/15/21	1045	21.6	8,440	0.844	1.4	6.60	84.8	Clear
	MW-25	Low Flow	4/13/21	1530	18.7	4,460	0.446	1.5	7.49	89.6	Clear
	MW-26	Low Flow	4/13/21	1655	18.8	6,720	0.672	1.0	7.01	99.1	Clear
	MW-27	Low Flow	4/13/21	1430	20.9	2,210	0.221	1.5	6.92	113.0	Clear
	MW-46R	Low Flow	4/14/21	1405	22.8	3,590	0.359	2.7	6.75	58.5	Clear
			9/15/21	1045	24.7	2,970	0.297	2.0	6.69	-40.3	Clear
	MW-68	Low Flow	4/14/21	825	18.6	3,100	0.310	4.0	6.79	85.3	Clear
	MW-71	Low Flow	4/14/21	925	18.6	6,560	0.656	2.1	6.85	115.1	Clear
	MW-89	Low Flow	4/13/21	1610	18.8	3,040	0.304	1.2	6.93	63.2	Clear
	NP-1	Low Flow	4/14/21	1115	18.0	4,100	0.410	2.5	6.73	483.7	Clear
			9/15/21	955	21.7	6,440	0.644	1.3	6.38	82.1	Clear
	NP-6	Low Flow	4/14/21	1020	18.1	5,350	0.535	2.2	6.53	471.1	Clear

Table 2 - Well Purging and Water Quality Field Measurement Data

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (umho/cm)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water [2]
Up-Gradient	UG-1	Low Flow	4/12/21	1610	25.6	3,210	0.321	5.2	6.89	109.9	Clear
	UG-2	Low Flow	4/12/21	1525	28.7	2,360	0.236	4.9	6.90	98.0	Clear
	UG-3R	Bladder	4/12/21	1755	23.1	2,620	0.262	5.1	6.97	109.0	Clear
	UG-4	Low Flow	4/12/21	1700	23.0	3,800	0.380	3.0	6.80	108.9	Clear

[1] **Purge Methods:**

Low Flow = peristaltic pump with dedicated tubing, purged until parameters stabilized

Bladder = bladder pump with dedicated tubing, purged until parameters stabilized

Grab = irrigation well sample collected from tap or valve

Definitions:

°C = Degrees Celsius

DO = Dissolved Oxygen

mg/L = milligrams per liter

mV = milliVolts

ORP = oxidation/reduction potential

S/m = Siemens per meter

std units = standard pH units

[2] **Potential Explanations of Water Quality Observations:**

"Odor" likely due to the presence of petroleum hydrocarbons

"Cloudy water" likely due to presence of suspended inorganic particles (silt, clay)

Dark, black, brown, yellow, gold, gray, orange, and "rusty" tints likely due to suspended clay/silt particles or microbial activity

"Particles" of varying color likely due to suspended clay/silt particles

"Orange algae" likely due to microbial activity

Table 3 - Groundwater Screening Levels and Selected Critical Groundwater Screening Levels

2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Analyte	WQCC GW Human Health (20.6.2.3103.A)	WQCC GW Domestic (20.6.2.3103.B)	WQCC GW Irrigation (20.6.2.3103.C)	USEPA MCL	NMED Tap Water (Table A-1)	USEPA Tap Water	NMED TPH (Table 6-4)	CGWSL	CGWSL Source
TPH (mg/L)									
TPH - gasoline range organics							1.01E-02	1.01E-02	NMED TPH (Table 6-4)
TPH - diesel range organics							8.58E-02	8.58E-02	NMED TPH (Table 6-4)
TPH - diesel range organics (Evaporation Ponds)							1.67E-02	1.67E-02	NMED TPH (Table 6-4)
VOCs (mg/L)									
1,1,1-Trichloroethane	2.00E-01			2.00E-01				2.00E-01	WQCC GW Human Health (20.6.2.3103.A)
1,1,2,2-Tetrachloroethane	1.00E-02							1.00E-02	WQCC GW Human Health (20.6.2.3103.A)
1,1,2-Trichloroethane	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
1,1-Dichloroethane	2.50E-02							2.50E-02	WQCC GW Human Health (20.6.2.3103.A)
1,1-Dichloroethene	7.00E-03			7.00E-03				7.00E-03	WQCC GW Human Health (20.6.2.3103.A)
1,2-Dibromo-3-chloropropane				2.00E-04				2.00E-04	USEPA MCL
1,2-Dibromoethane (ethylene dibromide)	5.00E-05			5.00E-05				5.00E-05	WQCC GW Human Health (20.6.2.3103.A)
1,2-Dichloroethane	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
1,2-Dichloropropane	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
1,2,4-Trimethylbenzene						5.60E-02		5.60E-02	USEPA Tap Water
1,3,5-Trimethylbenzene						6.00E-02		6.00E-02	USEPA Tap Water
2-Butanone (methyl ethyl ketone)					5.56E+00			5.56E+00	NMED Tap Water (Table A-1)
2-Phenylbutane (sec-butylbenzene)						2.00E+00		2.00E+00	USEPA Tap Water
4-Methyl-2-Pentanone (methyl isobutyl ketone)					1.24E+00			1.24E+00	NMED Tap Water (Table A-1)
Acetone					1.41E+01			1.41E+01	NMED Tap Water (Table A-1)
Benzene	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Bromodichloromethane				8.00E-02				8.00E-02	USEPA MCL
Bromomethane					7.54E-03			7.54E-03	NMED Tap Water (Table A-1)
Carbon Disulfide					8.10E-01			8.10E-01	NMED Tap Water (Table A-1)
Carbon tetrachloride	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Chlorobenzene				1.00E-01				1.00E-01	USEPA MCL
Chloroethane (ethyl chloride)					2.09E+01			2.09E+01	NMED Tap Water (Table A-1)
Chloroform	1.00E-01			8.00E-02				8.00E-02	USEPA MCL
Chloromethane					2.03E-02			2.03E-02	NMED Tap Water (Table A-1)
cis-1,2-Dichloroethene	7.00E-02			7.00E-02				7.00E-02	WQCC GW Human Health (20.6.2.3103.A)
cis-1,3-Dichloropropene					4.71E-03			4.71E-03	NMED Tap Water (Table A-1)
Dibromochloromethane				8.00E-02				8.00E-02	USEPA MCL
Dichlorodifluoromethane					1.97E-01			1.97E-01	NMED Tap Water (Table A-1)
Ethylbenzene	7.00E-01			7.00E-01				7.00E-01	WQCC GW Human Health (20.6.2.3103.A)
Isopropylbenzene (cumene)					4.47E-01			4.47E-01	NMED Tap Water (Table A-1)
m-Xylene					1.93E-01			1.93E-01	NMED Tap Water (Table A-1)
Methyl acetate					1.99E+01			1.99E+01	NMED Tap Water (Table A-1)
Methylene chloride (dichloromethane)	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Methyl tert-butyl ether		1.00E-01						1.00E-01	WQCC GW Domestic (20.6.2.3103.B)
n-Butylbenzene						1.00E+00		1.00E+00	USEPA Tap Water
n-Propylbenzene						6.60E-01		6.60E-01	USEPA Tap Water
Naphthalene	3.00E-02							3.00E-02	WQCC GW Human Health (20.6.2.3103.A)
o-Xylene					1.93E-01			1.93E-01	NMED Tap Water (Table A-1)
Styrene	1.00E-01			1.00E-01				1.00E-01	WQCC GW Human Health (20.6.2.3103.A)
tert-Butyl alcohol						1.50E-01		1.50E-01	USEPA Tap Water
Tetrachloroethene	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Toluene	1.00E+00			1.00E+00				1.00E+00	WQCC GW Human Health (20.6.2.3103.A)
trans-1,2-Dichloroethene	1.00E-01			1.00E-01				1.00E-01	WQCC GW Human Health (20.6.2.3103.A)
trans-1,3-Dichloropropene								--	--
Trichloroethene	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Trichlorofluoromethane					1.14E+00			1.14E+00	NMED Tap Water (Table A-1)
Vinyl chloride	2.00E-03			2.00E-03				2.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Xylenes	6.20E-01			1.00E+01				6.20E-01	WQCC GW Human Health (20.6.2.3103.A)

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Table 3 - Groundwater Screening Levels and Selected Critical Groundwater Screening Levels

2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Analyte	WQCC GW Human Health (20.6.2.3103.A)	WQCC GW Domestic (20.6.2.3103.B)	WQCC GW Irrigation (20.6.2.3103.C)	USEPA MCL	NMED Tap Water (Table A-1)	USEPA Tap Water	NMED TPH (Table 6-4)	CGWSL	CGWSL Source
Metals (mg/L)									
Aluminum			5.00E+00					5.00E+00	WQCC GW Irrigation (20.6.2.3103.C)
Arsenic	1.00E-02			1.00E-02				1.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Barium	2.00E+00			2.00E+00				2.00E+00	WQCC GW Human Health (20.6.2.3103.A)
Beryllium	4.00E-03			4.00E-03				4.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Boron			7.50E-01					7.50E-01	WQCC GW Irrigation (20.6.2.3103.C)
Cadmium	5.00E-03			5.00E-03				5.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Chromium	5.00E-02			1.00E-01				5.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Cobalt			5.00E-02					5.00E-02	WQCC GW Irrigation (20.6.2.3103.C)
Copper		1.00E+00		1.30E+00				1.00E+00	WQCC GW Domestic (20.6.2.3103.B)
Iron		1.00E+00						1.00E+00	WQCC GW Domestic (20.6.2.3103.B)
Lead	1.50E-02			1.50E-02				1.50E-02	WQCC GW Human Health (20.6.2.3103.A)
Manganese		2.00E-01						2.00E-01	WQCC GW Domestic (20.6.2.3103.B)
Mercury	2.00E-03			2.00E-03				2.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Molybdenum			1.00E+00					1.00E+00	WQCC GW Irrigation (20.6.2.3103.C)
Nickel			2.00E-01					2.00E-01	WQCC GW Irrigation (20.6.2.3103.C)
Selenium	5.00E-02			5.00E-02				5.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Silver	5.00E-02							5.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Vanadium					6.31E-02			6.31E-02	NMED Tap Water (Table A-1)
Water Quality Parameters (mg/L, unless noted otherwise)									
Chloride		2.50E+02						2.50E+02	WQCC GW Domestic (20.6.2.3103.B)
Cyanide	2.00E-01			2.00E-01				2.00E-01	WQCC GW Human Health (20.6.2.3103.A)
Fluoride	1.60E+00			4.00E+00				1.60E+00	WQCC GW Human Health (20.6.2.3103.A)
Nitrate (NO_3 as N)	1.00E+01			1.00E+01				1.00E+01	WQCC GW Human Health (20.6.2.3103.A)
pH (Std pH units)		6 to 9						6 to 9	WQCC GW Domestic (20.6.2.3103.B)
Sulfate		6.00E+02						6.00E+02	WQCC GW Domestic (20.6.2.3103.B)
Total Dissolved Solids		1.00E+03						1.00E+03	WQCC GW Domestic (20.6.2.3103.B)
SVOCs (mg/L)									
1,1'-Biphenyl					3.71E-02			3.71E-02	NMED Tap Water (Table A-1)
1-Methylnaphthalene	3.00E-02							3.00E-02	WQCC GW Human Health (20.6.2.3103.A)
1,4 Dioxane					4.59E-03			4.59E-03	NMED Tap Water (Table A-1)
2,4-Dimethylphenol					3.54E-01			3.54E-01	NMED Tap Water (Table A-1)
2-Methylnaphthalene	3.00E-02							3.00E-02	WQCC GW Human Health (20.6.2.3103.A)
2-Methylphenol								--	--
Acenaphthene					5.35E-01			5.35E-01	NMED Tap Water (Table A-1)
Anthracene					1.72E+00			1.72E+00	NMED Tap Water (Table A-1)
Atrazine	3.00E-03			3.00E-03				3.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Benzo(a)pyrene	2.00E-04			2.00E-04				2.00E-04	WQCC GW Human Health (20.6.2.3103.A)
Benzo(g,h,i)perylene								--	--
Bis(2-ethylhexyl)phthalate				6.00E-03				6.00E-03	USEPA MCL
Butylbenzylphthalate						1.60E-02		1.60E-02	USEPA Tap Water
Carbazole								--	--
Dibenzofuran						7.90E-03		7.90E-03	USEPA Tap Water
Diethyl phthalate					1.48E+01			1.48E+01	NMED Tap Water (Table A-1)
Di-n-butylphthalate					8.85E-01			8.85E-01	NMED Tap Water (Table A-1)
Fluoranthene					8.02E-01			8.02E-01	NMED Tap Water (Table A-1)
Fluorene					2.88E-01			2.88E-01	NMED Tap Water (Table A-1)
Naphthalene	3.00E-02							3.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Phenanthrene					1.70E-01			1.70E-01	NMED Tap Water (Table A-1)
Phenol		5.00E-03			5.76E+00			5.76E+00	NMED Tap Water (Table A-1)
Pyrene					1.17E-01			1.17E-01	NMED Tap Water (Table A-1)

Table 3 - Groundwater Screening Levels and Selected Critical Groundwater Screening Levels

2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Analyte	WQCC GW Human Health (20.6.2.3103.A)	WQCC GW Domestic (20.6.2.3103.B)	WQCC GW Irrigation (20.6.2.3103.C)	USEPA MCL	NMED Tap Water (Table A-1)	USEPA Tap Water	NMED TPH (Table 6-4)	CGWSL	CGWSL Source
Other Parameters (mg/L, unless noted otherwise)									
Uranium	3.00E-02			3.00E-02				3.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Polychlorinated Biphenyls	5.00E-04			5.00E-04				5.00E-04	WQCC GW Human Health (20.6.2.3103.A)

Definitions and Notes:

Blank cell indicates no standard is available

CGWSL = Critical Groundwater Screening Level

Heirarchy of selecting the CGWSL is as follows:

1. Lowest of either NM WQCC GW Standard (20.6.2.3103) or USEPA MCL.
2. If no NM WQCC GW Standard or USEPA MCL available, NMED Tap Water value.
3. If no NMED Tap Water value, USEPA Tap Water value, if available.
4. NMED TPH screening for "unknown oil" used for TPH-DRO.
5. NMED TPH screening value for "Diesel #2/New Crankase Oil" applied to TPH DRO samples collected from Evaporation Ponds.

NMAC = New Mexico Administrative Code

NMED = New Mexico Environment Department

NMED Tap Water = NMED Risk Assessment Guidance for Site Investigations and Remediation, November 2021, Table A-1, Tap Water Screening Level

NMED TPH = NMED Risk Assessment Guidance for Site Investigations and Remediation, November 2021, Table 6-4, TPH Groundwater Screening Levels

mg/L = Milligrams per Liter

pCi/L = PicoCuries per Liter

SVOC = Semivolatile Organic Compound

TPH = Total Petroleum Hydrocarbons

USEPA MCL = United States Environmental Protection Agency Maximum Contaminant Level from "Regional Screening Level (RSL) Summary Table", November 2021

USEPA Tap Water = United States Environmental Protection Agency Tap Water Screening Level from"Regional Screening Level (RSL) Summary Table", November 2021

VOC = Volatile Organic Compound

WQCC = New Mexico Water Quality Control Commission

WQCC GW Domestic = WQCC groundwater standard for domestic exposure, 20.6.2.3103.B NMAC

WQCC GW Human Health = WQCC groundwater standard for human health exposure, 20.6.2.3103.A NMAC

WQCC GW Irrigation = WQCC groundwater standard for irrigation exposure, 20.6.2.3103.C NMAC

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Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	TPH			Volatile Organic Compounds									
				Analyte	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
				CAS	TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
				CGWSL Source	NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	Well ID	Date	Dup														
Cross-Gradient	KWB-13	Apr-18			0.0567 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	KWB-13	Apr-19			<0.0247		0.00191	<0.000387	<0.000331	<0.000384	<0.000367	0.00236 J4	<0.000341		<0.000412	<0.00106	
	KWB-13	Jun-20			0.0396 J		<0.000322	<0.000104	0.000205 J	0.000234 J	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	KWB-13	Apr-21			0.0527 J		<0.000322	<0.000104	0.000162 J	0.000210 J	<0.000101	<0.00100	<0.000174		<0.000278	0.000438 J	
	MW-136	Apr-19		**<0.0314**	0.0741 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-136	Oct-19		**0.0731 JB**	0.0254 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-136	Jun-20		**0.326 V3**	**0.0924 J**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-136	Oct-20		**0.0320 J**	**0.0873 JB**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000122 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-136	Apr-21		**<0.0314**	**0.110**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000430 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-136	Sep-21		**<0.0314**	0.0432 J		<0.000322	<0.000104	<0.0000941	<0.000137	0.000624 J	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174	
	NP-5	Apr-15			0.0387 J		0.000804 J	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110	
	NP-5	Apr-17			<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NP-5	Apr-19			<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NP-5	Apr-21			0.0663 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	RA-3156	Apr-18					<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	RA-3156	Apr-19					<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106	
	RA-3156	Jun-20					<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	RA-3156	Apr-21					<0.000322	<0.000104	<0.0000941	<0.000137	0.000124 J	<0.00100	<0.000174		<0.000278	<0.000174	
Evaporation Ponds	MW-1R	Apr-18				**0.0624 J**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-1R	Apr-19				**0.0756 J**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-1R	Jun-20				**<0.0247**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-1R	Apr-21				**0.124**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-2A	Apr-19		**<0.0314**		**0.153**	<0.00186	<0.00194	<0.00166	<0.00192	<0.00184	<0.00500 J3	<0.00170		<0.00206	<0.00530	
	MW-2A	Oct-19		**0.0798 JB**		**0.0585 J**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-2A	Jun-20		**0.0484 J**		**<0.0247**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-2A	Oct-20		**<0.0314**		**0.153**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-2A	Apr-21		**<0.0314**		**1.25**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	MW-2A	Sep-21		**0.0423 J**		**0.181**											
	MW-3	Apr-19		**0.0731 J**		**3.93**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-3	Apr-19	FD	**0.192 B**		**3.77**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-3	Oct-19		**0.659**		**8.93**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-3	Oct-19	FD	**0.536 Q**		**9.30**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-3	Jun-20		**<1.57**		**7.01**	<0.00805	<0.00260	<0.00235	<0.00343	<0.00253	<0.0250	<0.00435		<0.00695	<0.00435	
	MW-3	Jun-20	FD	**0.691**		**7.98**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-3	Oct-20		**4.06 JB**		**6.84**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-3	Oct-20	FD	**0.491**		**7.08**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-3	Apr-21		**0.681**		**7.71**	<0.00805	<0.00260	<0.00235	<0.00343	<0.00253	<0.0250	<0.00435		<0.00695	<0.00435	
	MW-3	Apr-21	FD	**0.591**		**7.86**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-3	Sep-21		**0.242**		**6.28**											
	MW-3	Sep-21	FD	**0.239**		**7.13**											
	MW-4A	Apr-19		**0.669**		**6.82**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106	
	MW-4A	Oct-19		**0.417 B**		**4.88**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-4A	Jun-20		**0.377**		**4.07**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000195 J	<0.00100	<0.000174		<0.000278	0.000627 J	
	MW-4A	Oct-20		**0.586**		**4.93**	0.000437 J	<0.000104	<0.0000941	<0.000137	0.000244 J	<0.00100	0.000202 J		<0.000278	0.00234 J	
	MW-4A	Apr-21		**0.620**		**5.71**	0.000560 J	<0.000104	<0.0000941	<0.000137	0.000252 J	<0.00100 J4	<0.000174		<0.000278	0.000907 J	
	MW-4A	Sep-21		**0.291**		**4.50**											
	MW-4B	Apr-15		**0.119**		**1.31**	<0.000370	<0.000390	0.00183	0.000462 J	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110	
	MW-4B	Apr-17		**0.318**		**1.21**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106	
	MW-4B	Apr-19		**0.181**		**1.13**	<0.000373	<0.000387	0.000393 J	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106	
	MW-4B	Apr-21		**0.176 B**		**0.970**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000158 J	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	MW-5A	Apr-19		**2.25**		**4.80**	<0.000373	<0.000387	<0.000331	<0.000384	0.00129	<0.00100 J3	<0.000341		<0.000412	<0.00106	
	MW-5A	Oct-19		**1.72**		**4.01**	<0.000373	<0.000387	<0.000331	<0.000384	0.00143	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-5A	Jun-20		**0.959**		**7.01**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000812 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-5A	Oct-20		**1.75**		**6.72**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00142	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-5A	Apr-21		**2.56**		**7.21**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00156	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	MW-5A	Sep-21		**1.31**		**3.76**											
	MW-5B	Apr-15		**1.14**		**11.0**	0.000976 J	<0.000390	<0.000330	<0.000380	0.00148	<0.00100	<0.000340		<0.000780	<0.00110	
	MW-5B	Apr-17		**2.08**		**11.2**	0.000499 J	<0.000387	<0.000331	<0.000384	0.00140	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-5B	Apr-19		**1.82**		**11.5**	0.000414 J	<0.000387	<0.000331	<0.000384	0.000981 J	<0.00100 J3	<0.000341		<0.000412	<0.00106	
	MW-5B	Apr-21		**0.0371 JB**		**0.389**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000335 J	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	MW-5C	Apr-15		**<0.0310**		**0.580**	<0.000370	<0.000390	<0.000330	<0.000380	0.000507 J	<0.00100	<0.000340		<0.000780	<0.00110	
	MW-5C	Apr-17		**<0.0314**		**0.500**	<0.000373	<0.000387	<0.000331	<0.000384	0.000369 J	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-5C	Apr-19		**0.0423 JB**		**0.442**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106	
	MW-5C	Apr-21		**1.98**		**11.3**	0.000433 J	<0.000104	<0.0000941	<0.000137	0.000861 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-6A	Apr-18		**0.406**		**9.27**	<0.000373	<0.000387	<0.000331	0.00117	<0.000367	<0.00100	0.00192		0.00139	0.00360	
	MW-6A	Apr-19		**0.315**		**11.0**	<0.00186	<0.00194	0.00190 J	0.00197 J	<0.00184	<0.00500 J3	0.00291 J		0.00289 J	0.00704 J	
	MW-6A	Jun-20		**0.192**		**4.86**	<0.00161	<0.000520	<0.000471	0.000927 J	<0.000505	<0.00500	0.00171 J		<0.00139	0.00171 J	
	MW-6A	Apr-21		**0.356 B**		**6.04**	<0.00161	<0.000520	<0.000471	0.00142 J	<0.000505	<0.00500 J4	0.00304 J		0.00219 J	0.00602 J	
	MW-6B	Apr-15		**<0.0310**		**0.386**	<0.000370	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110	
	MW-6B	Apr-17		**<0.0314**		**0.276**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-6B	Apr-19		**0.0356 J**		**0.427**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106	
	MW-6B	Apr-21		**0.0463 JB**		**0.346**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	MW-7A	Apr-19		**0.605**		**1.33**	<0.000373	<0.000387	<0.000331	<0.000384	0.00122	<0.00100 J3	<0.000341		<0.000412	<0.00106	
	MW-7A	Apr-19	FD	**0.638**		**1.13**	<0.000373	<0.000387	<0.000331	<0.000384	0.00161	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-7A	Oct-19		**0.325**		**1.09**	<0.000373	<0.000387	<0.000331	<0.000384	0.00137	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-7A	Oct-19	FD	**0.317 Q**		**1.06**	<0.000373	<0.000387	<0.000331	<0.000384	0.00154	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-7A	Jun-20		**0.240**		**0.928**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000858 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-7A	Jun-20	FD	**0.337**		**0.915**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00113	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-7A	Oct-20		**0.351 B**		**0.940**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000957 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-7A	Oct-20	FD	**0.379**		**0.886**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000984 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-7A	Apr-21		**0.364 B**		**1.06**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000747 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-7A	Apr-21	FD	**0.358**		**1.07**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000765 J	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-7A	Sep-21		**0.299**		**1.00**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000870 J	0.00164 J	<0.000174	0.00432 J	<0.000278	<0.000174	
	MW-7A	Sep-21	FD	**0.298**		**0.959**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000863 J	0.00164 J	<0.000174	<0.00406	<0.000278	<0.000174	
	MW-7B	Apr-15		**<0.0310**		**0.120**	<0.000370	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110	
	MW-7B	Apr-17		**<0.0314**		**0.0845 J**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-7B	Apr-19		**0.0647 JB**		**0.0676 J**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106	
	MW-7B	Apr-21		**0.0342 J**		**0.0850 J**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-10	Apr-19		**0.816**		**1.85**	<0.000373	<0.000387	<0.000331	<0.000384	0.00170	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-10	Oct-19		**1.06**		**1.89**	<0.000373	<0.000387	<0.000331	<0.000384	0.00147	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-10	Jun-20		**0.931**		**1.57**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	0.00136	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-10	Oct-20		**0.640**		**1.76**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00136	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-10	Apr-21		**0.712**		**2.00**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00124	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	MW-10	Sep-21		**0.849**		**1.81**											
	MW-11A	Apr-19		**0.0422 JB**		**<0.0247**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-11A	Oct-19															
	MW-11A	Jun-20		**<0.0314**		**<0.0247**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-11A	Oct-20															
	MW-11A	Apr-21		**<0.0314**		**0.0459 J**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-11A	Sep-21															
	MW-11B	Apr-15		**<0.0310**		**<0.0250**	<0.000370	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110	
	MW-11B	Apr-17		**<0.0314**		**<0.0247**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106	
	MW-11B	Apr-19		**0.0345 JB**		**<0.0247**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-11B	Apr-21		**<0.0314**		**0.0402 J**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	TPH			Volatile Organic Compounds									
				Analyte	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
				CAS	TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
				CGWSL Source	NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	Well ID	Date	Dup														
Evaporation Ponds	MW-15	Apr-18		**0.328**		**0.479**	<0.000373	<0.000387	<0.000331	<0.000384	0.000836 J	<0.00100	<0.000341		<0.000412	<0.00106
	MW-15	Apr-19		**0.136 B**		**0.475**	<0.000373	<0.000387	<0.000331	<0.000384	0.000549 J	<0.00100	<0.000341		<0.000412	<0.00106
	MW-15	Jun-20		**<0.0314**		**<0.0247**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-15	Apr-21		**0.0455 J**		**0.358**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-18A	Apr-19				**0.652**	<0.000373	<0.000387	<0.000331	<0.000384	0.000600 J	<0.00100	<0.000341		<0.000412	<0.00106
	MW-18A	Oct-19				**0.410**	<0.000373	<0.000387	<0.000331	<0.000384	0.000793 J	<0.00100	<0.000341		<0.000412	<0.00106
	MW-18A	Jun-20				**0.408**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000734 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-18A	Oct-20				**0.373 B**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000678 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-18A	Apr-21				**0.518**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000522 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-18A	Sep-21				**0.491**										
	MW-18B	Apr-15		**<0.0310**		**0.280**	<0.000370	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110
	MW-18B	Apr-17		**0.0932 J**		**0.287**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-18B	Apr-19		**0.105 B**		**0.230**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-18B	Apr-21		**0.0456 J**		**0.335**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-22A	Apr-19		**2.75**		**4.55**	<0.000373	<0.000387	<0.000331	<0.000384	0.00438	<0.00100	<0.000341		<0.000412	<0.00106
	MW-22A	Apr-19	FD	**3.22**		**4.41**	<0.000373	<0.000387	<0.000331	<0.000384	0.00409	<0.00100	<0.000341		<0.000412	<0.00106
	MW-22A	Oct-19		**0.599 B**		**1.54**	<0.000373	<0.000387	<0.000331	<0.000384	0.000923 J	<0.00100	<0.000341		<0.000412	<0.00106
	MW-22A	Oct-19	FD	**0.612 B**		**1.54**	<0.000373	<0.000387	<0.000331	<0.000384	0.00103	<0.00100	<0.000341		<0.000412	<0.00106
	MW-22A	Jun-20		**2.73**		**2.91**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00242	<0.00100	<0.000174		<0.000278	<0.000174
	MW-22A	Jun-20	FD	**2.10**		**2.72**	0.000411 J	<0.000104 J4	<0.0000941	<0.000137	0.00254	<0.00100	<0.000174		<0.000278	<0.000174
	MW-22A	Oct-20		**1.68**		**3.45**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00286	<0.00100	<0.000174		<0.000278	<0.000174
	MW-22A	Oct-20	FD	**2.13**		**3.13**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00273	<0.00100	<0.000174		<0.000278	<0.000174
	MW-22A	Apr-21		**1.43**		**4.19**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00245	<0.00100	<0.000174		<0.000278	<0.000174
	MW-22A	Apr-21	FD	**1.45**		**3.94**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00245	<0.00100	<0.000174		<0.000278	<0.000174
	MW-22A	Sep-21		**0.539**		**1.16**										
	MW-22A	Sep-21	FD	**0.541**		**1.37**										
	MW-22B	Apr-15		**2.34**		**5.60**	<0.000370	<0.000390	<0.000330	<0.000380	0.00634	<0.00100	<0.000340		<0.000780 UJ	<0.00110
	MW-22B	Apr-17		**1.76**		**5.25**	<0.000373	<0.000387	<0.000331	<0.000384	0.00564	<0.00100	<0.000341		<0.000412	<0.00106
	MW-22B	Apr-19		**2.58**		**4.77**	<0.000373	<0.000387	<0.000331	<0.000384	0.00582	<0.00100	<0.000341		<0.000412	<0.00106
	MW-22B	Apr-21		**1.97**		**5.69**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00462	<0.00100	<0.000174		<0.000278	<0.000174
	MW-70	Apr-19		**1.92**		**0.688**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-70	Oct-19		**1.50**		**0.861**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-70	Jun-20		**1.29**		**0.833**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000119 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-70	Oct-20		**2.28**		**0.805**	<0.000322	<0.000104	<0.0000941	<0.000137	0.000124 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-70	Apr-21		**1.57**		**1.05**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-70	Sep-21		**1.81**		**0.860**										
	MW-72	Apr-18		**0.0713 J**		**0.555**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-72	Apr-19		**0.0396 J**		**0.497**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106
	MW-72	Jun-20		**0.0544 J**		**0.303**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-72	Apr-21		**0.0371 JB**		**0.362**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-73	Apr-18		**0.575**		**2.85**	0.000735 J	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-73	Apr-19		**0.0435 J**		**2.56**	<0.000373	<0.000387	<0.000331	<0.000384	0.000992 J	<0.00100	<0.000341		<0.000412	<0.00106
	MW-73	Jun-20		**0.408**		**2.86**	0.000589 J	<0.000104	<0.0000941	<0.000137	0.00105	<0.00100	<0.000174		<0.000278	<0.000174
	MW-73	Apr-21		**0.426**		**3.48**	0.000447 J	<0.000104	<0.0000941	<0.000137	0.00102	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-74	Apr-19		**0.674**		**39.4**	0.000588 J	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-74	Oct-19		**1.66**		**23.5**	0.00119	<0.000387	<0.000331	<0.000384	0.000725 J	<0.00100	<0.000341		<0.000412	<0.00106
	MW-74	Jun-20		**0.490**		**21.9**	0.000772 J	<0.000104	<0.0000941	<0.000137	0.000294 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-74	Oct-20		**1.64**		**15.6**	0.00157	0.000124 J	<0.0000941	<0.000137	0.000761 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-74	Apr-21		**1.47**		**15.9**	0.000857 J	<0.000104	<0.0000941	<0.000137	0.000577 J	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-74	Sep-21		**3.56**		**8.38**										
	MW-75	Apr-19		**1.64**		**12.0**	<0.000373	<0.000387	<0.000331	<0.000384	0.00644	<0.00100	<0.000341		<0.000412	<0.00106
	MW-75	Oct-19		**3.01**		**15.4**	<0.000373	0.000795 J	<0.000331	<0.000384	0.00232	<0.00100	<0.000341		<0.000412	<0.00106
	MW-75	Jun-20		**2.44 J**		**12.2**	<0.00805	<0.00260	<0.00235	<0.00343	0.00263 J	<0.0250	<0.00435		<0.00695	<0.00435
	MW-75	Oct-20		**3.45**		**15.1**	<0.00805	<0.00260	<0.00235	<0.00343	0.00583 J	<0.0250	<0.00435		<0.00695	<0.00435
	MW-75	Apr-21		**2.15**		**13.8**	<0.00805	<0.00260	<0.00235	<0.00343	<0.00253	<0.0250	<0.00435		<0.00695	<0.00435
	MW-75	Sep-21		**2.89**		**13.3**										
	MW-76	Apr-19		**1.67**		**25.3**	<0.000373	0.000418 J	<0.000331	<0.000384	0.0115	<0.00100	<0.000341		<0.000412	<0.00106
	MW-76	Oct-19		**1.70**		**30.1**	0.000510 J	0.000584 J	<0.000331	<0.000384	0.0123	<0.00100	<0.000341		<0.000412	<0.00106
	MW-76	Jun-20		**1.89**		**20.8**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	0.0111	<0.00100	<0.000174		<0.000278	0.000628 J
	MW-76	Oct-20		**1.11**		**16.4**	0.000376 J	0.000320 J	<0.0000941	<0.000137	0.00743	<0.00100	<0.000174		<0.000278	<0.000174
	MW-76	Apr-21		**0.902**		**12.2**	<0.000322	<0.000104	<0.0000941	<0.000137	0.00437	<0.00100	<0.000174		<0.000278	<0.000174
	MW-76	Sep-21		**0.790 J**		**11.1**										
	MW-77	Apr-18		**1.15**		**54.4**	<0.00373	<0.00387	<0.00331	<0.00384	<0.00367	<0.0100	<0.00341		<0.00412	<0.0106
	MW-77	Apr-19		**1.04**		**72.5**	<0.00373	<0.00387	<0.00331	<0.00384	0.00392 J	<0.0100	<0.00341		<0.00412	<0.0106
	MW-77	Jun-20		**2.88 J**		**53.1**	<0.00805	<0.00260	<0.00235	<0.00343	<0.00253	<0.0250	<0.00435		<0.00695	<0.00435
	MW-77	Apr-21		**0.649**		**68.5**	<0.00805	<0.00260	<0.00235	<0.00343	<0.00253	<0.0250	<0.00435		<0.00695	<0.00435
	MW-78	Apr-18		**<0.314**		**26.4**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-78	Apr-19		**<0.314**		**28.6**	<0.00373	<0.00387	<0.00331	<0.00384	<0.00367	<0.0100	<0.00341		<0.00412	<0.0106
	MW-78	Jun-20		**<1.57**		**38.5**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-78	Apr-21		**0.0950 J**		**385**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-79	Apr-19		**<0.0314**		**0.584**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-79	Oct-19		**0.0662 JB**		**0.200**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-79	Jun-20		**0.0534 J**		**0.0762 J**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-79	Oct-20		**0.0582 J**		**0.333**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-79	Apr-21		**<0.0314**		**0.331 B**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-79	Sep-21		**0.0338 J**		**0.255**										
	MW-80	Apr-18		**<0.0314**		**0.150**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-80	Apr-19		**<0.0314**		**0.210**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-80	Jun-20		**<0.0314**		**<0.0247**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-80	Apr-21		**<0.0314**		**0.254 B**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-81	Apr-18		**<0.0314**		**0.922**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-81	Apr-19		**<0.0314**		**1.42**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-81	Jun-20		**0.0978 J**		**0.269**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-81	Apr-21		**<0.0314**		**0.866 B**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-82	Apr-18		**0.432**		**3.03**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-82	Apr-19		**0.0619 J**		**5.49**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-82	Jun-20		**0.689**		**2.58**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-82	Apr-21		**0.216**		**1.75**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-83	Apr-19		**0.339**		**35.2**	<0.00186	<0.00194	<0.00166	<0.00192	<0.00184	<0.00500 J3	<0.00170		<0.00206	<0.00530
	MW-83	Oct-19		**0.996 B**		**19.1**	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-83	Jun-20		**0.843**		**8.93**	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-83	Oct-20		**1.17**		**10.2**	<0.000322	<0.000104	0.000236 J	<0.000137	0.000649 J	<0.00100	<0.000174		<0.000278	0.00127 J
	MW-83	Apr-21		**0.904**		**7.60**	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-83	Sep-21		**0.288**		**23.0**										
	MW-84	Apr-19		**0.453**		**48.1**	<0.00186	<0.00194	<0.00166	<0.00192	<0.00184	<0.00500 J3	<0.00170		<0.00206	<0.00530
	MW-84	Oct-19		**1.45**		**34.8**	<0.00187	<0.00194	<0.00166	<0.00192	<0.00184	<0.00500	<0.00170		0.00344 J	<0.00530
	MW-84	Jun-20		**1.45**		**58.9**	<0.00161	<0.000520	<0.000471	<0.000685	0.00112 J	<0.00500	<0.000870		<0.00139	<0.000870
	MW-84	Oct-20		**<3.14**		**59.2**	<0.00322	<0.00104	<0.000941	<0.00137	0.00104 J	<0.0100	<0.00174		<0.00278	<0.00174
	MW-84	Apr-21		**0.537**		**62.9**	<0.00322	<0.00104	<0.000941	<0.00137	<0.00101	<0.0100	<0.00174		<0.00278	<0.00174
	MW-84	Sep-21		**1.37**		**74.6**										
	MW-86	Jun-20		**1.77 J**		**93.9**	0.0200	0.00605 J	**0.0242**	0.0199 J	<0.00202	<0.0200	0.0216		0.0345	0.0483 J
	MW-86	Oct-20		**<6.28**		**80.2**	0.0223	0.00604 J	**0.0313**	0.0228	<0.00202	<0.0200	0.0288		0.0435	0.0583 J

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				TPH			Volatile Organic Compounds									
	Analyte Group															
	Analyte			GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
	CAS			TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
	Units			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL			0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
	CGWSL Source			NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	Well ID	Date	Dup													
Evaporation Ponds	MW-87	Apr-19		0.0422 JB		0.364	<0.000373	<0.000387	<0.000331	<0.000384	0.000622 J	<0.00100	<0.000341		<0.000412	<0.00106
	MW-87	Oct-19		0.0950 JB		0.247	<0.000373	<0.000387	<0.000331	<0.000384	0.00108	<0.00100	<0.000341		<0.000412	<0.00106
	MW-87	Jun-20		<0.0314		0.260	<0.000322	<0.000104	<0.0000941	<0.000137	0.000725 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-87	Oct-20		0.0469 JB		0.270 B	<0.000322	<0.000104	<0.0000941	<0.000137	0.000777 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-87	Apr-21		<0.0314		0.371	<0.000322	<0.000104	<0.0000941	<0.000137	0.000558 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-87	Sep-21		<0.0314		0.386										
	MW-88	Apr-19		<0.0314		0.359	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-88	Oct-19		0.120 B		0.325	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-88	Jun-20		0.0434 J		0.317	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-88	Oct-20		0.0806 JB		0.405	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-88	Apr-21		0.0750 JB		0.410	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-88	Sep-21		0.0602 J		0.421										
	MW-120	Apr-19		0.102		0.554	<0.00186	<0.00194	<0.00166	<0.00192	<0.00184	<0.00500 J3	<0.00170		<0.00206	<0.00530
	MW-120	Oct-19		0.611 B		0.463	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-120	Jun-20		0.0458 J		0.262	<0.00161	<0.000520	<0.000471	<0.000685	<0.000505	<0.00500	<0.000870		<0.00139	<0.000870
	MW-120	Oct-20		<0.0314		0.402	<0.00161	<0.000520	<0.000471	<0.000685	<0.000505	<0.00500	<0.000870		<0.00139	<0.000870
	MW-120	Apr-21		0.0797 J		0.614 B	<0.00161	<0.000520	<0.000471	<0.000685	<0.000505	<0.00500	<0.000870		<0.00139	<0.000870
	MW-120	Sep-21		0.0867 J		0.346	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-121	Apr-19		<0.0314		0.418	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106
	MW-121	Oct-19		0.0537 JB		0.310	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-121	Jun-20		<0.0314		0.204	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-121	Oct-20		<0.0314		0.268	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-121	Apr-21		<0.0314		0.368 B	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-121	Sep-21		<0.0314		0.212										
	MW-122	Apr-19		<0.0314		0.338	<0.00186	<0.00194	<0.00166	<0.00192	<0.00184	<0.00500 J3	<0.00170		<0.00206	<0.00530
	MW-122	Oct-19		0.233 JB		0.111	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-122	Jun-20		<1.57		0.0398 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-122	Oct-20		<1.57		0.122	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-122	Apr-21		<0.0314		0.0845 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-122	Sep-21		<0.0314		0.0810 J										
	MW-123	Apr-19		1.63		2.63	<0.000373	<0.000387	<0.000331	<0.000384	0.00163	<0.00100	<0.000341		<0.000412	<0.00106
	MW-123	Oct-19		1.58		2.36	<0.000373	<0.000387	<0.000331	<0.000384	0.00133	<0.00100	<0.000341		<0.000412	<0.00106
	MW-123	Jun-20		2.03		2.01	<0.000322	<0.000104 J4	<0.0000941	<0.000137	0.00149	<0.00100	<0.000174		<0.000278	<0.000174
	MW-123	Oct-20		1.30		2.29	<0.000322	<0.000104	<0.0000941	<0.000137	0.00174	<0.00100	<0.000174		<0.000278	<0.000174
	MW-123	Apr-21		1.24		2.51	<0.000322	<0.000104	<0.0000941	<0.000137	0.00153	<0.00100	<0.000174		<0.000278	<0.000174
	MW-123	Sep-21		0.989		2.35										
	MW-124	Apr-19		0.0422 JB		0.0404 J	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-124	Oct-19		<0.0314 Q		0.0611 J	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-124	Jun-20		<0.0314		<0.0247	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-124	Oct-20		<0.0314		0.0406 JB	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-124	Apr-21		<0.0314		0.0508 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-124	Sep-21		<0.0314		0.0518 J										
	OCD-1R	Apr-19		<0.0314		0.143	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-1R	Oct-19		0.0869 JB		0.181	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-1R	Jun-20		<0.0314		0.110	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-1R	Oct-20		0.0461 JB		0.117	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-1R	Apr-21		<0.0314		0.174	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-1R	Sep-21		<0.0314		0.184										
	OCD-2A	Apr-19		<0.0314		0.0563 J	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-2A	Oct-19		0.0765 JB		0.0255 J	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-2A	Jun-20		<0.0314		<0.0247	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-2A	Oct-20		0.0374 JB		0.0650 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-2A	Apr-21		<0.0314		0.0839 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-2A	Sep-21		<0.0314		0.0849 J										
	OCD-3	Apr-19		<0.0314		0.0267 J	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-3	Oct-19		0.0771 JB		<0.0247	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-3	Jun-20		<0.0314		<0.0247	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-3	Oct-20		0.0381 JB		0.0499 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-3	Apr-21		<0.0314		0.0580 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-3	Sep-21		<0.0314		0.0529 J										
	OCD-4	Apr-19		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-4	Oct-19		0.0736 JB		<0.0247	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-4	Jun-20		<0.0314		<0.0247	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-4	Oct-20		0.0326 JB		0.0404 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-4	Apr-21		<0.0314		0.0556 J	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-4	Sep-21		<0.0314		0.0605 J										
	OCD-5	Apr-19		0.179 B		0.233	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-5	Oct-19		0.912		0.954	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-5	Jun-20		1.09		0.773	<0.000322	<0.000104 J4	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-5	Oct-20		0.724		0.917	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-5	Apr-21		0.337		0.467	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-5	Sep-21		0.845		1.08										
	OCD-6	Apr-19		0.136		0.600	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106
	OCD-6	Oct-19		0.145 B		0.390	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-6	Jun-20		0.134		0.517	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-6	Oct-20		0.159		0.622	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-6	Apr-21		0.186 B		0.666	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	OCD-6	Sep-21		0.361		0.677										
	OCD-7AR	Apr-19		0.360		4.00	0.000498 J	<0.000387	<0.000331	<0.000384	0.000632 J	<0.00100 J3	<0.000341		<0.000412	<0.00106
	OCD-7AR	Oct-19		1.14		3.46	0.000670 J	<0.000387	<0.000331	<0.000384	0.00190	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-7AR	Jun-20		0.637		3.21	0.000452 J	<0.000104	<0.0000941	<0.000137	0.000944 J	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-7AR	Oct-20		0.878		3.45	0.000917 J	<0.000104	<0.0000941	<0.000137	0.00157	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-7AR	Apr-21		1.38		4.76	0.000378 J	<0.000104	<0.0000941	<0.000137	0.00129	<0.00100 J4	<0.000174		<0.000278	<0.000174
	OCD-7AR	Sep-21		1.72		4.00										
	OCD-7B	Apr-15		<0.0310		0.120	<0.000370	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110
	OCD-7B	Apr-17		<0.0314		0.0746 J	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-7B	Apr-19		<0.0314		0.0638 J	<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3	<0.000341		<0.000412	<0.00106
	OCD-7B	Apr-21		0.0516 JB		0.128	<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	OCD-8A	Apr-19		1.36		3.75	0.000406 J	<0.000387	<0.000331	<0.000384	0.00400	<0.00100 J3	<0.000341		<0.000412	<0.00106
	OCD-8A	Oct-19		0.128 B		0.648	<0.000373	<0.000387	<0.000331	<0.000384	0.000471 J	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-8A	Jun-20		0.419		2.19	0.000366 J	<0.000104	<0.0000941	<0.000137	0.00275	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-8A	Oct-20		0.644		2.17	0.000474 J	<0.000104	<0.0000941	<0.000137	0.00342	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-8A	Apr-21		1.04		2.86	0.000418 J	<0.000104	<0.0000941	<0.000137	0.00345	<0.00100	<0.000174		<0.000278	<0.000174
	OCD-8A	Sep-21		0.373		1.57										
	OCD-8B	Apr-15		<0.0310		0.840	<0.000370	<0.000390	<0.000330	<0.000380	0.00155	<0.00100	<0.000340		<0.000780	<0.00110
	OCD-8B	Apr-17		<0.0314		0.585	<0.000373	<0.000387	<0.000331	<0.000384	0.000919 J	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-8B	Apr-19		0.0648 JB		0.612	<0.000373	<0.000387	<0.000331	<0.000384	0.000876 J	<0.00100	<0.000341		<0.000412	<0.00106
	OCD-8B	Apr-21		0.0690 J		0.632	<0.000322	<0.000104	<0.0000941	<0.000137	0.000606 J	<0.00100	<0.000174		<0.000278	<0.000174
Field East of Refinery	KWB-1A	Apr-19			0.0541 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	KWB-1A	Oct-19			0.0614 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-1A	Jun-20			0.123		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-1A	Oct-20			0.0960 JB		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-1C	Apr-15			0.113		<0.000370	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110
	KWB-1C	Apr-17			0.140		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-1C	Apr-19			0.0921 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	KWB-1C	Apr-21			0.0847 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

			Analyte Group	**TPH**			**Volatile Organic Compounds**										
			Analyte	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
			CAS	TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL	0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
			CGWSL Source	NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**													
Field East of Refinery	KWB-7	Jun-20			**7.29**		**0.0876**	<0.000104	**0.0545**	0.00936	0.00932	0.00822	0.00226		0.000536 J	0.0413
	KWB-7	Oct-20			**1.05**		0.00287	<0.000104	**0.00789**	0.00262	0.00365	<0.00100	0.000402 J		<0.000278	0.00289 J
	KWB-7	Apr-21			**1.94**		**0.212**	0.00556	**1.01**	0.459	0.00489	**0.0306**	0.0116		0.0255	0.179
	KWB-7	Sep-21			**1.37**		**0.200**	0.000709 J	**0.0131**	0.331	0.00580	0.0108	0.00582	0.0287	0.00322	0.0822
	KWB-8	Oct-16			**3.02**		**0.170 J**	**<0.0774**	**11.5**	**0.828**	<0.0734	**<0.200** J4	0.150 J		**1.48**	**1.16**
	KWB-8	Apr-17			**3.41**		**0.380**	**0.0863 J**	**5.62**	**1.24**	**0.129**	**0.141 J**	0.145		0.747	**2.07**
	KWB-8	Oct-17			**3.30**		**0.114**	0.0225	**12.5**	0.617	**0.134** V3	**0.0519**	0.0133		0.336	**0.795**
	KWB-8	Oct-20			**6.80**		**0.833**	**0.191 J**	**17.8**	**2.89**	0.0230 J	**0.539 J**	0.139 J		**1.08**	**4.19**
	KWB-10R	Apr-17			**4.01**		**0.360**	**0.0907**	**4.95**	0.505	**3.65**	**0.156 J**	**0.198**		0.0605	**0.914**
	KWB-10R	Oct-17			**5.18**		**0.302**	**0.0759**	**7.06**	0.530	**5.41**	**0.152**	0.112 J		0.0588	**0.767**
	KWB-10R	Apr-18			**3.23**		**0.214 J**	**<0.0968**	**3.06**	0.354	**2.74**	**<0.250**	0.0922 J		<0.103	0.549 J
	KWB-10R	Oct-18			**3.35**		**0.215 J**	**<0.0968**	**3.81**	0.238 J	**4.12**	**<0.250**	<0.0852		<0.103	<0.265
	KWB-11A	Apr-19		**0.149**	**0.787**		0.000467 J	<0.000387	0.000898 J	<0.000384	0.00371	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-11A	Jun-20		**0.444**	**2.28**		0.0486	<0.000104	0.000492 J	0.000576 J	0.00359	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-11A	Oct-20		**0.0992 J**	**0.376**		0.00151	<0.000104	0.00234	<0.000137	0.00307	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-11A	Sep-21		**0.994**	**1.35**		0.0190	0.000835 J	**0.0512**	0.0382	0.00221	0.00154 J	0.000426 J	0.0932	0.000984 J	0.0213
	KWB-11B	Apr-19		**<0.0314**	0.0418 J		<0.000373	<0.000387	<0.000331	<0.000384	0.000774 J	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-11B	Oct-19		**0.0747 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	0.00103	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-11B	Jun-20		**<0.0314**	0.0514 J		<0.000322	<0.000104	<0.0000941	<0.000137	0.00140	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-11B	Oct-20		**<0.0314**	**0.0956 J**		<0.000322	<0.000104	0.00192	<0.000137	0.00156	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-11B	Apr-21		**<0.0314**	0.0356 J		<0.000322	<0.000104	<0.0000941	<0.000137	0.00105	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-11B	Sep-21		**<0.0314**	0.0363 J		<0.000322	<0.000104	0.0000957 J	0.000419 J	0.00152	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	KWB-12A	Oct-19		**0.0748 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-12A	Jun-20		**<0.0314**	0.0477 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-12A	Oct-20		**0.0364 J**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-12A	Sep-21		**<0.0314**	<0.0247		0.000476 J	<0.000104	0.000531 J	0.000527 J	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	KWB-12B	Apr-19		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-12B	Apr-19	FD	**0.0499 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-12B	Oct-19		**0.0739 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-12B	Oct-19	FD	**0.0768 JB**	**0.133**		0.000508 J	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-12B	Jun-20		**<0.0314**	0.0305 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-12B	Jun-20	FD	**0.0359 JB**	0.0415 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-12B	Oct-20		**0.0358 J**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-12B	Oct-20	FD	**<0.0314**	0.0684 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-12B	Apr-21		**<0.0314**	**0.0955 J**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-12B	Apr-21	FD	**0.0590 J**	0.0537 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	KWB-12B	Sep-21		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	KWB-12B	Sep-21	FD	**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	KWB-P4	Apr-15			0.0820 J		<0.000370	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110
	KWB-P4	Apr-17			0.0526 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	KWB-P4	Apr-19			0.0361 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	KWB-P4	Apr-21			0.0330 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-57	Apr-19		**<0.0314**	**0.139 J**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-57	Oct-19		**0.0894 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-57	Jun-20		**<0.0314**	0.0661 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-57	Oct-20		**0.0579 J**	0.0475 JB		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-57	Apr-21		**<0.0314**	**0.117**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-57	Sep-21		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-58	Oct-17			**9.77**		**0.166**	0.00130	**4.08**	0.0965	0.0987	**0.0469**	0.00179		0.0101	0.222
	MW-58	Apr-18			**5.73**		**0.574**	<0.0194	**4.12**	**0.946**	0.0303 J	**0.267**	<0.0170		<0.0206	0.268
	MW-58	Oct-18			**4.86**		0.0235 J	<0.0194	**7.11**	0.0351 J	0.0624	**<0.0500**	<0.0170		<0.0206	<0.0530
	MW-58	Oct-19			**12.1**		**0.272**	0.0123	**3.78**	0.634	<0.00367	**0.0917**	0.0119		0.0141 J4	0.407
	MW-111	Oct-18		**1.36**	**2.63**		<0.00932	<0.00968	**0.0268**	<0.00960	**1.47**	<0.0250	<0.00852		<0.0103	<0.0265
	MW-111	Apr-19		**1.88**	**1.54**		0.00243	<0.000387	**0.115**	0.00258	**1.46**	0.00408 J	<0.000341		0.000523 J	0.00523
	MW-111	Oct-19		**1.37**	**1.80**		0.00437	0.000852 J	**0.167**	0.0164	**1.23**	0.00372 J	0.000929 J		<0.0103	0.0109
	MW-111	Jun-20		**3.86**	**1.77**		0.0135 J	0.00436 J	**0.439**	0.0408	**1.30**	<0.0250	<0.00435		<0.00695	0.0148 J
	MW-112	Nov-14		**28.0**	**2.20**		**0.350**	**0.0900**	**8.50**	**0.970**	**1.00**	**0.200**	**0.600**		0.730	**2.00**
	MW-113	Apr-19		**1.91**	0.0450 J		0.00468	<0.000387	**0.0154**	0.00703	0.0112	0.00108 J	<0.000341		<0.000412	0.0113
	MW-113	Apr-19	FD	**1.83**	**0.113**		0.00523	0.00355	**0.0139**	0.00809	0.00973	0.00110 J	<0.000341		<0.000412	0.0128
	MW-113	Oct-19		**4.54**	**2.35**		**0.223**	<0.000387	**0.547 J4**	0.248	0.00823	**0.128**	0.00194		0.00609	0.309
	MW-113	Oct-19	FD	**4.37**	**2.53**		**0.240**	0.00170	**0.546**	0.270	0.00809	**0.0986**	0.00233		0.00657	0.286
	MW-113	Jun-20		**1.30**	**0.226**		0.0357	<0.000520	**0.0306**	0.00355 J	0.0129	<0.00500	<0.000870		<0.00139	0.0363
	MW-113	Jun-20	FD	**0.798** V3	**0.158**		0.0278	0.000589 J	**0.0248**	0.00448	0.0104	0.00195 J	0.000359 J		0.000490 J	0.0474
	MW-113	Oct-20		**3.18**	**0.784**		**0.102**	0.00118 J	**0.368**	0.129	0.0117	0.0101 J	<0.000870		0.00446 J	0.154
	MW-113	Oct-20	FD	**3.30**	**0.814**		**0.114**	<0.000104	**0.428**	0.137	0.0118	0.0104	0.000755 J		0.00403	0.166
	MW-113	Apr-21		**3.66**	**0.330**		0.0410	0.00273 J	**0.0272**	0.0126	0.00805	<0.00500	0.00172 J		<0.00139	0.0412
	MW-113	Apr-21	FD	**4.52**	**0.405**		0.0519	0.00345	**0.0417**	0.0183	0.00823	0.00507	0.00222		0.00120	0.0591
	MW-113	Sep-21		**22.6**	**6.19**		**0.564**	<0.00520	**3.43**	**2.14**	0.0544	**0.158 J**	<0.00870	**<0.203**	0.0330 J	**0.877**
	MW-113	Sep-21	FD	**20.7**	**3.49**		**0.627**	0.00833 J	**3.68**	**1.97**	0.0630	**0.118 J**	<0.00435	<0.102	0.0305	**0.872**
	MW-125	Apr-19		**<0.0314**	0.0670 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-125	Oct-19		**0.0827 JB**	**0.101**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412 J4	<0.00106
	MW-125	Jun-20		**<0.0314**	0.0700 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-125	Oct-20		**0.0382 J**	**0.0942 JB**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-125	Apr-21		**<0.0314**	0.0654 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-125	Sep-21		**0.0493 J**	0.0250 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-126A	Apr-19		**0.124 B**	**0.370**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	MW-126A	Oct-19		**0.903**	**0.583**		<0.000373	0.00162	**0.170**	0.0114	<0.000367	0.00221 J	<0.000341		0.00168	0.00569
	MW-126A	Jun-20		**0.0319 J**	**0.461**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000248 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-126A	Oct-20		**0.0669 J**	**0.451 B**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000502 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-126B	Apr-19		**0.0325 JB**	**0.232**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	MW-126B	Oct-19		**0.0766 JB**	**0.243**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-126B	Jun-20		**<0.0314**	**0.461**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-126B	Oct-20		**0.0343 J**	**0.312 B**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000114 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-126B	Apr-21		**<0.0314**	**0.250**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000152 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-126B	Sep-21		**<0.0314**	**0.181**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000151 J	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-127	Oct-17		**1.68**	**1.41**		0.0327	0.00452	**0.462**	0.0937	**0.885**	0.00901	0.00373		0.0396	0.0482
	MW-127	Apr-18		**5.15**	**1.06**		0.0375	<0.00774	**1.18**	0.121	**0.623**	<0.0200	<0.00682		0.0424	0.0654
	MW-127	Oct-18		**3.13**	**1.30**		0.0272	<0.00774	**1.15**	0.0797	**0.774**	<0.0200	<0.00682		0.0397	0.0458 J
	MW-127	Apr-19		**5.94**	**1.11**		0.0399	<0.00774	**1.65**	0.138	**0.628**	<0.0200 J4	<0.00682		0.0261	0.0933
	MW-128	Oct-17		**1.14**	**2.37**		0.00233	<0.000387	**0.0701**	0.00128	**0.785**	0.00142 J	<0.000341		0.000781 J	0.00336
	MW-128	Apr-18		**0.932**	**1.58**		<0.00746	<0.00774	**0.122**	<0.00768	**0.961**	**0.0422 J**	<0.00682		<0.00824	<0.0212
	MW-128	Oct-18		**2.76**	**2.04**		<0.00746	<0.00774	**0.729**	0.0247	**0.963**	<0.0200	<0.00682		<0.00824	<0.0212
	MW-128	Apr-19		**3.13**	**1.81**		<0.00746	<0.00774	**0.643**	0.0199 J	**0.765**	<0.0200	<0.00682		<0.00824	<0.0212
	MW-129	Apr-16		**2.70**	**1.68**		0.00382	0.000880 J	**<0.0166**	<0.0192	**4.59**	0.00534	0.000796 J		<0.0390	0.00278 J
	MW-129	Oct-16		**2.17**	**1.68**		0.00143	0.000479 J	**0.00791**	0.000985 J	**4.73**	0.00186 JJ4	<0.000341		0.000920 J	0.00124 J
	MW-129	Apr-17		**1.79**	**2.13**		0.00101	<0.000387	0.00299	<0.000384	**4.34**	0.00247 J	<0.000341		0.000543 J	<0.00106
	MW-129	Apr-18		**4.33**	**1.40**		0.000452 J	<0.000387	**0.00731**	0.00130	**5.40**	0.00124 J	<0.000341		0.000816 J	0.00125 J
	MW-130	Apr-19		**0.0395 JB**	**0.648**		<0.000373	<0.000387	0.000351 J	<0.000384	0.00131	<0.00100 J4	<0.000341		<0.000412	<0.00106
	MW-130	Oct-19		**0.0828 JB**	**0.774**		<0.000373	<0.000387	<0.000331	<0.000384	0.00295	<0.00100	<0.000341		<0.000412	<0.00106
	MW-130	Jun-20		**<0.0314**	**0.609**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00424	<0.00100	<0.000174		<0.000278	<0.000174
	MW-130	Oct-20		**<0.0314**	**0.676**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00328	<0.00100	<0.000174		<0.000278	<0.000174
	MW-130	Apr-21		**<0.0314**	**0.586**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00230	<0.00100	<0.000174		<0.000278	<0.000174
	MW-130	Sep-21		**0.0326 J**	**0.387**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00205	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	TPH			Volatile Organic Compounds									
				Analyte	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
				CAS	TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
				CGWSL Source	NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	Well ID	Date	Dup														
Field East of Refinery	MW-131	Apr-17		**6.81**	**1.77**		0.0137	0.00348	**3.09**	0.0532	**3.99**	0.0295	0.0406		0.153	0.114
	MW-131	Oct-17		**4.95**	**1.58**		**<0.0932**	0.00174	**1.39**	<0.0960	**5.25**	**0.0303**	<0.0852		0.0627	<0.265
	MW-131	Oct-19		**8.71**	**1.46**		**0.167**	0.0432	**0.796**	0.0255	**4.95**	**0.0314**	**0.312**		0.232	**0.993**
	MW-131	Jun-20		**8.68**	**1.83**		**0.110**	0.0408 J	**0.907**	0.0171 J	**2.91**	**<0.0500**	**0.242**		0.150	**0.786**
	MW-133	Nov-14		**9.40**	**2.80**		**0.280**	0.0530 J	**0.620**	0.300	**5.60**	**<0.100**	0.0380 J		0.100 J	0.220 J
	MW-133	Apr-15		**11.3**	**3.10**		**0.138**	<0.0390	**0.788**	0.199	**6.67**	**<0.100**	<0.0340		<0.0780	<0.110
	MW-134	Apr-19		**0.0450 JB**	**0.0911 J**		0.000846 J	<0.000387	0.000947 J	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	MW-134	Apr-19	FD	**<0.0314**	**0.0927 J**		0.000471 J	<0.000387	0.00279	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-134	Oct-19		**0.0965 JB**	**0.0947 J**		0.000835 J	<0.000387	0.000392 J	0.000442 J	<0.000367	0.00326 J	<0.000341		<0.000412	<0.00106
	MW-134	Oct-19	FD	**0.0939 JB**	**0.277**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	0.00248 J	<0.000341		<0.000412	0.00106 J
	MW-134	Jun-20		**0.0330 JB**	0.0820 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-134	Jun-20	FD	**0.0332 J**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-134	Oct-20		**<0.0314**	**0.107 B**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-134	Oct-20	FD	**<0.0314**	**0.129**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-134	Apr-21		**0.0419 J**	**0.120**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-134	Apr-21	FD	**0.101**	**0.0992 J**		<0.000322	<0.000104	0.000102 J	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-134	Sep-21		**<0.0314**	**0.297**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-134	Sep-21	FD	**<0.0314**	**0.304**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-135	Apr-19		**0.0317 JB**	0.0521 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	MW-135	Oct-19		**0.0796 JB**	0.0543 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-135	Jun-20		**0.0425 J**	0.0380 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-135	Oct-20		**<0.0314**	0.0723 JB		<0.000322	<0.000104	0.00250	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-135	Apr-21		**<0.0314**	0.0720 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-135	Sep-21		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	0.00174 J	<0.000174	<0.00406	<0.000278	0.000707 J
	MW-145	Oct-20					<0.000322	<0.000104	<0.0000941	<0.000137	0.000496 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-145	Oct-20	FD				<0.000322	<0.000104	<0.0000941	<0.000137	0.000507 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-145	Apr-21		**<0.0314**	**0.288**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000546 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-145	Sep-21		**<0.0314**	**0.302**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000998 J	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-146	Oct-20					<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-146	Apr-21		**<0.0314**	0.0733 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-146	Sep-21		**<0.0314**	**0.0874 J**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000125 J	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-146	Sep-21	FD	**<0.0314**	**0.0993 J**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000105 J	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-147	Oct-20					<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-147	Apr-21		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-147	Sep-21		**<0.0314**	**0.0884 J**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-148	Oct-20					<0.000322	<0.000104	<0.0000941	<0.000137	0.000183 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-148	Apr-21		**<0.0314**	**0.102**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-148	Sep-21		**<0.0314**	**0.212**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	RA-4196	Apr-19					<0.000373	<0.000387	<0.000331	<0.000384	0.00594	<0.00100	<0.000341		<0.000412	<0.00106
	RA-4196	Oct-19					<0.000373	<0.000387	<0.000331	<0.000384	0.00709	<0.00100	<0.000341		<0.000412	<0.00106
	RA-4196	Jun-20					<0.000322	<0.000104	<0.0000941	<0.000137	0.00948	<0.00100	<0.000174		<0.000278	<0.000174
	RA-4196	Oct-20					<0.000322	<0.000104	<0.0000941 Q	<0.000137	0.00798	<0.00100	<0.000174		<0.000278	<0.000174
	RA-4798	Apr-19					<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	RA-4798	Oct-19					<0.000373	<0.000387	<0.000331	<0.000384	0.00943	<0.00100	<0.000341		<0.000412	<0.00106
	RA-4798	Jun-20					<0.000322	<0.000104	<0.0000941	<0.000137	0.0170	<0.00100	<0.000174		<0.000278	<0.000174
	RA-4798	Oct-20					<0.000322	<0.000104	<0.0000941 Q	<0.000137	0.00654	<0.00100	<0.000174		<0.000278	<0.000174
	RA-4798	Apr-21					<0.000322	<0.000104	<0.0000941	<0.000137	0.0136	<0.00100	<0.000174		<0.000278	<0.000174
	RA-4798	Sep-21					<0.000322	<0.000104	<0.0000941	<0.000137	0.0166	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	RW-12R	Apr-17			**1.61**		0.0338	<0.00194	**0.335**	0.00823	0.00210 J	0.00877 J	0.00177 J		0.00354 J	0.0257
	RW-12R	Apr-18			**0.514 B**		0.00448	<0.000387	**0.0358**	0.00269	0.00315	0.00130 J	<0.000341		0.00157	0.00648
	RW-12R	Apr-19			**0.822**		0.0102	<0.000387	**0.0764**	0.00142	0.00341	<0.00100	0.000476 J		0.000866 J	0.00643
	RW-12R	Jun-20			**0.633**		0.00494	<0.000104	**0.154**	0.00223	0.00225	<0.00100	0.000522 J		0.000997 J	0.00605
	RW-13R	Apr-16			**0.808**		0.0443	0.00539	**0.878**	0.0691	0.0779	0.0148	0.0139		0.0175	0.108
	RW-13R	Apr-18			**0.526 B**		0.0443	0.000443 J	**0.0770**	0.00855	0.0559	0.00114 J	0.00159		0.00322	0.0299
	RW-18A	Apr-17					<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	RW-18A	Apr-18					<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	RW-18A	Apr-19					<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	RW-18A	Jun-20					<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	RW-20	Apr-15			**2.10**		**0.539**	**0.113**	**1.87**	**0.973**	**0.209**	**0.183**	0.0590		0.211	**1.35**
	RW-22	Apr-15			**5.40**		**0.575**	**0.0853**	**4.07**	**1.09**	**0.178**	**0.164**	0.0952		0.216	**0.945**
NCL	MW-18	Apr-18			**0.672**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-18	Apr-19			**0.842**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-18	Jun-20			**0.812**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000340 J	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-18	Apr-21			**1.59**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000338 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-45	Apr-19			**0.975**		<0.000373	<0.000387	<0.000331	<0.000384	0.0108	<0.00100	<0.000341		<0.000412	<0.00106
	MW-45	Oct-19			**0.983**		<0.000373	<0.000387	<0.000331	<0.000384	0.00874	<0.00100	<0.000341		<0.000412	<0.00106
	MW-45	Jun-20			**0.739**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00634	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-45	Oct-20			**0.728**		<0.000322	<0.000104	<0.0000941	<0.000137	0.0124	<0.00100	<0.000174		<0.000278	<0.000174
	MW-45	Apr-21			**0.967**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00926	<0.00100	<0.000174		<0.000278	<0.000174
	MW-45	Sep-21			**1.98**		<0.000322	<0.000104	0.000219 J	<0.000137	0.00981	<0.00100	<0.000174	0.00888	<0.000278	0.000483 J
	MW-53	Apr-16			**0.316**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000780	<0.00106
	MW-53	Apr-17			**0.258**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-53	Apr-18			**0.158**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-53	Apr-19			**0.229**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-53R	Oct-20			**0.206**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-53R	Apr-21			**0.123**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-54A	Apr-19			**3.63**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-54A	Oct-19			**2.54**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-54A	Jun-20			**1.97**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-54A	Oct-20			**2.82**		<0.000322	<0.000104	0.000171 J	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-54A	Apr-21			**3.49**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-54A	Sep-21			**3.89**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	0.00170 J	<0.000174	<0.00406	<0.000278	<0.000174
	MW-54B	Apr-15		**<0.0310**	**2.47**		<0.000370	<0.000390	<0.000330	<0.000380	<0.000370	<0.00100	<0.000340		<0.000780	<0.00110
	MW-54B	Apr-17		**<0.0314**	**0.881**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-54B	Apr-19		**<0.0314**	**1.84**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-54B	Apr-21		**<0.0314**	**2.02**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-55	Apr-19		**0.0547 J**	**1.18**		<0.000373	<0.000387	<0.000331	<0.000384	0.0672	<0.00100	<0.000341		<0.000412	<0.00106
	MW-55	Oct-19		**0.142 B**	**1.05**		<0.000373	<0.000387	<0.000331	<0.000384	**0.106**	<0.00100	<0.000341		<0.000412	<0.00106
	MW-55	Jun-20		**0.140**	**0.950**		<0.000322	<0.000104	<0.0000941	<0.000137	**0.228**	<0.00100	<0.000174		<0.000278	<0.000174
	MW-55	Oct-20		**0.635**	**1.34**		<0.00322	<0.00104	<0.000941	<0.00137	**0.299**	<0.0100	<0.00174		<0.00278	<0.00174
	MW-55	Apr-21		**0.412**	**1.81**		<0.00322	<0.00104	<0.000941	<0.00137	**0.449**	<0.0100	<0.00174		<0.00278	<0.00174
	MW-55	Sep-21		**0.187**	**1.41**		<0.000322	<0.000104	<0.0000941	<0.000137	**0.318**	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-56	Apr-18			**0.287**		<0.000373	<0.000387	<0.000331	<0.000384	0.00328	<0.00100	<0.000341		<0.000412	<0.00106
	MW-56	Apr-19			**0.583**		<0.000373	<0.000387	<0.000331	<0.000384	0.00208	<0.00100	<0.000341		<0.000412	<0.00106
	MW-56	Jun-20			**0.110**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000339 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-56	Apr-21			**0.175**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000138 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-108	Apr-19			**5.86**		0.0435	<0.00194	**0.328**	0.00347 J	<0.00184	<0.00500	0.00282 J		0.00475 J	0.0691
	MW-108	Oct-19			**3.36**		0.0279	0.00359 J	**0.301**	0.00383 J	<0.00184	0.00557 J	0.00221 J		0.00475 J	0.0643
	MW-108	Jun-20			**2.79**		0.0128	0.00213 J	**0.235**	0.00278 J	<0.000505	<0.00500 J4	0.00120 J		0.00293 J	0.0415
	MW-108	Oct-20			**3.18**		0.00527	0.000782 J	**0.100**	<0.000685	<0.000505	<0.00500	<0.000870		0.00141 J	0.0176
	MW-108	Apr-21			**4.44**		0.00750	0.000774 J	**0.200**	0.00278 J	<0.000505	<0.00500	<0.000870		0.00286 J	0.0313
	MW-108	Sep-21			**2.90**		0.00684 J	<0.00104	**0.141**	<0.00137	0.00231 J	<0.0100	<0.00174	<0.0406	<0.00278	0.0194 J

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	TPH			Volatile Organic Compounds									
				Analyte	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
				CAS	TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
				CGWSL Source	NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	Well ID	Date	Dup														
NCL	NCL-31	Apr-19			**1.86**		0.000429 J	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-31	Oct-19			**0.934**		0.000439 J	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-31	Jun-20			**0.494**		0.000542 J	0.000195 J	<0.0000941	0.000241 J	<0.000101	<0.00100 J4	0.000287 J		<0.000278	0.000954 J	
	NCL-31	Oct-20			**0.587**		0.000771 J	0.000160 J	<0.0000941	0.000275 J	<0.000101	<0.00100	0.000396 J		<0.000278	0.00123 J	
	NCL-31	Apr-21			**0.974**		0.00249	0.000458 J	<0.0000941	0.000613 J	<0.000101	0.00252 J	0.000352 J		<0.000278	0.00128 J	
	NCL-31	Sep-21			**0.720**		0.000439 J	<0.000104	<0.0000941	<0.000137	<0.000101	0.00185 J	<0.000174	<0.00406	<0.000278	<0.000174	
	NCL-32	Apr-19			**1.67**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-32	Oct-19			**0.970**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-32	Jun-20			**0.533**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	NCL-32	Oct-20			**0.800**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-32	Apr-21			**0.984**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-32	Sep-21			**1.56**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174	
	NCL-33	Apr-19			**7.38**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-33	Oct-19			**8.53**		<0.000373	<0.000387	<0.000331	<0.000384	0.000371 J	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-33	Jun-20			**7.21**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000208 J	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	NCL-33	Oct-20			**8.54**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000230 J	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-33	Apr-21			**17.3**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000449 J	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-33	Sep-21			**10.2**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000377 J	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174	
	NCL-34A	Oct-18			**7.41**		0.00612 J	<0.00387	**1.11**	0.00672 J	<0.00367	<0.0100	<0.00341		<0.00412	0.0266 J	
	NCL-34A	Apr-19			**6.59**		<0.00746	<0.00774	**0.479**	<0.00768	<0.00734	<0.0200 J3J4	<0.00682		<0.00824	<0.0212	
	NCL-34A	Oct-19			**5.90**		0.00369 J	0.00207 J	**0.562**	0.00677	<0.00184	<0.00500	<0.00170		<0.00206	0.0175	
	NCL-34A	Jun-20			**6.58**		0.0113 J	0.00286 J	**1.10**	0.00476 J	<0.00202	<0.0200 J4	<0.00348		<0.00556	0.0335 J	
	NCL-44	Apr-19			**7.31**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-44	Oct-19			**5.80**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-44	Jun-20			**4.52**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000383 J	<0.00100 J4	<0.000174		<0.000278	<0.000174	
	NCL-44	Oct-20			**5.12**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000412 J	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-44	Apr-21			**5.52**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000426 J	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-44	Sep-21			**3.77**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000313 J	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174	
	NCL-49	Apr-19			**0.0986 J**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-49	Apr-19	FD		0.0811 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-49	Oct-19			**0.153**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-49	Oct-19	FD		**0.119**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	NCL-49	Jun-20			**0.0917 J**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-49	Jun-20	FD		0.0640 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-49	Oct-20			0.0702 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-49	Oct-20	FD		0.0750 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-49	Apr-21			0.0315 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-49	Apr-21	FD		0.0728 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174	
	NCL-49	Sep-21			<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174	
	NCL-49	Sep-21	FD		**0.0925 JB**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174	
	MW-23	Apr-19		**15.0**	**13.4**		<0.0373	<0.0387	**5.52**	0.0397 J	<0.0367	**<0.100**	<0.0341		<0.0412	<0.106	
	MW-23	Oct-19		**4.70 B**	**20.1**		<0.00373	<0.00387	**1.42**	0.0105	0.0336	**0.0359 J**	<0.00341		<0.00412	<0.0106	
	MW-23	Jun-20		**8.73**	**13.0**		<0.00322	<0.00104	**2.68**	0.00865 J	0.0407	**0.0380 J**	<0.00174		<0.00278	<0.00174	
	MW-23	Oct-20		**2.93**	**17.9**		<0.00322	<0.00104	**0.915**	0.0264	0.0751	**0.0750**	<0.00174		<0.00278	<0.00174	
	MW-29	Apr-19		**0.0472 JB**	**0.961**		<0.000373	<0.000387	<0.000331	<0.000384	0.00116	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-29	Oct-19		**0.128 B**	**1.28**		<0.000373	<0.000387	<0.000331	0.000547 J	0.00208	<0.00100	<0.000341		<0.000412 J4	<0.00106	
	MW-29	Jun-20		**0.0764 JB**	**2.75**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00162	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-29	Oct-20		**0.0886 J**	**2.28**		<0.000322	<0.000104	0.00158	<0.000137	0.00251	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-29	Apr-21		**0.113**	**3.66**		<0.000322	<0.000104	0.0000994 J	<0.000137	0.00190	<0.00100	<0.000174		<0.000278	<0.000174	
	MW-29	Sep-21		**0.0560 J**	**8.12**		<0.000322	<0.000104	0.000196 J	<0.000137	0.0238	<0.00100	<0.000174	0.0109	<0.000278	<0.000174	
	MW-39	Apr-19		**0.785**	**6.54**		0.0144	0.00508	**0.0314**	0.00689	0.000625 J	<0.00100	0.0196		0.00189	0.0550	
	MW-39	Oct-19		**0.736 B**	**5.64**		0.00573	0.00237	**0.0271**	0.00609	0.00113	<0.00100	0.0149		0.00336 J4	0.0412	
	MW-39	Jun-20		**0.740**	**7.00**		0.00959	0.00206	**0.0289**	0.00317	0.00120	0.00109 J	0.00886		0.00195	0.0321	
	MW-39	Oct-20		**0.412**	**6.28**		0.00377	0.00119	0.00397	0.00165	0.00138	0.00123 J	0.00588		0.000978 J	0.0174	
	MW-40	Apr-17		**1.29**	**4.15**		0.000538 J	<0.000387	**0.00857**	0.000721 J	<0.000367	<0.00100	<0.000341		0.000732 J	0.0117	
	MW-40	Apr-18		**1.18**	**2.45**		<0.000373	<0.000387	0.000769 J	0.000567 J	<0.000367	<0.00100	<0.000341		0.000543 J	0.00619	
	MW-40	Apr-19		**0.769**	**3.38**		<0.000373	<0.000387	**0.0192**	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	0.00157 J	
	MW-40	Jun-20		**0.500**	**2.45**		<0.000322	<0.000104	0.000284 J	0.000220 J	<0.000101	<0.00100	<0.000174		0.000363 J	0.00241 J	
	MW-41	Apr-18		**0.111**	**3.30**		<0.000373	<0.000387	<0.000331	<0.000384	0.00796	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-41	Apr-19		**0.229**	**6.47**		<0.000373	<0.000387	**0.00758**	<0.000384	0.0178	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-41	Jun-20		**0.309 B**	**3.53**		<0.000322	<0.000104	**0.0173**	<0.000137	0.0254	<0.00100	<0.000174		0.000350 J	<0.000174	
	MW-41	Apr-21		**0.245**	**2.32**		<0.000322	<0.000104	**0.00922**	<0.000137	0.0267	<0.00100	<0.000174		0.000301 J	<0.000174	
	MW-42	Apr-18		**0.626**	**2.98**		0.00362	<0.000387	**0.0488**	<0.000384	0.00598	<0.00100	<0.000341		0.000959 J	0.00420	
	MW-42	Apr-19		**0.822**	**5.48**		0.0148	<0.00194	**0.164**	<0.00192	0.00655	<0.00500	<0.00170		<0.00206	0.0226	
	MW-42	Jun-20		**1.26 J**	**4.95**		0.0163	<0.000520	**0.109**	0.00108 J	0.0103	<0.00500	<0.000870		0.00172 J	0.0535	
	MW-42	Apr-21		**0.433**	**4.92**		0.00322 J	<0.000520	**0.00740**	<0.000685	0.0180	<0.00500	<0.000870		<0.00139	0.00852 J	
	MW-43	Apr-19		**2.12**	**7.90**		**0.450**	**0.0997 J**	**6.22**	<0.0768	<0.0734	**0.307 J**	<0.0682		<0.0824	**0.744**	
	MW-43	Oct-19		**32.6 B**	**13.5**		**0.423**	**0.128 J**	**5.74**	0.129 J	<0.0734	**0.229 J**	<0.0682		<0.0824	0.610	
	MW-43	Jun-20		**14.1**	**6.55**		**0.284**	0.00304 J	**3.09**	0.0311	0.0347	**0.132**	0.00925 J		0.0224	**0.712**	
	MW-43	Oct-20		**34.2**	**7.74**		**0.302**	<0.00520	**9.06**	0.136	0.0481 J	**0.105 J**	0.0510		0.0676	**0.903**	
	MW-59	Apr-17		**0.163**	**0.835**		<0.000373	<0.000387	0.00218	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-59	Apr-18		**0.232**	**0.576**		<0.000373	<0.000387	0.00105	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-59	Apr-19		**0.0605 JB**	**1.08**		<0.000373	<0.000387	0.000519 J	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-59	Jun-20		**0.302 B**	**2.97**		<0.000322	<0.000104	0.00112	<0.000137	0.00350	0.00202 J	<0.000174		<0.000278	<0.000174	
	MW-60	Apr-19		**0.252**	**1.61**		0.000401 J	<0.000387	0.00434	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	0.00202 J	
	MW-60	Apr-19	FD	**0.281**	**1.11**		<0.000373	<0.000387	0.00207	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	0.00124 J	
	MW-60	Oct-19		**0.646 B**	**1.01**		<0.000373	<0.000387	0.000658 J	0.000798 J	<0.000367	<0.00100	<0.000341		<0.000412 J4	0.0114	
	MW-60	Oct-19	FD	**0.632 B**	**1.00**		<0.000373	<0.000387	0.000602 J	0.000739 J	<0.000367	<0.00100	<0.000341		<0.000412	0.0108	
	MW-60	Jun-20		**0.466**	**0.754**		<0.000322	<0.000104	0.00187	0.000281 J	<0.000101	<0.00100	<0.000174		<0.000278	0.00157 J	
	MW-60	Jun-20	FD	**0.337**	**0.707**		0.000401 J	<0.000104	0.00390	0.000296 J	<0.000101	<0.00100	<0.000174		<0.000278	0.00194 J	
	MW-60	Oct-20		**0.528**	**1.03**		<0.000322	<0.000104	0.00231	0.000461 J	0.000168 J	<0.00100	<0.000174		<0.000278	0.00238 J	
	MW-60	Oct-20	FD	**0.587**	**0.930**		<0.000322	<0.000104	0.00279 B	0.000472 J	0.000180 J	<0.00100 J4	<0.000174		<0.000278	0.00224 J	
	MW-61	Apr-19		**6.39**	**2.67**		**0.174**	<0.0194	**1.59**	0.0512	<0.0184	**0.117 J**	<0.0170		0.106	0.483	
	MW-61	Oct-19		**11.1 B**	**4.75**		**0.237**	<0.0194	**0.835**	0.0550	<0.0184	**0.211 J**	<0.0170		0.0848	0.571	
	MW-61	Jun-20		**13.0 B**	**4.45**		**0.222**	<0.00520	**1.60**	0.0545	<0.00505	**0.177 J**	<0.00870		0.153	0.611	
	MW-61	Oct-20		**11.7**	**4.58**		**0.241**	0.0191 J	**1.60**	0.0519	0.0110 J	**0.177 J**	<0.00870		0.161	**0.695**	
	MW-61	Apr-21		**10.4**	**4.79**		**0.224**	0.0237 J	**1.29**	0.0587	0.00740 J	**0.185 J**	<0.00870		0.140	0.568	
	MW-61	Sep-21		**11.2**	**6.38**		**0.261**	0.0325 J	**1.62**	0.110	0.0286 J	**0.190 J**	<0.00870	**<0.203**	0.180	**0.789**	
	MW-62	Apr-19		**6.09**	**6.18**		**0.536**	**0.129**	**1.87**	0.0652	<0.00734	**0.177**	<0.00682		<0.00824	**0.988**	
	MW-62	Oct-19		**10.6 B**	**8.55**		**0.537**	**0.123**	**1.77**	0.0653	0.0449	**0.177**	<0.00682		<0.00824	**0.874**	
	MW-62	Jun-20		**9.16**	**7.79**		**0.382**	**0.0782**	**1.09**	0.0506	0.0672	**0.177**	<0.00348		<0.00556	0.557	
	MW-62	Oct-20		**7.35**	**7.46**		**0.347**	**0.0783**	**1.24**	0.151	0.0836	**0.116**	0.00538 J		<0.00556	**0.762**	
	MW-62	Sep-21		**21.8**	**11.3**		**1.20**	**0.204**	**2.11**	**0.773**	**0.120**	**0.344**	0.0261 J	**<0.203**	0.0236 J	**2.37**	
	MW-62R	Oct-20		**7.74**	**11.4**		**0.0775**	0.0117	**1.92**	0.0302	0.0107	**0.0790**	0.00103		0.000571 J	0.137	
	MW-62R	Apr-21		**2.40**	**9.88**		0.0469 J	<0.00520	**0.451**	0.0287 J	0.00545 J	**<0.0500**	<0.00870		<0.0139	<0.00870	
	MW-67	Oct-17		**0.649**	**8.48 J3J4**		0.00119	<0.000387	**0.130**	0.00330	**0.201**	<0.00100	<0.000341		0.00140	0.00245 J	
	MW-67	Apr-18		**1.53**	**4.25**		0.00206 J	<0.00194	**0.147**	0.00500	**0.219**	<0.00500	<0.00170		0.00261 J	0.00916 J	
	MW-67	Oct-18		**0.562**	**7.73**		0.000557 J	<0.000387	0.00480	0.000620 J	**0.289**	<0.00100	<0.000341		<0.000412	0.00113 J	
	MW-67	Apr-19		**0.868**	**9.31**		<0.00186	<0.00194	**0.122**	0.00237 J	**0.140**	<0.00500	<0.00170		<0.00206	<0.00530	
	MW-90	Apr-19		**0.0877 J**	**4.99**		<0.000373	<0.000387	0.00125	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106	
	MW-90	Oct-19		**0.321 B**	**2.21**		<0.000373	<0.000387	0.00267	0.000557 J	<0.000367	<0.00100	<0.000341		0.000519 JJ4	<0.00106	
	MW-90	Jun-20		**0.412**	**3.69**		<0.000322	<0.000104	0.00305	0.000290 J	<0.000101	<0.00100	0.000299 J		0.000350 J	0.000299 J	
	MW-90	Oct-20		**0.498**	**3.99**		<0.000322	<0.000104	0.00334	0.000310 J	<0.000101	<0.00100	0.000349 J		0.000323 J	0.000349 J	
	MW-90	Apr-21		**0.477**	**4.25**		<0.000322	<0.000104	0.00164	0.000228 J	<0.000101	<0.00100	0.000225 J		<0.000278	0.000225 J	
	MW-90	Sep-21		**0.384**	**3.31**		<0.00322	<0.00104	**0.00730 J**	<0.00137	<0.00101	<0.0100	<0.00174	<0.0406 J3	<0.00278	<0.00174	

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	TPH			Volatile Organic Compounds									
				Analyte	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
				CAS	TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
				CGWSL Source	NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	Well ID	Date	Dup														
North Refinery	MW-91	Oct-18		**16.7**	**11.8**		**0.182**	0.0510 J	**2.86**	0.210	<0.0367	**<0.100**	0.164		**1.24**	**0.716**
	MW-91	Apr-19		**13.8**	**15.8**		**0.216**	0.0571 J	**2.89**	0.481	<0.0367	**<0.100**	0.187		**1.94**	**0.799**
	MW-91	Oct-19		**34.8 B**	**10.8**		**0.239**	**0.0675 J**	**4.07**	**1.48**	<0.0367	**<0.100**	**0.548**		**7.07 J4**	**2.12**
	MW-91	Jun-20		**36.2**	**11.5**		**0.234**	**0.0671 J**	**4.12**	**1.85**	<0.0101	**<0.100**	**0.649**		**6.95**	**2.50**
	MW-92	Apr-16		**5.50**	**20.4**		**0.0588**	0.0174	**2.87**	0.462	**0.113**	**0.224 J**	0.0268		0.0173	0.188
	MW-92	Oct-16		**6.05**	**22.8**		0.0308	0.00835 J	**2.05**	0.400	**0.134**	**0.174**	0.0151 J		<0.0156	0.110
	MW-93	Apr-17		**3.73**	**7.89**		**0.148**	0.0236 J	**0.633**	<0.00960	<0.00918	**0.0422 J**	<0.00852		<0.0103	0.326
	MW-93	Apr-18		**3.59**	**5.05**		**0.116**	0.0260	**0.857**	0.00738	<0.000367	0.0256	0.00452		0.00797	0.336
	MW-93	Apr-19		**2.82**	**7.92**		**0.187**	0.0356	**0.673**	0.00962	<0.000367	**0.0482**	0.00409		0.00748	0.303
	MW-93	Jun-20		**6.28**	**8.54**		**0.111**	0.0243	**1.21**	0.00622 J	<0.00202	**0.0519 J**	<0.00348		0.0123 J	0.296
	MW-94	Oct-15		**6.12**	**25.6**		**0.432**	**0.0857**	**0.339**	0.509	**0.798**	**0.202**	**0.360**		0.553	0.574
	MW-94	Apr-16		**7.91**	**8.69**		**0.489**	**0.100**	**0.417**	0.553	**0.621**	**0.228 J**	**0.387**		0.687	0.615
	MW-94	Oct-16		**6.83**	**9.76**		**0.458**	**0.0917**	**0.297**	0.564	**2.01**	**0.128**	**0.390**		0.468	0.592
	MW-94	Apr-17		**10.2**	**9.96**		**0.398**	**0.0785**	**0.284**	0.432	**0.958**	**0.174**	**0.292**		0.435	0.460
	MW-95	Apr-17		**0.0826 J**	**6.96**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-95	Apr-18		**<0.0314**	**3.68**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-95	Apr-19		**<0.0314**	**7.34**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-95	Jun-20		**0.162 B**	**6.29**		<0.000322	<0.000104	0.000603 J	0.000196 J	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-96	Apr-19		**17.0**	**9.67**		<0.0186	<0.0194	**<0.0166**	<0.0192	**32.7**	**<0.0500**	<0.0170		<0.0206	<0.0530
	MW-96	Oct-19		**25.7 B**	**6.80**		<0.0187	<0.0194	**<0.0166**	<0.0192	**33.3**	**<0.0500**	<0.0170		<0.0206	<0.0530
	MW-96	Jun-20		**30.4**	**8.28**		**<0.0805**	<0.0260	**<0.0235**	<0.0343	**37.6**	**<0.250**	<0.0435		<0.0695	<0.0435
	MW-96	Oct-20		**71.6**	**6.91**		**<0.0805**	<0.0260	**0.0424 J**	<0.0343	**40.5**	**<0.250**	<0.0435		<0.0695	<0.0435
	MW-96	Sep-21		**14.5**	**8.33**		0.0116	0.00109 J	0.00122 J	0.00320 J	**29.5**	0.0248 J	0.00179 J	<0.0406	<0.00278	0.00179 J
	MW-98	Apr-19		**25.0**	**5.64**		**0.618**	**0.138**	**2.69**	**1.18**	<0.0184	**0.251**	0.0314 J		0.284	**2.19**
	MW-98	Oct-19		**19.5 B**	**6.15**		**0.453**	**0.112**	**1.88**	**0.870**	<0.0184	**0.301**	0.0266 J		0.246	**1.87**
	MW-98	Jun-20		**16.7**	**6.31**		**0.646**	**0.110**	**1.74**	**0.711**	<0.00505	**0.255**	0.0256 J		0.202	**2.17**
	MW-98	Oct-20		**22.0**	**5.31**		**0.371**	**0.0820**	**1.73**	**0.788**	<0.00505	**0.207 J**	0.0254 J		0.236	**1.88**
	MW-98	Apr-21		**14.4**	**4.89**		**0.431**	**0.0924**	**1.12**	**0.938**	<0.00505	**0.294**	0.0253 J		0.227	**1.84**
	MW-98	Sep-21		**14.1**	**6.01**		**0.392**	**0.0923**	**1.20**	0.629	<0.00505	**0.223 J**	0.0253 J	**<0.203**	0.204	**1.76**
	MW-137	Oct-17		**33.1**	**11.3**		**0.559**	**0.137 J**	**12.5**	**1.53**	0.0754 J	**0.317 J**	**0.265**		**1.54**	**1.16**
	MW-137	Apr-18		**26.6**	**9.60**		**0.531**	**0.125 J**	**9.63**	**1.86**	0.0758 J	**0.373 J**	**0.398**		**1.83**	**1.30**
	MW-137	Oct-18		**32.6**	**8.76**		**0.342**	**<0.0774**	**10.6**	**1.09**	0.0876 J	**0.237 J**	0.165 J		0.977	**0.688**
	MW-137	Apr-19		**33.2**	**9.76**		**0.426**	**0.0946 J**	**7.93**	**1.21**	<0.0734	**<0.200**	**0.274**		**1.28**	**0.821**
	MW-138	Oct-17		**2.20**	**15.0**		0.00547	<0.00194	**0.701**	0.0244	**0.163**	**0.0635**	<0.00170		0.00577	0.00565 J
	MW-138	Apr-18		**2.44**	**6.05**		0.0413	0.00633	**0.741**	0.222	**0.188**	**0.0667**	0.00541		0.0128	0.0492
	MW-138	Oct-18		**4.06**	**6.00**		**0.0799**	0.0121	**0.628**	0.423	**0.269**	**0.0379**	0.00635		0.00806	0.115
	MW-138	Apr-19		**4.17**	**6.67**		**0.126**	0.0214	**0.663**	0.389	**0.171**	**0.0377**	0.00315 J		0.00480 J	0.100
	RW-1R	Apr-16		**2.13**	**8.54**		0.00369	0.000516 J	**0.426**	0.0214	0.0133	0.00762	0.00110		0.00542	0.0122
	RW-1	Apr-17		**2.20**	**21.5**		<0.00373	<0.00387	**0.696**	0.0169	0.0441	<0.0100	<0.00341		0.0102	<0.0106
	RW-1	Apr-18		**6.05**	**8.92**		0.0303	0.00550	**1.52**	0.0964	0.0292	0.0132	0.00282		0.0176	0.0855
	RW-1	Apr-19		**5.13**	**16.1**		0.0348	0.00566	<0.000331	0.102	0.0218	0.00849	0.00412		0.0221	0.0844
	RW-2	Apr-15		**18.3**	**19.7**		**0.330**	**0.0772**	**5.34**	**1.02**	<0.00370	**0.157 J**	0.0853		0.115	0.530
	RW-2R	Apr-16		**20.8**	**17.3**		**0.188**	0.0419 J	**5.86**	0.591	0.0226 J	**0.145 J**	0.0461 J		0.0569 J	0.299
	RW-2	Apr-17		**17.2**	**11.6**		**0.271**	**0.0664**	**7.78**	**0.837**	<0.0184	**0.145 J**	0.0183 J		0.0430 J	0.431
	RW-2	Apr-18		**20.5**	**8.31**		**0.329**	**0.0783**	**4.68**	0.672	0.0120	**0.190**	0.00601		0.0312	0.446
	RW-7	Apr-17		**<0.0314**	**1.15**		<0.000373	<0.000387	<0.000331	<0.000384	0.0325	<0.00100	<0.000341		<0.000412	<0.00106
	RW-7	Apr-18		**0.177**	**11.3**		0.00502	0.000415 J	**0.0319**	0.00132	0.0378	0.00204 J	0.00114		0.00106	0.00545
	RW-7	Apr-19		**0.230**	**19.1**		0.00114	<0.000387	**0.0114**	<0.000384	0.0229	<0.00100	<0.000341		<0.000412	<0.00106
	RW-7	Jun-20		**0.334 JB**	**7.54**		0.000639 J	<0.000104	0.00487	0.000204 J	0.00825	<0.00100	0.000305 J		0.000397 J	0.00240 J
	RW-8	Apr-15			**7.30**		0.00710 J	<0.00390	**0.0412**	0.00801 J	**2.41**	<0.0100	<0.00340		<0.00780	<0.0110
	RW-8	Apr-17			**11.6**		**0.0928**	0.0249	**0.0718**	0.0198	**1.94**	**0.0320**	0.0112		0.00213	0.0498
	RW-9	Apr-18		**2.20**	**2.31**		0.00314	<0.000387	**0.243**	0.00159	0.00409	<0.00100	<0.000341		0.00218	0.0180
	RW-9	Apr-19		**1.67**	**4.33**		<0.000373	<0.000387	**0.0968**	0.00108	0.00439	<0.00100	<0.000341		0.00179	0.00929
	RW-9	Jun-20		**0.821**	**4.02**		0.000722 J	0.000313 J	0.000141 J	0.000448 J	0.0674	<0.00100	0.000387 J		0.00108	0.00136 J
	RW-9	Apr-21		**0.903**	**3.37**		0.00294	0.000584 J	0.000352 J	0.000652 J	**0.219**	0.00212 J	0.000732 J		0.000442 J	0.00200 J
	RW-10	Apr-18		**0.380**	**2.81**		0.000631 J	<0.000387	<0.000331	0.000727 J	<0.000367	<0.00100	0.00346		0.00163	0.00474
	RW-10	Apr-19		**0.195**	**3.06**		0.000377 J	<0.000387	<0.000331	0.000633 J	<0.000367	<0.00100	0.00272		0.00135	0.00369
	RW-10	Jun-20		**0.219**	**3.33**		0.000959 J	0.000180 J	0.000205 J	0.000865 J	0.000418 J	<0.00100	0.00235		0.00150	0.00387
	RW-10	Apr-21		**0.532**	**6.96**		0.00429	0.000850 J	0.000378 J	0.00500	0.00268	0.00196 J	0.0170		0.0104	0.0200
	RW-16B	Apr-17			**1.08**		<0.000373	<0.000387	<0.000331	<0.000384	0.0152	<0.00100	<0.000341		<0.000412	<0.00106
	RW-16B	Apr-18			**0.350**		<0.000373	<0.000387	<0.000331	<0.000384	0.00172	<0.00100	<0.000341		<0.000412	<0.00106
	RW-16B	Apr-19			**0.744**		<0.000373	<0.000387	<0.000331	<0.000384	0.00166	<0.00100	<0.000341		<0.000412	<0.00106
	RW-16B	Jun-20			**2.12**		0.000398 J	0.000156 J	<0.0000941	0.000328 J	0.00482	<0.00100	0.000377 J		0.000428 J	0.00125 J
	RW-17A	Apr-17		**0.0622 J**	**2.57**		<0.000373	<0.000387	<0.000331	<0.000384	**0.189**	<0.00100	<0.000341		<0.000412	<0.00106
	RW-17A	Apr-18		**0.0927 J**	**1.57**		<0.000373	<0.000387	<0.000331	<0.000384	**0.107**	<0.00100	<0.000341		<0.000412	<0.00106
	RW-17A	Apr-19		**<0.0314**	**1.45**		<0.000373	<0.000387	0.000850 J	<0.000384	0.0434	<0.00100	<0.000341		<0.000412	<0.00106
	RW-17A	Jun-20		**0.0426 J**	**1.44**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
North RO Field	MW-117	Apr-19		**0.0967 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-117	Oct-19		**0.0732 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-117	Jun-20		**<0.0314**	**0.109**		<0.000322	<0.000104	<0.0000941	<0.000137	0.000222 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-117	Oct-20		**<0.0314**	**0.0997 JB**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00195	<0.00100	<0.000174		<0.000278	<0.000174
	MW-117	Apr-21		**<0.0314**	**0.211**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00284	<0.00100	<0.000174		<0.000278	<0.000174
	MW-117	Sep-21		**0.0573 J**	**0.146**		<0.000322	<0.000104	<0.0000941	<0.000137	0.0580	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-118	Apr-19		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-118	Oct-19		**0.0728 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-118	Jun-20		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-118	Oct-20		**<0.0314**	0.0817 JB		<0.000322	<0.000104	<0.0000941	0.000149 J	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-118	Apr-21		**<0.0314**	0.0499 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-118	Sep-21		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	0.000139 J	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-119	Apr-19		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-119	Oct-19		**0.0830 JB**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-119	Jun-20		**<0.0314**	**0.376**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-119	Oct-20		**<0.0314**	**0.215 B**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-119	Apr-21		**<0.0314**	**0.135**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-119	Sep-21		**<0.0314**	0.0272 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
South Refinery	KWB-2R	Apr-17			**1.35**		0.0341	<0.000387	**0.0260**	0.00543	0.0192	0.00609	0.000772 J		<0.000412	0.0281
	KWB-2R	Oct-17			**4.84**		**0.150**	<0.000387	**1.12**	0.325	0.0202	**0.0675**	0.00977		0.0161	0.193
	KWB-2R	Apr-19			**0.887**		**0.148**	0.00172	**0.177**	0.686	0.0235	0.00993 J4	0.00500		0.00820	0.180
	KWB-2R	Oct-19			**4.64**		**0.139**	0.00233	**0.920**	0.264	0.0216	**0.0323**	0.00608		0.0140 J4	0.115
	KWB-5	Oct-17			**1.55**		**<0.0932**	<0.000387	**0.336**	<0.0960	**12.4**	0.0131	<0.0852		0.00156	<0.265
	KWB-5	Apr-18			**1.70**		**<0.0932**	**<0.0968**	**0.411**	<0.0960	**10.3**	**<0.250**	<0.0852		<0.103	<0.265
	KWB-5	Oct-18			**1.62**		**<0.0932**	**<0.0968**	**0.278**	<0.0960	**10.8**	**<0.250**	<0.0852		<0.103	<0.265
	KWB-5	Apr-19			**1.73**		**<0.0932**	**<0.0968**	**0.425**	<0.0960	**9.94**	**<0.250 J4**	<0.0852		<0.103	<0.265
	KWB-6	Apr-17			**2.04**		**0.399**	0.0517	**4.67**	0.346	**0.154**	**0.0563**	0.0179		0.0205	0.391
	KWB-6	Oct-17			**2.16**		**0.206**	0.0302	**3.22**	0.183	**0.102**	**0.0436**	0.00804		0.0122	0.283
	KWB-6	Apr-18			**1.77**		**0.164**	0.0557	**3.88**	0.156	**0.122**	**0.0587 J**	0.0350		0.00879 J	0.258
	KWB-6	Oct-18			**1.52**		**0.122**	**0.0611**	**2.64**	0.102	**0.120**	**0.0469 J**	0.0234		0.0126 J	0.379
	MW-28	Apr-19		**5.37**	**8.80**		**0.107**	<0.0194	**1.43**	0.0274 J	**0.268**	**0.0736 J**	<0.0170		0.0272 J	0.140 J
	MW-28	Oct-19		**10.4 B**	**11.6**		**0.213**	0.0243 J	**1.51**	0.0375 J	**0.692**	**0.137 J**	<0.0170		0.0384 J	0.264
	MW-28	Jun-20		**3.94**	**3.91**		0.0527	<0.000520	**0.397**	0.0201	**0.194**	0.0157 J	0.00154 J		0.0126	0.0916
	MW-28	Oct-20		**1.65**	**5.28**		0.0430	0.00133 J	**0.362**	0.0136	**0.214**	0.00638 J	0.00171 J		0.00882	0.0626
	MW-48	Apr-18		**45.6**	**6.50**		**0.381**	**<0.0968**	**14.9**	**1.36**	**0.171 J**	**<0.250**	<0.0852		**1.02**	**0.955**
	MW-48	Oct-18		**21.8**	**5.56**		**0.377**	**<0.0968**	**7.97**	0.479	**0.611**	**<0.250**	<0.0852		<0.103	0.358 J
	MW-48	Apr-19		**17.7**	**6.53**		**0.564**	**<0.0968**	**4.87**	0.603	**0.372**	**1.20 JJ4**	<0.0852		0.152 J	0.498 J
	MW-48	Oct-19		**31.9 B**	**6.48**		**0.240 J**	**<0.0967**	**5.04**	0.118 J	**0.517**	**<0.250**	<0.0852		0.138 J	0.290 J

