

GW - 028

**RO Reject Water
Discharge Fields
Site Investigation**

October 2013



Navajo Refining Company

**Reverse Osmosis Reject Water
Discharge Fields Site Investigation
Third Quarter 2013 Interim Report**

OCD Discharge Permit GW-028

Artesia Refinery
Artesia, New Mexico

October 2013



A handwritten signature in blue ink, appearing to read "Pamela Krueger", positioned above a horizontal line.

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**Reverse Osmosis Reject Water
Discharge Fields Site
Investigation Third Quarter
2013 Interim Report**

Prepared for:
New Mexico Environment Department
Hazardous Waste Bureau
and
New Mexico Energy, Minerals and
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October 30, 2013

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Acronyms and Abbreviations

CGWSL	Critical Groundwater Screening Level
COC	constituent of concern
GW-28	Discharge Permit GW-028
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
Navajo	Navajo Refining Company
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
OCD	New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division
ORO	oil-range organics
PCC Permit	Post-Closure Care Permit
QA/QC	quality assurance/quality control
Refinery	Artesia Refinery
RO	reverse osmosis
SVOC	semivolatile organic compound
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WQCC	Water Quality Control Commission

Executive Summary

Navajo Refining Company (Navajo) owns and operates the Artesia Refinery (refinery) in Artesia, New Mexico (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. Navajo maintains a groundwater monitoring program according to the requirements of the Post-Closure Care Permit (PCC Permit), which is administered by the New Mexico Environment Department (NMED) Hazardous Waste Bureau, and Discharge Permit GW-028 (GW-028) which is administered by the Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department.

Navajo operates a reverse osmosis (RO) unit that processes fresh water as a means to remove contaminants such as minerals and salts. The fresh water is a blend of fresh groundwater and publicly supplied water from the City of Artesia. The RO unit is a pretreatment step in the production of cooling tower makeup water and boiler grade feedwater. The RO unit produces two effluent streams: the RO permeate stream, which is the purified water, and the RO reject water stream, which contains the concentrated salts and minerals that cannot pass through the RO membranes. The RO reject water stream is discharged to the surface of one of two vacant fields located northeast of the refinery operations areas to water native grass in those fields (Figure 2). This discharge occurs in accordance with the April 1993 approved GW-028, issued by OCD.

On August 22, 2012, OCD issued a renewal and update to GW-028 for the refinery (OCD 2012). Section 6.D of GW-028 requires an investigation of groundwater beneath the two RO reject water discharge fields to determine if impacts to groundwater quality have occurred as a result of the discharge of RO fluid. Section 6.D.3 requires a Final Site Investigation Report to be submitted within 90 days following the completion of the fourth quarter sampling event and quarterly interim reports to be submitted 30 days following the receipt of analytical data during each event. This document presents the results from the third quarter sampling event.

This report provides the analytical results from groundwater samples collected during the third quarter of 2013. The following conclusions are based upon the information obtained from the monitoring activities:

- Groundwater concentrations of organic constituents were below reporting limits or screening levels in all samples collected. These results are consistent with the first and second quarter groundwater sampling results.

- Concentrations of several metals were detected above groundwater screening levels, including arsenic, boron, manganese, and uranium. These results are generally consistent with the first and second quarter groundwater sampling results.
- Concentrations of anions including chloride, fluoride, and sulfate were detected above screening levels. These results are consistent with the first and second quarter groundwater sampling results.

According to the requirements of Section 6.D.3 of GW-028, one additional quarterly monitoring event will be conducted. The Final Site Investigation Report will be submitted 90 days after the fourth quarter sampling event has been completed.

1. Introduction

Navajo Refining Company (Navajo) owns and operates the Artesia Refinery (refinery) in Artesia, New Mexico (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. Navajo maintains a groundwater monitoring program according to the requirements of the Post-Closure Care Permit (PCC Permit; NMED, 2010), which is administered by the New Mexico Environment Department (NMED) Hazardous Waste Bureau, and Discharge Permit GW-028 (GW-028) which is administered by the Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department.

Navajo operates a reverse osmosis (RO) unit that processes fresh water as a means to remove contaminants such as minerals and salts. The fresh water is a blend of fresh groundwater and publicly supplied water from the City of Artesia. The RO unit is a pretreatment step in the production of cooling tower makeup water and boiler grade feedwater. The RO unit produces two effluent streams: the RO permeate stream, which is the purified water, and the RO reject water stream, which contains the concentrated salts and minerals that cannot pass through the RO membranes. The RO reject water stream is discharged to the surface of one of two vacant fields located northeast of the refinery operations areas to water native grass in those fields. This discharge occurs in accordance with the April 1993 GW-028 issued by OCD.

On August 22, 2012, OCD issued a renewal and update to GW-028 for the refinery (OCD, 2012). Section 6.D of GW-028 requires an investigation of groundwater beneath the two RO reject water discharge fields to determine if impacts to groundwater quality have occurred as a result of the discharge of RO fluid. Section 6.D.3 requires a Final Site Investigation Report to be submitted within 90 days following the completion of the fourth quarter sampling event and quarterly interim reports to be submitted 30 days following the receipt of analytical data during each event. This document presents the results from the third quarter sampling event.

2. Scope of Services

This section describes groundwater monitoring activities performed during the third quarter sampling event.

2.1 Groundwater Sampling

Groundwater samples were collected from monitoring wells MW-114 through MW-119 on September 4 and 5, 2013. Due to an oversight by the field staff, a synoptic gauging event was not conducted prior to sampling. All wells were gauged on September 4, 2013 except for MW-114, which was gauged on September 5, 2013. There was no precipitation on either September 4 or 5, 2013.

All six wells were gauged on October 8, 2013 as part of the semiannual monitoring event required under GW-028 and the PCC Permit. Table 1 contains a summary of the water level measurements from the RO reject discharge field wells for the first, second, and third quarterly events and from the October 8, 2013 gauging event. The difference between groundwater elevations measured in September and October 2013 is likely due to a large rain event of almost 3 inches over two days on September 11 and 12, 2013.

Prior to collection of samples, each monitoring well was purged using low-flow procedures with a peristaltic pump and dedicated tubing. During the well purging process, water quality parameters, including pH, conductivity, temperature, and turbidity, were measured at regular intervals using a YSI multiparameter water quality meter with a flow-through cell. Purging continued until water quality parameters stabilized for at least four consecutive readings, indicating that collected water was characteristic of the surrounding formation. Field logs for the purging and sample collection from each well are provided in Appendix A, and final water quality parameters are summarized in Table 2.