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	TPH			Volatile Organic Compounds									
				Analyte	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
				CAS	TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
				CGWSL Source	NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	Well ID	Date	Dup														
South Refinery	MW-50	Apr-19			**0.632**			<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-50	Oct-19			**0.399**			<0.000373	<0.000387	<0.000331	0.000417 J	<0.000367	<0.00100	<0.000341		<0.000412 J4	<0.00106
	MW-50	Jun-20			**0.522**			<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-50	Oct-20			**0.526**			<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-50	Apr-21			**0.396**			<0.000322	<0.000104	0.000515 J	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-50	Sep-21			**0.437**			0.000688 J	0.000143 J	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-52	Apr-19		**0.0328 JB**	**0.146**			<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	MW-52	Oct-19		**0.0776 JB**	**0.183**			<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-52	Jun-20		**<0.0314**	**0.294**			<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-52	Oct-20		**<0.0314**	**0.282**			<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-52	Apr-21		**<0.0314**	**0.270**			<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-52	Sep-21		**<0.0314**	**0.432**			<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-64	Apr-19		**130**	**9.22**			**0.592**	**0.117**	**33.6**	**2.46**	**0.509**	**0.171**	**1.49**		**15.4**	**5.39**
	MW-64	Oct-19		**96.0**	**6.97**			**0.522**	**0.102**	**35.7**	**2.79**	**0.502**	**0.133**	**1.14**		**11.2**	**5.06**
	MW-64	Jun-20		**102**	**8.18**			**0.453 J**	**0.0760 J**	**27.5**	**1.76**	**0.461 J**	**<0.500**	**1.03**		**9.93**	**4.29**
	MW-64	Oct-20		**94.8**	**6.54**			**0.252 J**	<0.0520	**27.2**	**1.55**	**0.560**	**<0.500**	**0.794**		**8.09**	**3.10**
	MW-64	Apr-21		**100**	**6.54**			**0.436 J**	**0.0967 J**	**27.1**	**1.80**	**0.431 J**	**<0.500**	**0.928**		**8.88**	**4.15**
	MW-64	Sep-21		**98.2**	**7.63**			**0.315**	**0.0602**	**25.1**	**1.03**	**0.491**	**0.105 J**	**0.822**	**2.48**	**9.03**	**3.06**
	MW-65	Apr-18		**15.5**	**5.05**			<0.0373	<0.0387	**4.39**	0.0528 J	**1.73**	**0.253 J**	<0.0341		<0.0412	<0.106
	MW-65	Oct-18		**10.4**	**4.57**			<0.0373	<0.0387	**2.84**	<0.0384	**2.38**	**<0.100**	<0.0341		<0.0206	<0.106
	MW-65	Apr-19		**16.9**	**4.86**			<0.0373	<0.0387	**5.45**	0.0628 J	**2.35**	**0.152 J**	<0.0341		<0.0412	<0.106
	MW-65	Oct-19		**21.4 B**	**3.59**			<0.0373	<0.0387	**6.07**	0.0565 J	**1.82**	**0.148 J**	<0.0341		<0.0412	<0.106
	MW-66	Apr-19		**6.03**	**3.25**			<0.00932	<0.00968	**0.916**	<0.00960	**1.36**	**0.0987 J**	<0.00852		<0.0103	<0.0265
	MW-66	Oct-19		**7.15 B**	**2.77**			<0.00933	<0.00968	**1.24**	<0.00960	**1.69**	**0.0758 J**	<0.00852		<0.0103	<0.0265
	MW-66	Jun-20		**8.44**	**2.19**			0.000705 J	<0.000104	**1.18**	0.00717	**1.62**	**0.167**	0.00239		0.00581	0.0145
	MW-66	Oct-20		**4.41**	**3.36**			<0.00322	<0.00104	**0.965**	0.00643 J	**1.90**	**0.0737**	0.00183 J		0.00445 J	0.00787 J
	MW-66	Apr-21		**5.16**	**3.52**			0.00570 J	0.00114 J	**0.701**	0.0185	**3.15**	**0.0620**	0.00451 J		0.0129	0.0268 J
	MW-99	Oct-18		**11.9**	**2.23**			**0.284**	<0.0387	**2.54**	0.201	**3.10**	**<0.100**	<0.0341		<0.0412	0.358
	MW-99	Apr-19		**14.9**	**2.93**			**0.352**	<0.0387	**1.67**	0.491	**2.24**	**<0.100**	<0.0341		<0.0412	0.379
	MW-99	Oct-19		**5.02**	**2.30**			**0.234**	<0.0387	**0.233**	0.241	**0.533**	**<0.100**	<0.0341		<0.0412	0.218 J
	MW-99	Jun-20		**3.97**	**4.19**			**0.149**	<0.00104	**0.414**	0.0866	**0.379**	<0.0100	0.00630 J		0.00330 J	0.0784
	MW-101	Apr-19		**0.421**	**3.98**			<0.000373	<0.000387	<0.000331	<0.000384	0.0830	<0.00100	<0.000341		<0.000412	<0.00106
	MW-101	Oct-19		**0.440 B**	**4.58**			<0.000373	<0.000387	0.000430 J	<0.000384	0.0766	0.00270 J	<0.000341		<0.000412	<0.00106
	MW-101	Jun-20		**0.553**	**4.85**			<0.000322	<0.000104	0.00438	0.000302 J	0.0502	<0.00100	<0.000174		<0.000278	<0.000174
	MW-101	Oct-20		**5.37**	**6.07**			0.0254	0.00284	**2.32**	0.0180	0.0532	0.0180	0.000814 J		0.00858	0.0779
	MW-101	Apr-21		**2.91**	**4.65**			<0.00644	<0.00208	**0.810**	0.0141 J	0.0567	<0.0200	<0.00348		<0.00556	<0.00348
	MW-101	Sep-21		**2.07**	**6.14**			0.00172	0.000333 J	**0.687**	0.00801	0.0635	0.00215 J	0.000274 J	0.108	0.00279	0.00375
	MW-102	Apr-19		**27.7**	**9.96**			**0.235**	0.0306	**11.0**	<0.000384	**1.79**	**0.178**	0.0430		0.169	0.405
	MW-102	Oct-19		**34.7 B**	**13.6**			**0.263**	0.0481 J	**12.3**	**0.908**	**1.55**	**0.179 J**	0.0825		0.238	0.532
	MW-102	Jun-20		**27.1**	**5.50**			**0.0927 J**	<0.0104	**7.10**	0.477	**0.719**	**0.142 J**	<0.0174		0.0484 J	0.188 J
	MW-102	Oct-20		**28.9**	**9.97**			**0.0910 J**	0.0117 J	**8.72**	0.537	**1.20**	**0.127 J**	0.0274 J		0.0746 J	0.254 J
	MW-102	Apr-21		**19.7**	**12.6**			**0.114**	<0.0104	**7.61**	0.418	**1.23**	**0.156 J**	<0.0174		0.0385 J	0.165 J
	MW-102	Sep-21		**33.4**	**14.5**			**0.131**	0.00901 J	**10.7**	0.645	**1.22**	**0.172 J**	0.0149 J	**0.588**	0.0990	0.263
	MW-102	Sep-21	FD	**37.6**	**14.4**			**0.139**	0.0110 J	**10.8**	0.654	**1.22**	**0.186 J**	0.0196 J	**0.502**	0.0893	0.273
	MW-103	Apr-18		**6.45**	**6.23**			<0.000373	<0.000387	**1.75**	0.0384	<0.000367	**0.116**	0.00461		0.0408	0.0124
	MW-103	Apr-19		**6.55**	**7.87**			<0.00746	<0.00774	**1.39**	0.0573	<0.00734	0.0256 J	<0.00682		0.0347	<0.0212
	MW-103	Jun-20		**5.15**	**6.08**			<0.00644	<0.00208	**1.14**	0.00844 J	<0.00202	<0.0200	<0.00348		0.0121 J	<0.00348
	MW-103	Apr-21		**4.84**	**6.58**			<0.00644	<0.00208	**1.09**	0.00314 J	<0.00202	<0.0200	0.00571 J		0.0113 J	0.00571 J
	MW-104	Apr-19		**1.53**	**2.23**			<0.000373	<0.000387	**0.192**	0.000633 J	0.00178	<0.00100	<0.000341		0.000567 J	<0.00106
	MW-104	Apr-19	FD	**1.20**	**2.15**			<0.000373	<0.000387	**0.190**	<0.000384	0.00158	<0.00100	<0.000341		<0.000412	<0.00106
	MW-104	Oct-19		**1.34**	**1.26**			0.000715 J	<0.000387	**0.181**	0.00330	0.00165	0.00216 J	<0.000341		0.000515 JJ4	<0.00106
	MW-104	Oct-19	FD	**1.30**	**1.36**			0.000374 J	<0.000387	**0.173**	0.00250	<0.00184	0.00208 J	<0.000341		<0.000412	<0.00106
	MW-104	Jun-20		**1.44**	**1.14**			0.000486 J	<0.000104	**0.0720**	<0.000137	0.000680 J	<0.00100	<0.000174		0.000324 J	<0.000174
	MW-104	Jun-20	FD	**1.22**	**1.03**			0.000368 J	<0.000104	**0.0660**	0.000161 J	0.000790 J	<0.00100	<0.000174		0.000403 J	<0.000174
	MW-104	Oct-20		**1.32**	**1.04**			<0.000322	<0.000104	0.00473	<0.000137	0.000402 J	<0.00100	0.000239 J		<0.000278	0.000239 J
	MW-104	Oct-20	FD	**1.15**	**1.10**			0.000351 J	<0.000104	**0.00631**	<0.000137	0.000506 J	<0.00100	0.000193 J		<0.000278	0.000193 J
	MW-104	Apr-21		**1.06**	**0.762**			<0.000322	<0.000104	**0.0163**	<0.000137	0.000406 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-104	Apr-21	FD	**1.07**	**0.800**			<0.000322	<0.000104	**0.0169**	<0.000137	0.000417 J	<0.00100	<0.000174		<0.000278	<0.000174
	MW-104	Sep-21		**0.911**	**0.722**			<0.00161 J4	<0.000520 J4	<0.000471	<0.000685	<0.000505	<0.00500 J3	<0.000870	<0.0203	<0.00139	<0.000870
	MW-105	Apr-19		**20.3**	**7.24**			0.0442	0.0237	**8.07**	0.0988	0.00541	**0.0334**	<0.0170		0.0155	0.239
	MW-105	Oct-19		**17.1 B**	**7.63**			0.0522	0.0365 J	**4.23**	0.0963	<0.0184	**0.134 J**	<0.0170		<0.0206	0.308
	MW-105	Jun-20		**25.6**	**9.03**			0.0443 J	0.0247 J	**7.41**	0.0282 J	0.0234 J	**<0.0500**	<0.00870		0.0150 J	0.237
	MW-105	Oct-20		**32.8**	**9.39**			**0.0572**	0.0202 J	**11.5**	0.584	0.0230 J	**0.0778 J**	<0.00870		0.0187 J	0.371
	MW-105	Apr-21		**20.2**	**12.8**			**0.0594 J**	<0.0104	**7.07**	0.0453 J	0.0296 J	**<0.100**	<0.0174		<0.0278	0.215 J
	MW-106	Apr-19		**9.47**	**7.27**			**0.554**	**0.281 J**	**5.92**	<0.192	**<0.184**	**1.24 J**	<0.170		<0.206	<0.530
	MW-106	Oct-19		**60.5 B**	**16.1**			**0.0848**	<0.0194	**9.61**	0.0301 J	0.0757	**0.148 J**	<0.0170		0.158	0.196
	MW-106	Jun-20		**28.4 B**	**14.6**			**0.0861 J**	0.0146 J	**9.39**	0.0662 J	0.0672 J	**<0.100**	<0.0174		0.313	0.173 J
	MW-106	Oct-20		**54.4**	**16.5**			**0.0943 J**	<0.0208	**14.9**	0.161 J	**0.105 J**	**<0.200**	0.0359 J		0.295	0.289 J
	MW-106	Apr-21		**24.4**	**26.3**			**0.116 J**	<0.0208	**9.39**	0.101 J	0.0746 J	**<0.200**	<0.0348		0.289	0.245 J
	MW-107	Oct-16		**17.7**	**7.24**			0.00205 J	<0.00194	**6.35**	0.0192	**3.05**	**0.0614**	0.00265 J		0.00800 J	0.0112 J
	MW-107	Apr-17		**6.67**	**7.91**			<0.0186	<0.0194	**3.37**	<0.0192	**2.78**	**0.0788 J**	<0.0170		<0.0206	<0.0530
	MW-107	Apr-18		**21.6**	**4.50**			0.00228	0.00425	**6.55**	0.0382	**3.02**	**0.143**	0.00279		0.0142	0.0159
	MW-107	Apr-19		**23.3**	**7.93**			**<0.0932**	**<0.0968**	**6.43**	<0.0960	**3.39**	**<0.250**	<0.0852		<0.103	<0.265
	MW-109	Apr-19		**5.21 B**	**2.53**			<0.00746	<0.00774	**1.03**	0.0115 J	<0.00734	<0.0200 J4	<0.00682		0.0122 J	<0.0212
	MW-109	Oct-19		**5.46 B**	**2.84**			0.00288 J	<0.00194	**1.11**	0.00829	<0.00184	<0.00500	<0.00170		0.0151 J4	0.0136 J
	MW-109	Jun-20		**5.44**	**2.61**			<0.00322	<0.00104	**1.78**	0.00892 J	<0.00101	<0.0100	<0.00174		0.0221	0.0238 J
	MW-109	Oct-20		**3.77**	**2.33**			<0.00322	<0.00104	**1.11**	0.00637 J	<0.00101	<0.0100	<0.00174		0.0123	0.0114 J
	MW-109	Apr-21		**2.44**	**1.57**			<0.00322	<0.00104	**0.690**	0.00539 J	<0.00101	<0.0100	<0.00174		0.00829 J	0.00555 J
	MW-109	Sep-21		**5.69 J3**	**6.03**			<0.00805	<0.00260	**2.18**	0.00952 J	<0.00253	<0.0250	<0.00435	<0.102	0.0250 J	0.0145 J
	MW-110	Apr-19		**0.623**	**0.903**			0.000560 J	<0.000387	**0.0117**	0.000675 J	<0.000367	<0.00100 J4	<0.000341		0.000544 J	0.00169 J
	MW-110	Oct-19		**0.506 B**	**0.630**			<0.000373	<0.000387	0.000530 J	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-110	Jun-20		**0.587**	**0.696**			0.00293	0.000744 J	0.00152	0.000357 J	<0.000101	<0.00100	<0.000174		<0.000278	0.00123 J
	MW-110	Oct-20		**0.406**	**0.721**			<0.000322	<0.000104	0.000146 J	0.000175 J	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-110	Apr-21		**0.639**	**0.999**			<0.000322	0.000127 J	**0.0581**	0.000193 J	<0.000101	<0.00100	<0.000174		0.000418 J	0.000578 J
	MW-110	Sep-21		**0.616**	**1.49**			<0.000322	<0.000104	0.00427	<0.000137	<0.000101	0.00207 J	<0.000174	<0.00406	<0.000278	0.00315
	MW-139	Oct-19		**0.636 B**	**1.15**			<0.000373	<0.000387	0.00153	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-139	Jun-20		**0.411**	**1.55**			<0.000322	<0.000104	0.000275 J	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-139	Oct-20		**0.490**	**1.30**			<0.000322	<0.000104	0.000206 J	<0.000137	<0.000101	0.00410 J	<0.000174		<0.000278	<0.000174
	MW-139	Apr-21		**0.383**	**1.67**			<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-139	Sep-21		**0.635**	**1.91**			<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	RA-313	Apr-18						<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	RA-313	Apr-19						<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J4	<0.000341		<0.000412	<0.00106
	RA-313	Jun-20						<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	RA-313	Apr-21						<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	RW-4	Apr-17			**2.35**			<0.00186	<0.00194	**0.0294**	<0.00192	**0.132**	<0.00500	<0.00170		<0.00206	<0.00530
	RW-4	Apr-18			**1.02**			0.000659 J	<0.000387	**0.00821**	<0.000384	0.0583	0.00103 J	<0.000341		<0.000412	<0.00106
	RW-4	Apr-19			**2.53**			0.00105	0.000400 J	**0.0854**	0.00198	0.0933	0.0266	0.000454 J		0.000772 J	0.00192 J
	RW-4	Jun-20			**1.63**			0.000958 J	0.000329 J	**0.0184**	0.00185	0.0727	<0.00100	0.00105		0.00557	0.00375
	RW-5R	Apr-15			**6.42**			**0.298**	0.0558	**2.92**	**1.03**	**2.15**	**0.174**	**0.522**		**2.26**	**1.91**
	RW-5R	Apr-16			**7.39**			**0.437**	**0.100**	**3.48**	**1.20**	**1.64**	**0.205**	**0.570**		**2.51**	**2.25**
	RW-6	Apr-15			**11.4**			**0.134**	0.0280	**0.636**	0.0476	**2.27**	**0.0602**	0.0558		0.0126 J	0.158
	RW-6R	Apr-16			**4.20**			0.00555	0.00111	**0.218**	0.00474	**2.68**	0.00574	0.00275		0.00683	0.00747
	RW-6	Apr-18			**3.04**			0.0143	0.00259	**2.67**	0.0838	<0.000367	0.0290	0.0570		0.448	0.150
	RW-6	Apr-19			**3.23**			0.0110 J	<0.00774	**1.18**	0.0487	**0.792**	**0.0678 J**	0.00804 J		0.0211	0.0304 J

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	TPH			Volatile Organic Compounds									
				Analyte	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
				CAS	TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
				CGWSL Source	NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	Well ID	Date	Dup														
South Refinery	RW-15C	Apr-17			**9.74**		**1.46**	**0.231**	**19.1**	**4.19**	**4.25**	**0.383**	**0.472**		0.172	**5.39**
	RW-15C	Apr-18			**9.27**		**1.06**	**0.138**	**21.9**	**3.93**	**3.02**	**<0.500**	0.0285		0.111	**3.01**
	RW-15C	Apr-19			**11.7**		**0.728**	0.0476	<0.00331	**3.03**	**3.66**	**0.173** J4	0.00812 J		0.0871	**1.05**
South RO Field	MW-114	Apr-19		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-114	Oct-19		**0.0705** JB	0.0374 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-114	Jun-20		**<0.0314**	**0.436**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00475	<0.00100	<0.000174		<0.000278	<0.000174
	MW-114	Oct-20		**<0.0314**	**0.663**		<0.000322	<0.000104	<0.0000941	<0.000137	0.0112	<0.00100	<0.000174		<0.000278	<0.000174
	MW-114	Apr-21		**<0.0314**	**0.736**		<0.000322	<0.000104	<0.0000941	<0.000137	0.0101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-114	Sep-21		**0.0655 J**	**0.502**		<0.000322	0.000276 J	<0.0000941	<0.000137	0.0120	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
South RO Field	MW-115	Apr-19		**<0.0314**	0.0376 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-115	Oct-19		**0.0733** JB	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-115	Jun-20		**<0.0314**	0.0430 J		<0.000322	<0.000104	<0.0000941	<0.000137	0.00126	<0.00100	<0.000174		<0.000278	<0.000174
	MW-115	Oct-20		**<0.0314**	**0.222 B**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00364	<0.00100	<0.000174		<0.000278	<0.000174
	MW-115	Apr-21		**<0.0314**	**0.313**		<0.000322	<0.000104	<0.0000941	<0.000137	0.0113	<0.00100	<0.000174		<0.000278	<0.000174
	MW-115	Sep-21		**<0.0314**	**0.173**		<0.000322	<0.000104	<0.0000941	<0.000137	0.0228	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-116	Apr-19		**0.0383** JB	**0.172**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-116	Oct-19		**0.118 B**	**0.123**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412 J4	<0.00106
	MW-116	Jun-20		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-116	Oct-20		**<0.0314**	**0.127 B**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-116	Apr-21		**<0.0314**	**0.231**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-116	Sep-21		**<0.0314**	**0.214**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
TEL	MW-49	Apr-19		**4.03**	**8.93**		**0.0784**	0.0112	**0.400**	0.0137	**0.139**	0.0165 J	0.00242 J		0.00550	0.114
	MW-49	Oct-19		**5.13 B**	**6.47**		**0.0794**	0.0155	**0.576**	0.0175	**0.160**	0.0132 J	0.00243 J		0.00941	0.122
	MW-49	Jun-20		**5.45**	**4.96**		**0.115**	0.0214	**0.600**	0.0249	**0.148**	0.0241 J	<0.00348		0.00895 J	0.179
	MW-49	Oct-20		**5.05**	**5.44**		**0.0763**	0.0154 J	**0.404**	0.0121 J	**0.196**	<0.0200	<0.00348		<0.00556	0.113
	MW-49	Apr-21		**2.56**	**6.65**		0.0527	0.0105 J	**0.280**	0.00827 J	**0.257**	<0.0250	<0.00435		<0.00695	0.0793
	MW-49	Sep-21		**2.57**	**6.81**		0.0403	0.00713 J	**0.280**	0.00787 J	**0.210**	0.0201 J	<0.00174	<0.0406	0.00473 J	0.0675
	TEL-1	Oct-18		**0.381**	**8.36**		<0.00186	<0.00194	<0.00166	<0.00192	0.00255 J	<0.00500	<0.00170		<0.00206	<0.00530
	TEL-1	Apr-19		**0.357**	**8.30**		0.000820 J	<0.000387	<0.000331	0.000481 J	0.00297	<0.00100	0.00126		0.000600 J	0.00126 J
	TEL-1	Oct-19		**0.736** JB	**8.74**		0.00140	<0.000387	<0.000331	0.000750 J	0.00310	<0.00100	0.00196		0.000961 J	0.00284 J
	TEL-1	Jun-20		**0.366 J**	**5.74**		0.00114	0.000302 J	<0.0000941	0.000831 J	0.00230	<0.00100	0.00155		0.000961 J	0.00294 J
	TEL-2	Oct-18		**5.19**	**14.8**		**0.115**	0.0165 J	**0.936**	0.0121 J	<0.00918	<0.0250	<0.00852		0.0209 J	0.123
	TEL-2	Apr-19		**4.27**	**15.8**		**0.0639**	0.00655 J	**1.08**	0.00401 J	0.00752 J	<0.0100	<0.00341		0.0113	0.0843
	TEL-2	Oct-19		**3.00 B**	**13.5**		**0.0603**	0.00551 J	**0.618**	0.00384 J	0.00496 J	<0.0100	<0.00341		0.00920 J	0.0638
	TEL-2	Jun-20		**1.89**	**8.16**		0.0402	0.00377 J	**0.362**	0.00152 J	0.00459 J	<0.0100	<0.00174		0.00510 J	0.0489
	TEL-3	Apr-18		**2.05**	**7.42**		0.0200	0.000983 J	**0.392**	0.00162	0.0637	<0.00100	0.00313		0.00394	0.0219
	TEL-3	Apr-19		**0.999**	**4.14**		0.0226	<0.000387	**0.162**	0.000779 J	0.00433	<0.00100	0.00165		0.00166	0.00882
	TEL-3	Oct-19		**1.54 B**	**4.82**		0.0379	<0.000387	**0.0573**	0.000766 J	0.00175	0.00119 J	0.00191		0.00150	0.0142
	TEL-3	Oct-20		**2.28**	**6.36**		**0.0659**	0.00147	**0.182**	0.00262	0.00419	0.00365 J	0.00640		0.00449	0.0505
	TEL-4	Apr-19		**0.625**	**1.27**		0.00105	<0.000387	0.00190	<0.000384	0.00115	<0.00100	<0.000341		<0.000412	<0.00106
	TEL-4	Apr-19	FD	**0.664**	**1.31**		0.00105	<0.000387	0.00193	<0.000384	0.00122	<0.00100	<0.000341		<0.000412	<0.00106
	TEL-4	Oct-19		**0.919 B**	**4.16**		<0.00187	<0.00194	**0.0913**	<0.00192	0.0381	<0.00500	<0.00170		<0.00206	<0.00530
	TEL-4	Oct-19	FD	**1.34 B**	**4.31**		0.000713 J	<0.000387	**0.0955**	<0.000384	0.0425	<0.00100	<0.000341		0.000648 J	0.00125 J
	TEL-4	Jun-20		**0.456 J**	**5.73**		<0.00161	<0.000520	**0.00721**	<0.000685	0.0431	<0.00500	<0.000870		<0.00139	<0.000870
	TEL-4	Jun-20	FD	**0.976 J**	**5.68**		0.000866 J	<0.000104	**0.00759**	0.000453 J	0.0438	<0.00100	0.000275 J		0.000640 J	0.00211 J
	TEL-4	Oct-20		**0.837 J**	**5.91**		<0.00161	<0.000520	0.00154 J	<0.000685	0.0898	<0.00500	<0.000870		<0.00139	<0.000870
	TEL-4	Oct-20	FD	**1.07**	**6.12**		<0.000322	<0.000104	0.00133	0.000370 J	0.0891	<0.00100	0.000209 J		0.000395 J	0.00117 J
	TEL-4	Apr-21		**0.834**	**6.87**		0.00286	0.000486 J	0.000588 J	0.000952 J	0.0969	0.00240 J	0.000599 J		0.000798 J	0.00211 J
	TEL-4	Apr-21	FD	**0.829**	**6.87**		0.00291	0.000488 J	0.000602 J	0.00106	0.0942	0.00236 J	0.000592 J		0.000757 J	0.00209 J
	TEL-4	Sep-21		**0.847**	**6.36**		0.00135	<0.000104	**0.116**	0.000365 J	0.0369	0.00140 J	0.000229 J	0.130	0.00113	0.00136 J
	TEL-4	Sep-21	FD	**0.821**	**6.37**		0.00128	0.000193 J	**0.133**	0.000393 J	0.0393	0.00150 J	0.000254 J	0.147	0.00129	0.00132 J
Three Mile Ditch	MW-8	Apr-18		**0.0561 J**	**0.112**		<0.000373	<0.000387	<0.000331	<0.000384	0.0388	<0.00100	<0.000341		<0.000412	<0.00106
	MW-8	Apr-19		**0.127 B**	**0.0861 J**		<0.000373	<0.000387	<0.000331	<0.000384	0.0750	<0.00100 J3J4	<0.000341		<0.000412	<0.00106
	MW-8	Jun-20		**0.300**	0.0458 J		<0.000322	<0.000104	<0.0000941	<0.000137	**0.149**	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-8	Apr-21		**0.107**	**0.0902 J**		<0.000322	<0.000104	<0.0000941	<0.000137	**0.104**	<0.00100	<0.000174		<0.000278	<0.000174
	MW-16	Apr-18			**0.189**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-16	Apr-19			**0.156**		<0.000373	<0.000387 J4	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-16	Jun-20			**0.120**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-16	Apr-21			**0.138**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-20	Apr-18			0.0810 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-20	Apr-19			0.0561 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100 J3J4	<0.000341		<0.000412	<0.00106
	MW-20	Jun-20			<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-20	Apr-21			**0.141**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-21	Apr-19		**0.149 B**	**0.184**		<0.000373	<0.000387	<0.000331	<0.000384	**0.101**	<0.00100 J3J4	<0.000341		<0.000412	<0.00106
	MW-21	Oct-19		**0.229 B**	0.0847 J		<0.000373	<0.000387	<0.000331	<0.000384	**0.217**	<0.00100	<0.000341		<0.000412	<0.00106
	MW-21	Jun-20		**0.284**	**0.149**		<0.000322	<0.000104	<0.0000941	<0.000137	**0.128**	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-21	Oct-20		**0.492**	**0.163**		<0.00161	<0.000520	<0.000471	<0.000685	**0.243**	<0.00500	<0.000870		<0.00139	<0.000870
	MW-21	Apr-21		**0.0899 J**	**0.354**		<0.000322	<0.000104	<0.0000941	<0.000137	0.0948	<0.00100	<0.000174		<0.000278	<0.000174
	MW-21	Sep-21		**0.100 J**	**0.174**		<0.000322	<0.000104	<0.0000941	<0.000137	**0.191**	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-25	Apr-18			0.0327 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-25	Apr-19			0.0401 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-25	Jun-20			<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-25	Apr-21			0.0537 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-26	Apr-18			0.0492 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-26	Apr-19			0.0502 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-26	Jun-20			0.0276 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-26	Apr-21			0.0537 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-27	Apr-18			0.0537 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-27	Apr-19			0.0517 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-27	Jun-20			<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-27	Apr-21			0.0659 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-46R	Apr-19			<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-46R	Oct-19			0.0677 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-46R	Jun-20			0.0408 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-46R	Oct-20			**0.111**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-46R	Apr-21			**0.217**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-46R	Sep-21			**0.209**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174	<0.00406	<0.000278	<0.000174
	MW-68	Apr-18			0.0508 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-68	Apr-19			0.0267 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-68	Jun-20			0.0250 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-68	Apr-21			**0.0962 J**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	MW-71	Apr-18			<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-71	Apr-19			<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-71	Jun-20			0.0323 J		<0.000322	<0.000104	<0.0000941	<0.000137	0.00152	<0.00100 J4	<0.000174		<0.000278	<0.000174
	MW-71	Apr-21			**0.0936 J**		<0.000322	<0.000104	<0.0000941	<0.000137	0.00706	<0.00100	<0.000174		<0.000278	<0.000174
	MW-89	Apr-18			**0.403**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	0.000421 J		<0.000412	<0.00106
	MW-89	Apr-19			**0.611**		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	MW-89	Jun-20			**0.218**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100 J4	0.000664 J		<0.000278	0.000664 J
	MW-89	Apr-21			**0.175**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	0.000241 J		<0.000278	0.000241 J
	NP-1	Apr-19					<0.000373	<0.000387	<0.000331	<0.000384	0.0484	<0.00100 J3J4	<0.000341		<0.000412	<0.00106
	NP-1	Oct-19					<0.000373	<0.000387	<0.000331	<0.000384	**0.149**	<0.00100	<0.000341		<0.000412	<0.00106
	NP-1	Jun-20					<0.000322	<0.000104	<0.0000941	<0.000137	**0.216**	<0.00100 J4	<0.000174		<0.000278	<0.000174
	NP-1	Oct-20					0.000430 J	0.000104 J	<0.0000941	0.000245 J	**0.217**	<0.00100	<0.000174		<0.000278	0.000456 J
	NP-1	Apr-21					<0.000322	<0.000104	<0.0000941	<0.000137	**0.101**	<0.00100	<0.000174		<0.000278	<0.000174
	NP-1	Sep-21					<0.00805	0.000215 J	<0.0000941	<0.00343	**0.503**	0.00145 J	<0.000174	<0.00406	<0.000278	<0.000174

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				TPH			Volatile Organic Compounds									
	Analyte			GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	Ethylbenzene	MTBE	Naphthalene	o-Xylene	TBA	Toluene	Total Xylenes
	CAS			TPH-GRO	TPH-DRO	TPH-DRO	95-63-6	108-67-8	71-43-2	100-41-4	1634-04-4	91-20-3	95-47-6	75-65-0	108-88-3	1330-20-7
	Units			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL			0.0101	0.0858	0.0167	0.0560	0.0600	0.00500	0.700	0.100	0.0300	0.193	0.150	1.00	0.620
	CGWSL Source			NMED TPH			USEPA TW	USEPA TW	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC TW	USEPA TW	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**													
Three Mile Ditch	NP-6	Apr-15					<0.000370	<0.000390	<0.000330	<0.000380	0.00878	<0.00100 UJ	<0.000340		<0.000780	<0.00110
	NP-6	Apr-17					<0.000373	<0.000387	<0.000331	<0.000384	0.0353	<0.00100	<0.000341		<0.000412	<0.00106
	NP-6	Apr-19					<0.000373	<0.000387	<0.000331	<0.000384	0.0729	<0.00100 J3J4	<0.000341		<0.000412	<0.00106
	NP-6	Apr-21					<0.000322	<0.000104	<0.0000941	<0.000137	0.0407	<0.00100	<0.000174		<0.000278	<0.000174
Upgradient	UG-1	Apr-18		**<0.0314**	0.0723 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	UG-1	Apr-19		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	UG-1	Jun-20		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	UG-1	Apr-21		**<0.0314**	0.0579 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	UG-2	Apr-18		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	UG-2	Apr-19		**<0.0314**	0.0647 J		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	UG-2	Jun-20		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	UG-2	Apr-21		**<0.0314**	0.0316 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	UG-3R	Apr-18		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	UG-3R	Apr-19		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	UG-3R	Jun-20		**0.0421 J**	0.0478 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	UG-3R	Apr-21		**<0.0314**	**0.0931 J**		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	UG-4	Apr-18		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	UG-4	Apr-19		**<0.0314**	<0.0247		<0.000373	<0.000387	<0.000331	<0.000384	<0.000367	<0.00100	<0.000341		<0.000412	<0.00106
	UG-4	Jun-20		**<0.0314**	<0.0247		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174
	UG-4	Apr-21		**<0.0314**	0.0643 J		<0.000322	<0.000104	<0.0000941	<0.000137	<0.000101	<0.00100	<0.000174		<0.000278	<0.000174

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.
---	No applicable CGWSL.

Abbreviations

1,2,4-TMB	1,2,4-Trimethylbenzene
1,3,5-TMB	1,3,5-Trimethylbenzene
CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
DRO	Diesel Range Organics
DRO-EP	Diesel Range Organics data from wells located in the Evaporation Ponds area
Dup	Duplicate sample
FD	Field duplicate sample
GRO	Gasoline Range Organics
mg/L	Milligrams per Liter
MTBE	Methyl Tert-Butyl Ether
NMED TPH	NMED Risk Assessment Guidance for Site Investigations and Remediation, November 2021, Table 6-4 TPH Groundwater Screening Level
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, November 2021, Table A-1 Tap Water Screening Level
TBA	tert-Butyl alcohol (tert-Butanol)
TPH	Total Petroleum Hydrocarbons
USEPA TW	United States Environmental Protection Agency Tap Water Screening Level, "Regional Screening Levels (RSL) Summary Table", November 2021
WQCC Dom	NMED Groundwater standard for domestic water supply, 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
Q	Sample was prepared and/or analyzed past recommended holding time.
V3	Internal standard exhibited poor recovery due to sample matrix interference; analytical result biased high.

Table 4B - Summary of Groundwater Analytical Data - Total Metals

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HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCCIrr	WQCCIrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCCIrr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Cross-Gradient	KWB-13	Apr-18		0.00395	0.0325	0.343	<0.000160	0.000953 J	0.00437 B	**3.01**	0.00292	0.0490	0.0000726 JB	0.00296	0.0131	0.0249	0.0261
	KWB-13	Apr-19		0.00485	0.0372	0.376	0.000325 J	0.00113 J	0.00514 B	**2.18**	0.00472	0.0829	<0.0000490	0.00325	0.0151	0.0250	0.0308
	KWB-13	Jun-20		0.00587	0.0485	0.306	<0.000478	0.00163 J	0.00721	**4.41**	0.00654	0.113	<0.000100	0.0110	0.0103	0.0260	0.0327
	KWB-13	Apr-21		0.00822	0.0713	0.287	0.000652 J	0.00279	0.0152	**10.8**	0.00870	0.179	<0.000100	0.0107	0.0115	0.0196 J	0.0446
	MW-136	Apr-19		0.00283	0.0153	0.699	<0.000160	0.000319 J	0.000696 J	0.163	0.000319 J	0.0206	<0.0000490	0.00143 J	0.00503	**0.0729**	0.0169
	MW-136	Oct-19		0.00256	0.0121	0.663	<0.000160	<0.000260	<0.000540	0.0670 J	0.000261 J	0.0127	0.0000659 JB	0.00108 J	0.00581	**0.0599**	0.0184
	MW-136	Jun-20		0.00245	0.0147 J	0.571	<0.000478	0.000685 J	<0.00149	0.171	<0.00249	0.0352	<0.000100	0.00183 J	0.00593	**0.0639**	0.0161
	MW-136	Oct-20		0.00247	0.0123 J	0.556	<0.000478	<0.000477	<0.00149	0.0705 J	<0.00249	0.0123 B	<0.000100	0.00248	0.00553	**0.0558**	0.0158
	MW-136	Apr-21		0.00252	0.0122 J	0.475	<0.000150	0.000526 J	0.00160 J	0.116	0.00247	0.0207	<0.000100	0.00359	0.00730	**0.0459**	0.0153
	MW-136	Sep-21		0.00287	0.0125	0.505	<0.000150	0.000760 J	<0.00124	0.0558 J	<0.000849	0.0162	<0.000100	0.00251	0.00591	**0.0396**	0.0149
	NP-5	Apr-15		0.00288	0.0159				0.00109 J	0.437	0.000415 J	0.00318 J			0.0125		
	NP-5	Apr-17		0.00305	0.00938				<0.000540	0.0632 J	<0.000240	0.000586 J			0.0124		
	NP-5	Apr-19		0.00313	0.00844				<0.000540	0.0278 J	0.000709 J	0.000563 J			0.0119		
	NP-5	Apr-21		0.00331	0.00873 J				<0.00124	0.0551 J	<0.000849	0.00154 J			0.00904		
	RA-3156	Apr-18															
	RA-3156	Apr-19															
	RA-3156	Jun-20															
	RA-3156	Apr-21															
Evaporation Ponds	MW-1R	Apr-18		0.00180 J	0.0224				<0.000540	**3.42**	0.000344 J	**1.71**			0.000380 J		
	MW-1R	Apr-19		0.00176 J	0.0213				<0.000540	**2.17**	<0.000240	**0.995**			<0.000380		
	MW-1R	Jun-20		0.00119 J	0.0219				<0.00149	**1.87**	<0.00249	**1.30**			<0.000657		
	MW-1R	Apr-21		0.00120 J	0.0204				<0.00124	**1.67**	<0.000849	**0.996**			<0.000300		
	MW-2A	Apr-19		0.00824	0.0214				0.00139 J	**2.14**	0.000266 JB	**1.03**			0.00175 J		
	MW-2A	Oct-19		0.00661	0.0315				<0.000540	0.109	<0.000240	**1.10**			0.00186 J		
	MW-2A	Jun-20		**0.0140**	0.0200				<0.00149	**2.78**	<0.00249	**1.74**			<0.000657		
	MW-2A	Oct-20		0.00798	0.0148 J				<0.00149	0.700	<0.00249	**0.491 V**			0.000658 J		
	MW-2A	Apr-21		0.00878	0.0266				0.00282	0.335	<0.00424	**1.66**			0.00169 J		
	MW-2A	Sep-21		0.00921	0.0322				0.00135 J	0.375	<0.000849	**1.17**			0.00287		
	MW-3	Apr-19		**0.0238**	0.0128				0.00140 J	0.0281 J	<0.000240	**0.462**			0.0143		
	MW-3	Apr-19	FD	**0.0224**	0.0128				0.00172 J	0.0281 J	0.000432 J	**0.491**			0.0131		
	MW-3	Oct-19		**0.0976**	0.0151				0.000655 J	**3.73**	0.000341 J	**1.72**			0.00316		
	MW-3	Oct-19	FD	**0.101**	0.0154				0.000666 J	**3.79**	0.000337 J	**1.73**			0.00323		
	MW-3	Jun-20		**0.0278**	0.0125 J				<0.00149	<0.0489	<0.00249	**0.880**			0.00995		
	MW-3	Jun-20	FD	**0.0299**	0.0152 J				<0.00149	<0.0489	<0.00249	**0.913**			0.0100		
	MW-3	Oct-20		**0.0340**	0.0142 J				<0.00149	0.0772 J	<0.00249	**1.27**			0.00722		
	MW-3	Oct-20	FD	**0.0343**	0.0150 J				<0.00149	0.0500 J	<0.00249	**1.38**			0.00646		
	MW-3	Apr-21		**0.0415**	0.0154 J				**0.0536**	0.503	<0.000849	**1.96**			0.00471		
	MW-3	Apr-21	FD	**0.0417**	0.0158 J				0.0174	0.334 J	<0.00424	**1.90**			0.00570 J		
	MW-3	Sep-21		**0.0275**	0.0150				<0.00124	0.0896 J	<0.000849	**0.764**			0.0167		
	MW-3	Sep-21	FD	**0.0276**	0.0157				<0.00124	0.0840 J	<0.000849	**0.839**			0.0172		
	MW-4A	Apr-19		**0.132**	0.0121				0.000785 J	**1.67**	0.000346 JB	**1.82**			0.000731 J		
	MW-4A	Oct-19		**0.0758**	0.0131				0.000785 J	**1.88**	<0.000240	**2.01**			<0.000380		
	MW-4A	Jun-20		**0.111**	0.0125 J				<0.00149	**2.55**	<0.00249	**1.79**			<0.000657		
	MW-4A	Oct-20		**0.114**	0.0133 J				0.00183 J	**1.73**	<0.00249	**1.74**			<0.000657		
	MW-4A	Apr-21		**0.0799**	0.0125 J				<0.00124	**1.20**	<0.000849	**1.78**			0.000630 J		
	MW-4A	Sep-21		**0.0304**	0.0130				<0.00124	0.465	<0.000849	**2.17**			0.000490 J		
	MW-4B	Apr-15		**0.101**	0.0349				<0.00110	**3.60**	0.00189 J	**8.68**			<0.000760		
	MW-4B	Apr-17		**0.0371**	0.0182				<0.000540	**3.42**	<0.000240	**7.35**			<0.000380		
	MW-4B	Apr-19		**0.0699**	0.0165				0.000725 J	**1.54**	0.000544 JB	**11.1**			<0.000380		
	MW-4B	Apr-21		**0.0515**	0.0169 J				<0.00124	**2.05**	<0.000849	**8.88**			<0.000300		
	MW-5A	Apr-19		**0.0975**	0.0118				0.000668 J	**6.12**	0.000696 JB	**1.45**			0.000997 J		
	MW-5A	Oct-19		**0.0939**	0.0137				0.000572 J	**5.14**	0.000327 J	**1.69**			0.000737 J		
	MW-5A	Jun-20		**0.195**	0.0153 J				0.00159 J	**3.57**	<0.00249	**0.653**			0.00116 J		
	MW-5A	Oct-20		**0.202**	0.0160 J				<0.00149	**5.02**	<0.00249	**0.848**			0.000974 J		
	MW-5A	Apr-21		**0.165**	0.0148 J				<0.00124	**5.64**	<0.000849	**1.01**			0.000927 J		
	MW-5A	Sep-21		**0.116**	0.0143				<0.00124	**4.84**	<0.000849	**1.69**			0.000862 J		
	MW-5B	Apr-15		**0.201**	0.0112 J				0.00277 J	**6.11**	<0.00120	**3.87**			0.00197 J		
	MW-5B	Apr-17		**0.154**	0.0115				<0.000540	**4.61**	<0.000240	**3.32**			0.00139 J		
	MW-5B	Apr-19		**0.169**	0.0105				0.000773 J	**4.70**	<0.000240	**3.10**			0.00244		
	MW-5B	Apr-21		**0.0117**	0.0132 J				0.00390	0.828	<0.000849	**1.01**			<0.000300		
	MW-5C	Apr-15		**0.0145**	0.0200 J				<0.00270	**1.15**	<0.00120	**0.975**			<0.00190		
	MW-5C	Apr-17		**0.0113**	0.0237				<0.000540	**1.09**	0.000287 J	**0.918**			<0.000380		
	MW-5C	Apr-19		**0.0114**	0.0127				<0.000540	0.858	0.000611 JB	**0.971**			<0.000380		
	MW-5C	Apr-21		**0.178**	0.0114 J				0.00149 J	**4.87**	<0.000849	**3.00**			0.00162 J		
	MW-6A	Apr-18		0.00960	0.0132				0.00136 JB	0.275 B	0.000553 J	**0.301**			0.000614 J		
	MW-6A	Apr-19		0.00818	0.0127				0.000969 J	0.468	0.000315 JB	**0.304**			0.000599 J		
	MW-6A	Jun-20		0.00491	0.0121 J				<0.00149	0.472	<0.00249	**0.259**			<0.000657		
	MW-6A	Apr-21		0.00554	0.0129 J				0.00184 J	0.478	0.000966 J	**0.282**			0.000382 J		
	MW-6B	Apr-15		**0.0333**	0.0164				<0.00110	**1.37**	<0.000480	**3.45**			<0.000760		
	MW-6B	Apr-17		**0.0115**	0.0134				<0.000540	0.149	<0.000240	**0.889**			<0.000380		
	MW-6B	Apr-19		**0.0421 O1**	0.0154				<0.000540	**1.48 O1**	0.00132 JB	**2.34 O1V**			0.000416 J		
	MW-6B	Apr-21		**0.0462**	0.0141 J				0.00209	**1.59**	<0.000849	**2.24**			<0.000300		
	MW-7A	Apr-19		**0.0251**	0.0155				<0.000540	**4.21**	0.000377 JB	**0.431**			0.000446 J		
	MW-7A	Apr-19	FD	**0.0266**	0.0164				<0.000540	**4.69**	<0.000240	**0.476**			<0.000380		
	MW-7A	Oct-19		**0.0188**	0.0172				0.00212	0.325	0.000280 J	**0.360 V**			0.00524		
	MW-7A	Oct-19	FD	**0.0193**	0.0183				0.00191 J	0.387	<0.000240	**0.372**			0.00509		
	MW-7A	Jun-20		**0.0158**	0.0135 J				0.00168 J	**1.86**	<0.00249	**0.384**			<0.000657		
	MW-7A	Jun-20	FD	**0.0178**	<0.0389				<0.00745	**2.25**	<0.0124	**0.448**			<0.00328		
	MW-7A	Oct-20		**0.0373**	0.0164 J				0.00394	**4.89**	<0.00249	**0.400**			<0.000657		
	MW-7A	Oct-20	FD	**0.0240**	0.0170 J				0.00266	**2.97**	<0.00249	**0.386**			<0.000657		
	MW-7A	Apr-21		**0.0482**	0.0183 J				0.0119	**9.48**	0.00198 J	**0.501**			0.000516 J		
	MW-7A	Apr-21	FD	**0.0235**	0.0158 J				0.00392 B	**3.45**	<0.000849	**0.477**			0.000495 J		
	MW-7A	Sep-21		**0.0118**	0.0166				<0.00124	0.869	<0.000849	**0.557**			0.000622 J		
	MW-7A	Sep-21	FD	**0.0122**	0.0168				0.00277	0.905	<0.000849	**0.543**			0.000662 J		
	MW-7B	Apr-15		0.00588	0.0111				0.000702 J	0.188	<0.000240	**0.580**			<0.000380		
	MW-7B	Apr-17		0.00397	0.0111				<0.000540	0.146	<0.000240	**0.472**			<0.000380		
	MW-7B	Apr-19		0.00400	0.0114				<0.000540	0.0885 J	0.000403 JB	**0.488**			<0.000380		
	MW-7B	Apr-21		0.00427	0.0112 J				<0.00124	0.121 B	<0.000849	**0.570**			0.000437 J		
	MW-10	Apr-19		**0.0149**	0.0118				0.000749 J	0.136	0.000501 J	**2.63**			0.000838 J		
	MW-10	Oct-19		**0.0184**	0.0219				<0.000540	**1.05**	<0.000240	**2.74**			0.000619 J		
	MW-10	Jun-20		**0.0143**	0.0132 J				<0.00149	0.199	<0.00249	**2.13 V**			<0.000657		
	MW-10	Oct-20		**0.0149**	0.0129 J				<0.00149	0.208	<0.00249	**2.40**			<0.000657		
	MW-10	Apr-21		**0.0142**	0.0143 J				0.00169 J	0.342 B	<0.000849	**2.66**			<0.000300		
	MW-10	Sep-21		**0.0194**	0.0184				<0.00124	0.809	<0.000849	**2.45**			0.000515 J		
	MW-11A	Apr-19		0.000398 J	0.0283				0.0207	0.953	0.000513 J	**0.207**			<0.000380		
	MW-11A	Oct-19															
	MW-11A	Jun-20		<0.000735	0.0294				0.00339	**1.76**	<0.00249	**1.55**			<0.000657		
	MW-11A	Oct-20															
	MW-11A	Apr-21		<0.00180	0.0285 J				<0.0124	0.919 J	<0.00849	0.145			<0.00300		
	MW-11A	Sep-21															
	MW-11B	Apr-15		0.00453 J	0.0189 J				<0.00540	**4.38**	<0.00240	**0.427**			<0.00380		
	MW-11B	Apr-17		0.00420	0.0189				<0.000540	**4.59**	<0.000240	**0.374**			<0.000380		
	MW-11B	Apr-19		0.00336	0.0160				<0.000540	**3.67**	<0.000240	**0.367**			<0.000380		
	MW-11B	Apr-21		0.00370 J	0.0203 J				<0.00620	**3.96**	<0.00424	**0.403**			<0.00150		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCClrr	WQCClrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCClrr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Evaporation Ponds	MW-15	Apr-18		**0.0165**	0.0225					0.00926	0.0730 J	0.000357 JB	**0.394**			0.00128 J		
	MW-15	Apr-19		**0.0204**	0.0242					<0.000540	0.0520 J	0.000401 J	0.166			0.00101 J		
	MW-15	Jun-20		0.00841	0.0175 J					<0.00149	<0.0489	<0.00249	**0.547**			<0.000657		
	MW-15	Apr-21		**0.0192**	0.0168 J					<0.00124	0.0483 J	<0.000849	**0.206**			0.000799 J		
	MW-18A	Apr-19		0.00549	0.0172	**2.14**	<0.000160		0.00141 J	<0.000540	0.0468 J	0.000249 J	**0.375**	<0.0000490	0.0109	0.000716 J	**0.0379**	0.000813 J
	MW-18A	Oct-19		0.00524	0.0163	**2.19**	<0.000160		0.000751 J	<0.000540	0.786	0.000355 J	**1.73**	<0.0000490	0.00798	0.000613 J	0.0271	0.00120 JB
	MW-18A	Jun-20		0.00419 J	<0.0389 J5	**1.88**	<0.00239		<0.00238	<0.00745	**1.65**	<0.0124	**1.13** O1V	<0.000100	0.00735 J	<0.00328	**<0.0377** J5	<0.00493
	MW-18A	Oct-20		0.00468	0.0171 J	**1.98**	<0.000478		0.00139 J	<0.00149	0.348	<0.00249	**1.39**	<0.000100	0.00846	<0.000657	0.0226	<0.000986
	MW-18A	Apr-21		0.00467	0.0160 J	**1.93**	<0.000150		0.000366 J	0.00204 B	0.0895 JB	<0.000849	0.0562	<0.000100	0.0122	0.000977 J	0.0275	<0.000664
	MW-18A	Sep-21		0.00452	0.0168	**2.02**	<0.000150		0.000294 J	<0.00124	0.310	<0.000849	**1.52**	<0.000100	0.0103	<0.000300	0.0221	0.000672 J
	MW-18B	Apr-15		**0.0120**	0.0125					0.000942 J	0.139	0.000814 J	**0.789**			<0.000380		
	MW-18B	Apr-17		0.00883	0.0137					<0.000540	0.0793 J	0.00104 J	**0.803**			<0.000380		
	MW-18B	Apr-19		**0.0115**	0.0168					<0.000540	0.138	0.000778 J	**1.26**			<0.000380		
	MW-18B	Apr-21		0.00806	0.0137 J					<0.00124	0.0497 JB	<0.000849	**1.09**			<0.000300		
	MW-22A	Apr-19		**0.0355**	0.0149					0.00184 J	**2.29**	0.000242 J	**5.39**			0.00137 J		
	MW-22A	Apr-19	FD	**0.0333**	0.0152					0.00110 J	**2.25**	<0.000240	**5.54**			0.00101 J		
	MW-22A	Oct-19		**0.0263**	0.0315					<0.000540	0.769	0.000240 J	**1.46**			0.00842		
	MW-22A	Oct-19	FD	**0.0256**	0.0318					<0.000540	0.718	0.000294 J	**1.46**			0.00798		
	MW-22A	Jun-20		**0.0299**	0.0168 J					<0.00149	**2.21**	<0.00249	**2.94**			0.00271		
	MW-22A	Jun-20	FD	**0.0311**	0.0177 J					<0.00149	**1.77**	<0.00249	**3.10**			0.00171 J		
	MW-22A	Oct-20		**0.0309**	0.0163 J					<0.00149	**3.96**	<0.00249	**3.57**			0.00147 J		
	MW-22A	Oct-20	FD	**0.0301**	0.0165 J					<0.00149	**4.02**	<0.00249	**3.69**			0.00132 J		
	MW-22A	Apr-21		**0.0277**	0.0138 J					<0.00124	0.976	<0.000849	**3.63**			0.000986 J		
	MW-22A	Apr-21	FD	**0.0262**	0.0143 J					<0.00620	0.725	<0.00424	**3.67**			<0.00150		
	MW-22A	Sep-21		**0.0335**	0.0268					<0.00124	0.195	<0.000849	**0.849**			0.0279		
	MW-22A	Sep-21	FD	**0.0328**	0.0285					<0.00124	0.168	<0.00849	**0.868**			0.0288		
	MW-22B	Apr-15		**0.0389**	0.0160 J					<0.00270	**2.32**	0.00134 J	**4.32**			<0.00190		
	MW-22B	Apr-17		**0.0255**	0.0116					<0.000540	**1.03**	0.000313 J	**3.35**			0.000603 J		
	MW-22B	Apr-19		**0.0316**	0.0134					0.00173 J	**1.99**	<0.000240	**4.31**			0.000766 J		
	MW-22B	Apr-21		**0.0298**	0.0150 J					<0.00124	**2.04**	<0.000849	**5.02**			0.000614 J		
	MW-70	Apr-19		**0.0191**	0.0173					<0.000540	**1.23**	0.000601 J	**0.508**			<0.000380		
	MW-70	Oct-19		**0.0177**	0.0151					<0.000540	**3.92**	<0.000240	**0.369**			<0.000380		
	MW-70	Jun-20		**0.0157**	0.0156 J					<0.00149	**4.07**	<0.00249	**0.257**			<0.000657		
	MW-70	Oct-20		**0.0166**	0.0171 J					<0.00149	**4.50**	<0.00249	**0.299**			<0.000657		
	MW-70	Apr-21		**0.0168**	0.0144 J					<0.00124	**1.78**	<0.000849	0.0996			<0.000300		
	MW-70	Sep-21		**0.0187**	0.0193					<0.00124	**6.21**	<0.000849	**0.987**			<0.000300		
	MW-72	Apr-18		**0.0175**	0.0155					0.000688 JB	**2.04**	<0.000240	**3.04**			0.00173 J		
	MW-72	Apr-19		**0.0109**	0.0123					0.000785 J	**1.21**	<0.000240	**1.27**			0.00232		
	MW-72	Jun-20		0.00851	0.0124 J					<0.00149	**1.99**	<0.00249	**1.91**			0.00175 J		
	MW-72	Apr-21		0.00548	0.0114 J					0.00175 J	0.730	<0.00424	**0.952**			0.00102 J		
	MW-73	Apr-18		**0.0614**	0.00806					0.00109 JB	0.932	<0.000240	**1.84**			0.00147 J		
	MW-73	Apr-19		**0.0806**	0.0106					0.00152 J	0.315	<0.000240	0.0807			0.00616		
	MW-73	Jun-20		**0.0493**	0.00886 J					0.00186 J	**2.78**	<0.00249	**1.89**			0.00195 J		
	MW-73	Apr-21		**0.0440**	0.00786 J					0.00337	**1.45**	<0.00424	**0.337**			0.00136 J		
	MW-74	Apr-19		**0.0613**	0.0118					0.000701 J	<0.0150	<0.000240	**1.59**			**0.0893**		
	MW-74	Oct-19		**0.0885**	0.0185					0.000980 J	**1.09**	0.000594 J	**1.94**			0.0133		
	MW-74	Jun-20		**0.0552**	0.0160 J					0.00165 J	0.325	<0.00249	**1.13**			**0.151**		
	MW-74	Oct-20		**0.0779**	0.0153 J					<0.00149	0.0779 J	0.00433 J	**1.39**			0.0354		
	MW-74	Apr-21		**0.104**	0.0120 J					0.00131 J	0.0333 J	<0.000849	**1.36**			0.0146		
	MW-74	Sep-21		**0.101**	0.0151					<0.00124	**1.49**	0.00121 J	**2.03**			0.0132		
	MW-75	Apr-19		**0.110**	0.0183					0.00549	0.464	0.000549 J	**0.931**			0.00388		
	MW-75	Oct-19		**0.246**	0.0135					0.00116 J	**4.16**	<0.000240	**1.13**			0.00228		
	MW-75	Jun-20		**0.270**	0.0149 J					0.00163 J	**4.58**	<0.00249	**1.13**			0.00228		
	MW-75	Oct-20		**0.320**	0.0146 J					0.00240	**5.28**	<0.00249	**0.885**			0.00271		
	MW-75	Apr-21		**0.102**	0.0157 J					0.00132 J	0.314	<0.000849	**1.01**			0.00208		
	MW-75	Sep-21		**0.372**	0.0142					0.00140 J	**7.31**	<0.000849	**1.11**			0.00209		
	MW-76	Apr-19		**0.0519**	0.0116					0.00249	**3.42**	<0.000240	**0.640**			0.00338		
	MW-76	Oct-19		**0.0553**	0.0138					0.00157 J	**5.26**	<0.000240	**1.17**			0.00403		
	MW-76	Jun-20		**0.0378**	0.0121 J					0.00180 J	**3.52**	<0.00249	**0.737**			0.00379		
	MW-76	Oct-20		**0.0401**	0.0127 J					0.00176 J	**3.36**	<0.00249	**0.682**			0.00228		
	MW-76	Apr-21		**0.0333**	0.0126 J					<0.00124	**2.78**	<0.000849	**0.689**			0.00154 J		
	MW-76	Sep-21		**0.0325**	0.0135					<0.00124	**3.27**	<0.000849	**1.15**			0.00192 J		
	MW-77	Apr-18		**0.0431**	0.00992					0.00946	**5.64**	0.000745 J	**0.540**			0.00983		
	MW-77	Apr-19		**0.0406**	0.00936					0.0113	**9.12**	0.000342 J	**0.551**			0.0125		
	MW-77	Jun-20		**0.0416**	0.0107 J					0.00879	**8.79**	<0.00249	**0.576**			0.00835		
	MW-77	Apr-21		**0.0281**	0.0115 J					0.0138	**2.35**	<0.000849	**0.637**			0.00866		
	MW-78	Apr-18		0.0100	0.0459					**0.142**	0.185 B	0.000249 J	0.198			0.0119		
	MW-78	Apr-19		0.00686	0.0506					**0.248**	0.175	0.000454 J	0.0582			0.0185		
	MW-78	Jun-20		**0.0237**	0.0498					**0.126**	**6.51**	<0.00249	**0.735**			0.00764		
	MW-78	Apr-21		0.00985	0.0433					**0.215**	0.436	<0.000849	**0.372**			0.0120		
	MW-79	Apr-19		0.00562	0.0165					0.00117 J	0.0595 J	<0.000240	**0.443**			0.00174 J		
	MW-79	Oct-19		0.00670	0.0190					<0.000540	**5.43**	<0.000240	**5.54**			0.000432 J		
	MW-79	Jun-20		0.00291	0.0154 J					<0.00149	0.998	<0.00249	**4.60**			<0.000657		
	MW-79	Oct-20		0.00397	0.0158 J					<0.00149	**1.95**	<0.00249	**4.98**			<0.000657		
	MW-79	Apr-21		0.00266	0.0136 J					<0.00124	0.0976 J	<0.000849	**0.620**			0.000434 J		
	MW-79	Sep-21		0.00371	0.0155					<0.00124	0.318	<0.000849	**2.88**			0.000333 J		
	MW-80	Apr-18		0.00302	0.0110					0.00109 JB	0.139 B	<0.000240	0.129			0.00111 J		
	MW-80	Apr-19		0.00215	0.0139					**0.0511**	0.176	<0.000240	0.180			0.000866 J		
	MW-80	Jun-20		0.00174 J	0.0137 J					<0.00149	0.276	<0.00249	**1.47**			<0.000657		
	MW-80	Apr-21		0.00170 J	0.0130 J					<0.00124	0.0443 J	<0.000849	0.0589			0.000549 J		
	MW-81	Apr-18		0.00875	0.0154					0.000676 JB	<0.0150	0.000245 J	0.0200			0.00666		
	MW-81	Apr-19		0.00687	0.0132					0.00109 J	<0.0150	0.000324 J	0.0379 O1			0.00488		
	MW-81	Jun-20		0.00402	0.0110 J					<0.00149	<0.0489	<0.00249	**0.506**			0.00331		
	MW-81	Apr-21		0.00614	0.0144 J					<0.00124	<0.0281	<0.000849	0.0251			0.00699		
	MW-82	Apr-18		**0.0297**	0.0260					0.00125 J	0.0904 JB	0.000271 J	**2.00**			0.00146 J		
	MW-82	Apr-19		**0.0282**	0.0234					0.00139 J	0.0888 J	0.000348 J	**1.86**			0.00186 J		
	MW-82	Jun-20		**0.0964**	0.0235					0.00215	**4.11**	<0.00249	**2.22**			0.00109 J		
	MW-82	Apr-21		**0.0153**	0.0230					<0.00124	0.156	<0.000849	**2.70**			0.000571 J		
	MW-83	Apr-19		**0.0210**	0.0164					0.00725	0.324	0.00177 JB	**0.443**			0.0125		
	MW-83	Oct-19		**0.0508**	0.0477					0.0185	**7.75**	0.00166 J	**0.859**			0.00699		
	MW-83	Jun-20		**0.0378**	0.0246					0.00317	0.151	<0.00249	**0.332**			0.0101		
	MW-83	Oct-20		**0.0321**	0.0276					0.0189	**6.79**	<0.00249	**0.258**			0.00298		
	MW-83	Apr-21		**0.0423**	0.0311					0.00416	0.269	<0.000849	0.169			0.00282		
	MW-83	Sep-21		**0.0456**	0.0164					0.00337	0.192	<0.000849	0.0963			0.0111		
	MW-84	Apr-19		**0.0809**	0.0131					0.00180 J	0.643	0.000296 JB	**2.50**			0.00480		
	MW-84	Oct-19		**0.143**	0.0127					0.00201	**6.50**	<0.000240	**2.74**			0.00421		
	MW-84	Jun-20		**0.147**	0.0137 J					0.00570	**5.90**	<0.00249	**2.54**			0.00751		
	MW-84	Oct-20		**0.187**	0.0134 J					0.00501	**9.43**	0.00278 J	**3.05**			0.00589		
	MW-84	Apr-21		**0.102**	0.0129 J					0.00369	**1.25**	<0.000849	**2.46**			0.00662		
	MW-84	Sep-21		**0.218**	0.0158					0.0103	**9.62**	0.00101 J	**2.24**			0.0112		
	MW-86	Jun-20		**0.104**	0.0255	0.626	<0.000478		0.000506 J	**0.0552**	**4.20**	<0.00249	0.158	<0.000100	0.00828	0.00715	<0.00754	0.0220
	MW-86	Oct-20		**0.0948**	0.0184 J	0.671	<0.000478		<0.000477	0.0388	0.210	0.00356 J	0.170	<0.000100	0.00447	0.00443	<0.00754	0.0209

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCClrr	WQCClrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCClrr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Evaporation Ponds	MW-87	Apr-19		0.00484	0.0159				<0.000540	0.122	0.000477 J	0.189			<0.000380		
	MW-87	Oct-19		0.00577	0.0176				<0.000540	0.156	0.000308 J	**0.808**			0.000543 J		
	MW-87	Jun-20		0.00424	0.0145 J				0.00174 J	0.0502 J	<0.0124	**2.65**			<0.000657		
	MW-87	Oct-20		0.00783	0.0169 J				<0.00149	0.925	<0.00249	**1.56 V**			<0.000657		
	MW-87	Apr-21		0.00657	0.0156 J				<0.00124	0.881	<0.000849	**1.08**			<0.000300		
	MW-87	Sep-21		0.00620	0.0167				<0.00124	0.361	<0.000849	**1.90**			<0.000300		
	MW-88	Apr-19		0.00713	0.0109				0.00124 J	0.0221 J	<0.000240	**0.929**			0.000430 J		
	MW-88	Oct-19		0.00643	0.0110				<0.000540	0.0183 J	<0.000240	**0.926**			<0.000380		
	MW-88	Jun-20		0.00559	0.00971 J				<0.00149	0.0546 J	<0.00249	**0.807**			<0.000657		
	MW-88	Oct-20		0.00645	0.0106 J				<0.00149	<0.0489	<0.00249	**0.898**			<0.000657		
	MW-88	Apr-21		0.00716	0.0110 J				0.00295	0.0286 JB	<0.000849	**0.983**			0.000381 J		
	MW-88	Sep-21		0.00750	0.0103				<0.00124	0.0347 J	<0.000849	**0.982**			<0.000300		
	MW-120	Apr-19		**0.0141**	0.0112				<0.000540	**5.86**	0.000743 JB	**1.21**			0.000890 J		
	MW-120	Oct-19		0.00935	0.0115				<0.000540	**4.05**	<0.000240	**1.28**			0.000828 J		
	MW-120	Jun-20		0.00614	0.00971 J				<0.00149	**2.94**	<0.00249	**0.973**			<0.000657		
	MW-120	Oct-20		0.00769	0.0109 J				<0.00149	**4.31**	<0.00249	**1.38**			0.000719 J		
	MW-120	Apr-21		0.00624	0.0107 J				<0.00124	**4.59**	<0.000849	**1.32**			<0.000300		
	MW-120	Sep-21		0.00561	0.0104				<0.00124	**4.29**	<0.000849	**1.36 O1V**			0.000527 J		
	MW-121	Apr-19		**0.145**	0.0122				<0.000540	**2.10**	0.000348 JB	**2.02**			0.00529		
	MW-121	Oct-19		**0.0387**	0.0126				0.000795 J	0.212	<0.000240	**1.01**			0.00749		
	MW-121	Jun-20		**0.131**	0.0115 J				<0.00149	**2.33**	<0.00249	**2.29**			0.00453		
	MW-121	Oct-20		**0.105**	0.0134 J				0.00380	**1.88**	<0.00249	**2.51**			0.00320		
	MW-121	Apr-21		**0.0252**	0.0120 J				<0.00124	0.0709 J	<0.000849	**1.83**			0.00686		
	MW-121	Sep-21		**0.0251**	0.0120				<0.00124	0.0384 J	<0.000849	**1.94**			0.0108		
	MW-122	Apr-19		0.00196 J	0.0250				0.000767 J	0.833	0.000610 JB	**1.14**			0.000524 J		
	MW-122	Oct-19		0.00452	0.0213				0.000756 J	**5.96**	0.000780 J	**1.09**			<0.000380		
	MW-122	Jun-20		0.00412	0.0194 J				<0.00149	**3.11**	<0.00249	**1.02 V**			0.000840 J		
	MW-122	Oct-20		0.00425	0.0223				<0.00149	**4.97**	<0.00249	**1.01**			<0.000657		
	MW-122	Apr-21		0.00184 J	0.0191 J				0.00163 J	**1.02**	<0.000849	0.115			<0.000300		
	MW-122	Sep-21		0.00393	0.0221				<0.00124	**5.22**	<0.000849	**1.16**			<0.000300		
	MW-123	Apr-19		**0.0202**	0.0235				0.000931 J	0.0411 J	0.000440 J	**2.76**			0.000559 J		
	MW-123	Oct-19		**0.0263**	0.0228				<0.000540	0.647	<0.000240	**2.43 V**			0.000672 J		
	MW-123	Jun-20		**0.0185**	0.0328				<0.00149	0.0870 J	<0.00249	**3.19**			<0.000657		
	MW-123	Oct-20		**0.0195**	0.0317				<0.00149	0.0586 J	<0.00249	**3.23**			<0.000657		
	MW-123	Apr-21		**0.0181**	0.0316				<0.00124	0.0591 J	<0.000849	**3.40**			0.000398 J		
	MW-123	Sep-21		**0.0182**	0.0305				<0.00124	0.0900 J	<0.000849	**3.44**			<0.000300		
	MW-124	Apr-19		0.00175 J	0.0207				<0.000540	**3.87**	<0.000240	**0.535**			<0.000380		
	MW-124	Oct-19		0.00152 J	0.0194				<0.000540	**2.69**	<0.000240	**0.617**			<0.000380		
	MW-124	Jun-20		<0.00368	<0.0389				<0.00745	**6.01**	<0.0124	**0.440**			<0.00328		
	MW-124	Oct-20		0.00195 J	0.0214				<0.00149	**5.78**	<0.00249	**0.435**			<0.000657		
	MW-124	Apr-21		0.00144 J	0.0180 J				<0.00124	**3.65**	<0.000849	**0.390**			<0.000300		
	MW-124	Sep-21		0.00182 J	0.0190				<0.00124	**3.85**	<0.000849	**0.579**			<0.000300		
	OCD-1R	Apr-19		0.00271	0.0172				<0.000540	0.146	0.000336 J	**0.214**			0.00143 J		
	OCD-1R	Oct-19		0.00398	0.0247				0.000914 J	0.646	0.000264 J	**1.75**			0.00268		
	OCD-1R	Jun-20		0.00374	0.0202				<0.00149	**1.19**	<0.00249	**2.06**			<0.000657		
	OCD-1R	Oct-20		0.00318	0.0176 J				0.00201	0.435	<0.00249	**1.03**			0.000844 J		
	OCD-1R	Apr-21		0.00254	0.0194 J				0.00169 J	0.155	<0.000849	0.178			0.000499 J		
	OCD-1R	Sep-21		0.00689	0.0236				<0.00124	**2.41**	<0.000849	**2.00**			0.000465 J		
	OCD-2A	Apr-19		0.00207	0.0229				0.00138 J	0.860	<0.000240	0.180			<0.000380		
	OCD-2A	Oct-19		0.00146 J	0.0232				<0.000540	0.700	0.000258 J	**0.408**			0.00120 J		
	OCD-2A	Jun-20		0.00147 J	0.0206				<0.00149	**1.85**	<0.00249	**1.32**			<0.000657		
	OCD-2A	Oct-20		0.00376	0.0224				<0.00149	**4.39**	<0.00249	**1.16**			<0.000657		
	OCD-2A	Apr-21		0.00108 J	0.0221				0.00166 J	0.794	<0.000849	**0.445**			0.000378 J		
	OCD-2A	Sep-21		0.00279	0.0217				<0.00124	**2.04**	<0.000849	**0.736**			0.000395 J		
	OCD-3	Apr-19		0.00117 J	0.0187				0.00115 J	0.401	<0.000240	0.0976			<0.000380		
	OCD-3	Oct-19		0.000962 J	0.0207				<0.000540	0.327	<0.000240	0.178			<0.000380		
	OCD-3	Jun-20		0.000791 J	0.0168 J				<0.00149	0.174	<0.00249	**0.511**			<0.000657		
	OCD-3	Oct-20		0.000998 J	0.0185 J				0.00151 J	0.317	<0.00249	0.199			<0.000657		
	OCD-3	Apr-21		0.000755 J	0.0194 J				<0.00124	0.165	<0.000849	0.150			<0.000300		
	OCD-3	Sep-21		0.000890 J	0.0206				<0.00124	0.183	<0.000849	0.0832			0.000419 J		
	OCD-4	Apr-19		0.00267	0.0240				0.00158 J	**2.42**	<0.000240	0.185			0.000969 J		
	OCD-4	Oct-19		0.00219	0.0272				<0.000540	**1.22**	<0.000240	**0.299**			<0.000380		
	OCD-4	Jun-20		0.00325	0.0229				<0.00149	**3.26**	<0.00249	**0.300**			<0.000657		
	OCD-4	Oct-20		0.00221	0.0245				<0.00149	**1.95**	<0.00249	**0.218**			<0.000657		
	OCD-4	Apr-21		0.00159 J	0.0266 J				<0.00620	0.923	<0.00424	0.0597			<0.00150		
	OCD-4	Sep-21		0.00405	0.0256				<0.00124	**3.07**	<0.000849	**0.271**			<0.000300		
	OCD-5	Apr-19		0.00640	0.0222				0.000901 J	**6.05**	0.000447 J	**0.205**			<0.000380		
	OCD-5	Oct-19		**0.0125**	0.0270				<0.000540	**5.39**	<0.000240	**0.367**			<0.000380		
	OCD-5	Jun-20		**0.0146**	0.0256				<0.00149	**8.25**	<0.00249	**0.279**			<0.000657		
	OCD-5	Oct-20		**0.0142**	0.0266				0.00194 J	**7.26**	<0.00249	**0.332**			<0.000657		
	OCD-5	Apr-21		0.00580 J	0.0272 J				<0.00620	**5.05**	<0.00424	**0.269**			<0.00150		
	OCD-5	Sep-21		**0.0142**	0.0278				<0.00124	**9.83**	<0.000849	**0.357**			0.000322 J		
	OCD-6	Apr-19		0.00760	0.0233				0.000693 J	**2.13**	0.000310 JB	**2.27**			0.000644 J		
	OCD-6	Oct-19		0.00620	0.0188				<0.000540	0.397	<0.000240	**1.23**			0.00173 J		
	OCD-6	Jun-20		0.00686	0.0213				<0.00149	**2.80**	<0.00249	**2.28**			<0.000657		
	OCD-6	Oct-20		0.00831	0.0220				<0.00149	**4.53**	<0.00249	**2.54 V**			<0.000657		
	OCD-6	Apr-21		0.00751	0.0209				0.00202	**1.36**	<0.00424	**2.44**			0.000675 J		
	OCD-6	Sep-21		0.00808	0.0255				<0.00124	**3.86**	<0.000849	**1.92**			0.000818 J		
	OCD-7AR	Apr-19		**0.0650**	0.0130				0.00123 J	0.583	0.00175 JB	**0.203**			0.00225		
	OCD-7AR	Oct-19		**0.108**	0.0165				0.000615 J	**12.0**	<0.000240	**2.96**			0.00161 J		
	OCD-7AR	Jun-20		**0.0978**	0.0138 J				<0.00149	**9.81**	<0.00249	**2.62**			0.00152 J		
	OCD-7AR	Oct-20		**0.0974**	0.0149 J				<0.00149	**10.4**	<0.00249	**2.63**			0.00159 J		
	OCD-7AR	Apr-21		**0.110**	0.0154 J				<0.00124	**13.1**	<0.000849	**3.04 V**			0.00203		
	OCD-7AR	Sep-21		**0.0915**	0.0155				<0.00124	**11.8**	<0.000849	**3.07**			0.00163 J		
	OCD-7B	Apr-15		0.00294 J	0.0196 J				<0.00270	**3.52**	<0.00120	**0.710**			<0.00190		
	OCD-7B	Apr-17		0.00194 J	0.0179				<0.000540	**2.73**	<0.000240	**0.621**			<0.000380		
	OCD-7B	Apr-19		0.00184 J	0.0163				0.000918 J	**4.81**	0.000715 JB	**0.564**			<0.000380		
	OCD-7B	Apr-21		0.00169 J	0.0151 J				<0.00124	**4.34**	<0.000849	**0.669**			<0.000300		
	OCD-8A	Apr-19		**0.0819**	0.0176	**0.812**	<0.000160	0.00110 J	0.000683 J	**7.45**	0.000252 JB	**3.68**	<0.0000490	0.0199	0.00114 J	0.000772 J	0.000740 J
	OCD-8A	Oct-19		**0.0374**	0.0270	**1.73**	0.000164 J	0.00260	0.00197 J	0.847	<0.00120	**1.20**	<0.0000490	0.0627	0.0313	0.0168 J	0.00218 J
	OCD-8A	Jun-20		**0.0630**	0.0160 J	**0.958**	<0.000478	0.00175 J	0.00323	**4.76**	<0.00249	**1.88**	<0.000100	0.0670	0.00134 J	<0.00754	<0.000986
	OCD-8A	Oct-20		**0.0669**	0.0196 J	**1.08**	<0.000478	0.00192 J	0.00203	**5.36**	<0.00249	**2.42**	<0.000100	0.0384	0.00156 J	<0.00754	0.00105 J
	OCD-8A	Apr-21		**0.0621**	0.0174 J	**0.906**	<0.000150	0.00185 J	<0.00124	**5.53**	<0.000849	**2.49**	<0.000100	0.0310	0.00119 J	0.00343 J	0.000846 J
	OCD-8A	Sep-21		**0.0449**	0.0205	**1.19**	<0.000150	0.00332	<0.00124	**2.45**	<0.00849	**2.94**	<0.000100	0.0350	0.00117 J	0.00636 J	0.00120 J
	OCD-8B	Apr-15		**0.0126**	0.0141				0.000872 J	0.239	0.000392 J	**5.98**			0.000525 J		
	OCD-8B	Apr-17		0.00912	0.0124				<0.000540	0.266	0.000256 J	**6.36**			<0.000380		
	OCD-8B	Apr-19		0.0100	0.0135				<0.000540	0.240	0.000392 J	**7.21 V**			0.000541 J		
	OCD-8B	Apr-21		0.00986	0.0128 J				<0.00124	0.198 B	<0.000849	**6.01**			0.000465 J		
Field East of Refinery	KWB-1A	Apr-19		0.00375	0.00849	**0.809**	<0.000160	0.00429	0.00152 JB	<0.0150	0.000374 JB	**0.341**	<0.0000490	0.00761	0.000736 J	0.0199	0.0238
	KWB-1A	Oct-19		0.00353	0.00810	0.749	<0.000160	0.0135	<0.000540	<0.0150	0.000643 JB	**0.498**	0.0000552 JB	0.00727	0.000491 J	0.0156	0.0233
	KWB-1A	Jun-20		0.00334	0.00826 J	0.723	<0.000478	0.00315	<0.00149	<0.0489	<0.00249	**0.305**	<0.000100	0.00630	<0.000657	0.0157 J	0.0230
	KWB-1A	Oct-20		0.00378	0.00798 J	0.712	<0.000478	0.00550	<0.00149	<0.0489	<0.00249	**0.399**	<0.000100	0.00769	<0.000657	0.0128 J	0.0236
	KWB-1C	Apr-15		0.00338	0.00918				<0.000540	0.0537 J	0.000320 J	**0.462**			0.000549 J		
	KWB-1C	Apr-17		0.00303	0.00955				<0.000540	<0.0150	<0.000240	**0.501**			<0.000380		
	KWB-1C	Apr-19		0.00347	0.00925				0.00162 JB	0.0269 J	0.000292 JB	**0.482**			<0.000380		
	KWB-1C	Apr-21		0.00331	0.00957 J				<0.00124	0.0295 J	<0.000849	**0.420**			0.000303 J		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCClrr	WQCClrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCClrr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Field East of Refinery	KWB-7	Jun-20			0.00153 J	0.0692	0.418	<0.000478	<0.000477	<0.00149	0.678	0.00545	**2.57**	<0.000100	0.00133 J	<0.000657	<0.00754	0.00412 J
	KWB-7	Oct-20			<0.00368	0.0528 J	0.439	<0.00239	<0.00238	<0.00745	<0.244	<0.0124	**2.15**	<0.000100	<0.00476	<0.00328	**<0.0377**	<0.00493
	KWB-7	Apr-21			0.00346	0.259	0.435	<0.000150	0.00108 J	<0.00124	**1.58**	0.00264	**1.34**	<0.000100	0.00336	0.000427 J	0.00404 J	0.00459 J
	KWB-7	Sep-21			0.000478 J	0.0668	0.450	<0.000150	0.000222 J	<0.00124	0.673	0.00123 J	**2.06**	<0.000100	0.000855 J	<0.000300	0.000474 J	0.00116 J
	KWB-8	Oct-16			0.00109 J	0.139	0.665	<0.000160	<0.000260	0.000710 JB	0.672	0.00387	**0.997**	<0.0000490 J6	0.00102 JB	0.000475 J	0.000746 J	0.00122 J
	KWB-8	Apr-17			0.00129 J	0.106	0.632	<0.000160	0.000264 J	0.000851 J	**1.07**	0.00495	**1.83**	<0.0000490	0.00120 J	<0.000380	<0.000330	0.00157 J
	KWB-8	Oct-17			0.00135 J	0.130	**0.769**	<0.000160	<0.000260	0.00153 J	0.0804 J	0.00296	**0.510**	<0.0000490	0.000997 J	0.0463	<0.000330	0.00112 J
	KWB-8	Oct-20			0.00348	0.0706	0.661	<0.000478	0.000490 J	0.00626	**1.32**	0.00678	0.0432	<0.000100	0.00306	<0.000657	<0.00754	0.00115 J
	KWB-10R	Apr-17			**0.0157**	**3.82**				<0.000540	**5.21**	0.000971 J	0.157			<0.000380		
	KWB-10R	Oct-17			**0.0170**	**3.85**				<0.000540	**5.24**	0.000996 J	0.163			<0.000380		
	KWB-10R	Apr-18			**0.0169**	**3.91**				<0.000540	**4.57**	0.00320	0.170			<0.000380		
	KWB-10R	Oct-18			**0.0164**	**3.93**				<0.00270	**4.24**	0.00124 J	0.168			<0.00190		
	KWB-11A	Apr-19			0.00966	0.0450	0.444	<0.000160	0.0108	<0.000540	**3.95**	0.00137 J	**1.05**	<0.0000490	0.0137	0.000527 J	0.0148	0.00424 J
	KWB-11A	Jun-20			**0.0111**	0.0329	0.380	<0.000478	0.00371	<0.00149	**7.33**	0.00307 J	**0.570**	<0.000100	0.00429	0.00104 J	0.0143 J	0.00286 J
	KWB-11A	Oct-20			0.00403	0.0227	0.387	<0.000478	0.00271	<0.00149	**1.05**	<0.00249	**0.471**	<0.000100	0.00413	0.00134 J	0.0118 J	0.00555
	KWB-11A	Sep-21			0.00815	0.0251	0.379	<0.000150	0.00133 J	<0.00124	**4.00**	0.00116 J	**0.651**	<0.000100	0.00286	0.000361 J	0.0115	0.00404 J
	KWB-11B	Apr-19			0.00141 J	0.0137	0.161 JB	<0.000160	<0.000260	0.000800 J	<0.0150	0.000488 J	0.00172 J	<0.0000490	<0.000350	0.00969	0.0117	0.00783
	KWB-11B	Oct-19			0.00141 J	0.0137	0.100 J	<0.000160	<0.000260	0.000769 J	<0.0150	<0.000240	0.00109 J	0.0000867 JB	<0.000350	0.00915	0.0108	0.00915
	KWB-11B	Jun-20			0.00119 J	0.0144 J	0.0989 J	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	0.00213 J	<0.000100	<0.000952	0.00865	0.0125 J	0.00855
	KWB-11B	Oct-20			<0.00368	<0.0389	0.111 J	<0.00239	<0.00238	<0.00745	<0.244	<0.0124	<0.00660	<0.000100	<0.00476	0.00750 J	**<0.0377**	0.00905 J
	KWB-11B	Apr-21			0.00147 J	0.0146 J	0.102 J	<0.000150	<0.0000596	0.00141 J	0.0796 J	<0.000849	0.00333 J	<0.000100	<0.000816	0.00854	0.0125 J	0.00965
	KWB-11B	Sep-21			0.00146 J	0.0149	0.115 J	<0.000150	<0.0000596	<0.00124	<0.0281	<0.000849	0.00340 J	<0.000100	<0.000816	0.00639	0.0132	0.00872
	KWB-12A	Oct-19			0.00156 J	0.0144	0.568	<0.000160	<0.000260	<0.000540	0.0166 JB	0.000468 JB	0.00146 J	0.0000672 JB	0.000797 J	0.00368	0.0235	0.0113
	KWB-12A	Jun-20			0.00217	0.0182 J	0.552	<0.000478	<0.000477	<0.00149	0.195	<0.00249	0.0199	<0.000100	0.00213	0.00292	0.0268	0.0112
	KWB-12A	Oct-20			0.00148 J	0.0188 J	0.535	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	0.00279 JB	<0.000100	<0.000952	0.00371	0.0267	0.00976
	KWB-12A	Sep-21			0.00158 J	0.0194	0.503	<0.000150	0.0000641 J	0.00124 J	0.0498 J	<0.000849	0.00144 J	<0.000100	0.000944 J	0.00549	0.0260	0.0135
	KWB-12B	Apr-19			0.00195 J	0.0128	0.606	<0.000160	<0.000260	0.000875 JB	0.137	0.000534 JB	0.0110	<0.0000490	0.000567 JB	0.00355	0.0299	0.0141
	KWB-12B	Apr-19	FD		0.00186 J	0.0100	0.601	<0.000160	<0.000260	0.000663 J	0.0433 JB	<0.000240	0.00208 J	0.000152 J	0.00230	0.00310	0.0279	0.0121
	KWB-12B	Oct-19			0.00176 J	0.00924	0.580	<0.000160	<0.000260	<0.000540	0.0196 JB	0.000455 JB	0.00193 J	0.0000601 JB	<0.000350	0.00343	0.0257	0.0123
	KWB-12B	Oct-19	FD		0.00175 J	0.00933	0.577	<0.000160	<0.000260	0.000731 J	0.0234 J	<0.000240	0.00406 J	0.0000574 JB	0.000403 J	0.00354	0.0281	0.0124
	KWB-12B	Jun-20			0.00169 J	0.00835 J	0.594	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	<0.00132	<0.000100	<0.000952	0.00268	0.0275	0.0129
	KWB-12B	Jun-20	FD		0.00178 JB	0.00890 J	0.590	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	<0.00132	<0.000100	0.0162	0.00254	0.0266	0.0126
	KWB-12B	Oct-20			0.00189 J	0.00994 J	0.580	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	<0.00132	<0.000100	0.00146 J	0.00294	0.0287	0.0135
	KWB-12B	Oct-20	FD		0.00173 J	0.00955 J	0.577	<0.000478	<0.000477	0.00173 J	<0.0489	<0.00249	<0.00132	<0.000100	<0.000952	0.00269	0.0268	0.0134
	KWB-12B	Apr-21			0.00177 J	0.0102 J	0.600	<0.000150	0.0000762 J	<0.00124	0.0567 J	0.00113 J	0.00260 J	<0.000100	0.00113 J	0.00317	0.0278	0.0133
	KWB-12B	Apr-21	FD		0.00170 J	0.0103 J	0.594	<0.000150	0.0000869 J	<0.00124	0.0513 J	<0.000849	0.00145 J	<0.000100	0.000957 J	0.00265	0.0296	0.0130
	KWB-12B	Sep-21			0.00183 J	0.0133	0.596	<0.000150	0.0000597 J	<0.00124	<0.0281	<0.000849	0.00255 J	<0.000100	<0.000816	0.00737	0.0298	0.0147
	KWB-12B	Sep-21	FD		0.00185 J	0.0166	0.595	<0.000150	0.0000796 J	<0.00124	0.0380 J	0.000863 J	0.00136 J	<0.000100	<0.000816	0.00704	0.0299	0.0155
	KWB-P4	Apr-15																
	KWB-P4	Apr-17																
	KWB-P4	Apr-19																
	KWB-P4	Apr-21																
	MW-57	Apr-19			**0.0239**	0.150				0.0102	**8.63**	0.00950	**0.797**			0.0148		
	MW-57	Oct-19			0.00458	0.0175				0.000779 J	0.197	0.00603	0.0327			0.0166		
	MW-57	Jun-20			0.00366	0.0166 J				<0.00149	0.358	<0.00249	0.0473			0.0114		
	MW-57	Oct-20			**0.0157**	0.136				0.00879	**6.56**	0.0100	**0.333**			0.0120		
	MW-57	Apr-21			0.00954	0.0573				0.00558	**2.15**	0.00445	0.195			0.0145		
	MW-57	Sep-21			0.00799	0.0374				0.00249	**1.38**	0.00718	0.0587			0.0193		
	MW-58	Oct-17			0.00648	1.15	0.471	<0.000160	<0.000260	<0.000540	0.385	0.00204	**0.319**	<0.0000490	0.00129 J	<0.000380	<0.00165	0.00422 J
	MW-58	Apr-18			0.00453	1.35	0.511	<0.000160	<0.000260	<0.000540	**1.54**	0.00185 J	**0.210**	<0.0000490	0.00105 J	<0.000380	<0.000330	0.00270 J
	MW-58	Oct-18			0.00336	1.29	0.348	<0.000160	<0.000260	0.000567 J	0.721	0.00167 J	**0.335**	<0.0000490	0.000975 J	<0.000380	0.000458 J	0.00305 J
	MW-58	Oct-19			0.00549	0.988	0.736	<0.000160	0.000479 J	0.000715 J	0.767	0.00437	0.0912	0.0000567 JB	0.00160 J	<0.000380	<0.000330	0.00441 J
	MW-111	Oct-18			0.00849 J	0.0674				<0.00270	**6.39**	<0.00120	**1.42**			<0.00190		
	MW-111	Apr-19			**0.0199**	0.364				0.0112	**13.1**	0.00704	**1.79**			0.000631 J		
	MW-111	Oct-19			0.00909	0.0915				0.00109 J	**6.90**	0.000687 JB	**1.37**			<0.000380		
	MW-111	Jun-20			**0.0183**	0.285				0.00596	**9.23**	0.00469 J	**1.61**			<0.000657		
	MW-112	Nov-14			0.00500	**7.60**				0.00210	**5.80**	0.00130 J	**0.310**			0.00180 J		
	MW-113	Apr-19			0.00292	0.0208				0.00192 JB	0.399	0.000845 JB	**0.871**			0.000782 J		
	MW-113	Apr-19	FD		0.00236	0.0227				<0.000540	0.388	<0.000240	**0.834**			<0.000380		
	MW-113	Oct-19			0.00241	0.0367				0.000800 J	0.552 B	0.000743 JB	**1.15**			0.00309		
	MW-113	Oct-19	FD		0.00237	0.0370				0.00111 J	0.544	0.000692 J	**1.12**			0.00151 J		
	MW-113	Jun-20			0.00185 J	0.0334				0.00155 J	**1.16**	<0.00249	**1.29**			<0.000657		
	MW-113	Jun-20	FD		0.00186 J	0.0313				<0.00149	**1.03**	<0.00249	**1.34**			<0.000657		
	MW-113	Oct-20			<0.000735	0.0438				<0.00149	0.253	<0.00249	**1.08**			<0.000657		
	MW-113	Oct-20	FD		<0.00368	0.0408 J				<0.00745	<0.244	<0.0124	**1.12**			<0.00328		
	MW-113	Apr-21			0.00103 J	0.0245				<0.00124	0.730	<0.000849	**1.25**			<0.000300		
	MW-113	Apr-21	FD		0.00106 J	0.0251				<0.00124	0.776	<0.000849	**1.32**			<0.000300		
	MW-113	Sep-21			0.00194 J	0.162				<0.00124	<0.0281	0.00281	**0.390**			<0.000300		
	MW-113	Sep-21	FD		0.00176 J	0.169				<0.00124	0.0476 J	0.00258	**0.375**			<0.000300		
	MW-125	Apr-19			0.00386	0.00849				0.000670 J	0.0265 J	<0.000240	**0.405**			0.00433		
	MW-125	Oct-19			0.00354	0.00897				<0.000540	<0.0150	0.000326 JB	**0.415**			0.00403		
	MW-125	Jun-20			0.00388	0.00983 J				<0.00149	<0.0489	<0.00249	**0.431**			0.00289		
	MW-125	Oct-20			0.00367	0.0101 J				<0.00149	<0.0489	<0.00249	**0.430**			0.00180 J		
	MW-125	Apr-21			0.00388	0.00964 J				<0.00124	0.0682 J	<0.000849	**0.444**			0.00128 J		
	MW-125	Sep-21			0.00331	0.0100				<0.00124	<0.0281	<0.000849	**0.413**			0.00129 J		
	MW-126A	Apr-19			0.00122 J	0.0151				0.00136 JB	0.431	<0.000240	**0.776**			<0.000380		
	MW-126A	Oct-19			0.00261	0.0205				0.00105 J	**2.05**	0.000799 J	**0.649**			<0.000380		
	MW-126A	Jun-20			0.00110 J	0.0157 J				<0.00149	0.437	<0.00249	**0.617**			<0.000657		
	MW-126A	Oct-20			0.00225	0.0158 J				<0.00149	**1.78**	<0.00249	**0.707**			<0.000657		
	MW-126B	Apr-19			0.00400	0.00999				0.00150 JB	0.0379 J	0.000323 JB	0.0476			0.00332		
	MW-126B	Oct-19			0.00358	0.00916				0.000543 J	<0.0150	<0.000240	0.0434			0.00305		
	MW-126B	Jun-20			0.00346	0.0100 J				<0.00149	<0.0489	<0.00249	0.0425			0.00276		
	MW-126B	Oct-20			0.00367	0.00961 J				<0.00149	<0.0489	<0.00249	0.0481			0.00364		
	MW-126B	Apr-21			0.00367	0.00942 J				<0.00124	<0.0281	<0.000849	0.0464			0.00348		
	MW-126B	Sep-21			0.00366	0.0101				<0.00124	<0.0281	<0.000849	0.0421			0.00345		
	MW-127	Oct-17			**0.0114**	0.212				0.00109 J	**1.39**	0.000965 J	0.135			<0.000380		
	MW-127	Apr-18			0.00381	0.0682				0.00370 B	0.144 B	<0.000240	0.106			<0.000380		
	MW-127	Oct-18			0.00439	0.0589				<0.00108	0.0981 J	<0.000480	0.121			<0.000760		
	MW-127	Apr-19			0.00451	0.0960				0.000909 JB	0.0634 J	0.000461 JB	0.113			<0.000380		
	MW-128	Oct-17			**0.0554**	0.0610				0.000618 J	**3.07**	0.000404 J	**2.09**			0.00122 J		
	MW-128	Apr-18			**0.0566**	0.0728				0.00278	**4.19**	0.00257 B	**2.04**			0.000436 JB		
	MW-128	Oct-18			**0.0447**	0.0604				<0.000540	**2.40**	0.000261 J	**1.78** O1V			<0.000380		
	MW-128	Apr-19			**0.0546**	0.0910				0.00303 B	**4.19**	0.00535	**2.01**			0.000397 J		
	MW-129	Apr-16			**0.0272**	0.593				<0.00270	**5.49**	<0.00120	**1.10**			<0.00190		
	MW-129	Oct-16			**0.0236**	0.607				0.000625 JB	**4.79**	0.000529 J	**1.00**			<0.000380		
	MW-129	Apr-17			**0.0226**	0.627				<0.000540	**5.10**	<0.000240	**0.987**			<0.000380		
	MW-129	Apr-18			**0.0252**	0.516				<0.000540	**5.42**	<0.000240	**1.01**			<0.000380		
	MW-130	Apr-19			0.00385	0.0203				<0.000540	0.0697 J	0.000361 JB	0.101			0.0137		
	MW-130	Oct-19			0.00400	0.0198				0.000858 J	0.346	0.000349 J	0.101			0.00478		
	MW-130	Jun-20			0.00375	0.0168 J				<0.00149	0.0745 J	<0.00249	0.0968			0.00436		
	MW-130	Oct-20			0.00374	0.0173 J				0.00174 J	0.0826 J	<0.00249	0.101			0.00581		
	MW-130	Apr-21			0.00888	0.101				0.0257	**15.6**	0.0137	**0.282**			0.00862		
	MW-130	Sep-21			0.00432	0.0318				0.00557	**3.73**	0.00438	0.138			0.00421		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCCIrr	WQCCIrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCCIrr	WQCC HH	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
Field East of Refinery	MW-131	Apr-17		**0.0214**	**2.75**				<0.000540	**1.29**	<0.000240	**0.294**			<0.000380		
	MW-131	Oct-17		**0.0223**	1.98				<0.000540	**1.56**	<0.000240	**0.283**			<0.000380		
	MW-131	Oct-19		**0.0261**	1.65				<0.000540	**1.55**	0.000845 JB	**0.293**			<0.000380		
	MW-131	Jun-20		**0.0241**	**2.39**				<0.00149	**1.35**	<0.00249	**0.294**			<0.000657		
	MW-133	Nov-14		**0.0190**	0.130				0.000600 J	**3.50**	0.000800 J	**0.380**			<0.000380		
	MW-133	Apr-15		0.00897	0.157				<0.000540	**5.53**	0.00145 J	**0.312**			0.00124 J		
	MW-134	Apr-19		0.00471	0.0122				0.00278 B	0.193	0.000688 JB	0.0792			0.00747		
	MW-134	Apr-19	FD	0.00418	0.0122				0.00108 JB	0.183	0.00115 JB	0.0600			0.00829		
	MW-134	Oct-19		0.00417	0.00988				0.000807 J	0.0171 JB	0.000450 JB	0.0383			0.00818		
	MW-134	Oct-19	FD	0.00409	0.00949				0.00104 J	0.0163 J	<0.000240	0.0303			0.00704		
	MW-134	Jun-20		0.00368	0.00896 J				<0.00149	<0.0489	<0.00249	0.00741			0.00631		
	MW-134	Jun-20	FD	0.00384	0.00932 J				<0.00149	<0.0489	<0.00249	0.00677			0.00602		
	MW-134	Oct-20		0.00362	0.0101 J				<0.00149	0.0916 J	<0.00249	0.0370			0.00592		
	MW-134	Oct-20	FD	0.00356	0.0101 J				<0.00149	0.0671 J	<0.00249	0.0339			0.00527		
	MW-134	Apr-21		0.00352	0.00901 J				0.00150 J	0.0433 J	<0.000849	0.0163			0.00550		
	MW-134	Apr-21	FD	0.00344	0.0103 J				<0.00124	<0.0281	<0.000849	0.0165			0.00500		
	MW-134	Sep-21		0.00375	0.00927				<0.00124	0.0299 J	<0.000849	0.115			0.00469		
	MW-134	Sep-21	FD	0.00386	0.0106				<0.00124	0.0307 J	<0.000849	0.120			0.00443		
	MW-135	Apr-19		0.00383	0.0199				0.00245 B	0.205	0.000746 JB	0.0188			0.0334		
	MW-135	Oct-19		0.00335	0.00928				0.00140 J	0.221 B	0.00194 JB	0.0277			0.0200		
	MW-135	Jun-20		0.00326	0.0158 J				<0.00149	0.203	<0.00249	0.0119			0.0221		
	MW-135	Oct-20		<0.00368	<0.0389				<0.00745	0.745	<0.0124	0.0315			0.0186		
	MW-135	Apr-21		0.00321	0.0116 J				<0.00124	0.127	<0.000849	0.00777			0.0197		
	MW-135	Sep-21		0.00300	0.0186				<0.00124	0.253	<0.000849	0.0142			0.0221		
	MW-145	Oct-20															
	MW-145	Oct-20	FD														
	MW-145	Apr-21		0.00414	0.00871 J				<0.00124	0.0308 J	<0.000849	0.0259			0.00398		
	MW-145	Sep-21		0.00362	0.0102				0.00140 J	0.228	0.00237	0.0278			0.00345		
	MW-146	Oct-20															
	MW-146	Apr-21		0.00463	0.00848 J				<0.00124	<0.0281	<0.000849	0.00171 J			0.00815		
	MW-146	Sep-21		0.00404	0.00850				<0.00124	<0.0281	<0.000849	<0.000704			0.00953		
	MW-146	Sep-21	FD	0.00390	0.00907				<0.00124	<0.0281	<0.000849	<0.000704			0.00983		
	MW-147	Oct-20															
	MW-147	Apr-21		0.00308	0.0825				0.00282	**1.40**	0.00648	0.0783			0.0193		
	MW-147	Sep-21		0.00286	0.0156				0.00140 J	0.259	0.00381	0.0112			0.0180		
	MW-148	Oct-20															
	MW-148	Apr-21		0.00268	0.0192 J				0.00135 J	0.264	0.000893 J	0.0507			0.0114		
	MW-148	Sep-21		0.00317	0.0977				0.00275	**2.02**	0.00322	**0.477**			0.0101		
	RA-4196	Apr-19															
	RA-4196	Oct-19															
	RA-4196	Jun-20															
	RA-4196	Oct-20															
	RA-4798	Apr-19															
	RA-4798	Oct-19															
	RA-4798	Jun-20															
	RA-4798	Oct-20															
	RA-4798	Apr-21															
	RA-4798	Sep-21															
	RW-12R	Apr-17		0.000503 J	0.0409				0.0359	0.241	0.00193 J	**0.398**			<0.000380		
	RW-12R	Apr-18		0.000291 J	0.0387				0.00973	0.0459 J	0.00104 J	**0.718**			0.000554 J		
	RW-12R	Apr-19		0.00109 J	0.0354				0.00771 B	0.0800 J	0.00177 JB	**1.28**			0.000508 J		
	RW-12R	Jun-20		<0.000735	0.0342				**0.0557**	0.150	<0.00249	**1.39**			<0.000657		
	RW-13R	Apr-16		0.00922 J	0.0165				<0.00270	0.572	<0.00120	**1.26**			<0.00190		
	RW-13R	Apr-18		0.000839 J	0.0475				0.00357	0.349	0.000602 J	**0.985**			0.00161 J		
	RW-18A	Apr-17		0.00331	0.0107				<0.000540	<0.0150	<0.000240	0.000927 J			0.00406		
	RW-18A	Apr-18		0.00278	0.0105				<0.000540	<0.0150	<0.000240	0.00299 J			0.00321		
	RW-18A	Apr-19		0.00293	0.0117				0.00130 JB	0.0191 J	0.000246 JB	0.000480 J			0.00449		
	RW-18A	Jun-20		0.00451	0.0243				0.00223	**3.06**	0.00276 J	0.0307			0.00475		
	RW-20	Apr-15		0.00375 J	0.527				<0.00270	**1.75**	0.00354 J	**0.872**			<0.00190		
	RW-22	Apr-15		0.00248	0.816				0.00320	0.140	0.00397	**0.845**			0.00234		
NCL	MW-18	Apr-18		0.00413	0.0130	**1.40**	<0.000160	<0.000260	0.000973 J	<0.0150	0.000243 J	0.0125	<0.0000490	0.00198 J	0.0148	**0.0378**	0.0178
	MW-18	Apr-19		0.00342	0.0184	**1.60**	<0.000160	<0.000260	0.00228	0.0171 JB	<0.000240	0.00442 J	0.0000529 J	0.000907 J	0.0167	0.0283	0.0174
	MW-18	Jun-20		0.00271	0.0126 J	**2.52**	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	0.0169	<0.000100	0.00103 J	0.00739	**0.0451**	0.0180
	MW-18	Apr-21		0.00283	0.0126 J	**2.29**	<0.000150	0.000160 J	<0.00124	<0.0281	<0.000849	0.0190	<0.000100	0.00226	0.00494	**0.0484**	0.0189
	MW-45	Apr-19		0.00574	0.0171	0.643	<0.000160	<0.000260	<0.000540	**1.43**	0.00235	**0.481**	<0.0000490	0.00485	<0.000380	0.00135 J	0.000729 J
	MW-45	Oct-19		0.00373	0.0150	0.663	<0.000160	<0.000260	0.000546 JB	**1.64**	0.000564 JB	**0.432**	<0.0000490	0.00399 B	<0.000380	<0.000330	0.00116 J
	MW-45	Jun-20		0.00395	0.0157 J	0.573	<0.000478	<0.000477	<0.00149	**1.02**	<0.00249	**0.481**	<0.000100	0.00525	<0.000657	<0.00754	<0.000986
	MW-45	Oct-20		0.00493	0.0149 J	0.620	<0.000478	<0.000477	<0.00149	**1.26**	<0.00249	**0.526**	<0.000100	0.00569	<0.000657	<0.00754	0.00106 J
	MW-45	Apr-21		0.00782	0.0160 J	0.578	<0.000150	0.00122 J	<0.00124	**1.68**	**0.0155**	**0.692**	<0.000100	0.00859	<0.000300	0.00166 J	0.00226 J
	MW-45	Sep-21		0.00845	0.0167	0.625	<0.000150	0.000134 J	<0.00124	**3.30**	0.0113	**0.661**	<0.000100	0.00527	0.000446 J	0.00101	0.00100 J
	MW-53	Apr-16		0.00193 J	0.0308				<0.00270	<0.0750	<0.00120	**1.07**			0.00617 J		
	MW-53	Apr-17		0.00166 J	0.0201				<0.000540	<0.0150	<0.000240	**1.60**			0.00281		
	MW-53	Apr-18		0.00259	0.0423				0.000742 JJ3J4	0.0922 J	0.000794 J	**2.34**			0.000729 J		
	MW-53	Apr-19		0.00161 J	0.0190				<0.000540	0.0333 J	0.000346 J	**0.799**			<0.000380		
	MW-53R	Oct-20		0.00190 J	0.0482				0.00177 J	0.426	<0.00249	**0.474**			<0.000657		
	MW-53R	Apr-21		0.00191 J	0.0278				<0.00124	0.135 B	<0.000849	**0.663**			<0.000300		
	MW-54A	Apr-19		0.00339	0.0139				<0.000540	0.0627 J	0.000375 J	**0.499**			<0.000380		
	MW-54A	Oct-19		0.00506	0.0155				0.00121 JB	0.0952 JB	0.000304 JB	**0.581**			<0.000380		
	MW-54A	Jun-20		0.00452	0.0168 J				<0.00149	0.188	<0.00249	**0.589**			<0.000657		
	MW-54A	Oct-20		0.00516	0.0161 J				<0.00149	0.121	<0.00249	**0.625**			<0.000657		
	MW-54A	Apr-21		0.00595	0.0185 J				0.00137 JB	0.302 B	<0.000849	**0.778**			<0.000300		
	MW-54A	Sep-21		0.00450	0.0163				<0.00124	0.135	<0.000849	**0.768**			0.000825 J		
	MW-54B	Apr-15		0.00220	0.0165				<0.000540	0.0520 J	<0.000240	0.165			0.000400 J		
	MW-54B	Apr-17		0.00181 J	0.0158				<0.000540	<0.0150	<0.000240	**0.253**			0.000720 J		
	MW-54B	Apr-19		0.00251	0.0161				<0.000540	0.116	0.000628 J	0.197			0.000402 J		
	MW-54B	Apr-21		0.00222	0.0193 J				<0.00124	0.977	<0.000849	**0.582**			<0.000300		
	MW-55	Apr-19		0.00596	0.0114	**1.43**	<0.000160	<0.000260	0.000686 J	0.0504 JB	<0.000240	0.0855	0.000190 J	0.00592	0.00564	**0.0624**	0.0204
	MW-55	Oct-19		0.00642	0.0109 B	**1.05**	<0.000160	0.000276 J	<0.000540	0.0212 JB	0.00129 JB	0.144	<0.0000490	0.00777 B	0.00225	**0.0503**	0.0198
	MW-55	Jun-20		0.00632	0.0119 J	**0.979**	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	0.148	<0.000100	0.00713	0.00121 J	**0.0549**	0.0189
	MW-55	Oct-20		0.00684	0.0131 J	0.695	<0.000478	<0.000477	0.00201	0.0508 J	<0.00249	0.168	<0.000100	0.00670	0.00120 J	**0.0364**	0.0186
	MW-55	Apr-21		0.00683	0.0157 J	0.631	<0.000150	0.000304 J	<0.00124	<0.0281	0.00103 J	0.185	<0.000100	0.00602	0.000784 J	**0.0314**	0.0185
	MW-55	Sep-21		0.00611	0.0144	0.608	<0.000150	0.000311 J	<0.00124	<0.0281	<0.000849	**0.202**	<0.000100	0.00617	0.00121 J	0.0272	0.0176
	MW-56	Apr-18		0.00731	0.0119				0.0102	0.0355 J	0.000487 J	**0.307**			0.000796 J		
	MW-56	Apr-19		0.00631	0.0132				<0.000540	0.0310 J	0.000718 J	**0.325**			0.00217		
	MW-56	Jun-20		0.00529	0.0104 J				<0.00149	<0.0489	<0.00249	**0.302**			0.000968 J		
	MW-56	Apr-21		0.00529	0.0113 J				<0.00124	<0.0281	0.00105 J	**0.287**			0.00177 J		
	MW-108	Apr-19		0.00196 J	0.0304				0.00325	0.322	0.00135 J	0.0255			0.000390 J		
	MW-108	Oct-19		0.00107 J	0.0402				0.00132 J	0.273	0.00118 J	0.0633			<0.000380		
	MW-108	Jun-20		0.00111 J	0.0411				<0.00149	0.230	<0.00249	0.0401			<0.000657		
	MW-108	Oct-20		0.00115 J	0.0469				<0.00149	<0.0489	<0.00249	0.0593			<0.000657		
	MW-108	Apr-21		0.00120 J	0.0709				0.00169 JB	0.703	0.00174 J	**0.231**			<0.000300		
	MW-108	Sep-21		0.00103 J	0.0593				0.00152 J	0.363	<0.000849	0.0665			<0.000300		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCClrr	WQCClrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCClrr	WQCC HH	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
NCL	NCL-31	Apr-19		0.00772	0.0137				0.000759 J	0.821	0.000881 J	**1.93**			<0.000380		
	NCL-31	Oct-19		0.00915	0.0175				0.000613 J	0.0875 J	0.000376 J	**1.46**			0.00502		
	NCL-31	Jun-20		**0.0135**	0.0134 J				<0.00149	**1.13**	<0.00249	**2.24**			<0.000657		
	NCL-31	Oct-20		**0.0120**	0.0129 J				<0.00149	0.689	<0.00249	**2.15**			<0.000657		
	NCL-31	Apr-21		0.00668	0.0326				0.00265 B	**1.37**	0.00233	**1.49**			<0.000300		
	NCL-31	Sep-21		**0.0104**	0.0217				<0.00124	0.526	0.000940 J	**1.47**			<0.000300		
	NCL-32	Apr-19		0.00257	0.0172				<0.000540	**1.84**	0.000470 J	**1.14**			0.00222		
	NCL-32	Oct-19		0.00213	0.0153				0.000548 J	0.0391 J	0.000373 J	**1.50**			0.00249		
	NCL-32	Jun-20		0.00203	0.0165 J				<0.00149	<0.0489	<0.00249	**1.31**			0.00321		
	NCL-32	Oct-20		0.00236	0.0160 J				<0.00149	0.0494 J	<0.00249	**1.73**			0.00271		
	NCL-32	Apr-21		0.00270	0.0318				0.00688 B	**1.06**	0.00515	**1.60**			0.00222		
	NCL-32	Sep-21		0.00214	0.0185				0.00301	0.676	0.00172 J	**1.67**			0.00265		
	NCL-33	Apr-19		0.00327	0.0280				<0.000540	**1.97**	0.000403 J	0.106			0.000405 J		
	NCL-33	Oct-19		0.00457	0.0280				0.000581 J	**2.91**	0.000470 J	0.157			0.00132 J		
	NCL-33	Jun-20		0.00452	0.0289				<0.00149	**3.52**	<0.00249	0.194			0.00130 J		
	NCL-33	Oct-20		0.00531	0.0231				<0.00149	**4.03**	<0.00249	0.188			0.00144 J		
	NCL-33	Apr-21		0.00613	0.0243				<0.00124	**3.00**	<0.000849	0.191			0.00167 J		
	NCL-33	Sep-21		0.00642	0.0206				<0.00124	**3.17**	<0.000849	0.167			0.00154 J		
	NCL-34A	Oct-18		0.000692 J	0.376				<0.000540	<0.0150	<0.000240	0.0191			0.000423 J		
	NCL-34A	Apr-19		0.000663 JJ6	0.966 V				<0.000540	0.0216 J	<0.000240	0.0158 O1			**0.101 J3J6O1**		
	NCL-34A	Oct-19		0.000719 J	0.293				0.000842 JB	0.0403 JB	0.000906 JB	0.0318			0.000403 J		
	NCL-34A	Jun-20		0.000811 J	0.242				<0.00149	<0.0489	<0.00249	0.0416			<0.000657		
	NCL-44	Apr-19		**0.0245**	0.0215				0.000595 J	0.792	0.000443 J	**0.879**			0.000878 J		
	NCL-44	Oct-19		**0.0293**	0.0205				<0.000540	**1.16**	<0.000240	**0.912**			0.000383 J		
	NCL-44	Jun-20		**0.0305**	0.0218				<0.00149	**1.09**	<0.00249	**0.842**			<0.000657		
	NCL-44	Oct-20		**0.0211**	0.0201				0.00369	0.641	<0.00249	**0.820**			<0.000657		
	NCL-44	Apr-21		**0.0211**	0.0196 J				0.00152 JB	**1.14**	<0.000849	**0.831**			0.000456 J		
	NCL-44	Sep-21		**0.0188**	0.0190				<0.00124	0.661	<0.000849	**0.743**			<0.000300		
	NCL-49	Apr-19		0.00148 J	0.0135				0.000545 J	0.0420 J	0.000438 J	0.000612 JB			0.00606		
	NCL-49	Apr-19	FD	0.00157 J	0.0128				<0.000540	0.128	<0.000240	0.00721			0.00630		
	NCL-49	Oct-19		0.00144 J	0.0136 B				0.00113 JB	0.0164 JB	0.000412 JB	0.000870 JB			0.00551		
	NCL-49	Oct-19	FD	0.00139 J	0.0133 J				<0.00270	<0.0750	<0.00120	<0.00125 J3J5			0.00652 J		
	NCL-49	Jun-20		0.00135 J	0.0145 J				<0.00149	<0.0489	<0.00249	0.0222			0.00832		
	NCL-49	Jun-20	FD	0.00123 J	0.0126 J				<0.00149	<0.0489	<0.00249	0.00204 J			0.00717		
	NCL-49	Oct-20		0.00141 J	0.0129 J				0.00153 J	<0.0489	<0.00249	<0.00132			0.00873		
	NCL-49	Oct-20	FD	0.00155 J	0.0123 J				<0.00149	<0.0489	<0.00249	<0.00132			0.00920		
	NCL-49	Apr-21		0.00157 J	0.0132 J				<0.00124	<0.0281	<0.000849	0.00243 J			0.0104		
	NCL-49	Apr-21	FD	0.00163 J	0.0128 J				<0.00124	<0.0281	<0.000849	<0.000704			0.0103		
	NCL-49	Sep-21		0.00149 J	0.0112				<0.00124	<0.0281	<0.000849	<0.000704			0.0121		
	NCL-49	Sep-21	FD	0.00145 J	0.0129				<0.00124	<0.0281	<0.000849	<0.000704			0.0105		
North Refinery	MW-23	Apr-19		0.00499	**9.47**				0.000969 JB	0.0226 J	0.00230	0.0709			0.00135 J		
	MW-23	Oct-19		0.00587	**9.44**				<0.000540	0.0573 J	0.0150	0.0696			0.000501 J		
	MW-23	Jun-20		0.00595	**9.81 V**				<0.00149	0.0693 J	0.00484 J	0.0692			<0.000657		
	MW-23	Oct-20		0.00627	**12.3**				<0.00149	0.0501 J	0.00712	0.0769			<0.000657		
	MW-29	Apr-19		0.00173 J	0.0169				<0.000540	0.174 B	<0.000240	**0.534**			<0.000380		
	MW-29	Oct-19		**0.0161**	0.0171				<0.000540	**4.34**	<0.000240	**0.586**			0.000458 J		
	MW-29	Jun-20		0.00842	0.0172 J				<0.00149	0.0632 J	<0.00249	**0.258**			<0.000657		
	MW-29	Oct-20		**0.0170**	0.0188 J				<0.00149	0.294	<0.00249	**0.233 V**			0.000944 J		
	MW-29	Apr-21		**0.0433**	0.0232				<0.00124	**1.62**	0.00137 J	**0.414**			0.00150 J		
	MW-29	Sep-21		**0.104**	0.0213				<0.00124	**25.5**	0.00119 J	**1.40**			0.00301		
	MW-39	Apr-19		0.00933	0.0590				<0.000540	0.0175 J	0.000354 J	0.0267			0.000668 J		
	MW-39	Oct-19		0.00690	0.0118				<0.000540	<0.0150	<0.000240	0.0282			<0.000380		
	MW-39	Jun-20		0.00757	0.0145 J				<0.00149	<0.0489	<0.00249	0.0410			<0.000657		
	MW-39	Oct-20		0.00755	0.0130 J				<0.00149	<0.0489	<0.00249	0.0546			<0.000657		
	MW-40	Apr-17		0.000786 J	0.0249				<0.000540	0.0151 J	0.000660 J	0.0241			**0.0704**		
	MW-40	Apr-18		0.000656 J	0.0227				0.000593 JB	0.0289 J	0.000415 J	0.0161			<0.000380		
	MW-40	Apr-19		0.000873 J	0.0234				<0.000540	0.0848 J	0.000467 JB	0.0166			<0.000380		
	MW-40	Jun-20		<0.000735	0.0218				<0.00149	0.181	<0.00249	0.0270			<0.000657		
	MW-41	Apr-18		0.00729	0.0206				<0.000540	0.0230 J	0.000304 J	**1.03**			0.000470 J		
	MW-41	Apr-19		0.00673	0.0370				<0.000540	0.0802 JB	0.000601 J	**0.570**			0.000498 J		
	MW-41	Jun-20		**0.0107**	0.0183 J				<0.00149	<0.0489	<0.00249	**0.857**			<0.000657		
	MW-41	Apr-21		**0.0240**	0.0205				<0.00124	0.0987 J	<0.000849	**0.758**			0.000626 J		
	MW-42	Apr-18		0.00477	0.0206				<0.000540	0.0216 J	0.000406 J	0.123			<0.000380		
	MW-42	Apr-19		0.00516	0.0196				0.000790 J	0.0282 JB	0.000332 J	0.120			<0.000380		
	MW-42	Jun-20		0.00520	0.0191 J				<0.00149	0.233	<0.00249	0.144			<0.000657		
	MW-42	Apr-21		0.00948	0.0200				<0.00124	0.715	<0.000849	**0.335**			<0.000300		
	MW-43	Apr-19		0.00725	0.449	**1.14**	<0.000160	<0.000260	0.00113 JB	0.0770 J	0.00106 J	0.184	<0.0000490	0.00695	0.00568	<0.000330	0.00197 J	
	MW-43	Oct-19		**0.0101**	0.171	**0.964**	<0.000160	<0.000260	0.00120 J	0.285	0.000752 J	**0.361**	0.0000655 JB	0.00654	0.00140 J	0.00403 J	0.0127	
	MW-43	Jun-20		0.00612	0.443	**0.781**	<0.000478	<0.000477	<0.00149	0.375	<0.00249	**0.297**	<0.000100	0.00536	<0.000657	<0.00754	0.00385 J	
	MW-43	Oct-20		0.00541	0.801	**0.770**	<0.000478	<0.000477	0.00150 J	0.106	<0.00249	**0.252**	<0.000100	0.00410	<0.000657	<0.00754	0.00249 J	
	MW-59	Apr-17		**0.0234**	0.0202				<0.000540	0.123	<0.000240	**0.440**			<0.000380			
	MW-59	Apr-18		**0.0240**	0.0236				<0.000540	0.102 B	<0.000240	**0.448**			<0.000380			
	MW-59	Apr-19		**0.0213**	0.0293				0.000709 JB	0.0987 J	0.000432 J	**0.409**			<0.000380			
	MW-59	Jun-20		**0.0360**	0.0184 J				<0.00149	0.0703 J	<0.00249	**0.369**			<0.000657			
	MW-60	Apr-19		0.00433	0.0181	**0.780**	<0.000160	<0.000260	<0.000540	0.102	0.000291 J	**0.205**	<0.0000490	0.000946 J	<0.000380	0.00114 J	0.000385 J	
	MW-60	Apr-19	FD	0.00454	0.0205	**0.794**	<0.000160	<0.000260	<0.000540	0.0911 J	0.000630 J	0.200	<0.0000490	0.000941 J	<0.000380	0.00101 J	0.000224 J	
	MW-60	Oct-19		**0.0526**	0.0187	0.495	<0.000160	0.000356 J	0.000854 J	0.251	0.000344 JB	**0.226**	0.0000583 JB	0.0121	<0.000380	0.00155 J	0.000654 JB	
	MW-60	Oct-19	FD	**0.0126 J3J5O1**	0.0186	0.498	0.000791 J	0.000882 J	0.00130 J	0.276 B	0.00162 JB	**0.223 O1**	0.0000624 JB	0.00227	**0.0592 J3J6O1**	0.00269 J	0.00115 J	
	MW-60	Jun-20		0.00590	0.0194 J	0.447	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	**0.237**	<0.000100	0.00132 J	<0.000657	<0.00754	<0.000986	
	MW-60	Jun-20	FD	0.00559	0.0188 J	0.432	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	**0.229**	<0.000100	0.00121 J	<0.000657	<0.00754	<0.000986	
	MW-60	Oct-20		0.00621	0.0203	0.465	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	**0.227**	<0.000100	0.00161 J	<0.000657	<0.00754	<0.000986	
	MW-60	Oct-20	FD	0.00634	0.0193 J	0.461	<0.000478	<0.000477	<0.00149	<0.0489	0.00319 J	**0.222**	<0.000100	0.00110 J	<0.000657	<0.00754	<0.000986	
	MW-61	Apr-19		0.00215	0.0397				0.000543 JB	0.0304 J	0.00185 J	0.0181			**0.0628**			
	MW-61	Oct-19		0.00166 J	0.0542				0.000662 J	0.0443 JB	0.00197 JB	0.0261			0.00817			
	MW-61	Jun-20		0.00296	0.0482				<0.00149	<0.0489	0.00396 J	0.0197			<0.000657			
	MW-61	Oct-20		0.00299	0.0460				0.00151 J	<0.0489	0.00337 J	0.0141 B			<0.000657			
	MW-61	Apr-21		0.00352	0.0469				<0.00124	0.0503 J	0.00322	0.0229			<0.000300			
	MW-61	Sep-21		0.00312	0.0629				<0.00124	0.0379 J	0.00372	0.0182			0.000341 J			
	MW-62	Apr-19		0.00861	0.0632				0.000825 JB	0.0208 J	0.000399 J	0.00442 J			0.0369			
	MW-62	Oct-19		**0.0446 J6**	0.0472				0.000937 J	0.0794 J	0.00145 J	0.00462 J			0.00186 JJ3J6			
	MW-62	Jun-20		**0.0426**	0.0608				<0.00149	<0.0489	<0.00249	0.00669			<0.000657			
	MW-62	Oct-20		**0.0451**	0.0535				<0.00149	<0.0489	<0.00249	0.00657 B			<0.000657			
	MW-62	Sep-21		**0.0901**	0.0578				<0.00124	<0.0281	<0.000849	0.00840			<0.000300			
	MW-62R	Oct-20		**0.0788**	0.129				0.00169 J	**2.90**	<0.00249	**1.09**			<0.000657			
	MW-62R	Apr-21		**0.0449**	**3.61**				<0.00124	**4.03**	<0.000849	**0.245**			<0.000300			
	MW-67	Oct-17		**0.0103**	0.0906	0.464	<0.000160	<0.000260	0.000639 J	0.0172 J	0.00112 J	0.0986	<0.0000490	0.000648 J	<0.000380	<0.000330	0.000547 J	
	MW-67	Apr-18		**0.0107**	0.120	0.456	<0.000160	<0.000260	0.000927 JJ3J4	0.0743 J	0.00171 J	0.0943	<0.0000490	0.000828 J	0.000518 J	<0.000330	0.000584 J	
	MW-67	Oct-18		0.00516	0.0745	0.401	0.000220 JB	<0.000260	0.000568 J	0.0289 J	0.00192 JB	0.126	0.000120 J	0.000595 J	<0.000380	<0.000330	0.000634 J	
	MW-67	Apr-19		0.00750	0.0933	0.457	<0.000160	<0.000260	<0.000540	0.0253 J	0.000626 JB	0.0866	<0.0000490	0.000703 J	<0.000380	<0.000330	0.000405 J	
	MW-90	Apr-19		0.00236	0.0155				0.000889 JB	0.0179 J	0.000310 JB	0.0602			0.000671 J			
	MW-90	Oct-19		0.00423	0.0147				<0.000540	**1.04**	0.000315 JB	0.100			0.0141			
	MW-90	Jun-20		0.00299 B	0.0150 J				<0.00149	0.295	<0.00249	0.0909			<0.000657			
	MW-90	Oct-20		0.00318	0.0163 J				0.00157 J	0.495	<0.00249	0.124			<0.000657			
	MW-90	Apr-21		0.00598	0.0161 J				<0.00124	0.511	<0.000849	0.107			0.000845 J			
	MW-90	Sep-21		0.00920	0.0174				<0.00124	0.800	<0.000849	**0.533**			0.00178 J			

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCClrr	WQCClrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCClrr	WQCC HH	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
North Refinery	MW-91	Oct-18			0.00772	0.0484				0.000738 J	0.0472 J	0.00440 B	0.00539			0.000542 J		
	MW-91	Apr-19			0.00693	0.0460				<0.000540	0.0388 J	0.00412 B	0.00762			0.00460		
	MW-91	Oct-19			0.00392	0.0552				<0.000540	0.0186 J	0.00475	0.00710 B			0.0214		
	MW-91	Jun-20			0.00524 B	0.0561				<0.00149	0.197	0.00610	0.00381 J			<0.000657		
	MW-92	Apr-16			0.00316 J	**3.44** O1V				<0.00270	0.328 J	<0.00120	0.0363			0.00207 J		
	MW-92	Oct-16			0.00732	**2.81**				0.00101 JB	0.0744 J	0.00183 J	0.0274			0.00172 J		
	MW-93	Apr-17			0.00456	0.0228				0.00367	0.278	0.00116 J	0.0258			0.00683		
	MW-93	Apr-18			0.00706	0.0304				0.00945	0.145 B	0.00152 JB	0.0325			0.00377 B		
	MW-93	Apr-19			0.00456	0.0394				0.00174 JB	0.110	0.00105 J	0.0615			0.0144		
	MW-93	Jun-20			0.00827	0.0351				0.00257	0.181	<0.00249	**0.208**			0.00412		
	MW-94	Oct-15			**0.0215**	1.57				0.00144 J	<0.0150	<0.000240	0.00194 J			0.000935 J		
	MW-94	Apr-16			**0.0286**	0.353				<0.00270	<0.0750	<0.00120	0.00666 J			<0.00190		
	MW-94	Oct-16			**0.0115**	0.635				0.00119 JB	0.0159 J	0.000255 J	0.00631			0.000962 J		
	MW-94	Apr-17			**0.0170**	0.873				0.00141 J	0.134	0.000298 J	0.00382 J			0.00304		
	MW-95	Apr-17			0.00173 J	0.0612				<0.000540	<0.0150	<0.000240	0.0330			0.000407 J		
	MW-95	Apr-18			0.00154 J	0.0691				<0.000540	0.0155 J	<0.000240	0.0556			<0.000380		
	MW-95	Apr-19			0.00141 J	0.0597				<0.000540	<0.0150	0.000528 JB	0.0904			<0.000380		
	MW-95	Jun-20			0.00135 JB	0.0431				<0.00149	0.0879 J	<0.00249	0.156			<0.000657		
	MW-96	Apr-19			0.00237	0.161				<0.000540	0.0510 J	0.000267 JB	0.00103 JB			0.000465 J		
	MW-96	Oct-19			0.00199 J	0.149				<0.000540	0.0158 J	<0.000240	0.00648 B			0.00423		
	MW-96	Jun-20			0.00241 B	0.176				<0.00149	<0.0489	<0.00249	<0.00132			<0.000657		
	MW-96	Oct-20			0.00207	0.175				<0.00149	<0.0489	<0.00249	<0.00132			<0.000657		
	MW-96	Sep-21			0.00294	0.175				<0.00124	0.892	<0.000849	0.0364			0.000317 J		
	MW-98	Apr-19			0.000810 J	0.0409				<0.000540	<0.0150	0.00796	0.0220			<0.000380		
	MW-98	Oct-19			0.00231	0.0177				0.00153 J	0.0792 J	0.00771	0.0231			0.00508		
	MW-98	Jun-20			0.000895 J	0.0180 J				0.00316	0.0721 J	0.00815	0.0213			<0.000657		
	MW-98	Oct-20			0.000795 J	0.0176 J				<0.00149	<0.0489	0.00690	0.0208			<0.000657		
	MW-98	Apr-21			0.000700 J	0.0193 J				0.00134 J	0.0480 J	0.00642	0.0219			0.000516 J		
	MW-98	Sep-21			0.000689 J	0.0171				0.00133 J	0.0339 J	0.00671	0.0192			<0.000300		
	MW-137	Oct-17			**0.0156**	0.0756	**1.03**	<0.000160	<0.000260	0.00109 J	0.260	0.00338	**0.209**	<0.0000490	0.0198	0.0393	<0.000330	0.00771
	MW-137	Apr-18			**0.0512**	0.0711	**0.997**	<0.000160	<0.000260	0.00132 J	0.0740 JB	0.00433	0.154	<0.0000490	0.0134	0.00240 B	<0.000330	0.00718
	MW-137	Oct-18			**0.0129**	0.0942	**0.989**	<0.000160	<0.000260	0.000586 J	0.0553 J	0.00318	0.183	<0.0000490	0.0126	**0.341**	<0.000330	0.00844
	MW-137	Apr-19			**0.0285**	0.103	**1.02**	<0.000160	<0.000260	0.000596 JB	0.0240 J	0.00268	0.157	<0.0000490	0.0133	0.00601	<0.000330	0.00838
	MW-138	Oct-17			0.00507	0.103	**1.11**	<0.000160	<0.000260	0.000747 J	0.0334 J	0.000271 J	0.0931	<0.0000490	0.00619	0.00945	<0.000330	0.00195 J
	MW-138	Apr-18			0.00514	0.124	**0.984**	<0.000160	<0.000260	0.000785 J	0.160 B	<0.000240	0.103	<0.0000490	0.00977	0.000667 JB	<0.000330	0.00169 J
	MW-138	Oct-18			0.00464	0.108	**0.927**	<0.000160	<0.000260	<0.000540	0.0235 J	0.000249 J	0.111	<0.0000490	0.00490	**0.0973**	<0.000330	0.00120 J
	MW-138	Apr-19			0.00560	0.141	**0.951**	<0.000160	<0.000260	0.000855 JB	0.0228 J	0.000353 J	0.128	<0.0000490	0.00504	0.00102 J	<0.000330	0.00121 J
	RW-1R	Apr-16			0.00695 J	0.0414				<0.00270	**17.1**	0.00149 J	**0.317**			0.00246 J		
	RW-1	Apr-17			**0.0359**	0.0243				0.00254	**4.88**	0.00492	**0.240**			0.00573 B		
	RW-1	Apr-18			**0.0204**	0.0328				0.000826 JJ3J4	**1.50**	0.00156 J	0.0237			0.00213		
	RW-1	Apr-19			**0.0172**	0.0357				0.00100 JB	**1.14**	0.00100 JB	0.0173			0.00211		
	RW-2	Apr-15			**0.0264**	0.0245 J				0.00553 J	0.381 J	0.00233 J	**0.313**			**0.0705**		
	RW-2R	Apr-16			0.00552 J	0.171				0.00750 J	**2.25**	**0.0153**	0.0705			**0.422**		
	RW-2	Apr-17			0.00504	0.0566				0.00173 J	0.264	0.000960 J	0.0161			0.0100		
	RW-2	Apr-18			0.00374	0.139				0.00362	0.123 B	0.00163 JB	0.0215			0.00128 JB		
	RW-7	Apr-17			0.00332	0.0198				<0.000540	0.183	<0.000240	**1.13**			<0.000380		
	RW-7	Apr-18			**0.0174**	0.144				0.00434 B	**2.92**	0.000599 J	0.106			<0.000380		
	RW-7	Apr-19			**0.0246**	0.122				0.00234 B	**7.78**	0.000979 JB	0.173			0.000381 J		
	RW-7	Jun-20			0.00738	0.176				<0.00149	**2.57**	<0.00249	0.108			<0.000657		
	RW-8	Apr-15			0.00556 J	0.0889				<0.00270	0.427 J	<0.00120	0.0556			0.00200 J		
	RW-8	Apr-17			**0.0343**	0.0593				0.00135 J	**9.50**	0.00169 J	**1.12**			<0.000380		
	RW-9	Apr-18			0.00404	0.0462				<0.000540	0.0199 J	0.00111 J	**0.545**			0.000498 J		
	RW-9	Apr-19			0.00334	0.0411				<0.000540	0.0195 J	0.00200 B	**0.507**			0.000485 J		
	RW-9	Jun-20			0.00452	0.0367				<0.00149	<0.0489	<0.00249	**0.355**			<0.000657		
	RW-9	Apr-21			0.00432	0.0373				<0.00124	<0.0281	<0.000849	**0.320**			0.000308 J		
	RW-10	Apr-18			0.00234	0.0224				<0.000540	<0.0150	0.000469 J	0.189			<0.000380		
	RW-10	Apr-19			0.00158 J	0.0207				<0.000540	<0.0150	<0.000240	0.199			0.000555 J		
	RW-10	Jun-20			0.00405	0.0187 J				0.00188 J	<0.0489	<0.00249	0.182			<0.000657		
	RW-10	Apr-21			0.00573	0.0209				<0.00124	0.0380 J	<0.000849	0.157			0.000422 J		
	RW-16B	Apr-17			**0.0129**	0.0126				0.00108 J	0.0227 J	0.00125 J	**0.263**			0.00658		
	RW-16B	Apr-18			0.00922	0.0130				0.000754 JB	0.0239 J	0.000343 J	**0.201**			0.00643		
	RW-16B	Apr-19			**0.0135**	0.0158				<0.000540	0.0160 JB	0.000494 J	**0.508**			0.00933		
	RW-16B	Jun-20			**0.0267**	0.0591				0.00287	**1.10**	0.00385 J	0.0348			**0.0922**		
	RW-17A	Apr-17			**0.0113**	0.0223				0.000584 J	0.0569 J	0.0106	**0.719**			0.0106		
	RW-17A	Apr-18			**0.0106**	0.0232				<0.000540 J3J4	0.0346 J	0.00975	**0.767**			0.00322		
	RW-17A	Apr-19			**0.0151**	0.0205				0.000799 J	0.140	0.0138	**0.751**			0.000700 J		
	RW-17A	Jun-20			**0.0163**	0.0206				0.00178 J	0.232	0.0104	0.105			0.0154		
North RO Field	MW-117	Apr-19			0.00267	0.0119				0.00150 JB	0.127	0.000684 JB	0.00189 J			0.00940		
	MW-117	Oct-19			0.00253	0.0112				0.00105 J	0.114	<0.000240	0.00236 J			0.00898		
	MW-117	Jun-20			0.00249	0.0115 J				<0.00149	0.121	<0.00249	0.00283 J			0.00969		
	MW-117	Oct-20			0.00255	0.0110 J				<0.00149	0.132	<0.00249	0.00353 J			0.0123		
	MW-117	Apr-21			0.00260	0.0108 J				0.00191 J	0.112	0.00109 J	0.00472 J			0.0141		
	MW-117	Sep-21			0.00286	0.0130				<0.00124	0.144	0.00213	0.00367 J			0.00817		
	MW-118	Apr-19			**0.0106**	0.0106				0.00166 JB	0.0751 J	0.000334 JB	0.00119 J			0.00897		
	MW-118	Oct-19			0.00869	0.0147				0.00160 J	0.255	0.000359 J	0.00306 J			0.0120		
	MW-118	Jun-20			0.00806	0.0122 J				0.00175 J	<0.0489	<0.00249	<0.00132			0.0129		
	MW-118	Oct-20			0.00770	0.0149 J				0.00230	0.249	<0.00249	0.00273 J			0.0126		
	MW-118	Apr-21			0.00732	0.0108 J				0.00125 J	0.0458 J	<0.000849	<0.000704			0.0137		
	MW-118	Sep-21			0.00641	0.0111				0.00557	0.0652 J	<0.000849	0.00119 J			0.0145		
	MW-119	Apr-19			0.00439	0.0109				0.00115 JB	0.101	0.000477 JB	0.00405 J			0.00989		
	MW-119	Oct-19			0.00451	0.0277				0.00224	0.930	0.000875 J	0.0260			0.00456		
	MW-119	Jun-20			0.00394	0.0105 J				<0.00149	<0.0489	<0.00249	0.00689			0.00466		
	MW-119	Oct-20			0.00451	0.0101 J				0.00163 J	0.0836 J	<0.00249	0.0114 B			0.00422		
	MW-119	Apr-21			0.00449	0.0129 J				0.00278	0.276	<0.000849	0.0119			0.00456		
	MW-119	Sep-21			0.00343	0.0107				0.00190 J	0.0477 J	<0.000849	0.00435 J			0.00413		
South Refinery	KWB-2R	Apr-17			0.00152 J	0.0271				<0.000540	0.0346 J	0.000273 J	**0.564**			<0.000380		
	KWB-2R	Oct-17			0.00258	0.324				<0.000540	0.0522 J	0.00130 J	0.0596			<0.000380		
	KWB-2R	Apr-19			0.00182 J	0.0278				0.00151 JB	0.0333 J	0.000866 JB	**0.626**			<0.000380		
	KWB-2R	Oct-19			0.00126 J	0.290				<0.000540	<0.0150	0.00467	0.171			<0.000380		
	KWB-5	Oct-17			**0.0202**	**5.06**				<0.000540	**2.11**	0.000287 J	**1.64**			<0.000380		
	KWB-5	Apr-18			**0.0201**	**5.09**				<0.000540	**1.21**	0.000758 JB	**1.29**			<0.000380		
	KWB-5	Oct-18			**0.0166**	**3.75**				<0.00270	**2.13**	<0.00120	**1.55**			<0.00190		
	KWB-5	Apr-19			**0.0226**	**3.72**				0.00131 JB	**2.66**	0.00178 JB	**1.50**			<0.000380		
	KWB-6	Apr-17			0.00406	0.152				<0.000540	0.152	0.000533 J	**1.91**			<0.000380		
	KWB-6	Oct-17			0.00898	0.0998				<0.000540	0.250	0.000661 J	**2.15**			<0.000380		
	KWB-6	Apr-18			**0.0251**	0.120				0.00170 J	**4.68**	0.00564	**2.03**			<0.000380		
	KWB-6	Oct-18			0.00813	0.0699				<0.000540	0.149	<0.000240	**1.91**			0.000421 J		
	MW-28	Apr-19			0.00422	0.0660	**1.48**	<0.000160	<0.000260	0.00131 JB	0.0910 J	0.00990	0.0749	<0.0000490	0.00465	<0.000380	<0.000330	0.00270 J
	MW-28	Oct-19			0.00396	0.0522	**1.53**	<0.000160	<0.000260	0.000933 J	0.0502 JB	0.00717	0.0261	0.0000582 JB	0.00275	0.00329	<0.000330	0.00228 J
	MW-28	Jun-20			0.00705	0.0449	**1.32**	<0.000478	0.000802 J	<0.00149	0.122	0.0117	**0.708**	<0.000100 J6	0.00624	<0.000657	<0.00754	0.00364 J
	MW-28	Oct-20			0.00538	0.0371	**1.32**	<0.000478	<0.000477	<0.00149	0.0940 J	0.00540	**0.389**	<0.000100	0.00504	<0.000657	<0.00754	0.00375 JB
	MW-48	Apr-18			0.00554	1.82				<0.000540	0.105	0.00142 J	0.136			**0.247**		
	MW-48	Oct-18			0.00561	1.13 V				0.00119 J	0.231	0.00268	**0.347**			0.00132 J		
	MW-48	Apr-19			0.00395	1.04				0.000613 JB	0.195	0.00297	**0.481**			0.0405		
	MW-48	Oct-19			0.00646	1.04				0.00117 J	0.234	0.00232	**0.604**			0.000428 J		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCClrr	WQCClrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCClrr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
South Refinery	MW-50	Apr-19		0.00524	0.0143				0.00128 JB	**1.30**	0.000664 JB	**1.03**			0.00425		
	MW-50	Oct-19		0.00517	0.0155				<0.000540	0.773	0.000723 JB	**1.02**			0.00227		
	MW-50	Jun-20		0.00379 B	0.0113 J				<0.00149	0.226	<0.00249	**0.536**			0.0309		
	MW-50	Oct-20		0.00301	0.0128 J				<0.00149	0.0795 J	<0.00249	**0.450**			0.0377		
	MW-50	Apr-21		**0.0121**	0.0142 J				<0.00124	**3.96**	0.00161 J	**1.04**			0.000675 J		
	MW-50	Sep-21		0.00292	0.0142				<0.00124	0.191	<0.000849	0.156			**0.120**		
	MW-52	Apr-19		0.00357	0.0108	0.741	<0.000160	0.000338 J	0.00154 JB	<0.0150	0.000325 JB	0.0594	<0.0000490	0.00635	0.00537	0.0103	0.0262	
	MW-52	Oct-19		0.00353	0.0113	0.732	<0.000160	0.000402 J	0.000693 J	<0.0150	0.000510 JB	0.0618	0.0000644 JB	0.00980	0.00628	0.0114	0.0235	
	MW-52	Jun-20		0.00344	0.0149 J	**0.767**	<0.000478	0.000742 J	0.00273	0.252	<0.00249	0.0928	<0.000100	0.0260	0.00612	0.0131 J	0.0247	
	MW-52	Oct-20		0.00361	0.0123 J	**0.772**	<0.000478	0.000636 J	<0.00149	<0.0489	<0.00249	0.0661	<0.000100	0.0304	0.00578	0.0125 J	0.0240	
	MW-52	Apr-21		0.00350	0.0126 J	**0.765**	<0.000150	0.000735 J	<0.00124	0.0283 J	<0.000849	0.0738	<0.000100	0.0314	0.00522	0.0117 J	0.0255	
	MW-52	Sep-21		0.00363	0.0113	**0.774**	<0.000150	0.000791 J	<0.00124	<0.0281	<0.000849	0.0640	<0.000100	0.0377	0.00312	0.0104	0.0243	
	MW-64	Apr-19		**0.0266**	**2.43**				<0.000540	0.180	0.000861 JB	0.0831			0.000582 J		
	MW-64	Oct-19		**0.0230**	**2.03**				<0.000540	0.487	0.000743 JB	0.0793			<0.000380		
	MW-64	Jun-20		**0.0246**	**2.29**				<0.00149	0.349	<0.00249	0.0920			<0.000657		
	MW-64	Oct-20		**0.0249**	**2.15**				<0.00149	0.0846 J	<0.00249	0.0742			<0.000657		
	MW-64	Apr-21		**0.0237**	1.91				<0.00124	0.0631 J	0.00110 J	0.0619			0.000381 J		
	MW-64	Sep-21		**0.0234**	1.88				<0.00124	0.0938 J	<0.000849	0.0667			0.000570 J		
	MW-65	Apr-18		**0.0108**	**2.60**				<0.000540	**2.18**	0.000448 J	**0.527**			<0.000380		
	MW-65	Oct-18		0.00679 J	1.71				<0.00270	0.624	<0.00120	**0.431**			<0.00190		
	MW-65	Apr-19		0.00832	1.88				<0.000540	0.739	0.000373 JB	**0.530**			<0.000380		
	MW-65	Oct-19		0.00653	1.58				<0.000540	0.265	0.000311 JB	**0.405**			<0.000380		
	MW-66	Apr-19		0.00257	**2.75**	0.333	<0.000160	<0.000260	0.00118 JB	**1.20**	0.00158 J	**0.265**	<0.0000490	0.00606	<0.000380	<0.000330	0.000996 J	
	MW-66	Oct-19		0.00236	1.44	0.206	<0.000160	<0.000260	0.000717 J	0.426 B	0.00104 JB	**0.283**	0.0000567 JB	0.0131	0.00393	<0.000330	0.00180 J	
	MW-66	Jun-20		0.00235	1.99	0.250	<0.000478	<0.000477	<0.00149	0.748	<0.00249	**0.306**	<0.000100	0.00565	<0.000657	<0.00754	<0.000986	
	MW-66	Oct-20		0.00267	1.68	0.229	<0.000478	<0.000477	<0.00149	0.704	<0.00249	**0.339**	<0.000100	0.00675	<0.000657	<0.00754	0.00212 JB	
	MW-66	Apr-21		0.00481	**2.28**	0.294	0.000184 J	0.00135 J	0.00745	**3.81**	**0.0176**	**0.412**	<0.000100	0.0133	0.000342 J	0.000188 J	0.00606	
	MW-99	Oct-18		0.00821	0.452				0.000542 J	0.163	0.000718 J	**0.224**			0.00169 J		
	MW-99	Apr-19		0.00789	0.404				0.00207 B	0.346	0.00319	**0.225**			0.000538 J		
	MW-99	Oct-19		0.00338	0.200				0.00124 J	0.465 B	0.00301	0.193			0.00451		
	MW-99	Jun-20		0.00301	0.209				0.00275	0.168	<0.00249	**0.229**			<0.000657		
	MW-101	Apr-19		**0.0910**	0.0491				<0.000540	**3.08**	0.000245 J	**1.32**			<0.000380		
	MW-101	Oct-19		**0.0500**	0.0574				0.000548 J	**2.65**	0.000438 JB	**1.15**			0.00324		
	MW-101	Jun-20		**0.0735**	0.0551				<0.00149	**3.42**	<0.00249	**1.15**			<0.000657		
	MW-101	Oct-20		**0.0107**	0.0786				<0.00149	**1.75**	<0.00249	**0.912**			<0.000657		
	MW-101	Apr-21		0.00423	0.168				0.00212	0.337	0.00181 J	**0.669**			0.00102 J		
	MW-101	Sep-21		0.00301	0.0949				<0.00124	0.182	<0.000849	**0.651**			<0.000300		
	MW-102	Apr-19		**0.0151**	**9.15 V**				0.00168 JB	0.183	0.00384	0.0386			<0.000380 J6		
	MW-102	Oct-19		**0.0147**	0.537				0.00180 J	0.156 B	0.00374	0.0321			0.00915		
	MW-102	Jun-20		**0.0129**	**8.69**				<0.00149	0.187	0.00498 J	0.0370			<0.000657		
	MW-102	Oct-20		**0.0147**	**8.81**				0.00155 J	0.159	0.00387 J	0.0405			<0.000657		
	MW-102	Apr-21		**0.0169**	**8.02**				0.00128 J	0.131	0.00328	0.0441			<0.000300		
	MW-102	Sep-21		**0.0144**	1.05				<0.00124	0.0583 J	0.00266	0.0242			0.000649 J		
	MW-102	Sep-21	FD	**0.0143**	1.26				0.00162 J	0.0985 J	0.00288	0.0252			0.000829 J		
	MW-103	Apr-18		0.00699	**3.44**				<0.000540	0.0617 JB	<0.00240	0.00151 J			0.00106 J		
	MW-103	Apr-19		0.00567	1.34				0.00111 JB	0.316	0.00298 B	0.00530			0.000937 J		
	MW-103	Jun-20		0.00213	**2.61**				<0.00149	<0.0489	<0.00249	0.00522			<0.000657		
	MW-103	Apr-21		0.00139 J	1.26				0.00127 J	0.0716 J	0.00123 J	0.00923			<0.000300		
	MW-104	Apr-19		**0.0120**	0.0337				<0.000540	0.0208 J	<0.000240	0.0248			<0.000380		
	MW-104	Apr-19	FD	**0.0122**	0.0208				0.000737 J	0.0171 JB	<0.000240	0.0250			<0.000380		
	MW-104	Oct-19		0.00508	0.0213				0.00295	0.0284 J	0.000394 JB	0.0230			<0.000380		
	MW-104	Oct-19	FD	0.00508	0.0211				0.000987 J	0.0260 J	0.000327 JB	0.0235			0.00280		
	MW-104	Jun-20		0.00181 J	0.0253				<0.00149	<0.0489	<0.00249	0.0188			<0.000657		
	MW-104	Jun-20	FD	0.00163 JB	0.0237				<0.00149	<0.0489	<0.00249	0.0181			<0.000657		
	MW-104	Oct-20		0.00203	0.0248				0.00191 J	0.370	<0.00249	0.0252 B			<0.000657		
	MW-104	Oct-20	FD	0.00192 J	0.0238				0.00210	0.312	<0.00249	0.0245			<0.000657		
	MW-104	Apr-21		0.00144 J	0.0225				0.00174 J	<0.0281	0.000964 J	0.0383			<0.000300		
	MW-104	Apr-21	FD	0.00155 J	0.0228				0.00125 J	<0.0281	<0.000849	0.0395			0.000316 J		
	MW-104	Sep-21		0.00108 J	0.0225				<0.00124	<0.0281	<0.000849	0.0277			<0.000300		
	MW-105	Apr-19		0.0100	0.185				0.00175 J	0.390	0.00174 J	0.125			<0.000380		
	MW-105	Oct-19		0.00355	0.106				0.00510	**1.09**	0.00257	**0.240**			0.00809		
	MW-105	Jun-20		0.00808	0.983				0.00172 J	0.456	<0.00249	0.0818			<0.000657		
	MW-105	Oct-20		**0.0123**	**8.29**				0.00278	0.411	<0.00249	0.138			<0.000657		
	MW-105	Apr-21		0.00487	0.179				0.00274	**2.48**	<0.000849	**0.560**			<0.000300		
	MW-106	Apr-19		0.00725	0.0546				0.00142 J	0.438	0.00184 J	0.0113			<0.000380		
	MW-106	Oct-19		**0.0128**	0.0352				0.00208	0.0341 J	0.00187 J	0.0288			0.00324		
	MW-106	Jun-20		**0.0201**	0.0341				0.00229	0.224	0.00386 J	0.0118			0.000680 J		
	MW-106	Oct-20		**0.0255**	0.0306				0.00250	0.161	0.00411 J	0.00472 J			0.000967 J		
	MW-106	Apr-21		**0.0209**	0.0281				0.00210	0.279	0.00341	0.0323			0.000651 J		
	MW-107	Oct-16		0.00388	1.30				0.000930 JB	0.158	0.000595 J	0.0896			<0.000380		
	MW-107	Apr-17		0.00143 J	1.99				<0.000540	**5.17**	0.000437 J	0.105			0.0145		
	MW-107	Apr-18		0.00157 J	**2.32**				<0.000540	**4.54**	0.000427 JB	0.146			<0.000380		
	MW-107	Apr-19		0.00174 J	**2.64**				0.00139 JB	**2.77**	0.000542 J	0.185			<0.000380		
	MW-109	Apr-19		0.00159 J	0.0454				0.00199 JB	0.0173 J	<0.000240	0.0588			<0.000380		
	MW-109	Oct-19		0.000754 J	0.0426				<0.000540	<0.0150	0.000432 JB	0.0699			0.0289		
	MW-109	Jun-20		0.00261	0.0574				<0.00149	<0.0489	<0.00249	0.0531			<0.000657		
	MW-109	Oct-20		0.00193 J	0.0713				<0.00149	<0.0489	<0.00249	0.0544			<0.000657		
	MW-109	Apr-21		0.00417	0.177				<0.00124	0.0501 J	<0.000849	0.0800			<0.000300		
	MW-109	Sep-21		0.00199 J	0.110				<0.00124	0.0387 J	<0.000849	0.0424			<0.000300		
	MW-110	Apr-19		**0.0270**	0.0684				0.00191 JB	0.852	0.000241 JB	**1.70**			<0.000380		
	MW-110	Oct-19		**0.0326**	0.0476				<0.000540	**1.28**	0.00101 JB	**2.01**			0.00411		
	MW-110	Jun-20		**0.0345**	0.0516				<0.00149	0.919	<0.00249	**1.92**			<0.000657		
	MW-110	Oct-20		**0.0386**	0.0453				<0.00149	0.995	<0.00249	**2.01**			<0.000657		
	MW-110	Apr-21		**0.0507**	0.0598				0.00248	**3.19**	0.00142 J	**1.85**			0.000319 J		
	MW-110	Sep-21		**0.0278**	0.0602				<0.00124	**2.22**	0.00124 J	**1.54**			<0.000300		
	MW-139	Oct-19		0.00960	0.0359				0.00112 J	**2.30**	0.00170 J	**1.98**			0.000503 J		
	MW-139	Jun-20		0.00587 B	0.0324				<0.00149	0.561	<0.00249	**1.72**			<0.000657		
	MW-139	Oct-20		0.00744	0.0321				<0.00149	0.608	<0.00249	**1.89**			<0.000657		
	MW-139	Apr-21		0.00843	0.0335				0.00138 J	0.528	<0.000849	**1.71**			<0.000300		
	MW-139	Sep-21		0.00715	0.0298				<0.00124	0.355	<0.000849	**1.35**			<0.000300		
	RA-313	Apr-18																
	RA-313	Apr-19																
	RA-313	Jun-20																
	RA-313	Apr-21																
	RW-4	Apr-17		0.00340	0.0732				<0.000540	0.192	0.000419 J	0.0261			<0.000380		
	RW-4	Apr-18		0.00293	0.0671				0.000673 J	0.0270 JB	0.000685 JB	0.0548			0.000499 JB		
	RW-4	Apr-19		0.00271	0.148				0.000959 JB	0.0510 J	0.000725 J	0.0379			0.000455 J		
	RW-4	Jun-20		0.00356	0.0676				<0.00149	0.238	<0.00249	0.133			<0.000657		
	RW-5R	Apr-15		0.00136 J	0.0259				<0.000540	0.0952 J	0.000336 J	0.0177			<0.000380		
	RW-5R	Apr-16		0.00183 J	0.0282				<0.00270	<0.0750	<0.00120	0.0191 J			<0.00190		
	RW-6	Apr-15		**0.0332**	1.66				<0.000540	**13.8**	0.000574 J	**0.280**			<0.000380		
	RW-6R	Apr-16		**0.0712**	0.480				<0.00270	**3.70**	<0.00120	**0.553**			<0.00190		
	RW-6	Apr-18		**0.0170**	1.94				0.00106 J	**1.59**	0.000764 JB	**0.298**			<0.000380		
	RW-6	Apr-19		0.00630	**6.89**				0.000826 JB	0.173	0.000482 J	0.156			<0.000380		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCCIrr	WQCCIrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCCIrr	WQCC HH	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
South Refiner	RW-15C	Apr-17		**0.0274**	0.885					<0.000540	0.316	0.0116	**0.358**			0.000461 JB		
	RW-15C	Apr-18		**0.0239**	1.19					0.000699 J	0.264	0.000822 J	**0.372**			0.000836 J		
	RW-15C	Apr-19		**0.0135**	1.70					0.00534 B	0.473	0.00106 JB	**0.457**			0.00895		
South RO Field	MW-114	Apr-19		0.00215	0.0150					<0.000540	0.170	0.000421 J	**0.961**			0.00532		
	MW-114	Oct-19		0.00274	0.0141					<0.000540	<0.0150	<0.000240	**1.05**			0.00389		
	MW-114	Jun-20		0.00348	0.0145 J					<0.00149	<0.0489	<0.00249	**0.980**			0.00355		
	MW-114	Oct-20		0.00400	0.0131 J					<0.00149	<0.0489	<0.00249	**0.925**			0.00293		
	MW-114	Apr-21		0.00459	0.0148 J					<0.00124	0.340	<0.000849	**0.834**			0.00440		
	MW-114	Sep-21		0.00483	0.0151					<0.00124	<0.0281	<0.000849	**0.842**			0.00321		
	MW-115	Apr-19		0.00395	0.0133					<0.000540	0.189	0.000523 J	0.123			0.00497		
	MW-115	Oct-19		0.00434	0.0136					<0.000540	0.184	0.000400 J	0.146			0.00131 J		
	MW-115	Jun-20		0.00388	0.00892 J					<0.00149	<0.0489	<0.00249	0.115			0.00483		
	MW-115	Oct-20		0.00435	0.0112 J					<0.00149	<0.0489	<0.00249	0.0983			0.00844		
	MW-115	Apr-21		0.00467	0.0111 J					<0.00124	<0.140	<0.000849	0.0602			0.00972		
	MW-115	Sep-21		0.00433	0.0101					<0.00124	<0.0281	<0.000849	0.0334			0.00669		
	MW-116	Apr-19		0.00390	0.0121					0.00124 JB	0.0431 J	<0.000240	0.0234			0.00466		
	MW-116	Oct-19		0.00309	0.00893					0.000765 J	0.0209 J	0.000619 JB	0.00907			0.00768		
	MW-116	Jun-20		0.00294	0.00939 J					<0.00149	0.161	<0.00249	0.0241			0.00730		
	MW-116	Oct-20		0.00300	0.00929 J					<0.00149	0.0902 J	<0.00249	0.0150 B			0.00619		
	MW-116	Apr-21		0.00289	0.0144 J					0.00169 J	0.366	<0.000849	0.0199			0.00685		
	MW-116	Sep-21		0.00306	0.00954					0.00147 J	0.0549 J	<0.000849	0.0227			0.00754		
TEL	MW-49	Apr-19		0.00488	0.0541	0.729	<0.000160	<0.000260	<0.000540	0.0354 JB	0.000752 J	**0.209**	0.0000959 J	0.00773	<0.000380	<0.000330	0.000224 J	
	MW-49	Oct-19		0.00532	0.0486	0.642	<0.000160	<0.000260	<0.000540	0.0155 JB	0.000821 JB	0.169	<0.0000490	0.00660 B	<0.000380	<0.000330	0.000786 J	
	MW-49	Jun-20		0.00514	0.0552	0.638	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	0.147	<0.000100	0.00696	<0.000657	<0.00754	<0.000986	
	MW-49	Oct-20		0.00538	0.0500	0.661	<0.000478	<0.000477	<0.00149	0.0526 J	<0.00249	**0.220**	<0.000100	0.00835	<0.000657	<0.00754	<0.000986	
	MW-49	Apr-21		0.00564	0.0467	0.691	<0.000150	<0.0000596	<0.00124	0.113	<0.000849	**0.295**	<0.000100	0.00991	<0.000300	<0.0000700	<0.000664	
	MW-49	Sep-21		0.00466	0.0472	0.698	<0.000150	<0.0000596	<0.00124	0.0669 J	<0.000849	**0.213**	<0.000100	0.00919	0.000783 J	0.0000789	<0.000664	
	TEL-1	Oct-18		**0.0173**	0.0171					0.00240	0.0675 J	<0.000240	0.0419			<0.000380		
	TEL-1	Apr-19		**0.0142**	0.0203					0.00480	0.158	0.000325 J	0.0425			<0.000380		
	TEL-1	Oct-19		**0.0136**	0.0158					0.00444 B	0.0598 JB	0.000418 JB	0.0365			<0.000380		
	TEL-1	Jun-20		**0.0116**	0.0152 J					0.00273	0.120	<0.00249	0.0315			<0.000657		
	TEL-2	Oct-18		**0.0152**	0.101					0.00151 J	0.0287 J	0.000727 J	0.0273			0.000520 J		
	TEL-2	Apr-19		**0.0117**	0.111					0.00208	0.0688 J	0.00130 J	0.0190			0.00137 J		
	TEL-2	Oct-19		**0.0115**	0.0914					0.00295 B	0.0484 JB	0.000814 JB	0.0281			0.000498 J		
	TEL-2	Jun-20		0.00826	0.131					0.00193 J	0.0517 J	<0.00249	0.0341			<0.000657		
	TEL-3	Apr-18		**0.0109**	0.0248					**0.334**	**1.47**	0.000726 J	0.0114			<0.000380		
	TEL-3	Apr-19		0.00228	0.0214					**0.0851**	0.336	0.00111 J	0.0142			0.000982 J		
	TEL-3	Oct-19		0.00161 J	0.0182					0.0248	0.112 B	0.000803 JB	0.0205			<0.000380		
	TEL-3	Oct-20		0.00434	0.0158 J					0.0275	0.158	<0.00249	0.0170			<0.000657		
	TEL-4	Apr-19		0.00133 J	0.0122					**0.151**	0.319	0.000636 J	**0.944**			0.000600 J		
	TEL-4	Apr-19	FD	0.00181 J	0.0128					**0.147**	0.348	0.000616 J	**1.00**			<0.000380		
	TEL-4	Oct-19		0.00365	0.0158					**0.239**	0.360	0.00109 JB	**0.704**			0.000388 J		
	TEL-4	Oct-19	FD	0.00356	0.0163					**0.202**	0.322	0.000682 JB	**0.684**			0.000399 J		
	TEL-4	Jun-20		0.00632	0.0169 J					**0.103**	0.455	<0.00249	**1.17 V**			0.000712 J		
	TEL-4	Jun-20	FD	0.00618	0.0178 J					**0.125**	0.506	<0.00249	**1.19**			<0.000657		
	TEL-4	Oct-20		0.00923	0.0180 J					**0.106**	0.479	<0.00249	**1.24 V**			<0.000657		
	TEL-4	Oct-20	FD	0.00921	0.0181 J					**0.0522**	0.360	<0.00249	**1.19**			<0.000657		
	TEL-4	Apr-21		**0.0128**	0.0172 J					**0.316**	**1.18**	0.00118 J	**1.53**			0.000534 J		
	TEL-4	Apr-21	FD	**0.0130**	0.0185 J					**0.313**	**1.11**	0.00178 J	**1.49**			0.000518 J		
	TEL-4	Sep-21		0.00826	0.0164					**0.0655**	0.486	0.000871 J	**1.68**			0.000424 J		
	TEL-4	Sep-21	FD	0.00807	0.0183					**0.0560**	0.450	0.000975 J	**1.67**			0.000577 J		
Three Mile Ditch	MW-8	Apr-18		0.00948	0.0110					**0.0627**	0.462	0.000387 J	**0.702**			0.0181		
	MW-8	Apr-19		0.00965	0.0134					**0.0651**	0.364	0.000715 J	**0.747**			0.0213		
	MW-8	Jun-20		0.00709	0.0155 J					0.00547 B	<0.0489	<0.00249	**0.808**			**0.0626**		
	MW-8	Apr-21		0.00685	0.0155 J					0.0140	0.0819 J	<0.000849	**0.371**			**0.0543**		
	MW-16	Apr-18		0.00612	0.0157					<0.000540 J3J4	0.0436 J	<0.000240	**0.322**			0.00394		
	MW-16	Apr-19		0.00526	0.0129					<0.000540	0.0197 JB	0.000278 J	0.0793			0.00750		
	MW-16	Jun-20		0.00508	0.0161 J					<0.00149	<0.0489	<0.00249	0.116			0.0135		
	MW-16	Apr-21		0.00528	0.0186 J					<0.00124	0.0632 J	<0.000849	**0.215**			0.00859		
	MW-20	Apr-18		0.00700	0.0104					<0.000540	<0.0150	<0.000240	0.0197			0.0147		
	MW-20	Apr-19		0.00582	0.0110					<0.000540	<0.0150	0.000327 J	0.0134			0.00866		
	MW-20	Jun-20		0.00549	0.00996 J					<0.00149	<0.0489	<0.00249	0.00342 J			0.00505		
	MW-20	Apr-21		0.00531	0.0109 J					<0.00124	<0.0281	<0.000849	0.0237			0.00615		
	MW-21	Apr-19		0.00538	0.00886					0.00133 JB	<0.0150	0.000323 J	0.138			0.0378		
	MW-21	Oct-19		0.00562	0.00881					<0.000540	<0.0150	<0.000240	**0.699**			0.0384		
	MW-21	Jun-20		0.00561	0.00916 J					<0.00149	<0.0489	<0.00249	**0.353**			**0.0521**		
	MW-21	Oct-20		0.00571	<0.00778					<0.00149	<0.0489	<0.00249	0.193			0.0429		
	MW-21	Apr-21		0.00614	0.0102 J					<0.00124	<0.0281	<0.000849	0.0684			0.0340		
	MW-21	Sep-21		0.00490	0.0104					<0.00124	<0.0281	<0.000849	**1.35**			**0.0557**		
	MW-25	Apr-18		0.00338	0.0128					0.000687 J	0.0314 J	0.000330 J	**0.676 J3V**			0.00337		
	MW-25	Apr-19		0.00224	0.0135					0.000854 J	0.0348 JB	<0.000240	**0.439**			0.00299		
	MW-25	Jun-20		0.00216	0.0150 J					<0.00149	<0.0489	<0.00249	**0.906**			0.00318		
	MW-25	Apr-21		0.00178 J	0.0189 J					<0.00124	<0.0281	<0.000849	**2.16**			0.00249		
	MW-26	Apr-18		0.00426	0.00944					<0.000540 J3J4	<0.0150	0.000351 J	**0.513**			0.0238		
	MW-26	Apr-19		0.00326	0.00888					<0.000540	<0.0150	<0.000240	**0.521**			0.0226		
	MW-26	Jun-20		0.00335	0.00884 J					<0.00149	<0.0489	<0.00249	**0.295**			0.0196		
	MW-26	Apr-21		0.00310	0.0101 J					<0.00124	<0.0281	<0.000849	0.0517			0.0201		
	MW-27	Apr-18		0.00335	0.0150					0.000709 JB	0.183	0.000265 J	0.0539			0.0124		
	MW-27	Apr-19		0.00203	0.0158					<0.000540	<0.0150	<0.000240	0.0240			0.0127		
	MW-27	Jun-20		0.00228	0.0166 J					<0.00149	<0.0489	<0.00249	0.00890			0.0169		
	MW-27	Apr-21		0.00223	0.0179 J					<0.00124	<0.0281	<0.000849	0.0143			0.0173		
	MW-46R	Apr-19		0.00406	0.0122					0.000561 JB	0.277 B	<0.000240	0.0964			0.00330		
	MW-46R	Oct-19		0.00276	0.0121					<0.000540	0.102	<0.000240	0.0684			0.00199 J		
	MW-46R	Jun-20		0.00285	0.0128 J					<0.00149	0.0754 J	<0.00249	0.0688			0.00120 J		
	MW-46R	Oct-20		0.00290	0.0110 J					<0.00149	0.0522 J	<0.00249	0.0720			<0.000657		
	MW-46R	Apr-21		0.00230	0.0237					0.00246	0.961	0.00132 J	0.0628			0.00148 J		
	MW-46R	Sep-21		0.00319	0.0195					0.00189 J	0.492	0.00112 J	0.0335			0.00365		
	MW-68	Apr-18		0.00326	0.0119					0.00211 B	0.141	0.000658 J	0.0543			0.00780		
	MW-68	Apr-19		0.00215	0.0127					<0.000540	<0.0150	0.000318 J	0.00165 JB			0.0148		
	MW-68	Jun-20		0.00280	0.0155 J					<0.00149	<0.0489	<0.00249	<0.00132			0.0317		
	MW-68	Apr-21		0.00276	0.0134 J					<0.00124	0.0401 J	<0.000849	0.00543			0.0224		
	MW-71	Apr-18		0.00500	0.00896	0.673	<0.000160	<0.000260	0.00106 J	<0.0150	<0.000240	0.000412 J	<0.0000490	0.00115 J	0.0321	**0.0594**	0.0255	
	MW-71	Apr-19		0.00315	0.00901	0.670	<0.000160	<0.000260	0.000803 JB	0.0423 JB	<0.000240	0.00260 JB	<0.0000490	0.00130 J	0.0320	**0.0654**	0.0247	
	MW-71	Jun-20		0.00391	0.00943 J	0.622	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	<0.00132	<0.000100	0.00111 J	0.0332	**0.0698**	0.0251	
	MW-71	Apr-21		0.00385	0.00911 J	0.655	<0.000150	0.000147 J	<0.00124	<0.0281	<0.000849	0.00147 J	0.000261	0.00115 J	0.0264	**0.0666**	0.0242	
	MW-89	Apr-18		**0.0112**	0.0136					0.000638 JJ3J4	<0.0150	0.000617 J	**0.628**			0.00218		
	MW-89	Apr-19		0.00748	0.0140					0.000808 JB	0.0326 JB	0.000744 J	**0.439**			0.0299		
	MW-89	Jun-20		0.00857	0.0133 J					<0.00149	<0.0489	<0.00249	**0.579**			0.00476		
	MW-89	Apr-21		**0.0132**	0.0139 J					0.00131 J	0.305	<0.000849	**0.663 V**			0.00303		
	NP-1	Apr-19																
	NP-1	Oct-19																
	NP-1	Jun-20																
	NP-1	Oct-20																
	NP-1	Apr-21																
	NP-1	Sep-21																

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Total Metals													
				Analyte	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				CAS	7440-38-2	7440-39-3	7440-42-8	7440-43-9	7440-48-4	7440-47-3	7439-89-6	7439-92-1	7439-96-5	7439-97-6	7440-02-0	7782-49-2	7440-61-1	7440-62-2
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL	0.0100	2.00	0.750	0.00500	0.0500	0.0500	1.00	0.0150	0.200	0.00200	0.200	0.0500	0.0300	0.0631
				CGWSL Source	WQCC HH	WQCC HH	WQCCIrr	WQCCIrr	WQCC HH	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCCIrr	WQCC HH	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
Three Mile Ditch	NP-6	Apr-15																
	NP-6	Apr-17																
	NP-6	Apr-19																
	NP-6	Apr-21																
Upgradient	UG-1	Apr-18		0.00177 JB	0.0122	0.668	<0.000160	0.00130 J	<0.000540	<0.0150	<0.000240	0.000486 J	0.0000552 JB	0.00188 J	0.00692	0.0263	0.0153	
	UG-1	Apr-19		0.00158 J	0.0165	0.727	<0.000160	0.000332 J	0.000624 JB	<0.0150	<0.000240	0.00109 J	<0.0000490	0.00226 B	0.0149	**0.0353**	0.0147	
	UG-1	Jun-20		0.00139 J	0.0137 J	0.691	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	<0.00132	<0.000100	0.000984 J	0.0131	**0.0385**	0.0133	
	UG-1	Apr-21		0.00134 J	0.0137 J	0.741	<0.000150	0.000148 J	0.00204 B	<0.0281	<0.000849	0.00184 J	<0.000100	0.00238	0.0167	**0.0388**	0.0140	
	UG-2	Apr-18		0.00236 B	0.0142	0.303	<0.000160	<0.000260	<0.000540	0.0153 J	<0.000240	0.00678	0.0000684 JB	0.00188 J	0.00710	0.0131	0.0176	
	UG-2	Apr-19		0.00227	0.0183	0.299	0.000295 J	0.000357 J	0.000732 JB	0.0286 J	0.00107 JB	0.0129	<0.0000490	0.00316 B	0.00766	0.0160	0.0174	
	UG-2	Jun-20		0.00253	0.0141 J	0.274	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	0.00395 J	<0.000100	0.00250	0.00616	0.0161 J	0.0185	
	UG-2	Apr-21		0.00224	0.0160 J	0.265	<0.000150	0.000107 J	0.00271 B	0.0303 J	<0.000849	0.00420 J	<0.000100	0.00295	0.00599	0.0161 J	0.0200	
	UG-3R	Apr-18		0.00202 B	0.0170	0.470	<0.000160	<0.000260	<0.000540	0.0377 J	<0.000240	0.000713 J	<0.0000490	0.00104 J	0.00418	0.0124	0.0111	
	UG-3R	Apr-19		0.00164 J	0.0183	0.223	<0.000160	<0.000260	0.000713 JB	<0.0150	<0.000240	0.00132 J	<0.0000490	0.000581 JB	0.00266	0.0160	0.00947	
	UG-3R	Jun-20		0.00126 J	0.0205	0.173 J	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	<0.00132	<0.000100	<0.000952	0.00389	0.0167 J	0.00867	
	UG-3R	Apr-21		0.00140 J	0.0221	0.169 J	<0.000150	0.000113 J	0.00429 B	0.0430 J	0.000853 J	0.00180 J	<0.000100	0.00108 J	0.00420	0.0181 J	0.00939	
	UG-4	Apr-18		0.00177 JB	0.0158	**1.07**	<0.000160	<0.000260	<0.000540	0.0330 J	<0.000240	0.00117 J	0.0000571 JB	0.000467 J	0.0202	**0.0324**	0.00962 B	
	UG-4	Apr-19		0.00128 J	0.0171	**1.07**	<0.000160	<0.000260	<0.000540	0.0596 J	<0.000240	0.00792	<0.0000490	0.000696 JB	0.0167	**0.0379**	0.00813	
	UG-4	Jun-20		0.00105 J	0.0164 J	**1.02**	<0.000478	<0.000477	<0.00149	<0.0489	<0.00249	0.00403 J	<0.000100	0.00177 J	0.00925	**0.0357**	0.00757	
	UG-4	Apr-21		0.00146 J	0.0150 J	**0.983**	<0.000150	0.000184 J	<0.00124	0.0350 J	<0.000849	0.00426 J	<0.000100	<0.000816	0.00959	**0.0356**	0.00929	

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, November 2021, Table A-1, Tap Water Screening Level
WQCC Dom	NMED Groundwater standard for domestic exposure, 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC
WQCC Irr	NMED Groundwater standard for irrigation exposure, 20.6.2.3103.C NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Water Quality Parameters								Cyanide
			Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
			CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL		250	1.60			600	1000	10.0	0.200
			CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	Well ID	Date	Dup									
Cross-Gradient	KWB-13	Apr-18		558	136	0.704	1.66	227	**2470**	**3580**	**15.3**	<0.00180
	KWB-13	Apr-19		630	125	0.605	1.69	220	**2470**	**3580**	**14.0**	<0.00180
	KWB-13	Jun-20		598	121	0.791	2.10	169	**2430**	**3710**	**14.9**	<0.00180
	KWB-13	Apr-21		660	128	0.689	3.54	181	**2090**	**3610**	**16.1 V**	<0.00180
	MW-136	Apr-19		688	**284 B**	**1.69**	2.83	144	**2680**	**4150**	4.12 J6	0.00264 J
	MW-136	Oct-19		630	**280**	**1.73**	2.75	140	**2520**	**4100**	2.38	<0.00180
	MW-136	Jun-20		631	**300**	**1.62**	2.53	139	**2370**	**4290**	**13.2**	<0.00180
	MW-136	Oct-20		640	**290**	1.54	2.55	148	**2150**	**4180**	**14.4**	<0.00180
	MW-136	Apr-21		580	**272**	1.57	2.25	128	**2020**	**3640**	**13.8**	<0.00180
	MW-136	Sep-21		542	**268 B**	1.53	2.42	115 V	**1700**	**3360**	**12.2**	<0.00180
	NP-5	Apr-15		448	**993**	**2.13**	0.484 J	209	**3030**	**6060 J**	1.38	
	NP-5	Apr-17		514	**444**	**1.63**	0.422 J	212	**3770**	**4810**	2.22	
	NP-5	Apr-19		529	**310**	**2.16**	0.320 J	206	**3370**	**5240**	5	
	NP-5	Apr-21		529	**253**	**2.49**	0.258 J	226	**3320**	**5410**	0.721	
	RA-3156	Apr-18		341	**813**	0.470	2.63	444	**1020**	**2580**	<0.0197 J6	
	RA-3156	Apr-19		83.5	**807**	0.751	0.679 J	87.0	**1650**	**3240**	1.50	
	RA-3156	Jun-20		180	**280**	0.313	2.62	97.8	**603**	**1250**	<0.0500	
	RA-3156	Apr-21		338	**533**	0.587	2.49	268	**1340**	**2970**	0.0923 J	
Evaporation Ponds	MW-1R	Apr-18		623 V	**2200**	0.679	4.56	1520 V	**2740**	**6900**	0.0640 J	
	MW-1R	Apr-19		407	**1160**	0.710	3.80	1050	**2000**	**4980**	<0.0197	
	MW-1R	Jun-20		540	**1430**	0.732	4.01	831	**2060**	**3200**	<0.0500	
	MW-1R	Apr-21		418	**1000**	0.706	3.48	704	**1430**	**3030**	1.88	
	MW-2A	Apr-19		652	**5600**	**1.93**	5.50	3930	**5430**	**15800**	<0.0197	
	MW-2A	Oct-19		585	**2180**	**2.94**	4.21	1470	**2860**	**7000**	0.171	
	MW-2A	Jun-20		487	**879**	**2.70**	3.28	610	**1730**	**3960**	<0.0500	
	MW-2A	Oct-20		292	**1240**	**2.96**	3.46	908	**1860**	**4770**	0.0609 J	
	MW-2A	Apr-21		533	**2660**	**2.58**	3.74	2380	**3770**	**9880**	0.930	
	MW-2A	Sep-21		637	**3360**	**1.93**	4.43	3220	**4730**	**13100**	<0.0500	
	MW-3	Apr-19		579	**1140**	**1.96**	4.89	771	**2480**	**5510**	0.156	
	MW-3	Apr-19	FD	603	**1230**	**1.86**	4.92	774	**2530**	**5450**	0.157	
	MW-3	Oct-19		517	**1060**	**2.38**	7.63	840	**1680**	**4290**	<0.0197	
	MW-3	Oct-19	FD	540	**1190**	**2.53**	7.51	836	**1970**	**4950**	<0.0197	
	MW-3	Jun-20		553	**1280**	**2.40**	7.64	818	**2140**	**5200**	0.0662 JB	
	MW-3	Jun-20	FD	553	**1290**	**2.52**	7.54	827	**2260**	**4970 J4**	<0.0500	
	MW-3	Oct-20		514	**1250**	**1.97**	5.94	822	**1980**	**5250**	0.210	
	MW-3	Oct-20	FD	506	**939**	**1.69**	5.85	812	**1440**	**5090**	0.245 J6	
	MW-3	Apr-21		479	**1060**	**1.93**	5.09	785	**1690**	**3990**	0.214	
	MW-3	Apr-21	FD	493	**1110**	1.55	5.16 J	889	**1850**	**3790**	0.171	
	MW-3	Sep-21		680	**1510**	**1.80**	5.14	897	**2300**	**6070**	1.45	
	MW-3	Sep-21	FD		**1470**	**1.90**			**2400**	**6060**	1.46	
	MW-4A	Apr-19		418	**1450**	**1.82**	5.24	904	**1810**	**4940**	<0.0197	
	MW-4A	Oct-19		419	**1260**	**2.01**	5.80	855	**1380**	**4700**	0.0230 J	
	MW-4A	Jun-20		403	**1440**	**1.98**	4.72	962	**1890**	**4870**	<0.0500	
	MW-4A	Oct-20		415	**1350**	**2.31**	5.63	921	**1640**	**5000**	<0.0500	
	MW-4A	Apr-21		414	**1280**	**2.04**	6.03	914	**1630**	**3210**	<0.0500	
	MW-4A	Sep-21		505	**1390**	**1.90**	5.14	924	**2060**	**5680**	1.35	
	MW-4B	Apr-15		367	**1110**	0.963	2.32	696	**1340**	**3410 J**	<0.0200	
	MW-4B	Apr-17		360	**1330**	0.985	2.55	758	**1410**	**3690**	<0.0197	
	MW-4B	Apr-19		442	**1320**	0.775	2.50	703	**1430**	**4370**	<0.0197	
	MW-4B	Apr-21		406	**1130**	0.835	2.51	748	**1300**	**3310**	<0.0500	
	MW-5A	Apr-19		511	**3620**	**3.03**	6.36	3740	**8110**	**14800**	<0.0197	
	MW-5A	Oct-19		494	**2760**	**3.63**	6.85	3450	**6170**	**13900**	0.138	
	MW-5A	Jun-20		286	**1810**	**3.40**	5.65	2040	**3550**	**7460**	<0.0500	
	MW-5A	Oct-20		374	**2110**	**3.84**	8.27	2280	**4220**	**9910**	<0.0500	
	MW-5A	Apr-21		419	**2540**	**3.07**	7.69	2480	**5140**	**11700**	<0.0500	
	MW-5A	Sep-21		549	**3210**	**3.45**	7.37	3540	**7090**	**15400**	<0.0500	
	MW-5B	Apr-15		482	**1590**	1.41	9.01	1580	**3510**	**5980**	<0.0200	
	MW-5B	Apr-17		420	**1560**	**1.73**	9.18	1650	**2590**	**6290**	0.0210 J	
	MW-5B	Apr-19		389	**1530**	**1.70**	9.69	1490	**2660**	**6370**	<0.0197	
	MW-5B	Apr-21		359	**524**	1.05	3.74	431	**1370**	**2930**	<0.0500	
	MW-5C	Apr-15		427	**585**	0.910	3.97 J	485	**2020**	**3290**	<0.0200	
	MW-5C	Apr-17		383	**576**	0.971	3.90	500	**1740**	**3110**	<0.0197	
	MW-5C	Apr-19		390	**591**	0.896	4.11	450	**1540**	**3200**	<0.0197	
	MW-5C	Apr-21		379	**1360**	**2.06**	10.5	1420	**2380**	**5050**	<0.0500	
	MW-6A	Apr-18		303	**763**	1.59	1.31	776	**1690**	**3330**	0.0800 J	
	MW-6A	Apr-19		340	**803**	1.38	1.38	696	**1700**	**3520**	<0.0197	
	MW-6A	Jun-20		290	**669**	1.55	1.18 J	670	**1670**	**3640**	<0.0500	
	MW-6A	Apr-21		297	**647**	**1.67**	1.24 J	697	**1450**	**3070**	0.0885 J	
	MW-6B	Apr-15		568	**1740**	0.669 J	5.09	873	**2280**	**4760**	<0.0200	
	MW-6B	Apr-17		418	**1250**	0.694	3.97	738	**1730**	**4150**	<0.197	
	MW-6B	Apr-19		462	**1140**	0.519	4.45 O1	682	**1460**	**4190**	<0.0197	
	MW-6B	Apr-21		462	**970**	0.614	4.71	651	**1330**	**6950**	0.289	
	MW-7A	Apr-19		345	**2480**	1.10	3.95	1560	**3610**	**6920**	<0.0197	
	MW-7A	Apr-19	FD	373	**1990**	1.20	4.05	1530	**2490**	**6930**	<0.0197	
	MW-7A	Oct-19		423	**2880**	1.46	5.56	2310	**3250**	**9100**	3.13	
	MW-7A	Oct-19	FD	413	**2970**	1.27	5.48	2110	**3370**	**9440**	2.88	
	MW-7A	Jun-20		345	**2000**	1.20	3.28	1560	**2670**	**6630**	<0.0500	
	MW-7A	Jun-20	FD	370	**1950**	1.18	3.54 J	1550	**2600**	**6580**	0.0594 J	
	MW-7A	Oct-20		327	**1770**	1.42	3.83	1470	**2130**	**6330**	<0.0500 J6	
	MW-7A	Oct-20	FD	315	**1550**	1.29	3.71 B	1550	**1870**	**6260**	<0.0500	
	MW-7A	Apr-21		334	**1690**	1.21	3.68	1360	**2100**	**4800**	0.0648 J	
	MW-7A	Apr-21	FD	341	**2870**	1.15	3.93	1430	**3460**	**6460**	<0.0500	
	MW-7A	Sep-21		484	**2190**	1.16	3.92	1750	**3060**	**8170**	<0.0500	
	MW-7A	Sep-21	FD	495	**2260**	1.14	3.83	1740	**3160**	**8250**	<0.0500	
	MW-7B	Apr-15		556	**1060**	0.795	6.27	672	**2200**	**4640**	<0.0200	
	MW-7B	Apr-17		530	**1060**	0.966	6.71	652	**1750**	**4720**	0.0670 J	
	MW-7B	Apr-19		581	**1100**	0.823	6.70	581	**1910**	**4760**	<0.0197	
	MW-7B	Apr-21		562	**1030**	0.881	6.66	561	**1800**	**3430**	<0.0500	
	MW-10	Apr-19		457	**1290**	0.907	3.58	925	**2000**	**5070**	<0.0197	
	MW-10	Oct-19		653	**1610**	1.06	3.61	1190	**2530**	**6090 J3**	<0.0197	
	MW-10	Jun-20		445	**1300**	0.933	3.25	982 V	**1930**	**4970**	<0.0500	
	MW-10	Oct-20		435	**1250**	0.903	3.30	949	**1710**	**5080**	<0.0500	
	MW-10	Apr-21		431	**1170**	0.804	3.51	964	**1650**	**3620**	<0.0500 J6	
	MW-10	Sep-21		612	**1640**	1.11	3.22	1330	**2270**	**6630**	<0.0500	
	MW-11A	Apr-19		1140	**9210**	1.02	18.8	4410	**3430**	**19100**	0.744	
	MW-11A	Oct-19		1060	**7880**	1.32	22.0	4280	**2760**	**17000**	<0.0197	
	MW-11A	Jun-20		1110	**8800**	0.806	19.9	4410	**3210**	**18400 J3J4**	<0.0500	
	MW-11A	Oct-20		1180	**8020**	0.454	20.2	5080	**2720**	**20200**	<0.0500	
	MW-11A	Apr-21		1130	**8110**	0.794	20.6	5040	**3180**	**16200**	1.10	
	MW-11A	Sep-21		1230	**8880**	0.114 J	22.2	5180	**3290**	**18600**	<0.0500	
	MW-11B	Apr-15		1070	**6000**	0.562	36.6	4040	**3860**	**12700**	<0.0200	
	MW-11B	Apr-17		979	**6050**	0.825	35.2	3660	**2890**	**14000**	<0.197	
	MW-11B	Apr-19		935	**6410**	0.899	32.2	3410	**3340**	**11600**	<0.197	
	MW-11B	Apr-21		966	**6020**	0.829	34.1	3850	**3110**	**12800**	<0.0500	

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Water Quality Parameters								Cyanide
				Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL		250	1.60			600	1000	10.0	0.200
				CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Evaporation Ponds	MW-15	Apr-18		477	**1040**	**1.70 J5**	5.35	657	**1720**	**3580**	0.758	
	MW-15	Apr-19		614	**1670**	1.44	5.73	667	**2770**	**4720**	1.58	
	MW-15	Jun-20		480	**1200**	0.610	5.52	563	**1440**	**3830**	<0.0500	
	MW-15	Apr-21		581	**1220**	1.39	5.39	738	**1660**	**3490**	5.18	
	MW-18A	Apr-19		756	**6360**	**1.85**	46.1	3870	**6740**	**17800**	<0.0197	<0.00180
	MW-18A	Oct-19		619	**5490**	**3.14**	40.1	3670	**5780**	**16000 J3**	<0.0197	<0.00180
	MW-18A	Jun-20		574	**5140**	**2.52**	33.6 O1	3030 O1V	**5780**	**15500**	<0.0500	<0.00180
	MW-18A	Oct-20		616	**4600**	**2.72**	39.3	3380	**4820**	**16800**	<0.0500	<0.00180
	MW-18A	Apr-21		661	**5540**	**2.60**	39.9	3700	**5570**	**15600**	<0.0500	<0.00180
	MW-18A	Sep-21		696	**5350**	**2.30**	38.0	3880	**5780**	**16500**	<0.0500	<0.00180
	MW-18B	Apr-15		581	**763**	0.931	5.91	460	**1840**	**4410**	0.0280 J	
	MW-18B	Apr-17		576	**860**	0.797	5.91	481	**2070**	**4080**	<0.0197	
	MW-18B	Apr-19		807	**919**	0.727	8.43	506	**2030**	**4690**	<0.0197	
	MW-18B	Apr-21		612	**821**	0.802	6.66	534	**1790**	**4350**	<0.0500	
	MW-22A	Apr-19		426	**1650**	0.761	3.58	1330	**2300**	**5940**	0.0230 J	
	MW-22A	Apr-19	FD	431	**1700**	0.739	3.38	1190	**2230**	**6040**	<0.0197	
	MW-22A	Oct-19		969	**5760**	0.681	6.27	3060	**3450**	**13300**	0.418	
	MW-22A	Oct-19	FD	990	**5660**	0.293	6.42	2970	**3520**	**13100**	0.414	
	MW-22A	Jun-20		575	**4500**	0.900	4.36	2610	**3310**	**11900**	0.0816 JB	
	MW-22A	Jun-20	FD	566	**4450**	1.02	4.20	2270	**3330**	**11300 J4**	<0.0500	
	MW-22A	Oct-20		458	**2770**	0.821	3.75	1920	**2450**	**7820**	0.0711 J	
	MW-22A	Oct-20	FD	453	**2290**	0.795	3.71 B	2240	**2060**	**8210**	<0.0500	
	MW-22A	Apr-21		383	**1490**	0.682	3.08	1280	**1750**	**4840**	<0.0500	
	MW-22A	Apr-21	FD	399	**1550**	0.712	3.14 J	1370	**1910**	**4940**	<0.0500	
	MW-22A	Sep-21		947	**12200**	0.447	8.27	7360	**6680**	**29300**	1.76	
	MW-22A	Sep-21	FD	976	**12600**	0.542	8.60	7080	**7100**	**28400**	1.71	
	MW-22B	Apr-15		477	**1400**	0.823	4.02 J	1150	**2170**	**5590**	<0.0200	
	MW-22B	Apr-17		396	**1400**	0.771	4.15	1150	**2080**	**5670**	0.408 J	
	MW-22B	Apr-19		414	**1300**	0.818	4.30	985	**2170**	**5480**	<0.197	
	MW-22B	Apr-21		420	**1190**	0.677	3.99	1080	**1830**	**4760**	<0.0500	
	MW-70	Apr-19		843	**1280**	0.623	5.99	760	**2320**	**5770**	<0.0197	
	MW-70	Oct-19										
	MW-70	Jun-20		764	**1400**	0.577	5.22	764	**2510**	**5360 J3**	<0.0500	
	MW-70	Oct-20										
	MW-70	Apr-21		740	**1200**	0.595	5.52	832	**2060**	**5790**	<0.0500	
	MW-70	Sep-21										
	MW-72	Apr-18		707	**3540**	**5.82**	8.82	2490	**3010**	**8800**	2.99	
	MW-72	Apr-19		645	**2880**	**5.61**	7.71	1850	**2740**	**8500**	2.67	
	MW-72	Jun-20		627	**2830**	**5.71**	6.56	1730	**2810**	**8060**	0.645	
	MW-72	Apr-21		651	**2490**	**5.61**	6.98	1740	**2360**	**5940**	4.22	
	MW-73	Apr-18		589	**2350**	**1.95**	2.48	2490	**4020**	**8360**	0.348	
	MW-73	Apr-19		600	**2590**	**2.95**	2.60	2330	**3350**	**9180**	4.66	
	MW-73	Jun-20		561	**2540**	**1.67**	2.29	2410	**3990**	**8860**	<0.0500	
	MW-73	Apr-21		609	**3100**	**1.83**	2.46	2590	**4570**	**9400**	0.371	
	MW-74	Apr-19		582	**1400**	**8.15**	36.9	2250	**4650**	**9760**	**52.2**	
	MW-74	Oct-19		542	**1490**	**7.85**	33.4	1990	**3390**	**5720**	<0.0197	
	MW-74	Jun-20		507	**1540**	**7.75**	32.7	2260	**4190**	**7180**	**48.4**	
	MW-74	Oct-20		554	**1800**	**8.34**	35.8	2000	**3610**	**8370**	7.45	
	MW-74	Apr-21		562	**1850**	**7.50**	30.5	2120	**3400**	**6560**	4.80	
	MW-74	Sep-21		607	**1780**	**6.32**	29.6	2100	**3190**	**8640**	<0.0500	
	MW-75	Apr-19		348	**1410**	**7.71**	17.4	1420	**2010**	**5790**	1.56	
	MW-75	Oct-19		362	**1360**	**6.63**	15.9	1320	**1940**	**5320**	<0.0197	
	MW-75	Jun-20		366	**1470**	**7.22**	16.6	1340	**2080**	**6110**	<0.0500	
	MW-75	Oct-20		362	**1520**	**7.66**	17.9	1470	**2010**	**5680**	<0.0500	
	MW-75	Apr-21		370	**1350**	**6.71**	17.6	1370	**1770**	**4730**	2.16	
	MW-75	Sep-21		381	**1400**	**7.43**	18.2	1460	**1910**	**5720**	<0.0500	
	MW-76	Apr-19		439	**1090**	**3.02**	24.9	955	**2210**	**5620**	<0.0197	
	MW-76	Oct-19		483	**1150**	**3.03**	28.8	991	**2220**	**5270**	<0.0197	
	MW-76	Jun-20		454	**1150**	**2.89**	26.2	975	**2270**	**5620**	<0.0500	
	MW-76	Oct-20		426	**1220**	**3.14**	25.7	975	**2090**	**5330**	<0.0500	
	MW-76	Apr-21		425	**1090**	**3.00**	25.3	914	**1800**	**4300**	<0.0500	
	MW-76	Sep-21		490	**1130**	**2.94**	26.4	940	**1940**	**5420**	<0.0500	
	MW-77	Apr-18		521	**310**	**2.56**	68.8	1240	**3770**	**7230**	0.109	
	MW-77	Apr-19		491	**335**	**3.20**	66.0	1230	**4370**	**7850**	<0.0197	
	MW-77	Jun-20		488	**428**	**2.53**	64.2	1070	**3950**	**7430**	<0.0500	
	MW-77	Apr-21		495	**514**	**3.61**	65.9	1060	**3200**	**5240**	<0.0500	
	MW-78	Apr-18		331	239	**15.3**	19.2	393	**1800**	**3730**	2.70	
	MW-78	Apr-19		343	20.4	**17.2**	13.4	81.7	**1580**	**3150**	5.82	
	MW-78	Jun-20		584	51.7	**13.9**	16.6	184	**2580**	**4460**	<0.0500	
	MW-78	Apr-21		319	**317**	**14.8**	17.8	365	**1410**	**3480**	8.33	
	MW-79	Apr-19		636	**1940**	**7.01**	7.82	1250	**2470**	**6510**	2.08	
	MW-79	Oct-19		818	**2410**	**4.70**	7.08	1160	**2320**	**7470**	<0.0197	
	MW-79	Jun-20		768	**2150**	**5.09**	6.82	1160	**2540**	**7550**	<0.0500	
	MW-79	Oct-20		726	**2180**	**5.58**	7.03	1200	**2600**	**6470**	<0.0500	
	MW-79	Apr-21		647	**1700**	**5.90**	6.84	1110	**2120**	**5550**	2.35	
	MW-79	Sep-21		615	**1500**	**5.24**	5.86	1180	**2070**	**6100**	0.708	
	MW-80	Apr-18		506	**1190**	**2.97**	7.13	1110	**2310**	**5180 J3**	0.461	
	MW-80	Apr-19		559	**1180**	**3.03**	2.72	768	**2260**	**5120**	0.355	
	MW-80	Jun-20		620	**1210**	**2.19**	2.99	680	**1980**	**4990**	<0.0500	
	MW-80	Apr-21		592	**980**	**2.46**	2.77	684	**1750**	**3780**	2.02	
	MW-81	Apr-18		542	**1270**	**6.69**	17.9	1170	**2340**	**5600**	**19.8**	
	MW-81	Apr-19		527 O1V	**1210**	**6.81**	7.33	969 V	**2190**	**5740**	**14.7**	
	MW-81	Jun-20		441	**1050**	**5.73**	5.49	908	**1990**	**4750**	3.54	
	MW-81	Apr-21		456	**987**	**6.61**	6.52	962 V	**1840**	**4940**	1.65	
	MW-82	Apr-18		391	**1420**	**11.4**	9.36	1510	**2350**	**5460**	0.734	
	MW-82	Apr-19		395	**1360**	**11.4**	8.60	1300	**2250**	**5730**	3.50	
	MW-82	Jun-20		422	**1430**	**9.31 J**	8.75	1150	**2180**	**5560**	<0.0500	
	MW-82	Apr-21		520	**1410**	**8.40**	9.31	1080	**1870**	**5810**	1.40	
	MW-83	Apr-19		555	69.9	**2.81**	56.3	236	**6770**	**6470**	3.70	
	MW-83	Oct-19		536	**354**	**4.14**	64.3	370	**4520**	**7520**	<0.0197	
	MW-83	Jun-20		544	**314**	**4.63**	48.9	319	**4190**	**6810**	1.31	
	MW-83	Oct-20		349	**957**	**4.48**	31.8	659	**2380**	**5040**	<0.0500	
	MW-83	Apr-21		324	**992**	**3.94**	18.5	810	**1270**	**3430**	8.03	
	MW-83	Sep-21		552	126	**5.11**	94.1	220	**4840**	**8160**	**21.4**	
	MW-84	Apr-19		616	**1650**	**4.26**	7.12	1540	**3990**	**9140**	0.308	
	MW-84	Oct-19		594	**1730**	**5.44**	6.51	1450	**4200**	**9080**	<0.0197	
	MW-84	Jun-20		568	**1480**	**6.24**	7.06	1400	**4710**	**9700**	<0.0500	
	MW-84	Oct-20		579	**1670**	**6.29**	6.23	1350	**4910**	**10800**	<0.0500	
	MW-84	Apr-21		592	**1320**	**5.81**	6.44	1370	**3930**	**9040**	<0.0500	
	MW-84	Sep-21		602	**1360**	**5.54**	8.18	1660	**5100**	**10600**	<0.0500	
	MW-86	Jun-20		544	**555**	**8.20**	8.40	806	**4170**	**8130**	<1.00	<0.0900
	MW-86	Oct-20		535	**671**	**6.03**	6.70	947	**3100**	**7830**	<0.0500	0.00261 J

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Water Quality Parameters								Cyanide
			Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
			CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL		250	1.60			600	1000	10.0	0.200
			CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	Well ID	Date	Dup									
Evaporation Ponds	MW-87	Apr-19		723	**4460**	1.13	24.7	2800	**5150**	**13700**	<0.0197	
	MW-87	Oct-19										
	MW-87	Jun-20		596	**4070**	1.41	20.7	2690	**4840**	**12500**	<0.0500	
	MW-87	Oct-20										
	MW-87	Apr-21		649	**3420**	1.32	22.1	2640	**3780**	**13500**	<0.0500	
	MW-87	Sep-21										
	MW-88	Apr-19		426	**1740**	1.36	3.28	1280	**2700**	**6650**	<0.0197	
	MW-88	Oct-19										
	MW-88	Jun-20		406	**1510**	0.951	2.83	997	**2040**	**5240**	<0.0500	
	MW-88	Oct-20										
	MW-88	Apr-21		428	**1640**	1.16	3.22	1290	**2340**	**6300**	<0.0500	
	MW-88	Sep-21										
	MW-120	Apr-19		571	**2220**	**2.91**	2.92	1500	**4500**	**6610**	0.150	
	MW-120	Oct-19		562	**1390**	**4.02**	2.70	1210	**2830**	**4680** J3	<0.0197	
	MW-120	Jun-20		455	**1260**	**2.90**	2.23	992	**2530**	**5500**	<0.0500	
	MW-120	Oct-20		608	**1540**	**3.81**	2.67	1200	**2870**	**7000**	<0.0500	
	MW-120	Apr-21		592	**1410**	**3.64**	2.28	1080	**2850**	**5450**	<0.0500	
	MW-120	Sep-21		607	**1330**	**3.75**	2.23	1300	**3010**	**7220**	0.276	
	MW-121	Apr-19		616	**963**	**4.45**	3.14	696	**2530**	**5490**	0.497	
	MW-121	Oct-19		554	**770**	**5.48**	3.41	637	**2530**	**5090**	1.11	
	MW-121	Jun-20		560	**752**	**5.05**	2.71	613	**2790**	**4890**	0.0855 J	
	MW-121	Oct-20		595	**690**	**4.87**	3.34	665	**2400**	**5180**	<0.0500	
	MW-121	Apr-21		657	**1070**	**4.52**	3.31	636	**2300**	**4360** J3	0.0576 J	
	MW-121	Sep-21		671	**987**	**4.75**	3.06	617	**2290**	**5430**	0.638	
	MW-122	Apr-19		413	**1110**	**2.74**	3.91	866	**2040**	**4750**	0.0650 J	
	MW-122	Oct-19		340	**719**	**2.10**	3.54	617	**1260**	**3660**	0.0270 J	
	MW-122	Jun-20		413	**1470**	**2.58**	4.03	1080	**2450**	**6070**	<0.0500	
	MW-122	Oct-20		353	**940**	**2.54**	3.78	737	**1590**	**4220**	<0.0500	
	MW-122	Apr-21		357	**895**	**2.61**	3.60	750	**1600**	**3300**	0.0894 J	
	MW-122	Sep-21		395	**1450**	**1.74**	3.32	673	**2250**	**4240**	<0.0500	
	MW-123	Apr-19		501	**1420**	1.16	3.63	961	**2180**	**5600**	<0.0197	
	MW-123	Oct-19		690	**2030**	1.17	4.26	1190	**2250**	**6720**	<0.0197	
	MW-123	Jun-20		513	**1420**	1.04	3.54	984	**2140**	**5380**	<0.0500	
	MW-123	Oct-20		524	**1390**	1.07	3.55	1100	**1920**	**5460**	<0.0500	
	MW-123	Apr-21		519	**1270**	0.938	3.54	970	**1780**	**3770**	<0.0500	
	MW-123	Sep-21		554	**1350**	0.968	3.16	981	**1820**	**5540**	<0.0500	
	MW-124	Apr-19		867	**3120**	0.884	6.86	1730	**3560**	**11200**	<0.0197	
	MW-124	Oct-19		753	**3140**	1.12	6.86	1630	**3500**	**9980**	<0.0197	
	MW-124	Jun-20		785	**3510**	1.01	6.50 J	1700	**4500**	**7780**	<0.0500	
	MW-124	Oct-20		758	**2490**	1.03	6.57	1840	**3030**	**9940**	<0.0500	
	MW-124	Apr-21		792	**3080**	0.949	6.88	1750	**3580**	**10500**	0.0985 J	
	MW-124	Sep-21		799	**3280**	0.817	7.25	1740	**3890**	**10600**	<0.0500	
	OCD-1R	Apr-19		403	**1230**	**3.09**	3.03	977	**2250**	**5000**	0.485	
	OCD-1R	Oct-19		600	**1820**	**2.93**	4.13	1660	**3670**	**7760**	0.243	
	OCD-1R	Jun-20		599	**1640**	**2.60**	3.82	986	**2350**	**5850**	0.0815 JB	
	OCD-1R	Oct-20		500	**1070**	**2.78**	3.50	1070	**2020**	**5560**	0.0603 J	
	OCD-1R	Apr-21		474	**1010**	**2.77**	2.92	834	**1800**	**4340**	0.335	
	OCD-1R	Sep-21		547	**1740**	**2.54**	3.15	1480	**4480**	**7020**	<0.0500	
	OCD-2A	Apr-19		573	**1300** V	0.874	4.73	758	**2290** V	**5440**	0.185	
	OCD-2A	Oct-19										
	OCD-2A	Jun-20		609	**1290**	0.853	4.93	755	**2240**	**5020**	<0.0500	
	OCD-2A	Oct-20										
	OCD-2A	Apr-21		592	**1150**	0.706	5.28	656	**1690**	**4070**	0.672	
	OCD-2A	Sep-21										
	OCD-3	Apr-19		347	**907**	1.15	8.85	688	**1610**	**3850**	0.0700 J	
	OCD-3	Oct-19										
	OCD-3	Jun-20		375	**585**	1.10	7.17	446	**1580**	**3150**	0.0713 JB	
	OCD-3	Oct-20										
	OCD-3	Apr-21		398	**573**	0.887	7.28	447	**1480**	**2950**	0.149	
	OCD-3	Sep-21										
	OCD-4	Apr-19		818	**4400**	0.820	32.4	5380	**3240**	**11300**	0.0360 JJ6	
	OCD-4	Oct-19										
	OCD-4	Jun-20		840	**5000**	0.990	33.5	2580	**3300**	**12700**	<0.0500	
	OCD-4	Oct-20										
	OCD-4	Apr-21		858	**4670**	0.815	36.1	2980	**3100**	**11600**	0.0991 J	
	OCD-4	Sep-21										
	OCD-5	Apr-19		843	**4840**	0.790	38.9	2580	**3300**	**12400**	<0.0197	
	OCD-5	Oct-19		843	**5240**	0.628	35.7	3010	**3080**	**11900**	<0.0197	
	OCD-5	Jun-20		824	**4770**	0.950	37.3	2660	**3490**	**10700** J4	<0.0500	
	OCD-5	Oct-20		850	**4120**	0.702	35.8	3010	**2690**	**12100**	<0.0500	
	OCD-5	Apr-21		851	**4420**	0.837	41.2	2980	**3030**	**11500**	<0.0500	
	OCD-5	Sep-21		898	**5170**	0.745	36.0	3550	**3300**	**13100**	<0.0500	
	OCD-6	Apr-19		931	**4710**	**2.26**	17.0	2820	**2760**	**11400**	0.837	
	OCD-6	Oct-19		754	**3180**	**2.84**	11.3	2050	**2950**	**9760**	0.0320 J	
	OCD-6	Jun-20		918	**4880**	**2.04**	15.0	2710	**3160**	**10800**	<0.0500	
	OCD-6	Oct-20		922	**4850**	**2.27**	15.8	2720	**2870**	**11400**	<0.0500	
	OCD-6	Apr-21		925	**4320**	**2.19**	15.6	2770	**2650**	**7740**	3.58	
	OCD-6	Sep-21		979	**4590**	**2.06**	15.8	2910	**2720**	**12000**	<0.0500	
	OCD-7AR	Apr-19		662	**2700**	**2.30**	6.31	2600	**3950**	**10300**	0.711	
	OCD-7AR	Oct-19		602	**2680**	**2.80**	6.22	2420	**3640**	**10200**	<0.0197	
	OCD-7AR	Jun-20		619	**2990**	**2.13**	6.10	2520	**3990**	**9740**	<0.0500	
	OCD-7AR	Oct-20		643	**2680**	**2.75**	6.37	2590	**3640**	**10800**	<0.0500	
	OCD-7AR	Apr-21		635	**2660**	**2.99**	6.42	2530	**3780**	**9800**	1.95	
	OCD-7AR	Sep-21		639	**2650**	**2.70**	5.57	2650	**3700**	**10600**	<0.0500	
	OCD-7B	Apr-15		641	**910**	0.852	11.9	685	**2580**	**4520**	<0.0200	
	OCD-7B	Apr-17		564	**960**	1.05	11.0	629	**2100**	**4540**	<0.0197	
	OCD-7B	Apr-19		590	**874**	0.839	11.7	678	**2260**	**4760**	<0.0197	
	OCD-7B	Apr-21		590	**822**	0.950	11.6	680	**2170**	**4100**	<0.0500	
	OCD-8A	Apr-19		683	**2690**	**2.47**	8.77	2200	**3800**	**10500**	<0.0197	<0.00180
	OCD-8A	Oct-19		1010	**12000**	**2.02**	17.4	6590	**6010**	**29600**	0.275	<0.00180
	OCD-8A	Jun-20		665	**5120**	**2.01**	8.85	3440	**4510**	**12600**	<0.0500	<0.00180
	OCD-8A	Oct-20		758	**5270**	**2.36**	10.8	3710	**4260**	**15600**	<0.0500	<0.00180
	OCD-8A	Apr-21		729	**4880**	**2.20**	9.88	3090	**4270**	**13700**	<0.0500	<0.00180
	OCD-8A	Sep-21		764	**5560**	**2.40**	11.7	3700	**4730**	**15600**	<0.0500	<0.00180
	OCD-8B	Apr-15		680	**2020**	0.934	9.51	1520	**2910**	**7110**	0.0233 J	
	OCD-8B	Apr-17		660	**2030**	0.925	9.07	1800	**2620**	**7390**	0.0320 J	
	OCD-8B	Apr-19		715 V	**3230**	0.774	9.61	1490 V	**4950**	**7690**	<0.0197	
	OCD-8B	Apr-21		691	**2200**	0.744	9.76	1500	**2440**	**7480**	<0.0500	
Field East of Refinery	KWB-1A	Apr-19		538	**319**	1.26	1.20	291	**2580**	**4580**	0.446	<0.00180
	KWB-1A	Oct-19		466	**332**	1.46	0.954 J	258	**2660**	**4240**	0.101	<0.00180
	KWB-1A	Jun-20		465	**271**	1.33	0.854 J	234	**2600**	**4490**	0.142	<0.00180
	KWB-1A	Oct-20		476	**266**	1.33	0.994 JB	245	**2430**	**4320**	0.0862 J	<0.00180
	KWB-1C	Apr-15		619	**1160**	**25.3**	1.23	210	**2920**	**5340**	0.180	
	KWB-1C	Apr-17		560	**508**	1.25	1.36	267	**2860**	**5000**	0.0350 JP1	
	KWB-1C	Apr-19		533	**317**	1.16	1.39	274	**2550**	**4680**	0.629	
	KWB-1C	Apr-21		488	**275**	1.15	1.24 J	249	**2580**	**4490**	0.0807 J	

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Water Quality Parameters								Cyanide
				Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL		250	1.60			600	1000	10.0	0.200
				CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	Well ID	Date	Dup										
Field East of Refinery	KWB-7	Jun-20		330	**458**	0.915	<0.534	275	**834**	**2810**	<0.0500	<0.00180	
	KWB-7	Oct-20		371	**330**	0.794	<2.67	263	**1260**	**3180**	0.0590 J	<0.00180 J6	
	KWB-7	Apr-21		251	**369**	0.710	0.376 J	269	349	**2000**	0.109	<0.0450	
	KWB-7	Sep-21		371	**348**	0.736	0.288 J	231	**1340**	**3020**	<0.250	<0.0180	
	KWB-8	Oct-16		251	**579**	0.467	0.351 J	443	**701**	**3120**	0.0380 JB	<0.00900	
	KWB-8	Apr-17		237	**574**	0.623	0.414 J	320	442	**2400**	0.0510 J	<0.00180	
	KWB-8	Oct-17		273	**913**	0.467	0.411 J	462	417	**3270**	<0.985	<0.00180	
	KWB-8	Oct-20		301	**398**	0.694	<0.534	546	**1660**	**4440**	<1.00	<0.0180	
	KWB-10R	Apr-17		134	230	1.57	0.521 J	131	0.475 J	**1130**	<0.0197		
	KWB-10R	Oct-17		138	186	1.39	0.453 J	123	3.08 J	**1080**	0.440		
	KWB-10R	Apr-18		138	183	1.35	0.430 J	122	<0.0774	**1060**	0.0250 J		
	KWB-10R	Oct-18		130	188	1.33	0.836 JB	110	<0.0774	**1040**	<0.0197		
	KWB-11A	Apr-19		453	**744**	0.626	0.831 J	308	**1100**	**3380**	0.679	<0.00180	
	KWB-11A	Jun-20		408	**676**	0.753	0.800 J	319	**1180**	**3180**	0.0536 J	<0.00180	
	KWB-11A	Oct-20		396	**541**	0.652	0.676 J	306	**1090**	**2930**	0.414	<0.00180	
	KWB-11A	Sep-21		385	**501**	0.822	0.676 J	270	**1110**	**3080**	<0.0500	<0.00180	
	KWB-11B	Apr-19		516	**342**	0.359	2.19	87.2	**1500**	**2560**	3.31	<0.00180	
	KWB-11B	Oct-19		498	**329**	0.447 J	2.25	87.0	**1540**	**2620**	2.69	<0.00180 J6	
	KWB-11B	Jun-20		515	**369**	0.453	2.24	97.1	**1710**	**2880**	3.34	<0.00180	
	KWB-11B	Oct-20		509	**365**	0.395	<2.67	100	**1380**	**3130**	3.03	<0.00180	
	KWB-11B	Apr-21		519	**313**	0.365	2.24	95.6	**1360**	**2810**	2.93	<0.00180	
	KWB-11B	Sep-21		495	**367**	0.371	2.28	98.2	**1390**	**3000**	2.61	<0.00180 J6	
	KWB-12A	Oct-19		480	111	0.597	0.614 JB	122	**2210**	**3270**	8.01	<0.00180	
	KWB-12A	Jun-20		519	115	0.587	1.46 J	135	**2270**	**3490**	7.15	<0.00180	
	KWB-12A	Oct-20		541	129	0.537	1.07 JB	133	**2020**	**3520**	6.85	<0.00180	
	KWB-12A	Sep-21		544	195 B	0.623	1.07 J	185	**2090**	**3960**	**10.6 V**	<0.00180	
	KWB-12B	Apr-19		606	111	0.327	0.752 J	151	**2140**	**3600**	7.48	<0.00180	
	KWB-12B	Apr-19	FD	549	110	0.328	0.723 J	134	**2080**	**3580**	7.81	<0.00180	
	KWB-12B	Oct-19		527	114	0.425	0.575 JB	129	**2230**	**3830 J3**	7.10	<0.00180	
	KWB-12B	Oct-19	FD	533	113	0.417	0.621 J	134	**2280**	**3620**	7.15	<0.00180	
	KWB-12B	Jun-20		537	120	0.441	0.673 J	130	**2460**	**3790**	**11.5**	<0.00180	
	KWB-12B	Jun-20	FD	525	114	0.343	0.742 J	126	**2210**	**3600**	8.27	<0.00180	
	KWB-12B	Oct-20		578	130	0.386	0.656 JB	141	**2210**	**3820**	6.35	0.00596	
	KWB-12B	Oct-20	FD	533	126	0.395	0.642 J	141	**2140**	**3760**	7.25	0.0565	
	KWB-12B	Apr-21		562	136	0.374	0.691 J	140	**2350**	**3890**	7.85	<0.00180	
	KWB-12B	Apr-21	FD	556	121	0.394	0.669 J	143	**2070**	**3900**	8.05	<0.00180	
	KWB-12B	Sep-21		553	204 B	0.419	0.653 J	172	**2050**	**4020**	**13.8**	0.00210 J	
	KWB-12B	Sep-21	FD	545	201 B	0.413	0.618 J	165	**2090**	**3970**	**13.2**	<0.00180	
	KWB-P4	Apr-15											
	KWB-P4	Apr-17											
	KWB-P4	Apr-19											
	KWB-P4	Apr-21											
	MW-57	Apr-19		590	152	1.58	3.30	259	**1700**	**3160**	4.05		
	MW-57	Oct-19		638	**482**	**2.91**	2.35	429	**3160**	**5720**	**12.7**		
	MW-57	Jun-20		568	131	**2.63**	1.21 J	388	**3190**	**4840**	**13.8**		
	MW-57	Oct-20		529	135	**1.99**	2.97	287	**2140**	**4040**	4.83		
	MW-57	Apr-21		460	210	**1.88**	1.50 J	265	**1910**	**3730**	7.90		
	MW-57	Sep-21		652	**496**	**3.42**	3.11	455	**3310**	**3170**	**34.2**		
	MW-58	Oct-17		235	249	1.26	0.553 J	116	13.1	**1340**	<0.0197	<0.00180	
	MW-58	Apr-18		215	207	1.37	0.290 J	98.5	2.59 J	**1250**	<0.0985	<0.00180	
	MW-58	Oct-18		176	151	1.06	1.20	74.3	56.9	**1040**	<0.394	<0.00180 J3J6	
	MW-58	Oct-19		229	**294**	1.33	2.06	70.3	1.49 JB	**1140**	<0.0197	<0.00180	
	MW-111	Oct-18		203	**412**	1.46	0.588 JB	221	331	**1810**	<0.0197		
	MW-111	Apr-19		340	**375**	0.957	1.83	209	322	**2000**	<0.0197		
	MW-111	Oct-19		212	**429**	1.38	0.214 J	239	317	**2070**	<0.0197		
	MW-111	Jun-20		251	**409**	1.08	1.11 J	206	372	**1970**	<0.0500		
	MW-112	Nov-14		190	230	1.00	0.310 J	190	5.40	**1200**	<0.0200		
	MW-113	Apr-19		332	172	0.451	0.746 J	163	**997**	**2440**	<0.0197 J6		
	MW-113	Apr-19	FD	329 V	178	0.449	0.633 J	160 V	**1020**	**2070**	<0.0197		
	MW-113	Oct-19		299	211	0.593	0.377 JB	164	**1180**	**2050**	<0.0197		
	MW-113	Oct-19	FD	306	198	0.611	0.419 J	162	**971**	**2380**	<0.0197 J6		
	MW-113	Jun-20		317	192	0.519	0.598 J	159	**1210**	**2440**	<0.0500		
	MW-113	Jun-20	FD	313	184	0.605 J	<0.534	152	**958**	**2460**	<0.0500		
	MW-113	Oct-20		274	177	0.527	<0.534	158	**773**	**2200**	0.199		
	MW-113	Oct-20	FD	280	185	0.536	<2.67	177	**786**	**2210**	0.128		
	MW-113	Apr-21		331	169 B	0.480	0.602 J	170	**956**	**2480**	0.121		
	MW-113	Apr-21	FD	318	185	0.554	0.519 J	155	**1130**	**2480**	<0.0500		
	MW-113	Sep-21		202	**348**	0.539	0.385 J	208	55.2	**1710**	<0.0500		
	MW-113	Sep-21	FD	200	**317 B**	0.537	0.390 J	208	61.0	**1720**	<0.500		
	MW-125	Apr-19		549	**322**	1.25	1.23	206	**2860**	**4290**	0.457		
	MW-125	Oct-19		517	**304**	1.20	1.30	216	**3040**	**4480**	0.788 J5		
	MW-125	Jun-20		543	**330**	1.19	1.41 J	221	**2950**	**4500**	0.212 J5		
	MW-125	Oct-20		541	**271**	1.10	1.42 JB	221	**2270**	**4350**	0.0919 J		
	MW-125	Apr-21		549	**261 B**	0.983	1.36 J	224	**2300**	**4440**	0.155		
	MW-125	Sep-21		519	**271 B**	1.06	1.32 J	213	**2210**	**4370**	0.0618 J		
	MW-126A	Apr-19		382	191	0.757	0.547 JB	138	**1350**	**2540**	<0.0197		
	MW-126A	Oct-19		325	136	0.937	0.670 J	152	**1330**	**2330**	<0.0197 J5		
	MW-126A	Jun-20		357	198	0.869	<0.534	152	**1590**	**2680**	<0.0500		
	MW-126A	Oct-20		396	210	0.706	<0.534	189	**1510**	**3150**	<0.0500		
	MW-126B	Apr-19		590	**263**	0.629	2.80	219	**2060**	**3430**	0.381		
	MW-126B	Oct-19		545	**273**	0.779	2.31	198 V	**2250**	**4180**	0.364		
	MW-126B	Jun-20		539	**272**	0.784	2.27	210	**2440**	**4010**	0.414		
	MW-126B	Oct-20		562	**256**	0.705	2.36	195	**2140**	**3990**	0.429		
	MW-126B	Apr-21		552	243	0.739	2.31	202	**2210**	**4080**	0.509		
	MW-126B	Sep-21		539	249 B	0.712	2.28	198	**2010**	**4020**	0.399		
	MW-127	Oct-17		262	231	0.993	1.46	142	**776**	**1970**	0.146		
	MW-127	Apr-18		245	225	0.997	0.279 J	148	**677**	**2010**	<0.0985		
	MW-127	Oct-18		240	219	0.979	1.29 JB	135	**670**	**1940**	<0.0197		
	MW-127	Apr-19		267	208	0.855	0.438 JB	163	**612**	**1990**	<0.0197		
	MW-128	Oct-17		186	200	1.29	0.354 JB	107	248	**1370**	<0.0197		
	MW-128	Apr-18		181	175	1.23	0.764 J	115	207	**1280**	<0.0197		
	MW-128	Oct-18		161 V	170	1.13	0.412 J	97.3 O1V	147	**1650**	0.0230 JJ6		
	MW-128	Apr-19		181	173	1.06	0.725 J	115	126	**1300**	<0.0197		
	MW-129	Apr-16		170	**300**	1.10	0.331 J	210	44.1	**1520**	<0.197		
	MW-129	Oct-16		162	**293**	1.13	0.270 J	198	44.1	**1340**	0.0770 JB		
	MW-129	Apr-17		163	**300**	1.02	0.334 J	199	44.1	**1250**	<0.197 J5		
	MW-129	Apr-18		162	**282**	1.04	0.251 J	201	52.6	**1270**	<0.0197		
	MW-130	Apr-19		269	228	**1.81**	0.712 J	289	**940**	**2470 J4**	1.81		
	MW-130	Oct-19		250	243	0.913	0.789 J	275	**1000**	**2170**	0.777		
	MW-130	Jun-20		247	208	0.828	0.656 J	285	**972**	**2390**	0.861		
	MW-130	Oct-20		242	188	0.758	0.648 JB	285	**882**	**2430**	0.959		
	MW-130	Apr-21		423	156 B	0.718	4.08	302	**874**	**2490**	1.24		
	MW-130	Sep-21		278	136	0.710	1.44 J	271	**877**	**2350**	0.813		