Following completion of purging, groundwater samples were collected directly into laboratory prepared containers. Collected samples were placed in padded packing sleeves to prevent breakage and packed with ice in shipping containers. Samples were submitted to ALS Laboratory in Houston, Texas with chain-of-custody documentation and analyzed in accordance with the laboratory analytical methods referenced in Table 3. A copy of the chain-of-custody form is included in Appendix B in the laboratory analytical data reports.

2.2 RO Reject Discharge Sampling

A sample of the RO reject discharge was collected on September 4, 2013 from the discharge location in the north RO reject discharge field. The sample was collected as a grab sample by placing a clean bucket beneath the discharge stream and transferring water into the appropriate sample containers. The RO Reject sample was submitted to ALS Laboratory in Houston, Texas with chain-of-custody documentation and analyzed in accordance with the laboratory analytical methods referenced in Table 3. A copy of the chain-of-custody form is included in Appendix B with the analytical data reports.

2.3 Quality Assurance/Quality Control Samples

Quality Assurance/Quality Control (QA/QC) samples were collected during the third quarter sampling event to ensure activities were conducted according to standard sample collection procedures. One field duplicate, one equipment blank and multiple trip blanks were included as part of the QA/QC sampling.

2.4 Decontamination Procedures

All sampling equipment in contact with groundwater (downhole probes) was decontaminated between each sampling location to prevent cross-contamination. The equipment was washed in a bath of non-phosphate soap (such as AlconoxTM) and water then rinsed with distilled water.

2.5 Investigation-Derived Waste Disposal

All solid waste, which included gloves and paper towels, was collected temporarily in trash bag, then placed into the refinery trash bins for disposal.

All collected water from equipment decontamination and purging was collected and subsequently disposed of within the refinery process wastewater system, upstream of the oil-water separator.

2.6 Deviations from Site Investigation Work Plan

All activities were conducted as specified in the approved 2012 Reverse Osmosis Reject Water Discharge Fields Site Investigation Work Plan (ARCADIS 2012) except the collection of synoptic water levels prior to groundwater sampling. This deviation was due to an oversight by the field staff. The field staff has been instructed to ensure synoptic water level measurements are completed during the fourth quarterly event.

3. Regulatory Criteria

Regulatory standards used to evaluate analytical results of the groundwater sampling events are based on the presumption that the shallow groundwater might be used as a source of drinking water. The primary screening level value used for each contaminant of concern (COC) is the New Mexico Water Quality Control Commission (WQCC) standard from 20.6.2.3103 New Mexico Administrative Code (NMAC). If no WQCC standard exists for a COC, the Maximum Contaminant Level (MCL) from the National Primary Drinking Water Standards is used. For COCs where neither a WQCC standard or MCL exists, the screening level value used is the NMED Tap Water Standard listed in the updated Table A-1 (NMED, 2012b) of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a). For total petroleum hydrocarbons (TPH), the TPH Screening Guidelines for Potable Groundwater for unknown oil included in Table 6-2 of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a) were used, as corrected by subsequent correspondence from the NMED.

The Critical Groundwater Screening Level (CGWSL) for each COC is provided in the groundwater data summary table (Table 4).

4. Analytical Results and Discussion

Groundwater samples collected were analyzed for site COCs to delineate the extent of potential groundwater impacts underlying the RO discharge fields. In addition, the analytical results for the sample of RO discharge water collected from the discharge point are presented in Table 4 and are discussed below. Data validation will be completed, as necessary, for inclusion in the Final Site Investigation Report.

4.1 Laboratory Analytical Methods

As discussed previously, collected samples were analyzed for COCs in accordance with the laboratory analytical methods referenced in Table 3. The laboratory analytical reports are included in electronic format in Appendix B.

4.2 Data Validation

Data validation will be conducted as necessary and the validation reports will be included in the final report.

4.3 Results and Discussion

Concentrations of radium, TPH, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), nitrate/nitrite, and total dissolved solids (TDS) were either not detected above laboratory reporting limits or were below screening levels for all samples collected in the first, second, and third quarters of 2013. Exceedances of screening levels at the sampled locations are discussed by analytical group in detail in the following subsections.

4.3.1 Metals

None of the reported concentrations of metals were above the CGWSLs for samples collected from MW-117 and MW-119. Similarly, none of the reported concentrations of metals were above the CGWSLs for the samples collected from the RO reject discharge.

Concentrations of metals above CGWSLs were detected in samples collected from monitoring wells MW-114, MW-115, MW-116, and MW-118. Exceedances of CGWSLs were as follows:

- Arsenic was reported above the CGWSL in the first, second, and third quarter samples collected from MW-118, at concentrations of 0.011 milligrams per liter (mg/L), 0.0146 mg/L, and 0.0156 mg/L, respectively. Arsenic was not reported above the CGWSL in samples collected from the other five monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.
- Boron was reported at a concentration of 0.865 mg/L, above the CGWSL in the sample collected from monitoring well MW-115 during the first quarter. The reported concentration of boron (0.605 mg/L) in the sample collected from well MW-115 during the second quarter was below the CGWSL. For the third quarter, boron was reported in well MW-115 at a concentration of 0.782 mg/L, above the CGWSL. Boron was not reported above the CGWSL in samples collected from the other five monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.
- Manganese was reported at concentrations above the CGWSL in samples collected from MW-114 during the first, second, and third quarters (1.51 mg/L, 0.844 mg/L, and 1.42 mg/L, respectively), and in the sample collected from MW-115 (0.255 mg/L) during the first quarter. The reported concentration of manganese in the samples collected from well MW-115 during the second and third quarters (0.0267 mg/L and 0.0362 mg/L, respectively) were below the CGWSL. Manganese was not reported above the CGWSL in samples collected from the other four monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.
- Uranium was reported at concentrations above the CGWSL in samples collected during the first, second, and third quarters from MW-115 (0.0843 mg/L, 0.0825 mg/L and 0.0936 mg/L, respectively), MW-116 (0.0331 mg/L, 0.0343 mg/L and 0.04 mg/L, respectively), and MW-118 (0.037 mg/L, 0.033 mg/L, and 0.0395 mg/L, respectively). Uranium was not reported above the CGWSL in samples collected from the other three monitoring wells in the RO reject discharge fields or in the samples collected from the RO reject discharge.

4.3.2 Anions

Concentrations of anions above CGWSLs were detected in all samples collected during the monitoring event. Exceedances of CGWSLs observed for chloride, fluoride, and sulfate are detailed below.