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Water Quality Parameters								Cyanide
				Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL		250	1.60			600	1000	10.0	0.200
				CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	Well ID	Date	Dup										
Field East of Refinery	MW-131	Apr-17		151	**285**	0.773	0.275 J	153	10.3	**1230**	<0.197		
	MW-131	Oct-17		149	**284**	0.807	0.200 J	149	15.5	**1290**	<0.0197		
	MW-131	Oct-19		145	**288**	0.845	0.251 J	150	19.7	**1210**	<0.0197		
	MW-131	Jun-20		153	**283**	0.865	<0.534	163	24.7	**1270**	<0.0500		
	MW-133	Nov-14		200	170	1.10	0.460 J	140	140	**1300**	<0.0200		
	MW-133	Apr-15		163	174	1.19	0.323 J	122	116	**1190**	<0.200		
	MW-134	Apr-19		582	**417**	1.31	1.89	283	**3060**	**4960**	3.42		
	MW-134	Apr-19	FD	563	**403**	1.31	1.70	263	**2840**	**5250**	3.53		
	MW-134	Oct-19		511	**396**	1.37	1.48	243	**3140**	**4710**	2.67		
	MW-134	Oct-19	FD	542	**398**	1.42	1.54	249	**2780**	**4960**	2.55		
	MW-134	Jun-20		515	**370**	1.16	1.51 J	234 V	**2910**	**4870**	1.73 J5		
	MW-134	Jun-20	FD	516	**363**	1.45 J	1.43 J	239	**2530**	**4960**	<0.0500		
	MW-134	Oct-20		501	**349**	1.01	1.67 JB	243	**2700**	**4950**	1.37		
	MW-134	Oct-20	FD	503	**366**	1.32 J	1.64 J	251	**2530**	**4970**	1.39		
	MW-134	Apr-21		540	**295 B**	0.959	1.77 J	269	**2610**	**4870**	1.17		
	MW-134	Apr-21	FD	513	**335**	1.45 J	1.64 J	241	**2780**	**4820**	1.09		
	MW-134	Sep-21		503	**324**	0.905	1.44 J	248	**2820**	**4900**	5.94		
	MW-134	Sep-21	FD	513	**313 B**	1.06	1.43 J	255	**2620**	**4800**	0.586		
	MW-135	Apr-19		608	**652**	0.954	1.00	667	**2780**	**5780**	**29.5**		
	MW-135	Oct-19		513	**547**	1.20	0.744 JB	542	**2820**	**5240**	**13.4**		
	MW-135	Jun-20		542	**542**	1.14	0.801 J	594	**2940**	**5600**	**16.0**		
	MW-135	Oct-20		538	**504**	1.13	<2.67	621	**2970**	**5460**	**10.9**		
	MW-135	Apr-21		527	**440**	1.16	0.832 J	606	**3070**	**5550**	7.25		
	MW-135	Sep-21		538	**514**	1.24	0.875 J	560	**2960**	**5640**	**11.9**		
	MW-145	Oct-20											
	MW-145	Oct-20	FD										
	MW-145	Apr-21			**334**	1.20			**2560**	**4920**			
	MW-145	Sep-21			**369**	1.11			**2640**	**4910**			
	MW-146	Oct-20											
	MW-146	Apr-21			**294**	1.21			**2840**	**5130**			
	MW-146	Sep-21			**303**	1.17			**2890**	**5060**			
	MW-146	Sep-21	FD		**311**	1.15			**2990**	**5020**			
	MW-147	Oct-20											
	MW-147	Apr-21			**475**	0.791			**2730**	**5340**			
	MW-147	Sep-21			**484**	**1.80**			**3420**	**6460**			
	MW-148	Oct-20											
	MW-148	Apr-21			**255**	1.06			**2110**	**4190**			
	MW-148	Sep-21			**270**	1.07			**1890**	**3660**			
	RA-4196	Apr-19		370	112	0.309	2.34	90.6	**1060**	**1920**	<0.0197		
	RA-4196	Oct-19		363	131	0.299	1.96	89.2	**1250**	**2160**	<0.0197		
	RA-4196	Jun-20		365	126	0.324	2.17	90.1	**1330**	**2290**	<0.0500		
	RA-4196	Oct-20		382	123	0.348	2.36	98.7	**1250**	**2340**	0.842 J6		
	RA-4798	Apr-19		257	60.1	0.355	2.16	46.5	**726**	**1340**	1.02		
	RA-4798	Oct-19		366	130	0.339	1.91	93.8	**1260**	**1950**	1.14		
	RA-4798	Jun-20		449	163	0.321	2.30	117	**1620**	**2820**	1.50		
	RA-4798	Oct-20		356	104	0.358	2.36	87.6	**1080**	**2200**	1.18		
	RA-4798	Apr-21		424	122	0.347	2.45	106	**1410**	**2510**	1.49		
	RA-4798	Sep-21		461	171	0.281	2.29	126	**1660**	**2830**	1.05		
	RW-12R	Apr-17		392	189	0.623	0.293 J	152	**1740**	**2420 J3**	<0.197		
	RW-12R	Apr-18		378	155	0.700	0.220 J	171	**1400**	**2400**	<0.0197		
	RW-12R	Apr-19		369 V	154	0.609	0.408 JB	164 V	**1180**	**2450**	<0.0394		
	RW-12R	Jun-20		337	143	0.716	<0.534	158	**1300**	**2750**	<0.0500		
	RW-13R	Apr-16		202	222	0.691	0.346 J	167	341	**1190**	0.0460 J		
	RW-13R	Apr-18		242	207	0.650	0.378 J	183	525	**1700**	0.0260 JP1		
	RW-18A	Apr-17		504	176	**2.51**	1.09	141	**2870**	**4400**	1.90		
	RW-18A	Apr-18		491	206	**1.82**	0.832 J	132	**2750**	**3940**	0.408		
	RW-18A	Apr-19		549	199	**1.94**	0.832 J	130	**2390**	**3970**	0.286		
	RW-18A	Jun-20		515	211	**2.03**	0.990 J	120	**2490**	**4280**	0.460		
	RW-20	Apr-15		228	**256**	0.530	<0.180	228	125	**1430**	<0.200		
	RW-22	Apr-15		184	**402**	0.860	0.319 J	274	78.4	**1680**	<0.200		
NCL	MW-18	Apr-18		472	154	1.59	3.05	90.2	**1820**	**2580**	**37.9**	<0.00180	
	MW-18	Apr-19		536	86.7	**2.04**	7.60	76.6	**1910**	**3310**	**32.6**	<0.00180	
	MW-18	Jun-20		421	154	**1.61**	1.66 J	58.7	**1510**	**2870**	**18.3**	<0.00180	
	MW-18	Apr-21		393	206	**1.64**	1.56 J	63.7	**1150**	**2170**	9.30	<0.00180	
	MW-45	Apr-19		670	**462**	1.24	7.13	390	**2580**	**4760**	0.0470 JJ6	<0.00180	
	MW-45	Oct-19		588	**441**	**1.73**	5.54	375	**2530**	**4710**	0.0260 J	<0.00180	
	MW-45	Jun-20		574	**413**	1.54	4.80	339	**2490**	**4480**	<0.0500	0.00225 J	
	MW-45	Oct-20		577	**429**	**1.70**	4.70	359	**2350**	**4970**	<0.0500	<0.00180	
	MW-45	Apr-21		603	**372**	**1.97**	4.42	375	**2450**	**3680**	0.0756 J	<0.0180	
	MW-45	Sep-21		548	**334**	1.34	4.12	339	**2110**	**4010**	<0.0500	<0.00180	
	MW-53	Apr-16		459	**346**	1.06	1.42 J	161	**1340**	**2890**	**25.3**		
	MW-53	Apr-17		340	222	0.904	1.12	130	**1330**	**2290**	**15.6**		
	MW-53	Apr-18		315	72.9	1.13	1.12 B	118	**1250**	**1860**	1.58 J6		
	MW-53	Apr-19		259	59.6	1.30	1.17	88.4	**1100**	**1880**	0.290		
	MW-53R	Oct-20		298	66.7	1.11	4.08	69.1	**955**	**1920**	<0.0500		
	MW-53R	Apr-21		312	64.8	1.29	2.37	78.2	**1110**	**1870**	0.132		
	MW-54A	Apr-19		335	185	0.957	0.196 J	54.1	**778**	**1890**	<0.0197		
	MW-54A	Oct-19		356	212	1.03	0.292 JB	61.1	**833**	**2060**	0.154		
	MW-54A	Jun-20		366	198	0.809	<0.534	55.5	**838**	**2030**	<0.0500		
	MW-54A	Oct-20		374	196	0.913	<0.534	60.8	**768**	**1990**	<0.0500 J5		
	MW-54A	Apr-21		414	217	0.969	0.355 J	64.3	**916**	**1940**	0.115		
	MW-54A	Sep-21		410	221	1.03	0.319 J	61.1	**923**	**2300**	<0.0500		
	MW-54B	Apr-15		307	166	0.613	0.767 J	48.0	**752**	**1890 J**	0.0276 J		
	MW-54B	Apr-17		317	127	0.617	1.18	54.5	**1040**	**1840**	0.100 J		
	MW-54B	Apr-19		319	140	0.634	0.811 J	50.5	**818**	**1870**	0.0410 J		
	MW-54B	Apr-21		458	205	0.654	1.47 J	69.9	**1320**	**2290**	0.0845 J		
	MW-55	Apr-19		519	**520**	**1.62**	0.897 J	229	**1930**	**3900**	2.28	<0.00180	
	MW-55	Oct-19		414	**538**	1.58	0.749 J	235	**1610**	**3640**	0.419	<0.00180	
	MW-55	Jun-20		410	**580**	1.55	0.672 J	225	**1540**	**3480**	0.0643 J	<0.00180	
	MW-55	Oct-20		333	**505**	1.30	0.842 JB	228	**949**	**3010**	<0.0500	<0.00180	
	MW-55	Apr-21		293	**463**	**1.62**	0.683 J	244	**781**	**2130**	0.0762 J	<0.00180	
	MW-55	Sep-21		282	**448**	1.58	0.644 J	199	**770**	**2520**	<0.0500	<0.00180	
	MW-56	Apr-18		485	242	1.25	2.14	252	**2000**	**3080**	<0.0197		
	MW-56	Apr-19		475	221	1.06	1.99	212	**1890**	**3560**	<0.0197		
	MW-56	Jun-20		496	219	1.08	1.70 J	142	**1990**	**3520**	<0.0500		
	MW-56	Apr-21		484	211	1.19	1.80 J	140	**1740**	**2860**	0.252		
	MW-108	Apr-19		239	37.6	1.60	1.18	73.3	**790**	**2080**	<0.985		
	MW-108	Oct-19		244	23.4	**1.84**	0.725 J	60.8	**802**	**1940**	<0.394		
	MW-108	Jun-20		157	17.9	**1.63**	<0.534	45.5	365	**1270**	<5.00		
	MW-108	Oct-20		139	15.8	1.48	<0.534	46.8	221	**1150**	<0.0500		
	MW-108	Apr-21		209	27.0	**1.66**	0.412 J	64.6	**718**	**1610**	<0.0500		
	MW-108	Sep-21		308	40.3	**1.90**	0.801 J	63.0	**963**	**2190**	<2.50		

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Water Quality Parameters								Cyanide
				Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL		250	1.60			600	1000	10.0	0.200
				CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
NCL	NCL-31	Apr-19		323	32.1	1.34	0.459 J	97.6	**1520**	**2910**	<0.0197	
	NCL-31	Oct-19		419	20.6	**2.73**	3.06	83.2	**2240**	**3570**	2.46	
	NCL-31	Jun-20		308	21.3	1.36	<0.534	65.4	**1600**	**2580**	<0.0500	
	NCL-31	Oct-20		290	28.6	1.23	<0.534	69.7	**1360**	**2460**	<0.0500	
	NCL-31	Apr-21		251	45.1	**1.62**	0.539 J	70.8	**1100**	**1890**	0.118	
	NCL-31	Sep-21		206	50.2	**1.67**	0.346 J	43.1	**828**	**1680**	<0.0500	
	NCL-32	Apr-19		442	105	1.26	3.35	116	**1480**	**2730**	5.87	
	NCL-32	Oct-19		431	98.8	1.28	3.19	114	**1840**	**2880**	5.62	
	NCL-32	Jun-20		472	90.7	1.36	3.12	107	**1730**	**2940**	6.45	
	NCL-32	Oct-20		483	90.7	1.27	3.47	118	**1640**	**3040**	5.82	
	NCL-32	Apr-21		511	87.3	1.47	3.79	113	**1670**	**2490**	6.30	
	NCL-32	Sep-21		453	92.6	1.45	3.39	98.0	**1650**	**2920**	4.59	
	NCL-33	Apr-19		430	**483**	**2.12**	4.92	145	595	**1840**	0.890	
	NCL-33	Oct-19		547	**964**	**2.34**	5.54	157	**1090**	**3120**	<0.0197	
	NCL-33	Jun-20		714	**692**	**2.44**	5.60	166	**1540**	**3890**	0.0547 J	
	NCL-33	Oct-20		688	**667**	**2.64**	6.43	178	**1340**	**3960**	<0.0500	
	NCL-33	Apr-21		678	**790**	**2.72**	4.74	273	**1330**	**3420**	0.0825 J	
	NCL-33	Sep-21		548	**647**	**2.90**	6.37	254	**1340**	**3690**	<0.0500	
	NCL-34A	Oct-18		270	**289**	1.21 J3J5	1.25	111	117	**1710**	<0.394	
	NCL-34A	Apr-19		251 V	**262**	1.37	1.11	107 V	42.6	**1370**	<0.394	
	NCL-34A	Oct-19		235	245	1.38	1.15	116	119	**1470**	0.110	
	NCL-34A	Jun-20		283	**260**	1.31	1.13 J	104	234	**1680**	<5.00	
	NCL-44	Apr-19		371	138	1.48	2.39	131	**1230**	**2640**	<0.0197 J6	
	NCL-44	Oct-19		356	185	**1.67**	2.32	131	**1430**	**2740**	0.142	
	NCL-44	Jun-20		373	141	**1.66**	2.15	135	**1290**	**2700**	<0.0500	
	NCL-44	Oct-20		358	126 B	**1.63**	2.29	142	**1170**	**2730**	<0.0500	
	NCL-44	Apr-21		362	121	**1.80**	2.27	146	**1200**	**2180**	0.114	
	NCL-44	Sep-21		334	125	**1.84**	2.12	136	**1170**	**2550**	<0.0500	
	NCL-49	Apr-19		438	127	0.658	0.761 J	123	**1910**	**2490**	5.63	
	NCL-49	Apr-19	FD	450	129	0.653	0.701 J	124	**1830**	**2440**	5.66	
	NCL-49	Oct-19		474	137	0.740	0.736 J	129 V	**1910**	**3240**	6.39	
	NCL-49	Oct-19	FD	440	134	0.722	0.642 J	126 V	**1970**	**3390**	7.44	
	NCL-49	Jun-20		486	128	0.609	0.686 J	133	**1910**	**3350**	9.98	
	NCL-49	Jun-20	FD	472	128	0.613	0.652 J	135	**1920**	**3350**	9.95	
	NCL-49	Oct-20		487	135 B	0.606	0.692 JB	135	**1830**	**3380**	**10.1**	
	NCL-49	Oct-20	FD	482	135 B	0.600	0.675 JB	133	**1820**	**3430**	10.0	
	NCL-49	Apr-21		501	115	0.692	0.786 J	154	**1970**	**2930**	6.70	
	NCL-49	Apr-21	FD	491	118	0.645	0.706 J	149 V	**2030**	**2910**	7.30	
	NCL-49	Sep-21		491	105	0.697	0.726 J	140	**1980**	**3400**	**13.3**	
	NCL-49	Sep-21	FD	483	105	0.704	0.710 J	140	**1970**	**3340**	**13.3**	
North Refinery	MW-23	Apr-19		97.5	**444**	**1.70**	1.12	482	18.9	**2000**	<0.0197	
	MW-23	Oct-19		95.6	**428**	1.59	1.27	410	18.7	**2020**	<0.0197	
	MW-23	Jun-20		96.4	**410**	1.42	1.10 J	426 V	15.6	**1970**	<0.500	
	MW-23	Oct-20		96.8	**408**	1.19	1.29 J	459	7.39	**1990**	<0.0500	
	MW-29	Apr-19		617	**331**	**1.61**	1.98	360	**2790**	**5300**	<0.0197	
	MW-29	Oct-19		519	**351**	**2.05**	2.08	357	**2810**	**4180**	<0.0197	
	MW-29	Jun-20		396	**383**	**1.71**	2.03	356	**1890**	**3610**	<0.0500	
	MW-29	Oct-20		336	**418**	1.47	1.90 J	333 V	**1430**	**3530**	<0.0500	
	MW-29	Apr-21		379	**457**	**1.83**	2.06	330	**1580**	**3730**	0.105	
	MW-29	Sep-21		590	**502**	1.47	2.77	328	**2170**	**4180**	0.0504 J	
	MW-39	Apr-19		52.6	111	**4.21**	0.164 J	891	**1000**	**2580**	<0.0197	
	MW-39	Oct-19		45.8	86.8	**4.26**	0.245 J	771	**929**	**2590**	<0.0197	
	MW-39	Jun-20		61.8	97.7	**3.45**	<0.534	721	**821**	**2410**	<0.0500	
	MW-39	Oct-20		63.8	91.5	**3.28**	<0.534	655	**686**	**2260**	<0.0500	
	MW-40	Apr-17		474	156	**1.76**	1.62	110	**1550**	**3190**	<0.197	
	MW-40	Apr-18		425	141	**1.80**	1.41	107	**1440**	**2390**	<0.985	
	MW-40	Apr-19		450	106	1.52	1.39	107	**1400**	**2600 J3**	<0.394	
	MW-40	Jun-20		374	88.4	**1.88**	1.30 J	90.4	**1380**	**2430**	<0.500	
	MW-41	Apr-18		329	**682**	0.934	0.571 J	624	**1500**	**4060**	<0.0197	
	MW-41	Apr-19		238	**721**	0.884	0.590 J	624	**1140**	**4110**	<0.394	
	MW-41	Jun-20		282	**875**	1.00	0.653 J	828	**1780**	**4930**	<0.0500	
	MW-41	Apr-21		274	**856**	1.02	0.586 J	812	**1590**	**5010**	0.117	
	MW-42	Apr-18		241	**372**	0.984	0.433 J	445	**1180**	**2990 J3**	0.0310 JJ6	
	MW-42	Apr-19		233	**319**	0.780	0.449 J	425	**1010**	**2590**	<0.394	
	MW-42	Jun-20		246	**336**	0.851	<0.534	358	**1020**	**3310**	<2.50	
	MW-42	Apr-21		314	**585**	0.869	0.397 J	452	**1290**	**3870**	0.0775 J	
	MW-43	Apr-19		152	**639**	**1.71**	0.923 J	491	444	**2610**	<0.394	<0.0180
	MW-43	Oct-19		205	**662**	**1.66**	0.961 J	406	479	**2120**	<0.985	<0.0180 J4
	MW-43	Jun-20		141	**547**	1.36	0.828 J	341	198	**2210**	<0.250	<0.0360
	MW-43	Oct-20		141	**550**	1.09	0.896 J	350	102	**2150**	<0.0500	<0.0180
	MW-59	Apr-17		467	184	1.13	0.519 J	134	**1870**	**3160**	<0.197	
	MW-59	Apr-18		492	180	1.31	0.507 J	151	**1680**	**2760**	<0.0197 J6	
	MW-59	Apr-19		475	173	1.10	0.468 J	153	**1400**	**3110**	<0.0197	
	MW-59	Jun-20		366	201	1.33	<0.534	184	**1340**	**2900**	<0.0500	
	MW-60	Apr-19		448	**275 B**	1.06	0.766 J	258	**2380**	**3870**	<0.985	<0.00180
	MW-60	Apr-19	FD	429	**269 B**	0.901	0.703 J	250	**2300**	**4060**	<0.985	<0.00180
	MW-60	Oct-19		401	250	0.972	0.420 J	191	**2200**	**2930 J3**	<0.197	<0.0180
	MW-60	Oct-19	FD	402	**273**	0.936	0.445 JB	184 V	**2040**	**3320 J3**	<0.197	<0.0180
	MW-60	Jun-20		418	206	0.778	<0.534	178	**1770**	**3720**	<2.50	<0.0360
	MW-60	Jun-20	FD	424	219	1.18 J	<0.534	176	**1660**	**3790**	<0.500	<0.0360
	MW-60	Oct-20		418	202	0.715	<0.534	189	**1510**	**3560**	0.203	<0.0180
	MW-60	Oct-20	FD	401	219	1.21 J	<0.534	190	**1780**	**3660**	<0.0500	<0.0180
	MW-61	Apr-19		288	**322**	1.43	0.885 J	317	**725**	**2320**	<0.197	
	MW-61	Oct-19		402	**412**	**2.05**	2.49	234	**885**	**2690**	<0.985	
	MW-61	Jun-20		292	**471**	1.09	0.933 J	299	541	**2570**	<5.00	
	MW-61	Oct-20		246	**339**	1.06	0.820 JB	302	532	**2110**	<0.0500	
	MW-61	Apr-21		250	**339**	0.906	0.637 J	273	475	**2140**	<0.500	
	MW-61	Sep-21		225	**312**	0.933	0.635 J	231	327	**2040**	<2.50	
	MW-62	Apr-19		292	**266**	1.56	1.15	310	556	**2280**	<0.0197	
	MW-62	Oct-19		271	**285**	1.60	1.12	255 O1V	593	**2290**	<0.985	
	MW-62	Jun-20		282	**280**	1.19	0.973 J	235	524	**2290**	<2.50	
	MW-62	Oct-20		304	**296**	1.08	1.11 JB	241	531	**2370**	<0.0500	
	MW-62	Sep-21		376	**386**	1.03	1.07 J	225	**703**	**2750**	<2.50	
	MW-62R	Oct-20		304	**311**	0.806	3.38	152	571	**2240**	<0.0500	
	MW-62R	Apr-21		183	**280**	1.02	1.00 J	116	2.65 J	**1340**	<0.0500	
	MW-67	Oct-17		207	**305**	0.568	0.500 JB	200	388	**1740**	<0.0985	<0.00180
	MW-67	Apr-18		220	**328**	0.636	0.573 JB	245	404	**1660**	<0.197	<0.180
	MW-67	Oct-18		240	221	0.611	0.636 J	202	493	**1580**	<0.0197	<0.00180
	MW-67	Apr-19		202	**302**	0.637	0.538 J	225	447	**1630**	<0.0197	<0.00180
	MW-90	Apr-19		321	167	**1.99**	1.21	172	**1900**	**2710**	0.558 J	
	MW-90	Oct-19		434	79.1	**5.45**	1.73	109	**2540**	**3480**	0.0330 J	
	MW-90	Jun-20		331	173	**2.25**	1.13 J	142	**1790**	**3120**	<2.50	
	MW-90	Oct-20		293	210	1.05	0.913 J	171	**1280**	**2910**	<0.0500	
	MW-90	Apr-21		314	230	1.06	0.760 J	170	**1250**	**2960**	<0.0500	
	MW-90	Sep-21		452	163	**3.03**	1.75 J	133	**2330**	**4090**	<1.00	

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Water Quality Parameters								Cyanide
				Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL		250	1.60			600	1000	10.0	0.200
				CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
North Refinery	MW-91	Oct-18		433	221	1.27	0.639 J	35.2	**966**	**2820**	<0.985	
	MW-91	Apr-19		460	**295**	1.27	0.468 J	38.9	**915**	**3290**	<1.97	
	MW-91	Oct-19		451	**422**	1.29	0.520 J	39.6	**1020**	**2430**	<0.197	
	MW-91	Jun-20		478	**501**	1.19	<0.534	36.7	**813**	**2830**	<10.0	
	MW-92	Apr-16		130 O1	**415**	1.30	1.73 J	450 O1V	24.1	**2310**	0.602 J	
	MW-92	Oct-16		134	**539**	**1.63**	2.02	454	14.6	**2150**	<0.985	
	MW-93	Apr-17		489	192	**2.38**	2.97	167	**1430**	**2930**	<0.197	
	MW-93	Apr-18		537	193	**2.39**	3.55	191	**1400**	**2760**	<0.197	
	MW-93	Apr-19		505	214	**2.09**	3.76	195	**1400**	**2810**	0.0220 J	
	MW-93	Jun-20		491	233	**1.88**	3.11	163	**1070**	**2820**	<2.50	
	MW-94	Oct-15		109	245	1.01	0.224 J	355	75.8	**2530**	<0.197	
	MW-94	Apr-16		124	217	1.02	0.189 J	532	199	**2980**	<0.197	
	MW-94	Oct-16		137	172	1.04	0.467 J	319	175	**2530**	<0.0197	
	MW-94	Apr-17		95.6	196	0.874	0.331 J	427	85.7	**2660**	<0.197	
	MW-95	Apr-17		203 V	**349**	0.868	0.730 J	194 V	420	**1710**	<0.197	
	MW-95	Apr-18		229	**258**	0.884	0.602 J	163	471	**1770**	<0.0197	
	MW-95	Apr-19		246	**264**	0.830	0.472 J	172	561	**2020**	<0.0197	
	MW-95	Jun-20		250	**300**	0.739	<0.534	151	**682**	**2020**	<0.0500	
	MW-96	Apr-19		167	150	1.20	1.17	211	150	**1360**	0.141	
	MW-96	Oct-19		195	144	1.17	1.15	204	393	**1520**	<0.197	
	MW-96	Jun-20		147	131	1.32	1.52 J	200	95.2	**1320**	<2.50	
	MW-96	Oct-20		142	128	1.15	1.17 J	218	69.3 P1	**1420**	<0.0500	
	MW-96	Sep-21		207	129	1.37	1.29 J	193	422	**1800**	<0.500	
	MW-98	Apr-19		575	126	**1.69**	<0.0370	127	**1800**	**2980**	<1.97	
	MW-98	Oct-19		575	185	**1.99**	0.257 J	115	**1520**	**3330**	<0.985	
	MW-98	Jun-20		561	239	**1.69**	<0.534	129	**1590**	**3280**	<5.00	
	MW-98	Oct-20		515	195	**1.73**	<0.534	125	**1300**	**3060**	<0.0500	
	MW-98	Apr-21		580	195	1.58	0.219 J	166	**1390**	**3380**	**<50.0**	
	MW-98	Sep-21		510	177	1.56	0.284 J	175	**1320**	**3220**	<2.50	
	MW-137	Oct-17		141	**548**	1.11	0.979 JB	759	**683**	**2910**	<0.394	<0.00180
	MW-137	Apr-18		143	**446**	1.41	1.23	955	**713**	**3420**	<0.985	<0.180
	MW-137	Oct-18		133	**406**	0.873	0.971 J	632	384	**2730**	<1.97	<0.180
	MW-137	Apr-19		142	**407**	1.28	1.14	845	**607**	**3380**	<1.97	<0.0900
	MW-138	Oct-17		124	**453**	1.06	1.50 B	401	27.9	**2100**	<0.0985	<0.00180
	MW-138	Apr-18		130	**453**	0.874	1.58	436	26.8	**1910**	<0.0197	<0.00180
	MW-138	Oct-18		122	**408**	0.802	1.60	362	30.3	**1510**	<0.0197	<0.00180
	MW-138	Apr-19		130	**435**	0.966	1.62	402	41.4	**1730**	<0.0197	<0.00180
	RW-1R	Apr-16		505	180	1.38	6.39	203	**1500**	**2990**	0.422 J	
	RW-1	Apr-17		558	246	1.41	7.37	268	**1860**	**3690**	<0.197	
	RW-1	Apr-18		363	**255**	0.913	2.24	247	**1030**	**1810**	<1.97	
	RW-1	Apr-19		337	**286**	0.866	1.87	266	**939**	**2690**	<1.97	
	RW-2	Apr-15		726	**365**	**1.75**	5.55 J	383	**3510**	**5310**	<0.200	
	RW-2R	Apr-16		875	**430**	**2.09**	5.80	396	**2200**	**3810**	0.281 J	
	RW-2	Apr-17		519	**251**	**2.35**	2.86	261	**1200**	**3030**	<0.197	
	RW-2	Apr-18		402	**317**	**1.75**	2.25	335	**731**	**2600**	<0.394	
	RW-7	Apr-17		266	204	0.513	0.922 J	105	**693**	**1740**	<0.197	
	RW-7	Apr-18		295	217	1.22	2.54	149	475	**1820**	<0.985	
	RW-7	Apr-19		247	239	1.05	1.63	150	426	**1830**	<0.197	
	RW-7	Jun-20		184	218	0.995	0.651 J	151	162	**1530**	<2.50	
	RW-8	Apr-15		227	115	0.801	0.353 J	209	473	**1600**	<0.200	
	RW-8	Apr-17		218	163	0.731	0.360 J	161	**665**	**1820**	<0.197	
	RW-9	Apr-18		322	**353**	**1.80**	2.13	351	**1170**	**2750**	<0.985	
	RW-9	Apr-19		309	**399**	1.46	1.91	356	**1160**	**3100**	<1.97	
	RW-9	Jun-20		293	**469**	1.21	1.51 J	425	**1140**	**3330**	<2.50	
	RW-9	Apr-21		300	**556**	1.22	1.27 J	439	**1180**	**3560**	<0.500	
	RW-10	Apr-18		499	131	**3.41**	3.49	143	**1530**	**2670**	<0.985	
	RW-10	Apr-19		572	65.9	**3.66**	3.68	102	**1470**	**2540 J3**	<0.197	
	RW-10	Jun-20		485	92.9	**3.87**	4.43	151	**1450**	**2520**	<0.0500	
	RW-10	Apr-21		353	193	**3.26**	3.53	312	**1110**	**2730**	0.0679 J	
	RW-16B	Apr-17		499	**291**	**4.90**	0.832 J	372	**2740**	**5030**	2.20	
	RW-16B	Apr-18		546	43.5	**4.89**	0.788 J	259	**2660**	**4240**	0.894 J6	
	RW-16B	Apr-19		540	83.0	**4.48**	0.677 J	333	**2690**	**4440**	1.47 J3J6	
	RW-16B	Jun-20		516	181	**3.78**	1.65 J	492	**2970**	**4720**	<0.0500	
	RW-17A	Apr-17		568	**398**	**2.61**	4.02	306	**2950**	**4820**	3.33	
	RW-17A	Apr-18		635	**358**	**2.31**	3.87	345	**3080**	**4430**	0.0920 J	
	RW-17A	Apr-19		563	**398**	**2.64**	2.97	286	**3290**	**5430**	<0.0197	
	RW-17A	Jun-20		554	**389**	**2.58**	4.62	306	**2940**	**5730**	0.386	
North RO Field	MW-117	Apr-19		686	**307**	**2.99**	7.11	127	**1980**	**3720**	0.0740 J	
	MW-117	Oct-19		582	**267**	**3.25**	6.50	99.5	**2010**	**3330**	0.376	
	MW-117	Jun-20		578	**299**	**3.43**	6.39	129	**2300**	**3640**	2.46	
	MW-117	Oct-20		587	**271**	**3.25**	6.68	133	**2030**	**3870 J3**	4.05	
	MW-117	Apr-21		663	**304**	**2.89**	5.49	147	**2290**	**4080**	5.55	
	MW-117	Sep-21		614	**325 B**	**2.66**	5.98	144	**1910**	**4020**	1.76	
	MW-118	Apr-19		648	**256**	**5.40**	5.40	144	**2390**	**3800**	1.06	
	MW-118	Oct-19		573	**286**	**5.28**	3.78	153	**2580**	**4260**	1.76	
	MW-118	Jun-20		586	**290**	**5.20**	3.45	171	**2950**	**4620**	2.43	
	MW-118	Oct-20		558	**262**	**5.06**	3.07 B	178	**2600**	**4640**	2.03	
	MW-118	Apr-21		575	241	**4.51**	2.85	192	**2880**	**4840**	2.29	
	MW-118	Sep-21		568	**253 B**	**4.12**	2.38	186	**2720**	**4770**	2.06	
	MW-119	Apr-19		654	**404**	**2.59**	1.39	249	**2160**	**3680**	0.398	
	MW-119	Oct-19		633	**397**	**2.34**	1.31	203	**2360**	**4670**	0.132	
	MW-119	Jun-20		629	**345**	**1.66**	0.637 J	202	**2990**	**4500**	0.281	
	MW-119	Oct-20		641	**298**	1.39	0.832 JB	200 V	**2490**	**4420**	0.106	
	MW-119	Apr-21		620	**278**	1.49	0.690 J	189 V	**2580**	**4400**	0.237	
	MW-119	Sep-21		607	**282 B**	**1.70**	0.786 J	192	**2320**	**4360**	0.314	
South Refinery	KWB-2R	Apr-17		280	**279**	0.904	0.460 J	286	**1060**	**2550**	0.0220 J	
	KWB-2R	Oct-17		139	240	1.09	1.33	283	259	**1770**	<0.394	
	KWB-2R	Apr-19		322	246	0.656	0.516 JB	304	**1040**	**2370**	0.991 J	
	KWB-2R	Oct-19		169	**253**	0.927	0.534 J	246	345	**1590 J3**	<0.0197	
	KWB-5	Oct-17		220	**565**	0.877	1.41	208	21.9	**1560**	0.0530 J	
	KWB-5	Apr-18		233	**546**	0.861	1.95	215	9.96	**1730**	1.93	
	KWB-5	Oct-18		200	**546**	0.869	1.76 JB	208	11.8	**1450**	<0.0197	
	KWB-5	Apr-19		244	**525**	0.761	2.10	241	18.7	**1680**	<0.0197	
	KWB-6	Apr-17		227	**260**	0.965	0.183 J	120	211	**1630**	0.556 J	
	KWB-6	Oct-17		256	**290**	0.842	0.162 J	131	377	**1890**	<0.394	
	KWB-6	Apr-18		248	248	0.897	0.268 J	138	272	**1600**	0.0380 J	
	KWB-6	Oct-18		223	240	0.801	0.230 J	122	324	**1680 J3**	<0.0197	
	MW-28	Apr-19		361	138	1.14	0.964 J	112	**1030**	**2920**	<0.985	<0.0180
	MW-28	Oct-19		360	143	1.60	0.571 JB	101	**1630**	**2860**	<0.985	<0.0180 J4
	MW-28	Jun-20		285	149	1.10	4.23	109	**1310**	**2610**	<0.250	<0.0360
	MW-28	Oct-20		281	132	1.02	4.03	114	**1140**	**2670**	<0.0500	<0.00180
	MW-48	Apr-18		200	**689**	**1.90**	0.776 J	269	9.52	**2490**	0.0860 J	
	MW-48	Oct-18		172 V	**498**	1.20	0.863 J	293 V	125	**1730 J4**	<0.394	
	MW-48	Apr-19		168	179	**1.82**	1.16	290	**1210**	**1630 J4**	<0.394	
	MW-48	Oct-19		159	**429**	1.08	1.12	297	85.7	**1580 J3**	<0.985	

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Water Quality Parameters								Cyanide
				Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL		250	1.60			600	1000	10.0	0.200
				CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
South Refinery	MW-50	Apr-19		469	**320**	1.50	2.62	334	**2340**	**4440**	1.48		
	MW-50	Oct-19		406	**298**	**1.80**	2.63	289	**2450**	**3260**	1.53		
	MW-50	Jun-20		495	**418**	**2.92**	4.42	577	**3370**	**5550** Q	**74.6**		
	MW-50	Oct-20		490	**390**	**3.64**	4.05	682	**4100**	**7810**	**78.5** V		
	MW-50	Apr-21		387	191	1.47	2.42	242	**1650**	**3370**	0.0950 J		
	MW-50	Sep-21		513	**477**	**5.41**	9.75	851	**4950**	**9740**	**266**		
	MW-52	Apr-19		201	160	**1.87**	0.394 JB	321	**1080**	**2500** J3J4	**12.7**		<0.00180
	MW-52	Oct-19		206	**1140**	**1.71**	0.218 JB	322	**1110**	**2380** J3	**13.3**		<0.00180
	MW-52	Jun-20		239	195	**1.71**	<0.534	340	**1140**	**2810**	**13.0**		<0.00180
	MW-52	Oct-20		223	195	**1.62**	<0.534	332	**1110**	**2720**	**15.3** V		<0.00180
	MW-52	Apr-21		212	166 B	1.54	0.319 J	358	**958**	**2530**	**11.0**		<0.00180
	MW-52	Sep-21		211	179	1.53	0.240 J	308	**1050**	**2560**	**12.0**		<0.00180
	MW-64	Apr-19		105	**295**	0.833	0.713 J	359	1.94 J	**1340**	<0.0197		
	MW-64	Oct-19		83.5	**325**	0.742	0.587 J	327	4.42 JB	**1480**	<0.197		
	MW-64	Jun-20		90.7	**324**	0.993	0.655 J	350	5.03	**1620**	<0.100		
	MW-64	Oct-20		88.5	**310**	0.710	0.586 JB	343	8.17	**1590**	<0.0500 J3J6		
	MW-64	Apr-21		93.9	**275**	0.750	0.581 J	350	23.4	**1580**	<0.0500		
	MW-64	Sep-21		88.9	**286 B**	0.878	0.536 J	329	9.58	**1600**	<2.50		
	MW-65	Apr-18		132	**306**	1.33	0.732 J	264	10.2	**1340**	<0.0985		
	MW-65	Oct-18		127	**284**	1.12	0.823 JB	229	4.80 J	**1280**	<0.0197 J6		
	MW-65	Apr-19		155	**284**	0.967	0.532 JB	262	1.23 J	**1310**	<0.0197		
	MW-65	Oct-19		113	234	1.23	0.466 J	223	5.53 B	**1080**	<0.0197		
	MW-66	Apr-19		145	187	1.23	1.21	189	0.718 J	**1140**	<0.0197		<0.00180
	MW-66	Oct-19		121	168	1.04	1.18	131	6.99	912	<0.0197 J6		<0.00180
	MW-66	Jun-20		136	188	1.13	0.842 J	155	1.16 J	**1070**	0.0979 J		<0.00180
	MW-66	Oct-20		140	189	1.12	1.71 JB	145	6.68	**1060**	<0.0500		<0.00180
	MW-66	Apr-21		176	**257**	1.26	2.12	205	1.59 J	**1230**	0.0769 J		<0.00180
	MW-99	Oct-18		162	**254**	0.612	0.792 J	212	124	**1420**	<0.394		
	MW-99	Apr-19		184	225	0.572	1.31	214	145	**1390**	<0.394		
	MW-99	Oct-19		109	66.7	0.517	4.66	58.1	81.1	547	0.0300 J		
	MW-99	Jun-20		138	73.2	0.323	7.77	60.7	109	727	<0.0500		
	MW-101	Apr-19		208	223	0.984	0.384 J	158	182	**1370**	<0.0197 J5		
	MW-101	Oct-19		192	212	0.994	0.482 JB	138	202	**1370**	<0.0197		
	MW-101	Jun-20		183	202	0.965	0.556 J	144	183	**1330**	<0.0500		
	MW-101	Oct-20		207	185	0.915	0.881 JB	137	234	**1410**	<0.0500		
	MW-101	Apr-21		178	190	0.839	0.652 J	149	150	**1250**	0.112		
	MW-101	Sep-21		173	195	0.918	0.934 J	138	200	**1270**	<2.50		
	MW-102	Apr-19		101 V	**281**	0.797	0.275 J	401 V	23.3	**1510**	<0.197		
	MW-102	Oct-19		166	**294**	1.09	0.631 JB	392	190	**1870**	<0.197		
	MW-102	Jun-20		84.2	**285**	0.984	<0.534	446	21.2	**1610**	<0.0500		
	MW-102	Oct-20		91.9	**282**	0.812	<0.534	431	5.16	**1610**	<0.0500		
	MW-102	Apr-21		98.1	242 B	0.823	0.435 J	430	39.6	**1570**	0.0911 J		
	MW-102	Sep-21		118	226 B	0.899	0.532 J	410	55.5	**1650**	<2.50		
	MW-102	Sep-21	FD	117	**253**	1.05	0.601 J	423	55.0	**1620**	<2.50		
	MW-103	Apr-18		94.1	**6800**	**7.41**	1.41	5980	60.4	**13400**	<0.394		
	MW-103	Apr-19		91.2	**4550**	**5.85**	1.16	3990	133	**9260**	<0.0197		
	MW-103	Jun-20		120	**4480**	**4.50**	1.21 J	2830	44.3	**7620**	<0.500		
	MW-103	Apr-21		186	**4530**	**3.47**	1.26 J	3010	157 J	**8460**	<0.500		
	MW-104	Apr-19		321	67.0	1.18	8.16	113	**780**	**1650**	<0.0197		
	MW-104	Apr-19	FD	296	67.7	1.21	7.37	78.0	**793**	**1590**	<0.197		
	MW-104	Oct-19		241	68.0	1.55	5.92	72.2	**757**	**1390**	<0.0197		
	MW-104	Oct-19	FD	244	67.9	1.56	6.00	72.5	**863**	**1300**	<0.197		
	MW-104	Jun-20		224	69.8	1.51	5.03	77.2	**703**	**1290**	<0.250		
	MW-104	Jun-20	FD	218	69.2	1.33	4.88	73.6	**703**	**1140**	<0.500		
	MW-104	Oct-20		256	71.7	1.34	5.63	73.9	**785**	**1470**	0.153		
	MW-104	Oct-20	FD	241	71.7	1.36	5.28	73.7	**702**	**1450**	<0.0500		
	MW-104	Apr-21		321	55.4	1.15	4.78	67.3	**935**	**1820**	0.109		
	MW-104	Apr-21	FD	314	55.8	1.18	4.58	67.3	**929**	**1760**	<0.0500		
	MW-104	Sep-21		306	69.0	1.31	6.26	70.5	**834**	**1830**	<2.50		
	MW-105	Apr-19		294	21.4	1.18	2.78	31.0	600	**1360**	<0.197		
	MW-105	Oct-19		453	28.0	1.04	4.72	26.0	**1120**	**2040**	<0.985		
	MW-105	Jun-20		243	98.8	1.43	2.74	71.7	177	**1220**	<2.50		
	MW-105	Oct-20		170	99.9	1.47	2.73	89.5	17.4	**1050**	<0.0500		
	MW-105	Apr-21		325	119 B	1.32	3.02	94.8	**683**	**1910**	<0.0500		
	MW-106	Apr-19		225	150 B	0.952	2.09	153	**870**	**1900**	<0.985		
	MW-106	Oct-19		360	217	1.29	1.74	264	**1340**	**3240**	<0.985		
	MW-106	Jun-20		295	206	1.11	1.53 J	258	**1130**	**2890**	<10.0		
	MW-106	Oct-20		285	213	0.865	0.777 J	318	**980**	**3110**	<0.0500		
	MW-106	Apr-21		308	**322**	1.01	1.02 J	333	**1580**	**3260**	<0.0500		
	MW-107	Oct-16		186	**271**	**1.82**	0.965 J	80.1	72.4	**1480**	0.170 B		
	MW-107	Apr-17		140	**313**	**1.76**	0.655 J	75.4	<0.0774	**1260**	<0.197		
	MW-107	Apr-18		147	**269**	**1.66**	0.555 J	81.7	1.08 J	**1370**	0.0410 J		
	MW-107	Apr-19		147	246	1.33	0.631 J	82.5	0.657 J	**1270**	<0.0197		
	MW-109	Apr-19		103	180	**2.01**	0.935 J	470	589	**2010**	<0.0197		
	MW-109	Oct-19		98.3	190	**2.08**	0.720 JB	389	**710**	**1740**	0.0580 J		
	MW-109	Jun-20		87.7	191	**1.97**	0.786 J	423	496	**2150**	<2.50		
	MW-109	Oct-20		70.2	200	**1.86**	0.700 JB	430	376	**1990**	<0.0500		
	MW-109	Apr-21		60.3	218	**1.78**	0.591 J	492	204	**1820**	0.104		
	MW-109	Sep-21		76.6	61.9	1.44	0.758 J	394	321	**2020**	<0.500		
	MW-110	Apr-19		105	122	1.48	0.203 JB	278	403	**1340**	<0.0197		
	MW-110	Oct-19		103	105	1.41	0.0768 JB	256	529	**1240**	<0.0197		
	MW-110	Jun-20		97.8	95.6	1.39	<0.534	251	316	**1300**	<0.0500		
	MW-110	Oct-20		95.9	92.9	1.32	<0.534	252	401	**1290**	<0.0500		
	MW-110	Apr-21		101	75.8	1.33	0.430 J	271	433	**1310**	0.0916 J		
	MW-110	Sep-21		84.5	61.9	1.44	0.171 J	246	328	**1180**	<0.0500		
	MW-139	Oct-19		395	249	0.748	1.16	247	**1790**	**3480**	<0.0197		
	MW-139	Jun-20		362	236	0.646	0.597 J	252	**2010**	**3620**	<0.0500		
	MW-139	Oct-20		373	186	0.533	0.560 J	286	**1510**	**3690**	<0.0500		
	MW-139	Apr-21		363	163	0.636	0.433 J	282	**1630**	**3620**	<0.0500		
	MW-139	Sep-21		361	116	0.795	0.466 J	207	**1710**	**3350**	<0.0500		
	RA-313	Apr-18		181	15.3	0.888	0.954 J	18.0	467	819	0.507		
	RA-313	Apr-19		238	221	0.772	1.69	139	**605**	**1510**	0.533		
	RA-313	Jun-20		221	190	0.898	1.66 J	99.9	**635**	**1400**	0.570		
	RA-313	Apr-21		214	153	0.817	1.50 J	99.8 V	545	**1310**	0.640		
	RW-4	Apr-17		151	**280**	0.977	1.50	177	318	**1510**	<0.197		
	RW-4	Apr-18		181	242	0.909	1.52	172	410	**1550**	<0.0197		
	RW-4	Apr-19		188	228	0.691	1.24	151	325	**1660**	<0.197		
	RW-4	Jun-20		201	232	0.778	1.13 J	130	446	**1710**	<0.500		
	RW-5R	Apr-15		4.82	**260**	0.965	0.461 J	189	0.376 J	565	<0.0200		
	RW-5R	Apr-16		4.61 J	**262**	0.564	0.364 J	203	0.655 J	399	0.495 J		
	RW-6	Apr-15		168	**414**	0.628	0.686 J	205	129	**1650**	0.0335 J		
	RW-6R	Apr-16		191	**405**	0.747	0.356 J	226	104	**1470**	0.485 JP1		
	RW-6	Apr-18		183	**409**	0.804	0.684 J	224	45.6	**1530**	0.0460 J		
	RW-6	Apr-19		165	**325**	0.620	0.598 J	191	3.36 J	**1350**	<0.394		

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group	Water Quality Parameters								Cyanide
				Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL		250	1.60			600	1000	10.0	0.200
				CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
South Refinery	RW-15C	Apr-17		160	**409**	0.774	1.59	269	19.4	**1610**	0.442 J	
	RW-15C	Apr-18		211 V	**652**	0.868	1.28	349 V	0.754 J	**1850**	<0.0197	
	RW-15C	Apr-19		247	**264**	0.882	1.63	322	**1070**	**2110 J4**	<0.0197	
South RO Field	MW-114	Apr-19		616	228	**2.02**	2.73	118	**2400**	**3540**	0.356	
	MW-114	Oct-19		593	226	**2.14**	2.61	126	**2010**	**3530**	0.571	
	MW-114	Jun-20		586	**251**	**2.17**	2.42	127	**2060**	**3470**	0.478 J5	
	MW-114	Oct-20		528	233	**2.07**	2.37 B	119	**1590**	**3300**	0.110	
	MW-114	Apr-21		532	180 B	**1.98**	2.46	118	**1410**	**2960**	0.110	
	MW-114	Sep-21		466	227	**2.32**	2.26	109	**1380**	**2820**	<0.0500	
	MW-115	Apr-19		512 V	**281**	**2.12**	0.487 J	180 V	**2720**	**4240**	0.148	
	MW-115	Oct-19		431	**258**	**2.35**	0.496 J	184	**2280**	**4040**	0.163	
	MW-115	Jun-20		475	**424**	**2.09**	<0.534	187	**2590**	**4320**	3.94	
	MW-115	Oct-20		467	**406**	**1.73**	<0.534	179	**2350**	**4590**	3.99	
	MW-115	Apr-21		508	**357 B**	1.54	0.552 J	212	**2240**	**4560**	3.56	
	MW-115	Sep-21		466	**357**	**1.75**	0.547 J	215	**2170**	**4330**	1.85	
	MW-116	Apr-19		623	**263**	1.56	1.25	215	**2470**	**3890**	0.442	
	MW-116	Oct-19		546	**292**	**1.93**	1.52	175	**2600**	**3260**	0.417	
	MW-116	Jun-20		559	**282**	1.59	1.11 J	177	**2270**	**4210**	0.520	
	MW-116	Oct-20		550	**260**	1.53	1.14 JB	176	**1920**	**4040**	0.476	
	MW-116	Apr-21		588	**278 B**	1.52	1.39 J	186	**2080**	**4000**	0.636	
	MW-116	Sep-21		542	**283 B**	1.38	1.03 J	174	**1940**	**3860**	0.709	
TEL	MW-49	Apr-19		225	**435**	1.51	2.96	340	592	**2160**	<0.985	<0.0180
	MW-49	Oct-19		199	**418**	1.58	2.93	318	470	**2320**	<0.985	<0.0180
	MW-49	Jun-20		210	**442**	1.38	2.90	309	487	**2350**	<2.50	<0.0900
	MW-49	Oct-20		196	**451**	1.30	2.45	308	437	**2340**	<0.0500	0.0121 J
	MW-49	Apr-21		184	**395**	1.24	1.81 J	333	383	**1900**	<5.00	0.0990 J
	MW-49	Sep-21		164	**333**	1.26	1.96 J	290	317	**1810**	<2.50	<0.0900
	TEL-1	Oct-18		160	238	**2.13**	0.650 J	474	**719**	**2080**	<0.394	
	TEL-1	Apr-19		172	250	**2.14**	0.685 J	460	**803**	**2000**	<0.394	
	TEL-1	Oct-19		144	234	**2.23**	0.629 J	474	**640**	**2200**	<0.0197	
	TEL-1	Jun-20		143	184	**1.98**	0.565 J	435	**699**	**2140**	<0.500	
	TEL-2	Oct-18		266	205	0.967	1.14	363	**1360**	**2730**	<0.394	
	TEL-2	Apr-19		274	224	1.09	1.73	377	**1250**	**2940**	<0.394	
	TEL-2	Oct-19		298	159	1.28 B	1.30	407	**1610**	**3550**	<0.394	
	TEL-2	Jun-20		280	130	0.988	1.05 J	373	**1540**	**3400**	<0.500	
	TEL-3	Apr-18		302	**696**	**2.51**	6.00	308	442	**2440**	<0.0985	
	TEL-3	Apr-19		562	52.7	**2.77**	5.37	44.1	**1300**	**2290**	<0.0985	
	TEL-3	Oct-19		603	36.7	**3.06**	5.26	36.2	**1470**	**2790**	<0.985	
	TEL-3	Oct-20		424	114	**1.73**	2.55	86.5	**1290**	**2880**	<0.0500 J6	
	TEL-4	Apr-19		262	36.8	1.45	0.438 J	204	**1830**	**3140**	<0.0197	
	TEL-4	Apr-19	FD	264	36.3	1.44	0.432 J	213	**1860**	**2830**	<0.0197	
	TEL-4	Oct-19		283	**281**	**2.09**	0.556 J	303	**1680**	**3540**	<0.394	
	TEL-4	Oct-19	FD	285	**274**	**2.05**	0.529 J	286	**1640**	**3570**	<0.394	
	TEL-4	Jun-20		305	**456**	0.932	<0.534	284 O1V	**1480**	**3770**	<0.500	
	TEL-4	Jun-20	FD	308	**455**	0.841	<0.534	286	**1490**	**3770**	<0.0500	
	TEL-4	Oct-20		294	**400**	0.904	<0.534	296 V	**1140**	**3470**	<0.0500	
	TEL-4	Oct-20	FD	291	**450**	0.834	<0.534	307	**1230**	**3510**	<0.0500	
	TEL-4	Apr-21		342	**290**	0.829	0.513 J	367	**1240**	**3510**	0.0747 J	
	TEL-4	Apr-21	FD	341	**325**	0.825	0.521 J	356	**1410**	**3540**	0.0730 J	
	TEL-4	Sep-21		441	**316**	0.765	0.588 J	406	**1990**	**4670**	0.0517 J	
	TEL-4	Sep-21	FD	442	**308**	0.767	0.669 J	396	**2030**	**4700**	<0.0500	
Three Mile Ditch	MW-8	Apr-18		450	**443**	**1.99**	1.76	320	**2470**	**4040**	8.72	
	MW-8	Apr-19		499	**450**	**2.08**	1.85	336	**3050**	**4640 J4**	**18.7**	
	MW-8	Jun-20		534	**599**	**2.04**	1.98 J	393	**3060**	**5260**	**16.0**	
	MW-8	Apr-21		595	**625**	1.55	2.05	464	**2690**	**5790**	**19.4**	
	MW-16	Apr-18		600	**705**	**2.26**	9.59	643	**2820**	**4960**	0.428	
	MW-16	Apr-19		555	**349**	**2.57**	9.13	472	**2590**	**4590 J4**	0.790	
	MW-16	Jun-20		500	**446**	**2.69**	8.82	424	**2610**	**4390**	0.331	
	MW-16	Apr-21		487	**339**	**2.34**	8.73	371	**2040**	**4000**	1.20	
	MW-20	Apr-18		537	**525**	**2.13**	0.562 J	291	**2790**	**4700 J3**	4.56	
	MW-20	Apr-19		541	**373**	**2.27**	0.509 J	284	**2980**	**4710 Q**	2.02	
	MW-20	Jun-20		522	**382**	**2.26**	0.601 J	284	**2830**	**4590**	2.38	
	MW-20	Apr-21		572	**399**	**1.85**	0.598 J	295	**2590**	**4820**	3.60	
	MW-21	Apr-19		622	**628**	**2.02**	2.11	443	**3150**	**4990 J4**	**19.9**	
	MW-21	Oct-19		536	**592**	**1.68**	1.98	425	**2930**	**5410**	**15.1**	
	MW-21	Jun-20		586	**641**	**2.02**	2.17	440	**3130**	**5480**	**18.6**	
	MW-21	Oct-20		552	**616**	1.41	2.15	429	**2700**	**5600**	**17.5**	
	MW-21	Apr-21		592	**601**	**1.77**	2.18	467	**2570**	**5560**	**17.8**	
	MW-21	Sep-21		546	**647**	**1.91**	2.06	423	**2770**	**5490**	**17.1**	
	MW-25	Apr-18		368 V	**1230**	1.25	4.32	875 V	**1770**	**4080**	0.156	
	MW-25	Apr-19		330	**1040**	1.00	4.19	771	**1510**	**3810**	2.98	
	MW-25	Jun-20		323	**976**	1.31	3.90	653	**1450**	**3610**	0.143	
	MW-25	Apr-21		358	**940**	1.01	3.54	472	**1350**	**3660**	0.466	
	MW-26	Apr-18		664	**1120**	**1.61**	5.46	731	**3830**	**7170**	0.986	
	MW-26	Apr-19		584	**1010**	**2.09**	5.77	674	**4420**	**7020 Q**	1.66	
	MW-26	Jun-20		585	**671**	**2.06**	5.18	530	**3660**	**5990**	1.69	
	MW-26	Apr-21		517	**527**	**1.82**	4.86	530	**3130**	**5690**	1.79	
	MW-27	Apr-18		337	80.2	1.33	7.88	129	**1140**	**1870**	0.770	
	MW-27	Apr-19		297	55.2	1.42	7.82	104	**1030**	**1720 J4**	0.987	
	MW-27	Jun-20		301	56.7	1.38	7.62	91.0	**1070**	**1820**	1.78	
	MW-27	Apr-21		335	60.0	1.18	7.70	94.6	**1110**	**1990**	0.418	
	MW-46R	Apr-19		638	**319**	1.51	0.913 J	178	**2290**	**4030 J4**	0.293	
	MW-46R	Oct-19		602	**318**	1.29	0.949 J	178	**2390**	**4120**	0.527	
	MW-46R	Jun-20		607	204	1.43	0.731 J	172	**2550**	**3930**	0.0922 J	
	MW-46R	Oct-20		553	175 B	1.16	0.725 JB	166	**2070**	**3860**	<0.0500	
	MW-46R	Apr-21		596	203	1.18	0.838 J	179	**2100**	**3850**	0.127	
	MW-46R	Sep-21		466	119 B	1.47	0.779 J	146	**1680**	**3110**	<0.0500	
	MW-68	Apr-18		388	176	**1.82**	5.01	162	**1470**	**2150**	0.390	
	MW-68	Apr-19		326	145	**2.12**	4.87	153	**1310**	**2260 J4**	1.08	
	MW-68	Jun-20		420	**354**	**1.89**	5.27	190	**1700**	**3040**	2.05	
	MW-68	Apr-21		412	244	**1.70**	5.09	235	**1520**	**3090**	1.70	
	MW-71	Apr-18		638	**809**	1.51	3.77	516	**2970**	**5280**	**39.5**	<0.00180
	MW-71	Apr-19		673	**799**	**1.71**	3.47	502	**3260**	**5940 J4**	**32.1**	<0.00180
	MW-71	Jun-20		630	**770**	**1.89**	3.51	510	**3130**	**6020**	**27.8**	<0.00180
	MW-71	Apr-21		625	**689**	**1.62**	3.42	532	**2810**	**6010**	**27.8**	<0.0450
	MW-89	Apr-18		513	170	**2.64**	8.61	151	**1630**	**2430**	1.10	
	MW-89	Apr-19		607 V	233	**3.32**	11.7	193 V	**1040**	**3470 J4**	1.34	
	MW-89	Jun-20		480	162	**2.92**	8.84	148	**1810**	**2810**	0.151	
	MW-89	Apr-21		451	196	**2.35**	7.06	139 V	**1370**	**2650**	1.05	
	NP-1	Apr-19		445	**382**	**2.04**	3.94	325	**2280**	**4210 Q**	3.98	
	NP-1	Oct-19										
	NP-1	Jun-20		436	**409**	**1.89**	2.59	311	**2260**	**4060**	3.27	
	NP-1	Oct-20										
	NP-1	Apr-21		479	**402**	1.50	1.69 J	325	**1870**	**4090**	3.17	
	NP-1	Sep-21										

Table 4C - Summary of Groundwater Analytical Data - Water Quality and Cyanide

2021 Annual Groundwater Monitoring Report

HollyFontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Water Quality Parameters								Cyanide
			Analyte	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
			CAS	7440-70-2	16887-00-6	16984-48-8	7440-09-7	7440-23-5	14808-79-8	TDS	NO_3NO_2	57-12-5
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL		250	1.60			600	1000	10.0	0.200
			CGWSL Source		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**									
Three Mile Ditch	NP-6	Apr-15										
	NP-6	Apr-17										
	NP-6	Apr-19										
	NP-6	Apr-21										
Upgradient	UG-1	Apr-18		434	107	0.751	2.12	98.3	**1670**	**2600**	6.73	0.00224 JB
	UG-1	Apr-19		525	98.3	0.623	1.29	105	**1800**	**3150**	**10.1**	<0.00180
	UG-1	Jun-20		503	97.3	0.784	1.16 J	84.0	**2060**	**3550 B**	**10.6**	<0.00180
	UG-1	Apr-21		499	93.5	0.638	1.19 JB	93.1	**1860**	**2950**	**11.1**	<0.00180
	UG-2	Apr-18		321	72.5	**1.62**	1.33	85.4	**1050**	**1810**	**14.1**	<0.00180
	UG-2	Apr-19		357	61.3	1.32	1.58	90.6	**1020**	**2040 Q**	7.70 J6	<0.00180
	UG-2	Jun-20		342	75.9	1.52	1.41 J	85.7	**1190**	**2150 B**	9.75	<0.00180
	UG-2	Apr-21		330	66.3	1.36	1.33 JB	83.6	**1070**	**1710**	7.30	0.00321 J
	UG-3R	Apr-18		418	40.8	0.599	1.67	73.6	**1470**	**2190**	1.68	<0.00180
	UG-3R	Apr-19		479	36.3	0.502	1.99	37.1	**1390**	**2440**	0.905	<0.00180
	UG-3R	Jun-20		440	39.6	0.582	1.93 J	30.1	**1560**	**2430**	1.93	<0.00180
	UG-3R	Apr-21		489	61.7	0.466	2.10	34.9	**1530**	**2300**	3.16	<0.00180
	UG-4	Apr-18		620	125	0.574	1.77	201	**2680**	**4030**	0.515	<0.00180
	UG-4	Apr-19		694	133	0.544	1.96	190	**2420**	**4210**	0.418	<0.00180
	UG-4	Jun-20		622	108	0.605	1.78 J	168	**2810**	**4210 B**	0.326	<0.00180
	UG-4	Apr-21		635	76.0	0.676 J	1.82 J	164	**2610**	**3800**	0.491	<0.00180

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.
---	No applicable CGWSL.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
WQCC Dom	NMED Groundwater standard for domestic exposure, 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
P1	Relative percent difference value not applicable for sample concentrations less than 5 times the reporting limit.
Q	Sample was prepared and/or analyzed past recommended holding time.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Table 4D - Summary of Groundwater Analytical Data - Semi-Volatile Organic Compounds
2021 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Analyte Group				Semi-Volatile Organic Compounds					
Analyte				1-Methyl naphthalene	2-Methyl naphthalene	Bis (2-ethylhexyl) phthalate	Dibenzofuran	Naphthalene	Phenol
CAS				90-12-0	91-57-6	117-81-7	132-64-9	91-20-3	108-95-2
Units				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CGWSL				0.0300	0.0300	0.00600	0.00790	0.0300	0.00500
CGWSL Source				WQCC HH	WQCC HH	USEPA MCL	USEPA TW	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**						
North Refinery	MW-23	04/03/2019		**0.0531**	<0.00156	0.00460 J	0.00394 J	**0.0450**	**0.0133 J**
	MW-23	10/23/2019		**0.0922**	<0.00622	**<0.0142**	**0.00924 J**	0.0262	**0.0166 J**
	MW-43	04/03/2019		**0.0323**	0.0232	0.000920 J	0.00192 J	**0.0749**	**0.00703 J**
	MW-43	10/23/2019		**0.0956**	**0.0603**	**<0.0142**	<0.00676	**0.249**	**<0.00668**
	MW-61	04/03/2019		**0.0722**	0.0119	**0.00818**	0.00293 J	**0.0701**	0.00457 J
	MW-61	10/23/2019		**0.0902**	0.0163	0.00187 J	0.00398 J	**0.0831**	0.00164 J
	MW-61	09/14/2021		**0.0631**	0.0245	**0.00884**	0.00276 J	**0.0894**	<0.00433
	MW-62	04/03/2019		**0.0628**	**0.0320**	0.00168 J	0.00458 J	**0.0861**	<0.000334
	MW-62	10/23/2019		**0.144**	**0.0581**	**<0.0142**	**0.0128 J**	**0.168**	**<0.00668**
	MW-62	09/14/2021		**0.0984**	**0.0537**	<0.00448	0.00575 J	**0.157**	**<0.0217**
	MW-93	04/03/2019		**0.0313**	0.00507	0.00129 J	0.00397 J	**0.0307**	0.00492 J
	MW-93	06/17/2020		**0.0340**	<0.000585	<0.00448	0.00396 J	0.0298	**<0.0217**
	MW-95	04/03/2019		<0.000332	<0.000311	0.000850 J	0.00173 J	<0.000372	0.00279 J
	MW-95	06/16/2020		<0.000188	<0.000278	<0.00213	0.00259 J	0.00115 JB	**<0.0103**
	MW-137	04/03/2019		**0.0480**	**0.0474**	**<0.0142**	<0.00676	**0.116**	**<0.00668**
	MW-138	04/03/2019		0.00549	0.00356	<0.000709	0.000611 J	0.0117	0.00288 J
TEL	TEL-4	04/02/2019		0.00498	<0.000311	**0.0641**	0.00177 J	<0.000372	0.00150 J
	TEL-4	04/02/2019	FD	0.00531	<0.000311	0.000835 J	0.00205 J	<0.000372	0.00177 J
	TEL-4	10/22/2019		0.00275	<0.000311	0.00120 J	0.00161 J	0.000383 J	0.000961 J
	TEL-4	10/22/2019	FD	0.00300	<0.000311	0.00146 J	0.00169 J	0.000395 J	0.00146 J

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
--	Sample not collected

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
MCL	Maximum Contaminant Level
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, November 2021, Table A-1 Tap Water Screening Lev
USEPA MCL	United States Environmental Protection Agency MCL Screening Level, "Regional Screening Levels (RSL) Summary Table", Nover
USEPA TW	United States Environmental Protection Agency Tap Water Screening Level, "Regional Screening Levels (RSL) Summary Table",
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.

Table 5 - Summary of Production from Recovery Trenches and Wells

2021 Annual Groundwater Monitoring Report

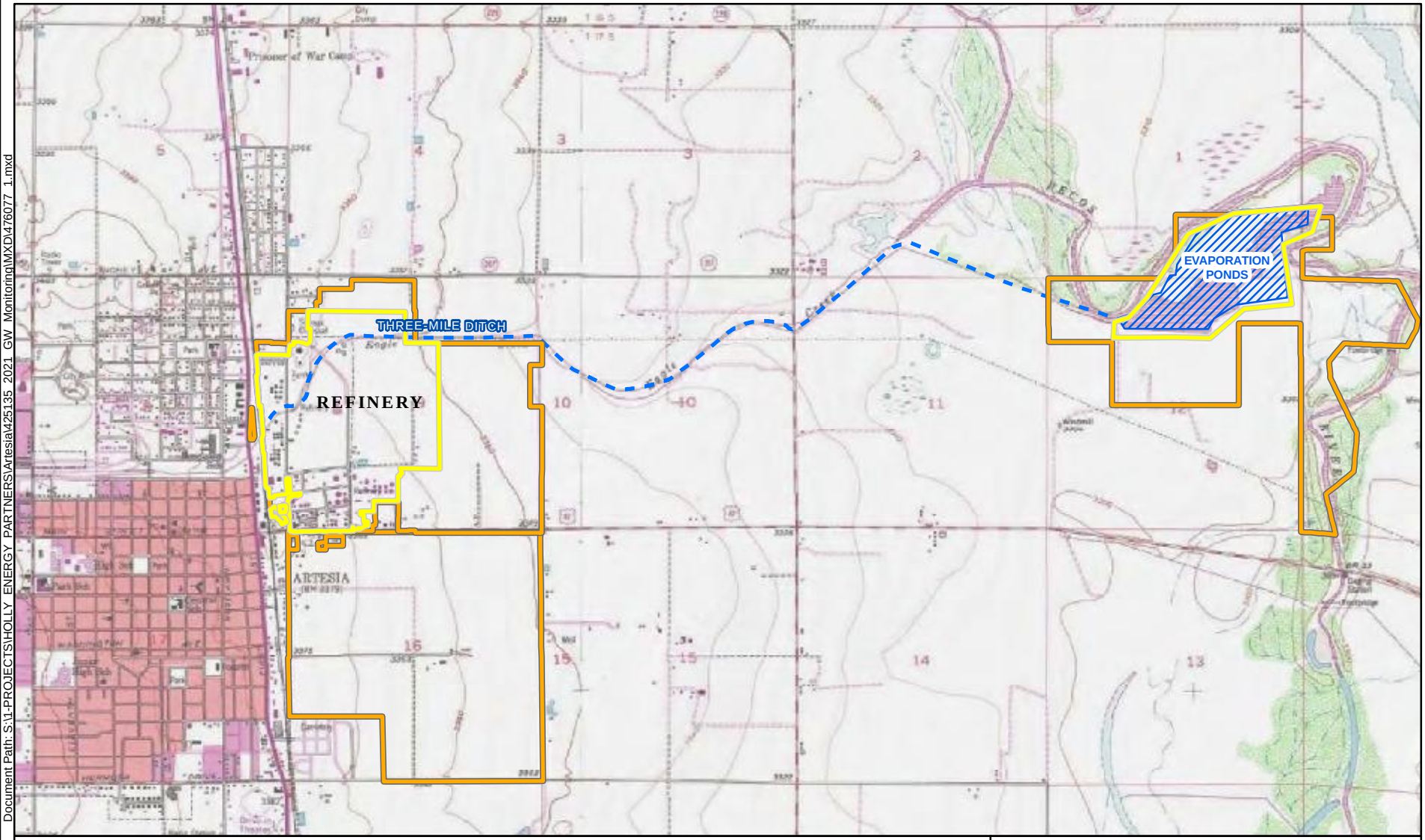
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Recovery Well	Recovery Method	Volume of Water Recovered [1] (gallons)					Volume of PSH Recovered [1] (gallons)				
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total 2021	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total 2021
RW-1R	Automated Pump	0	0	0	1	1	17,710	11,237	18,633	0	47,580
RW-2R	Automated Pump	225,697	263,284	550,894	232,062	1,271,937	6,025	2,498	5,232	428	14,183
RW-4R	Automated Pump	0	5,947	2,061,766	1,017,867	3,085,580	0	0	13,850	0	13,850
RW-5R	Automated Pump	11,848	5,481	29,110	5,298	51,737	19	63	0	0	82
RW-6R	Automated Pump	83,790	150,712	9,355	0	243,857	13,231	20,904	16,722	0	50,857
RW-7R	Automated Pump	649,845	493,404	847,641	576,289	2,567,179	8,431	12,709	10,436	392	31,968
RW-8R	Automated Pump	83,293	2,740	0	0	86,033	15,654	448	0	0	16,102
RW-12R	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-13R	Automated Pump	91	93,894	81,112	0	175,097	677	5,186	2,076	0	7,939
RW-14R	Automated Pump	143,477	418,228	542,548	0	1,104,253	7,383	32,314	28,171	0	67,868
RW-15	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-19	Automated Pump	14	0	0	0	14	0	0	0	0	0
RW-20	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-22 [2]	Automated Pump	11,170	5	75	0	11,250	18,014	14,113	13,492	0	45,619
TOTAL VOLUME RECOVERED:		1,209,225	1,433,695	4,122,501	1,831,517	**8,596,938**	87,144	99,472	108,612	820	**296,048**

[1] Volumes of recovered water and PSH are based on automated system readings, rounded to the nearest gallon

[2] The automated system associated with RW-22 is malfunctioning. Volume of water recovered is based off local totalizer readings.

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LEGEND

- FENCELINE
- HFNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- THREE-MILE DITCH
- EVAPORATION PONDS

SOURCE: BASE MAP USGS 7.5 MINUTE SERIES QUADS, ARTESIA AND SPRINGLAKE QUADRANGLES, 1955, PHOTOREVISED 1983.

N

0 1,600 3,200
Feet

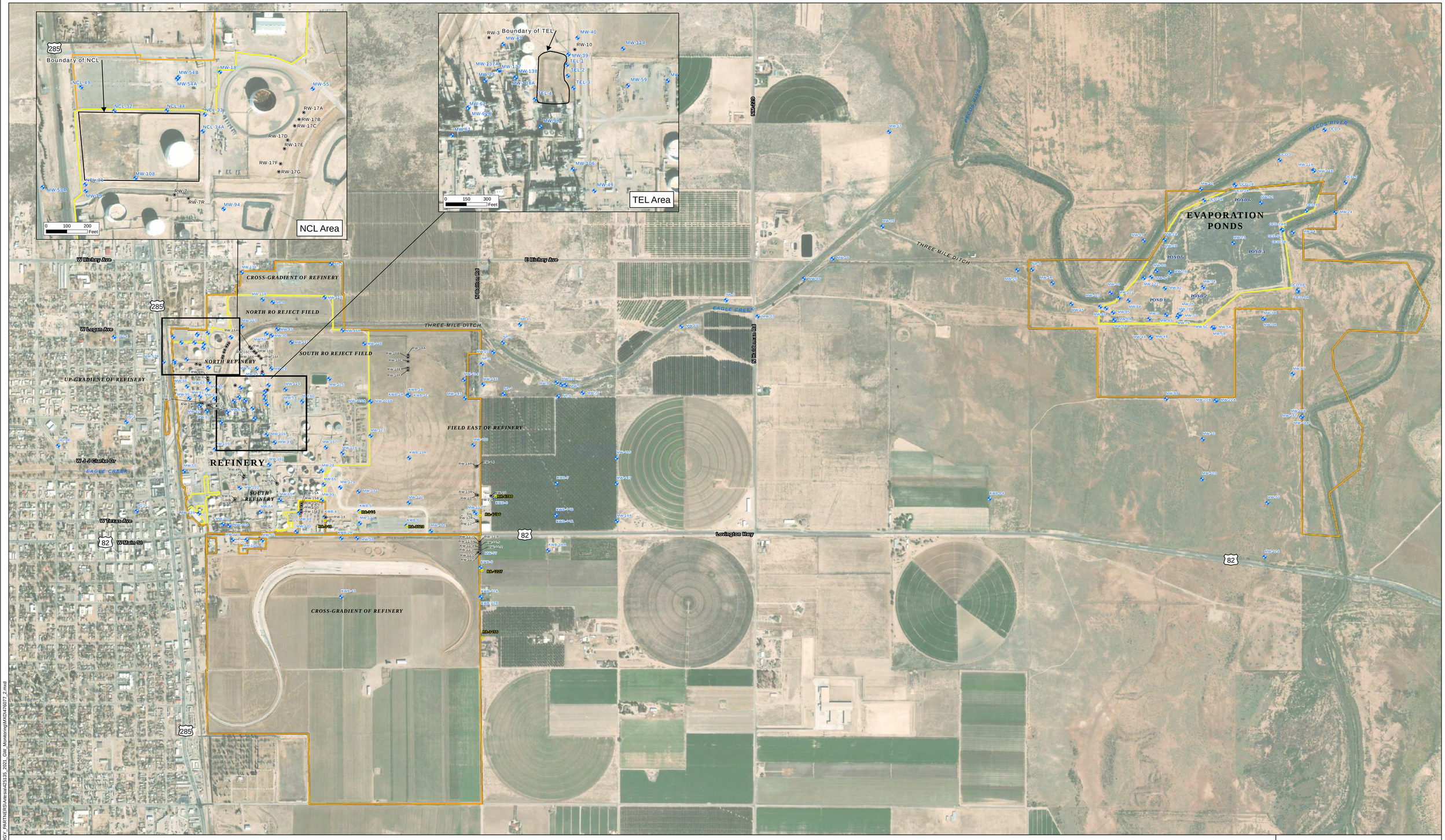
SITE LOCATION MAP

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

PROJECT NUMBER: 425135	FILE NAME: 476077_1
AUTHOR: MJAGOE	DATE: 1/28/2022

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FIGURE
1



LEGEND

- IRRIGATION WELL
- MONITORING WELL
- RECOVERY WELL
- FENCELINE
- HFNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

N W E S

0 800 1,600 Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

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WELL LOCATION MAP

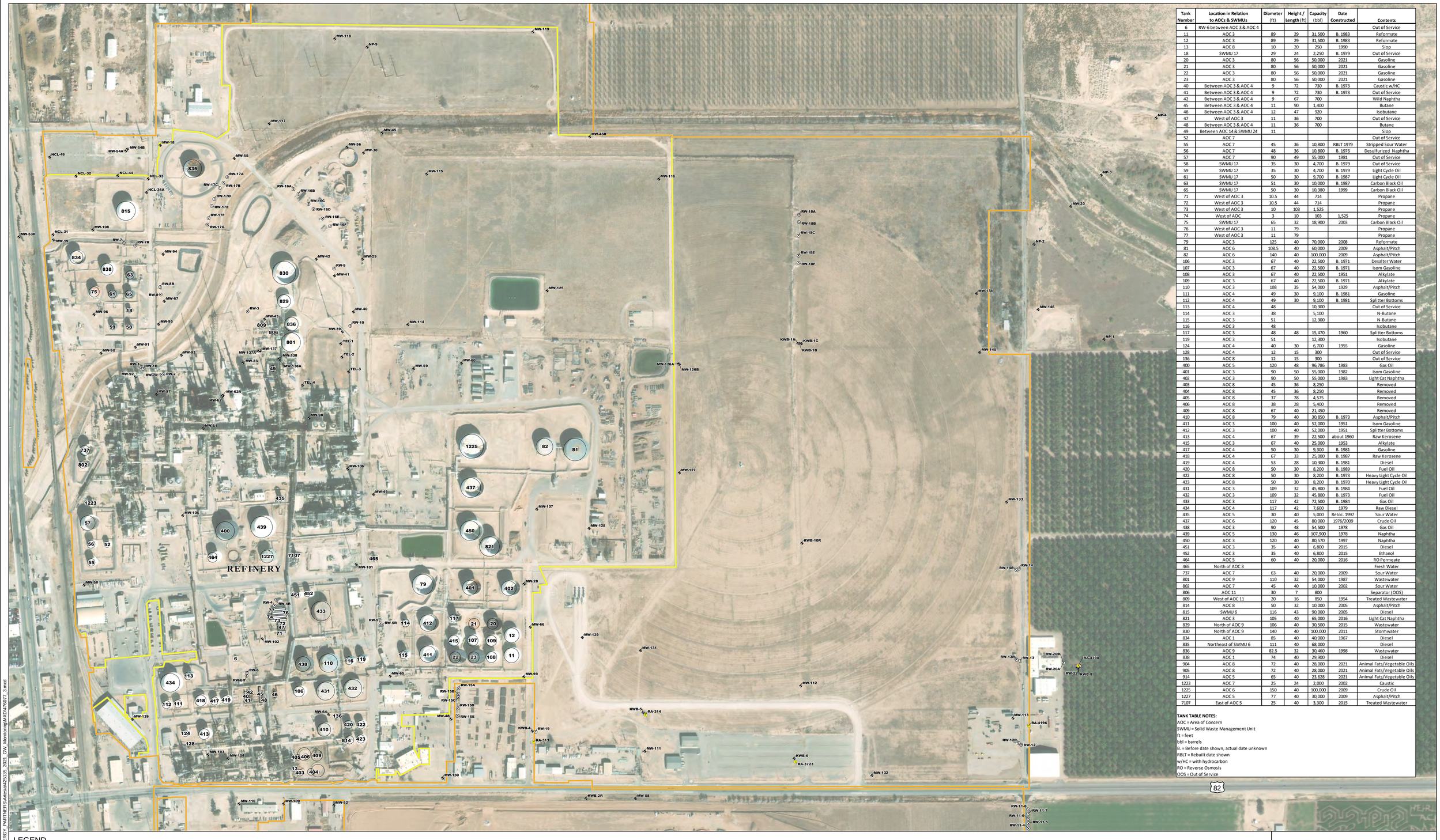
HOLLYFRONTIER NAVAJO REFINING LLC
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FIGURE 2

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Tank Number	Location in Relation to AOCs & SWMUs	Diameter (ft)	Height / Length (ft)	Capacity (bbl)	Date Constructed	Contents
6	RW-6 between AOC 3 & AOC 4					Out of Service
11	AOC 3	89	29	31,500	B. 1983	Reformate
12	AOC 3	89	29	31,500	B. 1983	Reformate
13	AOC 8	10	20	250	1990	Slop
18	SWMU 17	29	24	2,250	B. 1979	Out of Service
20	AOC 3	80	56	50,000	2021	Gasoline
21	AOC 3	80	56	50,000	2021	Gasoline
22	AOC 3	80	56	50,000	2021	Gasoline
23	AOC 3	80	56	50,000	2021	Gasoline
40	Between AOC 3 & AOC 4	9	72	730	B. 1973	Caustic w/HC
41	Between AOC 3 & AOC 4	9	72	730	B. 1973	Out of Service
42	Between AOC 3 & AOC 4	9	67	700		Wild Naphtha
45	Between AOC 3 & AOC 4	11	90	1,400		Butane
46	Between AOC 3 & AOC 4	12	47	920		Isobutane
47	West of AOC 3	11	36	700		Out of Service
48	Between AOC 3 & AOC 4	11	36	700		Butane
49	Between AOC 14 & SWMU 24	11				Slop
52	AOC 7					Out of Service
55	AOC 7	45	36	10,800	RBLT 1979	Stripped Sour Water
56	AOC 7	48	36	10,800	B. 1976	Desulfurized Naphtha
57	AOC 7	90	49	55,000	1981	Out of Service
58	SWMU 17	35	30	4,700	B. 1979	Out of Service
59	SWMU 17	35	30	4,700	B. 1979	Light Cycle Oil
61	SWMU 17	50	30	9,700	B. 1987	Light Cycle Oil
63	SWMU 17	51	30	10,000	B. 1987	Carbon Black Oil
65	SWMU 17	50	30	10,380	1999	Carbon Black Oil
71	West of AOC 3	10.5	44	714		Propane
72	West of AOC 3	10.5	44	714		Propane
73	West of AOC 3	10	103	1,525		Propane
74	West of AOC	3	10	103	1,525	Propane
75	SWMU 17	65	32	18,900	2003	Carbon Black Oil
76	West of AOC 3	11	79			Propane
77	West of AOC 3	11	79			Propane
79	AOC 3	125	40	70,000	2008	Reformate
81	AOC 6	108.5	40	60,000	2009	Asphalt/Pitch
82	AOC 6	140	40	100,000	2009	Asphalt/Pitch
106	AOC 3	67	40	22,500	B. 1971	Desalter Water
107	AOC 3	67	40	22,500	B. 1971	Isom Gasoline
108	AOC 3	67	40	22,500	1951	Alkylate
109	AOC 3	67	40	22,500	B. 1971	Alkylate
110	AOC 3	108	35	54,000	1929	Asphalt/Pitch
111	AOC 4	49	30	9,100	B. 1981	Gasoline
112	AOC 4	49	30	9,100	B. 1981	Splitter Bottoms
113	AOC 4	48		10,300		Out of Service
114	AOC 3	38		5,100		N-Butane
115	AOC 3	51		12,300		N-Butane
116	AOC 3	48				Isobutane
117	AOC 3	48	48	15,470	1960	Splitter Bottoms
119	AOC 3	51		12,300		Isobutane
124	AOC 4	40	30	6,700	1955	Gasoline
128	AOC 4	12	15	300		Out of Service
136	AOC 8	12	15	300		Out of Service
400	AOC 5	120	48	96,786	1983	Gas Oil
401	AOC 3	90	50	55,000	1982	Isom Gasoline
402	AOC 3	90	50	55,000	1983	Light Cat Naphtha
403	AOC 8	45	36	8,250		Removed
404	AOC 8	45	36	8,250		Removed
405	AOC 8	37	28	4,575		Removed
406	AOC 8	38	28	5,400		Removed
409	AOC 8	67	40	21,450		Removed
410	AOC 8	79	40	30,850	B. 1973	Asphalt/Pitch
411	AOC 3	100	40	52,000	1951	Isom Gasoline
412	AOC 3	100	40	52,000	1951	Splitter Bottoms
413	AOC 4	67	39	22,500	about 1960	Raw Kerosene
415	AOC 3	67	40	25,000	1953	Alkylate
417	AOC 4	50	30	9,300	B. 1981	Gasoline
418	AOC 4	67	33	25,000	B. 1987	Raw Kerosene
419	AOC 4	53	28	10,300	B. 1981	Diesel
420	AOC 8	50	30	8,200	B. 1989	Fuel Oil
422	AOC 8	50	30	8,200	B. 1973	Heavy Light Cycle Oil
423	AOC 8	50	30	8,200	B. 1970	Heavy Light Cycle Oil
431	AOC 3	109	32	45,800	B. 1984	Fuel Oil
432	AOC 3	109	32	45,800	B. 1973	Fuel Oil
433	AOC 3	117	42	72,500	B. 1984	Gas Oil
434	AOC 4	117	42	7,600	1979	Raw Diesel
435	AOC 5	30	40	5,000	Reloc. 1997	Sour Water
437	AOC 6	120	45	80,000	1976/2009	Crude Oil
438	AOC 3	90	48	54,500	1978	Gas Oil
439	AOC 5	130	46	107,900	1978	Naphtha
450	AOC 3	120	40	80,570	1997	Naphtha
451	AOC 3	35	40	6,800	2015	Diesel
452	AOC 3	35	40	6,800	2015	Ethanol
464	AOC 5	60	40	20,000	2016	RO Permeate
465	North of AOC 3					Fresh Water
737	AOC 7	63	40	20,000	2009	Sour Water
801	AOC 9	110	32	54,000	1987	Wastewater
802	AOC 7	45	40	10,000	2002	Sour Water
806	AOC 11	30	7	800		Separator (OOS)
809	West of AOC 11	20	16	850	1954	Treated Wastewater
814	AOC 8	50	32	10,000	2005	Asphalt/Pitch
815	SWMU 6	116	43	90,000	2005	Diesel
821	AOC 3	105	40	65,000	2016	Light Cat Naphtha
829	North of AOC 9	106	40	30,500	2015	Wastewater
830	North of AOC 9	140	40	100,000	2011	Stormwater
834	AOC 1	85	40	40,000	1967	Diesel
835	Northeast of SWMU 6	111	40	68,000		Diesel
836	AOC 9	82.5	32	30,460	1998	Wastewater
838	AOC 1	74	40	29,900		Diesel
904	AOC 8	72	40	28,000	2021	Animal Fats/Vegetable Oils
905	AOC 8	72	40	28,000	2021	Animal Fats/Vegetable Oils
914	AOC 5	65	40	23,628	2021	Animal Fats/Vegetable Oils
1223	AOC 7	25	24	2,000	2002	Caustic
1225	AOC 6	150	40	100,000	2009	Crude Oil
1227	AOC 5	77	40	30,000	2009	Asphalt/Pitch
7107	East of AOC 5	25	40	3,300	2015	Treated Wastewater

TANK TABLE NOTES:
AOC = Area of Concern
SWMU = Solid Waste Management Unit
ft = feet
bbl = barrels
B. = Before date shown, actual date unknown
RBLT = Rebuilt date shown
w/HC = with hydrocarbon
RO = Reverse Osmosis
OOS = Out of Service

LEGEND

- IRRIGATION WELL
- MONITORING WELL
- RECOVERY WELL
- FENCELINE
- HFNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- TANK

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

N W E S

0 250 500
Feet

1 IN = 250 FT

WELL LOCATIONS AND TANK INFORMATION WITHIN REFINERY

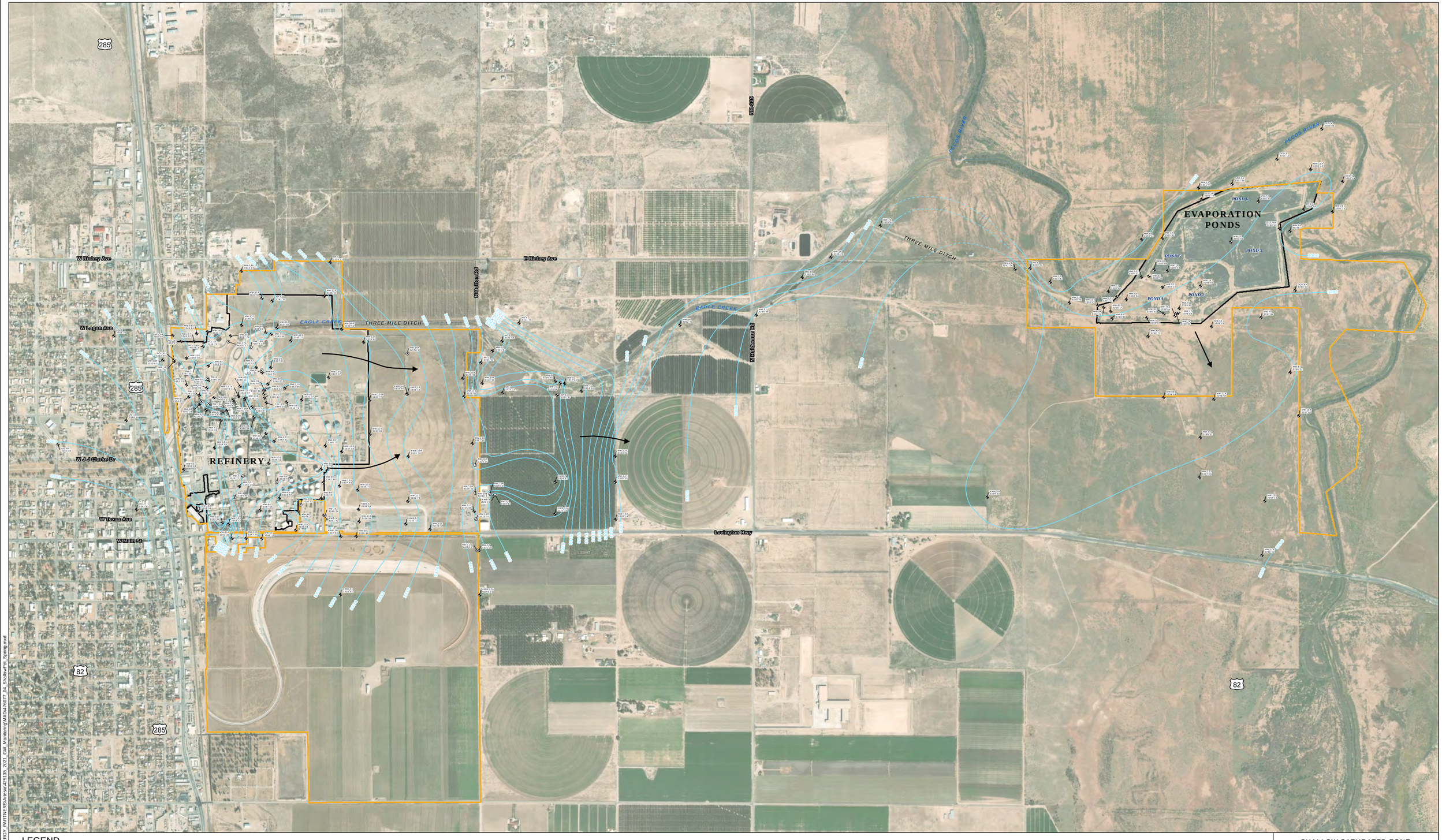
2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_3

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FIGURE 3

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LEGEND

- MONITORING WELL
- RECOVERY WELL
- GROUNDWATER FLOW DIRECTION
- SHALLOW SATURATED ZONE POTENTIOMETRIC SURFACE CONTOURS (FEET ABOVE MEAN SEA LEVEL)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- 3335.92 GROUNDWATER ELEVATION (FEET)

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NOTE:
1. GROUNDWATER ELEVATION WAS NOT MEASURED BECAUSE WELL IS NOT IN GAUGING PROGRAM, WELL COULD NOT BE LOCATED, OR WELL WAS DAMAGED.
2. WELL WAS DRY AT TIME OF GAUGING.
3. ONLY PSH PRESENT IN THE WELL.
4. GROUNDWATER ELEVATION NOT MEASURED DUE TO PUMP IN WELL.



SHALLOW SATURATED ZONE POTENTIOMETRIC SURFACE MAP 2021 FIRST SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

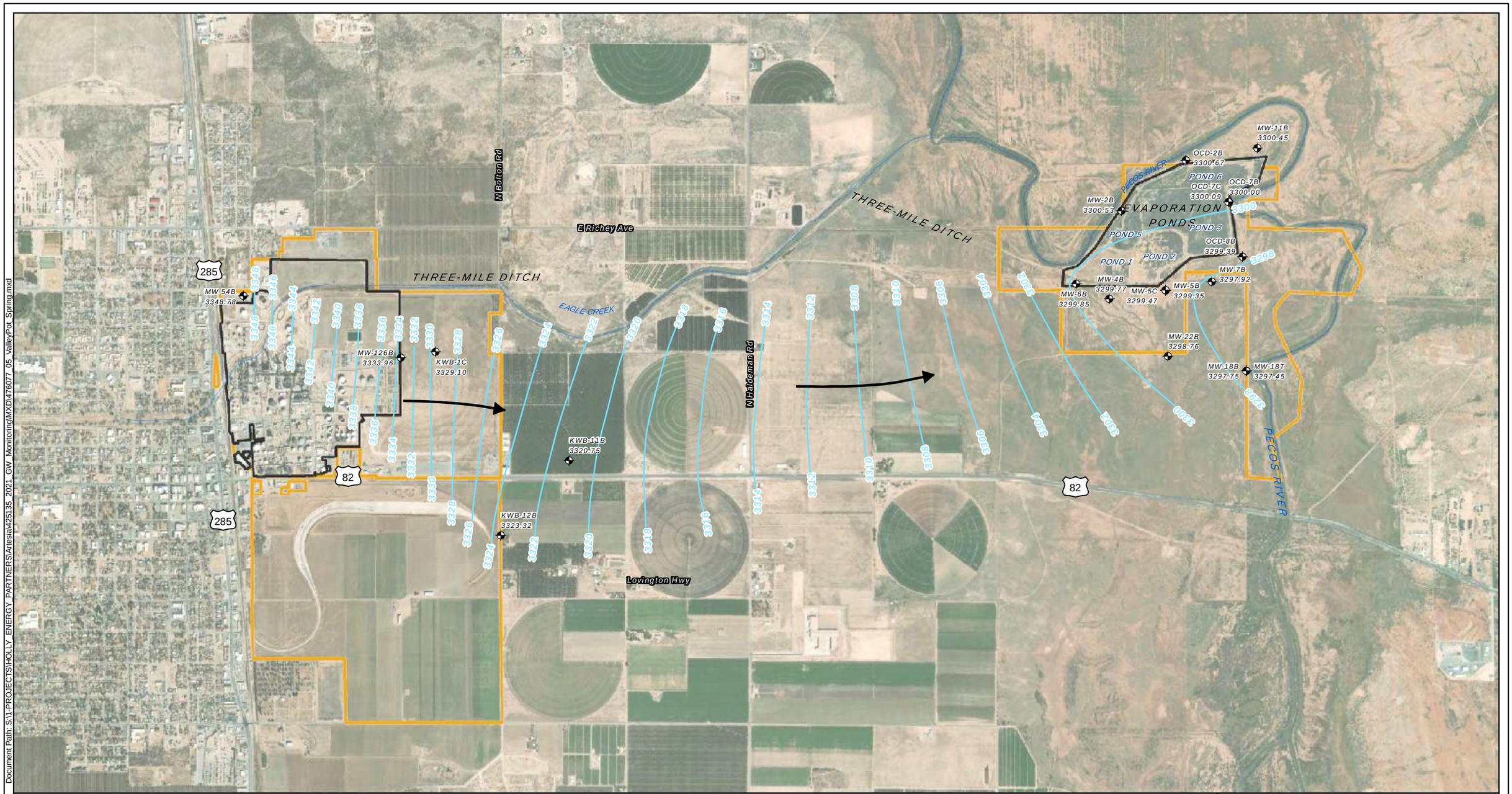
AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_04_ShallowPot_Spring

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FIGURE 4

AERIAL IMAGERY SOURCE: GOOGLE EARTH PRO AND THEIR DATA PARTNERS, 3/12/2016.

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LEGEND

- MONITORING WELL
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- GROUNDWATER FLOW DIRECTION
- 3323.32 GROUNDWATER ELEVATION (FEET)
- VALLEY FILL ZONE POTENTIOMETRIC SURFACE CONTOURS (FEET ABOVE MEAN SEA LEVEL)

N W E S

0 2,000 4,000
Feet

1 inch = 2,000 feet

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

VALLEY FILL ZONE
POTENTIOMETRIC SURFACE MAP
2021 FIRST SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

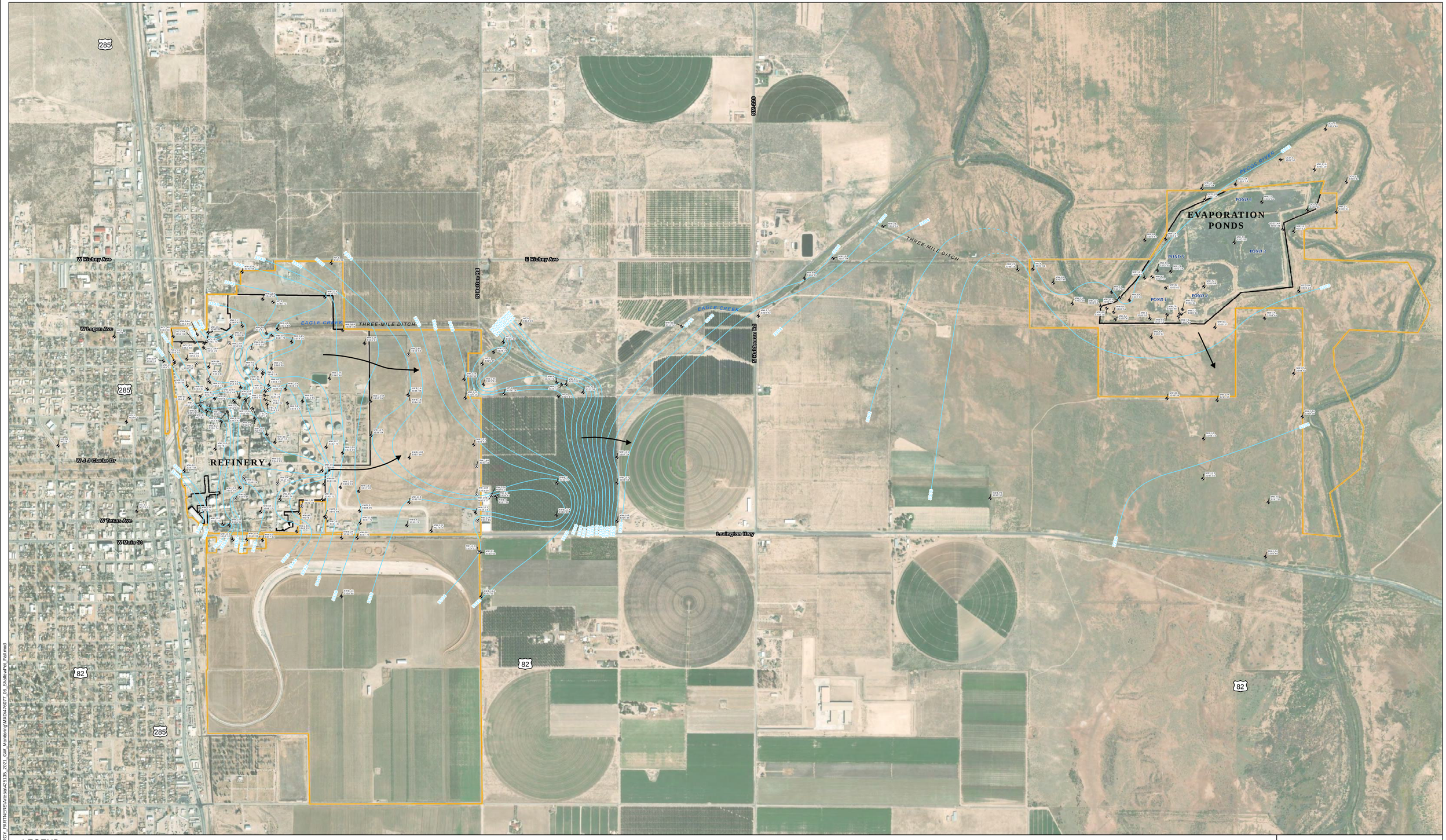
AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_05_ValleyPot_Spring

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FIGURE 5

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LEGEND

- MONITORING WELL
- RECOVERY WELL
- GROUNDWATER FLOW DIRECTION
- SHALLOW SATURATED ZONE POTENTIOMETRIC SURFACE CONTOURS - DASHED WHERE INFERRED (FEET ABOVE MEAN SEA LEVEL)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- 3349.57 GROUNDWATER ELEVATION (FEET)

N
W E
S

0 800 1,600
Feet

1 IN = 800 FT

NOTE:
1. GROUNDWATER ELEVATION WAS NOT MEASURED BECAUSE WELL IS NOT IN GAUGING PROGRAM, WELL COULD NOT BE LOCATED, OR WELL WAS DAMAGED.
2. WELL WAS DRY AT TIME OF GAUGING.
3. GROUNDWATER ELEVATION NOT USED IN POTENTIOMETRIC SURFACE CONTOURING.
4. GROUNDWATER ELEVATION NOT MEASURED DUE TO PUMP IN WELL.