- Chloride was reported at concentrations above the CGWSL in samples collected during the first, second, and third quarters from monitoring well MW-115 (422 mg/L, 373 mg/L, and 530 mg/L, respectively) and well MW-116 (389 mg/L, 330 mg/L and 344 mg/L, respectively). Reported concentrations from monitoring well MW-118 were above the CGWSL in samples collected during the first and second quarters (296 mg/L and 287 mg/L, respectively). Chloride was not reported above the CGWSL in samples collected from the other three monitoring wells in the RO reject discharge fields, the third quarter MW-118 sample, and the samples collected from the RO reject discharge.
- Fluoride was reported at concentrations above the CGWSL in samples collected during the first, second, and third quarters from monitoring wells MW-114 (1.76 mg/L, 1.91 mg/L, and 1.82 mg/L, respectively), MW-117 (2.73 mg/L, 2.29 mg/L, and 2.8 mg/L respectively), MW-118 (5.16 mg/L, 5.39 mg/L, and 4.48 mg/L), and MW-119 (2.36 mg/L, 2.43 mg/L, 2.28 mg/L, respectively). Fluoride was reported at concentrations above the CGWSL in samples collected from the RO reject discharge during the first, second, and third quarters at concentrations of 3.32 mg/L, 2.15 mg/L, and 2.26 mg/L, respectively. Fluoride was not reported above the CGWSL in samples collected from the other two monitoring wells in the RO reject discharge fields.
- Sulfate was reported at concentrations above the CGWSL in all samples collected during the first, second, and third quarters of 2013. Concentrations detected varied from 1,030 mg/L (RO reject discharge, third quarter) to 2,900 mg/L (MW-115, third quarter). The sulfate concentrations reported in the third quarter samples were similar to the concentrations reported during the first and second quarters at all monitoring wells and in the RO reject discharge.

5. Summary and Conclusions

The third quarterly monitoring event has been completed according to the approved work plan except for the collection of synoptic water levels prior to sample collection.

Review of field and laboratory analytical data indicates the following:

- Concentrations of organic constituents in groundwater samples were below reporting limits or screening levels in all samples collected. These results confirm that no impacts from hydrocarbons have occurred as a result of discharge of the RO reject stream to the two fields.
- Reported concentrations of arsenic in well MW-118 exceed the CGWSL, while all other samples contain concentrations of arsenic below the CGWSL. The concentrations of arsenic in the RO reject discharge samples are below the screening level.
- Reported concentrations of boron from well MW-115 for the first and third quarters exceed the CGWSL. All other concentrations of boron were below the CGWSL, including the RO reject discharge samples.
- Reported concentrations of manganese from well MW-114 exceeded the CGWSL during all three quarters. The reported concentration of manganese from MW-115 was above the CGSWL in the first quarter but has been lower than the CGSWL during the second and third quarters. The reported concentrations of manganese in the remaining four wells and in the RO reject discharge samples are all below the CGWSL.
- The reported concentrations of uranium from wells MW-115, MW-116, and MW-118 during the third quarter remained above the CGWSL, with concentrations similar to the first and second quarter results.
- The reported concentrations of chloride exceeded the CGWSL in samples collected from MW-115 and MW-116 during all three quarterly events. Reported concentrations of chloride exceeded the CGSWL during the first and second quarters in samples collected from MW-118 but were below the CGWSL in the sample collected during the third quarter. The reported concentration of chloride was below the CGWSL in all the RO reject discharge samples.

- The reported concentrations of fluoride exceeded the CGWSL in samples collected from MW-114, MW-117, MW-118, and MW-119 during all three quarterly events. The reported concentration of fluoride was above the CGWSL in all the RO reject discharge samples.
- The reported concentrations of sulfate exceeded the CGWSL in samples collected from all wells and the RO reject discharge during all three quarterly events.
- Radium-226 and Radium-228 were detected in samples collected during the third quarter but all detections were below the CGSWL.

The third quarterly sampling event has been completed. One additional quarterly groundwater sampling event will be performed in order to establish trends in concentration and evaluate potential impacts due to historic discharge.

A thorough comparison of the data from the four quarterly monitoring events will be presented in the final report along with an evaluation of potential impacts and potential sources of any impacts identified.

6. References

ARCADIS. 2012. Reverse Osmosis Reject Water Discharge Fields Site Investigation Work Plan, OCD Discharge Permit GW-028. November.

New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD). 2012. Discharge Permit (GW-028), Navajo Refining Company – Artesia Refinery. August.

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

NMED. 2012a. Risk Assessment Guidance for Site Investigations and Remediation. February.

NMED. 2012b. Table A-1 from the Risk Assessment Guidance for Site Investigations and Remediation, updated. June.



Tables

Table 1 - Water Level Measurements
Third Quarter 2013 Interim Report - RO Reject Discharge Fields
Navajo Refining Company, Artesia Refinery, New Mexico

Well ID	Screen Interval (feet bgs)	Northing	Easting	Top of Casing Elevation (ft amsl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft amsl)
MW-114	20-35	673082.16	523818.86	3361.68	2/3/2013	8.59	3353.09
					5/15/2013	7.75	3353.93
					9/5/2013	9.44	3352.24
					10/8/2013	6.99	3354.69
MW-115	10-25	673997.34	523932.93	3359.31	2/3/2013	7.49	3351.82
					5/15/2013	8.10	3351.21
					9/4/2013	8.23	3351.08
					10/8/2013	7.22	3352.09
MW-116	10-25	673966.06	525339.63	3353.77	2/3/2013	9.91	3343.86
					5/16/2013	10.25	3343.52
					9/4/2013	12.21	3341.56
					10/8/2013	10.82	3342.95
MW-117	10-25	674301.52	522979.73	3363.01	2/3/2013	7.07	3355.94
					5/15/2013	8.52	3354.49
					9/4/2013	6.09	3356.92
					10/8/2013	6.13	3356.88
MW-118	10-25	674819.18	523375.94	3361.95	2/5/2013	13.71	3348.24
					5/15/2013	4.63	3357.32
					9/4/2013	4.49	3357.46
					10/8/2013	5.15	3356.80
MW-119	10-25	674860.11	524575.80	3356.11	2/5/2013	6.67	3349.44
					5/15/2013	7.65	3348.46
					9/4/2013	10.72	3345.39
					10/8/2013	6.97	3349.14

Abbreviations:

amsl = above mean sea level

bgs = below ground surface

btoc = below top of casing

ft = feet

Notes:

1. Northing and easting are New Mexico State Plane Coordinate System Eastern Zone, NAD 83, referenced to NGS OPUS solution from the WSMN WHITE SANDS, NMRO ROSWELL, and PORTALESAP_NM2005 CORS sites.
2. Elevations are NAVD 88 datum, determined with Leitz Engineer level referenced to NGS benchmark designated G-416 with an elevation of 3368.79 feet.
3. Measuring point for all wells is top of casing on the north side.

Table 2 - Well Purging and Water Quality Measurement Data

Third Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

Well	Date	Time	Temperature (°C)	Conductivity (mS/cm)	pH (std units)	DO (mg/L)	ORP (mV)	Turbidity (NTU)
MW-114	09/05/2013	9:30	23.25	3.432	6.74	0.25	42.5	2.41
MW-115	09/04/2013	17:10	21.33	4.954	6.88	0.19	8.4	0.67
MW-116	09/04/2013	15:20	21.21	3.833	6.93	0.24	17.4	0.46
MW-117	09/04/2013	9:50	24.41	3.435	6.60	0.43	33.1	0.33
MW-118	09/04/2013	12:00	23.35	3.858	6.80	3.41	43.7	0.23
MW-119	09/04/2013	13:30	19.98	3.248	6.94	1.96	11.1	0.18

Notes:

°C = degrees Celsius

DO = dissolved oxygen

mg/L = milligrams per liter

mS/cm = milli-Siemens per centimeter

mV = millivolts

NTU = nephelometric turbidity units

ORP = oxygen reduction potential

std units = standard pH units

Table 3 - Laboratory Analytical Methods for Groundwater Samples

Third Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

Sample Matrix	Method	Analyte Group	Specific Compounds
Groundwater / RO Reject	8015 Mod	Total Petroleum Hydrocarbons	Gasoline Range Organics Diesel Range Organics Oil Range Organics
Groundwater / RO Reject	6020 and 7470/7471	Metals, Dissolved	Aluminum Arsenic Barium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Manganese Mercury Molybdenum Nickel Potassium Selenium Silver Sodium Uranium Zinc
Groundwater / RO Reject	8260	Volatile Organic Compounds	Target Compound List to include specific compounds listed in 20.6.2.7(WW), 20.6.2.3103.A, 20.6.2.3103.B, and 20.6.2.3103.C
Groundwater / RO Reject	8270	Semivolatile Organic Compounds	Target Compound List to include specific compounds listed in 20.6.2.7(WW), 20.6.2.3103.A, 20.6.2.3103.B, and 20.6.2.3103.C
Groundwater / RO Reject	9014	Cyanide	Cyanide
Groundwater / RO Reject	300	Anions/Cations	Chloride Fluoride Sulfate Nitrite/Nitrate
Groundwater / RO Reject	903.1	Radioactive Parameters	Radioactivity (combined Radium-226 and Radium-228)
Groundwater / RO Reject	2540C	Water Quality	Total Dissolved Solids
Groundwater / RO Reject	Field instrument	Water Quality	pH

Note:

RO = reverse osmosis

Table 4 - Summary of Groundwater Sampling Analytical Results

Third Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

Well:			MW-114									MW-115											
Date:			2/3/2013			5/15/2013			9/5/2013			2/3/2013			5/15/2013			5/15/2013 - Duplicate			9/4/2013		
Analyte	CGWSL	CGWSL Source	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Dissolved Metals (mg/L)																							
Aluminum	5.00E+00	20.6.2.3103.C	0.0265		0.01	0.00722	J	0.01	0.0085	J	0.01	0.00888	J	0.01	0.00816	J	0.01	0.00865	J	0.01	0.0065	J	0.01
Arsenic	1.00E-02	USEPA MCL	0.00561		0.005	0.00437	J	0.005	0.005		0.005	0.00499	J	0.005	0.00478	J	0.01	0.00427	J	0.005	0.0047	J	0.005
Barium	1.00E+00	20.6.2.3103.A	0.0204		0.005	0.0129		0.005	0.017		0.005	0.0309		0.005	0.0107		0.005	0.011		0.005	0.0106		0.005
Boron	7.50E-01	20.6.2.3103.C	0.139		0.1	0.101		0.1	0.132		0.05	0.865		0.5	0.605		0.5	0.635		0.1	0.782		0.05
Cadmium	5.00E-03	USEPA MCL		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Calcium	---	---	600		5	576		5	672		5	518		5	511		5	495		5	622		5
Chromium	5.00E-02	20.6.2.3103.A		U	0.005		U	0.005		U	0.005		U	0.005		U	0.01		U	0.005		U	0.005
Cobalt	5.00E-02	20.6.2.3103.C	0.00738		0.005	0.00451	J	0.005	0.0072		0.005	0.0029	J	0.005		U	0.01		U	0.005		U	0.005
Copper	1.00E+00	20.6.2.3103.B		U	0.005		U	0.005	0.002	J	0.005	0.00704		0.005		U	0.01	0.00151	J	0.005		U	0.005
Iron	1.00E+00	20.6.2.3103.B		U	0.2		U	0.2		U	0.2		U	0.2		U	0.4		U	0.2		U	0.2
Lead	1.50E-02	USEPA MCL		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Manganese	2.00E-01	20.6.2.3103.B	1.51		0.005	0.844		0.005	1.42		0.005	0.255		0.005	0.0267		0.01	0.023		0.005	0.0362		0.005
Mercury	2.00E-03	20.6.2.3103.A		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Molybdenum	1.00E+00	20.6.2.3103.C	0.0103		0.005	0.00978		0.005	0.0116		0.005	0.00877		0.005	0.0075		0.005	0.00723		0.005	0.0066		0.015
Nickel	2.00E-01	20.6.2.3103.C	0.00651		0.005	0.0041	J	0.005	0.0056		0.005	0.00483	J	0.005		U	0.005	0.00225	J	0.005	0.0021	J	0.005
Potassium	---	---	2.86		0.2	2.76		0.2	2.94		0.2	1.78		0.2	0.780		0.2	0.766		0.2	0.782		0.2
Selenium	5.00E-02	20.6.2.3103.A	0.00222	J	0.005	0.00636		0.005	0.0025	J	0.005	0.0081		0.005	0.00654	J	0.01	0.00734		0.005	0.0057		0.005
Silver	5.00E-02	20.6.2.3103.A		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Sodium	---	---	146		0.2	123		0.2	138		0.2	199		2	206		2	201		2	247		2
Uranium	3.00E-02	20.6.2.3103.A	0.0156		0.005	0.0108		0.005	0.0138		0.005	0.0843		0.005	0.0825		0.005	0.0731		0.005	0.0936		0.005
Zinc	1.00E+01	20.6.2.3103.B	0.00343	J	0.005		U	0.005		U	0.005	0.00973		0.005	0.00821		0.01		U	0.005		U	0.005
Anions (mg/L)																							
Chloride	2.50E+02	20.6.2.3103.B	158		25	150		50	199		25	422		25	373		50	364		50	530		25
Fluoride (F-, Anion)	1.60E+00	20.6.2.3103.A	1.76		0.1	1.91		0.1	1.82		0.1	1.1		0.1	1.18		0.1	1.15		0.1	0.845		0.1
Nitrate-N	1.00E+01	20.6.2.3103.A	1.43	H	0.1				0.055	JH	0.1	0.821	H	0.1							0.174	H	0.1
Nitrite	---	---		HU	0.1					UH	0.1	0.141	H	0.1								UH	0.1
Nitrate/Nitrite as N	1.00E+01	20.6.2.3103.A					U	2	0.055	JH	0.2					U	2		U	2	0.174	JH	0.2
Sulfate	6.00E+02	20.6.2.3103.B	2,200		25	1,800		50	1,950		25	2,790		25	2,490		50	2,420		50	2,900		25
Cyanide	2.00E-01	20.6.2.3103.A		U	0.02	0.00432	J	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02
Radium (pCi/L)																							
Radium-226	---	---	0.43	LT	0.23		U	0.36	0.37		0.21		U	0.23		U	0.58		Y1,U	0.54		U	0.26
Radium-228	---	---	0.74	LT	0.49		U	0.55	0.62		0.52		U	0.52		U	0.64		Y1,U	0.55		U	0.47
Radium-226 & Radium-228	3.00E+01	20.6.2.3103.A	1.17						0.99														
Total Dissolved Solids (mg/L)																							
Residue, filterable	1.00E+04	20.6.2.3103	3,760		10	3,900		10	3,870		10	4,960		10	5,510		10	4,990		10	6,130		10
TPH (mg/L)																							
Gasoline Range Organics	---	---		U	0.05		U	0.05		U	0.05		U	0.05		U	0.05		U	0.05		U	0.05
Diesel Range Organics	2.00E-01	NMED RA		U	0.052		U	0.052		U	0.052		U	0.051		U	0.051		U	0.052		U	0.052
Oil Range Organics	2.00E-01	NMED RA		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1