NEW MEXICO

SHALLOW SATURATED ZONE POTENTIOMETRIC SURFACE MAP 2021 SECOND SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

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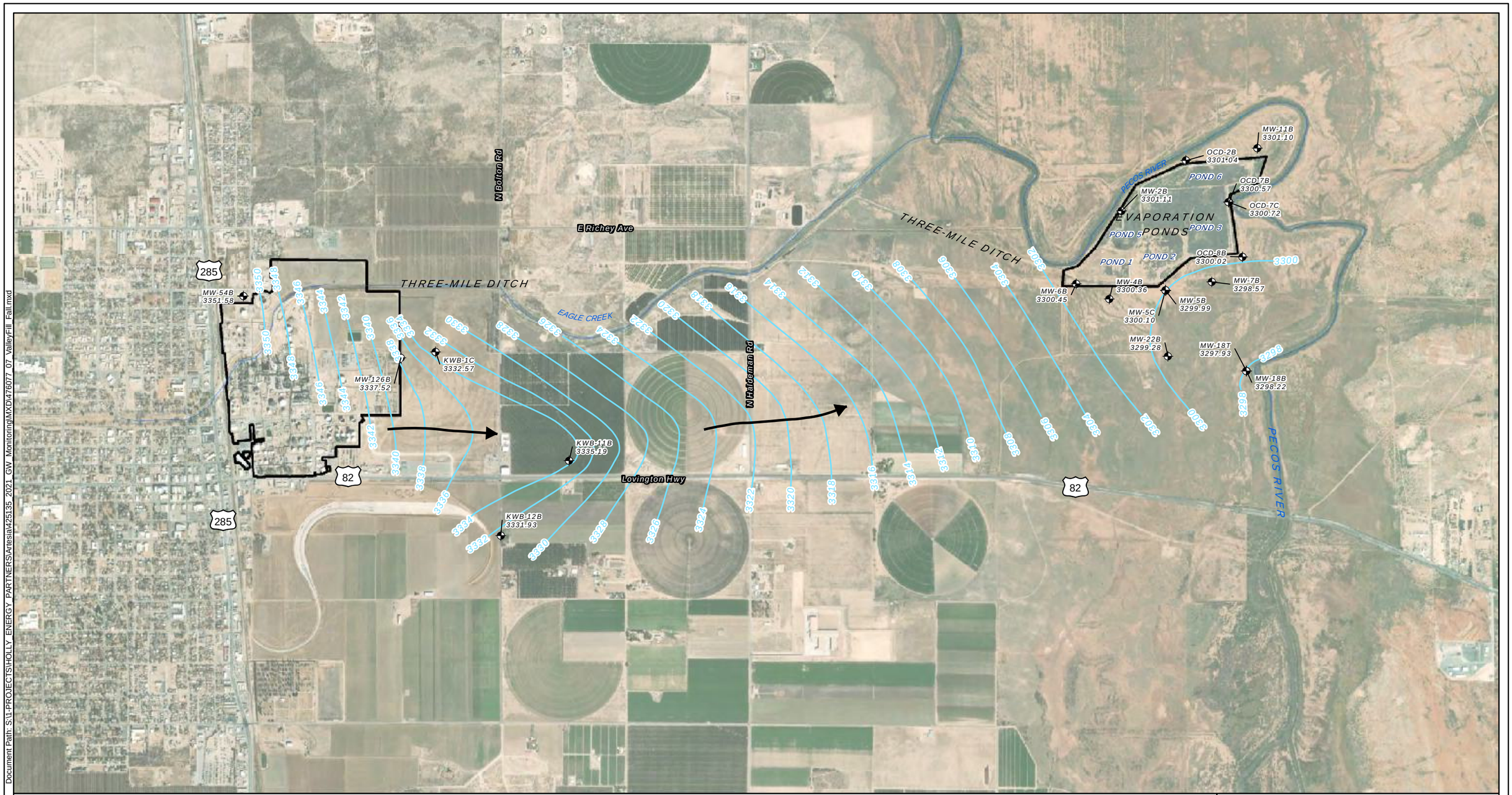
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FIGURE 6

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LEGEND

- MONITORING WELL
- FENCELINE
- VALLEY FILL ZONE POTENTIOMETRIC SURFACE CONTOURS (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION
- 3301.14 GROUNDWATER ELEVATION (FEET)

N W E S

0 2,050 4,100
Feet

1 inch = 2,000 feet

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

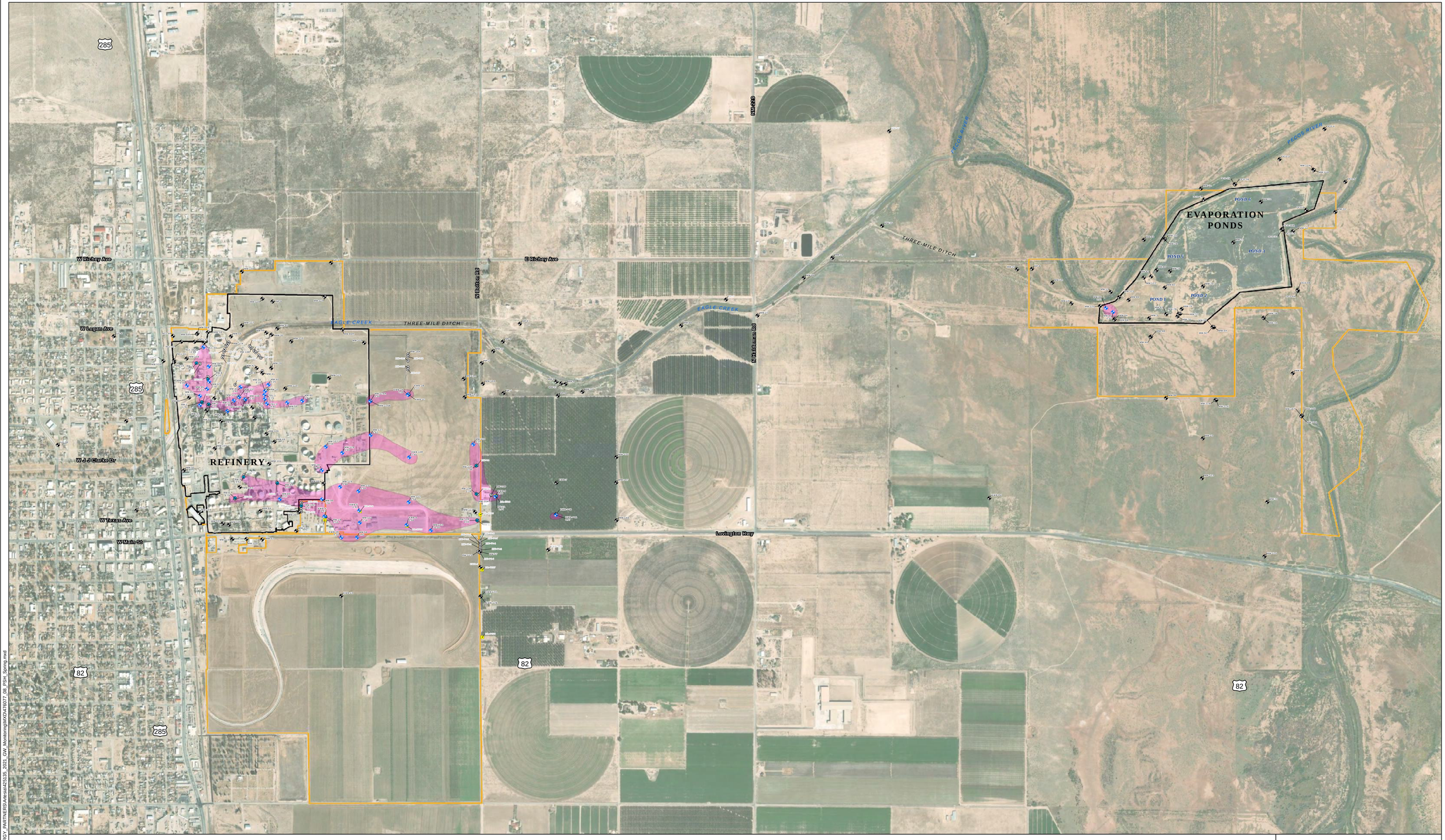
VALLEY FILL ZONE
POTENTIOMETRIC SURFACE MAP
2021 SECOND SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_07_ValleyFill_Fall

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FIGURE 7



LEGEND

- RECOVERY WELL
- MONITORING WELL
- IRRIGATION WELL
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

WELLS WITH PSH

- MONITORING WELL
- RECOVERY WELL
- RW-4 0.51 PSH THICKNESS
- RW-15A WELL NOT GAUGED

PSH THICKNESS IN FEET

- 0.03 - 7.06 FEET

NOTE:

1. ALL PHASE-SEPARATED HYDROCARBON (PSH) THICKNESSES PROVIDED IN FEET.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

PHASE-SEPARATED HYDROCARBON THICKNESS MAP
2021 FIRST SEMIANNUAL EVENT

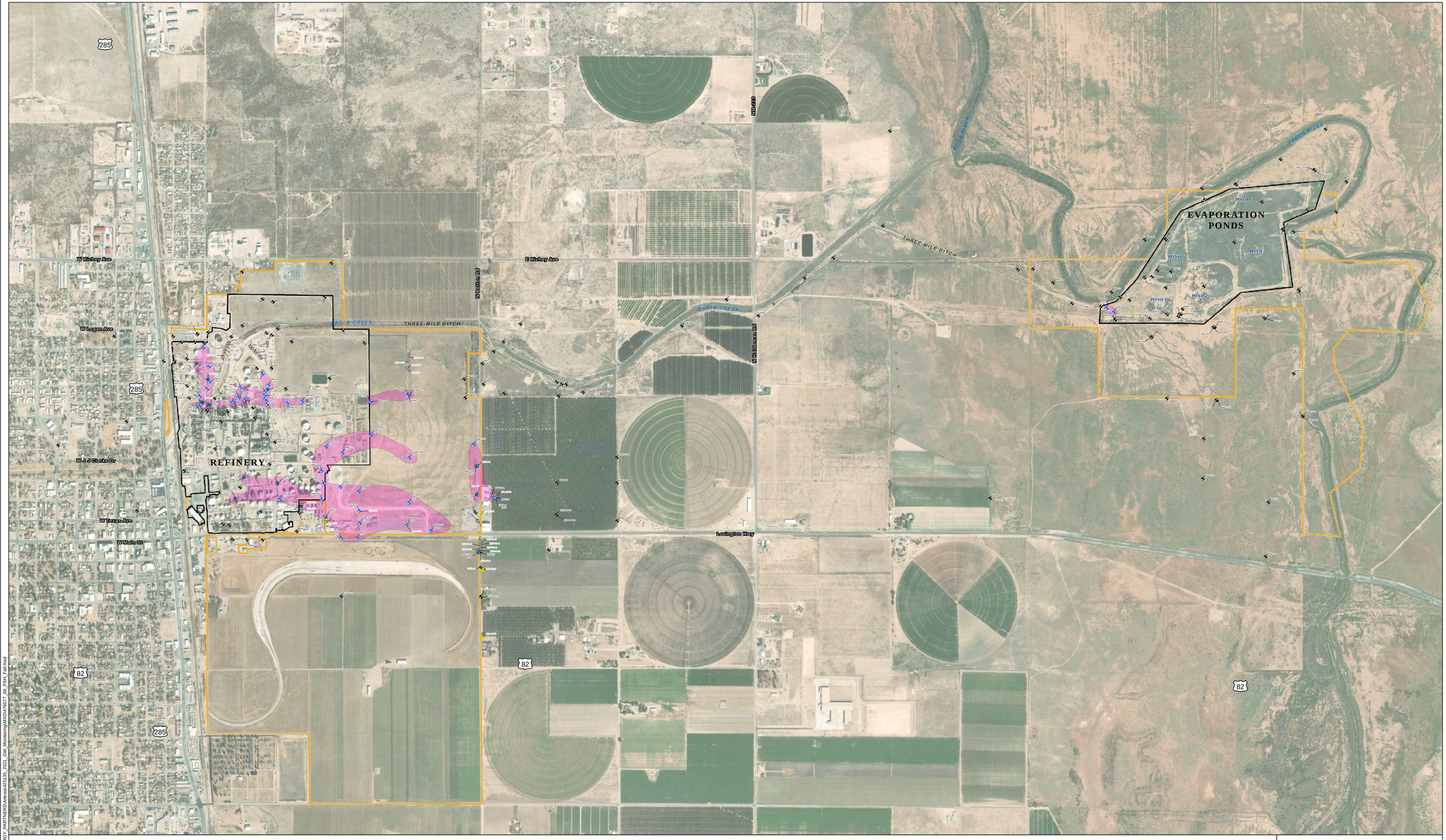
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HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_08_PSH_Spring

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FIGURE 8

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LEGEND

- RECOVERY WELL
- MONITORING WELL
- IRRIGATION WELL
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

WELLS WITH PSH

- MONITORING WELL
- RECOVERY WELL
- MW-131 1.20 PSH THICKNESS
- RW-14 WELL NOT GAUGED

PSH THICKNESS IN FEET

- 0.01 - 5.75 FEET

NOTE:

1. ALL PHASE-SEPARATED HYDROCARBON (PSH) THICKNESSES PROVIDED IN FEET.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

PHASE-SEPARATED HYDROCARBON THICKNESS MAP 2021 SECOND SEMIANNUAL EVENT

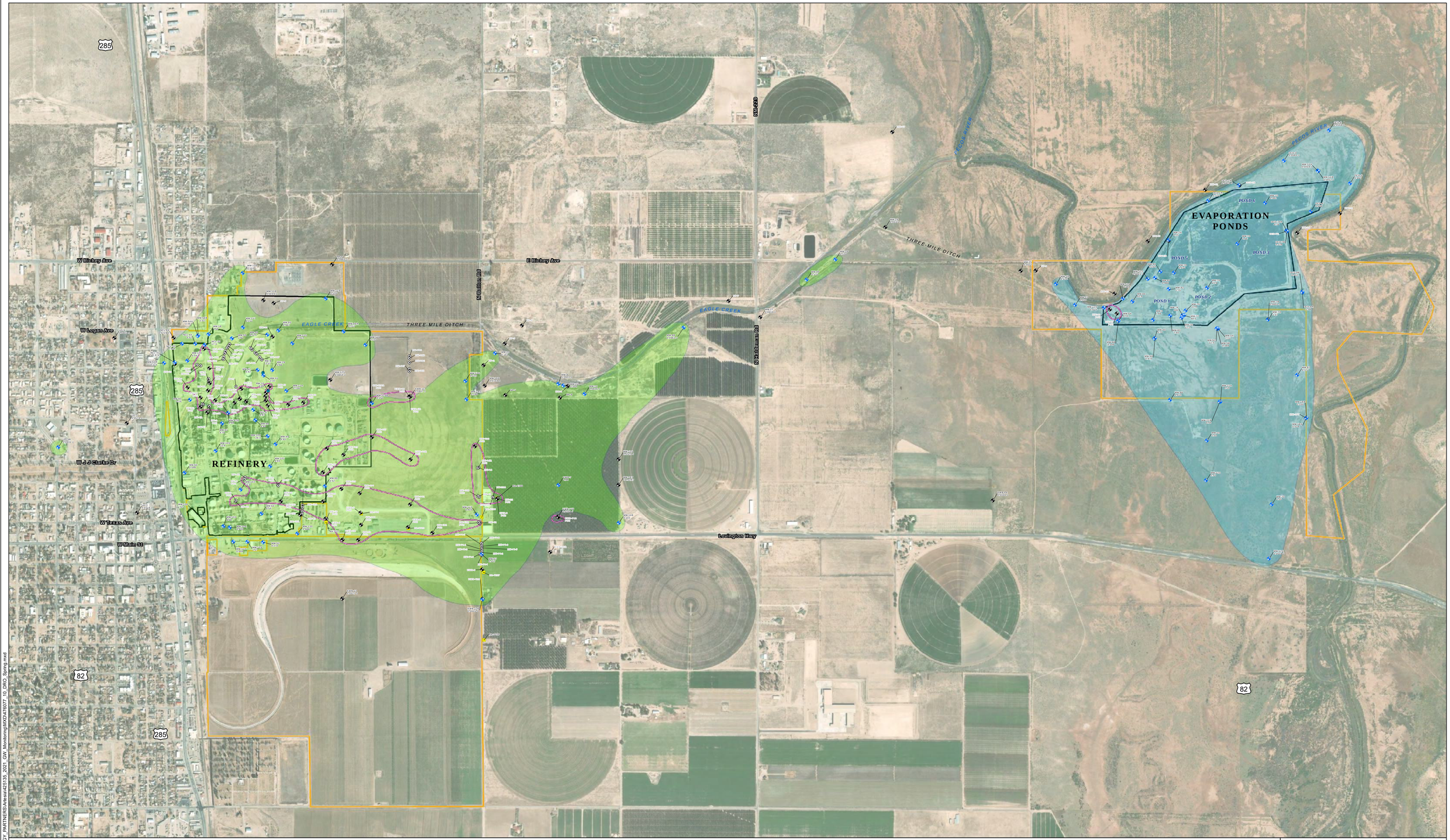
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HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_09_PSH_Fall

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FIGURE 9

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\MXD\476077_09_PSH_Fall.mxd



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL
- 1.57 DRO CONCENTRATION

- <0.0247 DRO NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-111 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- DRO CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.0858 mg/L)
- DRO CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA, EVAPORATION PONDS (CONCENTRATION > 0.0167 mg/L)
- FENCELINE

- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. DRO = DIESEL RANGE ORGANICS
3. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.



DRO CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

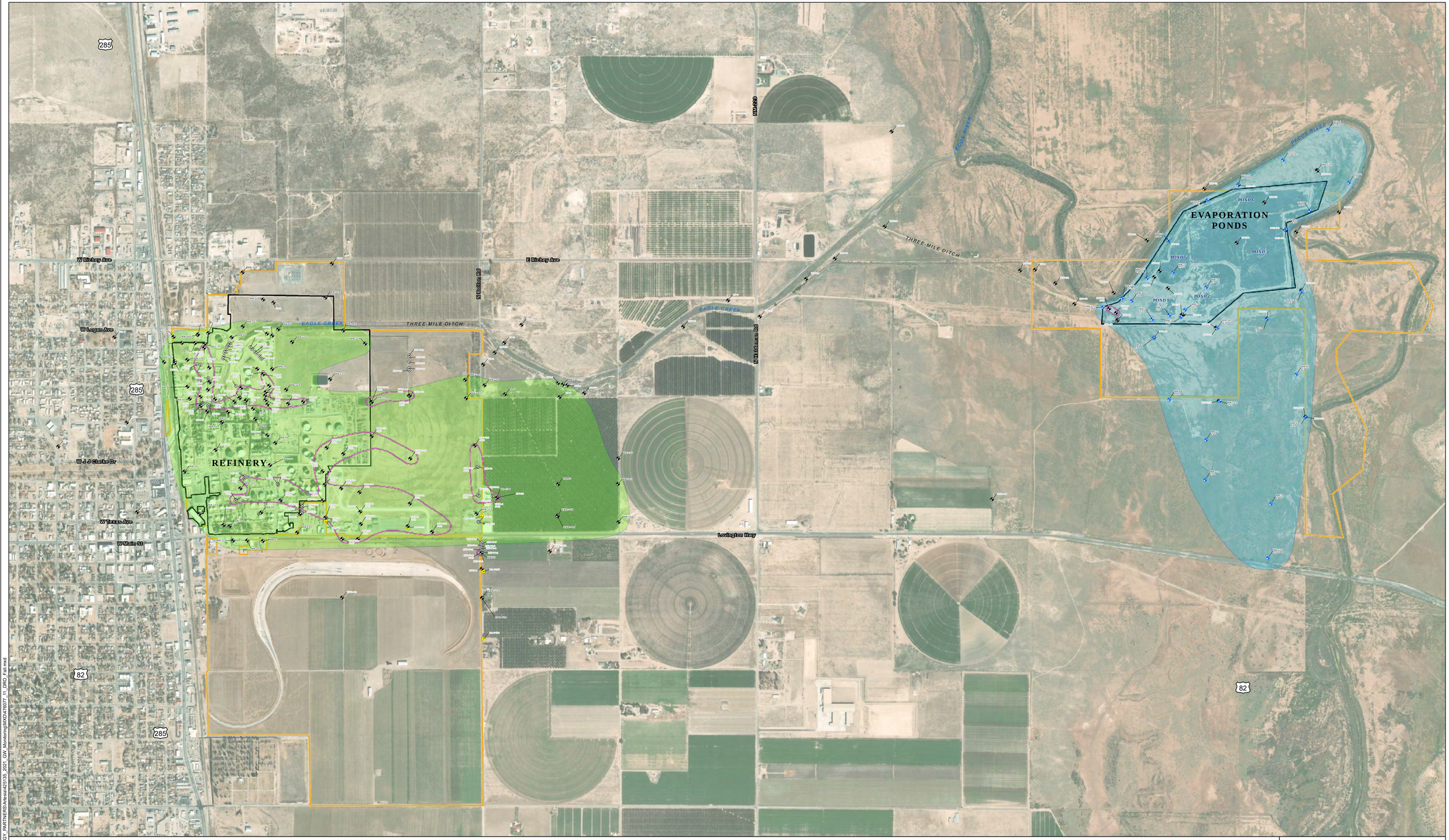
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HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

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FIGURE 10

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LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL
- 2.21 DRO CONCENTRATION
- <0.0247 DRO NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-105 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- DRO CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.0858 mg/L)
- DRO CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA, EVAPORATION PONDS (CONCENTRATION > 0.0167 mg/L)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. DRO = DIESEL RANGE ORGANICS
3. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

DRO CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

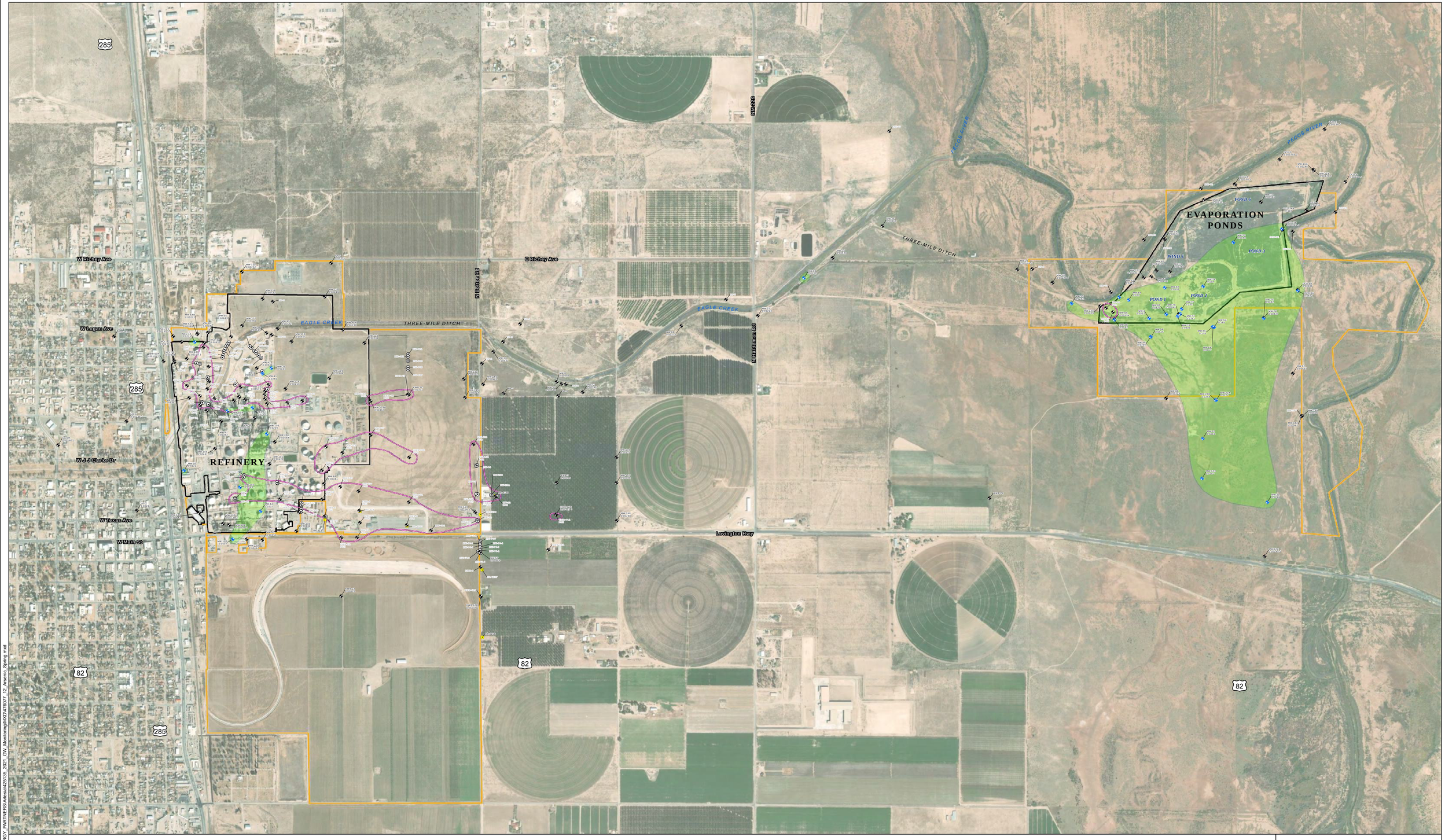
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ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

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FIGURE 11

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LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

- 0.0151 ARSENIC CONCENTRATION
- MW-97 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥0.03 FEET THICK)
- ARSENIC CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.01 mg/L)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

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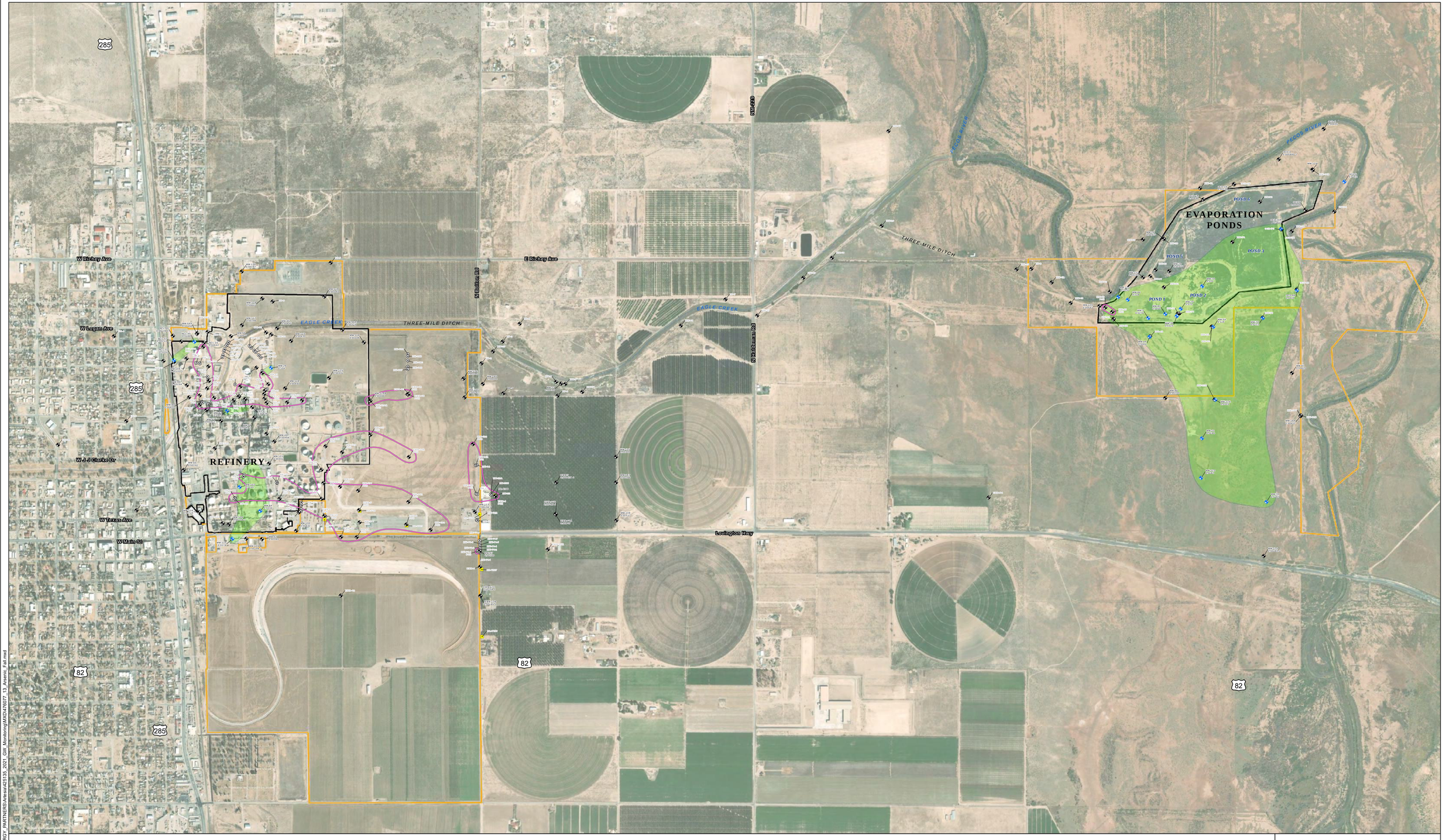
ARSENIC CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_12_Arsenic_Spring

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FIGURE 12



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

- 0.0144 ARSENIC CONCENTRATION
- MW-105 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- ARSENIC CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.01 mg/L)
- FENCELINE

- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

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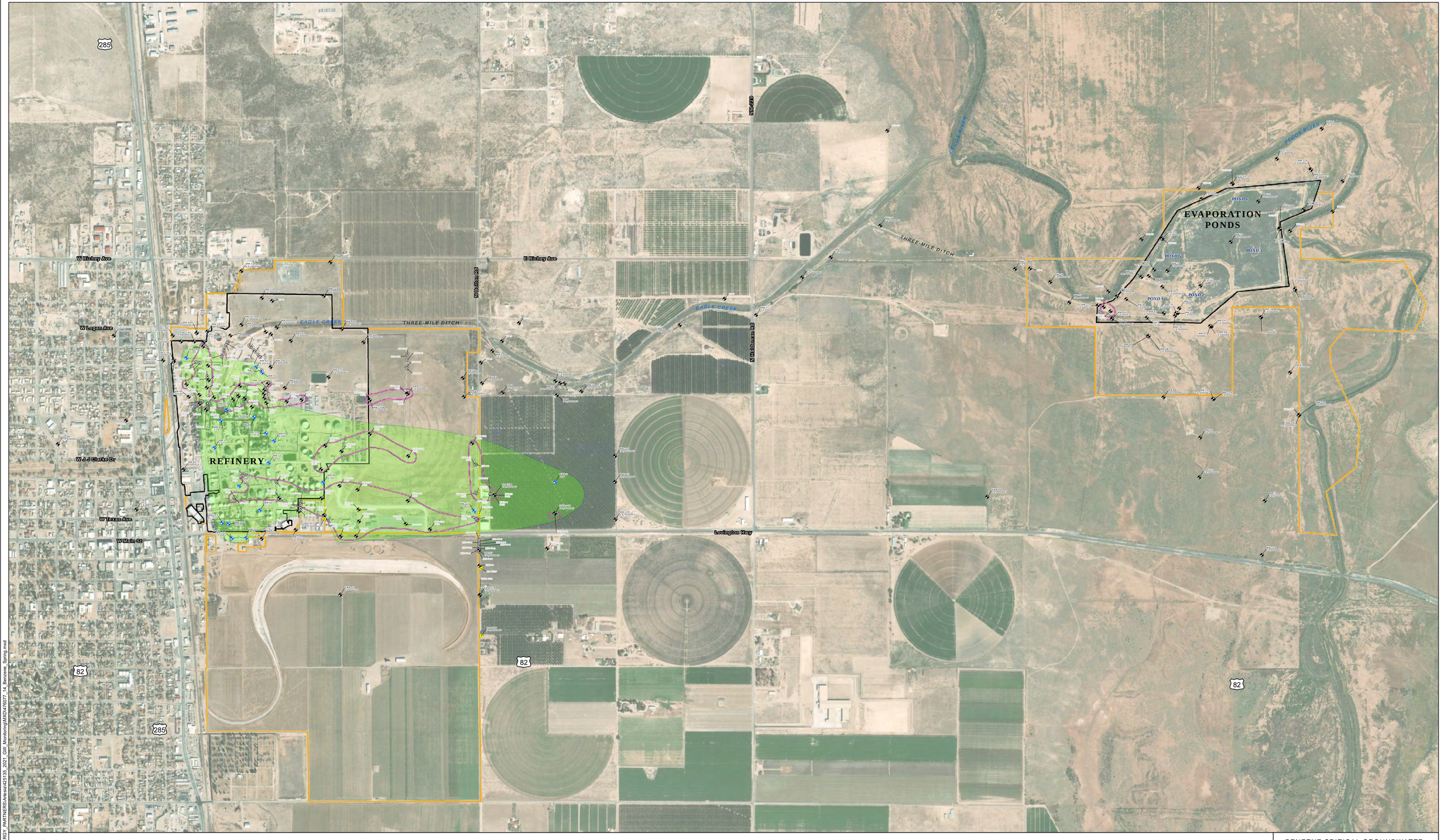
ARSENIC CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

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FIGURE 13



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

- 1.09 BENZENE CONCENTRATION
- <0.00331 BENZENE NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-28 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- BENZENE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.005 mg/L)
- FENCELINE

- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

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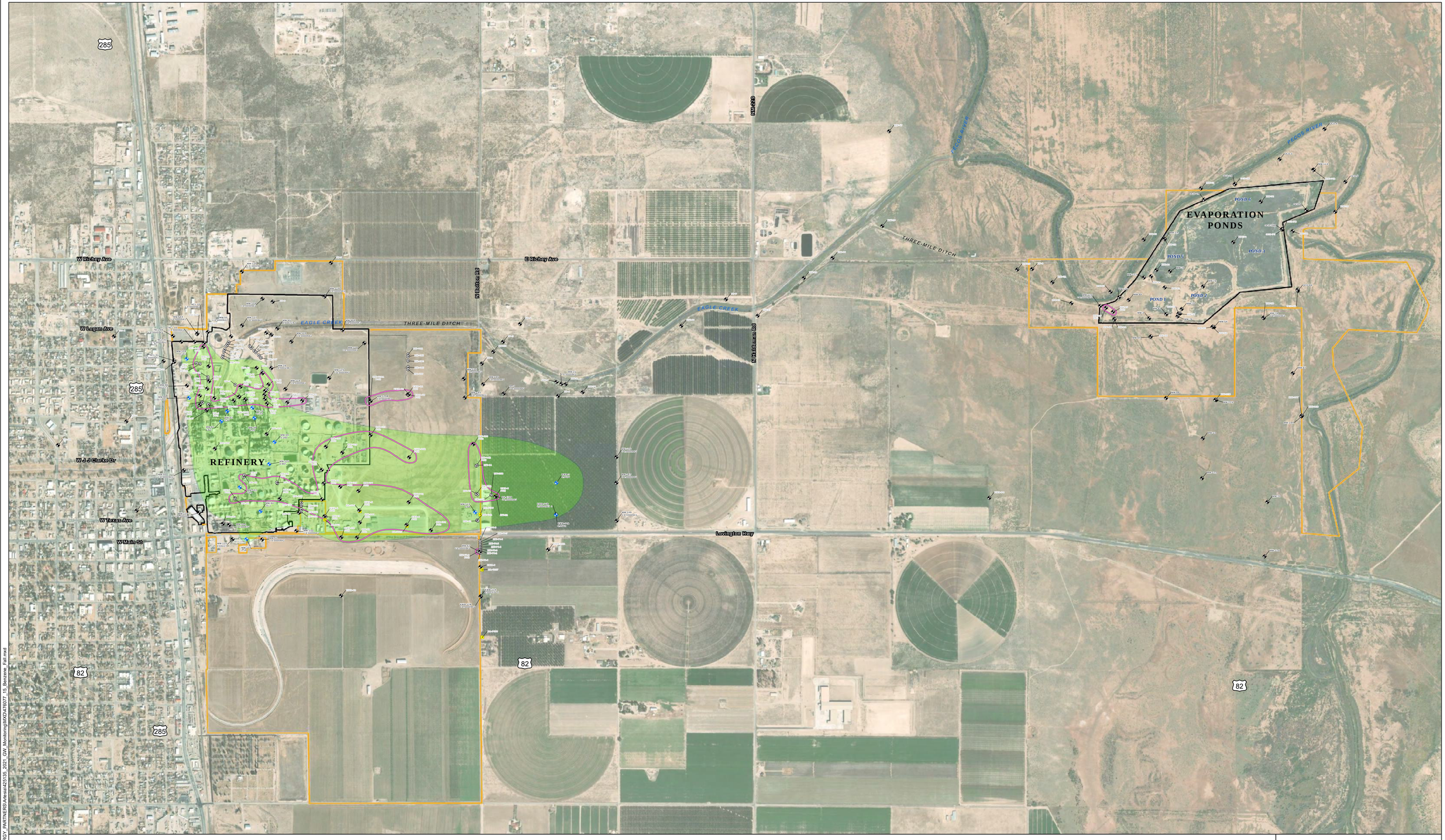
BENZENE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

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FIGURE
14



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

- 1.20 BENZENE CONCENTRATION
- <0.000331 BENZENE NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-106 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- BENZENE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.005 mg/L)
- FENCELINE

- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

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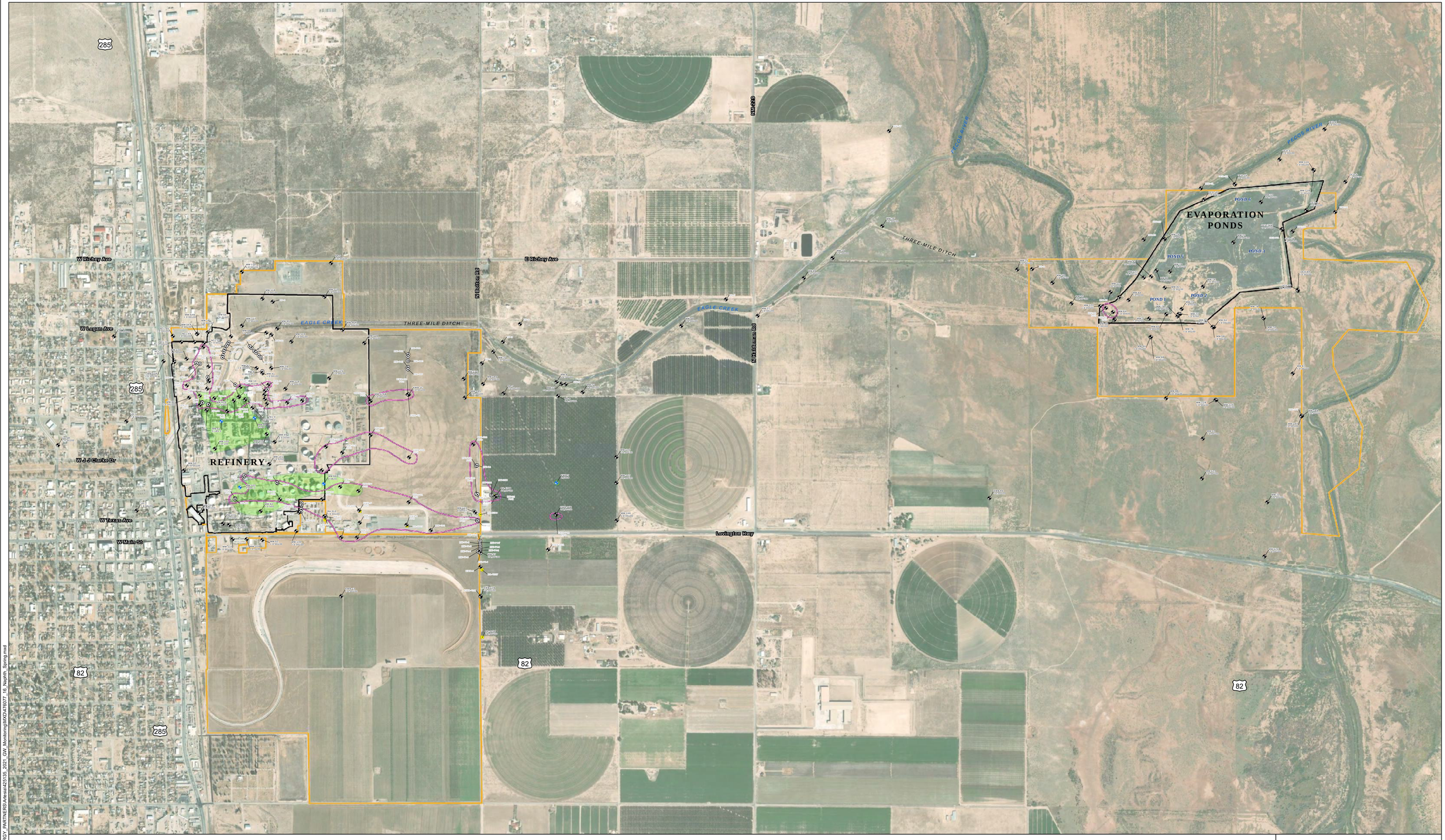
BENZENE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

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ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

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FIGURE 15



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

- 0.5 NAPHTHALENE CONCENTRATION
- <0.00100 NAPHTHALENE NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-28 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- NAPHTHALENE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.03 mg/L)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

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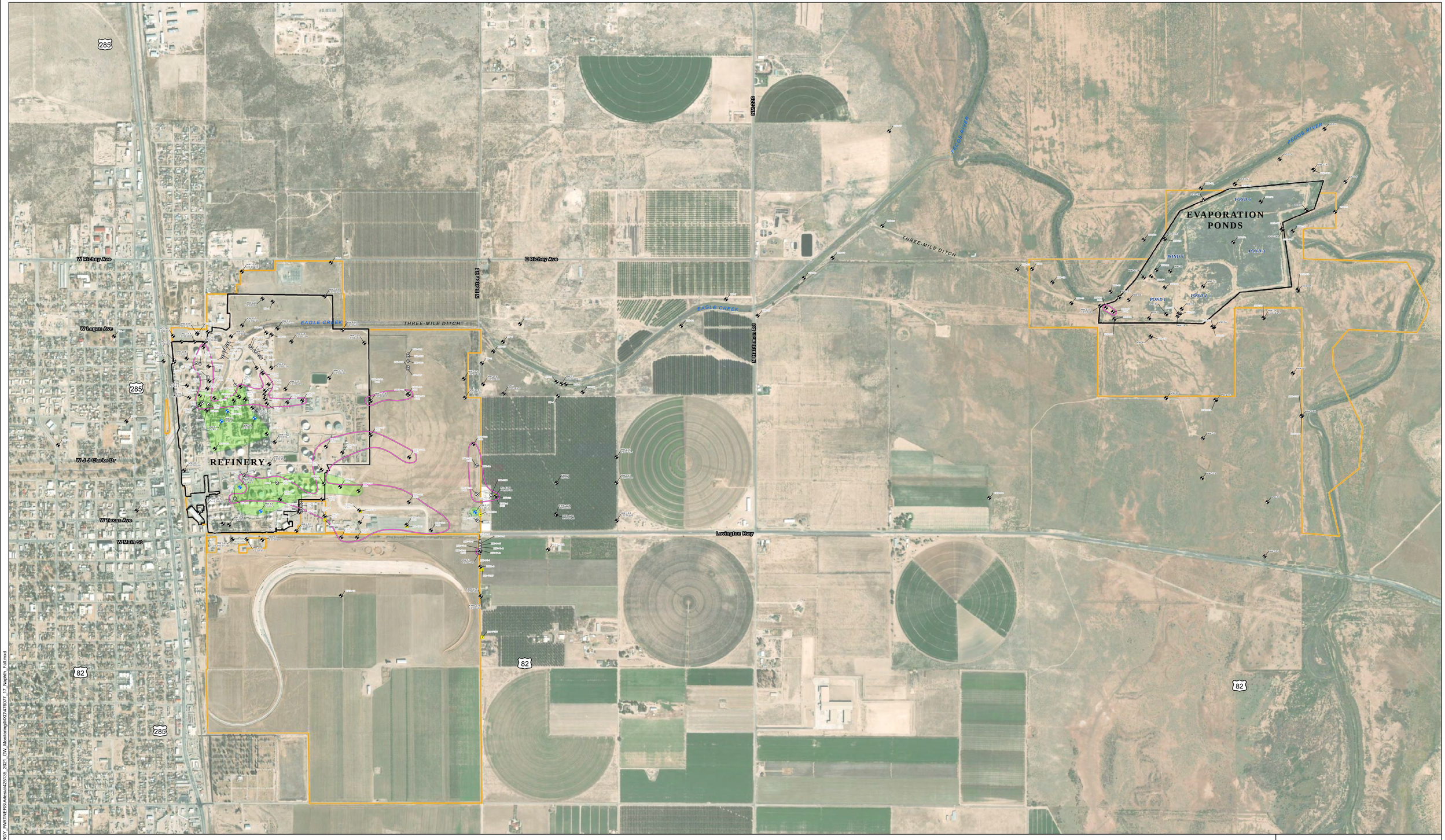
NAPHTHALENE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

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ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 1/28/2022	MXD: 476077_16_Naphth_Spring

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FIGURE 16



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

- 0.344 NAPHTHALENE CONCENTRATION
- < 0.00100 NAPHTHALENE NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-103 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- NAPHTHALENE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.03 mg/L)
- FENCELINE

- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

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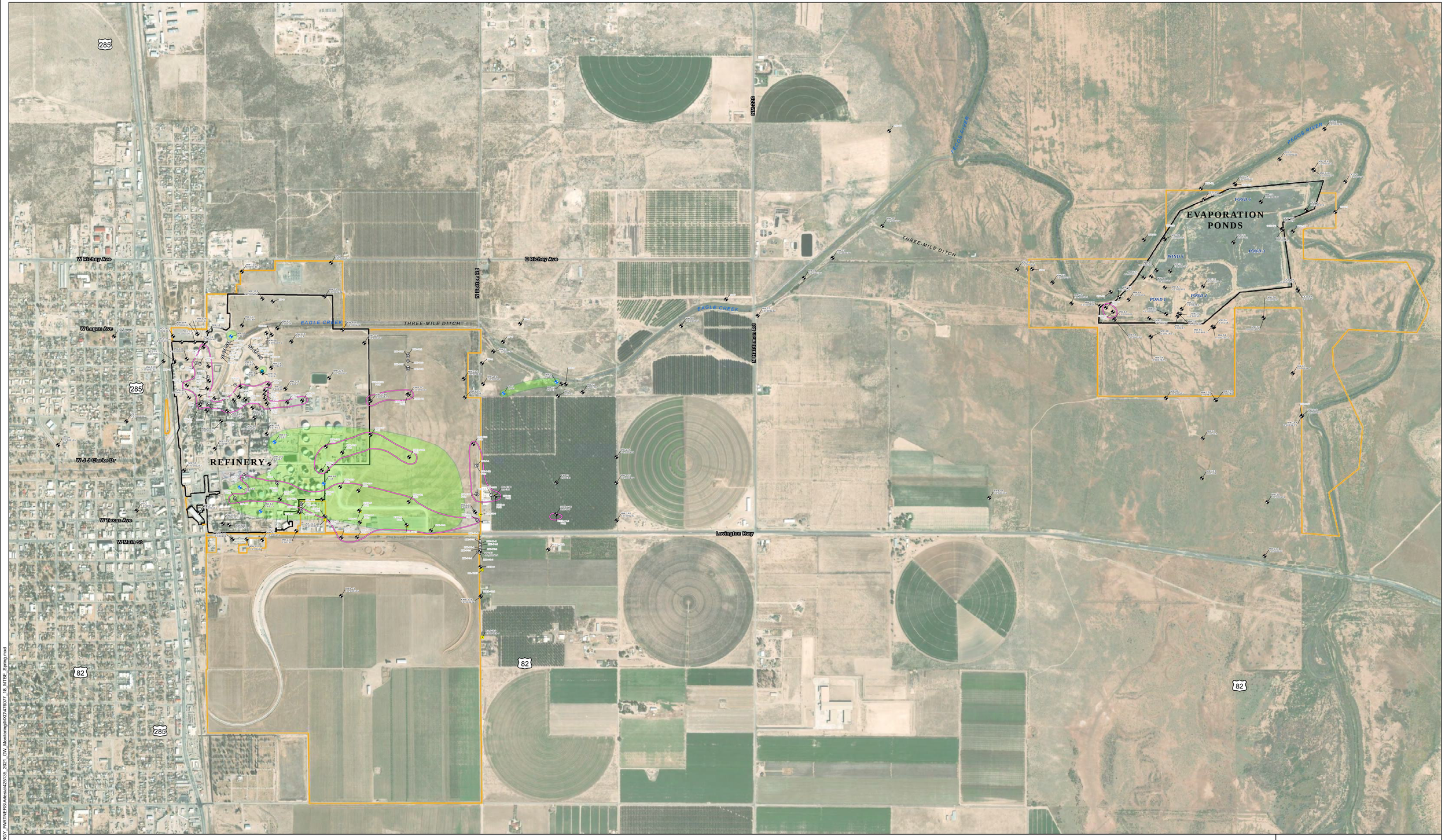
NAPHTHALENE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
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ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 1/28/2022	MXD: 476077_17_Naphth_Fall

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FIGURE 17



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

- 1.23 MTBE CONCENTRATION
- <0.000367 MTBE NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-128 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- MTBE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.1 mg/L)
- FENCELINE

- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.
3. MTBE = METHYL TERT-BUTYL ETHER

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

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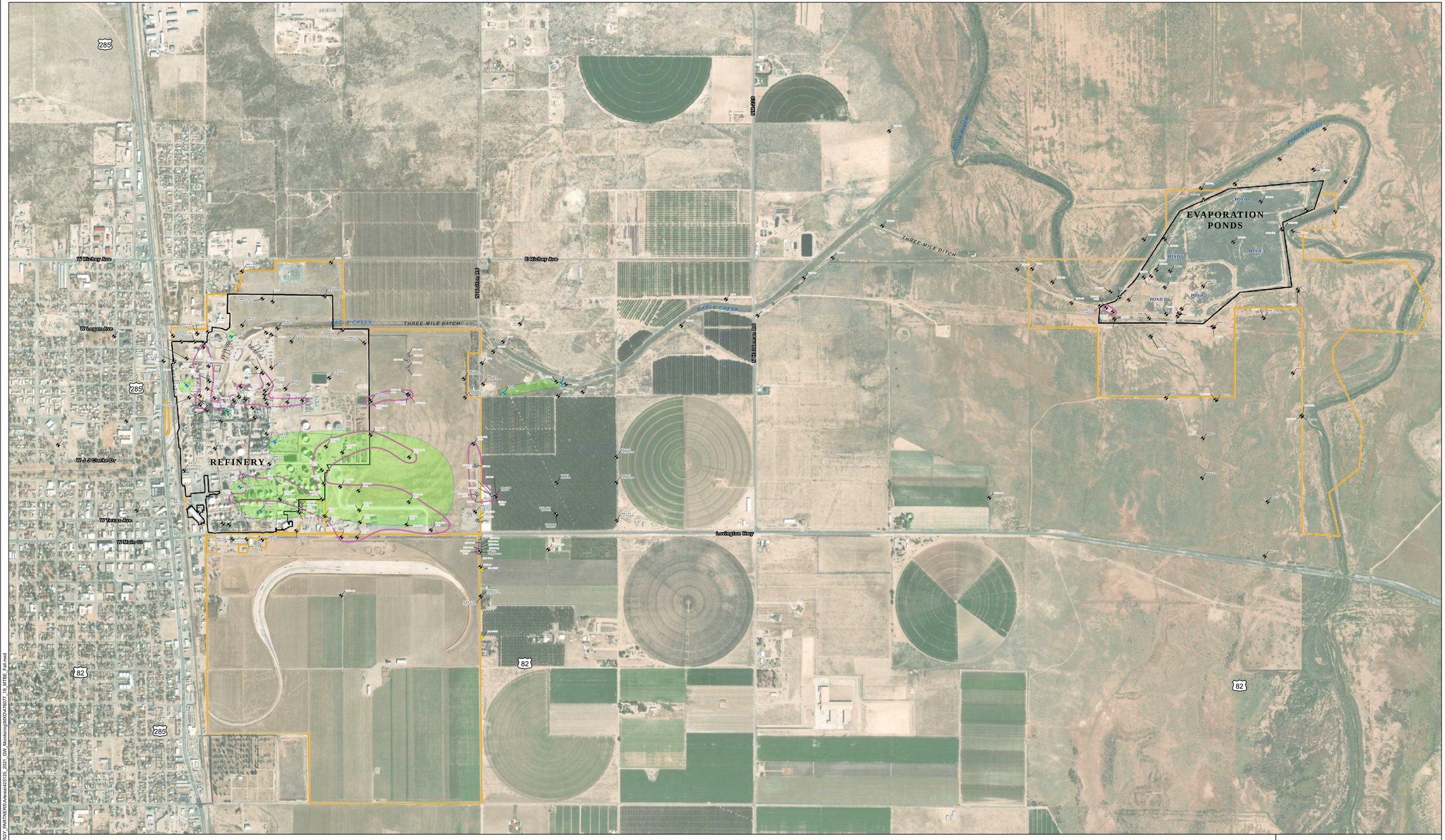
MTBE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

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FIGURE 18



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

- 1.22 MTBE CONCENTRATION
- <0.000367 MTBE NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-105 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- MTBE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.1 mg/L)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.
3. MTBE = METHYL TERT-BUTYL ETHER

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

MTBE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

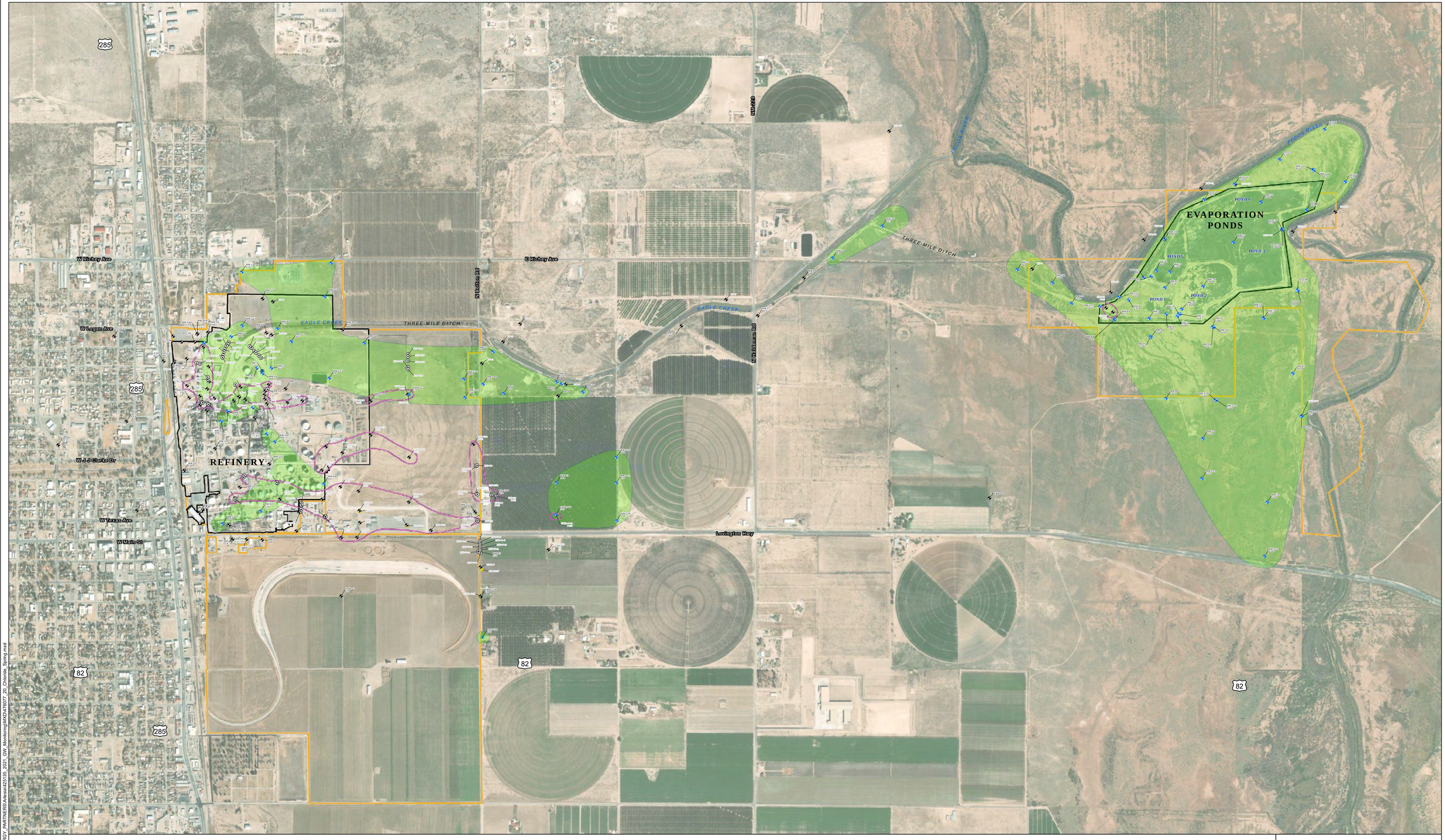
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FIGURE 19

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AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL EXCEEDS SCREENING LEVELS
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

242 CHLORIDE CONCENTRATION
MW-128 WELL NOT SAMPLED
PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
CHLORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 250 mg/L)
FENCELINE
NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
PHASE-SEPARATED HYDROCARBON (PSH)

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

CHLORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

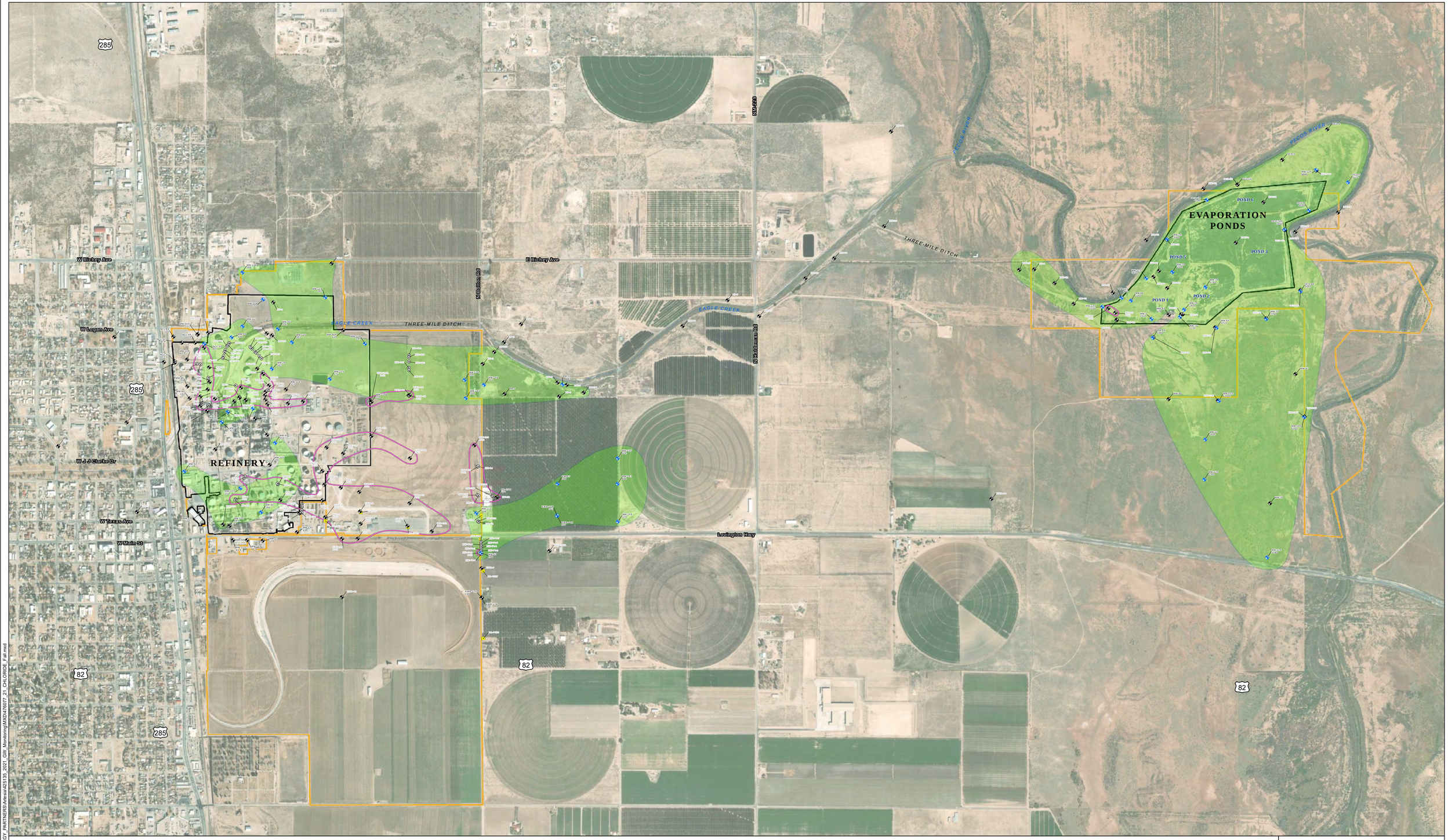
2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_20_Chloride_Spring

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FIGURE 20

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\425135_2021_GW_Monitoring\MXD\476077_20_Chloride_Spring.mxd



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

179 CHLORIDE CONCENTRATION

MW-106 WELL NOT SAMPLED

PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)

CHLORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 250 mg/L)

FENCELINE

NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\425135_2021_GW_Monitoring\MXD\476077_21_CHLORIDE_Fall.mxd

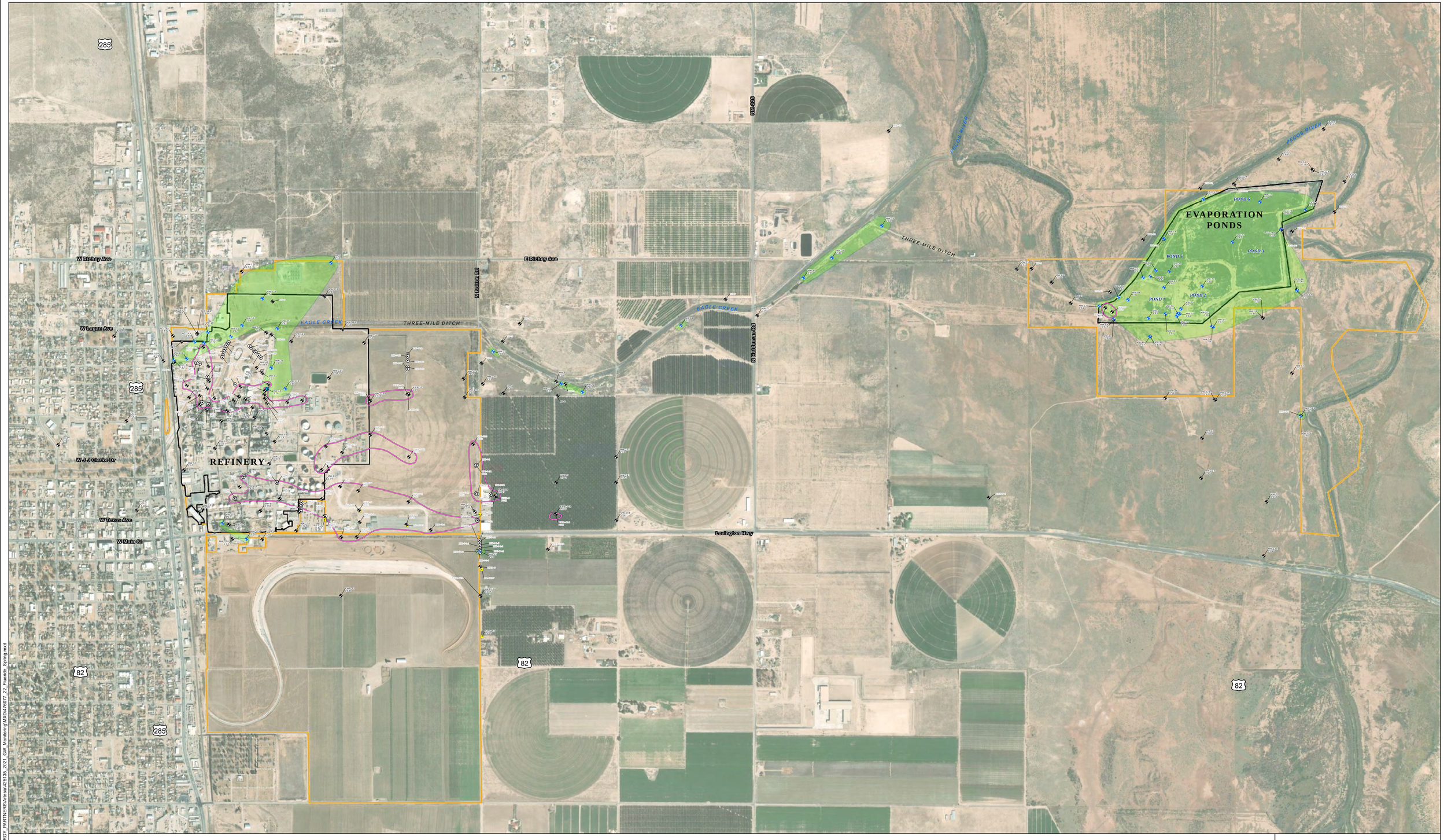
CHLORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 1/28/2022	MXD: 476077_21_CHLORIDE_Fall

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FIGURE 21



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

2.89 FLUORIDE CONCENTRATION

MW-97 WELL NOT SAMPLED

PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)

FLUORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 1.6 mg/L)

FENCELINE

NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).

N W E S

0 800 1,600

Feet

1 IN = 800 FT

NEW MEXICO

FLUORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

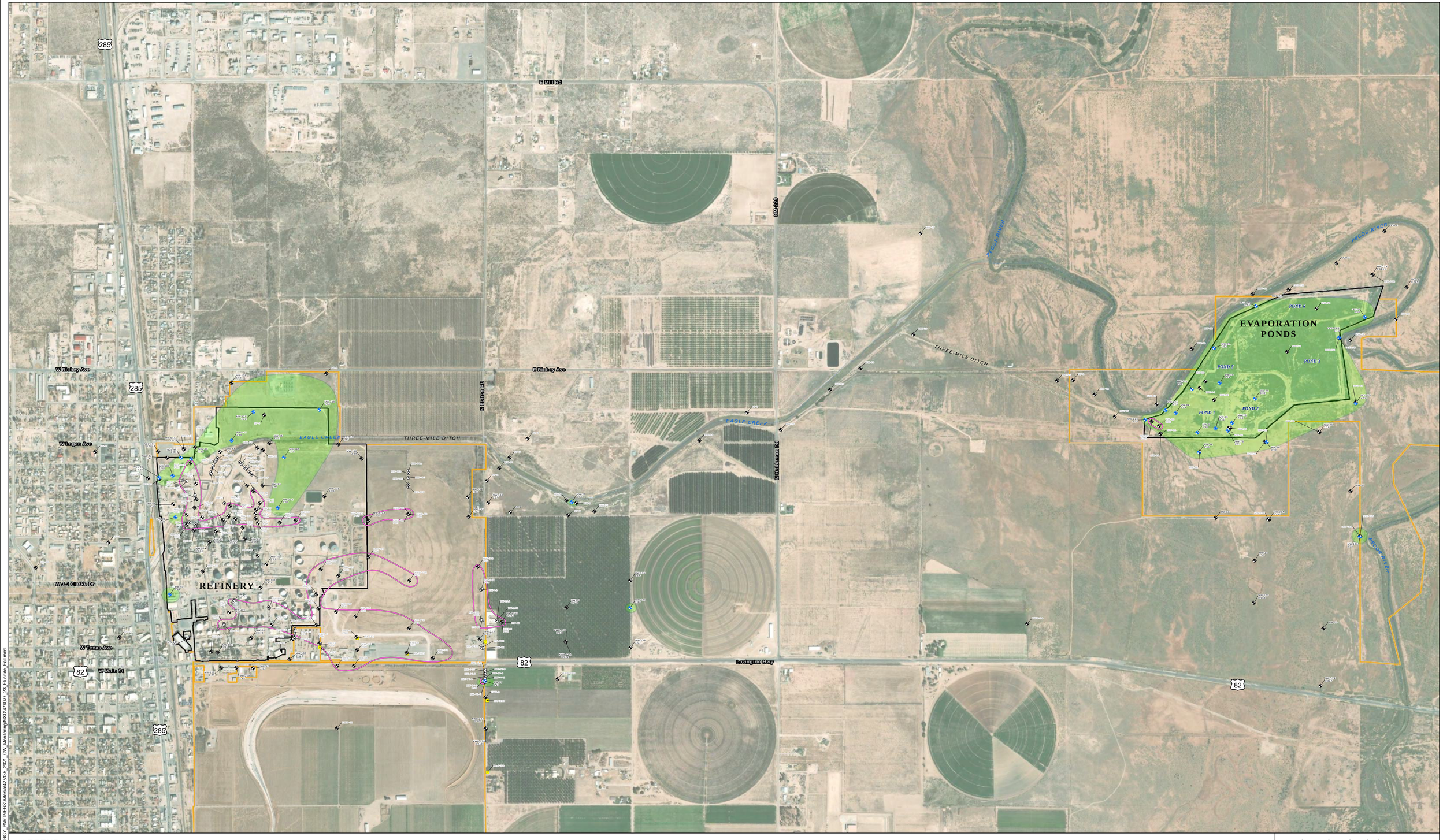
2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_22_Fluoride_Spring

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FIGURE 22

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\425135_2021_GW_Monitoring\MXD\476077_22_Fluoride_Spring.mxd



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

- 1.84 FLUORIDE CONCENTRATION
- MW-30 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- FLUORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 1.6 mg/L)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 750 1,500
Feet

1 IN = 750 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\425135_2021_GW_Monitoring\MXD\476077_23_Fluoride_Fall.mxd

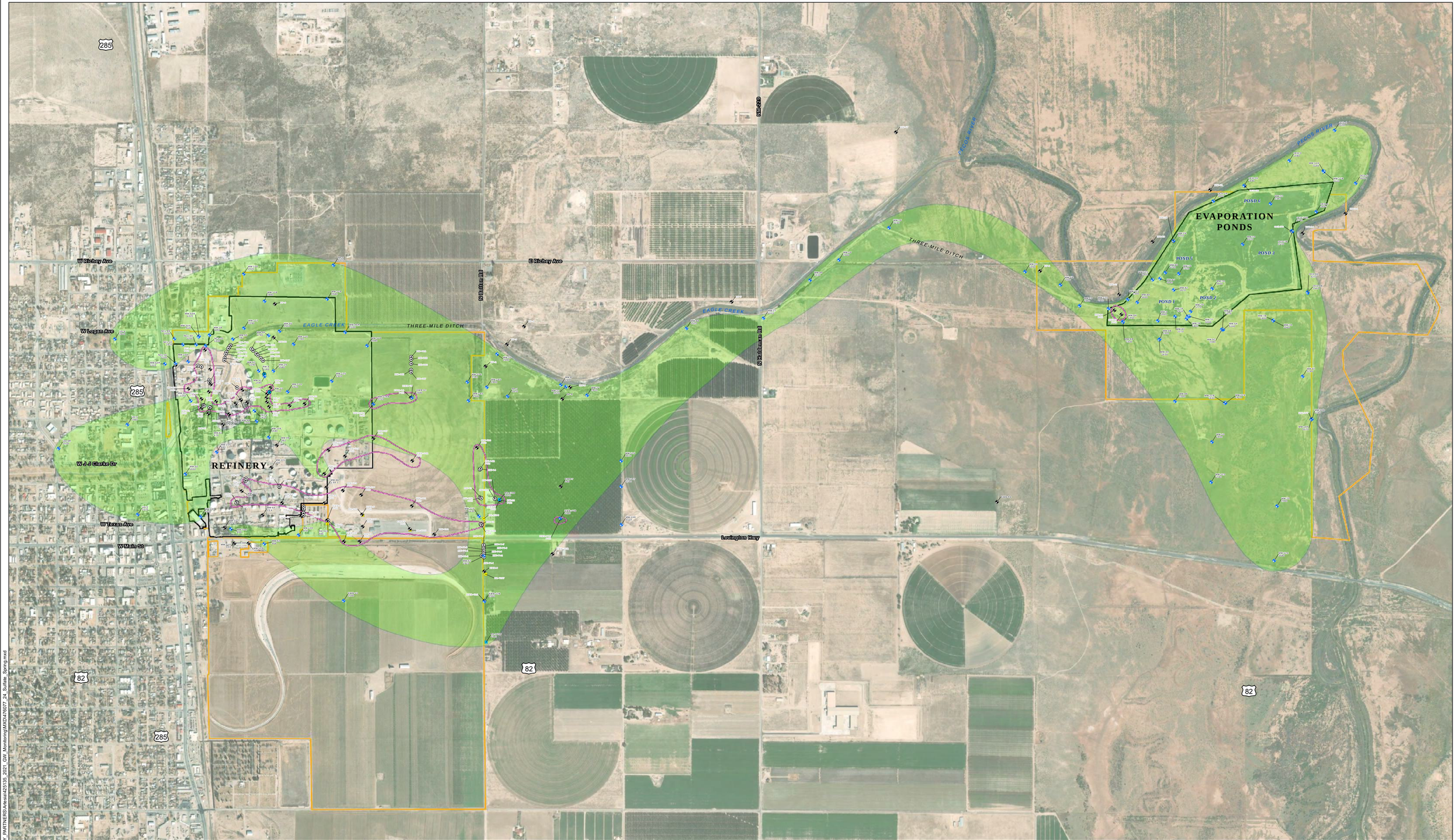
FLUORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 1/31/2022	MXD: 476077_23_Fluoride_Fall

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FIGURE 23



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL EXCEEDS SCREENING LEVELS
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

958 SULFATE CONCENTRATION
MW-97 WELL NOT SAMPLED
< 0.0774 SULFATE NOT DETECTED ABOVE METHOD DETECTION LIMIT
PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
SULFATE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 600 mg/L)
FENCELINE
NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\425135_2021_GW_Monitoring\MXD\476077_24_Sulfate_Spring.mxd

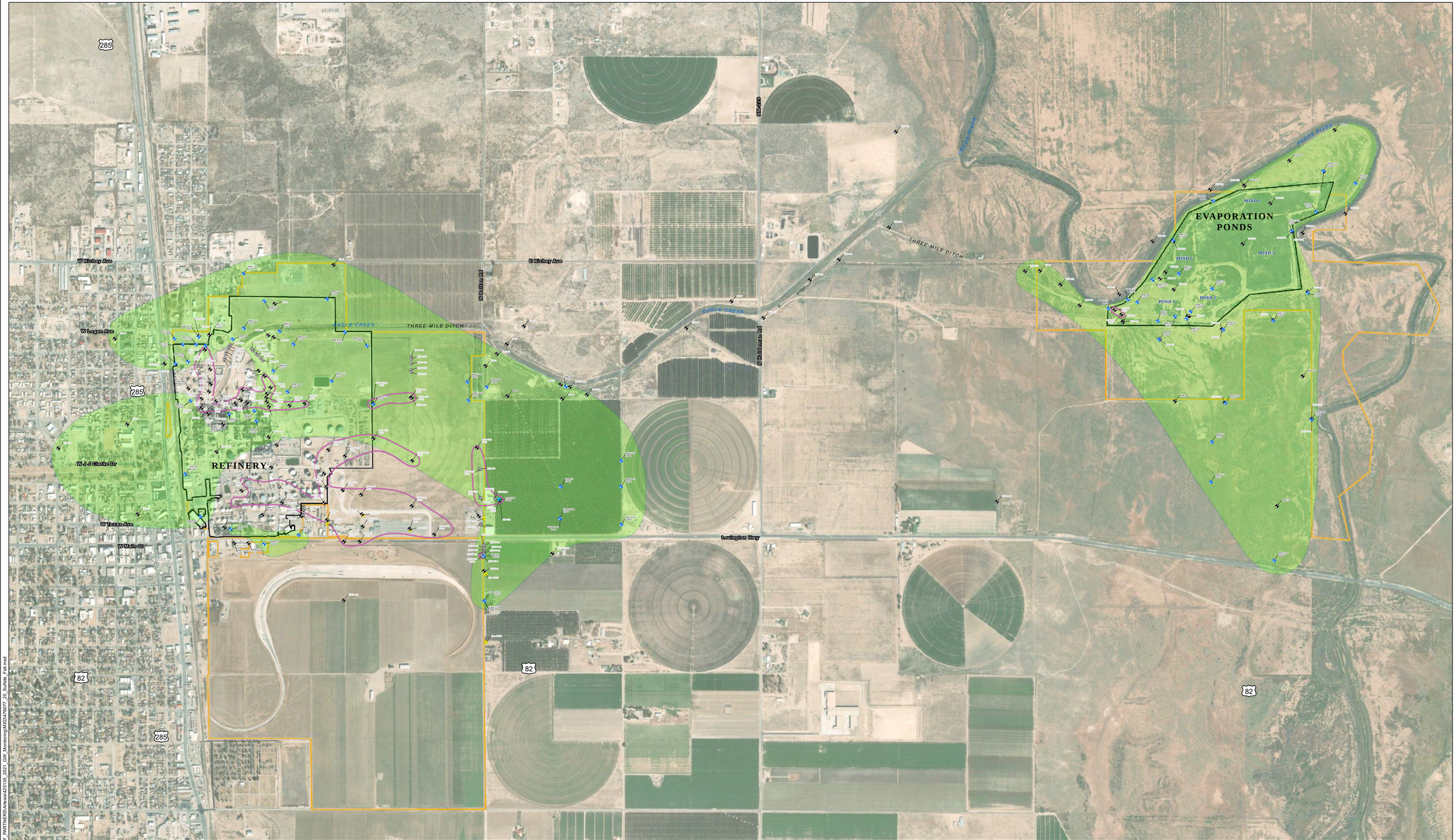
SULFATE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 1/28/2022	MXD: 476077_24_Sulfate_Spring

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FIGURE 24



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL EXCEEDS SCREENING LEVELS
- IRRIGATION WELL
- RECOVERY WELL

834 SULFATE CONCENTRATION

MW-105 WELL NOT SAMPLED

PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)

SULFATE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 600 mg/L)

FENCELINE

NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

NEW MEXICO

SULFATE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

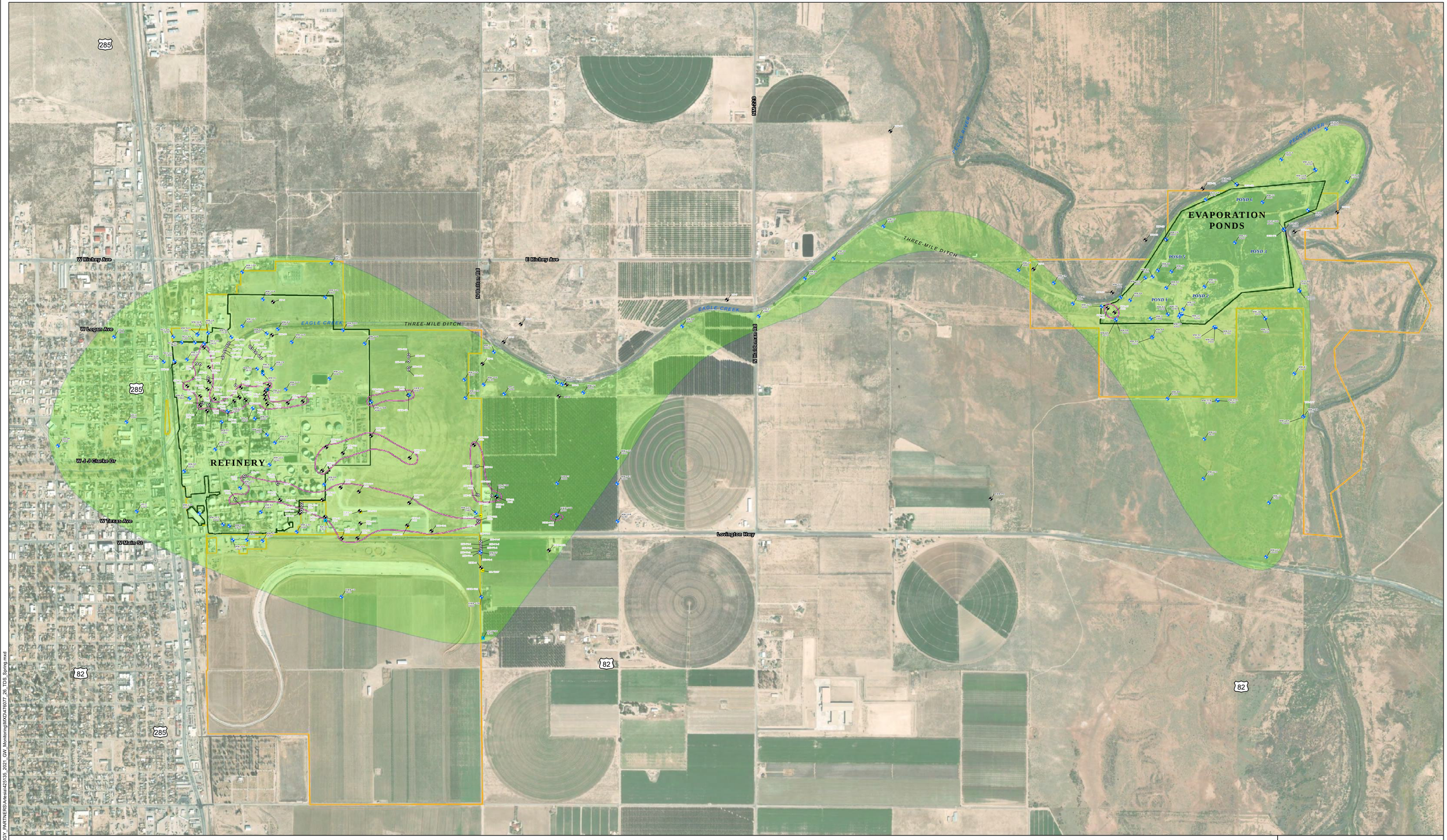
2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 1/28/2022	MXD: 476077_25_Sulfate_Fall

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FIGURE 25

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\425135_2021_GW_Monitoring\MXD\476077_25_Sulfate_Fall.mxd



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL EXCEEDS SCREENING LEVELS
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

- 1340 TOTAL DISSOLVED SOLIDS CONCENTRATION
- MW-19 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- TOTAL DISSOLVED SOLIDS CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 1000 mg/L)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).

N W E S

0 750 1,500
Feet

1 IN = 800 FT

NEW MEXICO

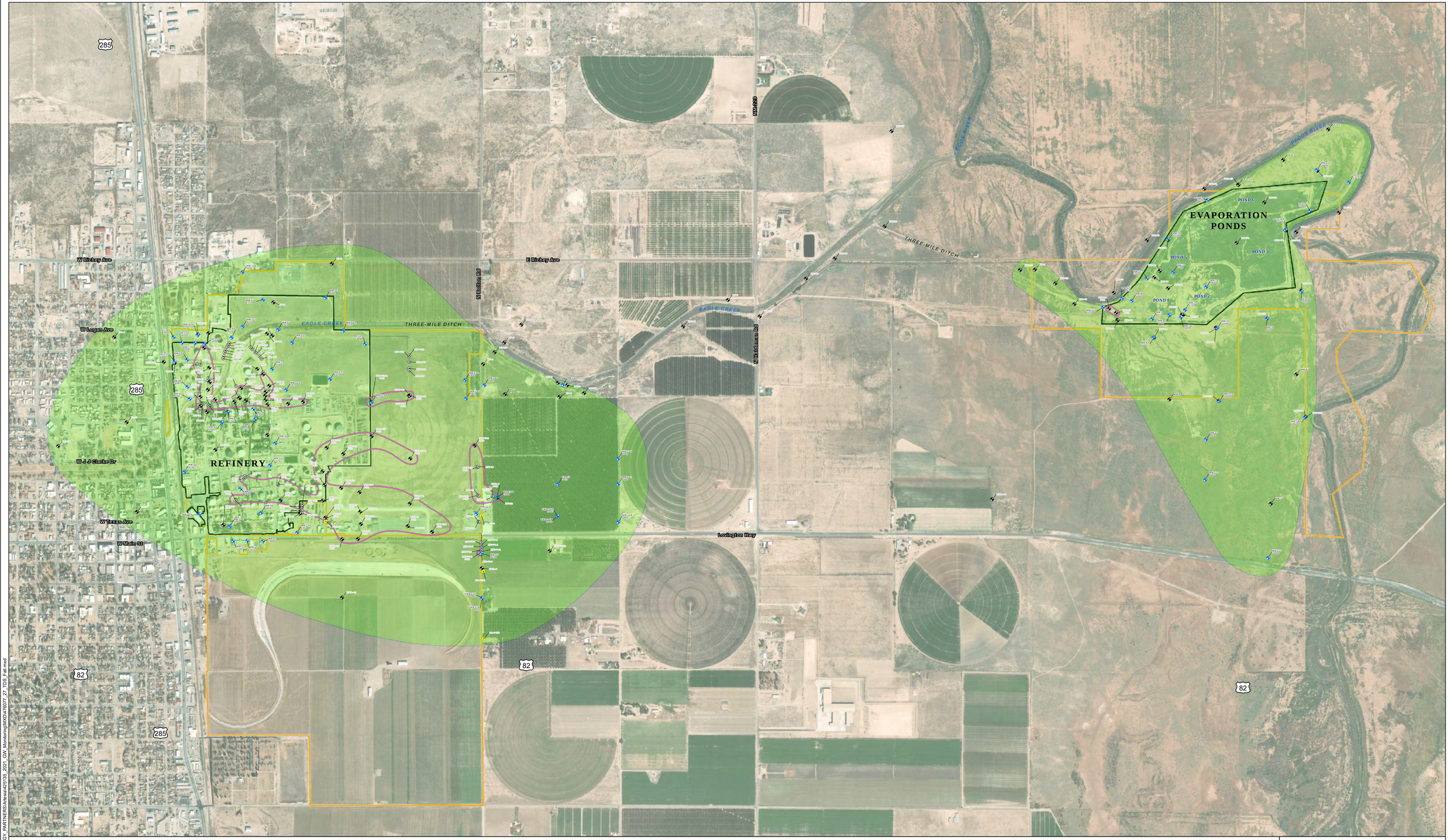
TOTAL DISSOLVED SOLIDS CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP
2021 FIRST SEMIANNUAL EVENT
2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 1/28/2022	MXD: 476077_26_TDS_Spring

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FIGURE 26

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\426135_2021_GW_Monitoring\MXD\476077_26_TDS_Spring.mxd



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL EXCEEDS SCREENING LEVELS
- IRRIGATION WELL
- RECOVERY WELL

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

2020 TOTAL DISSOLVED SOLIDS CONCENTRATION

MW-105 WELL NOT SAMPLED

PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)

TOTAL DISSOLVED SOLIDS CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 1000 mg/L)

FENCELINE

NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

TOTAL DISSOLVED SOLIDS CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

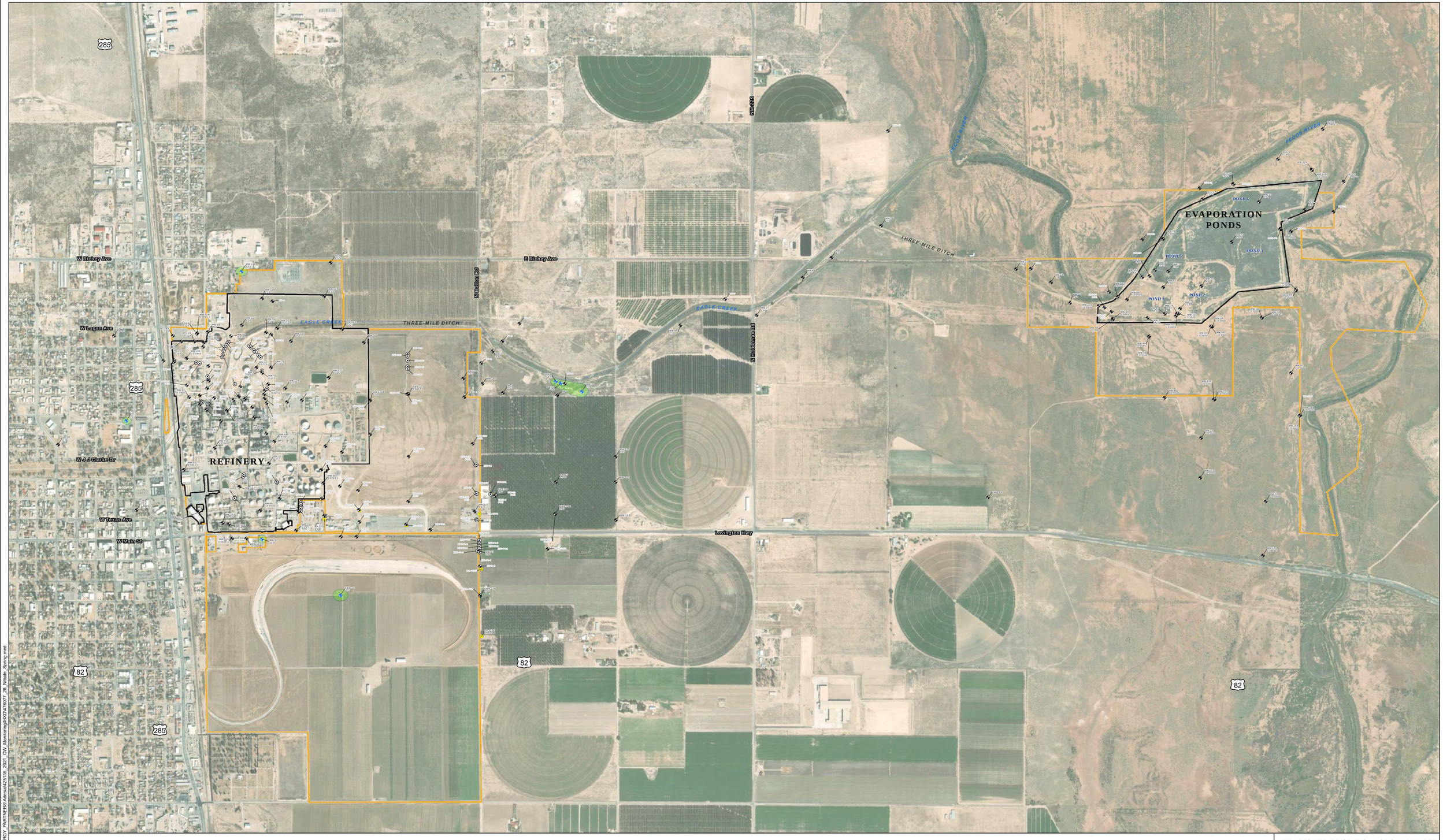
2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 1/28/2022	MXD: 476077_27_TDS_Fall

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FIGURE 27

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\426135_2021_GW_Monitoring\MXD\476077_27_TDS_Fall.mxd



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

- 11.0 NITRATE/NITRITE CONCENTRATION
- < 0.197 NITRATE/NITRITE NOT DETECTED ABOVE METHOD DETECTION LIMIT
- MW-19 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- NITRATE/NITRITE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 10 mg/L)
- FENCELINE
- NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600
Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\425135_2021_GW_Monitoring\MXD\476077_28_Nitrite_Spring.mxd

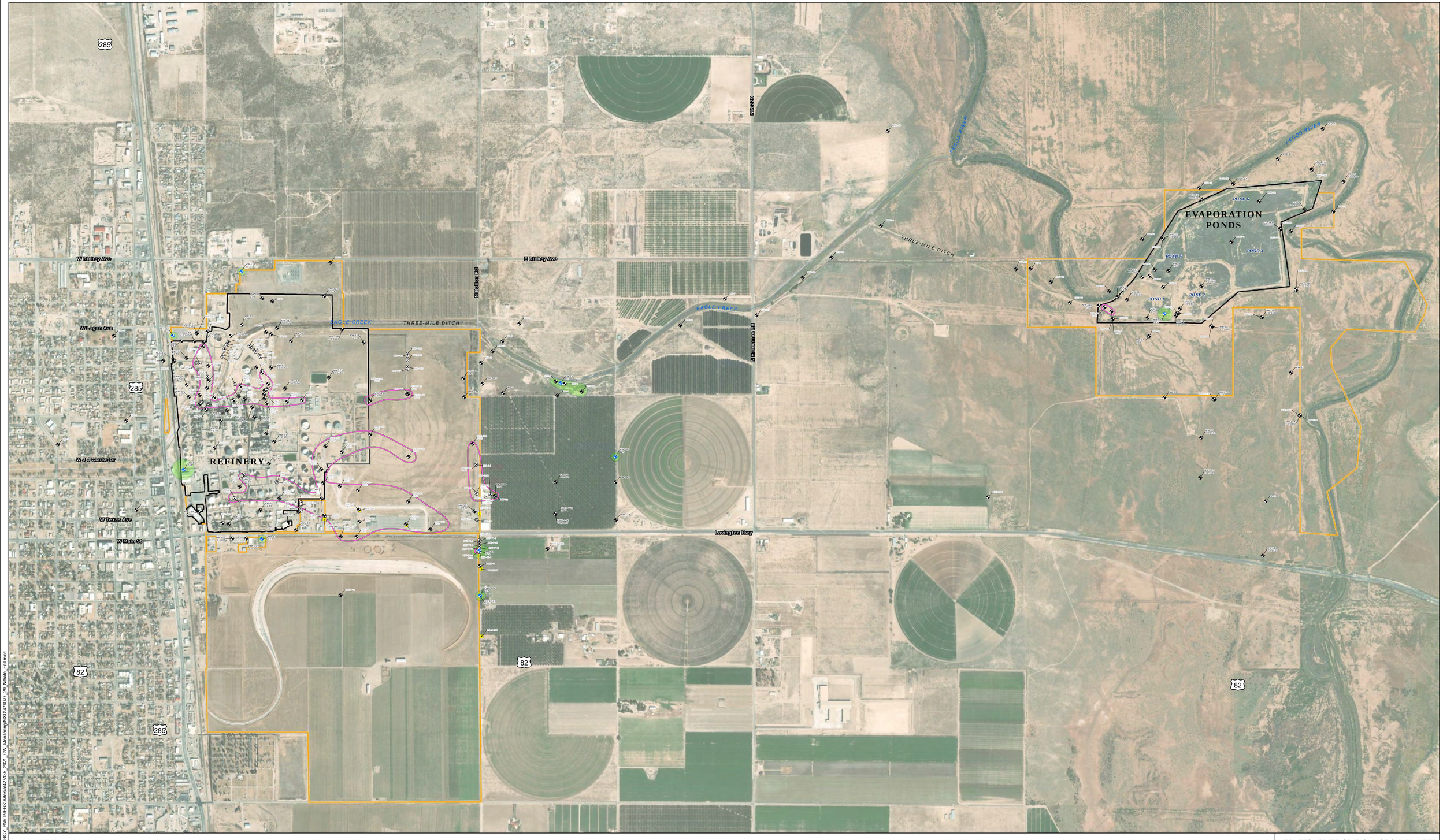
NITRATE/NITRITE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 FIRST SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_28_Nitrate_Spring

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FIGURE 28



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

1.85 NITRATE/NITRITE CONCENTRATION

< 0.394 NITRATE/NITRITE NOT DETECTED ABOVE METHOD DETECTION LIMIT

MW-105 WELL NOT SAMPLED

PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)

NITRATE/NITRITE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 10 mg/L)

FENCELINE

NAVAJO PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

N W E S

0 800 1,600

Feet

1 IN = 800 FT

NEW MEXICO

AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (10/1/20)

Document Path: S:\1-PROJECTS\HOLLY_ENERGY_PARTNERS\Artesia\425135_2021_GW_Monitoring\MXD\476077_29_Nitrite_Fall.mxd

NITRATE/NITRITE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2021 SECOND SEMIANNUAL EVENT

2021 ANNUAL GROUNDWATER REPORT
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE	SAVED: 2/2/2022	MXD: 476077_29_Nitrate_Fall

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FIGURE 29

Released to Imaging: 2/7/2025 11:04:41 AM
Received by OCD: 1/9/2025 2:39:13 PM

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service
Current Location: Elev: 3366 ft. Lat: 32.7547° N Lon: -104.3835° W
Station: **ARTESIA 6 S, NM US USC00290600**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 01/06/2022

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 0730 Observation Time Precipitation: 07

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time			24 Hour Amounts Ending at Observation Time				At Obs. Time			4 in. Depth			8 in. Depth		
			Max.	Min.	At Obs.	Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2021	04	01	65	31	33	0.00		0.0		0.0	95.7	0.20	5	55	54			
2021	04	02	66	33	44	0.00		0.0		0.0	215.0	0.37	5	54	53			
2021	04	03	78	44	47	0.00		0.0		0.0	226.8	0.32	5	54	52			
2021	04	04	78	47	54	0.00		0.0		0.0		0.22	5	56	55			
2021	04	05	76	54	54	0.00		0.0		0.0		0.21	5	56	55			
2021	04	06	90	53	58	0.00		0.0		0.0	244.2	0.32	5	58	55			
2021	04	07	85	38	39	0.00		0.0		0.0	257.9	0.37	5	59	58			
2021	04	08	82	39	42	0.00		0.0		0.0	88.2	0.28						
2021	04	09	87	42	54	0.00		0.0		0.0	179.0	0.14	5	58	56			
2021	04	10	85	34	35	0.00		0.0		0.0	198.8	0.33	5	56	54			
2021	04	11	85	34	41	0.00		0.0		0.0	180.2	0.32	5	54	54			
2021	04	12	86	41	50	0.00		0.0		0.0	172.1	0.31	5	56	54			
2021	04	13	73	38	39	0.00		0.0		0.0	111.8	0.20	5	56	55			
2021	04	14	73	38	49	0.00		0.0		0.0	162.8	0.24	5	56	55			
2021	04	15	72	48	49	0.01		0.0		0.0	190.1	0.25	5	56	55			
2021	04	16	62	43	49	0.00		0.0		0.0	224.9	0.08	5	57	55			
2021	04	17	72	43	43	0.00		0.0		0.0	101.9	0.19	5	55	55			
2021	04	18	55	43	43	0.05		0.0		0.0	111.2	0.17	5	55	54			
2021	04	19	55	35	40	0.12		0.0		0.0	54.1	0.05	5	55	52			
2021	04	20	71	36	37	0.00		0.0		0.0	162.2	0.25	5	54	52			
2021	04	21	71	33	35	0.00		0.0		0.0	137.9	0.22	5	54	52			
2021	04	22	62	35	38	0.00		0.0		0.0	223.7	0.25	5	54	52			
2021	04	23	76	38	48	0.00		0.0		0.0	257.2	0.27	5	54	52			
2021	04	24	76	39	43	0.00		0.0		0.0	211.3	0.34	5	56	53			
2021	04	25	80	40	51	0.00		0.0		0.0	164.0	0.32	5	56	55			
2021	04	26	88	51	53	0.00		0.0		0.0	206.3	0.42	5	59	56			
2021	04	27	82	53	59	0.00		0.0		0.0	210.0	0.35	5	59	58			
2021	04	28	78	57	59	0.00		0.0		0.0	216.2	0.36	5	59	58			
2021	04	29	70	50	51	0.03		0.0		0.0	195.1	0.17	5	59	57			
2021	04	30	54	50	52	1.09		0.0		0.0	113.1	0.03	5	56	55			
		Summary	74	42		1.30		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests. "At Obs." = Temperature at time of observation

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

HMI Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

April 18, 2021

Ms. Julie Speer, P.G.
Sr. Project Manager
TRC
505 East Huntland Drive, Suite 250
Austin, Texas 78752

Subject: April 2021 (Spring Biennial) Groundwater Monitoring Event
Sitewide Gauging – April 13, 2021
Groundwater Sampling – April 13-15, 2021
Navajo Refining Company, Artesia, New Mexico

Dear Ms. Speer:

This document summarizes groundwater monitoring field activities conducted by Hydrologic Monitoring, LLC (HMI) on behalf of TRC at the Navajo Refining Company, Artesia Refinery, Artesia, New Mexico.

Contents

Field Activities Narrative
Table 1: (Gauging Data, GW Field Parameters, Well Inspections, & Analytical Program)
Groundwater Sampling SOP Memo
Job Hazard Analysis (JHA) forms
Groundwater Sampling Forms, followed by Field Instrument Calibration Log
(three (3) emails - forms in order of field-strategy, Table 1)
Chain-of-Custody Forms

Field Activities Narrative

1. HMI conducted *Spring Biennial 2021* groundwater monitoring event in April 2021 (i.e., "SA", "A", and "B" designations, in Table 1). Sitewide gauging was conducted April 13, and groundwater sampling was conducted April 13-14, 2021. The four (4) wells in the City of Artesia (addressed annually), were gauged and sampled April 12, 2021.

2. Groundwater sampling was conducted in accordance with the Site Sampling and Analysis Plan, EPA guidance, and the attached Memorandum - Low-Flow Groundwater Monitoring Standard Operating Procedures, Navajo Refining Co. - Artesia, New Mexico. Per regulatory request, if measured LNAPL thickness was *less than* 0.03 feet, in any well scheduled for groundwater sampling, LNAPL was removed, and the well was sampled. If LNAPL thickness was equal to, or greater than 0.03 feet, in any well scheduled for sampling, the well was not sampled. Gauging data, groundwater field parameters, and well inspection information is summarized in Table 1. Samples were shipped Priority Overnight FedEx, per Pace National, Mt. Juliet, TN. The groundwater sampling process is documented on the attached groundwater sampling forms.

3. Field QA/QC Sampling (per Refinery Area):

   <u>Evaporation Ponds</u>
   Duplicates:
   Dup-EP-01 at MW-7A
   Dup-EP-02 at MW-22A
   Dup-EP-03 at MW-3
   Equipment Blanks:
   EB-EP-01 collected over decontaminated gauging probe after sampling at MW-74
   EB-EP-02 collected over decontaminated gauging probe after sampling at MW-124
   EB-EP-03 collected over decontaminated gauging probe after sampling at MW-5A
   EB-EP-04 collected over decontaminated gauging probe after sampling at MW-79
   Trip Blank-EP-01
   Trip Blank-EP-02
   Trip Blank-EP-03

   <u>NCL</u>
   Duplicate:
   Dup-NCL-01 at NCL-49
   Equipment Blank:
   EB-NCL-01 collected over decontaminated gauging probe after sampling at NCL-32
   Trip Blank-NCL-01

   <u>TMD</u>
   Trip Blank-TMD-01

   <u>TEL</u>
   Duplicate:
   Dup-TEL-01 at TEL-4

Equipment Blank:
EB-TEL-01 collected over decontaminated gauging probe after sampling at TEL-2
Trip Blank-TEL-01

REST ("rest" of the site)
Duplicates:
Dup-REST-01 at MW-113
Dup-REST-02 at MW-104
Dup-REST-03 at MW-134
Dup-REST-04 was not collected (due to LNAPL presence at MW-60)
Dup-REST-05 at KWB-12B
Equipment Blanks:
EB-REST-01 collected over decontaminated gauging probe after sampling at MW-113
EB-REST-02 collected over decontaminated gauging probe after sampling at MW-104
EB-REST-03 collected over decontaminated gauging probe after sampling at MW-134
EB-REST-04 was not collected (due to LNAPL presence at MW-60)
EB-REST-05 collected over decontaminated gauging probe after sampling at KWB-12B
Trip Blank-REST-01
Trip Blank-REST-02
Trip Blank-REST-03
Trip Blank-REST-04

4. Notes:

HMI's daily JHA forms to be included in deliverables package.
Email to TRC "Estimated Field Hours" table, pre-event, and followup with "Actual Field Hours" table, post-event.
Pre-2H20 - Wood installed wells MW-137A, MW-138A, and MW-62R inside Refinery. TRC installed MW-145, MW-146, MW-147, and MW-148 (East Field/Chase Farms), and replacement well MW-53R.
MW-48 was found destroyed…sediment-filled, and no cap (HMI placed a cap on the well for safety only; the well appears to be filled with sediment to approx. 4 ft-bgs).



MW-48 – filled with sediment to approximately 4 ft-bgs…well is not functional, 4-13-21

1H21, MW-101 is now an upright well, with concrete base, but not protective steel casing yet (adjacent to active in-plant construction), per Navajo (photo).



MW-101 condition, 4-13-21

A total of 62 of 222 gauged wells contained LNAPL in 1H21. Five (5) wells were dry. Several wells contained LNAPL (dark brown, low viscosity), for the first time in 1H21 (examples of clear-bailer drops are shown for MW-28, MW-59, and MW-60).



LNAPL in MW-28, 4-13-21



LNAPL in MW-59, 4-13-21



LNAPL in MW-60, 4-13-21

Irrigation wells may experience upcoming changes, per TRC (TBD, replacements, etc.), with possible renewed well-access on the Joy farm property upcoming, per TRC.

Training modules: "24HFNAV HOLLYFRONTIER SITE SPECIFIC ORIENTATION ARTESIA-NM", and additional "LPS" module – both @ HASC, annually (HMI's December-cycle). HMI's DISA 2-yr backgound check/drug/alcohol requirements approved by safety-trailer personnel 2017, 2019, 2021, etc., as reported through HASC system; HMI maintains its access qualifications.
Per Navajo, purgewater is disposed in the pad sump (inside, then to the left, after Main Gate-entrance). Alternately, North Bundle Pad sump (fenced area of drums, etc.), notifying FCC control room prior to entrance.
Sitewide well/gate lock combinations: "2-0-1-3" (less often "2-0-0-2").
With suggested telephone notification, FedEx pickup from locked Artesia Refinery shed (35-25-39 lock combination), no earlier than approximately 14:00 daily, located across from Artesia Wool Co (access shed-area from inside the Refinery).
North side of Hwy 82, east of site, gate with cable and combination lock (8810).
POTW bldg, check-in as needed, to borrow a key or get gate unlocked.
HMI borrows Navajo key sets for "Evaporation Ponds" & "TEL" at permitting; returning upon event completion.
Navajo's Mr. Randy Dade, Richard Orosco, for daily safety review & permit-issue per team member (commonly ~ 10-pers HMI team).
HMI reports well inspections on the well sampling forms. Well inspection - items of concern (i.e., "Issues") are highlighted in yellow (Table 1).