Table 4 - Summary of Groundwater Sampling Analytical Results
Third Quarter 2013 Interim Report - RO Reject Discharge Fields
Navajo Refining Company, Artesia Refinery, New Mexico

Well: Date:			MW-114									MW-115											
			2/3/2013			5/15/2013			9/5/2013			2/3/2013			5/15/2013			5/15/2013 - Duplicate			9/4/2013		
Analyte	CGWSL	CGWSL Source	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
VOCs (mg/L)																							
1,1,1-Trichloroethane	6.00E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2,2-Tetrachloroethane	1.00E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2-Trichloroethane	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethane	2.50E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethene	7.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dibromoethane	5.00E-02	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dichloroethane	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Benzene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Carbon Tetrachloride	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Chloroform	8.00E+01	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Dichloromethane	5.00E+00	USEPA MCL		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Ethylbenzene	7.00E+02	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Tetrachloroethene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Toluene	7.50E+02	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Total Xylenes	6.20E+02	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Trichloroethene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Vinyl Chloride	1.00E+00	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
SVOCs (mg/L)																							
1-Methylnaphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
2-Methylnaphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Naphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Total PAHs	3.00E+01	20.6.2.3103.A																					
Benzo(a)Pyrene	2.00E-01	USEPA MCL		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002

Table 4 - Summary of Groundwater Sampling Analytical Results

Third Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

Well:			MW-116												MW-117								
Date:			2/3/2013			5/16/2013			9/4/2013			9/4/2013 - Duplicate			2/3/2013			5/15/2013			9/4/2013		
Analyte	CGWSL	CGWSL Source	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Dissolved Metals (mg/L)																							
Aluminum	5.00E+00	20.6.2.3103.C	0.00797	J	0.01	0.349		0.01	0.0126		0.01	0.0118		0.01	0.0289		0.01	0.0184		0.01	0.0169		0.01
Arsenic	1.00E-02	USEPA MCL	0.00274	J	0.005	0.00502		0.005	0.00535		0.005	0.00467	J	0.005	0.00498	J	0.005	0.00367	J	0.01	0.00559		0.005
Barium	1.00E+00	20.6.2.3103.A	0.0161		0.005	0.0111		0.005	0.00928		0.005	0.00946		0.005	0.0235		0.005	0.0113		0.005	0.0108		0.005
Boron	7.50E-01	20.6.2.3103.C	0.22		0.1	0.238		0.1	0.304		0.05	0.281		0.05	0.207		0.1	0.175		0.1	0.202		0.05
Cadmium	5.00E-03	USEPA MCL		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Calcium	---	---	624		10	578		5	588		5	631		5	568		5	524		5	550		5
Chromium	5.00E-02	20.6.2.3103.A		U	0.005	0.00119	J	0.005		U	0.005		U	0.005		U	0.005		U	0.01		U	0.005
Cobalt	5.00E-02	20.6.2.3103.C		U	0.005		U	0.005		U	0.005		U	0.005	0.00256	J	0.005		U	0.01		U	0.005
Copper	1.00E+00	20.6.2.3103.B		U	0.005	0.00176	J	0.005		U	0.005		U	0.005	0.0141		0.005		U	0.01		U	0.005
Iron	1.00E+00	20.6.2.3103.B		U	0.2	0.201		0.2		U	0.2		U	0.2		U	0.2		U	0.4		U	0.2
Lead	1.50E-02	USEPA MCL		U	0.005		U	0.01		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Manganese	2.00E-01	20.6.2.3103.B	0.0437		0.005	0.0342		0.005	0.00478	J	0.005	0.00366	J	0.005	0.108		0.005	0.00978	J	0.01	0.00502		0.005
Mercury	2.00E-03	20.6.2.3103.A	0.000131	J	0.0002	4.6E-05	J	0.0002	6.1E-05	J	0.0002	0.00006	J	0.0002		U	0.0002		U	0.0002		U	0.0002
Molybdenum	1.00E+00	20.6.2.3103.C	0.00348	J	0.005	0.00308	J	0.005	0.00304	J	0.005	0.003	J	0.005	0.0112		0.005	0.00664		0.005	0.014		0.005
Nickel	2.00E-01	20.6.2.3103.C	0.0012	J	0.005	0.00204	J	0.005	0.00115	J	0.005	0.00112	J	0.005	0.00413	J	0.005		U	0.01	0.00189	J	0.005
Potassium	---	---	1.06		0.2	1.38		0.2	1.21		0.2	1.22		0.2	6.92		0.2	4.37		0.2	8.92		0.2
Selenium	5.00E-02	20.6.2.3103.A	0.00203	J	0.005	0.00733		0.005	0.00493	J	0.005	0.00558		0.005	0.00427	J	0.005	0.00585	J	0.01	0.00316	J	0.005
Silver	5.00E-02	20.6.2.3103.A		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Sodium	---	---	206		4	194		2	235		2	230		2	176		0.2	160		0.2	118		0.2
Uranium	3.00E-02	20.6.2.3103.A	0.0331		0.005	0.0343		0.01	0.04		0.005	0.0388		0.005	0.0263		0.005	0.0247		0.005	0.0224		0.005
Zinc	1.00E+01	20.6.2.3103.B	0.00291	J	0.005		U	0.005		U	0.005		U	0.005	0.0123		0.005		U	0.01	0.00266	J	0.005
Anions (mg/L)																							
Chloride	2.50E+02	20.6.2.3103.B	389		25	330		50	344		25	339		25	154		25	137		50	71		0.5
Fluoride (F-, Anion)	1.60E+00	20.6.2.3103.A	1.31		0.1	1.19		0.1	1.17		0.1	1.11		0.1	2.73		0.1	2.29		0.1	2.8		0.1
Nitrate-N	1.00E+01	20.6.2.3103.A	1.37	H	0.1				0.418	H	0.1	.450	H	0.1		HU	0.1					UH	0.1
Nitrite	---	---		HU	0.1					UH	0.1		UH	0.1		HU	0.1					UH	0.1
Nitrate/Nitrite as N	1.00E+01	20.6.2.3103.A					U	2	0.418	H	0.2	0.450	H	0.2					U	2		UH	0.2
Sulfate	6.00E+02	20.6.2.3103.B	2,250		25	2,080		50	2,180		25	2,140		25	2,310		25	2,010		50	2,020		25
Cyanide	2.00E-01	20.6.2.3103.A		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02
Radium (pCi/L)																							
Radium-226	---	---		U	0.32		U	0.36		U	0.25	0.28	LT	0.26	0.54	LT	0.09		U	0.45	0.2		0.08
Radium-228	---	---		U	0.55		U	0.46		U	0.53		U	0.54	0.89	LT	0.48		U	0.53	0.74		0.62
Radium-226 & Radium-228	3.00E+01	20.6.2.3103.A										0.28			1.43						0.94		
Total Dissolved Solids (mg/L)																							
Residue, filterable	1.00E+04	20.6.2.3103	3,650		10	4,480		10	4,440		10	4,470		10	3,910		10	4,260		10	3,970		10
TPH (mg/L)																							
Gasoline Range Organics	---	---		U	0.05		U	0.05		U	0.05		U	0.05		U	0.05		U	0.05		U	0.05
Diesel Range Organics	2.00E-01	NMED RA		U	0.051		U	0.052		U	0.052		U	0.052		U	0.052		U	0.052		U	0.051
Oil Range Organics	2.00E-01	NMED RA		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1

Table 4 - Summary of Groundwater Sampling Analytical Results
Third Quarter 2013 Interim Report - RO Reject Discharge Fields
Navajo Refining Company, Artesia Refinery, New Mexico

Well: Date:			MW-116												MW-117								
			2/3/2013			5/16/2013			9/4/2013			9/4/2013 - Duplicate			2/3/2013			5/15/2013			9/4/2013		
Analyte	CGWSL	CGWSL Source	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
VOCs (mg/L)																							
1,1,1-Trichloroethane	6.00E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2,2-Tetrachloroethane	1.00E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2-Trichloroethane	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethane	2.50E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethene	7.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dibromoethane	5.00E-02	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dichloroethane	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Benzene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Carbon Tetrachloride	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Chloroform	8.00E+01	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Dichloromethane	5.00E+00	USEPA MCL		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Ethylbenzene	7.00E+02	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Tetrachloroethene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Toluene	7.50E+02	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Total Xylenes	6.20E+02	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Trichloroethene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Vinyl Chloride	1.00E+00	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
SVOCs (mg/L)																							
1-Methylnaphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
2-Methylnaphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Naphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Total PAHs	3.00E+01	20.6.2.3103.A																					
Benzo(a)Pyrene	2.00E-01	USEPA MCL		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002

Table 4 - Summary of Groundwater Sampling Analytical Results
Third Quarter 2013 Interim Report - RO Reject Discharge Fields
Navajo Refining Company, Artesia Refinery, New Mexico