HMI appreciates the opportunity to assist TRC with this project. If you have any questions or would like additional information please feel free to call us at 713.464.5206.

Sincerely,

HYDROLOGIC MONITORING

Scott C. Ude

STATE OF TEXAS
SCOTT C. UDE
GEOLOGY
353
LICENSED
PROFESSIONAL GEOSCIENTIST

Scott C. Ude, P.G.

The seal appearing on this document was authorized by Scott C. Ude, P.G. 353 on April 18, 2021.

Attachments

cc: Dana Helbert, P.G., TRC-Austin

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)															PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-6A	Monitoring	MDB	1			1	EP	13-Apr	845	NP	13.58	0.00	19.04	13-Apr	910	7.25	18.4	4,990	1.0	-169.4	5.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-6B	Monitoring	MDB	2			2	EP	13-Apr	930	NP	13.50	0.00	52.28	13-Apr	955	6.84	19.5	5,840	1.0	-120.1	2.4	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-85	Monitoring	MDB		1		3	EP	13-Apr	1735	10.81	11.36	0.55	20.34			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-86	Monitoring	MDB		2		4	EP	13-Apr	1725	10.83	10.86	0.03	19.21			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-120	Monitoring	MDB	3			5	EP	13-Apr	1720	NP	13.48	0.00	28.00	14-Apr	1215	7.36	18.8	9,080	1.3	-120.5	4.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-121	Monitoring	MDB	4			6	EP	13-Apr	1715	NP	13.56	0.00	27.31	14-Apr	1250	7.49	18.2	7,040	1.8	2.6	5.6	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-84	Monitoring	MDB	5			7	EP	13-Apr	1710	NP	11.03	0.00	20.56	14-Apr	1130	7.06	19.2	11,170	1.2	-1.3	8.1	Clear, yellow tint	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-122	Monitoring	MDB	6			8	EP	13-Apr	1605	NP	11.48	0.00	23.32	13-Apr	1630	7.43	19.1	6,070	2.1	18.2	26.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-81	Monitoring	MDB	7			9	EP	13-Apr	1650	NP	11.83	0.00	18.62	14-Apr	1000	7.02	17.2	7,040	2.4	43.0	3.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-80	Monitoring	MDB	8			10	EP	13-Apr	1655	NP	9.83	0.00	19.69	14-Apr	915	6.59	16.8	6,650	1.3	32.1	8.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-79	Monitoring	MDB	9			11	EP	13-Apr	1700	NP	11.00	0.00	19.24	14-Apr	825	7.29	16.2	9,210	1.9	6.2	3.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-82	Monitoring	MDB	10			12	EP	13-Apr	1705	NP	10.59	0.00	20.02	14-Apr	1025	6.99	20.2	8,160	1.3	20.4	7.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-74	Monitoring	MDB	11			13	EP	13-Apr	1015	NP	10.10	0.00	20.19	13-Apr	1040	6.90	17.7	11,470	0.8	-45.4	15.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-73	Monitoring	MDB	12			14	EP	13-Apr	1105	NP	10.13	0.00	19.60	13-Apr	1130	7.51	16.9	13,540	1.4	-39.7	12.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-2A	Monitoring	MDB	13			15	EP	13-Apr	1505	NP	11.16	0.00	17.30	13-Apr	1530	7.65	18.4	12,180	1.5	-18.9	5.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-2B	Monitoring	MDB				16	EP	13-Apr	1545	NP	11.96	0.00	52.00			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program						
MW-72	Monitoring	MDB	14			17	EP	13-Apr	1420	NP	8.12	0.00	13.93	13-Apr	1445	7.80	18.1	11,790	0.9	6.9	3.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
OCD-6	Monitoring	MDB	15			18	EP	13-Apr	1335	NP	11.42	0.00	26.69	13-Apr	1400	7.49	18.8	17,590	1.0	-19.1	6.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-7AR	Monitoring	MDB	16			19	EP	13-Apr	1155	NP	10.44	0.00	21.28	13-Apr	1220	7.39	19.5	14,430	1.1	-134.2	30.9	Clr, red particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-7B	Monitoring	MDB	17			20	EP	13-Apr	1235	NP	10.26	0.00	56.85	13-Apr	1310	7.70	20.2	6,400	1.1	-127.7	6.5	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
OCD-7C	Monitoring	MDB				21	EP	13-Apr	1325	NP	10.01	0.00	71.95			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program						
RW-#15C	Recovery	MDB		3		22	REST	13-Apr	815	20.45	20.72	0.27	22.30			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-48	Monitoring	MDB		4		23	REST	13-Apr	805	*	*	########	32.00	* Well destroyed; obstructed @ 4.74' (sediment-filled); found with no cap									Issue	Issue	Issue	Issue	Y	SA	SA	SA	x				
MW-130	Monitoring	MDB	18			24	REST	13-Apr	800	NP	24.32	0.00	45.00	14-Apr	1520	7.09	23.6	3,300	2.8	68.7	65.4	Sl. Cloudy, white tint	Yes	Yes	Yes	Yes		SA	SA	SA	x				
KWB-4	Monitoring	MDB		5		25	REST	13-Apr	830	27.84	31.31	3.47	41.75			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
RW-19	Recovery [d]	MDB		6		26	REST	13-Apr	825	28.75	28.85	0.10	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-76	Monitoring	SCD	19			27	EP	13-Apr	1528	NP	11.99	0.00	20.33	14-Apr	1315	6.83	19.5	6,070	1.8	-203.5	5.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-77	Monitoring	SCD	20			28	EP	13-Apr	1523	NP	10.23	0.00	20.52	14-Apr	1405	6.94	19.7	7,490	2.1	-33.1	6.0	Clr, gold tint, odor	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-78	Monitoring	SCD	21			29	EP	13-Apr	1525	NP	10.29	0.00	19.57	14-Apr	1450	7.11	19.9	4,160	1.9	55.2	6.0	Clear, gold tint	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-75	Monitoring	SCD	22			30	EP	13-Apr	1520	NP	10.41	0.00	23.74	14-Apr	1540	7.10	20.7	7,430	1.0	-150.2	6.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-83	Monitoring	SCD	23			31	EP	13-Apr	1532	NP	10.26	0.00	19.91	14-Apr	1230	6.94	18.7	5,800	1.8	-132.8	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)															PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-3	Monitoring	SCD	24			32	EP	13-Apr	1535	NP	12.32	0.00	22.10	14-Apr	1120	7.07	18.3	6,050	2.4	-15.8	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-88	Monitoring	SCD	25			33	EP	13-Apr	1545	NP	9.79	0.00	20.31	13-Apr	1610	7.06	20.5	6,280	1.8	-67.9	6.8	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-22A	Monitoring	SCD	26			34	EP	13-Apr	1640	NP	9.02	0.00	22.65	14-Apr	825	7.04	17.2	15,330	2.0	-46.2	6.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-22B	Monitoring	SCD	27			35	EP	13-Apr	1643	NP	8.87	0.00	54.66	14-Apr	935	7.05	17.1	6,470	1.1	-96.2	5.0	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-10	Monitoring	SCD	28			36	EP	13-Apr	1655	NP	6.45	0.00	18.45	13-Apr	1720	7.10	19.2	6,370	2.2	-89.2	5.5	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-123	Monitoring	SCD	29			37	EP	13-Apr	1650	NP	6.93	0.00	25.71	14-Apr	1025	6.97	18.7	6,570	1.9	-138.1	6.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-4A	Monitoring	SCD	30			38	EP	13-Apr	1430	NP	12.47	0.00	16.55	13-Apr	1455	7.16	19.8	6,220	2.3	-138.5	6.3	Clr, black particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-4B	Monitoring	SCD	31			39	EP	13-Apr	1515	NP	12.24	0.00	72.37	13-Apr	1540	7.16	19.7	5,040	2.9	-139.9	6.9	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-5A	Monitoring	SCD	32			40	EP	13-Apr	1200	NP	9.39	0.00	20.15	13-Apr	1225	7.14	19.6	11,030	2.0	-134.1	5.9	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-5B	Monitoring	SCD	33			41	EP	13-Apr	1255	NP	9.60	0.00	53.54	13-Apr	1320	7.13	19.5	7,560	1.0	-100.0	4.3	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-5C	Monitoring	SCD	34			42	EP	13-Apr	1340	NP	9.81	0.00	71.64	13-Apr	1405	7.27	19.4	3,820	1.3	-70.0	6.2	Clr, white particles	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-7A	Monitoring	SCD	35			43	EP	13-Apr	1050	NP	10.17	0.00	18.65	13-Apr	1115	7.27	19.1	8,300	1.4	-83.4	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-7B	Monitoring	SCD	36			44	EP	13-Apr	1005	NP	9.95	0.00	52.56	13-Apr	1030	7.49	18.9	7,770	1.3	-90.8	6.5	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
OCD-8A	Monitoring	SCD	37			45	EP	13-Apr	920	NP	9.66	0.00	20.74	13-Apr	945	7.03	18.0	15,170	1.7	-112.2	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-8B	Monitoring	SCD	38			46	EP	13-Apr	830	NP	9.80	0.00	56.65	13-Apr	855	6.96	17.7	9,250	1.3	-59.5	7.4	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
KWB-P4	Monitoring	BRH	39			47	REST	13-Apr	1625	NP	6.17	0.00	30.26	14-Apr	1430	7.14	21.6	6,730	1.3	-44.9	3.7	Clear	Yes	Yes	Yes	Yes		B	B	B	x				
MW-25	Monitoring	BRH	40			48	TMD	13-Apr	1505	NP	14.55	0.00	28.18	13-Apr	1530	7.49	18.7	4,460	1.5	89.6	2.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
NP-8	Monitoring	BRH				49	TMD	13-Apr	1550	NP	14.66	0.00	>14.95			Not in sampling program							Yes	Issue	Yes	Yes		SA	Not in sampling program							
MW-1R	Monitoring	BRH	41			50	EP	13-Apr	1555	NP	11.77	0.00	20.63	14-Apr	1340	7.40	21.0	6,070	1.2	-108.7	4.4	Clear	Yes	Issue	Yes	Yes		SA	A	A	x				
MW-15	Monitoring	BRH	42			51	EP	13-Apr	1600	NP	12.97	0.00	21.70	14-Apr	1345	7.57	19.8	7,070	1.8	47.9	5.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
OCD-1R	Monitoring	BRH	43			52	EP	13-Apr	1355	NP	12.53	0.00	23.74	14-Apr	1250	7.34	22.0	6,090	1.3	22.8	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-2A	Monitoring	BRH	44			53	EP	13-Apr	1400	NP	12.82	0.00	27.56	14-Apr	1040	7.44	21.1	5,830	1.7	37.9	4.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-2B	Monitoring	BRH				54	EP	13-Apr	1405	NP	12.40	0.00	50.38			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
OCD-3	Monitoring	BRH	45			55	EP	13-Apr	1410	NP	13.19	0.00	25.20	14-Apr	955	7.57	21.4	4,430	1.7	35.9	5.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
OCD-4	Monitoring	BRH	46			56	EP	13-Apr	1415	NP	12.74	0.00	25.41	14-Apr	910	7.31	20.0	17,640	1.6	-17.2	5.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-11A	Monitoring	BRH	47			57	EP	13-Apr	1425	NP	10.33	0.00	22.01	14-Apr	1205	7.10	21.8	26,800	1.3	10.3	5.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-11B	Monitoring	BRH	48			58	EP	13-Apr	1430	NP	10.31	0.00	47.30	14-Apr	1125	7.02	21.5	21,300	1.1	-73.7	6.1	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
OCD-5	Monitoring	BRH	49			59	EP	13-Apr	1435	NP	10.95	0.00	25.41	14-Apr	825	7.13	17.8	16,570	1.4	-90.4	31.9	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-87	Monitoring	BRH	50			60	EP	13-Apr	935	NP	9.42	0.00	20.39	13-Apr	1000	7.04	19.0	17,150	1.8	-118.8	4.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-18A	Monitoring	BRH	51			61	EP	13-Apr	1020	NP	10.99	0.00	22.58	13-Apr	1045	7.29	17.8	21,700	1.4	23.3	3.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-18B	Monitoring	BRH	52			62	EP	13-Apr	1100	NP	10.99	0.00	50.59	13-Apr	1125	7.23	18.2	5,910	1.4	3.5	3.1	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-18T	Monitoring	BRH				63	EP	13-Apr	1140	NP	11.10	0.00	50.57			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
MW-70	Monitoring	BRH	53			64	EP	13-Apr	1145	NP	9.15	0.00	22.05	13-Apr	1210	7.24	17.8	7,410	1.2	-25.2	17.1	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-124	Monitoring	BRH	54			65	EP	13-Apr	1230	NP	9.74	0.00	22.00	13-Apr	1255	7.15	17.8	13,230	1.6	-50.9	10.8	Clr, orange particles	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-52	Monitoring	BRH/MDB	55			66	REST	13-Apr	1650	NP	22.59	0.00	34.67	14-Apr	1530	6.88	20.8	3,240	1.5	84.8	5.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-109	Monitoring	BRH/RJM	56			67	REST	13-Apr	1655	NP	20.34	0.00	29.48	14-Apr	1520	7.24	22.7	2,690	1.0	-363.4	5.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-110	Monitoring	BRH/RJM	57			68	REST	13-Apr	1700	NP	16.70	0.00	29.74	14-Apr	1425	7.22	22.4	1,728	0.9	-196.3	48.8	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-13	Monitoring	BRH				69	EP	13-Apr	815	NP	13.34	0.00	21.10			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river							
MW-69	Monitoring	BRH				70	EP	13-Apr	810	NP	11.74	0.00	22.51			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river							
MW-12	Monitoring	BRH				71	EP	13-Apr	800	NP	10.98	0.00	17.93			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river							
MW-24	Monitoring	BRH				72	EP	13-Apr	840	NP	12.66	0.00	23.51			Not in sampling program							Yes	Yes	Issue	Yes		SA	No sampling due to location E. of river							
MW-14	Monitoring	BRH				73	EP	13-Apr	835	NM	>11.81	NA	>11.81			Not in sampling program							Yes	Issue	Yes	Yes		SA	No sampling due to location N. of river							
RW-12	Recovery [d]					Field E of Refinery				Not in gauging program						Not in sampling program												-	-	-	-	-	-	-	-
RW-12R	Recovery [d]	BTB		7		74	REST	13-Apr	1110	28.06	28.09	0.03	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-113	Monitoring	BTB/GDS	58			75	REST	13-Apr	1120	NP	27.25	0.00	37.80	14-Apr	1225	6.61	22.1	2,820	1.4	-92.1	3.6	Clear, odor	Yes	Yes	Yes	Yes		SA	SA	SA	x				
KWB-8	Monitoring	BTB		8		76	REST	13-Apr	1045	26.93	28.29	1.36	35.80			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
RW-22	Recovery [d]	BTB		9		77	REST	13-Apr	1050	28.78	28.89	0.11	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-20A	Recovery [d]	BTB		10		78	REST	13-Apr	1055	Dry	Dry	NM	NM			(Historical LNAPL - Top of recovery pump @ 20.65 ft-toc							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-20B	Recovery [d]	BTB		11		79	REST	13-Apr	1100	Dry	Dry	NM	NM			(Historical LNAPL)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-13	Recovery [d]					Field E of Refinery				Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-
RW-13R	Recovery [d]	BTB		12		80	REST	13-Apr	1120	25.98	27.26	1.28	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-14	Recovery [d]					Field E of Refinery				Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-
RW-14R	Recovery [d]	BTB		13		81	REST	13-Apr	1130	24.63	27.09	2.46	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-133	Monitoring	BTB		14		82	REST	13-Apr	1140	22.24	22.53	0.29	37.64			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-134	Monitoring	BTB/GDS	59			83	REST	13-Apr	1200	NP	20.87	0.00	32.95	14-Apr	1120	6.75	19.9	4,340	2.0	92.1	3.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
RA-4798	Irrigation	BTB	60			84	REST		No gauge @ irrigation well					14-Apr	1305	7.17	20.8	2,198	3.1	-14.6	3.8	Clear	NA	NA	NA	Yes		NA	SA	SA	x				
RA-4196	Irrigation	BTB				85	REST		No gauge @ irrigation well					14-Apr	810	Electrical pump-outage; landowner to contact electrician							NA	NA	NA	Yes		NA	SA	SA	x				
RA-1227	Irrigation	BTB				86	REST									Removed from program by Navajo, 4-13-15												NA							
RA-3156	Irrigation	BTB	61			87	REST		No gauge @ irrig well (not used, per Chase Farms)					14-Apr	830	7.28	21.9	3,520	5.6	6.0	>200	Cloudy	NA	NA	NA	Yes		NA	A	A	x				
RA-313	Irrigation	BTB	62			88	REST		No gauge @ irrigation well					14-Apr	1335	8.34	23.8	1,661	3.9	125.6	1.4	Clear	NA	NA	NA	Yes		NA	A	A	x				
KWB-7	Monitoring	BTB	63			89	REST	13-Apr	1220	NP	19.59	0.00	34.83	14-Apr	1220	6.75	18.9	3,050	1.6	-203.1	1.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-135	Monitoring	BTB/GDS	64			90	REST	13-Apr	1610	NP	34.59	0.00	65.55	13-Apr	1635	6.68	18.3	7,280	3.7	189.9	15.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)															PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-20	Monitoring	BTB	65			91	TMD	13-Apr	1325	NP	19.28	0.00	26.66	14-Apr	1035	6.82	20.7	4,430	3.5	97.6	1.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
NP-3	Monitoring	BTB				92	TMD	13-Apr	1338	NP	21.27	0.00	21.59			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
NP-4	Monitoring	BTB				93	TMD	13-Apr	1332	NP	33.97	0.00	36.98			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
NP-2	Monitoring	BTB				94	TMD	13-Apr	1344	NP	21.15	0.00	21.49			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
NP-1	Monitoring	BTB	66			95	TMD	13-Apr	1350	NP	19.29	0.00	21.88	14-Apr	1115	6.73	18.0	4,100	2.5	483.7	1.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
NP-6	Monitoring	BTB	67			96	TMD	13-Apr	1250	NP	16.68	0.00	20.35	14-Apr	1020	6.53	18.1	5,350	2.2	471.1	3.4	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-8	Monitoring	BTB	68			97	TMD	13-Apr	1302	NP	17.99	0.00	23.30	14-Apr	950	6.70	18.0	5,410	2.0	92.6	2.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-21	Monitoring	BTB/GDS	69			98	TMD	13-Apr	1310	NP	17.23	0.00	25.12	14-Apr	905	6.80	17.9	5,310	2.8	126.1	3.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-9	Monitoring	BTB				99	TMD	13-Apr	1315	NP	18.68	0.00	22.25			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
MW-71	Monitoring	BTB	70			100	TMD	13-Apr	1243	NP	19.13	0.00	21.67	14-Apr	925	6.85	18.6	6,560	2.1	115.1	1.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-68	Monitoring	BTB	71			101	TMD	13-Apr	1235	NP	25.50	0.00	26.52	14-Apr	825	6.79	18.6	3,100	4.0	85.3	2.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-27	Monitoring	BTB	72			102	TMD	13-Apr	1405	NP	20.89	0.00	30.28	13-Apr	1430	6.92	20.9	2,210	1.5	113.0	3.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-89	Monitoring	BTB	73			103	TMD	13-Apr	1545	NP	12.44	0.00	20.28	13-Apr	1610	6.93	18.8	3,040	1.2	63.2	5.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-16	Monitoring	BTB	74			104	TMD	13-Apr	1500	NP	9.92	0.00	21.24	13-Apr	1525	7.05	18.2	4,550	2.0	90.7	3.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-26	Monitoring	BTB	75			105	TMD	13-Apr	1630	NP	13.47	0.00	27.58	13-Apr	1655	7.01	18.8	6,720	1.0	99.1	2.0	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
KWB-11A	Monitoring	BTB		15		106	REST	13-Apr	940	26.61	26.68	0.07	42.27			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
KWB-11B	Monitoring	BTB	76			107	REST	13-Apr	945	NP	27.28	0.00	72.45	13-Apr	1010	6.89	18.9	3,262	1.2	112.9	3.6	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	x				
KWB-3AR	Monitoring	BTB				108	REST									Removed from program by Navajo, 4-13-15 (farmer Jack Joy, 575-365-6042)																			
MW-115	Monitoring	BTB	77			109	REST	13-Apr	1714	NP	19.04	0.00	27.50	14-Apr	1610	6.74	19.5	4,340	1.9	89.7	0.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-114	Monitoring	BTB	78			110	REST	13-Apr	1721	NP	18.88	0.00	38.25	14-Apr	1515	6.62	22.0	3,360	1.6	90.1	1.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-125	Monitoring	BTB	9			111	REST	13-Apr	1706	NP	21.74	0.00	28.31	14-Apr	1425	6.72	20.1	4,360	2.3	80.3	4.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-117	Monitoring	GDS/OJD	80			112	REST	13-Apr	1340	NP	16.33	0.00	27.22	13-Apr	1405	6.41	19.1	3,630	1.8	70.8	8.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-118	Monitoring	GDS/OJD	81			113	REST	13-Apr	1255	NP	19.95	0.00	28.29	13-Apr	1320	6.60	19.1	3,830	3.5	76.1	9.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
NP-9	Monitoring	GDS				114	TMD	13-Apr	1245	NP	19.24	0.00	25.65			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
MW-119	Monitoring	GDS	82			115	REST	13-Apr	1205	NP	19.71	0.00	28.11	13-Apr	1230	6.48	18.8	3,790	1.9	63.1	17.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
NP-5	Monitoring	GDS	83			116	REST	13-Apr	940	NP	19.92	0.00	25.09	13-Apr	1005	6.87	19.0	6,430	2.2	141.7	19.9	Clear	Yes	Yes	Yes	Yes		SA	B	B	x				
MW-136	Monitoring	GDS	84			117	REST	13-Apr	1035	NP	18.36	0.00	27.90	13-Apr	1100	6.76	19.4	4,810	1.6	157.9	17.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-126A	Monitoring	GDS		16		118	REST	13-Apr	836	22.71	23.29	0.58	37.51			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-126B	Monitoring	GDS	85			119	REST	13-Apr	840	NP	22.71	0.00	51.43	13-Apr	905	6.46	18.1	5,260	1.8	122.4	19.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-127	Monitoring	GDS		17		120	REST	13-Apr	825	24.61	26.03	1.42	53.21			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-129	Monitoring	GDS		18		121	REST	13-Apr	1317	25.10	25.98	0.88	50.78			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label	PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC: Purge Parameters	General Sampling Frequency	(Analysis per COC)
										Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																					
KWB-1A	Monitoring	GDS		19		123	REST	13-Apr	1336	19.75	20.81	1.06	33.50			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
KWB-1B	Monitoring	GDS				124	REST	13-Apr	1342	21.40	22.67	1.27	33.92			Not in sampling program							Yes	Yes	Yes	Yes	Y	SA	Not in sampling program		
KWB-1C	Monitoring	GDS	86			125	REST	13-Apr	1350	NP	22.28	0.00	52.71	13-Apr	1415	6.60	20.0	5,660	1.1	141.6	23.2	Clear	Yes	Yes	Yes	Yes		SA	B	B	x
KWB-10R	Monitoring	GDS		20		126	REST	13-Apr	1328	20.79	23.19	2.40	29.46			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-131	Monitoring	GDS		21		127	REST	13-Apr	1438	27.31	29.35	2.04	53.35			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
KWB-5	Monitoring	GDS/OJD		22		128	REST	13-Apr	850	27.40	29.31	1.91	37.68			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-111	Monitoring	GDS/OJD		23		129	REST	13-Apr	900	28.60	29.74	1.14	40.83			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
KWB-6	Monitoring	GDS		24		130	REST	13-Apr	1303	26.07	28.65	2.58	36.44			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-112	Monitoring	GDS		25		131	REST	13-Apr	1308	25.13	27.72	2.59	37.54			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-132	Monitoring	GDS		26		132	REST	13-Apr	1247	>22.85	>22.85	NM	42.66			Navajo skimmer pump in well; no sampling (historical LNAPL)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-57	Monitoring	GDS/OJD	87			133	REST	13-Apr	1050	NP	25.81	0.00	34.32	13-Apr	1115	6.41	19.8	3,150	3.8	98.7	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
RW-#11-0[e]	Recovery [d]	GDS			1	134	REST	13-Apr	1130	Dry	Dry	Dry	22.20			No sampling (Well dry)							Yes	Yes	Yes	Yes		SA	A	A	x
KWB-9	Monitoring	GDS				135	REST			(Historically-obstructed @ 15.11')						Removed from program by Navajo, 4-26-16 (farmer Jack Joy, 575-365-6042)														
KWB-12A	Monitoring	GDS/OJD			2	136	REST	13-Apr	925	Dry	Dry	Dry	25.03			No sampling (Well dry)							Yes	Yes	Yes	Yes		SA	SA	SA	x
KWB-12B	Monitoring	GDS/OJD	88			137	REST	13-Apr	940	NP	28.31	0.00	39.39	13-Apr	1005	6.31	19.3	3,030	3.8	117.8	4.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
KWB-2R	Monitoring	GDS/OJD		27		138	REST	13-Apr	915	26.36	26.52	0.16	39.39			No sampling (LNAPL 0.03' or greater)							Issue	Issue	Issue	Issue	Y	SA	SA	SA	x
MW-58	Monitoring	GDS/OJD		28		139	REST	13-Apr	910	25.08	26.49	1.41	33.06			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
KWB-13	Monitoring	GDS	89			140	REST	13-Apr	1145	NP	29.75	0.00	33.10	13-Apr	1210	6.66	20.4	4,570	4.8	209.6	>200	Cloudy, tan	Yes	Yes	Yes	Yes		SA	A	A	x
MW-103	Monitoring	SCU	90			141	REST	13-Apr	1345	NP	18.49	0.00	25.22	13-Apr	1410	6.97	27.3	13,140	1.3	-288.9	23.6	Clear	Yes	Yes	Yes	Yes		SA	A	A	x
MW-104	Monitoring	SCU	91			142	REST	13-Apr	1235	NP	13.22	0.00	21.97	13-Apr	1300	7.04	22.1	2,050	1.2	-299.9	4.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-64	Monitoring	SCU	92			143	REST	13-Apr	1435	NP	22.46	0.00	34.08	13-Apr	1500	6.84	27.5	2,710	1.6	-297.8	19.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-65	Monitoring	SCU		29		144	REST	13-Apr	1520	19.83	20.10	0.27	28.78			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
RW-5	Recovery [d]						S Refinery			Not in gauging program						Not in sampling program											Y				
RW-5R	Recovery [d]	SCU		30		145	REST	13-Apr	1535	20.09	20.17	0.08	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-102	Monitoring	SCU	93			146	REST	13-Apr	1555	NP	17.44	0.00	26.45	14-Apr	1630	6.75	25.0	2,300	1.4	-286.3	13.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x
RW-4	Recovery [d]	SCU		31		147	REST	13-Apr	1600	15.99	16.50	0.51	36.62			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
RW-6	Recovery [d]	SCU		32		148	REST	13-Apr	1610	17.12	23.90	6.78	34.90			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x
MW-99	Monitoring	SCU		33		149	REST	13-Apr	1625	21.52	23.13	1.61	27.80			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-66	Monitoring	SCU	94			150	REST	13-Apr	1645	NP	21.12	0.00	29.80	14-Apr	1535	6.73	23.9	2,070	1.7	-124.3	91.0	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	x
MW-28	Monitoring	SCU		34		151	REST	13-Apr	1650	22.12	23.10	0.98	27.82			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x
MW-59	Monitoring	SCU		35		152	REST	13-Apr	1720	19.50	20.43	0.93	32.72			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label	PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-60	Monitoring	SCU		36		153	REST	13-Apr	1735	20.59	22.20	1.61	37.78			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-107	Monitoring	SCU		37		154	REST	13-Apr	1705	18.72	18.80	0.08	19.05			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-128	Monitoring	SCU		38		155	REST	13-Apr	1715	20.48	22.78	2.30	35.35			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-116	Monitoring	SCU	95			156	REST	13-Apr	1800	NP	19.17	0.00	27.63	14-Apr	1525	6.87	19.0	3,040	1.5	-110.9	7.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-46R	Monitoring	SCU	96			157	TMD	13-Apr	1815	NP	16.59	0.00	19.10	14-Apr	1405	6.75	22.8	3,590	2.7	58.5	10.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
RW-#18A	Recovery	GDS to SCU			3	122	REST	13-Apr	1220	Dry	Dry	NM	17.78			No sampling (Well dry)							Yes	Yes	Yes	Yes		SA	A	A	x				
MW-145	Monitoring	SCU	97			157.1	REST	13-Apr	1135	NP	21.24	0.00	32.10	13-Apr	1200	6.83	21.2	4,820	2.1	157.0	11.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-146	Monitoring	SCU	98			157.2	REST	13-Apr	1050	NP	24.73	0.00	33.40	13-Apr	1115	6.93	21.5	4,880	2.0	101.9	13.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-147	Monitoring	SCU	99			157.3	REST	13-Apr	845	NP	34.23	0.00	39.83	13-Apr	910	6.90	19.6	5,330	5.4	130.6	95.6	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-148	Monitoring	SCU	100			157.4	REST	13-Apr	935	NP	37.45	0.00	40.38	13-Apr	1020	7.05	21.0	4,180	5.0	103.7	>200	Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	x				
UG-3R	Monitoring	SCU	101			158	REST	12-Apr	1730	NP	24.03	0.00	38.58	12-Apr	1755	6.97	23.1	2,620	5.1	109.0	3.4	Clear	Yes	Yes	Yes	Yes		A	A	A	x				
UG-4	Monitoring	SCU	102			159	REST	12-Apr	1635	NP	21.00	0.00	39.24	12-Apr	1700	6.80	23.0	3,800	3.0	108.9	23.6	Clear	Yes	Yes	Yes	Yes		A	A	A	x				
UG-1	Monitoring	SCU	103			160	REST	12-Apr	1545	NP	14.25	0.00	24.08	12-Apr	1610	6.89	25.6	3,210	5.2	109.9	10.3	Clear	Yes	Yes	Yes	Yes		A	A	A	x				
UG-2	Monitoring	SCU	104			161	REST	12-Apr	1500	NP	18.00	0.00	29.28	12-Apr	1525	6.90	28.7	2,360	4.9	98.0	3.7	Clear	Yes	Yes	Yes	Yes		A	A	A	x				
MW-101	Monitoring	TAB/RJM	105			162	REST	13-Apr	1530	NP	17.15	0.00	22.15	14-Apr	1320	6.93	21.9	1,884	1.5	-318.3	8.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-105	Monitoring	TAB	106			163	REST	13-Apr	1515	NP	10.95	0.00	17.20	14-Apr	825	6.46	19.3	1,989	1.6	-343.0	5.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
RW-2	Recovery [d]	TAB		39		164	REST	13-Apr	800	17.28	24.34	7.06	36.13			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-61	Monitoring	TAB	107			165	REST	13-Apr	1500	NP	14.89	0.00	29.30	14-Apr	1235	6.74	21.8	2,040	1.2	-406.4	3.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-62	Monitoring	TAB/OJD		40		166	REST	13-Apr	1430	18.83	19.03	0.20				No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-62R	Monitoring	TAB/OJD	108			166.1	REST	13-Apr	1440	NP	18.50	0.00	24.51	14-Apr	1025	6.60	21.7	1,460	1.8	-307.7	3.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-93	Monitoring	TAB		41		167	REST	13-Apr	1000	*	*		20.23	* Covered by construction-related gravel; unable to locate with shovels									Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-43	Monitoring	TAB/RJM				168	REST	13-Apr	1740	17.30	17.70	0.40	19.67			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-137	Monitoring	TAB/RJM		42		169	REST	13-Apr	1330	14.82	17.00	2.18	29.60			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-137A	Monitoring	TAB/RJM		43		169.1	REST	13-Apr	1340	Dry	Dry	Dry	14.88			No sampling (well dry; historical LNAPL)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-138	Monitoring	TAB/RJM		44		170	REST	13-Apr	1400	16.40	18.75	2.35	24.81			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-138A	Monitoring	TAB/RJM		45		170.1	REST	13-Apr	1420	Dry	Dry	Dry	15.03			No sampling (well dry; historical LNAPL)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-23	Monitoring	TAB/OJD		46		171	REST	13-Apr	1420	19.30	22.28	2.98	23.10			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
TEL-4	Monitoring	TAB	109			172	TEL	13-Apr	815	NP	16.37	0.00	27.27	13-Apr	840	6.28	20.2	3,000	1.0	-184.0	6.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
TEL-3	Monitoring	TAB		47		173	TEL	13-Apr	930	17.20	22.10	4.90	27.19			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
TEL-2	Monitoring	TAB		48		174	TEL	13-Apr	945	18.30	20.25	1.95	27.20			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
TEL-1	Monitoring	TAB		49		175	TEL	13-Apr	1020	17.70	18.45	0.75	27.00			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC							
										Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	General Sampling Frequency	(Analysis per COC)					
MW-39	Monitoring	TAB/RJM		50		176	REST	13-Apr	1550	18.30	18.40	0.10	25.44			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-98	Monitoring	TAB	110			177	REST	13-Apr	1230	NP	15.30	0.00	25.60	13-Apr	1255	6.60	21.7	2,650	1.1	-403.1	1.0	Clear, odor	Yes	Yes	Yes	Yes		SA	SA	SA	x				
RW-10	Recovery [d]	TAB	111			178	REST	13-Apr	1040	NP	18.29	0.00	22.49	13-Apr	1105	7.00	20.5	2,400	0.6	-351.8	1.7	Clr, odor, light sheen	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-40	Monitoring	TAB		51		179	REST	13-Apr	1600	16.87	17.12	0.25	24.75			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-41	Monitoring	TAB/RJM	112			180	REST	13-Apr	1630	NP	16.02	0.00	21.56	14-Apr	1000	6.67	21.3	5,420	3.1	-323.8	6.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
RW-9	Recovery [d]	TAB/RJM	113			181	REST	13-Apr	1610	NP	18.12	0.00	21.83	14-Apr	1100	6.86	21.7	4,150	1.0	-368.7	5.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-42	Monitoring	TAB	114			182	REST	13-Apr	1640	NP	18.43	0.00	24.32	14-Apr	1325	6.53	21.0	3,170	1.6	-340.1	3.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-29	Monitoring	TAB	115			183	REST	13-Apr	1720	NP	23.59	0.00	24.22	14-Apr	1225	7.08	21.9	4,000	1.8	-128.3	5.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
RW-#16B	Recovery	TAB/RJM			4	184	REST	13-Apr	1650	Dry	Dry	Dry	17.70			No sampling (Well dry)							Yes	Yes	Yes	Yes		SA	A	A	x				
MW-30	Monitoring	TAB				185	REST	13-Apr	1700	NP	18.40	0.00	23.50			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program							
MW-56	Monitoring	TAB	116			186	NCL	13-Apr	1710	NP	19.02	0.00	26.50	14-Apr	915	6.93	19.8	2,460	1.6	-300.4	1.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	x				
MW-49	Monitoring	TAB/RJM	117			187	TEL	13-Apr	1540	NP	15.32	0.00	33.07	14-Apr	900	6.88	21.2	2,790	2.7	-347.2	6.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-106	Monitoring	TAB/RJM	118			188	REST	13-Apr	1130	NP	12.97	0.00	22.80	13-Apr	1155	6.52	23.6	2,730	1.9	-407.9	2.3	Clear, odor	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-45	Monitoring	TAB	119			189	NCL	13-Apr	1740	NP	13.88	0.00	15.05	14-Apr	1420	7.02	21.0	3,560	1.1	-239.6	4.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-139	Monitoring	RJM/BTA	120			190	REST	13-Apr	1605	NP	14.69	0.00	29.60	13-Apr	1630	7.04	21.2	3,490	1.2	-250.3	7.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-50	Monitoring	RJM/BTA	121			191	REST	13-Apr	935	NP	15.42	0.00	28.22	13-Apr	1000	6.90	22.7	4,380	1.1	-73.2	6.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-97	Monitoring	RJM/BTA		52		192	REST	13-Apr	1705	NM	NM	NM	Construction in area; entire area covered with soil and gravel; not located, in conjunction with Navajo; Historical LNAPL													Y	SA	SA	SA	x				
MW-92	Monitoring	RJM/BTA		53		193	REST	13-Apr	910	15.73	19.78	4.05	22.60			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
RW-1	Recovery [d]	RJM/BTA		54		194	REST	13-Apr	855	18.33	20.24	1.91	35.39			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-91	Monitoring	RJM/BTA		55		195	REST	13-Apr	835	15.18	16.75	1.57	25.35			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-90	Monitoring	RJM/BTA	122			196	REST	13-Apr	1035	NP	15.39	0.00	22.80	13-Apr	1100	6.97	22.1	3,040	1.0	-364.3	7.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
MW-96	Monitoring	RJM/BTA		56		197	REST	13-Apr	1130	16.12	16.18	0.06	25.57			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Issue	Yes	Y	SA	SA	SA	x				
MW-94	Monitoring	RJM/BTA		57		198	REST	13-Apr	850	18.56	22.22	3.66	23.45			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
RW-8	Recovery [d]	RJM/BTA		58		199	REST	13-Apr	840	18.19	22.31	4.12	37.22			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
MW-67	Monitoring	RJM/BTA		59		200	REST	13-Apr	830	15.86	17.68	1.82	27.30			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	x				
MW-95	Monitoring	RJM/BTA		60		201	REST	13-Apr	1200	18.23	20.38	2.15	25.37			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
RW-7	Recovery [d]	RJM/BTA		61		202	REST	13-Apr	900	19.29	21.53	2.24	37.00			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A	A	x				
NCL-34A	Monitoring	RJM/BTA		62		203	NCL	13-Apr	910	16.42	No water	>2.84	19.26			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Issue	Yes	Y	SA	SA	SA	x				
NCL-33	Monitoring	RJM/BTA	123			204	NCL	13-Apr	1105	NP	15.22	0.00	19.60	13-Apr	1130	6.47	21.0	4,200	1.5	-41.2	5.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
NCL-44	Monitoring	RJM/BTA	124			205	NCL	13-Apr	1025	NP	14.93	0.00	21.34	13-Apr	1050	6.60	21.1	2,550	1.6	-126.4	4.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				
NCL-32	Monitoring	RJM/BTA	125			206	NCL	13-Apr	930	NP	14.54	0.00	20.04	13-Apr	955	6.78	20.4	2,700	1.5	82.1	16.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x				

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H21

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Sampled Wells)	# wells with LNAPL	# dry wells	HMI Use (Field-Strategy)	Location	Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label	PSH Expected?	Gauging Frequency	GW Sampling Frequency / Analysis per COC: Purge Parameters	General Sampling Frequency	(Analysis per COC)					
										Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																									
MW-108	Monitoring	RJM/BTA	126			207	NCL	13-Apr	1435	NP	18.84	0.00	27.74	13-Apr	1500	6.98	22.7	1,875	0.8	-393.3	8.4	Clear, slight odor	Yes	Yes	Yes	Yes		SA	SA	SA	x					
NCL-31	Monitoring	RJM/BTA	127			208	NCL	13-Apr	1200	NP	15.14	0.00	20.16	13-Apr	1225	6.92	20.7	2,220	1.4	-184.8	27.6	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	x					
MW-19	Monitoring	RJM/BTA				209	NCL	13-Apr	1150	NP	15.58	0.00	22.08			Not in sampling program							Yes	Yes	Issue	Yes		SA	Not in sampling program								
MW-55	Monitoring	RJM/BTA	128			210	NCL	13-Apr	1235	NP	17.03	0.00	26.85	13-Apr	1300	6.76	22.2	3,120	1.7	-32.8	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x					
RW-#17A	Recovery	RJM/BTA			5	211	REST	13-Apr	1340	Dry	Dry	Dry	16.01			No sampling (Well dry)							Yes	Yes	Yes	Yes		SA	A	A	x					
MW-18	Monitoring	RJM/BTA	129			212	NCL	13-Apr	1240	NP	16.92	0.00	22.20	13-Apr	1305	6.69	20.8	2,560	1.7	70.5	5.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	x					
MW-54A	Monitoring	RJM/BTA	130			213	NCL	13-Apr	1500	NP	17.65	0.00	31.30	13-Apr	1525	6.76	22.2	2,290	1.8	57.6	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x					
MW-54B	Monitoring	RJM/BTA	131			214	NCL	13-Apr	1545	NP	17.69	0.00	46.80	13-Apr	1615	6.54	21.8	1,870	1.6	3.1	5.9	Clear	Yes	Yes	Yes	Yes		SA	B	B	x					
NCL-49	Monitoring	RJM/BTA	132			215	NCL	13-Apr	1335	NP	20.26	0.00	32.18	13-Apr	1400	6.85	22.1	3,080	2.9	58.4	9.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	x					
MW-53R	Monitoring	RJM/BTA	133			216	NCL	13-Apr	1425	NP	15.18	0.00	24.05	13-Apr	1450	6.83	22.2	2,000	1.8	46.7	20.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA*	x	future sampling frequency TBD				
KWB-P3	Monitoring					Field E of Refinery				Not in gauging program						Not in sampling program												Not included in monitoring program due to distance from impact								

Notes:

Abbreviations:

A = Annual (Mar/Apr event)
B = Biennial (starts Mar/Apr 2011)
BR = Bolton Road
DRO = Diesel Range Organics
E = East
EP = Evaporation Ponds
ft bgs = ft below ground surface
ft btoc = ft below top of casing
ft MSL = ft Mean Sea Level
GRO = Gasoline Range Organics
HR = Haldeman Road
in = inches
N = North
NA = Not accessible
NAPI = North API Separator
NCL = North Colony Landfarm
NE = Northeast
NW = Northwest
OCD = Oil Conservation District
PSH = Phase Separated Hydrocarbon
ROW = right of way
RR = Richey Road
S = South
SA = Semi-annual (Mar/Apr and Sep/Oct events)
SE = Southeast
SW = Southwest
TMD = Three Mile Ditch
TEL = Tetra Ethyl Lead Impoundment
UG = Upgradient
US285 = U.S. Highway 285
US82 = U.S. Highway 82
VOC = Volatile Organic Compounds
W = West
Y = Yes

= Well with recently gauged LNAPL (light nonaqueous phase liquid)

Note - groundwater samples are not collected from any well with LNAPL measured 0.03-ft thick, or greater

At wells scheduled for groundwater sampling (having LNAPL <0.03-ft, LNAPL will be removed, and well will be sampled

Groundwater analytical methods can include:

1. Purge parameters to be measured and recorded in the field will include pH, temp, spec. cond., diss. oxy., and oxidation-reduction potential.
2. DRO by Method 8015Mod.
3. GRO by Method 8015Mod.
4. VOCs by Method 8260, to include methyl tert butyl ether (MTBE).
5. Total metals by Method 6010/6020 and/or 7470. Specific metals shown in heading, abbreviations from periodic chart (incl B, Cd, Co, U, per 3-7-16 State request).
6. Dissolved metals - same list as total metals but only analyzed during April event (field filtered by HMI)
7. Cyanide by Method SM4500.
8. Cations/anions to include Calcium, Potassium, and Sodium by Method 6010 or 6020 and Sulfate, Chloride and Fluoride by Method 300.
9. Nitrates/Nitrites as Nitrogen by Method 300.
10. Total Dissolved Solids by Method 2540C.

"-" indicates parameter not required.

Recovery trenches 11, 15, 16, 17 and 18 have multiple vertical "wells". Gauging & sampling points are: RW #11-0, RW #15C, RW #16B, RW #17A and RW #18A.

HMI Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

M E M O R A N D U M

Groundwater Monitoring Standard Operating Procedures
Navajo Refining LLC – Artesia, New Mexico

HMI conducts low-flow groundwater sampling in accordance with the site Sampling and Analysis Plan and EPA guidance (including Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling; REV No. 4, September 19, 2017, and Yeskis & Zavala, 2002, EPA/542:S-02/00, Groundwater Sampling Guidelines for Superfund and RCRA Project Managers).

Groundwater Sampling Methodology

HMI conducts low-flow groundwater sampling using a peristaltic pump and dedicated polyethylene tubing at wells with requisite depths-to-water. At a limited number of wells with depths-to-water greater than peristaltic range, low-flow groundwater sampling is conducted using dedicated or non-dedicated bladder pumps. In 2016, at no cost to TRC, HMI installed HMI-owned bladder pumps in a limited number of wells (approximately four). At such time that HMI no longer conducts routine groundwater monitoring at the site, it respectfully requests the opportunity to recover these dedicated bladder pumps. Sample intakes are set at midscreen, when possible (generally at least two feet from the base of the well). Sample intake depths are permanently marked, ensuring future sampling events consistently monitor the targeted water-bearing interval. During sampling with a peristaltic pump, the sample tube is attached to the pump using a one-foot section of dedicated, flexible silicone tubing (item #5703, Geotech Environmental Equipment, Inc.). A two-foot segment of polyethylene tubing connects the silicone tubing in the pump to the flow-through cell, using a disposable segment of silicone tubing. Purging commences through a sealed flow-through cell at EPA-recommended purge rates (generally 0.1 to 0.2 liters/minute), while well drawdown is monitored. Groundwater field parameter readings are measured at 0.5-liter intervals (generally an equivalent of one cell-volume "turnover"). Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential are monitored inside the cell. Turbidity is monitored outside the cell. Groundwater field instrumentation is calibrated and recorded daily in accordance with manufacturer specifications.

Purging continues until a requisite volume of groundwater is purged (generally a minimum of 3,000 ml or six flow-through cell volumes), and field parameters have stabilized in accordance with EPA guidance:

Water Quality Parameters (Stabilization Parameters in Accordance with EPA (2002), Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, Yeskis & Zavala, EPA/542:S-02/001)

- pH +/- 0.1 units;
- Temperature -
- Conductivity +/- 3%
- Dissolved Oxygen +/- 0.3 mg/L
- ORP +/- 10%
- Turbidity 10%

Immediately prior to sampling, the input tubing to the flow-through cell is disconnected from the disposable silicone receiving tubing on the input barb on the flow-through cell, and groundwater samples are collected directly into lab-supplied containers. Groundwater samples are placed in iced coolers, and remain in HMI's custody until shipped to ESC Lab Sciences via FedEx-overnight. Peristaltic tubes and/or dedicated bladder pumps may be dedicated in respective wells. Alternatively, dedicated tubing may be retrieved, bagged, labeled, and stored in tubs maintained at HMI. Wells with very limited water column thicknesses may be sampled with disposable bailers. Active recovery well and irrigation wells are sampled using sample ports. The purging and sampling process is documented on groundwater sampling field forms.

Cross-Contamination Prevention Program

Dedicated peristaltic tubing and dedicated bladder pumps are used as possible, to minimize any potential cross-contamination issues during the groundwater monitoring process. Remaining non-dedicated equipment (e.g., electronic gauging probes or non-dedicated bladder pumps, etc.) is properly decontaminated prior to use and between wells. The decontamination procedure may include a combination of chemical and mechanical decontamination. For example, scrubbing with ethyl alcohol (isopropanol) as warranted, followed by scrubbing using an Alconox-water solution, and distilled water rinse. The decontamination procedure for non-dedicated bladder pumps consists of cycling an Alconox-water solution through the pump bladder. Distilled water is cycled through the pump bladder, followed by decontaminating the exterior body of the pump, using the methods outlined above.

HMI Deliverables

HMI provides field documentation of groundwater monitoring activities in a deliverables package that includes a brief narrative, summary table (with gauging data, field parameters, well inspection data, and required analytical scope), groundwater sampling forms, field instrument calibration log, and chain-of-custody forms (by Refinery "Area"), and a groundwater sampling SOP memo.

HMI Groundwater

HYDROLOGIC MONITORING
JOB HAZARD ANALYSIS

4/12/21 4/13/21 4/14/21

Activity: Groundwater Sampling	**Date:**
Arkoma GW	**Project:**
Description of the work: Collect fluid level information and water samples from monitoring wells. NOTE: All site workers have STOP WORK Authorization at any time site conditions change and/or become unsafe	Scott Ude Scott Ude Scott Ude **Site Supervisor:** TABARY **Attendees Signatures:** TABARY Richie Bump B. Bump Richie DO2 B. Bump DO2

Work Activity Sequence	Potential Health and Safety Hazards	Hazard Controls
• General Hazards	• Accidents due to lack of training	• All workers will complete Safety Council Basic Plus Training and all site-specific training. • All workers will complete OSHA 40-hr HAZWOPER training with yearly updates. • Workers will be trained prior to performing new activities. • Tailgate safety meetings will be held daily.
	• Head Injury	• ANSI-approved hard hats will be worn at all times, in the manner they were designed (brim forward, no modifications no ball caps, etc.) Bump hats and Cowboy hard hats are not permitted.
	• Hearing Damage	• Workers will wear hearing protection whenever voices must be raised above normal conversational speech or when noise levels exceed 85 decibels due to loud noise sources such as working near heavy equipment.
	• Hand Injury	• Leather gloves will be worn when handling

Work Activity Sequence	Potential Health and Safety Hazards	Hazard Controls
		sharp, rough, or slippery surfaces. • Appropriate gloves for chemicals will be worn per project HASP.
	• Injuries resulting from manual lifting	• Workers will be instructed in safe lifting techniques (keep back straight, bend at knees, keep load close to body, lift smoothly, and do not twist at the waist. • Split heavy loads into smaller loads when possible. • Stretch before doing task • Make sure the path of travel is clear prior to the lift.
	• Foot Injury	• Workers will wear sturdy leather safety-toed boots that reach the ankle at all times. • For wet conditions or for chemical hazards proper water resistant overboots or chemical resistant safety-toed boots must be worn.
	• Eye Injury	• Workers will wear protective eyewear with sideshields that meet ANSI Z-87 at all times. If the worker wears prescription eyeglasses they must meet the same criteria or wear ANSI Z-87 safety over glasses. • Workers must have immediate access to Chemical monogoggles. Retaining rings are not permitted.
	• Slips, trips, and falls	• Walking/working surfaces will be kept free of clutter, debris, and congestion to the greatest extent possible. • Personnel should be aware of wet/muddy surfaces and use caution. Use caution when traversing uneven ground.
	• Injuries associated with insects, snakes, spiders, alligators, and poisonous plants	• Workers will wear snake chaps, leggings or sturdy rubber knee high boots when walking in uncleared, grassy areas. • Workers will avoid walking in areas where snakes or alligators may hide. Always look ahead where you are walking for signs of either. Use caution when moving or lifting objects that could be used for cover. Never reach under or behind objects, or into other areas where snakes or alligators may hide. • Workers will use insect repellant for all types of biting / stinging insects. Use care when opening wells to avoid bites and / or stings. • Workers will always use the buddy system and have a means of contacting emergency

Work Activity Sequence	Potential Health and Safety Hazards	Hazard Controls
		aid if needed by cell phone or Radio. • Workers will immediately wash any areas that were exposed to poisonous plants.
	• Chemical Exposure	• MSDS will be kept onsite in a location that all workers can access. • All workers must know where the emergency rally point is located when an evacuation alarm sounds in the plant. • Workers will sign in and out when they arrive and leave the work area.
	• Heat Stress	• All workers will take routine breaks in a cool, shaded area. • Workers will drink plenty of water throughout the day. • Workers will decrease intake of coffee and caffeinated soft drinks during working hours.
	• Vehicle accidents	• All vehicles must be inspected for safe operation onsite. • Vehicle operators must have a valid driver's license and will be instructed in safe operations while on the site. • Seat belts will be worn by all occupants. • When backing, use the buddy system or get out and look at position of objects. • All vehicles must contain a fire extinguisher, first aid kit, evacuation map, and route to hospital (map/directions). • Drivers will observe and not exceed posted plant speed limits. • Cell phone use is prohibited in a moving vehicle (drivers only) - hands free device not permitted. • Use caution at railroad crossings. • Watch for pedestrians walking into driving lanes.
	• Injury due to inclement weather	• Outdoor work will cease during extreme weather conditions, such as electrical storms, high wind, rain, and dangerous temperatures. • All equipment will be shut down when lightning is visible. • Workers will seek shelter indoors when possible or stay in vehicles.
• Groundwater Sampling	• Collect Measurements and Samples	• All site workers will wear proper PPE to prevent exposure to groundwater.

Work Activity Sequence	Potential Health and Safety Hazards	Hazard Controls
	• Using peristaltic pumps	• All workers using peristaltic pumps should inspect the power cord for damage before and after each use.
	• Fire extinguishers	• Fire extinguishers should be on hand and inspected.
	• Lifting	• All workers should use proper lifting techniques when lifting objects. Mechanical assistance may be used to lift objects weighing over 50 pounds.
	• Drive All Terrain Vehicles	• All workers that will drive All-Terrain Vehicles (ATVs) will follow site specific policies regarding use and operation of ATVs. • In addition, conditions of ATV use will be addressed on Safe Work Permit(s). • All workers will be trained in operating the ATV. • The maximum speed limit is 5 miles per hour. • Read owners manual prior to operating • ATVs are not made for multiple riders. Never carry anyone else on the ATV. • Stay seated at all times while ATV is in motion. • Do not operate the ATV on streets, highways or paved roads. • Driver must have a valid driver's license. • Driver exercise caution when loading and unloading ATV.

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Hydrologic Monitoring, LLC (HMI) Job Hazard Analysis (JHA) Job Safety Analysis (JSA) and Personal Protective Equipment (PPE) Assessment	**Task Title:** Mitigating *Exposure to Coronavirus "COVID-19"*		**Date:** HMI Groundwater **New: 4-7-20; Revised:_____**
	Title: HMI employees, contractors, and visitors	**Supervisor (Print and Sign):**	**Prepared by:** HMI Contractor Safety and Crisis Support
Client Name / Site Location:	**Locations:** HMI-wide	**Business Unit:** All	**Reviewed By:** HMI Committee **Approved By:** HMI Committee

Required or Recommended Personal Protective Equipment: 4/12/21 4/13/21 4/14/21

☐ Hard Hat ☒ Safety Glasses ☐ HiVis Vest ☐ Safety Toe Boots ☒ Gloves: Disposable, Work, etc based on task ☐ Hearing Protection ☒ Other: See below

Site wide Site wide Site wide

For certain tasks (see JHA below) the following are required:

- Potable water and soap (preferable) or hand sanitizer with 60%> alcohol
- Paper towels
- Disinfectant wipes
- Tissues
- Nitrile gloves
- Safety glasses or goggles
- Disinfectant spray list of cleaning products to kill Coronavirus

Diluted household bleach solutions can be used in place of disinfectant wipes or sprays if appropriate for the surface. Be sure to test the surface for color-fastness prior to use. Follow manufacturer's instructions for application and proper ventilation. Check that the product is not past its expiration date. Never mix household bleach with ammonia or other cleanser. Unexpired household bleach is effective against coronaviruses when properly diluted.

- Prepare a bleach solution by mixing:
  - 5 tablespoons (1/3rd cup) bleach per gallon of water or 4 teaspoons bleach per quart of water

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This JHA applies to the 2019 Novel Coronavirus (SARS-CoV-2) or the disease known as "COVID-19". The Centers for Disease Control and Prevention (CDC), World Health Organization, (WHO), Occupational Safety and Health Administration (OSHA), and other public health agencies are considering the outbreak of COVID-19 to be a pandemic. It is important that employees, contractors, and visitors take standard precautions recommended by CDC and OSHA. For OSHA's guidance related to Hazard Recognition regarding COVID-19 visit https://www.osha.gov/SLTC/covid-19/hazardrecognition.html.

Risk Assessment: Incomplete information about incubation, infectious period, and transmissibility, as well as evolving circumstances make a definitive risk assessment challenging. In light of this, awareness and operationally informed precautions are warranted. Risk increases with increased exposure to persons potentially infected with COVID-19, warranting enhanced precautions described below. HMI will continue to monitor the situation closely in coordination with appropriate stakeholders and will adjust guidance as appropriate. HMI employees, contractors, and visitors should continue to maintain situational awareness for this outbreak.

Personnel should practice good hygiene, wash hands frequently, and cover their cough or sneeze. Stay away from work if you are ill and contact your health provider for guidance. Avoid unnecessary congregate settings where COVID-19 exposure is more probable. Keep your hands below your chin, and avoid touching mouth, eyes, nose and mucous membranes where contaminated hands can spread the disease to your respiratory system. These basic preventative measures reduce the exposure potential for personnel and slow the spread of communicable diseases.

While most COVID-19 lab confirmed cases do display symptoms, some persons may display mild or no symptoms. Symptoms may appear at different stages of the disease.

Operations/Contractor Work	Risk Category	Hazards	Protective Measures / PPE Guidance
1. Fitness for Duty (working from home or before reporting to work)	**Low**	**1. Being unfit for duty – impacted by illness (e.g coronavirus)**	**1a**. Check that you are fit for duty. If you feel unwell or show signs or symptoms of the coronavirus, do not come to work. Current CDC guidance is that if you have a temperature above 100.4 F [37.8 C], or in close contact with someone suspected of having the coronavirus, then you must stay home. If you have an elevated temperature, do not come to work and contact your healthcare provider. Also, contact your supervisor. By coming to work and onto the project site, employees are self-certifying that they do not have a temperature or show other signs of being unwell and are able to work within the guidelines of the CDC.
2. General Field Work	**Low**	**2a. Working around others** **Signs and Symptoms of** COVID-19 include; • Fever • Cough	**2a**. If experiencing signs or symptoms of COVID-19 infection, such as fever, dry cough, or other flu-like symptoms, do not report to work. If symptoms begin while at work, stop what you are doing immediately and contact your supervisor and an HMI Representative. HMI employees and/or their immediate supervisor are also to contact Human Resources immediately. Personnel and contractors shall maintain at least 6-foot distance from each other. Practice social distancing at tailgate meetings and in break rooms and job trailers.

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		• Extreme Fatigue • Difficulty breathing • Other Flu Like Symptoms	Limit the number of people in job trailers and other confined areas so that this distance can be maintained. If possible, hold meetings outside. If indoors, open window(s) for circulation. Wipe down window handles prior to opening and use gloves to open. Even when practicing social distancing, limit the amount of people in groups to less than 10 people, or fewer if directed by a particular jurisdictional order.
		2b. Encountering frequent touch points and shared equipment	**2b**. Wipe down and disinfect equipment before use with soap and water or alcohol wipes. Wear disposable gloves if possible or regularly wash hands when handling tools or equipment. Replace gloves regularly or wash hands, especially before eating or drinking. Clean hands often with soap and water for at least 20 seconds: • after using the restroom, • after you have been in a public place, • before and after eating, • after blowing your nose, coughing, or sneezing, • after smoking or vaping in designated areas. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands, including around and under fingernails, and rub your hands together until they feel dry. Wear safety glasses and gloves (nitrile or other work gloves) to avoid contact and to reduce touching face, eyes, nose, and mouth. Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw used tissues in the trash. Immediately wash or sanitize your hands.
		2c. Eating lunch and bathroom breaks	**2c**. Be sure to wash hands with soap and water whenever a bathroom is nearby. At minimum, do so during bathroom and lunch breaks. Use a paper towel to door handle when exiting bathroom. If using outside toilet facilities (i.e. Porta Johns), wash hands with soap and water or hand sanitizer both before and after opening or closing the door. If wearing nitrile gloves, change gloves prior to using the toilet and remove and dispose of them in a trash receptacle when finished. Use hand sanitizer after you dispose of the gloves. Where possible, personnel are encouraged to pack meals and snacks as needed for the duration of the work day and avoid visiting stores and restaurants. If necessary, modify your schedule to avoid restaurants and public restrooms during peak (i.e., crowded), periods to minimize contact with the public. Use drive-through service for

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			food pick-up if available. When eating lunch as a group, try to do so outside or in a space with windows open. Wipe down windows prior to opening. Maintain a distance of at least 6 feet and do not share dishes (e.g., bag of chips, communal salad bowl, etc.). Refrain from sharing a field office coffee pot.
3. General Office Work	**Low**	**3a. Working around others**	**3a**. Work from home when possible. Clean hands often with soap and water for at least 20 seconds: • after using the restroom, • after you have been in a public place, • before and after eating, or • after blowing your nose, coughing, or sneezing. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands, including around and under fingernails, and rub your hands together until your hands feel dry. Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw used tissues in the trash. Immediately wash or sanitize your hands. Sit at least six feet apart from others. Change work stations to accommodate this. Even if you are practicing social distancing, you must still limit groups of people to 10 or fewer. Do not hold in-person meetings. After tailgate meetings and/or JHA reviews, supervisors should seek verbal agreement from each attendee and note each acknowledgement rather than passing around for signature. Make hand-sanitizers, sanitizing wipes, and other hygienic supplies readily available. Do not eat or hang out in common areas.
		3b. Encountering frequent "touch points" and handling shared equipment	**3b**. Wipe down keyboards, mouse, phone, headset/headphones, and other "touch points". Limit contact of shared items. Wipe down surfaces before coming into contact with them. Wash hands after handling or wear disposable gloves. In reception areas, use your own pen to sign in and out of offices. Do not eat candy out of candy dishes.

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			Assign someone to clean and disinfect frequently touched surfaces daily. Follow the manufacturer's instructions for cleaning and disinfection products (e.g., concentration, application method, and contact time).
4. Essential Work (deemed by Operations, Project Manager, EHS) where a continued 6 foot distance between persons in not possible.	**Low-Medium**	**4a.**Examples such as Operation and Maintenance tasks, groundwater and potable water monitoring, ballast water sampling, post-closure care services, etc.	4a. Mitigation tactics such as cloth face covers, face shields, gloves, facing away from another person, etc. must be implemented.

Additional Information

Prior to starting work, check that required supplies (i.e., disinfectant spray and wipes, soap, hand sanitizer, nitrile gloves) are available. Request re-supply if stock runs low.

Use alcohol-based hand sanitizer that contains at least 60% alcohol. Wash hands with soap and water whenever available. Remember that soap, including bar soap, is generally available and is considered superior to hand sanitizer or disinfectant wipes and sprays. If disinfectants are unavailable, prepare diluted bleach solution as described on page 1 and use in their place.

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Common touch points and surfaces include but are not limited to:

*Arms on chairs *Table tops *Doorknobs and handles *Countertops *Elevator Buttons *Coffee Pots
*Refrigerator, microwave, dishwasher, toaster handles *Water Dispensers *Cabinet and file drawer knobs and handles
*Phone receivers, keypads *Copier, printer, and fax control buttons *Sink faucets *Light switches
*Shared office supplies such as staplers, paper cutters, scissors, packaging tape dispensers, writing utensils *Vehicle handles, tailgates, etc.

If personnel are showing possible symptoms of or have been in recent direct contact with others showing symptoms of coronavirus, stop work and notify the site supervisor and HR.

Visit the CDC webpage on cleaning and disinfecting procedures: CDC Guidance for Community and Residential Cleaning-Disinfection for Coronavirus

A list of approved disinfectants for use against COVID-19, is available here: US EPA List of Disinfectants Effective Against Coronaviruses.

Special Considerations:

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6A
Event: 1121
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(1)

Initials: [illegible]

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	845	NP	13.58	0.00	19.04	14.1	Y	Y	Y	Y		Weather: Cloudy 40°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	850	13.59	0.5	7.44	18.0	5060	2.5	-192.4	12.7	Clear	*Low-flow groundwater sample:*
	852	13.59	1.0	7.40	18.2	5020	2.1	-184.5	10.4		(A) peristaltic pump w/ ded tubing
	855	13.59	1.5	7.37	18.2	5010	1.7	-182.3	9.1		B) ded bladder pump
	857	13.59	2.0	7.35	18.3	5020	1.4	-178.6	8.7		C) non-ded bladder pump; or
	900	13.59	2.5	7.31	18.3	5010	1.2	-174.3	8.1		*Standard groundwater sample:*
	902	13.59	3.0	7.29	18.4	5000	1.1	-172.7	7.7		D) bailer due to limited column; or
	905	13.59	3.5	7.27	18.4	5000	1.1	-170.5	6.8		E) recovery well cycling sample
	907	13.59	4.0	7.25	18.4	4990	1.0	-169.4	5.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4-13-21	910	MW-6A	13.59	7.25	18.4	4990	1.0	-169.4	5.7	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6B
Event: (N2)
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(2)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	930	NP	13.50	0.00	52.28	47.3	Yes	Yes	Yes	Yes		Weather: Cloudy 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	935	13.53	0.5	7.52	19.4	5850	3.0	-81.9	5.9	Clear	*Low-flow groundwater sample:*
	937	13.53	1.0	7.39	19.4	5840	2.3	-90.6	5.3		(A) peristaltic pump w/ ded tubing
	940	13.53	1.5	7.21	19.5	5830	1.9	-97.1	5.0		B) ded bladder pump
	942	13.53	2.0	7.06	19.5	5830	1.5	-103.9	4.6		C) non-ded bladder pump; or
	945	13.53	2.5	7.00	19.5	5830	1.2	-107.6	4.0		*Standard groundwater sample:*
	947	13.53	3.0	6.90	19.5	5830	1.1	-113.8	3.6		D) bailer due to limited column; or
	950	13.53	3.5	6.87	19.5	5840	1.0	-116.4	3.3		E) recovery well cycling sample
	952	13.53	4.0	6.84	19.5	5840	1.0	-120.1	2.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	955	MW-6B	13.53	6.84	19.5	5840	1.0	-120.1	2.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-85
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS
Vault __	Other __	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB (3)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1735	10.81	11.36	0.55	20.34	NS (2' off bottom, if sampled)	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5		Not Sampled due to presence of LNAPL						*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-85			Not Sampled					Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-86
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AMDB (4)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/3/21	1325	10.83	10.86	0.03	19.21	17.21	Yes	Yes	Yes	Yes		Weather: Clear 70s

Well Purging Record

* Pulled sock and allowed well to equilibrate

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		Not Sampled due to presence of LNAPL						(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-86			Not Sampled					Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-120
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MPB (5)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1720	NP	13.48	0.00	28.00	17.5	Yes	Yes	Yes	Yes		Weather: Cloudy 60s
4-14-21	1150	NP	13.49	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1155	13.76	0.5	7.63	19.0	9330	2.5	-90.9	8.1	Clear	*Low-flow groundwater sample:*
↓	1157	13.76	1.0	7.58	18.8	9270	2.0	-98.3	7.2	↓	(A) peristaltic pump w/ ded tubing
	1200	13.76	1.5	7.50	18.8	9210	1.8	-103.4	6.7		B) ded bladder pump
	1202	13.76	2.0	7.45	18.7	9160	1.6	-109.7	5.9		C) non-ded bladder pump; or
	1205	13.76	2.5	7.43	18.6	9140	1.4	-112.2	5.6		*Standard groundwater sample:*
	1207	13.76	3.0	7.41	18.7	9110	1.3	-114.6	4.9		D) bailer due to limited column; or
	1210	13.76	3.5	7.38	18.8	9100	1.3	-119.3	4.6		E) recovery well cycling sample
↓	1212	13.76	4.0	7.36	18.8	9080	1.3	-120.5	4.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1215	MW-120	13.76	7.36	18.8	9085	1.3	-120.5	4.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-12
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

(6)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1715	NP	13.58	0.00	27.31	17.5	Yes	Yes	Yes	Yes		Weather: Cloudy 60's
4-19-21	1225	NP	13.58	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-19-21	1230	13.76	0.5	7.81	18.6	7210	3.4	6.2	11.4	Clear Moderate sediment	Low-flow groundwater sample:
	1232	13.77	1.0	7.73	18.4	7190	2.6	6.0	10.1		(A) peristaltic pump w/ ded tubing
	1235	13.81	1.5	7.66	18.3	7140	2.3	5.3	9.2		B) ded bladder pump
	1237	13.82	2.0	7.60	18.2	7100	1.9	4.9	8.4		C) non-ded bladder pump; or
	1240	13.83	2.5	7.54	18.2	7080	1.7	4.5	7.3		Standard groundwater sample:
	1242	13.84	3.0	7.53	18.2	7060	1.7	4.1	6.9		D) bailer due to limited column; or
	1245	13.85	3.5	7.51	18.2	7050	1.7	3.3	6.2		E) recovery well cycling sample
	1247	13.86	4.0	7.49	18.2	7040	1.8	2.6	5.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-19-21	1250	MW-12	13.86	7.49	18.2	7040	1.8	2.6	5.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-84
Event: (H2)
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2 in	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(7)

Initials: MBS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1710	NP	11.03	0.00	20.56	15.2	Yes	Yes	Yes	Yes		Weather: Cloudy 50's
4-14-21	1105	NP	11.05	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1110	11.15	0.5	7.22	19.4	11040	3.0	15.4	21.0	Clear/yellow tint	*Low-flow groundwater sample:*
	1112	11.18	1.0	7.19	19.4	11100	2.3	13.8	15.9		(A) peristaltic pump w/ ded tubing
	1115	11.21	1.5	7.14	19.4	11130	1.6	12.0	12.3		B) ded bladder pump
	1117	11.23	2.0	7.11	19.3	11150	1.4	10.0	10.4		C) non-ded bladder pump; or
	1120	11.25	2.5	7.09	19.3	11160	1.3	5.8	9.7		*Standard groundwater sample:*
	1122	11.27	3.0	7.08	19.2	11160	1.3	3.4	9.3		D) bailer due to limited column; or
	1125	11.30	3.5	7.07	19.2	11170	1.3	-0.2	8.8		E) recovery well cycling sample
	1127	11.32	4.0	7.06	19.2	11170	1.2	-1.3	8.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1130	MW-84	11.32	7.06	19.2	11170	1.2	-1.3	8.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-122
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

(8)

Initials: NAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1605	ND	11.48	0.00	23.32	18.4	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1610	12.08	0.5	7.78	20.5	6800	3.5	21.4	38.7	Clear	*Low-flow groundwater sample:*
	1612	12.16	1.0	7.64	20.4	6560	3.0	21.1	33.5	1	(A) peristaltic pump w/ ded tubing
	1615	12.21	1.5	7.59	20.0	6350	2.7	21.0	31.6	|	B) ded bladder pump
	1617	12.28	2.0	7.51	19.4	6140	2.3	19.9	29.9	|	C) non-ded bladder pump; or
	1620	12.32	2.5	7.47	19.3	6110	2.2	19.6	28.4	|	*Standard groundwater sample:*
	1622	12.36	3.0	7.43	19.2	6090	2.2	19.3	27.3	|	D) bailer due to limited column; or
	1625	12.39	3.5	7.40	19.1	6080	2.1	18.8	26.8	|	E) recovery well cycling sample
	1627	12.47	4.0	7.43	19.1	6070	2.1	18.7	26.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1630	MW-122	12.47	7.43	19.1	6070	2.1	18.7	26.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02' remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-81
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: WDB (9)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1650	NP	11.83	0.00	18.62	13.7	Yes	Yes	Yes	Yes		Weather: Cloudy 50's
4-14-21	935	NP	11.85	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	940	11.93	0.5	6.83	17.3	6960	4.2	42.5	8.1	Clear	*Low-flow groundwater sample:*
	942	12.02	1.0	6.90	17.2	6990	3.9	42.1	7.2		(A) peristaltic pump w/ ded tubing
	945	12.06	1.5	6.94	17.2	7010	3.4	41.9	6.8		B) ded bladder pump
	947	12.09	2.0	6.97	17.2	7030	3.0	42.0	5.6		C) non-ded bladder pump; or
	950	12.13	2.5	6.98	17.1	7040	2.7	42.2	4.9		*Standard groundwater sample:*
	952	12.14	3.0	6.99	17.1	7040	2.5	42.4	4.3		D) bailer due to limited column; or
	955	12.18	3.5	7.01	17.2	7050	2.4	42.7	3.7		E) recovery well cycling sample
	957	12.22	4.0	7.02	17.2	7040	2.4	43.0	3.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1000	MW-81	12.22	7.02	17.2	7040	2.4	43.0	3.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-80
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(10)

Initials: MDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1655	NP	9.83	0.00	19.69	14.7	Yes	Yes	Yes	Yes		Weather: Cloudy 50's
4-14-21	850	NP	9.86	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	855	9.96	0.5	6.47	16.9	7200	3.3	29.4	15.1	Clear	*Low-flow groundwater sample:*
	857	10.00	1.0	6.49	16.8	7050	2.9	29.6	13.9		(A) peristaltic pump w/ ded tubing
	900	10.01	1.5	6.51	16.8	6890	2.3	29.9	12.7		B) ded bladder pump
	902	10.01	2.0	6.53	16.8	6740	1.8	30.5	11.4		C) non-ded bladder pump; or
	905	10.01	2.5	6.55	16.8	6710	1.5	30.9	10.1		*Standard groundwater sample:*
	907	10.01	3.0	6.56	16.8	6690	1.4	31.2	9.8		D) bailer due to limited column; or
	910	10.01	3.5	6.58	16.8	6670	1.3	31.7	9.2		E) recovery well cycling sample
	912	10.01	4.0	6.59	16.8	6650	1.3	32.1	8.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	915	MW-80	10.01	6.59	16.8	6650	1.3	32.1	8.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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+ EB-EP-04

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-79
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

(11)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1700	NP	11.00	0.00	19.24	15.0	Yes	Yes	Yes	Yes		Weather: Cloudy 50s
4-14-21	800	NP	11.02	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	805	11.20	0.5	7.60	15.8	9330	3.0	-6.5	10.2	Clear	*Low-flow groundwater sample:*
	807	11.23	1.0	7.54	15.9	9300	2.5	-4.5	8.4		(A) peristaltic pump w/ ded tubing
	810	11.26	1.5	7.49	16.0	9280	2.4	-1.2	7.9		B) ded bladder pump
	812	11.29	2.0	7.45	16.1	9270	2.3	1.8	7.1		C) non-ded bladder pump: or
	815	11.31	2.5	7.38	16.1	9240	2.1	3.2	6.8		*Standard groundwater sample:*
	817	11.33	3.0	7.34	16.2	9230	2.0	4.3	5.2		D) bailer due to limited column; or
	820	11.35	3.5	7.31	16.2	9220	1.9	5.5	4.7		E) recovery well cycling sample
	822	11.37	4.0	7.29	16.2	9210	1.9	6.2	3.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	825	MW-79	11.37	7.29	16.2	9210	1.9	6.2	3.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	810	EB-EP-04	NA	→	→	→	→	→	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-82
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(12)

Initials: MDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1705	NP	10.59	0.00	20.02	15.0	Yes	Yes	Yes	Yes		Weather: Cloudy 60's
4-14-21	1020	NP	10.60	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1025	11.12	0.5	7.06	20.3	8070	2.1	24.1	13.1	Clear	*Low-flow groundwater sample:*
	1027	11.13	1.0	7.04	20.3	8100	1.9	22.1	10.6		(A) peristaltic pump w/ ded tubing
	1030	11.13	1.5	7.03	20.2	8130	1.5	21.4	9.7		B) ded bladder pump
	1032	11.13	2.0	7.02	20.2	8150	1.4	21.2	9.1		C) non-ded bladder pump; or
	1035	11.13	2.5	7.01	20.2	8160	1.3	21.2	8.4		*Standard groundwater sample:*
	1037	11.13	3.0	7.01	20.2	8160	1.3	21.2	8.0		D) bailer due to limited column; or
	1040	11.13	3.5	7.00	20.2	8160	1.3	20.7	7.6		E) recovery well cycling sample
↓	1042	11.13	4.0	6.99	20.2	8160	1.3	20.4	7.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, ML Juliet, TN
4-14-21	1045	MW-82	11.13	6.99	20.2	8160	1.3	20.4	7.1	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ EB-EP-01
+ Trip Blank - EP-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-74
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(13)

Initials: MWR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1015	NP	10.10	0.00	20.19	14.8	Yes	Yes	Yes	Yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1020	10.21	0.5	6.77	18.2	10900	1.9	-32.3	32.3	Clear	*Low-flow groundwater sample:*
↓	1022	10.21	1.0	6.80	18.5	11180	1.5	-34.2	28.1	↓	(A) peristaltic pump w/ ded tubing
	1025	10.25	1.5	6.83	18.3	11270	1.3	-35.6	24.5		B) ded bladder pump
	1028	10.25	2.0	6.85	18.1	11350	1.1	-37.1	21.6		C) non-ded bladder pump; or
	1030	10.25	2.5	6.87	17.9	11400	1.0	-39.5	18.9		*Standard groundwater sample:*
	1032	10.26	3.0	6.81	17.8	11440	0.9	-40.6	17.0		D) bailer due to limited column; or
	1035	10.26	3.5	6.90	17.7	11460	0.8	-43.8	16.7		E) recovery well cycling sample
↓	1037	10.26	4.0	6.90	17.7	11470	0.8	-45.4	15.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1040	MW-74	10.26	6.90	17.7	11470	0.8	-45.4	15.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓												
✓	1055	EB-EP-01	NA	—	—	—	—	—	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-73
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(14)

Initials: MDM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1105	NP	10.18 (10.13)	0.00	19.60	14.6	Yes	Yes	Yes	Yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1110	10.18	0.5	7.58	18.5	13460	2.6	-34.3	29.8	Clear	*Low-flow groundwater sample:*
	1112	10.17	1.0	7.58	18.0	13500	2.1	-34.1	23.4	"	(A) peristaltic pump w/ ded tubing
	1115	10.18	1.5	7.57	17.5	13530	1.8	-33.9	21.9	"	B) ded bladder pump
	1117	10.18	2.0	7.56	17.4	13530	1.7	-33.7	16.7	"	C) non-ded bladder pump; or
	1120	10.18	2.5	7.55	17.2	13540	1.6	-33.8	14.4	"	*Standard groundwater sample:*
	1122	10.18	3.0	7.55	17.0	13550	1.5	-33.4	13.8	"	D) bailer due to limited column; or
	1125	10.18	3.5	7.52	17.0	13540	1.4	-36.1	12.7	"	E) recovery well cycling sample
	1127	10.18	4.0	7.51	16.9	13540	1.4	-39.7	12.1	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1130	MW-73	10.18	7.51	16.9	13540	1.4	-39.7	12.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2A
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(15)

Initials: M.DB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1505	NP	11.16	0.00	17.30	15.0	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Flow-Cell

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1510	11.29	0.5	8.01	19.8	11510	2.1	7.3	11.1	Clear	*Low-flow groundwater sample:*
	1512	11.35	1.0	8.00	18.9	11380	1.7	-2.9	10.6		(A) peristaltic pump w/ ded tubing
	1515	11.41	1.5	7.91	18.5	11300	1.4	-10.2	9.8		B) ded bladder pump
	1517	11.45	2.0	7.81	18.5	11370	1.4	-14.2	9.3		C) non-ded bladder pump; or
	1520	11.47	2.5	7.74	18.5	11890	1.5	-16.0	8.2		*Standard groundwater sample:*
	1522	11.50	3.0	7.69	18.5	12010	1.5	-17.3	6.9		D) bailer due to limited column; or
	1525	11.52	3.5	7.67	18.4	12100	1.5	-18.3	6.1		E) recovery well cycling sample
	1527	11.54	4.0	7.65	18.4	12180	1.5	-18.9	5.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1530	MW-2A	11.54	7.65	18.4	12180	1.5	-18.9	5.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2B
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDS (16)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1545	NP	11.96	0.00	52.00	NS	Yes	Yes	Yes	Yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								Standard groundwater sample:
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-2B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-72
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade ___	2-in ___	PVC ✓
Upright ✓	4-in ✓	SS ___
Vault	Other ___	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

(17)

Initials: WDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1420	NP	8.12	0.00	13.93	11.9	Yes	Yes	Yes	Yes		Weather: Clear 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1425	8.36	0.5	7.90	20.2	12950	2.0	5.9	12.1	Clear	*Low-flow groundwater sample:*
	1427	8.37	1.0	7.92	20.0	12560	1.7	6.3	10.7		(A) peristaltic pump w/ ded tubing
	1430	8.37	1.5	7.89	19.4	12100	1.3	7.0	9.2		B) ded bladder pump
	1432	8.37	2.0	7.87	19.8	11990	1.2	7.3	6.8		C) non-ded bladder pump; or
	1435	8.37	2.5	7.84	18.3	11920	1.1	7.4	5.3		*Standard groundwater sample:*
	1437	8.37	3.0	7.83	18.1	11840	1.0	7.5	4.7		D) bailer due to limited column; or
	1440	8.37	3.5	7.81	18.1	11810	1.0	7.1	3.9		E) recovery well cycling sample
	1442	8.37	4.0	7.80	18.1	11790	0.9	6.9	3.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4-13-21	1445	MW-72	8.37	7.80	18.1	11790	0.9	6.9	3.1	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-6
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(18)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1335	NP	11.47	0.00	26.69	21.6	Yes	Yes	Yes	Yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1340	11.57	0.5	7.57	20.7	16990	2.1	-28.7	26.7	clear, colorless	*Low-flow groundwater sample:*
	1342	11.57	1.0	7.58	19.8	17210	1.7	-27.6	21.9		(A) peristaltic pump w/ ded tubing
	1345	11.57	1.5	7.60	19.2	17480	1.4	-25.8	17.6		B) ded bladder pump
	1347	11.57	2.0	7.57	19.0	17510	1.1	-24.5	13.4		C) non-ded bladder pump; or
	1350	11.57	2.5	7.54	18.9	17550	1.0	-21.9	8.7		*Standard groundwater sample:*
	1352	11.57	3.0	7.53	18.8	17560	1.0	-21.0	7.4		D) bailer due to limited column; or
	1355	11.57	3.5	7.50	18.8	17580	1.0	-19.9	7.1		E) recovery well cycling sample
	1357	11.57	4.0	7.49	18.8	17590	1.0	-19.1	6.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1400	OCD-6	11.57	7.49	18.8	17590	1.0	-19.1	6.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 7AR
Event: 1Q21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(19)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1155	NP	10.44	0.00	21.28	16.0	Yes	Yes	Yes	Yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1200	10.65	0.5	7.84	20.2	14520	2.2	-120.9	46.7	Clear w/ red particles	*Low-flow groundwater sample:*
|	1202	10.67	1.0	7.74	20.1	14500	1.7	-123.1	43.9	|	(A) peristaltic pump w/ ded tubing
|	1205	10.70	1.5	7.62	19.7	14480	1.4	-126.2	40.8	|	B) ded bladder pump
|	1207	10.73	2.0	7.56	19.6	14470	1.3	-129.7	35.7	|	C) non-ded bladder pump; or
|	1210	10.75	2.5	7.50	19.4	14460	1.2	-130.9	33.9	|	*Standard groundwater sample:*
|	1212	10.77	3.0	7.47	19.4	14440	1.1	-131.7	32.4	|	D) bailer due to limited column; or
|	1215	10.79	3.5	7.43	19.4	14430	1.1	-132.6	31.6	|	E) recovery well cycling sample
V	1217	10.81	4.0	7.39	19.5	14430	1.1	-134.2	30.9	V	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1220	OCD-7AR	10.81	7.39	19.5	14430	1.1	-134.2	30.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7B
Event: 1121
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDS (20)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1235	NP	10.26	0.00	56.85	51.9	Yes	Yes	Yes	Yes		Weather: Cloudy 60's
			(10.26)									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1240	11.14	0.5	8.17	20.7	7210	3.1	-92.0	17.7	Clear	*Low-flow groundwater sample:*
↓	1242	11.53	1.0	8.06	20.5	7030	2.3	-99.8	12.3	↓	(A) peristaltic pump w/ ded tubing
	1245	11.90	1.5	7.99	20.3	6760	1.9	-114.0	10.7		B) ded bladder pump
	1247	12.15	2.0	7.89	20.3	6690	1.5	-116.2	9.4		C) non-ded bladder pump; or
	1250	12.62	2.5	7.84	20.2	6610	1.3	-120.5	8.6	Reduced purge	*Standard groundwater sample:*
	1255	12.76	3.0	7.82	20.2	6500	1.2	-123.1	7.4	rate to 0.1 L/m	D) bailer due to limited column; or
	1300	12.88	3.5	7.73	20.1	6420	1.1	-126.9	7.1	↓	E) recovery well cycling sample
↓	1305	12.96	4.0	7.70	20.2	6400	1.1	-127.7	6.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4-13-21	1310	OCD-7B	12.96	7.70	20.2	6400	1.1	-127.7	6.5	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7C
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDS (21)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1325	NP	10.61	0.00	71.95	NS	Yes	Yes	Yes	Yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								Standard groundwater sample:
			3.0								D) baiter due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) Irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		OCD-7C								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Annually. bagged tube + guidance device

Monitoring Well Purging and Sampling Record

(Tool Co. locks gate by 5:00 PM)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#15C
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other ✓	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(22)

Initials: MWH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	815	20.45	20.72	0.27	22.30	20.0	Yes	Yes	Yes	Yes		Weather: Cloudy 40

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			Not sampled due to presence of LNAPL					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-#15C			Not sampled					Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-48
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright	4-in	SS
Vault	Other	Other

Well Destroyed !! 4/13/21

Hydrologic Monitoring for TRC
Houston, Texas

(23)

Initials: MNA

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	0805	NM	4.74	NA	32.00 4.74	26.9	*Rusted	X	Yes	Yes		Weather: Cloudy 40s

Well Purging Record

*Obstruction @ 4.74. well cap and casing missing along with well cover. Casing full of sand

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Unable to gauge well, obstruction @ 4.74						B) ded bladder pump
			2.0		At-grade plate and well cap both missing						C) non-ded bladder pump; or
			2.5		(Well Casing was full of dirt)						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-48								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Navajo unexpectedly removed and disposed HMI's weighted tube prior to 1H21 event)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-130
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-In __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(24)

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Wate: (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	0800	NP	24.32	0.00	45.00	37.5	Yes	Yes	Yes	Yes		Weather: Clear, 70S
4-14-21	1450	NP	24.35	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Colo: / Clarity	
4-14-21	1455	24.41	0.5	7.55	24.4	3650	4.2	60.9	89.4	sl. cloudy, white tint	Low-flow groundwater sample:
	1457	24.43	1.0	7.41	24.3	3540	3.9	63.8	85.0		(A) peristaltic pump w/ ded tubing
	1500	24.43	1.5	7.32	24.0	3450	3.6	65.6	81.7		B) ded bladder pump
	1502	24.43	2.0	7.26	23.9	3400	3.3	66.5	73.9		C) non-ded bladder pump: or
	1505	24.43	2.5	7.19	23.8	3370	3.1	67.1	73.0		Standard groundwater sample:
	1507	24.43	3.0	7.15	23.7	3330	2.9	67.6	70.1		D) bailer due to limited column; or
	1510	24.43	3.5	7.14	23.7	3330	2.8	67.9	68.4		E) recovery well cycling sample
	1512	24.43	4.0	7.12	23.6	3310	2.8	68.1	69.0		F) irrigation well grab sample
	1515	24.43	4.5	7.10	23.6	3300	2.8	68.4	66.6		
↓	1517	24.43	5.0	7.09	23.6	3300	2.8	68.7	65.4	↓ ↓	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4-14-21	1520	MW-130	24.43	7.09	23.6	3300	2.8	68.7	65.4	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-4
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(25)

Initials BMA

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	830	27.84	31.31	3.47	41.75'	31.7	Yes	Yes	Yes	Yes		Weather: Cloudy 40s

Well Purging Record

X. Pulled sock and allowed well to equilibrate prior to sampling

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not sampled due to presence of LNAPL						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) baller due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-4			Not	Sampled				Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Gauge to top of 1-in galvanized pipe)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-19
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC __
Upright __	4-in __	SS __
Vault ✓	Other ✓	Other ✓

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MW (26)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	835	28.75	28.85	0.10	NM	10' off base as needed	Yes	Yes	Yes	Yes		Weather: Cloudy 40's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			Not Sampled due to presence of LNAPL					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-19			NM	Sampled				Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-76
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (27)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1528	NP	11.99	0.00	20.33	16.0	Yes	Yes	Yes	Yes		Weather: Cloudy 60's
4/14/21	1250	NP	12.02	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1255	12.07	0.5	6.90	20.0	6190	3.0	-178.5	9.8	clear/colorless	*Low-flow groundwater sample:*
↓	1257	12.07	1.0	6.88	19.8	6150	2.4	-183.4	7.5	↓	(A) peristaltic pump w/ ded tubing
	1300	12.07	1.5	6.86	19.7	6120	2.1	-189.1	7.0		B) ded bladder pump
	1302	12.07	2.0	6.85	19.7	6100	2.0	-193.5	6.7		C) non-ded bladder pump; or
	1305	12.07	2.5	6.85	19.6	6090	1.9	-196.2	6.1		*Standard groundwater sample:*
	1307	12.07	3.0	6.84	19.6	6080	1.9	-198.1	5.8		D) bailer due to limited column; or
	1310	12.07	3.5	6.84	19.6	6070	1.8	-200.5	5.2		E) recovery well cycling sample
↓	1312	12.07	4.0	6.83	19.5	6070	1.8	-203.5	5.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab. Pace National, Mt. Juliet, TN
4/14/21	1315	MW-76	12.07	6.83	19.5	6070	1.8	-203.5	5.0	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03"; if LNAPL thickness is measured at 0.01" or 0.02", remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-77
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (28)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1523	NP	10.23	0.00	20.52	15.2	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy 60's
4/14/21	1240	NP	10.25	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1345	10.39	0.5	7.04	20.0	7030	2.9	-42.5	9.1	Gold tint / clear	*Low-flow groundwater sample:*
	1347	10.41	1.0	7.01	19.8	7320	2.5	-39.1	8.2	odor	(A) peristaltic pump w/ ded tubing
	1350	10.43	1.5	6.99	19.7	7410	2.4	-37.2	7.9		B) ded bladder pump
	1352	10.44	2.0	6.97	19.7	7450	2.3	-36.1	7.5		C) non-ded bladder pump; or
	1355	10.45	2.5	6.95	19.6	7470	2.2	-35.2	7.1		*Standard groundwater sample:*
	1357	10.45	3.0	6.95	19.6	7480	2.2	-34.2	6.7		D) bailer due to limited column; or
	1400	10.45	3.5	6.94	19.6	7480	2.1	-33.9	6.5		E) recovery well cycling sample
↓	1402	10.45	4.0	6.94	19.7	7490	2.1	-33.1	6.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1405	MW-77	10.45	6.94	19.7	7490	2.1	-33.1	6.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-78
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (29)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1525	NP	10.29	0.00	19.57	14.6	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy 60's
4/14/21	1425	NP	10.30	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1430	10.38	0.5	7.21	19.9	4320	2.6	44.1	9.2	Gold tint / clear	*Low-flow groundwater sample:*
↓	1432	10.45	1.0	7.17	19.8	4270	2.3	49.2	8.7	↓	(A) peristaltic pump w/ ded tubing
	1435	10.50	1.5	7.14	19.8	4230	2.2	51.6	8.1		B) ded bladder pump
	1437	10.54	2.0	7.13	19.7	4210	2.1	53.8	7.5		C) non-ded bladder pump; or
	1440	10.58	2.5	7.12	19.7	4200	2.1	54.1	7.0		*Standard groundwater sample:*
	1442	10.62	3.0	7.12	19.8	4180	2.0	54.5	6.7		D) bailer due to limited column; or
	1445	10.68	3.5	7.11	19.8	4170	2.0	54.9	6.5		E) recovery well cycling sample
↓	1447	10.72	4.0	7.11	19.9	4160	1.9	55.2	6.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4/14/21	1450	MW-78	10.72	7.11	19.9	4160	1.9	55.2	6.0	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-75
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (30)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1520	NP	10.41	0.00	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy 60's
4/14/21	1515	NP	10.42	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1520	10.45	0.5	7.22	20.1	7590	1.9	-139.6	12.5	colorless/clear	*Low-flow groundwater sample:*
	1522	10.46	1.0	7.19	20.3	7530	1.5	-142.8	9.7		(A) peristaltic pump w/ ded tubing
	1525	10.46	1.5	7.15	20.5	7480	1.3	-145.2	9.0		B) ded bladder pump
	1527	10.46	2.0	7.13	20.6	7460	1.2	-147.3	8.7		C) non-ded bladder pump; or
	1530	10.46	2.5	7.12	20.6	7450	1.2	-148.3	7.9		*Standard groundwater sample:*
	1532	10.46	3.0	7.11	20.7	7440	1.1	-149.1	7.3		D) bailer due to limited column; or
	1535	10.46	3.5	7.11	20.7	7440	1.1	-149.4	6.9		E) recovery well cycling sample
	1537	10.46	4.0	7.10	20.7	7430	1.0	-150.2	6.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1540	MW-75	10.46	7.10	20.7	7430	1.0	-150.2	6.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-83
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (31)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1532	NP	10.26	0.00	19.91	15.6	Yes	Yes	Yes	Yes		Weather: Cloudy 50's
4/14/21	1205	NP	10.27	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1210	10.36	0.5	7.11	19.2	5510	2.7	-120.5	10.1	clear/colorless	*Low-flow groundwater sample:*
	1212	10.41	1.0	7.05	19.0	5720	2.3	-122.5	9.5		(A) peristaltic pump w/ ded tubing
	1215	10.42	1.5	7.00	18.9	5760	2.0	-125.6	9.0		B) ded bladder pump
	1217	10.42	2.0	6.98	18.9	5780	1.9	-128.1	8.6		C) non-ded bladder pump; or
	1220	10.42	2.5	6.96	18.8	5790	1.9	-130.9	8.2		*Standard groundwater sample:*
	1222	10.42	3.0	6.95	18.8	5790	1.9	-131.5	7.9		D) bailer due to limited column; or
	1225	10.42	3.5	6.95	18.7	5790	1.8	-132.5	7.5		E) recovery well cycling sample
	1227	10.42	4.0	6.94	18.7	5800	1.8	-132.8	7.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1230	MW-83	10.42	6.94	18.7	5800	1.8	-132.8	7.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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+ Dup - EP-03

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-3
Event: 1121
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

32

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1535	NP	12.32	0.00	22.10	18.1	Yes	Yes	Yes	Yes		Weather: Cloudy 50's
4/14/21	1055	NP	12.34	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1100	12.39	0.5	7.24	18.6	6110	3.6	-22.4	9.8	clear / colorless	*Low-flow groundwater sample:*
	1102	12.40	1.0	7.18	18.5	6100	2.9	-20.1	9.2		(A) peristaltic pump w/ ded tubing
	1105	12.40	1.5	7.10	18.5	6090	2.7	-18.3	8.5		B) ded bladder pump
	1107	12.40	2.0	7.09	18.4	6070	2.6	-17.1	8.1		C) non-ded bladder pump; or
	1110	12.40	2.5	7.08	18.4	6060	2.6	-16.9	7.5		*Standard groundwater sample:*
	1112	12.40	3.0	7.08	18.4	6060	2.5	-16.5	7.2		D) bailer due to limited column; or
	1115	12.40	3.5	7.07	18.3	6050	2.5	-16.0	6.9		E) recovery well cycling sample
	1117	12.40	4.0	7.07	18.3	6050	2.4	-15.8	6.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1124	MW-3	12.40	7.07	18.3	6050	2.4	-15.8	6.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	1000	Dup-EP-03	12.40	7.07	18.3	6050	2.4	-15.8	6.1	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-88
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCJ (33)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1545	NP	9.79	0.00	20.31	14.8	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1550	9.84	0.5	7.15	20.1	6140	2.7	-57.6	10.1	clear/colorless w/	*Low-flow groundwater sample:*
"	1552	9.85	1.0	7.10	20.3	6190	2.2	-59.2	9.7	orange particles	(A) peristaltic pump w/ ded tubing
"	1555	9.85	1.5	7.08	20.4	6210	2.0	-61.3	9.1	"	B) ded bladder pump
"	1557	9.85	2.0	7.07	20.4	6250	1.9	-64.9	7.9	"	C) non ded bladder pump; or
"	1600	9.85	2.5	7.07	20.4	6260	1.9	-65.1	7.5	"	*Standard groundwater sample:*
"	1602	9.85	3.0	7.06	20.5	6270	1.8	-66.8	7.4	"	D) bailer due to limited column; or
"	1605	9.85	3.5	7.06	20.5	6280	1.8	-67.2	7.0	"	E) recovery well cycling sample
"	1607	9.85	4.0	7.06	20.5	6280	1.8	-67.9	6.8	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4/13/21	1610	MW-88	9.85	7.06	20.5	6280	1.8	-67.9	6.8	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup - EP-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22A
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (34)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1640	NP	9.02	0.00	22.65	17.4	Yes	Yes	Yes	Yes		Weather: Cloudy, 50's
4/14/21	800	NP	9.00	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	805	9.06	0.5	7.12	17.1	15,210	3.0	-67.8	9.1	colorless / clear	*Low-flow groundwater sample:*
	807	9.12	1.0	7.10	17.2	15,250	2.5	-54.8	8.7		(A) peristaltic pump w/ ded tubing
	810	9.15	1.5	7.08	17.2	15,290	2.2	-51.6	8.6		B) ded bladder pump
	812	9.16	2.0	7.06	17.3	15,310	2.1	-49.3	7.5		C) non-ded bladder pump; or
	815	9.17	2.5	7.05	17.3	15,320	2.1	-48.2	7.2		*Standard groundwater sample:*
	817	9.17	3.0	7.05	17.3	15,330	2.0	-47.1	6.8		D) bailer due to limited column; or
	820	9.18	3.5	7.04	17.2	15,330	2.0	-46.9	6.2		E) recovery well cycling sample
	822	9.18	4.0	7.04	17.2	15,330	2.0	-46.2	6.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	825	MW-22A	9.18	7.04	17.2	15,330	2.0	-46.2	6.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	800	Dup-EP-02	9.18	7.04	17.2	15,330	2.0	-46.2	6.0	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22B
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (35)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1643	NP	8.87	0.00	54.66	49.7	Yes	Yes	Yes	Yes		Weather: Cloudy 50's
4/14/21	910	NP	8.90	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	915	8.97	0.5	7.24	17.2	6580	2.0	-51.2	8.7	colorless/clear	*Low-flow groundwater sample:*
	917	8.97	1.0	7.15	17.0	6560	1.7	-89.3	7.9		(A) peristaltic pump w/ ded tubing
	920	8.97	1.5	7.08	17.0	6530	1.5	-92.5	7.2		B) ded bladder pump
	922	8.97	2.0	7.06	17.0	6510	1.3	-93.1	6.9		C) non-ded bladder pump; or
	925	8.97	2.5	7.06	17.0	6490	1.2	-94.5	6.2		*Standard groundwater sample:*
	927	8.97	3.0	7.05	17.1	6480	1.2	-95.1	5.9		D) bailer due to limited column; or
	930	8.97	3.5	7.05	17.1	6480	1.1	-95.3	5.4		E) recovery well cycling sample
	932	8.97	4.0	7.05	17.1	6470	1.1	-96.2	5.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	935	MW-22B	8.97	7.05	17.1	6470	1.1	-96.2	5.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-10
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (36)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1655	NP	6.45	0.00	18.45	13.3	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1700	6.46	0.5	7.25	19.7	6490	2.9	-105.6	8.9	clear/colorless w/	*Low-flow groundwater sample:*
	1702	6.47	1.0	7.19	19.5	6430	2.5	-98.3	7.5	orange particles	(A) peristaltic pump w/ ded tubing
	1705	6.47	1.5	7.15	19.4	6410	2.4	-95.4	7.0	↓	B) ded bladder pump
	1707	6.47	2.0	7.13	19.3	6390	2.3	-93.8	6.3	↓	C) non-ded bladder pump; or
	1710	6.47	2.5	7.12	19.3	6380	2.3	-92.1	6.3	↓	*Standard groundwater sample:*
	1712	6.47	3.0	7.12	19.2	6380	2.2	-90.7	6.4	↓	D) bailer due to limited column; or
	1715	6.47	3.5	7.10	19.2	6370	2.2	-89.5	5.8	↓	E) recovery well cycling sample
↓	1717	6.47	4.0	7.10	19.2	6370	2.2	-89.2	5.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4/13/21	1720	MW-10	6.47	7.10	19.2	6370	2.2	-89.2	5.5	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-123
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CCD (37)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1650	NP	6.93	0.00	25.71	25.0	Yes	Yes	Yes	Yes		Weather: Cloudy, 50's
4/14/21	1000	NP	6.95	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1005	6.96	0.5	7.11	18.1	6680	3.3	-157.6	9.5	Clear/colorless	*Low-flow groundwater sample:*
	1007	6.96	1.0	7.05	18.4	6650	2.5	-147.5	8.9		(A) peristaltic pump w/ ded tubing
	1010	6.96	1.5	7.01	18.5	6620	2.1	-145.9	8.2		B) ded bladder pump
	1012	6.96	2.0	6.99	18.5	6610	2.0	-143.0	8.0		C) non-ded bladder pump; or
	1015	6.96	2.5	6.98	18.6	6590	2.0	-142.3	7.5		*Standard groundwater sample:*
	1017	6.96	3.0	6.98	18.6	6580	1.9	-140.7	7.1		D) bailer due to limited column; or
	1020	6.96	3.5	6.97	18.6	6580	1.9	-139.7	6.7		E) recovery well cycling sample
	1022	6.96	4.0	6.97	18.7	6570	1.9	-138.1	6.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1025	MW-123	6.96	6.97	18.7	6570	1.9	-138.1	6.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4A
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (38)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1430	NP	12.47	0.00	16.55	Well Base	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1435	12.48	0.5	7.29	20.1	6080	2.8	-122.5	9.5	clear/colorless w/	*Low-flow groundwater sample:*
	1437	12.48	1.0	7.25	19.9	6120	2.6	-125.6	9.0	black particles	(A) peristaltic pump w/ ded tubing
	1440	12.48	1.5	7.21	19.8	6150	2.5	-129.1	8.6		B) ded bladder pump
	1442	12.48	2.0	7.20	19.8	6170	2.5	-133.9	8.1		C) non-ded bladder pump; or
	1445	12.48	2.5	7.18	19.7	6190	2.4	-135.1	7.5		*Standard groundwater sample:*
	1447	12.48	3.0	7.17	19.7	6200	2.4	-137.8	7.2		D) bailer due to limited column; or
	1450	12.48	3.5	7.17	19.7	6210	2.3	-138.1	6.9		E) recovery well cycling sample
	1452	12.48	4.0	7.16	19.8	6220	2.3	-138.5	6.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1455	MW-4A	12.48	7.16	19.8	6220	2.3	-138.5	6.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4B
Event: 1121
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in ...	SS __
Vault __	Other ...	Other ..