Well:			MW-118									MW-119								
Date:			2/5/2013			5/15/2013			9/4/2013			2/5/2013			5/15/2013			9/4/2013		
Analyte	CGWSL	CGWSL Source	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Dissolved Metals (mg/L)																				
Aluminum	5.00E+00	20.6.2.3103.C	0.0146		0.01	0.00796	J	0.01	0.00992	J	0.01	0.00994	J	0.01	0.0296		0.01	0.0113		0.01
Arsenic	1.00E-02	USEPA MCL	0.011		0.005	0.0146		0.005	0.0156		0.005	0.00294	J	0.005	0.0054		0.005	0.00595		0.005
Barium	1.00E+00	20.6.2.3103.A	0.0145		0.005	0.00919		0.005	0.0099		0.005	0.00981		0.005	0.0063		0.005	0.00864		0.005
Boron	7.50E-01	20.6.2.3103.C	0.226		0.05	0.230		0.1	0.307		0.05	0.0987		0.05	0.13		0.1	0.183		0.05
Cadmium	5.00E-03	USEPA MCL		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Calcium	---	---	563		10	530		5	543		5	494		10	491		5	635		5
Chromium	5.00E-02	20.6.2.3103.A		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Cobalt	5.00E-02	20.6.2.3103.C		U	0.005		U	0.005		U	0.005	0.000871	J	0.005		U	0.005		U	0.005
Copper	1.00E+00	20.6.2.3103.B	0.00156	J	0.005	0.00156	J	0.005		U	0.005	0.00309	J	0.005	0.0014	J	0.005		U	0.005
Iron	1.00E+00	20.6.2.3103.B		U	0.2		U	0.2		U	0.2		U	0.2		U	0.2		U	0.2
Lead	1.50E-02	USEPA MCL		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Manganese	2.00E-01	20.6.2.3103.B	0.0232		0.005		U	0.005		U	0.005	0.0424		0.005		U	0.005		U	0.005
Mercury	2.00E-03	20.6.2.3103.A	0.000042	J	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Molybdenum	1.00E+00	20.6.2.3103.C	0.0195		0.005	0.0179		0.005	0.0162		0.005	0.0083		0.005	0.0075		0.005	0.00846		0.005
Nickel	2.00E-01	20.6.2.3103.C	0.00173	J	0.005	0.00184	J	0.005	0.00131	J	0.005	0.00174	J	0.005	0.0016	J	0.005	0.0014	J	0.005
Potassium	---	---	7.95		0.2	7.2		0.2	7.69		0.2	0.87		0.2	0.794		0.2	0.993		0.2
Selenium	5.00E-02	20.6.2.3103.A	0.00861		0.005	0.0127		0.005	0.0129		0.005	0.00246	J	0.005	0.0051		0.005	0.0066		0.005
Silver	5.00E-02	20.6.2.3103.A		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Sodium	---	---	218		4	229		2	215		2	127		4	120		0.2	133		0.2
Uranium	3.00E-02	20.6.2.3103.A	0.037		0.005	0.033		0.005	0.0395		0.005	0.0244		0.005	0.0222		0.005	0.0275		0.005
Zinc	1.00E+01	20.6.2.3103.B		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005		U	0.005
Anions (mg/L)																				
Chloride	2.50E+02	20.6.2.3103.B	296		25	287		50	132		25	116		25	118		50	244		25
Fluoride (F-, Anion)	1.60E+00	20.6.2.3103.A	5.16		0.1	5.39		0.1	4.48		0.1	2.36		0.1	2.43		0.1	2.28		0.1
Nitrate-N	1.00E+01	20.6.2.3103.A	2.39		0.1				0.325	H	0.1	2.35		0.1				0.228	H	0.1
Nitrite	---	---		U	0.1					UH	0.1		U	0.1					UH	0.1
Nitrate/Nitrite as N	1.00E+01	20.6.2.3103.A				2.09		2	0.325	H	0.2				1.91	J	2	0.228	H	0.2
Sulfate	6.00E+02	20.6.2.3103.B	2,450		25	2,250		50	2,310		25	2,090		25	1,970		50	1,940		25
Cyanide	2.00E-01	20.6.2.3103.A		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02		U	0.02
Radium (pCi/L)																				
Radium-226	---	---	0.38	Y1,LT	0.21	0.22	LT	0.2		U	0.21		U	0.25		Y1,U	0.31	0.17	LT	0.08
Radium-228	---	---	0.87	Y1,LT	0.49		U	0.48	0.64	LT	0.6		U	0.52		Y1,U	0.47		U	0.64
Radium-226 & Radium-228	3.00E+01	20.6.2.3103.A	1.25			0.22			0.64									0.17		
Total Dissolved Solids (mg/L)																				
Residue, filterable	1.00E+04	20.6.2.3103	4,610		10	5,090		10	4,550		10	3,670		10	4,030		10	4,030		10
TPH (mg/L)																				
Gasoline Range Organics	---	---	0.0436	J	0.05		U	0.05		U	0.05	0.0371	J	0.05		U	0.05		U	0.05
Diesel Range Organics	2.00E-01	NMED RA		U	0.052		U	0.051		U	0.052		U	0.051		U	0.052		U	0.052
Oil Range Organics	2.00E-01	NMED RA		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1		U	0.1

Table 4 - Summary of Groundwater Sampling Analytical Results
Third Quarter 2013 Interim Report - RO Reject Discharge Fields
Navajo Refining Company, Artesia Refinery, New Mexico

Well:			MW-118									MW-119								
Date:			2/5/2013			5/15/2013			9/4/2013			2/5/2013			5/15/2013			9/4/2013		
Analyte	CGWSL	CGWSL Source	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
VOCs (mg/L)																				
1,1,1-Trichloroethane	6.00E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2,2-Tetrachloroethane	1.00E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1,2-Trichloroethane	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethane	2.50E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,1-Dichloroethene	7.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dibromoethane	5.00E-02	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
1,2-Dichloroethane	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Benzene	5.00E+00	USEPA MCL	0.0042		0.001		U	0.001		U	0.001	0.0036		0.001		U	0.001		U	0.001
Carbon Tetrachloride	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Chloroform	8.00E+01	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Dichloromethane	5.00E+00	USEPA MCL		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002		U	0.002
Ethylbenzene	7.00E+02	USEPA MCL	0.0024		0.001		U	0.001		U	0.001	0.0021		0.001		U	0.001		U	0.001
Tetrachloroethene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Toluene	7.50E+02	20.6.2.3103.A	0.0033		0.001		U	0.001		U	0.001	0.0027		0.001		U	0.001		U	0.001
Total Xylenes	6.20E+02	20.6.2.3103.A	0.0047		0.001		U	0.001		U	0.001	0.0037		0.001		U	0.001		U	0.001
Trichloroethene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
Vinyl Chloride	1.00E+00	20.6.2.3103.A		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001		U	0.001
SVOCs (mg/L)																				
1-Methylnaphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
2-Methylnaphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Naphthalene	---	---		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002
Total PAHs	3.00E+01	20.6.2.3103.A																		
Benzo(a)Pyrene	2.00E-01	USEPA MCL		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002		U	0.0002