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (39)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1515	NP	12.24	0.00	72.37	67.4	Yes	Yes	Yes	Yes		Weather: Pt. cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1520	11.33	0.5	7.51	18.9	5100	3.5	-125.3	10.5	clear / colorless	*Low-flow groundwater sample:*
	1522	11.33	1.0	7.32	19.1	5080	3.2	-129.5	9.1		(A) peristaltic pump w/ ded tubing
	1525	11.33	1.5	7.23	19.3	5050	3.1	-131.5	8.5		B) ded bladder pump
	1527	11.33	2.0	7.19	19.5	5040	3.0	-134.6	8.2		C) non-ded bladder pump; or
	1530	11.33	2.5	7.16	19.6	5040	3.0	-136.1	7.9		*Standard groundwater sample:*
	1532	11.33	3.0	7.15	19.6	5030	2.9	-138.0	7.6		D) bailer due to limited column; or
	1535	11.33	3.5	7.16	19.6	5030	2.9	-139.5	7.1		E) recovery well cycling sample
↓	1537	11.33	4.0	7.16	19.7	5040	2.9	-139.9	6.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1540	MW-4B	11.33	7.16	19.7	5040	2.9	-139.9	6.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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+ EB-EP-03

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5A
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (40)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1200	NP	9.39	0.00	20.15	14.8	Yes	Yes	Yes	Yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1205	9.44	0.5	7.37	19.9	11,360	3.2	-116.7	9.1	clear/ colorless w/	*Low-flow groundwater sample:*
	1207	9.44	1.0	7.29	19.7	11,170	2.5	-120.3	8.5	orange particles	(A) peristaltic pump w/ ded tubing
	1210	9.44	1.5	7.21	19.6	11,120	2.2	-124.1	8.1	↓	B) ded bladder pump
	1212	9.44	2.0	7.19	19.6	11,050	2.1	-125.6	7.5	↓	C) non-ded bladder pump; or
	1215	9.44	2.5	7.16	19.5	11,060	2.1	-130.5	7.2	↓	*Standard groundwater sample:*
	1217	9.44	3.0	7.15	19.5	11,050	2.0	-132.8	6.9	↓	D) bailer due to limited column; or
	1220	9.44	3.5	7.15	19.5	11,040	2.0	-133.8	6.7	↓	E) recovery well cycling sample
↓	1222	9.44	4.0	7.14	19.6	11,030	2.0	-134.1	5.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1225	MW-5A	9.44	7.14	19.6	11,030	2.0	-134.1	5.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓	1245	EB-EP-03	NA	—	—	—	—	—	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5B
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (41)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1255	NP	9.60	0.00	53.54	48.5	Yes	Yes	Yes	Yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1300	9.61	0.5	7.26	18.9	7850	2.1	-109.0	8.9	clear/colorless	*Low-flow groundwater sample:*
	1302	9.61	1.0	7.20	19.1	7730	1.5	-105.1	7.5		(A) peristaltic pump w/ ded tubing
	1305	9.61	1.5	7.17	19.2	7660	1.2	-103.9	6.9		B) ded bladder pump
	1307	9.61	2.0	7.15	19.4	7600	1.1	-102.5	6.3		C) non-ded bladder pump; or
	1310	9.61	2.5	7.14	19.4	7580	1.1	-101.3	5.8		*Standard groundwater sample:*
	1312	9.61	3.0	7.14	19.5	7570	1.0	-100.9	5.2		D) bailer due to limited column; or
	1315	9.61	3.5	7.13	19.5	7570	1.0	-100.3	4.8		E) recovery well cycling sample
↓	1317	9.61	4.0	7.13	19.5	7560	1.0	-100.0	4.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1320	MW-5B	9.61	7.13	19.5	7560	1.0	-100.0	4.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5C
Event: 1Q21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (42)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1340	NP	9.81	0.00	71.64	66.6	Yes	Yes	Yes	Yes		Weather: Cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1345	9.83	0.5	7.48	18.5	4140	2.1	-87.9	9.5	clear/colorless w/	*Low-flow groundwater sample:*
	1347	9.83	1.0	7.40	18.7	4050	1.7	-83.4	8.9	white particles	(A) peristaltic pump w/ ded tubing
	1350	9.83	1.5	7.34	19.0	3970	1.5	-80.4	8.2		B) ded bladder pump
	1352	9.83	2.0	7.31	19.2	3890	1.4	-76.5	7.9		C) non-ded bladder pump; or
	1355	9.83	2.5	7.29	19.3	3860	1.4	-74.2	7.4		*Standard groundwater sample:*
	1357	9.83	3.0	7.28	19.3	3840	1.3	-72.5	7.0		D) bailer due to limited column; or
	1400	9.83	3.5	7.28	19.4	3830	1.3	-71.5	6.8		E) recovery well cycling sample
↓	1402	9.83	4.0	7.27	19.4	3820	1.3	-70.0	6.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1405	MW-5C	9.83	7.27	19.4	3820	1.3	-70.0	6.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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+ Dup-EP-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7A
Event: 1121
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (43)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1050	NP	10.17	0.00	18.65	13.6	Yes	Yes	Yes	Yes		Weather: Cloudy 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1055	10.26	0.5	7.47	19.6	7860	2.9	-75.4	10.3	clear/colorless	*Low-flow groundwater sample:*
	1057	10.27	1.0	7.37	19.3	8220	2.1	-77.9	9.5		(A) peristaltic pump w/ ded tubing
	1100	10.27	1.5	7.34	19.2	8240	1.8	-79.5	8.7		B) ded bladder pump
	1102	10.27	2.0	7.31	19.2	8260	1.6	-80.0	6.9		C) non-ded bladder pump; or
	1105	10.27	2.5	7.29	19.2	8280	1.5	-82.4	6.3		*Standard groundwater sample:*
	1107	10.27	3.0	7.28	19.1	8290	1.5	-82.9	5.8		D) bailer due to limited column; or
	1110	10.27	3.5	7.28	19.1	8290	1.4	-83.2	5.4		E) recovery well cycling sample
↓	1112	10.27	4.0	7.27	19.1	8300	1.4	-83.4	5.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1115	MW-7A	10.27	7.27	19.1	8300	1.4	-83.4	5.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓	1000	Dup-EP-01	10.27	7.27	19.1	8300	1.4	-83.4	5.1	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7B
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (44)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1005	NP	9.95	0.00	52.56	47.6	Yes	Yes	Yes	Yes		Weather: Cloudy 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Curr. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1010	10.07	0.5	7.59	19.4	8260	1.9	-83.5	9.5	Clear / colorless	*Low-flow groundwater sample:*
	1012	10.07	1.0	7.54	19.2	7980	1.7	-85.2	8.9		(A) peristaltic pump w/ ded tubing
	1015	10.07	1.5	7.52	19.1	7890	1.5	-87.1	8.2		B) ded bladder pump
	1017	10.07	2.0	7.51	19.1	7850	1.4	-88.5	7.9		C) non-ded bladder pump; or
	1020	10.07	2.5	7.50	19.0	7810	1.4	-89.1	7.5		*Standard groundwater sample:*
	1022	10.07	3.0	7.50	19.0	7790	1.3	-89.6	7.1		D) bailer due to limited column; or
	1025	10.07	3.5	7.49	18.9	7780	1.3	-90.5	6.9		E) recovery well cycling sample
	1029	10.07	4.0	7.49	18.9	7770	1.3	-90.8	6.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1030	MW-7B	10.07	7.49	18.9	7770	1.3	-90.8	6.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Trip Blank - EP-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8A
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

45

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	920	NP	9.66	0.00	20.74	16.4	Yes	Yes	Yes	Yes		Weather: Cloudy 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	925	9.72	0.5	7.07	17.7	15,290	3.5	-109.8	9.8	Clear/colorless	*Low-flow groundwater sample:*
	927	9.81	1.0	7.06	17.6	15,240	2.4	-110.5	8.6		(A) peristaltic pump w/ ded tubing
	930	9.88	1.5	7.05	17.7	15,210	2.1	-110.9	8.1		B) ded bladder pump
	932	9.93	2.0	7.05	17.8	15,190	1.9	-111.1	7.5		C) non-ded bladder pump; or
	935	9.95	2.5	7.04	17.9	15,180	1.8	-111.5	7.0		*Standard groundwater sample:*
	937	9.96	3.0	7.04	17.9	15,180	1.8	-111.8	6.8		D) bailer due to limited column; or
	940	9.97	3.5	7.04	18.0	15,170	1.7	-112.3	6.5		E) recovery well cycling sample
	942	9.97	4.0	7.03	18.0	15,170	1.7	-112.2	6.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	945	OCD-8A	9.97	7.03	18.0	15,170	1.7	-112.2	6.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03"; if LNAPL thickness is measured at 0.01" or 0.02", remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8B
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD (46)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	830	NP	9.80	0.00	56.65	51.7	Yes	Yes	Yes	Yes		Weather: Cloudy 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	835	9.83	0.5	7.12	17.0	9200	2.1	-79.2	14.8	clear/colorless	*Low-flow groundwater sample:*
	837	9.84	1.0	7.04	17.3	9210	1.7	-74.3	10.9		(A) peristaltic pump w/ ded tubing
	840	9.84	1.5	7.00	17.5	9220	1.5	-70.1	9.7		B) ded bladder pump
	842	9.84	2.0	6.98	17.6	9230	1.4	-67.8	9.1		C) non-ded bladder pump; or
	845	9.84	2.5	6.97	17.6	9240	1.4	-65.2	8.6		*Standard groundwater sample:*
	847	9.84	3.0	6.97	17.7	9240	1.3	-63.1	8.3		D) bailer due to limited column; or
	850	9.84	3.5	6.96	17.7	9250	1.3	-60.9	7.9		E) recovery well cycling sample
	852	9.84	4.0	6.96	17.7	9250	1.3	-59.5	7.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample ID.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	855	OCD-8B	9.84	6.96	17.7	9250	1.3	-59.5	7.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-P4
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (47)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1625	NP	6.17	0.00	30.26	22.8	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-14-21	1405	NP	6.19	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1410	6.49	0.5	7.85	22.4	5980	3.0	-11.3	11.4	colorless, clear	*Low-flow groundwater sample:*
↓	1413	6.67	1.0	7.56	22.0	6260	2.2	-21.8	9.8	↓	(A) peristaltic pump w/ ded tubing
	1415	6.71	1.5	7.41	21.8	6540	1.9	-27.6	7.2		B) ded bladder pump
	1418	6.72	2.0	7.30	21.7	6630	1.7	-31.9	5.6		C) non-ded bladder pump; or
	1420	6.72	2.5	7.23	21.7	6670	1.5	-36.2	4.9		*Standard groundwater sample:*
	1423	6.73	3.0	7.19	21.6	6710	1.4	-40.7	4.4		D) bailer due to limited column; or
	1425	6.73	3.5	7.16	21.6	6720	1.3	-42.6	4.0		E) recovery well cycling sample
↓	1428	6.73	4.0	7.14	21.6	6730	1.3	-44.9	3.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1430	KWB-P4	6.73	7.14	21.6	6730	1.3	-44.9	3.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-25
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (48)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1505	NP	14.55	0.00	28.18	23.2	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1510	14.87	0.5	7.95	20.2	5470	3.6	77.6	10.1	colorless, clear	*Low-flow groundwater sample:*
	1513	14.90	1.0	7.79	19.1	4980	2.7	76.1	7.2		(A) peristaltic pump w/ ded tubing
	1515	14.91	1.5	7.72	18.9	4730	2.1	78.4	5.9		B) ded bladder pump
	1518	14.91	2.0	7.60	18.8	4590	1.9	80.2	4.7		C) non-ded bladder pump; or
	1520	14.91	2.5	7.55	18.8	4520	1.7	83.0	4.0		*Standard groundwater sample:*
	1523	14.91	3.0	7.52	18.7	4490	1.6	85.1	3.6		D) bailer due to limited column; or
	1525	14.91	3.5	7.50	18.7	4470	1.5	87.4	3.1		E) recovery well cycling sample
	1528	14.91	4.0	7.49	18.7	4460	1.5	89.6	2.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1530	MW-25	14.91	7.49	18.7	4460	1.5	89.6	2.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-8
Event: 1121
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(49)

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1550	NP	14.66	0.00	214.95	NS	Yes	Issue	Yes	Yes		Weather: Sunny, 70s
					(blockage)							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								A) peristaltic pump w/ ded tubing
			1.5		*Blockage @	14.95'	TOC				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								Standard groundwater sample:
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
										Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-1R
Event: 1Q21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (50)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1555	NP	11.77	0.00	20.63	15.6	Yes	Issue	Yes	Yes		Weather: Pt. Cloudy, 60s
4-14-21	1315	NP	11.79	0.00				↓				

↳ Bent casing lid makes closure difficult. well still locks & is functional.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1320	11.94	0.5	7.88	19.7	6440	2.6	-113.9	9.3	colorless, clear	*Low-flow groundwater sample:*
↓	1323	11.94	1.0	7.70	20.5	6300	2.1	-112.7	7.2	↓	(A) peristaltic pump w/ ded tubing
	1325	11.94	1.5	7.59	20.6	6220	1.7	-111.4	6.5		B) ded bladder pump
	1328	11.94	2.0	7.51	20.8	6140	1.5	-110.9	6.1		C) non-ded bladder pump; or
	1330	11.94	2.5	7.45	20.9	6100	1.4	-110.3	5.8		*Standard groundwater sample:*
	1333	11.94	3.0	7.43	20.9	6090	1.3	-109.9	5.4		D) bailer due to limited column; or
	1335	11.94	3.5	7.41	21.0	6080	1.2	-109.2	4.7		E) recovery well cycling sample
↓	1338	11.94	4.0	7.40	21.0	6070	1.2	-108.7	4.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1340	MW-1R	11.94	7.40	21.0	6070	1.2	-108.7	4.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-15
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas
(51)

Initials: mmg

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1600	NP	12.97	0.00	21.70	17.7	Yes	Yes	Yes	Yes		Weather: Clear 60s
4-14-21	1320	NP	12.99	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1325	13.03	0.5	7.99	20.9	7030	3.5	48.9	10.2	Clear/colorless	*Low-flow groundwater sample:*
	1327	13.03	1.0	7.90	20.6	7050	3.0	48.5	9.2		(A) peristaltic pump w/ ded tubing
	1330	13.03	1.5	7.89	20.1	7070	2.9	48.2	8.5		B) ded bladder pump
	1332	13.03	2.0	7.79	19.7	7070	2.5	47.8	8.1		C) non-ded bladder pump; or
	1335	13.03	2.5	7.68	19.8	7070	2.1	47.5	6.7		*Standard groundwater sample:*
	1337	13.03	3.0	7.64	19.8	7070	1.9	47.5	6.3		D) bailer due to limited column; or
	1340	13.03	3.5	7.60	19.8	7070	1.8	47.6	5.6		E) recovery well cycling sample
	1342	13.03	4.0	7.57	19.8	7070	1.8	47.9	5.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1345	MW-15	13.03	7.57	19.8	7070	1.8	47.9	5.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'. If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

✓ + Trip Blank - EP-03

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-1R
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BR-W

(52)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1355	NP	12.53	0.00	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 60s
4-14-21	1225	NP	12.55	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1230	12.81	0.5	7.72	20.6	9020	2.7	33.1	11.0	colorless, clear	*Low-flow groundwater sample:*
	1233	12.81	1.0	7.60	21.4	8070	2.0	31.5	9.2		(A) peristaltic pump w/ ded tubing
	1235	12.81	1.5	7.50	21.7	7190	1.6	32.2	8.4		B) ded bladder pump
	1238	12.81	2.0	7.44	21.8	6430	1.5	30.6	7.6		C) non-ded bladder pump; or
	1240	12.81	2.5	7.40	21.9	6180	1.4	27.9	7.1		*Standard groundwater sample:*
	1243	12.81	3.0	7.38	21.9	6120	1.3	25.4	6.8		D) bailer due to limited column; or
	1245	12.81	3.5	7.36	22.0	6100	1.3	23.2	6.4		E) recovery well cycling sample
↓	1248	12.81	4.0	7.34	22.0	6090	1.3	22.8	6.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1250	OCD-1R	12.81	7.34	22.0	6090	1.3	22.8	6.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 2A
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BPH (53)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1400	NP	12.82	0.00	27.56	22.3	Yes	Yes	Yes	Yes		Weather: Cloudy, 50s
4-14-21	1015	NP	12.82	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1020	13.01	0.5	7.73	21.6	5690	3.4	73.5	10.8	colorless, clear	*Low-flow groundwater sample:*
	1023	13.01	1.0	7.65	21.5	5730	2.9	62.9	9.1		(A) peristaltic pump w/ ded tubing
	1025	13.01	1.5	7.60	21.4	5760	2.4	54.7	7.2		B) ded bladder pump
	1028	13.01	2.0	7.55	21.3	5790	2.0	48.2	6.4		C) non-ded bladder pump; or
	1030	13.01	2.5	7.51	21.2	5810	1.9	44.9	5.7		*Standard groundwater sample:*
	1033	13.01	3.0	7.48	21.2	5820	1.8	41.7	5.3		D) bailer due to limited column; or
	1035	13.01	3.5	7.46	21.1	5825	1.8	39.6	5.1		E) recovery well cycling sample
	1038	13.01	4.0	7.44	21.1	5830	1.7	37.9	4.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4-14-21	1040	OCD-2A	13.01	7.44	21.1	5830	1.7	37.9	4.8	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2B
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: (54)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1405	NP	12.40	0.00	50.38	NS	Yes	Yes	Yes	Yes		Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		OCD-2B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-3
Event: IH21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BEH (55)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1410	NP	13.19	0.00	25.20	20.2	Yes	Yes	Yes	Yes		Weather: Cloudy, 50s
4-14-21	930	NP	13.20	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	935	13.36	0.5	7.91	20.7	6080	3.8	48.4	12.6	colorless, clear	*Low flow groundwater sample:*
	938	13.36	1.0	7.79	21.2	5190	2.9	49.1	11.4		(A) peristaltic pump w/ ded tubing
	940	13.36	1.5	7.72	21.4	4820	2.4	47.7	9.0		B) ded bladder pump
	943	13.36	2.0	7.65	21.4	4530	2.0	44.6	7.5		C) non-ded bladder pump; or
	945	13.36	2.5	7.62	21.3	4490	1.8	41.0	6.7		*Standard groundwater sample:*
	948	13.36	3.0	7.60	21.3	4460	1.7	39.2	6.1		D) bailer due to limited column; or
	950	13.36	3.5	7.59	21.4	4440	1.7	37.6	5.9		E) recovery well cycling sample
	953	13.36	4.0	7.57	21.4	4430	1.7	35.9	5.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	955	OCD-3	13.36	7.57	21.4	4430	1.7	35.9	5.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-4
Event: (H2)
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (56)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1415	NP	12.74	0.00	25.41	20.1	Yes	Yes	Yes	Yes		
4-14-21	845	NP	12.76	0.00								Weather: Cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (l)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	850	12.90	0.5	7.60	19.7	17340	3.2	30.1	9.7	colorless, clear	*Low-flow groundwater sample:*
	853	12.90	1.0	7.51	19.8	17480	2.4	24.6	9.1		(A) peristaltic pump w/ ded tubing
	855	12.90	1.5	7.44	19.8	17530	2.2	16.9	8.4		B) ded bladder pump
	858	12.90	2.0	7.40	19.9	17570	1.9	5.8	7.6		C) non-ded bladder pump; or
	900	12.90	2.5	7.37	19.9	17600	1.7	-4.7	7.2		*Standard groundwater sample:*
	903	12.90	3.0	7.35	20.0	17620	1.6	-11.9	6.9		D) bailer due to limited column; or
	905	12.90	3.5	7.33	20.0	17630	1.6	-14.6	6.3		E) recovery well cycling sample
	908	12.90	4.0	7.31	20.0	17640	1.6	-17.2	5.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	910	OCD-4	12.90	7.31	20.0	17640	1.6	-17.2	5.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11A
Event: 1121
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(57)

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1425	NP	10.33	0.00	22.01	17.0	Yes	Yes	Yes	Yes		Weather: Cloudy, 50s
4-14-21	1140	NP	10.35	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1145	10.54	0.5	7.19	21.0	25,800	2.7	-14.8	8.3	Colorless, clear	*Low-flow groundwater sample:*
	1148	10.54	1.0	7.15	21.5	26,200	2.1	-10.9	7.8		(A) peristaltic pump w/ ded tubing
	1150	10.54	1.5	7.13	21.6	26,400	1.8	-4.6	7.2		B) ded bladder pump
	1153	10.54	2.0	7.12	21.8	26,500	1.6	-1.1	6.9		C) non-ded bladder pump; or
	1155	10.54	2.5	7.11	21.8	26,600	1.5	2.4	6.5		*Standard groundwater sample:*
	1158	10.54	3.0	7.11	21.9	26,700	1.4	5.7	6.1		D) bailer due to limited column; or
	1200	10.54	3.5	7.10	21.9	26,700	1.4	8.8	5.9		E) recovery well cycling sample
	1203	10.54	4.0	7.10	21.8	26,800	1.3	10.3	5.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1205	MW-11A	10.54	7.10	21.8	26,800	1.3	10.3	5.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11B
Event: 1Q21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BEH (58)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1430	NP	10.31	0.00	47.30	42.3	Yes	Yes	Yes	Yes		Weather: Cloudy, 50s
4-14-21	1100	NP	10.31	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1105	10.33	0.5	7.43	21.9	19830	2.5	-81.9	10.6	Colorless, clear	*Low-flow groundwater sample:*
	1108	10.33	1.0	7.29	21.8	20100	2.0	-87.4	9.1		(A) peristaltic pump w/ ded tubing
	1110	10.33	1.5	7.19	21.7	20500	1.7	-82.6	8.4		B) ded bladder pump
	1113	10.33	2.0	7.11	21.6	20800	1.4	-81.3	7.7		C) non-ded bladder pump; or
	1115	10.33	2.5	7.07	21.6	21100	1.3	-79.4	7.2		*Standard groundwater sample:*
	1118	10.33	3.0	7.05	21.5	21200	1.2	-77.6	6.8		D) bailer due to limited column; or
	1120	10.33	3.5	7.04	21.5	21200	1.1	-75.9	6.4		E) recovery well cycling sample
	1123	10.33	4.0	7.02	21.5	21300	1.1	-73.7	6.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1125	MW-11B	10.33	7.02	21.5	21300	1.1	-73.7	6.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'. If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-5
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (59)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1435	NP	10.95	0.00	25.41	20.6	Yes	Yes	Yes	Yes		
4-14-21	800	NP	10.96	0.00								Weather: Cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	805	10.98	0.5	7.69	18.4	16670	3.4	-100.6	63.0	clear, colorless	*Low-flow groundwater sample:*
	808	10.98	1.0	7.50	18.0	16640	2.9	-99.8	51.0	w/ orange particles	(A) peristaltic pump w/ ded tubing
	810	10.98	1.5	7.36	17.9	16620	2.2	-99.0	44.6		B) ded bladder pump
	813	10.98	2.0	7.24	17.8	16600	1.8	-97.4	41.2		C) non-ded bladder pump; or
	815	10.98	2.5	7.19	17.8	16590	1.6	-95.8	37.8		*Standard groundwater sample:*
	818	10.98	3.0	7.16	17.8	16580	1.5	-93.2	34.5		D) bailer due to limited column; or
	820	10.98	3.5	7.14	17.8	16580	1.4	-91.7	32.6		E) recovery well cycling sample
	823	10.98	4.0	7.13	17.8	16570	1.4	-90.4	31.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	825	OCD-5	10.98	7.13	17.8	16570	1.4	-90.4	31.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-87
Event: 1321
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (60)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	935	NP	9.42	0.00	20.39	15.1	Yes	Yes	Yes	Yes		Weather: Pt. cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	940	9.58	0.5	7.39	18.7	17410	3.9	-107.2	8.4	Colorless, clear	*Low-flow groundwater sample:*
	943	9.62	1.0	7.30	18.9	17320	2.7	-110.1	7.9		(A) peristaltic pump w/ ded tubing
	945	9.66	1.5	7.24	19.0	17250	2.5	-113.6	7.1		B) ded bladder pump
	948	9.69	2.0	7.16	19.0	17210	2.1	-115.9	6.5		C) non-ded bladder pump; or
	950	9.72	2.5	7.10	19.0	17190	2.0	-117.0	6.0		*Standard groundwater sample:*
	953	9.75	3.0	7.07	19.0	17170	1.9	-117.8	5.7		D) bailer due to limited column; or
	955	9.78	3.5	7.05	19.0	17160	1.8	-118.2	5.2		E) recovery well cycling sample
↓	958	9.81	4.0	7.04	19.0	17150	1.8	-118.8	4.9	↓	F) Irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1000	MW-87	9.81	7.04	19.0	17150	1.8	-118.8	4.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18A
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in ___	PVC ✓
Upright ✓	4-in ✓	SS ___
Vault ___	Other ___	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (61)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1020	NP	10.99	0.00	22.58	17.9	Yes	Yes	Yes	Yes		Weather: Ft. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1025	11.20	0.5	7.59	18.2	21100	2.7	29.1	7.7	colorless, clear	*Low-flow groundwater sample:*
	1028	11.27	1.0	7.48	18.1	21300	2.1	32.9	6.4		(A) peristaltic pump w/ ded tubing
	1030	11.33	1.5	7.42	18.0	21400	1.8	34.6	5.9		B) ded bladder pump
	1033	11.38	2.0	7.37	18.0	21500	1.6	29.7	5.2		C) non-ded bladder pump; or
	1035	11.41	2.5	7.33	17.9	21600	1.5	28.4	4.6		*Standard groundwater sample:*
	1038	11.44	3.0	7.31	17.9	21600	1.4	26.2	4.1		D) bailer due to limited column; or
	1040	11.47	3.5	7.30	17.8	21700	1.4	24.9	3.8		E) recovery well cycling sample
	1043	11.50	4.0	7.29	17.8	21700	1.4	23.3	3.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1045	MW-18A	11.50	7.29	17.8	21700	1.4	23.3	3.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18B
Event: 1421
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRB (62)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1100	NP	10.99	0.00	50.59	45.6	Yes	Yes	Yes	Yes		Weather: PT. Cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1105	11.02	0.5	7.67	19.0	7940	2.9	-11.6	9.3	Colorless, clear	*Low-flow groundwater sample:*
	1108	11.02	1.0	7.51	18.6	6620	2.1	-8.8	7.2		(A) peristaltic pump w/ ded tubing
	1110	11.02	1.5	7.39	18.4	6180	1.8	-4.9	6.0		B) ded bladder pump
	1113	11.02	2.0	7.31	18.3	6020	1.6	-1.3	5.1		C) non-ded bladder pump; or
	1115	11.02	2.5	7.28	18.2	5960	1.5	0.7	4.4		*Standard groundwater sample:*
	1118	11.02	3.0	7.26	18.2	5940	1.5	1.5	3.7		D) bailer due to limited column; or
	1120	11.02	3.5	7.24	18.2	5920	1.4	2.6	3.3		E) recovery well cycling sample
↓	1123	11.02	4.0	7.23	18.2	5910	1.4	3.5	3.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1125	MW-18B	11.02	7.23	18.2	5910	1.4	3.5	3.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18T
Event: 1321
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(63)

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1240	NP	11.10	0.00	50.57	NS	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-18T								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-70
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: Brit (64)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1145	NP	9.15	0.00	22.05	16.8	Yes	Yes	Yes	Yes		Weather: PtCloudy, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1150	9.21	0.5	7.58	18.6	7230	3.0	52.1	39.2	Colorless, Clear	*Low-flow groundwater sample:*
↓	1153	9.21	1.0	7.50	18.3	7290	2.4	20.4	31.6	w/ orange particles	(A) peristaltic pump w/ ded tubing
	1155	9.21	1.5	7.41	18.1	7320	1.9	3.6	27.5	↓	B) ded bladder pump
	1158	9.21	2.0	7.36	17.9	7366	1.6	-9.4	22.9		C) non-ded bladder pump; or
	1200	9.21	2.5	7.29	17.8	7390	1.4	-17.4	20.4		*Standard groundwater sample:*
	1203	9.21	3.0	7.27	17.8	7400	1.3	-21.7	18.6		D) bailer due to limited column; or
	1205	9.21	3.5	7.25	17.8	7410	1.2	-23.6	17.9		E) recovery well cycling sample
↓	1208	9.21	4.0	7.24	17.8	7410	1.2	-25.2	17.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4-13-21	1210	MW-70	9.21	7.24	17.8	7410	1.2	-25.2	17.1	Per COC	Per COC	
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

+ EB-EP-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-124
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BEH (65)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1230	NP	9.74	0.00	22.00	17.0	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1235	9.79	0.5	7.45	18.5	12910	4.0	-40.9	33.6	colorless, clear,	*Low-flow groundwater sample:*
	1238	9.79	1.0	7.40	18.1	13010	2.7	-41.6	27.8	w/orange particles	(A) peristaltic pump w/ ded tubing
	1240	9.79	1.5	7.34	18.0	13060	2.2	-43.2	23.0		B) ded bladder pump
	1243	9.79	2.0	7.28	17.9	13140	2.0	-45.8	21.4		C) non-ded bladder pump; or
	1245	9.79	2.5	7.22	17.8	13190	1.8	-47.6	17.9		*Standard groundwater sample:*
	1248	9.79	3.0	7.19	17.8	13210	1.7	-49.1	13.6		D) bailer due to limited column; or
	1250	9.79	3.5	7.17	17.8	13220	1.6	-50.4	11.2		E) recovery well cycling sample
↓	1253	9.79	4.0	7.15	17.8	13230	1.6	-50.9	10.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1255	MW-124	9.79	7.15	17.8	13230	1.6	-50.9	10.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓												
↓	1310	EB-EP-02	NA	—	—	—	—	—	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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Driveway near bldg. A/C unit

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-52
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (66)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1650	NP	22.59	0.00	34.67	29.5	Yes	Yes	Yes	Yes		Weather: Sunny, 70
4-14-21	1505	NP	22.62	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1510	22.66	0.5	7.32	21.4	3740	2.6	75.7	8.1	Colorless, clear	*Low-flow groundwater sample:*
	1513	22.66	1.0	7.11	21.0	3490	2.1	74.2	7.4		(A) peristaltic pump w/ ded tubing
	1515	22.66	1.5	7.04	20.9	3360	1.9	76.7	7.0		B) ded bladder pump
	1518	22.66	2.0	6.98	20.8	3310	1.8	78.1	6.6		C) non-ded bladder pump; or
	1520	22.66	2.5	6.94	20.8	3280	1.7	80.6	6.3		*Standard groundwater sample:*
	1523	22.66	3.0	6.91	20.8	3270	1.6	82.0	5.9		D) bailer due to limited column; or
	1525	22.66	3.5	6.89	20.8	3250	1.6	83.4	5.7		E) recovery well cycling sample
	1528	22.66	4.0	6.88	20.8	3240	1.5	84.8	5.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1530	MW-52	22.66	6.88	20.8	3240	1.5	84.8	5.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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E. side of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-109
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RSM (67)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1655	NP	20.34	0.00	29.48	25.5	Yes	Yes	Yes	Yes		Weather: Clear 70's
4-14-21	1455	NP	20.35	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1500	20.45	0.5	7.29	22.4	2740	1.9	-350.2	10.2	Colorless / clear	*Low-flow groundwater sample:*
	1502	20.51	1.0	7.28	22.5	2750	1.5	-354.5	9.7		(A) peristaltic pump w/ ded tubing
	1505	20.56	1.5	7.28	22.5	2740	1.3	-357.2	9.0		B) ded bladder pump
	1507	20.60	2.0	7.27	22.5	2720	1.2	-358.9	7.6		C) non-ded bladder pump; or
	1510	20.63	2.5	7.27	22.6	2710	1.2	-360.3	7.2		*Standard groundwater sample:*
	1512	20.65	3.0	7.26	22.7	2700	1.1	-361.1	6.4		D) bailer due to limited column; or
	1515	20.67	3.5	7.25	22.7	2700	1.1	-362.5	5.9		E) recovery well cycling sample
	1517	20.68	4.0	7.24	22.7	2690	1.0	-363.4	5.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1520	MW-109	20.68	7.24	22.7	2690	1.0	-363.4	5.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-110
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJM (68)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1700	NP	16.70	0.00	29.74	24.7	Yes	Yes	Yes	Yes		Weather: Clear 70's
4-14-21	1400	NP	16.71	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1405	16.80	0.5	7.26	22.0	1776	2.6	-186.9	90.4	Colorless / Sl. Cloudy	*Low-flow groundwater sample:*
	1407	16.85	1.0	7.25	22.1	1750	2.0	-190.2	72.6		(A) peristaltic pump w/ ded tubing
	1410	16.89	1.5	7.24	22.2	1749	1.7	-192.5	54.5		B) ded bladder pump
	1412	16.91	2.0	7.24	22.2	1745	1.4	-193.8	52.8		C) non-ded bladder pump; or
	1415	16.93	2.5	7.23	22.3	1741	1.1	-194.4	51.9		*Standard groundwater sample:*
	1417	16.94	3.0	7.23	22.2	1736	1.0	-195.1	51.4		D) bailer due to limited column; or
	1420	16.94	3.5	7.23	22.3	1737	1.0	-195.6	50.3		E) recovery well cycling sample
	1422	16.94	4.0	7.22	22.4	1728	0.9	-196.3	48.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1425	MW-110	16.94	7.22	22.4	1728	0.9	-196.3	48.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-13
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Located N. of river

Hydrologic Monitoring
for TRC
Houston, Texas

(69)

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	815	NP	13.34	0.00	21.10	NS	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-13								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-69
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Located N. of river

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

(70)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	810	NP	11.74	0.00	22.51	NS	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-69								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-12
Event: 1121
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault	Other __	Other __

Located N. of river

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (71)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	800	NP	10.98	0.00	17.93	NS	Yes	Yes	Yes	Yes		Weather: Pt. cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-12								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-24
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade	2-in ___	PVC ✓
Upright ✓	4-in ✓	SS ___
Vault ___	Other ___	Other ___

Located E. of river

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH (72)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	840	NP	12.66	0.00	23.51	NS	Yes	Yes	Issue	Yes		Weather: Pt. Cloudy, 50s
									↳ Broken hasp/hinge			

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-24								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-14
Event: 1H21
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS
Vault __	Other __	Other

Located N. of river

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BEH (73)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	835	NM	>11.81	NA	>11.81	NS	Yes	Issue	Yes	Yes		Weather: Pt. Cloudy, Sor

Well Purging Record

* Blockage @ 11.81' TOC

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								Standard groundwater sample:
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-14								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube; Sample via port if RW is active

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-12R
Event: 1H21
Area of Concern: REST

Completion: At-Grade __ / Upright __ / Above-grade Vault ✓
Casing Diam.: 2-in __ / 4-in __ / Other 12-in
Casing Material: PVC ✓ / SS __ / Other __

(RW recently off due to water rights issue)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS (74)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1110	28.06	28.09	0.03	NM	Top of Pump (if pump not operating)	Yes	Yes	Yes	Yes		Weather: Overcast

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not	Sampled	due to	LNAPL				(A) peristaltic pump w/ ded tubing
			1.5				≥ 0.03'				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5							or	(E) recovery well cycling sample if recovery pump on
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-12R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup-REST-01
+ EB-REST-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-113
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BO / BA (75)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1127	NP	27.25	0.00	37.80	33.8	Yes	Yes	Yes	Yes		Weather: Overcast 60's
4/14/21	1200	NP	27.15	0.00								SUNNY, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1205	27.23	0.5	6.71	23.5	2900	2.8	-106.9	11.1	Colorless, clear	*Low-flow groundwater sample:*
	1208	27.26	1.0	6.65	22.9	2850	2.6	-104.7	10.3	odor	(A) peristaltic pump w/ ded tubing
	1210	27.26	1.5	6.64	22.8	2840	2.5	-102.3	9.2	↓	B) ded bladder pump
	1213	27.26	2.0	6.62	22.3	2830	2.3	-100.1	6.8	↓	C) non-ded bladder pump; or
	1215	27.26	2.5	6.62	22.1	2830	2.0	-97.8	5.5	↓	*Standard groundwater sample:*
	1218	27.26	3.0	6.61	22.1	2820	1.8	-95.6	4.9	↓	D) bailer due to limited column; or
	1220	27.26	3.5	6.61	22.1	2820	1.6	-94.7	4.2	↓	E) recovery well cycling sample
↓	1223	27.26	4.0	6.61	22.1	2820	1.4	-92.1	3.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1225	MW-113	27.26	6.61	22.1	2820	1.4	-92.1	3.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓												
	1000	Dup-REST-01	27.26	6.61	22.1	2820	1.4	-92.1	3.6	Per COC	Per COC	
↓	1240	EB-REST-01	NA	→	→	→	→	→	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-8
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-In ✓	PVC ✓
Upright ✓	4-in _	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA (76)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1045	26.93	28.29	1.36	35.80	30.8	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

(Removed LNAPL saturated sock before gauging & let equilibrate)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not Sampled due to				presence			(A) peristaltic pump w/ ded tubing
			1.5	of LNAPL		>0.03					B) ded bladder pump
			2.0			—					C) non-ded bladder pump; or
			2.5								*Stantderd groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-8								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-22
Event: 1H21
Area of Concern: REST

Completion: At-Grade __ / Above-grade Vault ✓ / Upright __
Casing Diam.: 2-in __ / 4-in __ / Other 12-in
Casing Material: PVC ✓ / SS __ / Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (77)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1050	28.78	28.89	0.11	NM	Sample port if RW active	Yes	Yes	Yes	Yes		Weather: Sunny 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low flow groundwater sample:*
			1.0	Not sampled due to LNAPL ≥ 0.03'							A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-22								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record (Historical LNAPL)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-20A
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other 6-in	Other __

metal roof canopy
- RW-20A
- ----- [] Vault
- RW-20B

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BD

(78)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1055	> 20.65 →			NM *	Sample Port	Yes	Yes	Yes	Yes		Weather: Sunny 60's

* Likely well base @ 21.98' per Navajo

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	(Appears to be dry.)							A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-20A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record (Historical LNAPL)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-20B
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other 6-in	Other __

metal roof canopy — RW-20A — Vault — RW-20B

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BD (79)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1100	28.78 *	→		NM	Sample Port	Yes	Yes	Yes	Yes		Weather Overcast 60's

Well Purging Record

* Appears to be dry, gray silt on probe. (Confirmed with Domingo)

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	No	Sampled.	Dry	!!				A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-20B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged / labeled tube stored inside above-grade vault

Monitoring Well Purging and Sampling Record (Historical LNAPL)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-13R
Event: 1H21
Area of Concern: REST Above-grade

Completion	Casing Diam.	Casing Material
At-Grade __	2-In	PVC ✓
Upright __	4-In	SS __
Vault ✓	Other 12-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (80)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1120	25.98	27.26	1.28	NM	30.0	Yes	Yes	Yes	Yes		Weather: Overcast 60's
						or Sample	port if	RW is active				

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not sampled due to presence							(A) peristaltic pump w/ ded tubing
			1.5	of LNAPL being			>0.03				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								or (E) recovery well cycling sample if RW is active
			4.0								F) Irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-13R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-14R
Event: 1H21
Area of Concern: REST

Completion: At-Grade ___ Upright ___ Above-grade Vault ✓
Casing Diam.: 2-in ___ 4-in ___ Other 12-in
Casing Material: PVC ✓ SS Other ___

Hydrologic Monitoring for TRC
Houston, Texas

Initials: [illegible] (81)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1130	24.63	27.09	2.46	NM	Sample Port	Yes	Yes	Yes	yes		Weather: Overcast 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not	sampled	due to	presence				A) peristaltic pump w/ ded tubing
			1.5	of	LNAPL	being	≥ 0.03				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-14R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-133
Event: (H2)
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BD (82)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/24	1140	22.24	22.53	0.29	37.64	27.9	Yes	Yes	Yes	Yes		Weather: Overcast 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not sampled due to presence							(A) peristaltic pump w/ ded tubing
			1.5	of LNAPL being ≥0.03							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-133								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup - REST-03
+ EB - REST-03
+ Trip Blank - REST-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-134
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SS/BA (83)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Lacel	Other	Comments
4/13/21	1200	NP	20.87	0.00	32.95	28.4	Yes	Yes	Yes	Yes		Weather: Overcast 60's
4/14/21	1055	NP	20.88	0.00								Mostly cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1100	20.90	0.5	6.87	20.7	4360	2.9	83.0	7.2	Colorless, clear	*Low-flow groundwater sample:*
	1103	20.90	1.0	6.80	20.5	4350	2.5	85.6	6.9		(A) peristaltic pump w/ ded tubing
	1105	20.90	1.5	6.77	20.1	4350	2.2	88.4	6.1		B) ded bladder pump
	1108	20.90	2.0	6.77	20.1	4350	2.2	88.8	5.7		C) non-ded bladder pump; or
	1110	20.90	2.5	6.76	20.0	4340	2.1	89.5	5.0		*Standard groundwater sample:*
	1113	20.90	3.0	6.76	20.0	4340	2.1	90.0	4.8		D) bailer due to limited column; or
	1115	20.90	3.5	6.75	19.9	4340	2.0	91.6	4.2		E) recovery well cycling sample
	1118	20.90	4.0	6.75	19.9	4340	2.0	92.1	3.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1120	MW-134	20.90	6.75	19.9	4340	2.0	92.1	3.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	900	Dup-REST-03	20.90	6.75	19.9	4340	2.0	92.1	3.9	Per COC	Per COC	
	1135	EB-REST-03	NA							Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4798
Event: 1H21
Area of Concern: REST

Irrigation well
Inside green, block bldg.
No purge; sample port (faucet)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (84)

Well Inspection Information (Screen: 840-850)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/14/21	1305	NM	NM	NM	NM	NM	NA	NA	NA	Yes		Weather: Sunny 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		No purge; active water well w/ sample port						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5							Clear	*Standard groundwater sample:*
			3.0							colorless	D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1305	RA 4798	NM	7.17	20.8	2198	3.1	-14.6	3.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4196
Event: (H2)
Area of Concern: REST

Irrigation well
Inside green, block bldg.
No purge; Sample port (faucet)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (screen: 280-292)

Initials: BB (85)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/14/21	810	NM	NM	NM	NM	NM	NA	NA	NA	Yes		Weather: Cloudy 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		No purge; active water well w/ Sample port						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		Not Sampled. Upon arrival well						*Standard groundwater sample:*
			3.0		was not active. Called Chris with Chase						D) bailer due to limited column; or
			3.5		Farms for his assistance. System had no						E) recovery well cycling sample
			4.0		power & Called power company to come out						(F) irrigation well grab sample
					and check it out. Chase was told it was in						
					their disconnects. Electricians were able to come						
					out for Chase for a couple of days.						

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4/14/21	810	RA-4196								Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01" or 0.02", remove LNAPL, and collect groundwater sample

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DO NOT ADDRESS
Removed from Program by Navajo, 4-13-15

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-1227
Event: 1H21
Area of Concern: REST

Irrigation well
Removed from Program

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: (86)

Well Inspection Information (Screen: 194-246)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		DO NOT ADDRESS						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
	RA-1227									Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-3156
Event: 1H21
Area of Concern: REST

Irrigation well; sample port; Unused, per Chase Farms, due to slightly elevated SC, as described to HMI, 2021

Hydrologic Monitoring for TRC Houston, Texas

Initials: BB (87)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/14/21	830	NM	NM	NM	NM	NA	NA	NA	NA	Yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Curr. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								A) peristaltic pump w/ ded tubing
			1.5			(Inactive water well w/ sample port)					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5							Rusty brown	Standard groundwater sample:
			3.0							Cloudy	D) bailer due to limited column; or
			3.5					(purged 100 gal		prior to sampling)	E) recovery well cycling sample
			4.0								(F) irrigation well grab sample
						Chase Farms' Chris Kuykendahl will operate					well for HMI's
						sampling only; they do not use this					irrigation well,
						due to slightly elevated SC, per Chase					to HMI, 2021.

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	830	RA-3156	NM	7.28	21.9	3,520	5.6	6.0	>200	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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E. of MW-101; across street

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-313
Event: 1H21
Area of Concern: REST

[Irrigation and water-supply purpose, per Navajo]

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Screen: 904-1157)

Initials: BB (88)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/14/21	1335	NM	NM	NM	NM	NA	NA	NA	NA	YES		Weather: Sunny 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		No purge; active water well w/ sample port (By Tank 465)						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1335	RA-313	NM	8.34	23.8	1661	3.9	125.6	1.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Pecan Grove)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-7
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (* KWB-7 area was being flooded. All areas flooded around well also) Initials: BS (89)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to * Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1220	NP	19.54	0.00	34.83	30.6	Yes	YES	Yes	Yes		Weather: Cloudy 60's
4/14/21	1155	NP	19.67	0.00								

Well Purging Record Removed sock to gauge & reinstalled after sampling (reason for shallowing DTW meas. 4/14/21)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1200	17.68	0.5	6.93	19.4	3,280	3.4	-163.8	5.2	Colorless, clear (Strong HC odor)	*Low-flow groundwater sample:*
	1203	17.68	1.0	6.86	19.2	3,160	2.8	-184.6	4.3	" " "	(A) peristaltic pump w/ ded tubing
	1205	17.68	1.5	6.81	19.1	3,120	2.5	-191.4	3.3	" " "	B) ded bladder pump
	1208	17.68	2.0	6.78	19.0	3,090	2.2	-197.6	2.7	" " "	C) non-ded bladder pump; or
	1210	17.68	2.5	6.76	19.0	3,070	1.9	-199.8	2.1	" " "	*Standard groundwater sample:*
	1213	17.68	3.0	6.76	19.0	3,060	1.7	-201.4	1.9	" " "	D) bailer due to limited column; or
	1215	17.68	3.5	6.75	18.9	3,060	1.6	-202.3	1.8	" " "	E) recovery well cycling sample
↓	1218	17.68	4.0	6.75	18.9	3,050	1.6	-203.1	1.8	" " "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1220	KWB-7	17.68	6.75	18.9	3,050	1.6	-203.1	1.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-135
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: LDS (90)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1610	NP	34.59	0.00	65.55	50.0	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1615	34.60	0.5	7.27	19.1	7120	6.0	158.6	77.1	colorless / sl. cloudy	*Low-flow groundwater sample:*
	1617	34.60	1.0	7.00	18.6	7230	4.7	169.9	35.6	↓	A) peristaltic pump w/ ded tubing
	1620	34.60	1.5	6.86	18.4	7290	4.0	175.6	36.4	colorless / clear	(B) ded bladder pump
	1623	34.60	2.0	6.77	18.3	7300	3.8	181.6	28.9		C) non-ded bladder pump; or
	1625	34.60	2.5	6.73	18.3	7310	3.7	185.2	22.3		*Standard groundwater sample:*
	1627	34.60	3.0	6.71	18.3	7300	3.7	187.0	18.1		D) bailer due to limited column; or
	1630	34.60	3.5	6.69	18.3	7300	3.7	188.5	16.9		E) recovery well cycling sample
↓	1633	34.60	4.0	6.68	18.3	7280	3.7	189.9	15.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1635	MW-135	34.60	6.68	18.3	7280	3.7	189.9	15.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-20
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS/BA (91)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1325	NP	19.28	0.00	26.66	21.9	Yes	Yes	Yes	Yes		Weather: Pt cldy 60's
4/14/21	1010	NP	19.30	0.00								11

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1015	19.35	0.5	7.00	20.8	4470	4.5	83.7	6.5	Colorless, clear	*Low-flow groundwater sample:*
	1018	19.38	1.0	6.90	20.7	4470	4.1	91.4	5.7		(A) peristaltic pump w/ ded tubing
	1020	19.40	1.5	6.87	20.7	4450	3.9	94.1	4.3		B) ded bladder pump
	1023	19.40	2.0	6.85	20.7	4440	3.7	96.1	3.9		C) non-ded bladder pump; or
	1025	19.40	2.5	6.83	20.7	4440	3.7	96.5	3.1		*Standard groundwater sample:*
	1028	19.40	3.0	6.83	20.7	4440	3.6	96.9	2.8		D) bailer due to limited column; or
	1030	19.40	3.5	6.82	20.7	4430	3.5	97.2	2.0		E) recovery well cycling sample
	1033	19.40	4.0	6.82	20.7	4430	3.5	97.6	1.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1035	MW-20	19.40	6.82	20.7	4430	3.5	97.6	1.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-3
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS (92)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1338	NP	21.27	0.00	21.59	NS	Yes	Yes	Yes	Yes		Weather: PtCy Cldy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) baller due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-3								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-4
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials BS (93)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/23/25	1332	NP	33.97	0.00	36.98	NS	Yes	Yes	Yes	Yes		Weather: Partly Cldy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								Standard groundwater sample:
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-4								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record

(Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-2
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (94)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1344	NP	21.15	0.00	21.49	NS	Yes	Yes	Yes	Yes		Weather: Partly cldy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-2								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-1
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (95)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1355	NP	19.29	0.00	21.88	19.6	Yes	Yes	Yes	Yes		Weather: Sunny, Clear, 60's
4/14/21	1050	NP	19.31	0.00								

Well Purging Record

(*Double checked)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1055	19.31	0.5	6.84	18.3	4,150	3.4	418.6	4.1	Colorless, Clear	*Low-flow groundwater sample:*
	1058	19.31	1.0	6.81	18.2	4,130	3.1	439.7	3.2	" "	(A) peristaltic pump w/ ded tubing
	1100	19.31	1.5	6.78	18.2	4,120	2.9	457.8	2.4	" "	B) ded bladder pump
	1103	19.31	2.0	6.76	18.2	4,120	2.7	465.2	2.1	" "	C) non-ded bladder pump; or
	1105	19.31	2.5	6.75	18.1	4,120	2.6	470.8	1.9	" "	*Standard groundwater sample:*
	1108	19.31	3.0	6.74	18.1	4,110	2.6	478.3	1.6	" "	D) bailer due to limited column; or
	1110	19.31	3.5	6.74	18.1	4,110	2.5	481.6	1.6	" "	E) recovery well cycling sample
	1113	19.31	4.0	6.73	18.0	4,100	2.5	483.7	1.5	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1115	NP-1	19.31	6.73	18.0	4,100	2.5	483.7	1.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-6
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (96)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample * Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1350	NP	16.68	0.00	20.35	18.0	Yes	Yes	Yes	Yes		Weather: Overcast 60's
4/14/21	955	NP	16.64	0.00								

* lowered intake 18.0' (*double checked)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	* Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1000	16.64	0.5	6.94	18.5	5,490	3.3	390.4	6.9	Colorless, clear	*Low-flow groundwater sample:*
	1003	16.69	1.0	6.79	18.3	5,440	2.9	443.6	5.9	" "	(A) peristaltic pump w/ ded tubing
	1005	16.64	1.5	6.71	18.2	5,410	2.7	449.7	5.3	" "	B) ded bladder pump
	1008	16.64	2.0	6.63	18.2	5,390	2.5	457.2	4.7	" "	C) non-ded bladder pump; or
	1010	16.64	2.5	6.60	18.1	5,370	2.4	463.6	3.8	" "	*Standard groundwater sample:*
	1013	16.64	3.0	6.57	18.1	5,360	2.3	466.7	3.5	" "	D) bailer due to limited column; or
	1015	16.64	3.5	6.55	18.1	5,360	2.3	469.8	3.4	" "	E) recovery well cycling sample
↓	1018	16.64	4.0	6.53	18.1	5,350	2.2	471.1	3.4	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1020	NP-6	16.64	6.53	18.1	5,350	2.2	471.1	3.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-8
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB/BA (97)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1302	NP	17.93	0.00	23.30	18.3	yes	yes	yes	yes		Weather: PM, Cloudy 60's
4/14/21	925	ND	17.93	0.00								"

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	930	17.94	0.5	6.74	18.2	5430	2.7	94.0	8.1	colorless, clear	*Low-flow groundwater sample:*
	933	17.94	1.0	6.72	18.1	5420	2.5	93.8	7.6		(A) peristaltic pump w/ ded tubing
	935	17.94	1.5	6.71	18.1	5420	2.2	93.5	6.4		B) ded bladder pump
	938	17.94	2.0	6.71	18.0	5420	2.1	93.5	5.1		C) non-ded bladder pump; or
	940	17.94	2.5	6.71	18.0	5420	2.1	93.3	4.8		*Standard groundwater sample:*
	943	17.94	3.0	6.70	18.0	5410	2.1	93.0	3.9		D) bailer due to limited column; or
	945	17.94	3.5	6.70	18.0	5410	2.0	92.7	3.3		E) recovery well cycling sample
	948	17.94	4.0	6.70	18.0	5410	2.0	92.6	2.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	950	MW-8	17.94	6.70	18.0	5410	2.0	92.6	2.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Trip Blank - TMD-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-21
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS/BA (98)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1310	NP	17.23	0.00	25.12	19.9	Yes	Yes	Yes	Yes		Weather: Partly cldy 60's
4/14/21	840	NP	17.18	0.00								"

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	845	17.29	0.5	6.90	17.9	5100	3.5	98.3	11.1	Colorless, clear	*Low-flow groundwater sample:*
	848	17.32	1.0	6.88	17.9	5210	3.1	99.5	10.5		(A) peristaltic pump w/ ded tubing
	850	17.32	1.5	6.84	17.9	5220	3.0	101.8	9.6		B) ded bladder pump
	853	17.32	2.0	6.83	17.9	5240	2.9	107.0	7.4		C) non-ded bladder pump; or
	855	17.32	2.5	6.81	17.9	5280	2.7	120.5	5.9		*Standard groundwater sample:*
	858	17.32	3.0	6.80	17.9	5300	2.7	121.3	4.8		D) bailer due to limited column; or
	900	17.32	3.5	6.80	17.9	5310	2.7	123.6	4.2		E) recovery well cycling sample
↓	903	17.32	4.0	6.80	17.9	5310	2.8	126.1	3.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	905	MW-21	17.32	6.80	17.9	5310	2.8	126.1	3.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-9
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (99)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1315	NP	18.68	0.00	22.25	NS	Yes	Yes	Yes	Yes		Weather: PHy cldy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-9								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-71
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (100)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1243	NP	19.13	0.00	21.67	16.9	Yes	Yes	Yes	Yes	X	Weather: Overcast 60's
4/14/21	900	NP	19.11	0.00							Cracked Pad	

(Lowered to well base, permanently)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	905	19.12	0.5	7.01	19.8	6,660	2.9	98.6	4.9	Colorless, Clear	*Low-flow groundwater sample:*
	908	19.12	1.0	6.96	19.4	6,630	2.6	105.7	4.1	" "	(A) peristaltic pump w/ ded tubing
	910	19.12	1.5	6.91	19.1	6,610	2.4	109.3	3.7	" "	B) ded bladder pump
	913	19.12	2.0	6.89	18.9	6,590	2.3	111.2	2.9	" "	C) non-ded bladder pump; or
	915	19.12	2.5	6.87	18.7	6,580	2.2	112.6	2.3	" "	*Standard groundwater sample:*
	918	19.12	3.0	6.86	18.6	6,570	2.2	113.9	2.0	" "	D) bailer due to limited column; or
	920	19.12	3.5	6.86	18.6	6,570	2.1	114.3	1.8	" "	E) recovery well cycling sample
	923	19.12	4.0	6.85	18.6	6,560	2.1	115.1	1.8	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	925	MW-71	19.12	6.85	18.6	6,560	2.1	115.1	1.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-68
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS / BA (101)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1235	NP	25.50	0.00	26.52	23.5	yes	yes	yes	yes		Weather: Overcast 60's
4/14/21	800	NP	25.50	0.00								"

(Lowered intake to base of well)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	805	25.52	0.5	6.85	18.2	2450	5.4	76.0	8.8	colorless, clear	*Low-flow groundwater sample:*
	808	25.52	1.0	6.84	18.3	2600	5.2	78.4	7.6		(A) peristaltic pump w/ ded tubing
	810	25.52	1.5	6.83	18.4	2750	5.0	80.1	5.2		B) ded bladder pump
	813	25.52	2.0	6.82	18.4	2910	4.7	82.3	4.8		C) non-ded bladder pump; or
	815	25.52	2.5	6.82	18.5	3010	4.4	83.4	4.1		*Standard groundwater sample:*
	818	25.52	3.0	6.80	18.5	3040	4.2	83.9	3.9		D) bailer due to limited column; or
	820	25.52	3.5	6.80	18.6	3080	4.0	84.8	3.3		E) recovery well cycling sample
↓	823	25.52	4.0	6.79	18.6	3100	4.0	85.3	2.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	825	MW-68	25.52	6.79	18.6	3100	4.0	85.3	2.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-27
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (102)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1405	NP	20.89	0.00	30.28	25.0	Yes	Yes	Yes	Yes		Weather: Sunny 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1410	20.92	0.5	7.19	21.5	1,848	2.4	96.3	9.8	Colorless	Clear
	1413	20.92	1.0	7.08	21.3	1,990	2.1	103.7	7.2	"	"
	1415	20.92	1.5	7.03	21.2	2,150	1.9	107.2	6.3	"	"
	1418	20.92	2.0	6.99	21.1	2,180	1.7	109.8	4.9	"	"
	1420	20.92	2.5	6.97	21.1	2,190	1.6	111.3	4.3	"	"
	1423	20.92	3.0	6.95	21.0	2,200	1.6	111.9	4.0	"	"
	1425	20.92	3.5	6.94	21.0	2,210	1.5	112.4	3.8	"	"
	1428	20.92	4.0	6.92	20.9	2,210	1.5	113.0	3.7	"	"

Low flow groundwater sample:
(A) peristaltic pump w/ ded tubing
B) ded bladder pump
C) non-ded bladder pump; or
Standard groundwater sample:
D) bailer due to limited column; or
E) recovery well cycling sample
F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1430	MW-27	20.92	6.92	20.9	2,210	1.5	113.0	3.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-89
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (103)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1545	NP	12.44	0.00	20.28	15.2	Yes	Yes	Yes	Yes		Weather: Sunny 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1550	12.49	0.5	7.13	19.8	3,170	2.6	54.6	9.2	Colorless, Clear	*Low-flow groundwater sample:*
	1553	12.49	1.0	7.02	19.2	3,120	1.9	58.4	8.1	" "	(A) peristaltic pump w/ ded tubing
	1555	12.49	1.5	6.99	19.0	3,080	1.6	60.1	7.6	" "	B) ded bladder pump
	1558	12.49	2.0	6.97	18.9	3,060	1.5	61.8	6.2	" "	C) non-ded bladder pump; or
	1600	12.49	2.5	6.95	18.9	3,050	1.4	62.3	5.8	" "	*Standard groundwater sample:*
	1603	12.49	3.0	6.94	18.9	3,050	1.3	62.7	5.5	" "	D) bailer due to limited column; or
	1605	12.49	3.5	6.94	18.8	3,040	1.2	63.1	5.4	" "	E) recovery well cycling sample
	1608	12.49	4.0	6.93	18.8	3,040	1.2	63.2	5.3	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1610	MW-89	12.49	6.93	18.8	3,040	1.2	63.2	5.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-16
Event: 1421
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BTB (104)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1500	NP	9.92	0.00	21.24	16.2	Yes	Yes	Yes	Yes		Weather: Sunny 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1505	9.92	0.5	7.21	19.6	4,680	3.1	104.6	8.4	Colorless, clear	*Low-flow groundwater sample:*
"	1508	9.92	1.0	7.16	19.0	4,610	2.5	99.4	6.7	" "	(A) peristaltic pump w/ ded tubing
	1510	9.92	1.5	7.11	18.6	4,580	2.3	95.2	5.2	" "	B) ded bladder pump
	1513	9.92	2.0	7.09	18.4	4,570	2.2	93.8	4.4	" "	C) non-ded bladder pump; or
	1515	9.92	2.5	7.07	18.3	4,560	2.1	92.6	3.9	" "	*Standard groundwater sample:*
	1518	9.92	3.0	7.06	18.2	4,560	2.1	91.9	3.5	" "	D) bailer due to limited column; or
	1520	9.92	3.5	7.05	18.2	4,560	2.0	91.3	3.3	" "	E) recovery well cycling sample
↓	1523	9.92	4.0	7.05	18.2	4,550	2.0	90.7	3.2	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1525	MW-16	9.92	7.05	18.2	4,550	2.0	90.7	3.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-26
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB (105)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1630	NP	13.47	0.00	27.58	22.6	Yes	Yes	Yes	Yes		Weather: Sunny 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1635	13.51	0.5	7.31	19.4	6,480	2.3	89.6	8.1	Colorless, Clear	*Low flow groundwater sample:*
	1638	13.53	1.0	7.21	19.2	6,670	2.0	93.8	7.1	" "	(A) peristaltic pump w/ ded tubing
	1640	13.54	1.5	7.14	19.1	6,690	1.7	95.4	6.3	" "	B) ded bladder pump
	1643	13.55	2.0	7.11	19.0	6,700	1.5	96.2	4.3	" "	C) non-ded bladder pump; or
	1645	13.55	2.5	7.08	19.0	6,700	1.3	97.1	3.1	" "	*Standard groundwater sample:*
	1648	13.55	3.0	7.03	18.9	6,710	1.1	97.9	2.7	" "	D) bailer due to limited column; or
	1650	13.55	3.5	7.01	18.8	6,720	1.0	98.5	2.2	" "	E) recovery well cycling sample
V	1653	13.55	4.0	7.01	18.8	6,720	1.0	99.1	2.0	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1655	MW-26	13.55	7.01	18.8	6720	1.0	99.1	2.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02' remove LNAPL, and collect groundwater sample

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(Pecan grove access from 82 gate)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11A
Event: 1st 2)
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ (106)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	940	26.61	26.68	0.07	42.27	37.0	Yes	Yes	Yes	Yes		Weather: Sunny, 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not Sampled due to Presence							(A) peristaltic pump w/ ded tubing
			1.5	of LNAPL							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-11A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Pecan grove access from 82 gate)

Monitoring Well Purging and Sampling Record

(Removed sock & reinstalled after sampling)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11B
Event: 1H21
Area of Concern: REST

Completion	Casing Diam	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(107)

Initials: BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	945	NP	27.28	0.00	72.45	62.2	Yes	Yes	Yes	Yes	*	Weather: Sunny 50's

Well Purging Record

*Same as last event's. Severely cracked pad

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	950	27.49	0.5	6.97	18.5	3390	2.3	97.6	13.8	Colorless Clear	*Low-flow groundwater sample:*
	953	27.53	1.0	6.95	18.7	3279	1.8	100.7	10.2	" "	(A) peristaltic pump w/ ded tubing
	955	27.55	1.5	6.93	18.7	3275	1.5	104.2	7.3	" "	B) ded bladder pump
	958	27.56	2.0	6.92	18.8	3273	1.3	107.8	5.4	" "	C) non-ded bladder pump; or
	1003	27.57	2.5	6.91	18.8	3269	1.3	109.3	4.7	" "	*Standard groundwater sample:*
	1003	27.57	3.0	6.90	18.8	3267	1.2	111.0	4.2	" "	D) bailer due to limited column; or
	1005	27.57	3.5	6.90	18.8	3264	1.2	112.2	3.8	" "	E) recovery well cycling sample
↓	1008	27.57	4.0	6.89	18.9	3262	1.2	112.9	3.6	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1010	KWB-11B	27.57	6.89	18.9	3262	1.2	112.9	3.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Removed from Program by Navajo, 4-13-15

Monitoring Well Purging and Sampling Record (Former Jack Joy 575-365-6042)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-3AR
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(108)

Initials:

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		DO NOT ADDRESS						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
										Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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ATV - S. Ro Field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-115
Event: 1#21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ (109)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1714	~~NP~~	19.04	0.00	27.50	19.8	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/14/21	1545	NP	19.01	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1550	19.04	0.5	6.94	20.5	4,660	3.8	81.2	2.7	Colorless, clear	*Low-flow groundwater sample:*
	1553	19.05	1.0	6.87	20.1	4,420	3.1	84.3	2.2	" "	(A) peristaltic pump w/ ded tubing
	1555	19.05	1.5	6.84	19.9	4,390	2.7	86.7	1.9	" "	B) ded bladder pump
	1558	19.05	2.0	6.80	19.8	4,370	2.4	87.3	1.6	" "	C) non-ded bladder pump; or
	1600	19.05	2.5	6.77	19.7	4,360	2.2	88.2	1.3	" "	*Standard groundwater sample:*
	1603	19.05	3.0	6.75	19.7	4,350	2.0	88.7	1.1	" "	D) bailer due to limited column; or
	1605	19.05	3.5	6.74	19.6	4,350	1.9	89.2	1.0	" "	E) recovery well cycling sample
	1608	19.05	4.0	6.74	19.5	4,340	1.9	89.7	0.9	" "	F) Irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1610	MW-115	19.05	6.74	19.5	4,340	1.9	89.7	0.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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ATV - S. RO Field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-114
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS (110)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1721	NP	18.88	0.00	38.25	30.5	yes	yes	yes	yes		Weather: Sunny 70's
4/14/21	1450	NP	18.87	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1455	18.90	0.5	6.81	24.1	3980	4.3	77.8	4.6	Colorless, Clear	*Low-flow groundwater sample:*
	1458	18.90	1.0	6.72	23.0	3,720	3.0	81.4	3.4	" "	(A) peristaltic pump w/ ded tubing
	1500	18.90	1.5	6.68	22.6	3,570	2.6	83.6	2.9	" "	B) ded bladder pump
	1503	18.90	2.0	6.65	22.4	3,460	2.1	85.7	2.5	" "	C) non-ded bladder pump; or
	1505	18.90	2.5	6.63	22.2	3,410	1.8	87.1	2.2	" "	*Standard groundwater sample:*
	1508	18.90	3.0	6.62	22.1	3,390	1.7	88.2	2.0	" "	D) bailer due to limited column; or
	1510	18.90	3.5	6.62	22.1	3,370	1.6	89.4	2.0	" "	E) recovery well cycling sample
	1513	18.90	4.0	6.62	22.0	3,360	1.6	90.1	1.9	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1515	MW-114	18.90	6.62	22.0	3,360	1.6	90.1	1.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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ATV - S. RO Field (mesquite !!)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-125
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BO (III)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1706	NP	21.74	0.00	28.31	23.5	yes	yes	yes	yes		Weather: Sunny 70's
4/14/21	1400	NP	21.72	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1405	21.76	0.5	6.94	21.8	4,170	4.5	68.8	10.4	Colorless clear	*Low-flow groundwater sample:*
	1408	21.78	1.0	6.87	20.9	4,250	3.9	78.2	8.6	" "	(A) peristaltic pump w/ ded tubing
	1410	21.79	1.5	6.83	20.6	4,280	3.4	78.8	6.9	" "	B) ded bladder pump
	1413	21.80	2.0	6.78	20.4	4,320	2.9	79.3	5.2	" "	C) non-ded bladder pump; or
	1415	21.80	2.5	6.75	20.3	4,340	2.5	79.6	4.5	" "	*Standard groundwater sample:*
	1418	21.80	3.0	6.73	20.3	4,350	2.4	79.8	4.3	" "	D) bailer due to limited column; or
	1420	21.80	3.5	6.72	20.2	4,350	2.3	80.1	4.2	" "	E) recovery well cycling sample
	1423	21.80	4.0	6.72	20.1	4,360	2.3	80.3	4.0	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1425	MW-125	21.80	6.72	20.1	4360	2.3	80.3	4.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-117
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in .	SS __
Vault __	Other .	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OSD (112)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1340	NP	16.33	0.00	27.22	19.7	yes	yes	yes	yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1345	16.33	0.5	6.63	20.2	3470	2.7	99.6	22.6	Colorless/Clear	*Low-flow groundwater sample:*
	1348	16.33	1.0	6.60	20.1	3490	2.4	88.6	17.3		(A) peristaltic pump w/ ded tubing
	1350	16.33	1.5	6.58	19.8	3520	2.2	85.3	13.5		B) ded bladder pump
	1353	16.33	2.0	6.55	19.5	3550	2.1	82.1	12.1		C) non-ded bladder pump; or
	1355	16.33	2.5	6.51	19.3	3580	2.0	78.9	10.8		*Standard groundwater sample:*
	1358	16.33	3.0	6.47	19.2	3590	1.9	75.4	9.7		D) bailer due to limited column; or
	1400	16.33	3.5	6.43	19.1	3610	1.9	72.6	9.1		E) recovery well cycling sample
	1403	16.33	4.0	6.41	19.1	3630	1.8	70.8	8.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1405	MW-117	16.33	6.41	19.1	3630	1.8	70.8	8.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-118
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade _	2-in ✓	PVC ✓
Upright ✓	4-in _	SS _
Vault _	Other _	Other _

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: DSD (113)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1255	NP	19.95	0.00	28.29	21.0	yes	yes	yes	yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1300	20.07	0.5	6.87	19.8	3470	4.5	87.0	26.4	Color/Less/Clear	Low-flow groundwater sample:
	1303	20.12	1.0	6.80	19.5	3680	4.2	85.3	20.7		(A) peristaltic pump w/ ded tubing
	1305	20.17	1.5	6.75	19.3	3730	4.0	83.1	18.3		B) ded bladder pump
	1308	20.23	2.0	6.73	19.3	3750	3.8	82.4	15.4		C) non-ded bladder pump; or
	1310	20.26	2.5	6.70	19.2	3780	3.7	80.7	13.1		Standard groundwater sample:
	1313	20.29	3.0	6.66	19.2	3810	3.6	78.8	11.7		D) bailer due to limited column; or
	1315	20.35	3.5	6.63	19.1	3820	3.6	77.3	10.8		E) recovery well cycling sample
	1318	20.39	4.0	6.60	19.1	3830	3.5	76.1	9.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1320	MW-118	20.39	6.60	19.1	3830	3.5	76.1	9.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-9
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OSD (114)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
9-13-21	1295	NP	19.29	0.00	25.65	NS	yes	yes	yes	yes		Weather: Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								Standard groundwater sample:
			3.0								D) baller due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NP-9								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-119
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: DSD (115)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1205	NP	19.71	0.00	28.11	20.8	yes	yes	yes	yes		Weather: Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1210	19.75	0.5	6.78	19.2	3320	2.7	87.7	39.8	colorless/clear	*Low-flow groundwater sample:*
	1213	19.75	1.0	6.71	19.1	3670	2.5	84.6	30.6		(A) peristaltic pump w/ ded tubing
	1215	19.75	1.5	6.68	19.1	3730	2.3	80.7	27.4		B) ded bladder pump
	1218	19.75	2.0	6.63	19.0	3750	2.2	77.4	22.3		C) non-ded bladder pump; or
	1220	19.75	2.5	6.58	19.0	3770	2.1	73.6	20.7		*Standard groundwater sample:*
	1223	19.75	3.0	6.53	18.9	3780	2.0	70.6	19.2		D) bailer due to limited column; or
	1225	19.75	3.5	6.51	18.9	3790	2.0	66.8	18.5		E) recovery well cycling sample
	1228	19.75	4.0	6.48	18.8	3790	1.9	63.1	17.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1230	MW-119	19.75	6.48	18.8	3790	1.9	63.1	17.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Located: inside locked gate. Contact security to have gate unlocked. 575-746-5438

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-5
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (116)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	940	ND	19.92	0.00	25.09	20.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	945	19.93	0.5	7.17	18.9	6360	3.5	127.4	31.7	Colorless / Clear	*Low-flow groundwater sample:*
	947	19.99	1.0	7.07	18.7	6420	2.9	129.8	25.0		(A) peristaltic pump w/ ded tubing
	950	19.99	1.5	6.98	18.7	6450	2.6	134.1	20.7		B) ded bladder pump
	953	19.99	2.0	6.94	18.6	6460	2.3	137.8	19.6		C) non-ded bladder pump; or
	955	19.99	2.5	6.92	18.8	6430	2.2	139.4	23.9		*Standard groundwater sample:*
	957	19.99	3.0	6.88	19.0	6420	2.2	140.3	21.7		D) bailer due to limited column; or
	1000	19.99	3.5	6.88	19.0	6430	2.2	141.1	20.4		E) recovery well cycling sample
↓	1003	19.99	4.0	6.87	19.0	6430	2.2	141.7	19.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1005	NP-5	19.99	6.87	19.0	6430	2.2	141.7	19.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-136
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-In ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GS (117)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1035	NP	18.36	0.00	27.90	23.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1040	18.39	0.5	7.05	19.6	4990	2.7	150.1	41.1	Colorless / Sl. Cloudy	*Low-flow groundwater sample:*
	1043	18.40	1.0	6.96	19.5	4920	1.8	152.4	36.0	↓	(A) peristaltic pump w/ ded tubing
	1045	18.40	1.5	6.85	19.5	4870	1.6	154.0	30.8	colorless / clear	B) ded bladder pump
	1047	18.40	2.0	6.81	19.4	4840	1.6	154.0	25.9		C) non-ded bladder pump; or
	1050	18.40	2.5	6.79	19.4	4830	1.6	155.1	22.1		*Standard groundwater sample:*
	1053	18.40	3.0	6.77	19.3	4820	1.6	156.8	20.5		D) bailer due to limited column; or
	1055	18.40	3.5	6.77	19.4	4810	1.6	158.4	19.0		E) recovery well cycling sample
↓	1057	18.40	4.0	6.76	19.4	4810	1.6	157.9	17.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1100	MW-136	18.40	6.76	19.4	4810	1.6	157.9	17.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126A
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GOS (118)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	836	22.71	23.29	0.58	37.51	29.5	Yes	Yes	Yes	Yes		Weather: Cloudy, 40's
			(23.29)									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT SAMPLED due to						C) non-ded bladder pump; or
			2.5		LNAPL Thickness ≥ 0.03'						*Standstill groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-126A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126B
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (119)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	840	NP	22.71	0.00	51.43	48.4	Yes	Yes	Yes	Yes		Weather: Partly cloudy, 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	845	22.81	0.5	5.88	17.9	5200	3.3	112.2	18.6	CLEAR / colorless	Low-flow groundwater sample:
	847	22.81	1.0	6.12	18.0	5240	2.3	111.3	20.6		(A) peristaltic pump w/ ded tubing
	850	22.81	1.5	6.23	18.0	5260	1.9	112.9	24.1		B) ded bladder pump
	853	22.81	2.0	6.33	17.9	5270	1.8	112.5	22.0		C) non-ded bladder pump; or
	855	22.81	2.5	6.38	18.1	5260	1.9	116.8	21.4		Standard groundwater sample:
	857	22.81	3.0	6.40	18.2	5260	1.8	119.5	20.6		D) bailer due to limited column; or
	900	22.81	3.5	6.44	18.1	5260	1.8	121.8	20.1		E) recovery well cycling sample
	903	22.81	4.0	6.46	18.1	5260	1.8	122.4	19.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	905	MW-126B	22.81	6.46	18.1	5260	1.8	122.4	19.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-127
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (120)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	825	24.61	26.03	1.42	53.21	38.4	Yes	Yes	Yes	Yes		Weather: Cloudy, 40's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		NOT SAMPLED DUE to						*Standard groundwater sample:*
			3.0		LNAPL thickness ≥ 0.03'						D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-127								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Recompleted at-grade prior to 1H21)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-129
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (121)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1317	25.10	25.98	0.88	50.78	NA (5' off base if sampled)	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT SAMPLED DUE TO WELL						C) non-ded bladder pump; or
			2.5		HAVING LNAPL THICKNESS						*Standard groundwater sample:*
			3.0		≥ 0.03'						D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-129								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.02'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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[DRY 4/13/21]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#18A
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH (122)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1220	DRY	DRY	DRY	17.78	~~16.7~~	YES	YES	YES	YES		Weather: pt. cloudy, 50s

↳ * DRY 4/13/21

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0		well	Dry	4/13/21	;(Sediment		mated on probe tip	(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) baller due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		RW-#18A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
					NO	SAMPLE	/	DRY				

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1A
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: (DJ) (123)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1336	19.75	20.81	1.06	33.50	25.8	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ dedt tubing
			1.5								B) ded bladder pump
			2.0		Not	Sampled	Due to well				C) non-ded bladder pump; or
			2.5		having	LNAPL	thickness				*Standard groundwater sample:*
			3.0			≥ 0.03'					D) baller due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-1A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1B
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RAS (124)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1342	21.40	22.67	1.27	33.92	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-1B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 1C
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: KDS (125)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1350	NP	22.28	0.00	52.71	42.7	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1355	22.31	0.5	6.97	20.8	5710	2.7	132.8	190	TAN / cloudy	*Low-flow groundwater sample:*
	1357	22.31	1.0	6.80	20.6	5700	1.2	137.4	89.9	TAN / sl. cloudy	(A) peristaltic pump w/ ded tubing
	1400	22.31	1.5	6.70	20.4	5670	1.3	140.1	58.1	↓	B) ded bladder pump
	1403	22.31	2.0	6.68	20.4	5650	1.2	146.1	30.6	colorless / clear	C) non-ded bladder pump; or
	1405	22.31	2.5	6.64	19.9	5680	1.2	147.5	24.3		*Standard groundwater sample:*
	1407	22.31	3.0	6.62	19.8	5670	1.1	147.0	23.7		D) bailer due to limited column; or
	1410	22.31	3.5	6.61	19.9	5660	1.1	140.7	25.0		E) recovery well cycling sample
↓	1413	22.31	4.0	6.60	20.0	5660	1.1	141.6	23.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4/13/21	1415	KWB-1C	22.31	6.60	20.0	5660	1.1	141.6	23.2	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Located ~25' N. of original KWB-10 pad)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-10R
Event: 1122
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (126)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1328	20.79	23.19	2.40	29.46	22.0	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT	SAMPLED	DUE	TO	WELL	HAVING	C) non-ded bladder pump; or
			2.5			LNAPL	THICKNESS	≥	0.03'		*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-10R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-131
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: LGS (127)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1438	27.31	29.35	2.04	53.35	38.1	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			Not Sampled due to well					C) non-ded bladder pump; or
			2.5			having LNAPL thickness					*Standard groundwater sample:*
			3.0			≥ 0.03'					D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-131								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-5
Event: (H2)
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: DSD (128)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	850	27.40	29.31	1.91	37.68	30.7	yes	yes	yes	yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21			0.5								*Low-flow groundwater sample:*
			1.0			NOT	SAMPLED	DUE	to		A) peristaltic pump w/ ded tubing
			1.5			LNAPL	≥ 0.03				(B) ded bladder pump *
			2.0			!					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0							NOTE:	F) irrigation well grab sample
										* Navajo removed	HMI - bladder pump &
										misplaced, after	searching on 4/14/21.

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-5								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-111
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OSD (129)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	900	28.60	29.74	1.14	40.83	35.8	yes	yes	yes	yes		Weather: Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21			0.5								*Low-flow groundwater sample:*
			1.0		NOT SAMPLED DUE TO						A) peristaltic pump w/ ded tubing
			1.5		LNAPL thickness ≥ 0.03						B) ded bladder pump *
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0							NOTE:	F) irrigation well grab sample
										* Navajo removed HMI bladder pump & misplaced, after searching on 4/14/21	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-111								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-6
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: LDS (130)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1303	26.07	28.65	2.58	36.44	27.4	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT Sampled due to well						C) non-ded bladder pump; or
			2.5		having LNAPL Thickness						*Standard groundwater sample:*
			3.0		≥ 0.03'						D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-6								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-112
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS (131)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1308	25.13	27.72	2.59	37.54	32.5	Yes	yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT SAMPLED	DUE TO	WELL				C) non-ded bladder pump; or
			2.5		HAVING	LNAPL	THICKNESS				*Standard groundwater sample:*
			3.0		20.59'						D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-112								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-132
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GOS (132)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1247	722.85	722.85	NM	42.06	NA	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
			*									

Well Purging Record

* Top of Navajo's LNAPL skimmer pump

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5				[Navajo's LNAPL				B) ded bladder pump
			2.0			NOT SAMPLED;	SKIMMER pump				C) non-ded bladder pump; or
			2.5			has been installed in well					*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0		[Historical		LNAPL	present]			F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-132								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Located inside yellow vault; furthest South

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-57
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: DSO

(133)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1050	NP	25.81	0.00	34.32	32.8	yes	yes	yes	yes		Weather: Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1055	25.91	0.5	6.66	20.7	2950	4.6	67.1	10.8	COLORLESS/CLEAR	Low-flow groundwater sample:
	1058	25.95	1.0	6.60	20.3	3050	4.5	70.3	9.1		A) peristaltic pump w/ ded tubing
	1100	26.07	1.5	6.57	20.2	3070	4.2	73.4	8.6		(B) ded bladder pump
	1103	26.13	2.0	6.53	20.1	3090	4.0	78.9	8.1		C) non-ded bladder pump; or
	1105	26.17	2.5	6.50	20.1	3110	3.9	82.1	7.3		Standard groundwater sample:
	1108	26.21	3.0	6.48	20.0	3130	3.9	87.8	7.1		D) bailer due to limited column; or
	1110	26.27	3.5	6.45	19.9	3140	3.8	92.8	6.6		E) recovery well cycling sample
↓	1113	26.33	4.0	6.41	19.8	3150	3.8	98.7	6.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1115	MW-57	26.33	6.41	19.8	3150	3.8	98.7	6.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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~32" corrugated stickup

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#11-O
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC __
Upright ✓	4-in __	SS __
Vault __	Other 32-in	Other ✓ corrugated pipe

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OSD (134)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1130	Dry	Dry	Dry	22.20	NA	yes	yes	yes	yes		Weather: Clear 70°S

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			Well is		dry			C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample
											(Historically not sampled)

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-#11-O								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(until further notice, do not address in any way, per Navajo 4-26-16)

Monitoring Well Purging and Sampling Record

(Farmer - Jack Joy, 575-365-6042)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-9
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: KS (135)

Well Inspection Information

(Historically - well casing obstructed @ 15.11')

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1241	NM	NM	NM	NM	NA	—	—	—	—		Weather: Partly Cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		DO NOT ADDRESS						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-9								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12A
Event: 1N21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(136)

Initials: DSD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	925	Dry	Dry	Dry	25.03	24.9	yes	yes	yes	yes		Weather: Clear 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5			well confirmed Dry					*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-12A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup-REST-05
+ EB-REST-05
+ Trip Blank-REST-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12B
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: DSO (137)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	940	NP	28.31	0.00	39.39	35.2	yes	yes	yes	yes		Weather: CLEAR 70S

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	945	28.38	0.5	6.45	20.4	2950	4.8	81.6	8.1	Colorless/Clear	*Low-flow groundwater sample:*
	948	28.38	1.0	6.40	20.3	2970	4.5	87.3	7.8		A) peristaltic pump w/ ded tubing
	950	28.38	1.5	6.38	20.1	2990	4.3	92.7	7.1		(B) ded bladder pump
	953	28.38	2.0	6.37	19.8	3010	4.1	99.9	6.6		C) non-ded bladder pump; or
	955	28.38	2.5	6.35	19.5	3020	4.0	105.7	6.1		*Standard groundwater sample:*
	958	28.38	3.0	6.33	19.3	3020	3.9	110.8	5.8		D) bailer due to limited column; or
	1000	28.38	3.5	6.32	19.3	3020	3.9	113.6	5.1		E) recovery well cycling sample
	1003	28.38	4.0	6.31	19.3	3030	3.8	117.8	4.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1005	KWB-12B	28.38	6.31	19.3	3030	3.8	117.8	4.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	1200	Dup-REST-05	28.38	6.31	19.3	3030	3.8	117.8	4.8	Per COC	Per COC	
	1025	EB-REST-05	NA							Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-2R
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: (138)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	915	26.36	26.52	0.16	39.39	32.4	*ISSue	ISSue	ISSue	ISSue	✓	Weather:

Well Purging Record

*At Grade completion Damaged, Reeds Replacing; PVC well Remains functional

Date	Time	Depth to Water (Ft-TOC)	Curr. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		NOT	SAMPLED	Due to	LNAPL	>0.03		(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-2R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-58
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials DSD (139)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	910	25.08	26.49	1.41	33.06	25.6	yes	yes	yes	yes		Weather: Clear (60's)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED	Due to LNAPL			70.03		B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-58								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

* START - cycle pump due to limited H2O column

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-13
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: LDS (140)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1145	* NP	*29.78	0.00	33.10	*30.1	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 60's
						* (OVERED intake to base of well (33.0' TOC)						

* Removed pump to gauge

* Top of pump @ 28.40; pump length is 4.5'

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1150	728.40	0.5	6.63	21.2	4570	5.5	194.6	>200	TAN / cloudy	*Low-flow groundwater sample:*
	1153	728.40	1.0	6.63	21.3	4540	5.0	198.8	>200		A) peristaltic pump w/ ded tubing
	1155	728.40	1.5	6.64	20.9	4550	4.7	249.8	>200		(B) ded bladder pump
	1157	728.40	2.0	6.65	20.6	4550	4.6	202.9	>200		C) non-ded bladder pump; or
	1200	728.40	2.5	6.67	20.5	4570	4.7	205.1	>200		*Standard groundwater sample:*
	1203	728.40	3.0	6.67	20.4	4560	4.7	208.8	>200		D) bailer due to limited column; or
	1205	728.40	3.5	6.65	20.5	4560	4.8	210.4	>200		E) recovery well cycling sample
	1207	728.40	4.0	6.66	20.4	4570	4.8	209.6	>200		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1210	KWB-13	728.40	6.66	20.4	4570	4.8	209.6	>200	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Sign-in & permit from South Crude Control Room prior to entry

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-103
Event: 1N21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SLa (141)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1345	NP	18.49	0.00	25.22	22.2	Yes	Yes	Yes	Yes		Weather: p.cl. cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1350	18.75	0.5	6.99	26.8	12,540	2.9	-275.1	18.0	colorless, clear	*Low-flow groundwater sample:*
	1352	18.81	1.0	6.98	26.9	12,730	2.4	-277.8	18.4		(A) peristaltic pump w/ ded tubing
	1355	18.87	1.5	6.98	27.0	12,850	2.0	-280.5	18.1		B) ded bladder pump
	1357	18.91	2.0	6.97	27.1	12,970	1.6	-283.5	19.5		C) non-ded bladder pump; or
	1400	18.94	2.5	6.97	27.2	13,030	1.4	-285.4	19.9		*Standard groundwater sample:*
	1402	18.97	3.0	6.97	27.3	13,100	1.3	-287.5	21.4		D) bailer due to limited column; or
	1405	19.00	3.5	6.97	27.3	13,120	1.3	-288.3	21.7		E) recovery well cycling sample
	1407	19.03	4.0	6.97	27.3	13,140	1.3	-288.9	23.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1410	MW-103	19.03	6.97	27.3	13,140	1.3	-288.9	23.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Sign-in & Permit from South Crude Control Room prior to entry

Monitoring Well Purging and Sampling Record

+ Dup-REST-02
+ EB-REST-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-104
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCG (142)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1235	NP	13.22	0.00	21.97	19.0	Yes	Yes	Yes	Yes		Weather: ph cloudy, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1240	13.35	0.5	6.98	22.4	2130	2.1	-278.5	10.1	colorless, clear	*Low-flow groundwater sample:*
	1242	13.41	1.0	7.00	22.3	2120	1.9	-282.0	7.6		(A) peristaltic pump w/ ded tubing
	1245	13.46	1.5	7.01	22.2	2100	1.6	-287.5	7.2		B) ded bladder pump
	1247	13.50	2.0	7.02	22.1	2090	1.4	-290.1	7.0		C) non-ded bladder pump; or
	1250	13.53	2.5	7.03	22.0	2070	1.3	-294.5	5.4		*Standard groundwater sample:*
	1252	13.56	3.0	7.04	22.0	2070	1.3	-295.6	4.8		D) bailer due to limited column; or
	1255	13.59	3.5	7.03	22.1	2050	1.2	-299.8	4.3		E) recovery well cycling sample
	1257	13.62	4.0	7.04	22.1	2050	1.2	-299.9	4.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1300	MW-104	13.62	7.04	22.1	2050	1.2	-299.9	4.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet TN
	1200	DUP-REST-02	13.62	7.04	22.1	2050	1.2	-299.9	4.2	Per COC	Per COC	
	1305	EB-REST-02	NA							Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03', if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube; stretch to outside of berm

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-64
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(143)

Well Inspection Information

(Removed sock prior to sampling; replaced when finished)

Initials: SCG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1435	NP	22.46	0.00	34.08	26.6	Yes	Yes	Yes	Yes		Weather: clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1440	22.86	0.5	6.93	27.8	3090	2.1	-278.4	23.6	colorless, clear, odor	*Low-flow groundwater sample:*
	1442	22.75	1.0	6.91	27.8	3000	1.9	-282.5	23.7		(A) peristaltic pump w/ ded tubing
	1445	22.87	1.5	6.87	27.7	2820	1.8	-287.3	23.8		B) ded bladder pump
	1447	22.86	2.0	6.86	27.5	2780	1.7	-291.5	22.1		C) non-ded bladder pump; or
	1450	22.87	2.5	6.85	27.5	2760	1.6	-293.4	20.4		*Standard groundwater sample:*
	1452	22.87	3.0	6.85	27.5	2750	1.6	-295.1	20.0		D) bailer due to limited column; or
	1455	22.87	3.5	6.85	27.5	2720	1.6	-297.4	19.8		E) recovery well cycling sample
	1457	22.87	4.0	6.84	27.5	2710	1.6	-297.8	19.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1500	MW-64	22.87	6.84	27.5	2710	1.6	-297.8	19.5	Per COC	Per COC	Lab: Pace National. Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube; Located in front of Navajo storage shed.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-65
Event: 1H21
Area of Concern: BEST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Navajo's sock pulled from well to permit gauging (oil-soaked); then replaced in well; (recommendation; replace sock w/ shorter cord)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCG

144

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1520	19.93	20.10	0.27	28.78	23.8	Yes	Yes	Yes	Yes		Weather: clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color/Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0			Not	Sampled /				(A) peristaltic pump w/ ded tubing
			1.5			LNAPL	present				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0				(dark brown; crude oil-like)				D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		MW-65								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge to top of guide-pipe

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-5R
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Above-grade Vault ✓	Other ✓	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCG (145)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1535	20.09	20.17	0.08	NM	24.0	Yes	Yes	Yes	Yes		Weather: Clear, 60S
					(pump in well; prepared total depth = 35; 30 Ft-TOC historically)							

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5			NOT	SAMPLED				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5			LNAPL	PRESENT				*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5				(yellow, refined product-like)				(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		RW-5R								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tubc; do not dedicate, per historical observations.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-102
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

jmt replaced degraded 4-in expandable locking cap

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCG (146)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1555	NP	17.44	0.00	26.45	21.3	4x5	4x5	4x5	4x5		Weather: clear, 60s
4/14/21	1600	NP	17.42	0.00	26.45	21.3						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1610	17.45	0.5	6.80	25.5	2280	2.0	-272.4	36.6	colorless, clear	*Low-flow groundwater sample:*
	1612	17.45	1.0	6.78	25.2	2280	1.7	-274.0	19.1		(A) peristaltic pump w/ ded tubing
	1615	17.45	1.5	6.77	25.2	2290	1.5	-275.9	15.5		B) ded bladder pump
	1617	17.45	2.0	6.77	25.3	2290	1.5	-277.4	14.9		C) non-ded bladder pump; or
	1620	17.45	2.5	6.76	25.2	2290	1.5	-281.4	14.4		*Standard groundwater sample:*
	1622	17.45	3.0	6.75	25.1	2300	1.5	-285.0	13.9		D) bailer due to limited column; or
	1625	17.45	3.5	6.75	25.1	2300	1.5	-286.0	13.6		E) recovery well cycling sample
↓	1627	17.45	4.0	6.75	25.0	2300	1.4	-286.3	13.0	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4/14/21	1630	MW-102	17.45	6.75	25.0	2300	1.4	-286.3	13.0	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-4
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other ✓	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCG (147)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1600	15.99	16.50	0.51	36.62	31.6	Yes	Yes	Yes	Yes		Weather: clear, 60s

Well Purging Record

* Gauge/Sample through labeled guide-pipe.
* Drawdown not measured (narrow diam guide-pipe)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21		NM*	0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED,						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		LNAPL PRESENT						*Standard groundwater sample:*
			3.0								D) baller due to limited column; or
			3.5				(very light yellow, low viscosity)				E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		RW-4								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-6
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other ✓	Other __

Recovery well Doghouse

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM (148)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1610	17.12	23.90	6.78	34.90	30.0	Yes	Yes	Yes	Yes		Weather: clear, 60s
			(As signaled produced by oil/water interface probe, - SCM						4/13/21)			

Well Purging Record

* Gauge/Sample through labeled guide-pipe
* Drawdown not measured (narrow diam. guide-pipe)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21		NM *	0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			NOT	SAMPLED /				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5			LNAPL	PRESENT				*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5				(Light	yellow,	low-viscosity		E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		RW-6								Per COC	Per COC	Lab: Pace National- Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Position marked on adjacent fence; well is ~4' N. of chain-link fence; Possibly covered by gravel/silt.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-99
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS
Vault __	Other __	Other __

(Stick-up well)

Hydrologic Monitoring for TRC
Houston, Texas

Initials: SCG

149

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1625	21.52	23.13	1.61	27.80	22.8	Yes	Yes	Yes	Yes		Weather: clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (l)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		LNAPL	PRESENT					*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		MW-99								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Middle of gravel road; location marked on adjacent chain-link fence.

Monitoring Well Purging and Sampling Record

Tube was removed from well, unexpectedly.

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-66
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

HMW replaced degraded 4-in expandable locking cap

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH (150)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1045	NP	21.12	0.00	29.80	~~24.8~~	Yes	Yes	Yes	Yes		Weather: Clear, 60s
4/14/21	1505	NP	21.12	0.00	29.80	26.8						

Well Purging Record

Navajo removed tube unexpectedly; Installed new tube w/ intake @ 26.8'

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1515	21.27	0.5	6.83	23.9	2140	2.8	-115.9	102.1	Sl. cloudy	Low-flow groundwater sample:
	1517	21.34	1.0	6.79	23.9	2120	2.5	-118.1	99.4		(A) peristaltic pump w/ ded tubing
	1520	21.35	1.5	6.77	23.7	2110	2.1	-120.1	97.8		B) ded bladder pump
	1522	21.35	2.0	6.75	23.5	~~2090~~	1.8	-122.4	96.0		C) non-ded bladder pump; or
	1525	21.35	2.5	6.74	23.8	2080	1.8	-123.1	96.1		Standard groundwater sample:
	1527	21.35	3.0	6.73	23.8	2070	1.8	-125.7	93.7		D) bailer due to limited column; or
	1530	21.35	3.5	6.73	23.9	2070	1.7	-124.1	91.9		E) recovery well cycling sample
	1532	21.35	4.0	6.73	23.9	2070	1.7	-124.3	91.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1535	MW-66	21.35	6.73	23.9	2070	1.7	-124.3	91.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube.

Monitoring Well Purging and Sampling Record

Tube removed from well, unexpectedly, likely due to LNAPL

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-28
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Formerly: Extended vertically through gravel berm
Converted to upright completion (in area of former berm, cut out to ground surface, pre 1120. Initials: SCH

Hydrologic Monitoring
for TRC
Houston, Texas
(151)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1450	22.12	23.10	0.98	27.82	23.8	Yes	Yes	Yes	Yes		Weather: clear, 60s

Well Purging Record

LNAPL signal on probe was confirmed using clear bailer (photo)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED;						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		LNAPL PRESENT						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5			(dark brown); low		viscosity			E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		MW-28								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-59
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH (152)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1720	19.50	20.43	0.93	32.72	25.3	Yes	Yes	Yes	Yes		Weather: clear, 60s

(confirmed with clear bailer (photo))

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0			NOT	SAMPLED;				(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			LNAPL	present				C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0				(dk brown, low viscosity)				D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		MW-59								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Support-trailer parking area)

Monitoring Well Purging and Sampling Record

+ Dup-REST-04
+ EB-REST-04

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-60
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SVG (153)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1735	20.59	22.20	1.61	37.78	26.7	Yes	Yes	Yes	Yes		Weather: clear, 60s

(confirmed with clear bailer (photo)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0		NOT	SAMPLED;					(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		LNAPL PRESENT						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0							(dark brown, low viscosity)	D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		MW-60								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
		DUP-REST-04								Per COC	Per COC	
		EB-REST-04 NA								Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-107
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH (154)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1705	18.72	18.80	0.08	19.05	17.1	Yes	Yes	Yes	Yes		Weather: clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0			NOT	SAMPLED				(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			LNAPL	PRESENT				C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4/13/21		MW-107								Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Located 15' NW of NW corner of berm; Commonly buried by gravel/silt

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-128
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM (155)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1715	20.48	22.78	2.30	35.35	25.4	YES	YES	YES	YES		Weather: clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0			NOT SAMPLED;					(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0				LNAPL PRESENT				C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21		MW-128								Per COC	Per COC	Lab: Pace National Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged extension (when Flooded)

Monitoring Well Purging and Sampling Record

+ Trip Blank - REST-03

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-116
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH

(156)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1800	NP	19.17	0.00	27.63	20.0	Yes	Yes	Yes	Yes		Weather: clear, 60s
4/14/21	1500	NP	19.15	0.00	27.63	20.0						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1505	19.17	0.5	7.17	20.4	3,130	2.5	-112.7	21.6	Clear, colorless	*Low-flow groundwater sample:*
	1507	19.17	1.0	7.09	20.0	3130	2.1	-111.3	11.8		(A) peristaltic pump w/ ded tubing
	1510	19.17	1.5	6.99	19.4	3180	1.7	-111.4	10.2		B) ded bladder pump
	1513	19.17	2.0	6.93	19.2	3170	1.5	-112.5	9.6		C) non-ded bladder pump; or
	1515	19.17	2.5	6.91	19.0	3050	1.4	-112.7	9.4		*Standard groundwater sample:*
	1517	19.17	3.0	6.89	19.0	3050	1.4	-111.4	8.8		D) bailer due to limited column; or
	1520	19.17	3.5	6.88	19.0	3040	1.5	-111.1	7.9		E) recovery well cycling sample
	1523	19.17	4.0	6.87	19.0	3040	1.5	-110.9	7.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1525	mw-116	19.17	6.87	19.0	3040	1.5	-110.9	7.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if I NAPL thickness is greater than, or equal to 0.03'; if I NAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-46R
Event: 1H21
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

N. side of dirt road; in line with westernmost row of pecan trees; Position marked on adjacent chain-link fence (12' S. of fence)

Hydrologic Monitoring
for TRC
Houston, Texas

(157)

Initials: SCY

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1315	NP	16.59	0.00	19.10	19.00	Yes	Yes	Yes	Yes		Weather: clear, 60's
4/14/20	1340	NP	16.59	0.00	19.10	19.00						

(permanently moved in table from 14.10 to 19.10 due to clearing DTW)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1345	16.61	0.5	6.78	23.3	3410	3.9	42.9	24.7	colorless, clear	*Low-flow groundwater sample:*
	1347	16.61	1.0	6.77	23.1	3440	3.5	46.2	22.1		(A) peristaltic pump w/ ded tubing
	1350	16.61	1.5	6.77	22.8	3540	3.0	52.4	20.8		B) ded bladder pump
	1352	16.61	2.0	6.7	22.7	3570	2.8	55.1	17.4		C) non-ded bladder pump; or
	1355	16.61	2.5	6.75	22.7	3580	2.7	57.1	14.3		*Standard groundwater sample:*
	1357	16.61	3.0	6.75	22.7	3580	2.6	57.8	11.4		D) bailer due to limited column; or
	1400	16.61	3.5	6.75	22.7	3580	2.6	58.3	11.0		E) recovery well cycling sample
	1402	16.61	4.0	6.75	22.8	3590	2.7	58.5	10.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1405	MW-46R	16.61	6.75	22.8	3590	2.7	58.5	10.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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[New well installed pre-2H20]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-145
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH

157.1

Well Inspection Information

(Screen: 4-29 ft)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1135	NP	21.24	0.00	32.10	31.10	Yes	Yes	Yes	Yes		Weather: pt. cloudy, SW5

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1140	21.27	0.5	7.00	21.4	4820	3.3	121.0	22.7	colorless, clear	*Low-flow groundwater sample:*
	1142	21.27	1.0	6.93	21.5	4820	2.8	128.5	17.9		(A) peristaltic pump w/ ded tubing
	1145	21.27	1.5	6.90	21.4	4830	2.6	135.7	15.1		B) ded bladder pump
	1147	21.27	2.0	6.88	21.4	4830	2.4	138.4	13.5		C) non-ded bladder pump; or
	1150	21.27	2.5	6.87	21.3	4820	2.3	142.4	12.8		*Standard groundwater sample:*
	1152	21.27	3.0	6.85	21.2	4820	2.2	148.9	12.4		D) bailer due to limited column; or
	1155	21.27	3.5	6.84	21.2	4820	2.1	153.8	11.9		E) recovery well cycling sample
	1157	21.27	4.0	6.83	21.2	4820	2.1	157.0	11.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1200	MW-145	21.27	6.83	21.2	4820	2.1	157.0	11.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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[New well installed pre-2H20]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-146
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

(Screen: 10-30 Ft)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH

157.2

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/21	1050	NP	24.73	0.00	33.40	32.40	Yes	Yes	Yes	Yes		Weather: p.cloudy, 58°F

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1055	24.75	0.5	7.11	21.6	4850	2.9	97.4	42.8	v. sl. cloudy, colorless	Low-flow groundwater sample:
	1057	24.75	1.0	7.01	21.5	4870	2.5	99.7	37.1	↓	(A) peristaltic pump w/ ded tubing
	1100	24.75	1.5	6.97	21.5	4870	2.4	100.6	23.4	clear	B) ded bladder pump
	1102	24.75	2.0	6.95	21.5	4880	2.1	101.4	20.1		C) non-ded bladder pump; or
	1105	24.75	2.5	6.94	21.5	4880	2.0	101.5	18.4		Standard groundwater sample:
	1107	24.75	3.0	6.94	21.5	4880	2.0	101.8	15.7		D) bailer due to limited column; or
	1110	24.75	3.5	6.93	21.5	4880	1.9	101.9	13.6		E) recovery well cycling sample
↓	1112	24.75	4.0	6.93	21.5	4880	2.0	101.9	13.9	↓	F) Irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
4/13/21	1115	MW-146	24.75	6.93	21.5	4880	2.0	101.9	13.9	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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[New well installed pre-2H20]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-147
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCY

157.3

Well Inspection Information

(Screen : 20-40 Ft)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	845	NP	34.23	0.00	39.83	38.83	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	850	34.23	0.5	7.12	19.3	5270	6.2	124.3	105	sl. cloudy, colorless	Low-flow groundwater sample:
	852	34.23	1.0	7.04	19.4	5280	6.0	127.3	104		A) peristaltic pump w/ ded tubing
	855	34.23	1.5	6.99	19.4	5300	5.9	129.0	107		(B) ded bladder pump
	857	34.23	2.0	6.95	19.5	5310	5.9	129.9	102		C) non-ded bladder pump; or
	900	34.23	2.5	6.91	19.5	5320	5.9	130.4	99.4		Standard groundwater sample:
	902	34.23	3.0	6.90	19.6	5330	5.5	130.6	97.1		D) bailer due to limited column; or
	905	34.23	3.5	6.90	19.6	5330	5.4	130.7	97.1		E) recovery well cycling sample
↓	907	34.23	4.0	6.90	19.6	5330	5.4	130.6	95.6	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	910	MW-147	34.23	6.90	19.6	5330	5.4	130.6	95.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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[New well installed pre-2H20] **Monitoring Well Purging and Sampling Record**

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-148
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

(Screen: 20-40 Ft)

(* Disposable bailer based on DTW)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SLG

157.4

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	935	NP	37.45	0.00	40.38	39.38	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 50s

Well Purging Record * Top of pump @ 33.30'; pulled pump to measure static DTW

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	945		0.5								*Low-flow groundwater sample:*
			1.0	* Immediately upon starting low-flow purging, well							A) peristaltic pump w/ ded tubing
			1.5	ran dry; pulled bladder pump; allowed for limited							* (B) ded bladder pump
			2.0	recovery and sampled by disposable bailer							C) non-ded bladder pump; or
			2.5							(colorless, cloudy)	*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: Pace National, Mt. Juliet, TN
4/13/21	1020	MW-148	NM *	7.05	21.0	4180	5.0	103.7	>200	Per COC	Per COC	cloudy

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Furthest west "city well"

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-3R
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in _	PVC ✓
Upright _	4-in ✓	SS _
Vault _	Other _	Other _

Hydrologic Monitoring
for TRC
Houston, Texas

(158)

Initials: SCa

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/12/21	1730	NP	24.03	0.00	38.58	35.6	Yes	Yes	Yes	Yes		Weather: Clear, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/12/21	1735	24.10	0.5	7.18	23.4	2670	5.7	108.3	7.4	colorless clear	*Low-flow groundwater sample:*
	1737	24.11	1.0	7.15	23.3	2670	5.4	101.9	6.4		A) peristaltic pump w/ ded tubing
	1740	24.12	1.5	7.09	23.3	2660	5.3	104.0	4.7		(B) ded bladder pump
	1742	24.13	2.0	7.05	23.3	2650	5.2	105.4	4.3		C) non-ded bladder pump; or
	1745	24.13	2.5	7.02	23.2	2640	5.1	106.8	3.8		*Standard groundwater sample:*
	1747	24.13	3.0	7.01	23.2	2630	5.1	107.3	3.5		D) bailer due to limited column; or
	1750	24.13	3.5	6.98	23.2	2620	5.1	108.4	3.4		E) recovery well cycling sample
	1752	24.13	4.0	6.97	23.1	2620	5.1	109.0	3.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/12/21	1755	UG-3R	24.3	6.97	23.1	2620	5.1	109.0	3.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Location @ North-side park

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-4
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH (159)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/12/21	1635	NP	21.00	0.00	39.24	34.5	Yes	* Yes	Yes	Yes		Weather: clear, 70s

Well Purging Record

* possible tree-root intrusion through screen @ 19.75'; probe able to pass with repeated effort.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	Low-flow groundwater sample:
4/12/21	1640	21.17	0.5	6.97	23.3	3760	3.5	103.1	24.9	Colorless, clear	
↓	1642	21.18	1.0	6.91	23.2	3780	3.2	105.1	26.0	↓	(A) peristaltic pump w/ ded tubing
	1645	21.19	1.5	6.86	23.2	3790	3.1	106.5	26.1		B) ded bladder pump
	1647	21.20	2.0	6.84	23.1	3790	3.1	107.4	24.2		C) non-ded bladder pump; or
	1650	21.21	2.5	6.83	23.0	3790	3.1	108.0	23.9		Standard groundwater sample:
	1652	21.21	3.0	6.82	23.0	3790	3.1	108.2	23.7		D) bailer due to limited column; or
	1655	21.22	3.5	6.81	23.0	3790	3.1	108.1	23.6		E) recovery well cycling sample
↓	1657	21.22	4.0	6.80	23.0	3800	3.0	108.9	23.6	↓	F) irrigation well grab sample

Well Sampling Record

After sampling; pulled tube / cleared tree roots (photo); reinstall tube

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/12/21	1700	UG-4	21.22	6.80	23.0	3800	3.0	108.9	23.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL and collect groundwater sample

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North of elementary school

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-1
Event: 1H21
Area of Concern: REST

Completion:	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM (160)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/12/21	1545	NP	14.25	0.00	24.08	19.1	Yes	Yes	Yes	Yes		Weather: Clear, 70s

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/12/21	1550	14.26	0.5	6.98	25.6	3190	5.6	103.8	8.9	colorless, clear	*Low-flow groundwater sample:*
	1552	14.26	1.0	6.94	25.5	3200	5.5	105.9	9.1		(A) peristaltic pump w/ ded tubing
	1555	14.26	1.5	6.92	25.6	3200	5.3	107.8	9.1		B) ded bladder pump
	1557	14.26	2.0	6.91	25.8	3200	5.2	108.4	8.7		C) non-ded bladder pump; or
	1600	14.26	2.5	6.90	25.6	3210	5.2	109.0	8.5		*Standard groundwater sample:*
	1602	14.26	3.0	6.89	25.6	3210	5.2	109.2	8.9		D) bailer due to limited column; or
	1605	14.26	3.5	6.89	25.6	3210	5.2	109.6	10.1		E) recovery well cycling sample
	1607	14.26	4.0	6.89	25.6	3210	5.2	109.9	10.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/12/21	1610	UG-1	14.26	6.89	25.6	3210	5.2	109.9	10.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Located near E-W alley, NW of Artesia Hotel

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-2
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ___	PVC ✓
Upright ___	4-in ✓	SS ___
Vault ___	Other ___	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SLG (161)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/12/21	1500	ND	18.00	0.00	29.28	24.3	Yes	Yes	Yes	Yes		Weather: clear, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/12/21	1505	18.06	0.5	6.55	24.6	2570	5.3	95.4	17.9	colorless, clear	*Low-flow groundwater sample:*
	1507	18.06	1.0	6.66	24.6	2490	5.2	96.2	11.0		(A) peristaltic pump w/ ded tubing
	1510	18.07	1.5	6.77	24.6	2490	5.0	96.8	5.4		B) ded bladder pump
	1512	18.07	2.0	6.81	24.7	2490	4.9	97.3	4.0		C) non-ded bladder pump; or
	1515	18.08	2.5	6.83	24.6	2390	4.9	97.6	3.8		*Standard groundwater sample:*
	1517	18.08	3.0	6.88	24.6	2380	4.9	97.6	3.8		D) bailer due to limited column; or
	1520	18.08	3.5	6.89	24.6	2370	4.9	97.9	3.7		E) recovery well cycling sample
	1522	18.08	4.0	6.90	24.7	2360	4.9	98.0	3.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/12/21	1525	UG-2	18.08	6.90	28.7	2360	4.9	98.0	3.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Recompleted at-grade prior to 1420) (* Recompleted Stand Pipe Prior to 1421) + Trip Blank - REST-04

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-101
Event: 1421
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB/RJM (162)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1580	NP	17.15	0.00	22.15	18.86	* yes	yes	yes *	yes		Weather: Clear 70°
4-14-21	1255	NP	17.17	0.00								

Well Purging Record

* Exposed PVC casing; no prot. outer casing

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1300	17.22	0.5	7.00	21.4	1924	2.3	-296.4	13.8	Colorless / clear	*Low-flow groundwater sample:*
	1302	17.24	1.0	6.98	21.7	1903	2.0	-302.6	9.8		(A) peristaltic pump w/ ded tubing
	1305	17.25	1.5	6.97	21.6	1897	1.7	-308.5	9.5		B) ded bladder pump
	1307	17.25	2.0	6.97	21.7	1895	1.7	-311.1	9.1		C) non-ded bladder pump; or
	1310	17.25	2.5	6.95	21.8	1892	1.6	-313.6	8.7		*Standard groundwater sample:*
	1312	17.25	3.0	6.94	21.8	1888	1.6	-315.9	8.7		D) bailer due to limited column; or
	1315	17.25	3.5	6.94	21.9	1885	1.6	-317.2	8.5		E) recovery well cycling sample
	1317	17.25	4.0	6.93	21.9	1884	1.5	-318.3	8.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1320	MW-101	17.25	6.93	21.9	1884	1.5	-318.3	8.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-105
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright	4-in ✓	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (163)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1515	ND	10.95	0.00	17.20	14.2	yes	yes	yes	yes		Weather: Clear 70°
4/14/21	900	ND	11.00	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	805	11.05	0.5	6.41	19.0	2010	2.3	-318.5	22.1	clear colorless	*Low-flow groundwater sample:*
	807	11.05	1.0	6.45	19.1	2010	2.1	-329.7	16.1		(A) peristaltic pump w/ ded tubing
	810	11.05	1.5	6.46	19.1	2000	2.0	-333.3	10.1		B) ded bladder pump
	813	11.05	2.0	6.46	19.2	2000	2.0	-340.4	7.2		C) non-ded bladder pump; or
	815	11.05	2.5	6.47	19.3	1994	1.8	-341.6	6.3		*Standard groundwater sample:*
	817	11.05	3.0	6.48	19.3	1992	1.6	-341.9	5.9		D) bailer due to limited column; or
	820	11.05	3.5	6.47	19.3	1990	1.6	-342.8	5.8		E) recovery well cycling sample
	823	11.05	4.0	6.46	19.3	1989	1.6	-343.0	5.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	825	MW-105	11.05	6.46	19.3	1989	1.6	-343.0	5.7	Per COC	Per COC	Lab: Pace National Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Located in "Doghouse"; Bagged tube

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-2
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (164)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	8:50	17.28	24.34	7.06	36.13	31.1	yes	yes	yes	yes		Weather: pt/cloudy, 55°

Well Purging Record

* Gauge/Sample through labeled 1-in guide-pipe

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5	Not	Sampled	Due	To	LNAPL			*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-2								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-61
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (165)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1500	NP	14.57	0.00	29.30	24.3	yes	yes	yes	yes		Weather: clear 75°
4/14/21	1200	NP	14.89	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1205	15.06	0.5	6.79	21.5	1996	1.8	-389.5	7.1	Clear/Colorless	*Low-flow groundwater sample:*
	1207	15.18	1.0	6.78	21.6	2020	1.5	-395.4	5.6		(A) peristaltic pump w/ ded tubing
	1210	15.29	1.5	6.77	21.7	2030	1.4	-397.7	5.5		B) ded bladder pump
	1213	15.37	2.0	6.77	21.8	2040	1.3	-401.6	5.4		C) non-ded bladder pump; or
	1215	15.47	2.5	6.76	21.8	2050	1.3	-402.4	4.7	Reduced flow	*Standard groundwater sample:*
	1218	15.57	3.0	6.76	21.8	2050	1.3	-403.7	4.4	rate to 0.1gpm	D) bailer due to limited column; or
	1225	15.67	3.5	6.75	21.8	2040	1.2	-404.1	3.8		E) recovery well cycling sample
	1230	15.71	4.0	6.74	21.8	2040	1.2	-406.4	3.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	~~1235~~ 1235	MW-61	15.71	6.74	21.8	2040	1.2	-406.4	3.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-62
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (166)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1430	18.83	19.03	0.20	29.50	21.3	yes	yes	yes	yes		Weather: Clear 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0	Not Sampled Due to LNAPL							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-62								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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[New well installed pre-2H20]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-62R
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

(Screen: 5'-25' bgs)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TA BS

(16641)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1440	ND	18.30	0.00	24.51	22.51	yes	yes	yes	yes		Weather: Clear 78°
4/14/21	1000	ND	18.55	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1005	18.75	0.5	6.77	21.0	1581	3.1	-284.9	6.6	clear/colorless	Low-flow groundwater sample:
	1007	18.80	1.0	6.74	21.1	1563	2.8	-286.6	5.3		(A) peristaltic pump w/ ded tubing
	1010	18.82	1.5	6.66	21.4	1491	2.1	-296.4	4.9		B) ded bladder pump
	1013	18.82	2.0	6.62	21.6	1468	2.0	-301.4	4.6		C) non-ded bladder pump; or
	1015	18.82	2.5	6.64	21.6	1466	2.0	-304.4	4.1		Standard groundwater sample:
	1017	18.82	3.0	6.62	21.6	1462	1.9	-305.4	4.0		D) bailer due to limited column; or
	1020	18.82	3.5	6.61	21.7	1461	1.8	-306.6	3.6		E) recovery well cycling sample
	1023	18.82	4.0	6.60	21.7	1460	1.8	-307.7	3.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1025	MW-62R	18.82	6.60	21.7	1460	1.8	-307.7	3.4	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-93
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in	PVC ✓
Upright	4-in ✓	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information 4/13 & 4/14/21 Covered by new gravel in area

Initials: TAB (167)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1000				20.23 (Formerly)	15.9						Weather: clear 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5	Attempted to locate / Recover w/ shovel, etc.							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5	Not located; updated Navajo 4/14/21							*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-93								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-43
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (168)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1740	17.30	17.70	0.40	19.67	16.5	Yes	Yes	Yes	Yes		Weather: clear, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT	SAMPLED;	LNAPL	PRESENT			C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
										Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-137
Event: HZ1
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (169)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1330	19.82	17.00	2.18	29.60	24.6	yes	yes	yes	yes		Weather: Clear 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5	NOT	SAMPLED	DUE	TO	LNAPL			*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-137								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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[New well installed pre-2H20]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-137A
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (169.1)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
1H21	1340	Dry	Dry	Dry	14.88		yes	yes	yes	yes		Weather: Clear 70°
						Intake at	base of well (if not	dry; if no	LNAPL;	if scheduled for sampling)		

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0	NOT SAMPLED; DRY							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-137A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-138
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (170)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1400	16.40	18.75	2.35	24.81	19.8	YES	YES	YES	YES		Weather: clear 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Curr. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0	NOT Sampled Due to LNAPL							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-138								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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New well installed pre-2H20

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-138A
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAS (170.1)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1420	DRY	DRY	DRY	15.03		YES	YES	YES	YES		Weather Clear 70s
						(Intake at base of well (if not dry; if no LNAPL; if scheduled for sampling))						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								Low-flow groundwater sample:
			1.0								(A) peristaltic pump w/ ded tubing
			1.5	NOT SAMPLED; DRY							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								Standard groundwater sample:
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-138A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-23
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (171)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1420	19.30	22.28	2.98	23.10	17.9	yes	yes	yes	yes		Weather: clear 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump.
			2.0								C) non-ded bladder pump; or
			2.5	NOT SAMPLED DUE TO LNAPL							*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-23								Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'. If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup - TEL-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-4
Event: 1H21
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (172)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	815	NP	16.37	0.00	27.27	22.2	yes	yes	yes	yes		Weather: Clear 50°

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	820	16.61	0.5	6.12	19.1	2930	1.9	-163.8	17.5	Clear, colorless	*Low-flow groundwater sample:*
	823	16.61	1.0	6.14	19.2	2940	1.6	-165.9	10.2		(A) peristaltic pump w/ ded tubing
	825	16.61	1.5	6.21	19.6	2970	1.4	-177.8	8.6		B) ded bladder pump
	827	16.61	2.0	6.23	19.7	2980	1.3	-179.2	8.0		C) non-ded bladder pump; or
	830	16.61	2.5	6.25	19.8	2980	1.2	-181.9	7.2		*Standard groundwater sample:*
	833	16.61	3.0	6.27	19.9	2990	1.1	-181.7	6.6		D) bailer due to limited column; or
	835	16.61	3.5	6.28	20.1	2990	1.1	-182.9	6.4		E) recovery well cycling sample
↓	837	16.61	4.0	6.28	20.2	3000	1.0	-184.0	6.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	840	TEL-4	16.61	6.28	20.2	3000	1.0	-184.0	6.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓	900	DUP-TEL-01	16.61	6.28	20.2	3000	1.0	-184.0	6.2	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-3
Event: 1H21
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC
Upright ✓	4-in	SS ✓
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AB (173)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	930	17.20	22.10	4.90	27.19	22.2	yes	yes	yes	yes		Weather: Mostly Cloudy / 60°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5	Not	Sampled	Due to	LNAPL				*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		TEL-3								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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+EB-TEL-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-2
Event: 1121
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (174)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/12/21	945	18.30	20.25	1.95	27.20	22.1	yes	yes	ye	yes		Weather: cloudy 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (l)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0	NOT SAMPLED DUE TO LNAPL							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/12/21		TEL-2								Per COC	Per COC	Lab: Pace National, ML Juliet, TN
↓	1000	EB-TEL-01	NA	—	—	—	—	—	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03"; if LNAPL thickness is measured at 0.01" or 0.02", remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+Trip Blank - TEL-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-1
Event: 1H21
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAT3 (175)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/16/21	1020	17.90	18.45	0.75	27.00	22.9	yes	yes	yes	yes		Weather: cloudy 60°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (l)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0	Not sampled due to LNAPL							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		TEL-1								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-39
Event: 1142
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC
Upright ✓	4-in	SS ✓
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AB (176)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/12/21	1550	18.30	18.40	0.10	25.44	20.4	yes	yes	yes	yes		Weather: Clear 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0	not sampled due to LNAPL							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-39								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-98
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (177)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1230	NP	15.30	8.00	25.60	21.5	yes	yes	yes	yes		Weather: pt/cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1235	15.35	0.5	6.65	21.7	2670	1.7	-389.1	1.9	clear odor	Low-flow groundwater sample:
	1237	15.35	1.0	6.63	21.7	2670	1.6	-391.4	1.7		(A) peristaltic pump w/ ded tubing
	1240	15.36	1.5	6.62	21.8	2660	1.5	-392.9	1.5		B) ded bladder pump
	1243	15.36	2.0	6.62	21.8	2660	1.4	-394.5	1.4		C) non-ded bladder pump; or
	1245	15.36	2.5	6.60	21.8	2670	1.2	-396.6	1.2		Standard groundwater sample:
	1247	15.37	3.0	6.60	21.7	2660	1.1	-400.7	1.1		D) bailer due to limited column; or
	1250	15.37	3.5	6.60	21.7	2650	1.1	-401.8	1.1		E) recovery well cycling sample
↓	1253	15.37	4.0	6.60	21.7	2650	1.1	-403.1	1.0	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1255	MW-98	15.37	6.60	21.7	2650	1.1	-403.1	1.0	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-10
Event: 11121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 8-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(178)

Well Inspection Information The former RW-10 is permanently covered by heavy steel box. Current RW-10 is the stand-pipe ~50' South of former RW-10 per Navajo. Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	* Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4.13.21	1040	ND	18.29	0.00	22.49	17.5'	yes	yes	yes	yes		Weather: Partly cloudy/ 60s

Well Purging Record * lowered Intake To 22.00

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.13.21	1045	18.30	0.5	7.09	20.6	2460	0.9	-337.7	22.1	Clear/Odor	*Low-flow groundwater sample:*
	1047	18.30	1.0	7.05	20.7	2450	0.9	-338.2	12.9	Light Sheen	(A) peristaltic pump w/ ded tubing
	1050	18.30	1.5	7.04	20.7	2440	0.9	-342.7	12.6		B) ded bladder pump
	1053	18.30	2.0	7.02	20.4	2430	0.8	-346.2	6.9		C) non-ded bladder pump; or
	1055	18.30	2.5	7.02	20.4	2420	0.7	-347.4	5.5		*Standard groundwater sample:*
	1057	18.30	3.0	7.01	20.5	2420	0.7	-349.0	5.2		D) bailer due to limited column; or
	1100	18.30	3.5	7.00	20.5	2410	0.6	-350.1	2.4		E) recovery well cycling sample
	1103	18.30	4.0	7.00	20.5	2400	0.6	-351.8	1.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4.13.21	1105	RW-10	18.30	7.00	20.5	2400	0.6	-351.8	1.7	Per COC	Per COC	Lab: Pace National Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-40
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (179)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1600	16.87	17.12	0.25	24.75	21.8	yes	yes	yes	yes		Weather: Clear 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5	Not Sampled Due to				LNAPL			B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-40								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-41
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAR / RJM (180)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1630	ND	16.08	0.00	21.56	18.6	Yes	Yes	Yes	Yes		Weather: clear 70°
4-14-21	935	ND	16.04	0.00			↓	↓	↓	↓		

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	940	16.05	0.5	6.78	20.8	5270	4.0	-315.2	9.6	Colorless / clear	*Low-flow groundwater sample:*
	942	16.07	1.0	6.74	20.9	5300	3.8	-317.8	8.5		(A) peristaltic pump w/ ded tubing
	945	16.07	1.5	6.71	21.0	5330	3.6	-320.2	8.2		B) ded bladder pump
	947	16.07	2.0	6.70	21.0	5360	3.3	-321.4	8.0		C) non-ded bladder pump; or
	950	16.07	2.5	6.69	21.2	5380	3.2	-321.9	7.9		*Standard groundwater sample:*
	952	16.07	3.0	6.69	21.2	5400	3.1	-323.1	7.7		D) bailer due to limited column; or
	955	16.07	3.5	6.68	21.2	5410	3.1	-323.7	6.5		E) recovery well cycling sample
↓	957	16.07	4.0	6.67	21.3	5420	3.1	-323.8	6.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1000	MW-41	16.07	6.67	21.3	5420	3.1	-323.8	6.2	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-9
Event: IH21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in	SS __
Vault __	Other 8-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information The former RW-9 is permanently covered by heavy steel box. Current RW-9 is the stand-pipe ~50' East of former RW-9, per Navajo. Initials: TAR / RJM (181)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	* Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/20	1610	NP	18.12	0.00	21.83	16.8	yes	yes	yes	yes		Weather: Clear 70s
4-14-21	1635	NP	18.19	0.00								

Well Purging Record * lowered sample intake as needed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1040	18.20	0.5	6.94	21.5	4190	2.2	-358.2	7.3	Colorless / clear	*Low-flow groundwater sample:*
	1042	18.20	1.0	6.91	21.4	4180	1.9	-360.9	6.4		(A) peristaltic pump w/ ded tubing
	1045	18.20	1.5	6.89	21.5	4180	1.5	-362.1	6.2		B) ded bladder pump
	1047	18.20	2.0	6.88	21.6	4180	1.3	-364.5	5.7		C) non-ded bladder pump; or
	1050	18.20	2.5	6.87	21.6	4170	1.1	-365.8	5.4		*Standard groundwater sample:*
	1052	18.20	3.0	6.87	21.7	4170	1.0	-367.1	5.3		D) bailer due to limited column; or
	1055	18.20	3.5	6.86	21.7	4160	1.0	-368.4	5.1		E) recovery well cycling sample
	1057	18.20	4.0	6.86	21.7	4150	1.0	-368.7	5.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1100	RW-9	18.20	6.86	21.7	4150	1.0	-368.7	5.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-42
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAR (182)

Well Inspection Information

Date	Time	Depth to NAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1640	NP	18.43	0.00	24.32	21.3	yes	yes	yes	yes		Weather: Sunny 70s
4/14/21	1300	NP	18.43	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1305	18.79	0.5	6.65	21.1	3180	1.5	-329.0	16.1	Clear/Colorless	Low-flow groundwater sample:
	1307	18.82	1.0	6.63	21.0	3180	1.4	-327.8	8.4		(A) peristaltic pump w/ ded tubing
	1310	18.85	1.5	6.60	20.9	3170	1.3	-328.2	6.9		B) ded bladder pump
	1313	18.86	2.0	6.58	20.9	3160	1.4	-331.1	6.1		C) non-ded bladder pump; or
	1315	18.86	2.5	6.56	21.0	3180	1.5	-336.1	5.2		Standard groundwater sample:
	1317	18.86	3.0	6.55	21.0	3170	1.6	-337.7	4.4		D) bailer due to limited column; or
	1320	18.86	3.5	6.54	21.0	3170	1.6	-338.7	4.1		E) recovery well cycling sample
↓	1323	18.86	4.0	6.53	21.0	3170	1.6	-340.1	3.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	1325	MW-42	18.86	6.53	21.0	3170	1.6	-340.1	3.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-29
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AB / RJM (183)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	* Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1720	NP	23.59	0.00	24.22	19.2	yes	yes	yes	yes		Weather: Clear 70s
4-14-21	1200	NP	23.59	0.00								

Well Purging Record

* lowered Sample Intake as needed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	1205	23.60	0.5	7.01	21.4	3960	2.6	-110.5	7.9	Colorless / clear	*Low-flow groundwater sample:*
	1207	23.60	1.0	7.03	21.6	3970	2.4	-118.2	7.8		(A) peristaltic pump w/ ded tubing
	1210	23.61	1.5	7.04	21.6	3970	2.4	-119.1	7.5		B) ded bladder pump
	1212	23.61	2.0	7.06	21.7	3980	2.2	-122.6	7.2		C) non-ded bladder pump; or
	1215	23.61	2.5	7.07	21.7	3990	2.0	-124.3	6.8		*Standard groundwater sample:*
	1217	23.61	3.0	7.07	21.8	3990	1.9	-125.9	6.4		D) bailer due to limited column; or
	1220	23.61	3.5	7.08	21.8	3990	1.9	-127.2	6.1		E) recovery well cycling sample
	1222	23.61	4.0	7.08	21.9	4000	1.8	-128.3	5.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	1225	MW-29	23.61	7.08	21.9	4000	1.8	-128.3	5.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample.

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#16B
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault	Other 8-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAS (184)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1650	NP	Dry	0.00	17.70	14.7	yes	yes	yes	yes		Weather: Clear 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0	NOT	SAMPLED; WELL IS DRY						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-#16B								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-30
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB (185)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1700	NR	18.40	0.00	23.50	NS	yes	yes	yes	yes		Weather: Clear 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-30								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-56
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAS (186)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1710	NP	19.02	0.00	26.50	21.4	yes	yes	yes	yes		Weather: Clear 90°
4/14/21	850	NP	19.00	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	855	19.03	0.5	7.08	19.7	2420	2.0	-282.7	4.4	clear, colorless	*Low-flow groundwater sample:*
	857	19.03	1.0	7.04	19.6	2430	1.9	-284.8	3.8		(A) peristaltic pump w/ ded tubing
	900	19.03	1.5	7.03	19.6	2450	1.8	-288.8	3.3		B) ded bladder pump
	903	19.03	2.0	6.99	19.7	2450	1.6	-293.0	2.9		C) non-ded bladder pump; or
	905	19.03	2.5	6.98	19.7	2460	1.6	-295.8	2.5		*Standard groundwater sample:*
	907	19.03	3.0	6.95	19.8	2460	1.6	-297.8	2.0		D) bailer due to limited column; or
	910	19.03	3.5	6.94	19.8	2460	1.6	-298.1	1.8		E) recovery well cycling sample
↓	913	19.03	4.0	6.93	19.8	2460	1.6	-300.4	1.1	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/14/21	915	MW-56	19.03	6.93	19.8	2460	1.6	-300.4	1.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Located under yellow barricade

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-49
Event: 1Q21
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB / RSM (187)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1540	ND	15.32	0.00	33.07	27.8	yes	yes	yes	yes		Weather: Clear 70°
4-14-21	835	ND	15.36	0.00								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-14-21	840	15.54	0.5	7.06	20.9	2840	4.0	-319.2	17.7	Colorless / Clear	*Low-flow groundwater sample:*
	842	15.58	1.0	7.01	20.9	2840	3.5	-322.5	9.0		(A) peristaltic pump w/ ded tubing
	845	15.60	1.5	6.96	21.0	2830	3.2	-328.7	8.7		B) ded bladder pump
	847	15.61	2.0	6.94	21.1	2820	3.0	-335.4	8.2		C) non-ded bladder pump; or
	850	15.61	2.5	6.91	21.1	2820	2.9	-340.9	7.8		*Standard groundwater sample:*
	852	15.61	3.0	6.89	21.2	2810	2.8	-343.6	7.5		D) bailer due to limited column; or
	855	15.61	3.5	6.89	21.2	2800	2.7	-345.8	7.2		E) recovery well cycling sample
	857	15.61	4.0	6.88	21.2	2790	2.7	-347.2	6.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-14-21	900	MW-49	15.61	6.88	21.2	2790	2.7	-347.2	6.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.05'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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May get covered with gravel

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-106
Event: (H2)
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(188)

Well Inspection Information *Located in-line with the final letter "A" from "Ammonia" sign on gray tank with yellow ladder. Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1130	ND	12.97	0.60	22.80	17.5	yes	yes	yes	yes		Weather: pt/cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/13/21	1135	13.05	0.5	6.76	23.4	2690	1.4	-392.3	4.0	clear odor oil/less	Low-flow groundwater sample:
	1137	13.08	1.0	6.69	23.4	2700	2.2	-395.6	3.6		(A) peristaltic pump w/ ded tubing
	1140	13.10	1.5	6.60	23.4	2710	2.1	-398.2	3.5		B) ded bladder pump
	1143	13.12	2.0	6.56	23.4	2710	2.0	-401.0	3.0		C) non-ded bladder pump; or
	1145	13.13	2.5	6.53	23.5	2730	2.0	-404.6	2.8		Standard groundwater sample:
	1147	13.14	3.0	6.52	23.5	2720	2.0	-406.6	2.7		D) bailer due to limited column; or
	1150	13.14	3.5	6.52	23.6	2720	1.9	-407.1	2.5		E) recovery well cycling sample
	1153	13.14	4.0	6.52	23.6	2730	1.9	-407.9	2.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/13/21	1155	MW-106	13.14	6.52	23.6	2730	1.9	-407.9	2.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-45
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAS (189)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	*Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	1740	NP	13.88	0.00	15.05	12.3	yes	yes	yes	yes		Weather: clear 70s
4/14/21	1355	NP	13.91	0.00								

Well Purging Record

*Lowest Intake to BASE of Well

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/14/21	1400	13.95	0.5	7.19	22.5	3600	1.7	-235.8	12.5	clear, colorless	Low-flow groundwater sample:
	1403	13.95	1.0	7.16	22.3	3600	1.6	-234.2	10.6		(A) peristaltic pump w/ ded tubing
	1405	13.95	1.5	7.12	22.0	3590	1.4	-230.0	8.2		B) ded bladder pump
	1407	13.95	2.0	7.06	21.5	3580	1.2	-228.4	6.1		C) non-ded bladder pump; or
	1410	13.95	2.5	7.04	21.2	3570	1.2	-228.4	5.4		Standard groundwater sample:
	1413	13.95	3.0	7.03	21.1	3570	1.2	-228.7	4.4		D) bailer due to limited column; or
	1415	13.95	3.5	7.02	21.0	3560	1.1	-229.1	4.2		E) recovery well cycling sample
↓	1417	13.95	4.0	7.02	21.0	3560	1.1	-229.6	4.0	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4.14.21	1420	MW-45	13.95	7.02	21.0	3560	1.1	-229.6	4.0	Per COC	Per COC	Lab. Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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SW corner of Lawder Bldg. Installed 2H19.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-139
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJM (190)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1605	NP	14.69	0.00	29.60	24.6	Yes	Yes	Yes	Yes		Weather: Clear 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1610	14.74	0.5	7.10	21.6	3440	1.6	-242.3	12.1	Colorless / Clear	*Low-flow groundwater sample:*
	1612	14.74	1.0	7.09	21.5	3460	1.5	-243.9	9.8		(A) peristaltic pump w/ ded tubing
	1615	14.75	1.5	7.07	21.5	3470	1.4	-245.4	9.3		B) ded bladder pump
	1617	14.75	2.0	7.07	21.4	3470	1.4	-246.7	8.6		C) non-ded bladder pump; or
	1620	14.75	2.5	7.06	21.3	3480	1.3	-246.1	8.2		*Standard groundwater sample:*
	1622	14.75	3.0	7.05	21.3	3480	1.2	-249.0	7.9		D) bailer due to limited column; or
	1625	14.75	3.5	7.05	21.2	3480	1.2	-249.5	7.6		E) recovery well cycling sample
	1627	14.75	4.0	7.04	21.2	3490	1.2	-250.3	7.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1630	MW-139	14.75	7.04	21.2	3490	1.2	-250.3	7.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.01'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-50
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information *Located in Artesia wool laydown yard, N. of main warehouse.

Initials: RJM (191)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	935	NP	15.42	0.00	28.22	24.1	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	940	15.44	0.5	7.04	21.9	4180	1.9	-97.1	12.9	Colorless; Clear	*Low-flow groundwater sample:*
↓	942	15.44	1.0	7.00	22.3	4210	1.5	-88.4	9.2	↓	(A) peristaltic pump w/ ded tubing
	945	15.45	1.5	6.97	22.5	4250	1.3	-82.3	9.0		B) ded bladder pump
	947	15.45	2.0	6.94	22.5	4290	1.2	-79.9	8.5		C) non-ded bladder pump; or
	950	15.45	2.5	6.92	22.5	4320	1.2	-77.2	8.1		*Standard groundwater sample:*
	952	15.45	3.0	6.91	22.6	4350	1.2	-75.6	7.6		D) bailer due to limited column; or
	955	15.45	3.5	6.91	22.6	4370	1.1	-74.0	7.3		E) recovery well cycling sample
↓	957	15.48	4.0	6.90	22.7	4380	1.1	-73.2	6.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1000	MW-50	15.45	6.90	22.7	4380	1.1	-73.2	6.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-97
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJM (192)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.13.21	1705	NM	NM	NM	21.20	5' off base	NA	NA	NA	NA		Weather: Clear 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		As noted in 7/20, Searched extensively						B) ded bladder pump
			2.0		for Well. Could not locate well.						C) non-ded bladder pump; or
			2.5		Excess gravel present in area.						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-97			Not Sampled					Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-92
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJM (193)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	910	15.73	19.78	4.05	22.60	17.6	YES	YES	YES	YES		Weather: Pt. Cloudy 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT Sampled;	LNAPL	≥ 0.03				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-92								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
			No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample									

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Bagged tube

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-1
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information In "doghouse"; gauge/sample through 1-in guide-pipe

Initials: RJM (194)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	855	18.33	20.24	1.91	35.39	30.4	Yes	Yes	Yes	Yes		Weather: PT. Cloudy, 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT Sampled;	LNAPL	20.03				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-1								Per COC	Per COC	Lab: Pace National, ML Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-91
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJM (195)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	835	15.18	16.75	1.57	25.35	17.9	YES	YES	YES	YES		Weather: Cloudy 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled,	LNAPL	≥ 0.03				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-91								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-90
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJM (196)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/13/21	1035	NP	15.39	0.00	22.80	21.5	yes	yes	yes	yes		Weather: Pt. Cloudy 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1040	15.37	0.5	7.00	22.0	3110	1.5	-329.2	9.8	Colorless, Clear;	*Low-flow groundwater sample:*
	1042	15.42	1.0	7.01	21.9	3100	1.3	-339.8	9.5	Sl. odor	(A) peristaltic pump w/ ded tubing
	1045	15.46	1.5	7.00	21.8	3090	1.2	-345.6	9.4		B) ded bladder pump
	1047	15.49	2.0	6.99	21.9	3090	1.2	-352.1	8.8		C) non-ded bladder pump; or
	1050	15.53	2.5	6.99	21.9	3070	1.2	-356.4	8.3		*Standard groundwater sample:*
	1052	15.55	3.0	6.98	22.0	3050	1.1	-359.2	8.1		D) bailer due to limited column; or
	1055	15.57	3.5	6.97	22.0	3050	1.1	-362.1	7.9		E) recovery well cycling sample
	1057	15.59	4.0	6.97	22.1	3040	1.0	-364.3	7.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1100	MW-90	15.59	6.97	22.1	3040	1.0	-364.3	7.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-96
Event: 1121
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(197)

Initials: RJM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1130	16.12	16.18	0.06	25.57	21.2	Yes	Yes	No ↓	Yes		Weather: Pt. Cloudy, 60's

* well was struck prior to 2Q13 event. Flange is covered; well is not secure

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled;	LNAPL	≥ 0.03				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-96								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-94
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA (198)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	850	18.56	22.22	3.66	23.45	16.0	YES	YES	YES	YES		Weather: PARTLY cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		No SAMPLE - LNAPL 20.03						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								F) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-94								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Bagged tube

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-8
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(199)

Well Inspection Information In "doghouse"; gauge/sample through 1-in. guide-pipe.

Initials: BA

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	840	18.19	22.31	4.12	37.22	35.2	YES	YES	YES	YES		Weather: Partly Cloudy, 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		No SAMPLE - LNAPL			70.03			B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
										Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-67
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.:	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA (200)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	830	15.86	17.68	1.82	27.30	19.9	YES	YES	YES	YES		Weather: PARTLY cloudy, 56F

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NO SAMPLE	; LNAPL ≥ 0.03					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-67								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-95
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BSM (20)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1200	18.23	20.38	2.15	25.37	20.4	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy; 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled; LNAPL ≥			0.03			B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-95								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-7
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information In "doghouse"; gauge / sample through 1-in guide-pipe.

Initials: BA (202)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/13/21	900	19.29	21.53	2.24	37.00	32.0	YES	YES	YES	YES		Weather: Partly cloudy, 50's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NO SAMPLE - LNAPL			>0.03			C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-7								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-34A
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA (203)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	910	16.42	719.26	2.84	19.26	10.8	YES	YES	no lock	YES		Weather: Partly Cloudy, 50's

Well Purging Record

No water in this well; all LNAPL

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NO SAMPLE - LNAPL ≥ 0.03						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		NCL-34A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-33
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA (204)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1105	NP	15.22	0.00	19.60	17.7	YES	YES	YES	YES		Weather: Partly cloudy, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1110	15.34	0.5	6.56	22.4	4230	2.0	-55.5	87.6	clear, colorless	*Low-flow groundwater sample:*
↓	1113	15.40	1.0	6.50	22.0	4230	2.0	-54.7	14.2	↓	(A) peristaltic pump w/ ded tubing
	1115	15.44	1.5	6.48	21.8	4220	1.9	-53.1	12.1		B) ded bladder pump
	1118	15.48	2.0	6.48	21.4	4220	1.9	-51.9	10.9		C) non-ded bladder pump; or
	1120	15.51	2.5	6.48	21.1	4210	1.7	-50.2	8.8		*Standard groundwater sample:*
	1123	15.53	3.0	6.47	21.1	4210	1.6	-46.7	7.4		D) bailer due to limited column; or
	1125	15.55	3.5	6.47	21.1	4210	1.6	-43.3	6.7		F) recovery well cycling sample
↓	1128	15.56	4.0	6.47	21.0	4200	1.5	-41.2	5.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1130	NCL-33	15.56	6.47	21.0	4200	1.5	-41.2	5.8	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-44
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA

(205)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1025	NP	14.93	0.00	21.34	16.3	YES	YES	YES	YES		Weather: Partly Cloudy, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1030	14.96	0.5	6.67	21.7	2570	1.8	-121.7	9.1	Clear, colorless	*Low-flow groundwater sample:*
	1033	14.96	1.0	6.64	21.5	2560	1.7	-122.6	8.3		(A) peristaltic pump w/ ded tubing
	1035	14.96	1.5	6.62	21.3	2560	1.7	-123.5	7.9		B) ded bladder pump
	1038	14.96	2.0	6.62	21.3	2560	1.7	-124.3	7.0		C) non-ded bladder pump; or
	1040	14.96	2.5	6.62	21.2	2560	1.6	-124.9	6.7		*Standard groundwater sample:*
	1043	14.96	3.0	6.61	21.2	2550	1.6	-125.2	5.8		D) bailer due to limited column; or
	1045	14.96	3.5	6.61	21.1	2550	1.6	-125.8	5.4		E) recovery well cycling sample
	1048	14.96	4.0	6.60	21.1	2550	1.6	-126.4	4.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1050	NCL-44	14.96	6.60	21.1	2550	1.6	-126.4	4.3	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+EB-NCL-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-32
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA (206)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	930	NP	14.54	0.00	20.04	18.1	YES	YES	YES	YES		Weather: Partly Cloudy, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	935	14.61	0.5	6.80	20.9	2740	2.2	91.0	21.4	clear, colorless	*Low-flow groundwater sample:*
↓	938	14.66	1.0	6.80	20.9	2730	1.9	86.8	21.3	↓	(A) peristaltic pump w/ ded tubing
	940	14.67	1.5	6.80	20.7	2720	1.8	84.4	21.2		B) ded bladder pump
	943	14.67	2.0	6.79	20.6	2720	1.7	82.6	21.1		C) non-ded bladder pump; or
	945	14.67	2.5	6.79	20.6	2710	1.6	81.8	21.0		*Standard groundwater sample:*
	948	14.67	3.0	6.78	20.5	2710	1.6	81.9	19.2		D) bailer due to limited column; or
	950	14.67	3.5	6.78	20.4	2700	1.5	82.0	17.3		E) recovery well cycling sample
↓	953	14.67	4.0	6.78	20.4	2700	1.5	82.1	16.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	955	NCL-32	14.67	6.78	20.4	2700	1.5	92.1	16.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
↓												
↓	1010	EB-NCL-01	NA	—	—	—	—	—	→	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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*Access on foot

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-108
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RSM (207)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Lacel	Other	
4-13-21	1435	NP	18.84	0.00	27.74	22.5	yes	yes	Yes	Yes		Weather: Clear 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1440	18.94	0.5	7.08	22.4	1918	1.4	-371.2	10.5	Colorless / Clear ;	*Low-flow groundwater sample:*
	1442	19.01	1.0	7.05	22.4	1902	1.2	-376.8	10.1	SL. odor	(A) peristaltic pump w/ ded tubing
	1445	19.08	1.5	7.02	22.5	1894	1.1	-383.9	9.7		B) ded bladder pump
	1447	19.13	2.0	7.00	22.5	1886	1.0	-386.2	9.5		C) non-ded bladder pump; or
	1450	19.18	2.5	6.99	22.6	1882	0.9	-388.1	9.0		*Standard groundwater sample:*
	1452	19.22	3.0	6.99	22.7	1879	0.9	-390.7	8.8		D) bailer due to limited column; or
	1455	19.26	3.5	6.98	22.7	1877	0.8	-391.8	8.5		E) recovery well cycling sample
	1457	19.30	4.0	6.98	22.7	1875	0.8	-393.3	8.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1500	MW-108	19.30	6.98	22.7	1875	0.8	-393.3	8.41	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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SW of NCL field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-31
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BG (208)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1200	NP	15.14	0.00	20.16	17.4	NO *	YES	YES	YES		Weather: SUNNY, 60's

* unable to close protective lid and fit cap; therefore no cap present

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1205	15.38	0.5	6.99	21.6	2400	1.8	-193.9	63.0	slightly cloudy	Low-flow groundwater sample:
	1208	15.40	1.0	6.96	21.3	2380	1.7	-190.3	50.0	↓	(A) peristaltic pump w/ ded tubing
	1210	15.41	1.5	6.94	21.0	2340	1.6	-188.6	44.7	↓	B) ded bladder pump
	1213	15.41	2.0	6.94	21.0	2320	1.6	-187.0	38.6	clear, colorless	C) non-ded bladder pump; or
	1215	15.42	2.5	6.93	20.9	2270	1.5	-186.2	36.8	↓	Standard groundwater sample:
	1218	15.42	3.0	6.93	20.9	2260	1.5	-185.4	33.7	↓	D) bailer due to limited column; or
	1220	15.42	3.5	6.92	20.7	2240	1.5	-185.3	30.9	↓	E) recovery well cycling sample
↓	1223	15.42	4.0	6.92	20.7	2220	1.4	-184.8	27.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1225	NCL-31	15.42	6.92	20.7	2220	1.4	-184.8	27.6	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Gauge

Monitoring Well Purging and Sampling Record (Not in "Sampling" Program)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-19
Event: 1421
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

(209)

Initials: BA

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1150	NP	15.58	0.00	22.08	NS	YES	YES	YES, *	YES		Weather: Clear, 60's

* no outer protective casing

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-19								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-55
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJM (210)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1235	NP	17.03	0.00	26.85	21.7	YES	YES	YES	YES		Weather: Pt. cloudy, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1240	17.06	0.5	6.93	22.5	3200	2.7	-60.5	9.1	Colorless / clear	*Low-flow groundwater sample:*
"	1242	17.06	1.0	6.86	22.4	3180	2.4	-51.8	7.6		(A) peristaltic pump w/ ded tubing
"	1245	17.06	1.5	6.82	22.2	3160	2.2	-45.6	7.2		B) ded bladder pump
"	1247	17.07	2.0	6.80	22.2	3150	2.0	-40.3	6.8		C) non-ded bladder pump; or
"	1250	17.07	2.5	6.78	22.2	3140	1.9	-37.2	6.4		*Standard groundwater sample:*
"	1252	17.07	3.0	6.77	22.1	3140	1.8	-35.4	5.9		D) bailer due to limited column; or
"	1255	17.07	3.5	6.76	22.1	3130	1.8	-34.9	5.2		E) recovery well cycling sample
↓	1257	17.07	4.0	6.76	22.2	3120	1.7	-32.8	5.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1300	MW-55	17.07	6.76	22.2	3120	1.7	-32.8	5.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#17A
Event: 1H21
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Bell-shaped PVC stickup w/ PVC slip cap

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RJM (211)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1340	Dry	Dry	NA	16.01	14.0	yes	yes	yes	yes		Weather: Clear 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled; Well is Dry						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		RW-#17A								Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At Grade	2-in	PVC ✓
Upright ✓	4-in	SS
Vault	Other 6-in	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BH (212)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1240	NP	16.92	0.00	22.20	20.2	YES	YES	YES	YES		Weather: Clear, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1245	16.96	0.5	6.76	21.5	2600	2.1	70.8	13.5	clear, colorless	*Low-flow groundwater sample:*
	1248	16.98	1.0	6.73	21.3	2590	2.0	70.9	12.4		(A) peristaltic pump w/ ded tubing
	1250	16.98	1.5	6.72	21.2	2570	1.9	71.0	11.2		B) ded bladder pump
	1253	16.98	2.0	6.71	21.1	2570	1.8	71.2	10.9		C) non-ded bladder pump; or
	1255	16.98	2.5	6.71	20.9	2570	1.8	71.2	9.6		*Standard groundwater sample:*
	1258	16.98	3.0	6.70	20.9	2560	1.7	71.0	8.4		D) bailer due to limited column; or
	1300	16.98	3.5	6.70	20.8	2560	1.7	70.9	6.9		E) recovery well cycling sample
↓	1303	16.98	4.0	6.69	20.8	2560	1.7	70.5	5.5	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1305	MW-18	16.98	6.69	20.8	2560	1.7	70.5	5.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54A
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: DSD (213)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1500	NP	17.65	0.00	31.30	23.6	yes	yes	yes	yes		Weather: Clear 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (um/ho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1505	17.66	0.5	6.98	22.7	2490	2.5	77.2	9.6	Colorless/Clear	*Low-flow groundwater sample:*
	1508	17.66	1.0	6.93	22.3	2370	2.3	73.6	9.1		(A) peristaltic pump w/ ded tubing
	1510	17.66	1.5	6.90	22.2	2350	2.1	70.8	8.7		B) ded bladder pump
	1513	17.66	2.0	6.87	22.2	2330	2.0	68.8	8.3		C) non-ded bladder pump; or
	1515	17.66	2.5	6.83	22.1	2310	1.9	65.4	7.6		*Standard groundwater sample:*
	1518	17.66	3.0	6.81	22.1	2300	1.8	62.7	7.1		D) bailer due to limited column; or
	1520	17.66	3.5	6.79	22.2	2300	1.8	59.9	6.6		E) recovery well cycling sample
	1523	17.66	4.0	6.76	22.2	2290	1.8	57.6	6.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (um/ho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1525	MW-54A	17.66	6.76	22.2	2290	1.8	57.6	6.1	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54B
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-In	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: OSD (214)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1545	N/P	17.69	0.00	46.80	41.8	yes	yes	yes	yes		Weather: Clear 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1555	17.72	0.5	6.78	22.6	2270	2.3	27.1	8.8	Colorless/Clear	*Low-flow groundwater sample:*
	1558	17.72	1.0	6.73	22.3	2080	2.1	22.3	8.1		(A) peristaltic pump w/ ded tubing
	1600	17.72	1.5	6.71	22.2	2030	2.0	17.3	7.5		B) ded bladder pump
	1603	17.72	2.0	6.68	22.1	1970	1.9	12.5	7.3		C) non-ded bladder pump; or
	1605	17.72	2.5	6.63	22.1	1930	1.8	8.3	7.1		*Standard groundwater sample:*
	1608	17.72	3.0	6.60	22.0	1910	1.7	6.9	6.8		D) bailer due to limited column; or
	1610	17.72	3.5	6.57	21.9	1890	1.6	5.8	6.3		E) recovery well cycling sample
	1613	17.72	4.0	6.54	21.8	1870	1.6	3.1	5.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1615	MW-54B	17.72	6.54	21.8	1870	1.6	3.1	5.9	Per COC	Per COC	Lab: Pace National, Mt. Juliet, IN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; If LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Monitoring Well Purging and Sampling Record

+ Dup - NCL-01
+ Trip Blank - NCL-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-49
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA

215

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-13-21	1335	NP	20.26	0.00	32.18	27.2	YES	YES	YES	YES		Weather: Clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1340	20.32	0.5	6.95	22.5	3100	3.4	49.4	24.0	Clear, colorless	Low-flow groundwater sample:
	1343	20.32	1.0	6.93	22.3	3090	3.3	50.2	22.9		(A) peristaltic pump w/ ded tubing
	1345	20.32	1.5	6.90	22.2	3090	3.1	52.9	20.1		B) ded bladder pump
	1348	20.32	2.0	6.88	22.2	3090	3.0	55.5	17.5		C) non-ded bladder pump; or
	1350	20.32	2.5	6.88	22.2	3090	3.0	56.8	12.2		Standard groundwater sample:
	1353	20.32	3.0	6.87	22.2	3080	3.0	57.3	11.8		D) bailer due to limited column; or
	1355	20.32	3.5	6.85	22.1	3080	2.9	57.9	10.9		E) recovery well cycling sample
	1358	20.32	4.0	6.85	22.1	3080	2.9	58.4	9.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1400	NCL-49	20.32	6.85	22.1	3080	2.9	58.4	9.7	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN
	1100	DUP-NCL-01	20.32	6.85	22.1	3080	2.9	58.4	9.7	Per COC	Per COC	

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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(Replacement well for MW-53, that was destroyed by construction activities in 2020)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-53R
Event: 1H21
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Located ~15' North of 70 mi marker (Hwy 285 Northbound)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BA (216)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4-13-21	1425	NF	15.18	0.00	24.05	19.1	YES	YES	YES	YES		Weather: Clear, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-13-21	1430	15.31	0.5	6.97	22.9	2100	2.9	34.3	30.1	clear, colorless	Low-flow groundwater sample:
	1433	15.39	1.0	6.95	22.4	2090	2.5	35.5	28.7		(A) peristaltic pump w/ ded tubing
	1435	15.44	1.5	6.92	22.3	2060	2.3	39.3	27.1		B) ded bladder pump
	1438	15.48	2.0	6.90	22.3	2040	2.2	41.6	25.9		C) non-ded bladder pump; or
	1440	15.51	2.5	6.88	22.3	2030	2.1	43.4	24.1		Standard groundwater sample:
	1443	15.55	3.0	6.87	22.2	2020	2.0	44.1	23.5		D) bailer due to limited column; or
	1445	15.58	3.5	6.85	22.2	2010	1.9	45.8	21.9		E) recovery well cycling sample
	1448	15.61	4.0	6.83	22.2	2000	1.8	46.7	20.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-13-21	1450	MW-53R	15.61	6.83	22.2	2000	1.8	46.7	20.5	Per COC	Per COC	Lab: Pace National, Mt. Juliet, TN

No groundwater sample collected if LNAPL thickness is greater than, or equal to 0.03'; if LNAPL thickness is measured at 0.01' or 0.02', remove LNAPL, and collect groundwater sample

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Instrument Calibration Log

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Hydrologic Monitoring
for TRC
Houston, Texas

Date	Time	pH Hanna (Std. units)	Specific Conductivity Hanna (umho/cm)	Dissolved Oxygen Hanna (Slope Cal. in saturated air)	Turbidity Lamotte (NTU)	ORP Hanna HI 7020 Soln (200-275 mV)	PID Thermo Environmental 100 ppm. Isobutylene	Initials / Comments
4/12/21	1430	4.01/7.00	1,000	100%	10.0	240.4	NA	SCM
4/13/21	0630	4.01/7.00	1,000	100%	10.0	242.0	NA	SCM
4/13/21	0635	4.01/7.00	1,000	100%	10.0	251.6	NA	TAB
4/13/21	0638	4.01/7.00	1,000	100%	10.0	273.3	NA	BRH
4/13/21	0642	4.01/7.00	1,000	100%	10.0	234.2	NA	BRH
4/13/21	0645	4.01/7.00	1,000	100%	10.0	244.6	NA	BA
4/13/21	0651	4.01/7.00	1,000	100%	10.0	237.1	NA	COSJ
4/13/21	0653	4.01/7.00	1,000	100%	10.0	213.9	NA	RJM
4/13/21	0655	4.01/7.00	1,000	100%	10.0	218.6	NA	OSD
4-13-21	0657	4.01/7.00	1,000	100%	10.0	229.1	NA	MDB
4-13-21	700	4.01/7.00	1,000	100%	10.0	235.9	NA	SCD
4/14/21	635	4.01/7.00	1,000	100%	10.0	242.5	NA	SCM
4/14/21	640	4.01/7.00	1,000	100%	10.0	250.1	NA	TAB
4/14/21	643	4.01/7.00	1,000	100%	10.0	232.9	NA	BRH
4/14/21	645	4.01/7.00	1,000	100%	10.0	244.6	NA	BA
4/14/21	648	4.01/7.00	1,000	100%	10.0	256.7	NA	BR
4/14/21	620	4.01/7.00	1,000	100%	10.0	223.8	NA	OD
4-14-21	622	4.01/7.00	1,000	100%	10.0	210.9	NA	RM
4-14-21	625	4.01/7.00	1,000	100%	10.0	228.1	NA	MDB

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Instrument Calibration Log

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Hydrologic Monitoring
for TRC
Houston, Texas

Date	Time	pH Hanna (Std. units)	Specific Conductivity Hanna (umho/cm)	Dissolved Oxygen Hanna (Slope Cal. in saturated air)	Turbidity Lamotte (NTU)	ORP Hanna HI 7020 Soln (200-275 mV)	PID Thermo Environmental 100 ppm. Isobutylene	Initials / Comments
4/12/21	1430	4.01/7.00	1,000	100%	10.0	240.4	NA	SCM
4/13/21	0630	4.01/7.00	1,000	100%	10.0	242.0	NA	SCM
4/13/21	0635	4.01/7.00	1,000	100%	10.0	251.6	NA	TAB
4/13/21	0638	4.01/7.00	1,000	100%	10.0	273.3	NA	BRH
4/13/21	0642	4.01/7.00	1,000	100%	10.0	234.2	NA	BRH
4/13/21	0645	4.01/7.00	1,000	100%	10.0	244.6	NA	BA
4/13/21	0651	4.01/7.00	1,000	100%	10.0	237.1	NA	COSJ
4/13/21	0653	4.01/7.00	1,000	100%	10.0	213.9	NA	RJM
4/13/21	0655	4.01/7.00	1,000	100%	10.0	218.6	NA	OSD
4-13-21	0657	4.01/7.00	1,000	100%	10.0	229.1	NA	MDB
4-13-21	700	4.01/7.00	1,000	100%	10.0	235.9	NA	SCD
4/14/21	635	4.01/7.00	1,000	100%	10.0	242.5	NA	SCM
4/14/21	640	4.01/7.00	1,000	100%	10.0	250.1	NA	TAB
4/14/21	643	4.01/7.00	1,000	100%	10.0	232.9	NA	BRH
4/14/21	645	4.01/7.00	1,000	100%	10.0	244.6	NA	BA
4/14/21	648	4.01/7.00	1,000	100%	10.0	256.7	NA	BP
4/14/21	620	4.01/7.00	1,000	100%	10.0	223.8	NA	OD
4-14-21	622	4.01/7.00	1,000	100%	10.0	210.9	NA	RM
4-14-21	625	4.01/7.00	1,000	100%	10.0	228.1	NA	MDB

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505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 2 of 2 SU SV

Pace Analytical®
National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1330279
B140

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB: CS 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-128	Grab	GW				10	X	X	X	X	X	X						
MW-125	Grab	GW				10	X	X	X	X	X	X						
MW-116	Grab	GW				10	X	X	X	X	X	X						
UG-3R	Grab	GW		4/12/21	1755	11	X	X	X		X	X	X	X				-01
UG-4	Grab	GW		4/12/21	1700	11	X	X	X		X	X	X	X				-02
UG-1	Grab	GW		4/12/21	1610	11	X	X	X		X	X	X	X				-03
UG-2	Grab	GW		4/12/21	1525	11	X	X	X		X	X	X	X				-04
MW-101	Grab	GW				10	X	X	X	X	X	X						
MW-105	Grab	GW				10	X	X	X	X	X	X						
RW-2	Grab	GW				12	X	X	X	X	X	X			X			

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking # 1480 1659 7100

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/13/21	0900	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)		Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 1.9 1.2 2.1 °C Bottles Received: 44

If preservation required by Login: Date/Time

Date: 4/14/21 Time: 9:45

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 2 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# L1339469

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB: CS 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-113	Grab	GW				10	X	X	X	X	X	X						
~~KWB-8~~ LNAPL	Grab	GW				~~9~~	X	X			X	X	X	X				
~~RW-22~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~RW-20A~~ DRY	Grab	GW				~~8~~	X	X		X	X	X						
~~RW-20B~~ DRY	Grab	GW				~~8~~	X	X		X	X	X						
~~RW-13R~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~RW-14R~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~MW-133~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
MW-134	Grab	GW				10	X	X	X	X	X	X						
RA-4798	Grab	GW				5	X				X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Scott Ude	4/14/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 0273705
				If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900 0430 of 4/16
				Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Chain of Custody Page 3 of 14

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National Center for Testing & Innovation

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Phone: 800-767-5859
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L# L1339469

Table #

Acctnum: **TRCATX**
Template: **T121997**
Prelogin: **P835518**
TSR: **526**
PB: 3/22/21

Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
RA-4196	Grab	GW				5	X				X	X						
RA-3156	Grab	GW				5	X				X	X						
RA-313	Grab	GW				5	X				X	X						
KWB-7	Grab	GW				9	X	X			X	X	X	X				
MW-135	Grab	GW		4/13/21	1635	10	X	X	X	X	X	X						-01
~~KWB-11A~~ LNAPL	Grab	GW				~~11~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~				
KWB-11B	Grab	GW		4/13/21	1010	11	X	X	X		X	X	X	X				-26
MW-115	Grab	GW				10	X	X	X	X	X	X						
MW-114	Grab	GW				10	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Scott Ude	4/14/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 01213595
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/14/21 Time: 0900

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dbelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 4 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# L1339469

Table #

Acctnum: **TRCATX**
Template: **T121997**
Prelogin: **P835518**
TSR: **526**
PB: DR 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-117	Grab	GW		4/13/21	1405	10	X	X	X	X	X	X						-02
MW-118	Grab	GW		4/13/21	1320	10	X	X	X	X	X	X						-03
MW-119	Grab	GW		4/13/21	1230	10	X	X	X	X	X	X						-04
NP-5	Grab	GW		4/13/21	1005	8	X	X		X	X	X						-05
MW-136	Grab	GW		4/13/21	1100	11	X	X	X		X	X	X	X				-06
~~MW-126A~~ LNAPL	Grab	GW				~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
MW-126B	Grab	GW		4/13/21	905	10	X	X	X	X	X	X						-07
~~MW-127~~ LNAPL.	Grab	GW				~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
~~MW-129~~ LNAPL	Grab	GW				~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
~~RW-#18A~~ DRY	Grab	GW				~~6~~	~~X~~			~~X~~	~~X~~	~~X~~						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier

Tracking #

Sample Receipt Checklist

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

Relinquished by : (Signature) Scott Ude	Date: 4/14/21	Time: 1200	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 13.2 °C 0.2+3=0.5 Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 5 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# L1339465

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB: CK 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
~~KWB-1A LNAPL~~	Grab	GW				~~9~~	X	X			X	X	X	X				
KWB-1C	Grab	GW		4/13/21	1415	8	X	X		X	X	X						-08
~~KWB-10R LNAPL~~	Grab	GW				~~8~~	X	X		X	X	X						
~~MW-131 LNAPL~~	Grab	GW				~~10~~	X	X	X	X	X	X						
~~KWB-5 LNAPL~~	Grab	GW				~~8~~	X	X		X	X	X						
~~MW-111 LNAPL~~	Grab	GW				~~10~~	X	X	X	X	X	X						
~~KWB-6 LNAPL~~	Grab	GW				~~11~~	X	X		X	X	X				X		
~~MW-112 LNAPL~~	Grab	GW				~~10~~	X	X	X	X	X	X						
~~MW-132 LNAPL~~	Grab	GW				~~10~~	X	X	X	X	X	X						
MW-57	Grab	GW		4/13/21	1115	10	X	X	X	X	X	X						-09

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp 1.3 °C Bottles Received: 0.2+1.3=0.5	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: 4/14

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 6 of 14

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National Center for Testing & Innovation

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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1339465

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB: cb 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
~~RW-#11-0~~ DRY	Grab	GW				~~8~~	X	X		X	X	X						
~~KWB-12A~~ DRY	Grab	GW				~~11~~	X	X	X		X	X	X	X				
KWB-12B	Grab	GW		4/13/21	1005	11	X	X	X		X	X	X	X				-10
~~KWB-2R~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~MW-58~~ LNAPL	Grab	GW				~~9~~	X	X			X	X	X	X				
KWB-13	Grab	GW		4/13/21	1210	9	X	X			X	X	X	X				-11
MW-103	Grab	GW		4/13/21	1410	10	X	X	X	X	X	X						-22
MW-104	Grab	GW		4/13/21	1300	10	X	X	X	X	X	X						-12
MW-64	Grab	GW		4/13/21	1500	10	X	X	X	X	X	X						-28
~~MW-65~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 °C Bottles Received: 0,2,3,6,9,5	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: 4/16 Condition: NCF / OK

Shipment #2

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170** Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 7 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# L1339469

Table #

Acctnum: **TRCATX**

Template: **T121997**

Prelogin: **P835518**

TSR: **526**

PB: **cb 3/22/21**

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
~~RW-5R~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
MW-102	Grab	GW				10	X	X	X	X	X	X						
~~RW-4~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~RW-6~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~MW-99~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
MW-66	Grab	GW				11	X	X	X		X	X	X	X				
~~MW-28~~ LNAPL	Grab	GW				~~11~~	X	X	X		X	X	X	X				
~~MW-59~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
~~MW-60~~ LNAPL	Grab	GW				~~11~~	X	X	X		X	X	X	X				
~~MW-107~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

Sample Receipt Checklist

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

	Date:	Time:		
Relinquished by : (Signature) Scott Ude	4/14/21	1200	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 15 °C Bottles Received: 0,2,4,3,9,5
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900

If preservation required by Login: Date/Time

Hold: Condition: NCF / 0

Shipped

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 8 of 14

Pace Analytical®
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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1339469

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB: CB 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
~~MW-128~~ LNAPL	Grab	GW				~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
MW-125	Grab	GW				10	X	X	X	X	X	X						
MW-116	Grab	GW				10	X	X	X	X	X	X						
~~UG-3R~~	Grab	GW				11	X	X	X		X	X	X	X				
~~UG-4~~	Grab	GW				11	X	X	X		X	X	X	X				
~~UG-1~~	Grab	GW				11	X	X	X		X	X	X	X				
~~UG-2~~	Grab	GW				11	X	X	X		X	X	X	X				
MW-101	Grab	GW				10	X	X	X	X	X	X						
MW-105	Grab	GW				10	X	X	X	X	X	X						
~~BW-2~~ LNAPL	Grab	GW				12	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			X			

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

Sample Receipt Checklist

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 +3 = 7.5 °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0930	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 9 of 14

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National Center for Testing & Innovation

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Mount Juliet, TN 37122
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Fax: 615-758-5859

L# L1339469

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB: CS 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-61	Grab	GW				10	X	X	X	X	X	X						
~~MW-62~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
MW-93	Grab	GW				10	X	X	X	X	X	X						
~~MW-43~~ LNAPL	Grab	GW				~~11~~	X	X	X		X	X	X	X				
~~MW-137~~ LNAPL	Grab	GW				13	X	X	X		X	X	X	X	X			
~~MW-138~~ LNAPL	Grab	GW				~~13~~	X	X	X		X	X	X	X	X			
~~MW-23~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
~~MW-39~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
MW-98	Grab	GW		4/13/21	1255	10	X	X	X	X	X	X						-13
RW-10	Grab	GW		4/13/21	1105	10	X	X	X	X	X	X						-14

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/14/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 4.2 °C Bottles Received: 30
Date: 4/15/21 Time: 0900

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 10 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# L1339469

Table #

Acctnum: TRCATX

Template: T121997

Prelogin: P835518

TSR: 526

PB: cs 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
~~MW-40~~ LNAPL	Grab	GW				~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
MW-41	Grab	GW				10	X	X	X	X	X	X						
RW-9	Grab	GW				10	X	X	X	X	X	X						
MW-42	Grab	GW				10	X	X	X	X	X	X						
MW-29	Grab	GW				10	X	X	X	X	X	X						
~~RW-#16B~~ DRY	Grab	GW				~~8~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~						
MW-106	Grab	GW		4/13/21	1155	10	X	X	X	X	X	X						15
MW-50	Grab	GW		4/13/21	1000	8	X	X		X	X	X						16
~~MW-97~~ missing; covered by Navajo gravel	Grab	GW				~~12~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			X			
~~MW-92~~ LNAPL	Grab	GW				~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/14/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 2.2, 3.2, 2.5 °C Bottles Received:

Date: 4/15/21 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dbelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 11 of 14

Pace Analytical®
National Center for Testing & Innovation

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

Lab # L1339469

Table #

Acctnum: TRCATX

Template: T121997

Prelogin: P835518

TSR: 526

PB: 03/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
~~RW-1~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
~~MW-91~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
MW-90	Grab	GW		4/13/21	1100	10	X	X	X	X	X	X						-17
~~MW-96~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
~~MW-94~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
~~BW-8~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~MW-67~~ LNAPL	Grab	GW				~~11~~	X	X	X		X	X	X	X				
~~MW-95~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
~~RW-7~~ LNAPL	Grab	GW				~~10~~	X	X	X	X	X	X						
~~RW-#17A~~ DRY	Grab	GW				~~10~~	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Scott Ude	4/14/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp 13 °C Bottles Received: 3,2,4,3,0,5
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0930

If preservation required by Login: Date/Time

Hold: 4/16

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Analysis / Container / Preservative

Chain of Custody Page 12 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# L1339469

Table #

Acctnum: **TRCATX**
Template: **T121997**
Prelogin: **P835518**
TSR: **526**
PB: CS 3/22/21
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
DUP-REST-01	Grab	GW				10	X	X	X	X	X	X						
DUP-REST-02	Grab	GW		4/13/21	1200	10	X	X	X	X	X	X						-18
DUP-REST-03	Grab	GW				10	X	X	X	X	X	X						
~~DUP-REST-04~~ LNAPL	Grab	GW				~~11~~	X	X	X		X	X	X	X				
DUP-REST-05	Grab	GW		4/13/21	1200	11	X	X	X		X	X	X	X				-19
EB-REST-01	Grab	GW				10	X	X	X	X	X	X						
EB-REST-02	Grab	GW		4/13/21	1305	10	X	X	X	X	X	X						-29
EB-REST-03	Grab	GW				10	X	X	X	X	X	X						
~~EB-REST-04~~ LNAPL related	Grab	GW				~~11~~	X	X	X		X	X	X	X				
EB-REST-05	Grab	GW		4/13/21	1025	11	X	X	X		X	X	X	X				-20

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: A3 °C Bottles Received: 0,3,3,3,5	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: Condition: NCF / OK

Shipment 1 of 2

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
Trip Blank-REST-01	Grab	GW				1	X											
Trip Blank-REST-02	Grab	GW		4/13/21	—	1	X											-21
Trip Blank-REST-03	Grab	GW				1	X											
Trip Blank-REST-04	Grab	GW				1	X											
~~Trip Blank-REST-05~~	Grab	GW				1	X	SH										

Analysis / Container / Preservative

Chain of Custody Page 13 of 14

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

L# L1339469

Table #

Acctnum: TRCATX

Template: T121997

Prelogin: P835518

TSR: 526

PB: OK 3/22/21

Shipped Via:

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/14/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No HCL / MeoH TBR

Temp: 1.3 +c Bottles Received: 22

3705

Date: 4/15/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

4/16

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 14 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# L1394469

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB: cs 3/22/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	SVOCs - 8270	Remarks	Sample # (lab only)
MW-62R	Grab	GW				9	X	X	X	X	X	X	X					
~~MW-137A~~ DRY	Grab	GW				~~11~~	X	X	X		X	X	X	X	X			
~~MW-138A~~ DRY	Grab	GW				~~11~~	X	X	X		X	X	X	X	X			
MW-139	Grab	GW		4/13/21	1630	10	X	X	X	X	X	X	X					-22
MW-145	Grab	GW		4/13/21	1200	8	X	X	X	X		X						-23
MW-146	Grab	GW		4/13/21	1115	8	X	X	X	X		X						-24
MW-147	Grab	GW		4/13/21	910	8	X	X	X	X		X						-30
MW-148	Grab	GW		4/13/21	1020	8	X	X	X	X		X						-25
	Grab	GW																

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp 13 °C Bottles Received: 0212.3.0.5	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: 04/16 Condition: NCF / OK

Ship

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dbelbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Analysis / Container / Preservative

Chain of Custody Page 1 of 7

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National Center for Testing & Innovation

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

L #

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB: cb 3/19/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-6A	Grab	GW		4/13/21	910	10	X	X	X	X	X	X						
MW-6B	Grab	GW		4/13/21	955	10	X	X	X	X	X	X						
~~MW-85~~ LNAPL	Grab	GW				~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
~~MW-86~~ LNAPL	Grab	GW				~~11~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	X	X				
MW-120	Grab	GW				10	X	X	X	X	X	X						
MW-121	Grab	GW				10	X	X	X	X	X	X						
MW-84	Grab	GW				10	X	X	X	X	X	X						
MW-122	Grab	GW		4/13/21	1630	10	X	X	X	X	X	X						
MW-81	Grab	GW				10	X	X	X	X	X	X						
MW-80	Grab	GW				10	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.8 °C Bottles Received: 6, 2, 1, 3, 2, 5	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

Shipment

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 2 of 7

Pace Analytical® National Center for Testing & Innovation

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

L #

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB: **CE 3/19/21**

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-79	Grab	GW				10	X	X	X	X	X	X						
MW-82	Grab	GW				10	X	X	X	X	X	X						
MW-74	Grab	GW		4/13/21	1040	10	X	X	X	X	X	X						
MW-73	Grab	GW		4/13/21	1130	10	X	X	X	X	X	X						
MW-2A	Grab	GW		4/13/21	1530	10	X	X	X	X	X	X						
MW-72	Grab	GW		4/13/21	1445	10	X	X	X	X	X	X						
OCD-6	Grab	GW		4/13/21	1400	10	X	X	X	X	X	X						
OCD-7AR	Grab	GW		4/13/21	1220	10	X	X	X	X	X	X						
OCD-7B	Grab	GW		4/13/21	1310	10	X	X	X	X	X	X						
MW-76	Grab	GW				10	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Sam Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 °C Bottles Received: 0.2+3=0.5	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

Shipment

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dbolbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Analysis / Container / Preservative

Chain of Custody Page 3 of 7

Pace Analytical® National Center for Testing & Innovation

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

L #

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB: CA 3/19/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-77	Grab	GW				10	X	X	X	X	X	X						
MW-78	Grab	GW				10	X	X	X	X	X	X						
MW-75	Grab	GW				10	X	X	X	X	X	X						
MW-83	Grab	GW				10	X	X	X	X	X	X						
MW-3	Grab	GW				10	X	X	X	X	X	X						
MW-88	Grab	GW		4/13/21	1610	10	X	X	X	X	X	X						
MW-22A	Grab	GW				10	X	X	X	X	X	X						
MW-22B	Grab	GW				10	X	X	X	X	X	X						
MW-10	Grab	GW		4/13/21	1720	10	X	X	X	X	X	X						
MW-123	Grab	GW				10	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp 1.2 °C Bottles Received: 0.2+3005	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 4 of 7

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB: 4/13/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-4A	Grab	GW		4/13/21	1455	10	X	X	X	X	X	X						
MW-4B	Grab	GW		4/13/21	1540	10	X	X	X	X	X	X						
MW-5A	Grab	GW		4/13/21	1225	10	X	X	X	X	X	X						
MW-5B	Grab	GW		4/13/21	1320	10	X	X	X	X	X	X						
MW-5C	Grab	GW		4/13/21	1405	10	X	X	X	X	X	X						
MW-7A	Grab	GW		4/13/21	1115	10	X	X	X	X	X	X						
MW-7B	Grab	GW		4/13/21	1030	10	X	X	X	X	X	X						
OCD-8A	Grab	GW		4/13/21	945	11	X	X	X		X	X	X	X				
OCD-8B	Grab	GW		4/13/21	855	10	X	X	X	X	X	X						
MW-1R	Grab	GW				8	X	X		X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 °C Bottles Received: 02+3=05	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Analysis / Container / Preservative

Chain of Custody Page 5 of 7

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L #

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB: **cs 3/19/21**

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-15	Grab	GW				10	X	X	X	X	X	X						
OCD-1R	Grab	GW				10	X	X	X	X	X	X						
OCD-2A	Grab	GW				10	X	X	X	X	X	X						
OCD-3	Grab	GW				10	X	X	X	X	X	X						
OCD-4	Grab	GW				10	X	X	X	X	X	X						
MW-11A	Grab	GW				10	X	X	X	X	X	X						
MW-11B	Grab	GW				10	X	X	X	X	X	X						
OCD-5	Grab	GW				10	X	X	X	X	X	X						
MW-87	Grab	GW		4/13/21	1000	10	X	X	X	X	X	X						
MW-18A	Grab	GW		4/13/21	1045	9	X	X			X	X	X	X				

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: TBR °C Bottles Received: 0,2,3,4,5,6	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

shipment

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com;** dhelbert@trccompanies.com

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-18B	Grab	GW		4/13/21	1125	10	X	X	X	X	X	X						
MW-70	Grab	GW		4/13/21	1210	10	X	X	X	X	X	X						
MW-124	Grab	GW		4/13/21	1255	10	X	X	X	X	X	X						
DUP-EP-01	Grab	GW		4/13/21	1000	10	X	X	X	X	X	X						
DUP-EP-02	Grab	GW				10	X	X	X	X	X	X						
DUP-EP-03	Grab	GW				10	X	X	X	X	X	X						
EB-EP-01	Grab	GW		4/13/21	1055	10	X	X	X	X	X	X						
EB-EP-02	Grab	GW		4/13/21	1310	10	X	X	X	X	X	X						
EB-EP-03	Grab	GW		4/13/21	1245	10	X	X	X	X	X	X						
EB-EP-04	Grab	GW				10	X	X	X	X	X	X						

Analysis / Container / Preservative

Chain of Custody Page 6 of 7

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB: dd 3/19/21

Shipped Via:

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 0227,3=9,5	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

Shipment

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhalbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
Trip Blank-EP-01	Grab	GW		4/13/21	—	1	X											
Trip Blank-EP-02	Grab	GW		4/13/21	—	1	X											
Trip Blank-EP-03	Grab	GW				1	X											

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB: **ck 3/19/21**

Shipped Via:

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	if preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp 4.3 °C Bottles Received: 0,2,3=0.5	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

Shipment #2

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com**

Project Description: **TMD Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-TMD**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TMD (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

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Fax: 615-758-5859

L# ~~L1339415~~ J073 L1339491

Acctnum: TRCATX

Template: T120266

Prelogin: P835833

TSR: 526

PB: ck 3/23/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-25	Grab	GW		4/13/21	1530	8	X	X		X	X	X						-01
MW-20	Grab	GW				8	X	X		X	X	X						
NP-1	Grab	GW				5	X				X	X						
NP-6	Grab	GW				3	X											
MW-8	Grab	GW				10	X	X	X	X	X	X						
MW-21	Grab	GW				10	X	X	X	X	X	X						
MW-71	Grab	GW				9	X	X			X	X	X	X				
MW-68	Grab	GW				8	X	X		X	X	X						
MW-27	Grab	GW		4/13/21	1430	8	X	X		X	X	X						-02
MW-89	Grab	GW		4/13/21	1610	8	X	X		X	X	X						-03

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

Remarks:

pH _____ Temp _____

4 temps for coolers received 4d/16.1C Other _____

Samples returned via: __UPS ✓FedEx __Courier __ _____

Tracking # 9517 5771 D.S D508 / D.S 2989

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/14/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 1.3 °C Bottles Received: 24
0.2+1.5+0.5

If preservation required by Login: Date/Time

Date: 4/15/21 Time: 0930

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com**

Project Description: **TMD Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-TMD**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TMD (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace Analytical® National Center for Testing & Innovation

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Phone: 800-767-5859
Fax: 615-758-5859

L# L1339491

Table #

Acctnum: TRCATX
Template: T120266
Prelogin: P835833
TSR: 526
PB: 4 3/23/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-16	Grab	GW		4/13/21	1525	8	X	X		X	X	X						-04
MW-26	Grab	GW		4/13/21	1655	8	X	X		X	X	X						-05
MW-46R	Grab	GW				8	X	X		X	X	X						
Trip Blank-TMD-01	Grab	GW				1	X											

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR
Scott Ude	4/14/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 14
				0223005
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

4/15

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **TEL Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-TEL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TEL (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

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L# 1340036
1109

Acctnum: TRCATX
Template: T118731
Prelogin: P835834
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
TEL-4	Grab	GW		4/13/21	840	10	X	X	X	X	X	X						
TEL-3 LNAPL	Grab	GW				10	X	X	X	X	X	X						
TEL-2 LNAPL	Grab	GW				10	X	X	X	X	X	X						
TEL-1 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-49	Grab	GW		4/14/21	900	11	X	X	X		X	X	X	X				-01
DUP-TEL-01	Grab	GW		4/13/21	900	10	X	X	X	X	X	X						
EB-TEL-01	Grab	GW		4/15/21	1000	10	X	X	X	X	X	X						
Trip Blank-TEL-01	Grab	GW		4/15/21	—	1	X	—										

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Scott Ude	4/15/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 11
				0.1+3=0.4
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# L1339469

J074

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB: CK 3/23/21

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
~~RW-15C~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~MW-48~~ Well destroyed	Grab	GW				~~10~~	X	X	X	X	X	X						
MW-130	Grab	GW				10	X	X	X	X	X	X						
~~KWB-4~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
~~RW-19~~ LNAPL	Grab	GW				~~8~~	X	X		X	X	X						
KWB-P4	Grab	GW				4	X	X										
MW-52	Grab	GW				11	X	X	X		X	X	X	X				
MW-109	Grab	GW				10	X	X	X	X	X	X						
MW-110	Grab	GW				10	X	X	X	X	X	X						
~~RW-12R~~ LNAPL	Grab	GW		~~4/13/21~~		~~8~~	X	X		X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking # 9517 5771 0508 2989

Temps for coolers received 4/16: 0.5 / 0.5

Sample Receipt Checklist

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp 1.3 °C Bottles Received: 0127350.5	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

Ship

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Chain of Custody Page 1 of 14

Pace Analytical* National Center for Testing & Innovation

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

L# 1340127

J076

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
RW-#15C LNAPL	Grab	GW				8	X	X		X	X	X						
MW-48 Well destroyed	Grab	GW				10	X	X	X	X	X	X						
MW-130	Grab	GW		4/14/21	1520	10	X	X	X	X	X	X						-01
KWB-4 LNAPL	Grab	GW				8	X	X		X	X	X						
RW-19 LNAPL	Grab	GW				8	X	X		X	X	X						
KWB-P4	Grab	GW		4/14/21	1430	4	X	X										-02
MW-52	Grab	GW		4/14/21	1530	11	X	X	X		X	X	X	X				-03
MW-109	Grab	GW		4/14/21	1520	10	X	X	X	X	X	X						-04
MW-110	Grab	GW		4/14/21	1425	10	X	X	X	X	X	X						-05
RW-12R LNAPL	Grab	GW		4/13/21		8	X	X		X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking # atto.

Sample Receipt Checklist

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeOH TBR	
Scott Ude	4/15/21	1200		KH	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.1/4.3 °C	Bottles Received: 269+418
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21	Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Ship

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 2 of 14

Pace Analytical®
National Center for Testing & Innovation

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

L# 134027

Table #

Acctnum: TRCATX

Template: T121997

Prelogin: P835518

TSR: 526

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-113	Grab	GW		4/14/21	1225	10	X	X	X	X	X	X						-06
KWB-8 LNAPL	Grab	GW				9	X	X			X	X	X	X				
RW-22 LNAPL	Grab	GW				8	X	X		X	X	X						
RW-20A DRY	Grab	GW				8	X	X		X	X	X						
RW-20B DRY	Grab	GW				8	X	X		X	X	X						
RW-13R LNAPL	Grab	GW				8	X	X		X	X	X						
RW-14R LNAPL	Grab	GW				8	X	X		X	X	X						
MW-133 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-134	Grab	GW		4/14/21	1120	10	X	X	X	X	X	X						-07
RA-4798	Grab	GW		4/14/21	1305	5	X				X	X						-08

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No, HCL / MeoH, TBR
Scott Ude	4/15/21	1200		X4
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 26+4TB
				a/A3=0.4
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930
				Hold: Condition: NCF / OK

If preservation required by Login: Date/Time

Shipment #3

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 3 of 14

Pace Analytical® National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 134027
Table #
Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
RA-4196 Not Sampled; electrical problem per Samp. form	Grab	GW		4/14/21	Not Sampled	5	X				X	X						
RA-3156	Grab	GW		4/14/21	830	5	X				X	X						-09
RA-313	Grab	GW		4/14/21	1335	5	X				X	X						-10
KWB-7	Grab	GW		4/14/21	1220	9	X	X			X	X	X	X				-11
~~MW-135~~	Grab	GW		~~4/13/21~~	~~1635~~	10	X	X	X	X	X	X						
~~KWB-11A~~ LNAPL	Grab	GW				11	X	X	X		X	X	X	X				
~~KWB-11B~~	Grab	GW		~~4/13/21~~	~~1010~~	11	X	X	X		X	X	X	X				
MW-115	Grab	GW		4/14/21	1610	10	X	X	X	X	X	X						-12
MW-114	Grab	GW		4/14/21	1515	10	X	X	X	X	X	X						-13

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

4/16

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/15/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCl / MeoH
TBR
x4

Temp: 4.3 °C Bottles Received: 2 1 3 3 4 2 6 9+4 TB

If preservation required by Login: Date/Time

Date: 4/16/21 Time: 0930

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 4 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# 340127

Table #

Acctnum: **TRCATX**

Template: **T121997**

Prelogin: **P835518**

TSR: **526**

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-117	Grab	GW		4/13/21	1405	10	X	X	X	X	X	X						
MW-118	Grab	GW		4/13/21	1320	10	X	X	X	X	X	X						
MW-119	Grab	GW		4/13/21	1230	10	X	X	X	X	X	X						
NP-5	Grab	GW		4/13/21	1405	8	X	X		X	X	X						
MW-136	Grab	GW		4/13/21	1100	11	X	X	X		X	X	X	X				
MW-126A LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-126B	Grab	GW		4/13/21	905	10	X	X	X	X	X	X						
MW-127 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-129 LNAPL	Grab	GW				10	X	X	X	X	X	X						
RW-#18A DRY	Grab	GW				6	X			X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes (No) HCL / MeoH TBR
Scott Ude	4/15/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 269+47B
				2.1+3=5.4
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dbolbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 5 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# 134027

Table #

Acctnum: **TRCATX**

Template: **T121997**

Prelogin: **P835518**

TSR: **526**

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
KWB-1A LNAPL	Grab	GW				9	X	X			X	X	X	X				
KWB-1C	Grab	GW		4/13/21	1415	8	X	X		X	X	X						
KWB-10R LNAPL	Grab	GW				8	X	X		X	X	X						
MW-131 LNAPL	Grab	GW				10	X	X	X	X	X	X						
KWB-5 LNAPL	Grab	GW				8	X	X		X	X	X						
MW-111 LNAPL	Grab	GW				10	X	X	X	X	X	X						
KWB-6 LNAPL	Grab	GW				11	X	X		X	X	X				X		
MW-112 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-132 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-57	Grab	GW		4/13/21	1115	10	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Scott Ude	4/15/21	1200		NA
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3°C Bottles Received: 269+4TB
				0,1,3,2,4
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Shipped

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 6 of 14

Pace Analytical® National Center for Testing & Innovation

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

L # 1340127

Table #

Acctnum: **TRCATX**
Template: **T121997**
Prelogin: **P835518**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
RW-#11-0 DRY	Grab	GW				8	X	X		X	X	X						
KWB-12A DRY	Grab	GW				11	X	X	X		X	X	X	X				
KWB-12B	Grab	GW		4/13/21	1005	11	X	X	X		X	X	X	X				
KWB-2R LNAPL	Grab	GW				8	X	X		X	X	X						
MW-58 LNAPL	Grab	GW				9	X	X			X	X	X	X				
KWB-13	Grab	GW		4/13/21	1210	9	X	X			X	X	X	X				
MW-103	Grab	GW		4/13/21	1410	10	X	X	X	X	X	X						
MW-104	Grab	GW		4/13/21	1300	10	X	X	X	X	X	X						
MW-64	Grab	GW		4/13/21	1500	10	X	X	X	X	X	X						
MW-65 LNAPL	Grab	GW				10	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: (Yes) No HCL MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/15/21	1200		x4	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received:	
				01+03=04 269+410	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930	Hold: Condition: NCF / OK

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Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 7 of 14

Pace Analytical* National Center for Testing & Innovation

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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # 1346127

Table #

Acctnum: **TRCATX**
Template: **T121997**
Prelogin: **P835518**
TSR: **526**
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
RW-5R LNAPL	Grab	GW				8	X	X		X	X	X						
MW-102	Grab	GW		4/14/21	1630	10	X	X	X	X	X	X						-14
RW-4 LNAPL	Grab	GW				8	X	X		X	X	X						
RW-6 LNAPL	Grab	GW				8	X	X		X	X	X						
MW-99 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-66	Grab	GW		4/14/21	1535	11	X	X	X		X	X	X	X				-15
MW-28 LNAPL	Grab	GW				11	X	X	X		X	X	X	X				
MW-59 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-60 LNAPL	Grab	GW				11	X	X	X		X	X	X	X				
MW-107 LNAPL	Grab	GW				10	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR	
Scott Ude	4/15/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3°C Bottles Received: 3,1A3=0.4 2G9+4TB	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930	Hold: / Condition: NCF / OK

Chain of Custody Page 8 of 14

Pace Analytical* National Center for Testing & Innovation

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

L# 134012?

Table #

Acctnum: TRCATX

Template: T121997

Prelogin: P835518

TSR: 526

PB:

Shipped Via:

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apinvoiceapproval@trcsolutions.com

Pres Chk

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Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-128 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-125	Grab	GW		4/14/21	1425	10	X	X	X	X	X	X						-16
MW-116	Grab	GW		4/14/21	1525	10	X	X	X	X	X	X						-17
UG-3R	Grab	GW				11	X	X	X		X	X	X	X				
UG-4	Grab	GW				11	X	X	X		X	X	X	X				
UG-1	Grab	GW				11	X	X	X		X	X	X	X				
UG-2	Grab	GW				11	X	X	X		X	X	X	X				
MW-101	Grab	GW		4/14/21	1320	10	X	X	X	X	X	X						-18
MW-105	Grab	GW		4/14/21	825	10	X	X	X	X	X	X						-19
RW-2 LNAPL	Grab	GW				12	X	X	X	X	X	X			X			

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/15/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCl / MeoH
TBR

Temp: 4.3 °C Bottles Received: 0+1+3=4 269+4TB

Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Conditions NCF / OK

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Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

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

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ✓

Analysis / Container / Preservative

Chain of Custody Page 9 of 14

Pace Analytical® National Center for Testing & Innovation

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

L# 134027

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-61	Grab	GW		4/14/21	1235	10	X	X	X	X	X	X						-20
MW-62 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-93 covered by gravel; not located	Grab	GW				10	X	X	X	X	X	X						
MW-43 LNAPL	Grab	GW				11	X	X	X		X	X	X	X				
MW-137 LNAPL	Grab	GW				13	X	X	X		X	X	X	X	X			
MW-138 LNAPL	Grab	GW				13	X	X	X		X	X	X	X	X			
MW-23 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-39 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-98	Grab	GW		4/13/21	1255	10	X	X	X	X	X	X						
RW-10	Grab	GW		4/13/21	1105	10	X	X	X	X	X	X						

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
___ UPS ✓ FedEx ___ Courier ___

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/15/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

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

Temp: 1.3 °C Bottles Received: 6, 17330 4 269+47B

If preservation required by Login: Date/Time

Date: 4/16/21 Time: 0930

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	Billing Information: **Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095** **apinvoiceapproval@trcsolutions.com**	Pres Chk
Report to: **Julie Speer**	Email To: **jspeer@trccompanies.com; dbelbert@trccompanies.com**	
Project Description: **REST Spring 2021**	City/State Collected: **Artesia, NM**	
Phone: **512-684-3170** Fax:	Client Project # **330538.0000.0000**	Lab Project # **TRCATX-REST**
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID # **REST (Navajo - Artesia)**	P.O. #
Collected by (signature):	*Rush?* (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # Date Results Needed
Immediately Packed on Ice N___ Y✓		

Analysis / Container / Preservative

Chain of Custody Page 10 of 14

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
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L# 1340127

Table #

Acctnum: TRCATX

Template: T121997

Prelogin: P835518

TSR: 526

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-40 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-41	Grab	GW		4/14/21	1000	10	X	X	X	X	X	X						-21
RW-9	Grab	GW		4/14/21	1100	10	X	X	X	X	X	X						-22
MW-42	Grab	GW		4/14/21	1325	10	X	X	X	X	X	X						-23
MW-29	Grab	GW		4/14/21	1225	10	X	X	X	X	X	X						-24
RW-#16B DRY	Grab	GW				8	X	X		X	X	X						
MW-106	Grab	GW		~~4/13/21~~	~~1155~~	10	X	X	X	X	X	X						
MW-50	Grab	GW		~~4/13/21~~	~~1000~~	8	X	X		X	X	X						
MW-97 missing; covered by Navajo gravel	Grab	GW				12	X	X	X	X	X	X			X			
MW-92 LNAPL	Grab	GW				10	X	X	X	X	X	X						

* Matrix:
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GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

Sample Receipt Checklist

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

Relinquished by : (Signature) Scott Ude	Date: 4/15/21	Time: 1200	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR ✓4
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 °C Bottles Received: 0,1,3,2,4 269+47B HCl
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

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P.O. #

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Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)
RW-1 LNAPL	Grab	GW				10	X	X	X	X	X	X				
MW-91 LNAPL	Grab	GW				10	X	X	X	X	X	X				
MW-90	Grab	GW		4/15/21	1100	10	X	X	X	X	X	X				
MW-96 LNAPL	Grab	GW				10	X	X	X	X	X	X				
MW-94 LNAPL	Grab	GW				10	X	X	X	X	X	X				
RW-8 LNAPL	Grab	GW				8	X	X		X	X	X				
MW-67 LNAPL	Grab	GW				11	X	X	X		X	X	X	X		
MW-95 LNAPL	Grab	GW				10	X	X	X	X	X	X				
RW-7 LNAPL	Grab	GW				10	X	X	X	X	X	X				
RW-#17A DRY	Grab	GW				10	X	X	X	X	X	X				

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

Relinquished by : (Signature) Scott Ude | Date: 4/15/21 | Time: 1200 | Received by: (Signature)

Relinquished by : (Signature) | Date: | Time: | Received by: (Signature)

Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature)

Trip Blank Received: Yes / No (HCl / MeoH / TBR) x4

Temp: 1.1 °C Bottles Received: 269+4TB

Date: 4/16/21 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

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

Chain of Custody Page 11 of 14

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National Center for Testing & Innovation

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L# 1340127

Table #

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Prelogin: P835518

TSR: 526

PB:

Shipped Via:

Remarks | Sample # (lab only)

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Pres Chk

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Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Chain of Custody Page 12 of 14

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National Center for Testing & Innovation

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L# 1390127

Table #

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Template: **T121997**
Prelogin: **P835518**
TSR: **526**
PB:

Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
DUP-REST-01	Grab	GW		4/14/21	1000	10	X	X	X	X	X	X						-25
DUP-REST-02	Grab	GW		4/13/21	1200	10	X	X	X	X	X	X						
DUP-REST-03	Grab	GW		4/14/21	900	10	X	X	X	X	X	X						-26
DUP-REST-04 - LNAPL	Grab	GW				11	X	X	X		X	X	X	X				
DUP-REST-05	Grab	GW		4/13/21	1200	11	X	X	X		X	X	X	X				
EB-REST-01	Grab	GW		4/14/21	1240	10	X	X	X	X	X	X						-27
EB-REST-02	Grab	GW		4/13/21	1305	10	X	X	X	X	X	X						
EB-REST-03	Grab	GW		4/14/21	1135	10	X	X	X	X	X	X						-28
EB-REST-04 LNAPL related	Grab	GW				11	X	X	X		X	X	X	X				
EB-REST-05	Grab	GW		4/13/21	1025	11	X	X	X		X	X	X	X				

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes (HCl / MeoH TBR) No	If preservation required by Login: Date/Time
Scott Ude	4/15/21	1200		X4	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 4/13=04 269+4TB	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0900	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

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

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ✓

Analysis / Container / Preservative

Chain of Custody Page 13 of 14

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Phone: 800-767-5859
Fax: 615-758-5859

L # 1340127

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
Trip Blank-REST-01	Grab	GW		4/14/21	—	1	X											-29
~~Trip Blank-REST-02~~	Grab	GW		~~4/13/21~~	~~—~~	~~1~~	~~X~~											
Trip Blank-REST-03	Grab	GW		4/14/21	—	1	X											-30
Trip Blank-REST-04	Grab	GW		4/14/21	—	1	X											-31
~~Trip Blank-REST-05~~	Grab	GW				~~1~~	~~X~~	SH									(Not requested)	

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR
Scott Ude	4/15/21	1200		X4
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 0.1+3=4 269+4TB
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **REST Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. #

Collected by (signature):

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

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ✓

Analysis / Container / Preservative

Chain of Custody Page 14 of 14

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Phone: 800-767-5859
Fax: 615-758-5859

L # 1340127

Table #

Acctnum: TRCATX
Template: T121997
Prelogin: P835518
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	SVOCs - 8270	Remarks	Sample # (lab only)
MW-62R	Grab	GW		4/14/21	1025	9	X	X	X	X	X	X	X					-32
~~MW-137A~~ DRY	Grab	GW				11	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
~~MW-138A~~ DRY	Grab	GW				11	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
~~MW-139~~	Grab	GW		~~4/13/21~~	~~1630~~	10	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~MW-145~~	Grab	GW		~~4/13/21~~	~~1200~~	8	~~X~~	~~X~~	~~X~~	~~X~~		~~X~~						
~~MW-146~~	Grab	GW		~~4/13/21~~	~~1115~~	8	~~X~~	~~X~~	~~X~~	~~X~~		~~X~~						
~~MW-147~~	Grab	GW		~~4/13/21~~	~~910~~	8	~~X~~	~~X~~	~~X~~	~~X~~		~~X~~						
~~MW-148~~	Grab	GW		~~4/13/21~~	~~1020~~	8	~~X~~	~~X~~	~~X~~	~~X~~		~~X~~						
	Grab	GW																

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR
Scott Ude	4/15/21	1200		XY
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.3 °C Bottles Received: 26 9 4 7 TB
				adt 0.3=0.4
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Conditions NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dbalbert@trccompanies.com**

Project Description: **NCL Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-NCL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **NCL (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

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L# 1370040
1110

Acctnum: TRCATX
Template: T118751
Prelogin: P835832
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-45	Grab	GW		4/14/21	1420	9	X	X			X	X	X	X				-01
MW-56	Grab	GW		4/14/21	915	8	X	X		X	X	X						-02
~~MW-55~~	Grab	GW		~~4/13/21~~	~~1300~~	11	X	X	X		X	X	X	X				
NCL-34A LNAPL	Grab	GW				8	X	X		X	X	X						
~~NCL-33~~	Grab	GW		~~4/13/21~~	~~1130~~	8	X	X		X	X	X						
~~NCL-44~~	Grab	GW		~~4/13/21~~	~~1050~~	8	X	X		X	X	X						
~~NCL-32~~	Grab	GW		~~4/13/21~~	~~955~~	8	X	X		X	X	X						
~~MW-108~~	Grab	GW		~~4/13/21~~	~~1500~~	8	X	X		X	X	X						
~~NCL-31~~	Grab	GW		~~4/13/21~~	~~1225~~	8	X	X		X	X	X						
~~MW-18~~	Grab	GW		~~4/13/21~~	~~1305~~	9	X	X			X	X	X	X				

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR
Scott Ude	4/15/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.1+3=0.4 °C Bottles Received: 17
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF ✓

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505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **NCL Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-NCL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **NCL (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-54A	Grab	GW		4/13/21	1525	8	X	X		X	X	X						
MW-54B	Grab	GW		4/13/21	1615	10	X	X	X	X	X	X						
NCL-49	Grab	GW		4/13/21	1400	8	X	X		X	X	X						
MW-53R	Grab	GW		4/13/21	1450	8	X	X		X	X	X						
DUP-NCL-01	Grab	GW		4/13/21	1100	8	X	X		X	X	X						
EB-NCL-01	Grab	GW		4/13/21	1010	8	X	X		X	X	X						
Trip Blank-NCL-01	Grab	GW		4/13/21		1	X											

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

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Fax: 615-758-5859

L # L1390040

Table #

Acctnum: **TRCATX**
Template: **T118751**
Prelogin: **P835832**
TSR: **526**
PB:

Shipped Via:

Remarks | Sample # (lab only)

4/16

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR
Scott Ude	4/15/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.1/2.3=2.4 °C Bottles Received: 17
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Shipping

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 7

Pace Analytical
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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1340819
J075

Acctnum: TRCATX
Template: T120302
Prelogin: P835500
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-6A	Grab	GW		4/13/21	910	10	X	X	X	X	X	X						
MW-6B	Grab	GW		4/13/21	955	10	X	X	X	X	X	X						
MW-85 LNAPL	Grab	GW				10	X	X	X	X	X	X						
MW-86 LNAPL	Grab	GW				11	X	X	X		X	X	X	X				
MW-120	Grab	GW		4/14/21	1215	10	X	X	X	X	X	X						-01
MW-121	Grab	GW		4/14/21	1250	10	X	X	X	X	X	X						-02
MW-84	Grab	GW		4/14/21	1130	10	X	X	X	X	X	X						-03
MW-122	Grab	GW		4/13/21	1030	10	X	X	X	X	X	X						
MW-81	Grab	GW		4/14/21	1000	10	X	X	X	X	X	X						-04
MW-80	Grab	GW		4/14/21	915	10	X	X	X	X	X	X						-05

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/15/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCl / MeoH
TBR
1

Temp 4.3 °C
0.1+3=4
Bottles Received: 279

Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Ship

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 2 of 7

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Fax: 615-758-5859

L# 1390049

Table #

Acctnum: TRCATX
Template: T120302
Prelogin: P835500
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-79	Grab	GW		4/14/21	825	10	X	X	X	X	X	X						-06
MW-82	Grab	GW		4/14/21	1045	10	X	X	X	X	X	X						-07
~~MW-74~~	Grab	GW		~~4/13/21~~	~~1040~~	10	X	X	X	X	X	X						
~~MW-73~~	Grab	GW		~~4/13/21~~	~~1130~~	10	X	X	X	X	X	X						
~~MW-2A~~	Grab	GW		~~4/13/21~~	~~1530~~	10	X	X	X	X	X	X						
~~MW-72~~	Grab	GW		~~4/13/21~~	~~1445~~	10	X	X	X	X	X	X						
~~OCD-6~~	Grab	GW		~~4/13/21~~	~~1400~~	10	X	X	X	X	X	X						
~~OCD-7AR~~	Grab	GW		~~4/13/21~~	~~1220~~	10	X	X	X	X	X	X						
~~OCD-7B~~	Grab	GW		~~4/13/21~~	~~1310~~	10	X	X	X	X	X	X						
MW-76	Grab	GW		4/14/21	1315	10	X	X	X	X	X	X						-08

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR
Scott Ude	4/15/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 °C Bottles Received: 27
				0.1+3.1=4.2
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Shipm

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 3 of 7

Pace Analytical®
National Center for Testing & Innovation

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

L# 134004 9

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-77	Grab	GW		4/14/21	1405	10	X	X	X	X	X	X						-09
MW-78	Grab	GW		4/14/21	1450	10	X	X	X	X	X	X						-10
MW-75	Grab	GW		4/14/21	1540	10	X	X	X	X	X	X						-11
MW-83	Grab	GW		4/14/21	1230	10	X	X	X	X	X	X						-12
MW-3	Grab	GW		4/14/21	1120	10	X	X	X	X	X	X						-13
~~MW-88~~	Grab	GW		~~4/13/21~~	~~1610~~	~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
MW-22A	Grab	GW		4/14/21	825	10	X	X	X	X	X	X						-14
MW-22B	Grab	GW		4/14/21	935	10	X	X	X	X	X	X						-15
~~MW-10~~	Grab	GW		~~4/13/21~~	~~1720~~	~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
MW-123	Grab	GW		4/14/21	1025	10	X	X	X	X	X	X						-16

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR	
Scott Ude	4/15/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 279	If preservation required by Login: Date/Time
				on ice 3294	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930	Hold: Condition NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 4 of 7

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

L# 1346099

Table #

Acctnum: **TRCATX**
Template: **T120302**
Prelogin: **P835500**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-4A	Grab	GW		4/13/21	1455	10	X	X	X	X	X	X						
MW-4B	Grab	GW		4/13/21	1540	10	X	X	X	X	X	X						
MW-5A	Grab	GW		4/13/21	1225	10	X	X	X	X	X	X						
MW-5B	Grab	GW		4/13/21	1320	10	X	X	X	X	X	X						
MW-5C	Grab	GW		4/13/21	1405	10	X	X	X	X	X	X						
MW-7A	Grab	GW		4/13/21	1115	10	X	X	X	X	X	X						
MW-7B	Grab	GW		4/13/21	1030	10	X	X	X	X	X	X						
OCD-8A	Grab	GW		4/13/21	945	11	X	X	X		X	X	X	X				
OCD-8B	Grab	GW		4/13/21	855	10	X	X	X	X	X	X						
MW-1R	Grab	GW		4/14/21	1340	8	X	X		X	X	X						-17

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Scott Ude	4/15/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.1+3=0.4 °C Bottles Received: 29
				If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930
				Hold: Condition: NCF / OK

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505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhalbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Analysis / Container / Preservative

Chain of Custody Page 5 of 7

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Fax: 615-758-5859

L# 1340049

Table #

Acctnum: TRCATX
Template: T120302
Prelogin: P835500
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-15	Grab	GW		4/14/21	1345	10	X	X	X	X	X	X						-18
OCD-1R	Grab	GW		4/14/21	1250	10	X	X	X	X	X	X						-19
OCD-2A	Grab	GW		4/14/21	1040	10	X	X	X	X	X	X						-20
OCD-3	Grab	GW		4/14/21	955	10	X	X	X	X	X	X						-21
OCD-4	Grab	GW		4/14/21	910	10	X	X	X	X	X	X						-22
MW-11A	Grab	GW		4/14/21	1205	10	X	X	X	X	X	X						-23
MW-11B	Grab	GW		4/14/21	1125	10	X	X	X	X	X	X						-24
OCD-5	Grab	GW		4/14/21	825	10	X	X	X	X	X	X						-25
~~MW-87~~	Grab	GW		~~4/13/21~~	~~1000~~	~~10~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						~~-26~~
~~MW-18A~~	Grab	GW		~~4/13/21~~	~~1045~~	~~9~~	~~X~~	~~X~~			~~X~~	~~X~~	~~X~~	~~X~~				

4/16

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR
Scott Ude	4/15/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 7.3 °C Bottles Received: 279
				0.1+3=0.4
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition NCF / OK

Shipment

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dbelbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 6 of 7

Pace Analytical® National Center for Testing & Innovation

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Fax: 615-758-5859

L# 13840049

Table # 4/16

Acctnum: TRCATX
Template: T120302
Prelogin: P835500
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-18B	Grab	GW		4/13/21	1125	10	X	X	X	X	X	X						
MW-70	Grab	GW		4/13/21	1210	10	X	X	X	X	X	X						
MW-124	Grab	GW		4/13/21	1255	10	X	X	X	X	X	X						
DUP-EP-01	Grab	GW		4/13/21	1000	10	X	X	X	X	X	X						
DUP-EP-02	Grab	GW		4/14/21	800	10	X	X	X	X	X	X						-2726
DUP-EP-03	Grab	GW		4/14/21	1000	10	X	X	X	X	X	X						-2827
EB-EP-01	Grab	GW		4/13/21	1055	10	X	X	X	X	X	X						
EB-EP-02	Grab	GW		4/13/21	1310	10	X	X	X	X	X	X						
EB-EP-03	Grab	GW		4/13/21	1245	10	X	X	X	X	X	X						
EB-EP-04	Grab	GW		4/14/21	840	10	X	X	X	X	X	X						-2928

4/16

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Scott Ude	4/15/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 27	If preservation required by Login: Date/Time
				0.1/13/21	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/16/21 Time: 0930	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dhelbert@trccompanies.com**

Project Description: **EP Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 7 of 7

Pace Analytical® National Center for Testing & Innovation

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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1340049

Table #

Acctnum: TRCATX
Template: T120302
Prelogin: P835500
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
Trip Blank-EP-01	Grab	GW		4/13/21		1	X											
Trip Blank-EP-02	Grab	GW		4/13/21		1	X											
Trip Blank-EP-03	Grab	GW		4/14/21		1	X											-3029

4/16

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

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

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/15/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

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

Temp: 1.3 °C Bottles Received: 279
0.1+3=0.4

Date: 4/16/21 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Ship...

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com**

Project Description: **TMD Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-TMD**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TMD (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

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Fax: 615-758-5859

L# 134062
1111

Acctnum: TRCATX
Template: T120266
Prelogin: P835833
TSR: 526
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-25	Grab	GW		~~4/13/21~~	~~1530~~	8	X	X		X	X	X						
MW-20	Grab	GW		4/14/21	1035	8	X	X		X	X	X						-01
NP-1	Grab	GW		4/14/21	1115	5	X				X	X						-02
NP-6	Grab	GW		4/14/21	1020	2	X											-03
MW-8	Grab	GW		4/14/21	950	10	X	X	X	X	X	X						-04
MW-21	Grab	GW		4/14/21	905	10	X	X	X	X	X	X						-05
MW-71	Grab	GW		4/14/21	925	9	X	X			X	X	X	X				-06
MW-68	Grab	GW		4/14/21	825	8	X	X		X	X	X						-07
MW-27	Grab	GW		~~4/13/21~~	~~1430~~	8	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~						
MW-89	Grab	GW		~~4/12/21~~	~~1610~~	8	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~						

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/15/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.1, 3=04 °C Bottles Received: 61 + ITB	
Relinquished by : (Signature)	Date:	Time:	Received for lab by (Signature)	Date: 4/16/21 Time: 0930	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com**

Project Description: **TMD Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-TMD**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TMD (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

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Phone: 615-758-5858
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Fax: 615-758-5859

L# 1340062

Table #

Acctnum: TRCATX

Template: T120266

Prelogin: P835833

TSR: 526

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-16	Grab	GW		4/13/21	1525	8	X	X		X	X	X						
MW-26	Grab	GW		4/13/21	1655	8	X	X		X	X	X						
MW-46R	Grab	GW		4/14/21	1405	8	X	X		X	X	X						-08
Trip Blank-TMD-01	Grab	GW		4/14/21	—	1	X											-09

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

4/16

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/15/21	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: (Yes) / ~~No~~ HCl / MeoH TSR

Temp: 4.3 °C Bottles Received: 9,1h 3:04 +7 (6)+1TB

If preservation required by Login: Date/Time

Date: 4/16/21 Time: 0930

Hold:

Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **TEL Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-TEL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TEL (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

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

L #

Table #

Acctnum: **TRCATX**
Template: **T118731**
Prelogin: **P835834**
TSR: **526**
PB: **cs 3/23/21**

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
TEL-4	Grab	GW		4/13/21	840	10	X	X	X	X	X	X						
~~TEL-3~~ LNAPL	Grab	GW				10	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
~~TEL-2~~ LNAPL	Grab	GW				10	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
~~TEL-1~~ LNAPL	Grab	GW				10	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
MW-49	Grab	GW				11	X	X	X		X	X	X	X				
DUP-TEL-01	Grab	GW		4/13/21	900	10	X	X	X	X	X	X						
EB-TEL-01	Grab	GW		4/13/21	1000	10	X	X	X	X	X	X						
Trip Blank-TEL-01	Grab	GW		4/13/21	—	1	X											

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

Remarks:
Dissolved metals field-filtered.

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.2+3=0.5 °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com;** dbelbert@trccompanies.com

Project Description: **NCL Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-NCL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **NCL (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

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

L #

Table #

Acctnum: **TRCATX**
Template: **T118751**
Prelogin: **P835832**
TSR: **526**
PB: **CR 3/23/21**

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)	Remarks	Sample # (lab only)
MW-45	Grab	GW				9	X	X			X	X	X	X				
MW-56	Grab	GW				8	X	X		X	X	X						
MW-55	Grab	GW		4/13/21	1300	11	X	X	X		X	X	X	X				
~~NCL-34A~~ LNAPL	Grab	GW				~~8~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~						
NCL-33	Grab	GW		4/13/21	1130	8	X	X		X	X	X						
NCL-44	Grab	GW		4/13/21	1050	8	X	X		X	X	X						
NCL-32	Grab	GW		4/13/21	955	8	X	X		X	X	X						
MW-108	Grab	GW		4/13/21	1500	8	X	X		X	X	X						
NCL-31	Grab	GW		4/13/21	1225	8	X	X		X	X	X						
MW-18	Grab	GW		4/13/21	1305	9	X	X			X	X	X	X				

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Scott Ude	4/14/21	1200		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.3 °C Bottles Received: 0,2,1,3,5,0,5
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trccompanies.com; dholbert@trccompanies.com**

Project Description: **NCL Spring 2021**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **330538.0000.0000**

Lab Project # **TRCATX-NCL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **NCL (Navajo - Artesia)**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Total/Dissolved Short List Metals	Cations (from "total metals" bottle)	Anions,NO2NO3, TDS	Total/Dissolved Long List Metals	Cyanide	SVOCs (8270)	EDB (8011)
MW-54A	Grab	GW		4/13/21	1525	8	X	X		X	X	X				
MW-54B	Grab	GW		4/13/21	1615	10	X	X	X	X	X	X				
NCL-49	Grab	GW		4/13/21	1400	8	X	X		X	X	X				
MW-53R	Grab	GW		4/13/21	1450	8	X	X		X	X	X				
DUP-NCL-01	Grab	GW		4/13/21	1100	8	X	X		X	X	X				
EB-NCL-01	Grab	GW		4/13/21	1010	8	X	X		X	X	X				
Trip Blank-NCL-01	Grab	GW		4/13/21	—	1	X									

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T118751**
Prelogin: **P835832**
TSR: **526**
PB: CK 3/23/21

Shipped Via:

Remarks | Sample # (lab only)

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Scott Ude	4/14/21	1200			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 °C Bottles Received: 0,2,3,2a,b	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/15/21 Time: 0900	Hold: / Condition: NCF / OK

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
https://www.emnrd.nm.gov/ocd/contact-us

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 419189

CONDITIONS

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID: 15694
	Action Number: 419189
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
joel.stone	None	2/7/2025