Table 4 - Summary of Groundwater Sampling Analytical Results

Third Quarter 2013 Interim Report - RO Reject Discharge Fields

Navajo Refining Company, Artesia Refinery, New Mexico

Well:			RO Reject Discharge								
Date:			2/3/2013			5/16/2013			9/4/2013		
Analyte	CGWSL	CGWSL Source	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
Dissolved Metals (mg/L)											
Aluminum	5.00E+00	20.6.2.3103.C	0.00668	J	0.01	0.0053	J	0.01	0.00809	J	0.01
Arsenic	1.00E-02	USEPA MCL	0.00494	J	0.005	0.0025	J	0.01	0.00244		0.005
Barium	1.00E+00	20.6.2.3103.A	0.0628		0.005	0.0464		0.005	0.0553		0.005
Boron	7.50E-01	20.6.2.3103.C	0.143		0.1	0.104		0.1	0.0934		0.05
Cadmium	5.00E-03	USEPA MCL		U	0.002		U	0.002		U	0.002
Calcium	---	---	625		25	397		5	410		5
Chromium	5.00E-02	20.6.2.3103.A		U	0.005		U	0.01	0.00114		0.005
Cobalt	5.00E-02	20.6.2.3103.C		U	0.005		U	0.01		U	0.005
Copper	1.00E+00	20.6.2.3103.B	0.00177	J	0.005		U	0.01		U	0.005
Iron	1.00E+00	20.6.2.3103.B		U	0.2		U	0.4		U	0.2
Lead	1.50E-02	USEPA MCL		U	0.005		U	0.01		U	0.005
Manganese	2.00E-01	20.6.2.3103.B		U	0.005		U	0.01		U	0.005
Mercury	2.00E-03	20.6.2.3103.A		U	0.0002		U	0.0002		U	0.0002
Molybdenum	1.00E+00	20.6.2.3103.C	0.0125		0.005	0.0062		0.005	0.00604		0.005
Nickel	2.00E-01	20.6.2.3103.C	0.00264	J	0.005		U	0.01	0.00329	J	0.005
Potassium	---	---	4.41		0.2	2.91		0.2	2.72		0.2
Selenium	5.00E-02	20.6.2.3103.A	0.013		0.005	0.0075	J	0.01	0.00669		0.005
Silver	5.00E-02	20.6.2.3103.A		U	0.005		U	0.005		U	0.005
Sodium	---	---	65.4		0.2	40.4		0.2	45.7		0.2
Uranium	3.00E-02	20.6.2.3103.A	0.00601		0.005		U	0.01		U	0.005
Zinc	1.00E+01	20.6.2.3103.B	0.0132		0.005	0.0052	J	0.01	0.00672		0.005
Anions (mg/L)											
Chloride	2.50E+02	20.6.2.3103.B	67.5		0.5	38.2		0.5	61.1		0.5
Fluoride (F-, Anion)	1.60E+00	20.6.2.3103.A	3.32		0.1	2.15		0.1	2.26		0.1
Nitrate-N	1.00E+01	20.6.2.3103.A	3.22	H	0.1				1.56	H	0.1
Nitrite	---	---		HU	0.1					UH	0.1
Nitrate/Nitrite as N	1.00E+01	20.6.2.3103.A				2.11		2	1.56	H	0.2
Sulfate	6.00E+02	20.6.2.3103.B	1,690		25	1,080		50	1,030		25
Cyanide	2.00E-01	20.6.2.3103.A		U	0.02	0.0049	J	0.02		U	0.02
Radium (pCi/L)											
Radium-226	---	---				0.49	LT	0.24	0.46	LT	0.23
Radium-228	---	---					U	0.52		U	0.57
Radium-226 & Radium-228	3.00E+01	20.6.2.3103.A				0.49			0.46		
Total Dissolved Solids (mg/L)											
Residue, filterable	1.00E+04	20.6.2.3103	3,150		10	2,410		10	2,290		10
TPH (mg/L)											
Gasoline Range Organics	---	---		U	0.05		U	0.05		U	0.05
Diesel Range Organics	2.00E-01	NMED RA		U	0.052		U	0.053		U	0.052
Oil Range Organics	2.00E-01	NMED RA	0.17		0.1		U	0.11		U	0.042

Table 4 - Summary of Groundwater Sampling Analytical Results
Third Quarter 2013 Interim Report - RO Reject Discharge Fields
Navajo Refining Company, Artesia Refinery, New Mexico

Well: Date:			RO Reject Discharge								
			2/3/2013			5/16/2013			9/4/2013		
Analyte	CGWSL	CGWSL Source	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
VOCs (mg/L)											
1,1,1-Trichloroethane	6.00E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001
1,1,2,2-Tetrachloroethane	1.00E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001
1,1,2-Trichloroethane	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001
1,1-Dichloroethane	2.50E+01	20.6.2.3103.A		U	0.001		U	0.001		U	0.001
1,1-Dichloroethene	7.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001
1,2-Dibromoethane	5.00E-02	USEPA MCL		U	0.001		U	0.001		U	0.001
1,2-Dichloroethane	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001
Benzene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001
Carbon Tetrachloride	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001
Chloroform	8.00E+01	USEPA MCL		U	0.001		U	0.001		U	0.001
Dichloromethane	5.00E+00	USEPA MCL		U	0.002		U	0.002		U	0.002
Ethylbenzene	7.00E+02	USEPA MCL		U	0.001		U	0.001		U	0.001
Tetrachloroethene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001
Toluene	7.50E+02	20.6.2.3103.A		U	0.001		U	0.001		U	0.001
Total Xylenes	6.20E+02	20.6.2.3103.A		U	0.001		U	0.001		U	0.001
Trichloroethene	5.00E+00	USEPA MCL		U	0.001		U	0.001		U	0.001
Vinyl Chloride	1.00E+00	20.6.2.3103.A		U	0.001		U	0.001		U	0.001
SVOCs (mg/L)											
1-Methylnaphthalene	---	---		U	0.0002		U	0.0002		U	0.0002
2-Methylnaphthalene	---	---		U	0.0002		U	0.0002		U	0.0002
Naphthalene	---	---		U	0.0002		U	0.0002		U	0.0002
Total PAHs	3.00E+01	20.6.2.3103.A									
Benzo(a)Pyrene	2.00E-01	USEPA MCL		U	0.0002		U	0.0002		U	0.0002

Table 4 - Summary of Groundwater Sampling Analytical Results
Third Quarter 2013 Interim Report - RO Reject Discharge Fields
Navajo Refining Company, Artesia Refinery, New Mexico

Notes:

CGWSL is the lowest of the following sources:
New Mexico Water Quality Standards found in NMAC 20.6.2.3103.
If no value in NMAC 20.6.2.3103 was available, then the EPA Federal MCL was used.
TPH results are screened against the "unknown oil" SSL from Table 6-2, 2012 NMED RAG.
Bold, italic font with yellow highlighting indicates a result reported above the CGWSL.
RLs shown in italics font with gray highlighting exceed the CGWSL for that compound.

Blank cells indicate that the analyte was not detected at the RL shown, no qualifier exists, or that the compound was not analyzed for that sample (if no RL is shown).

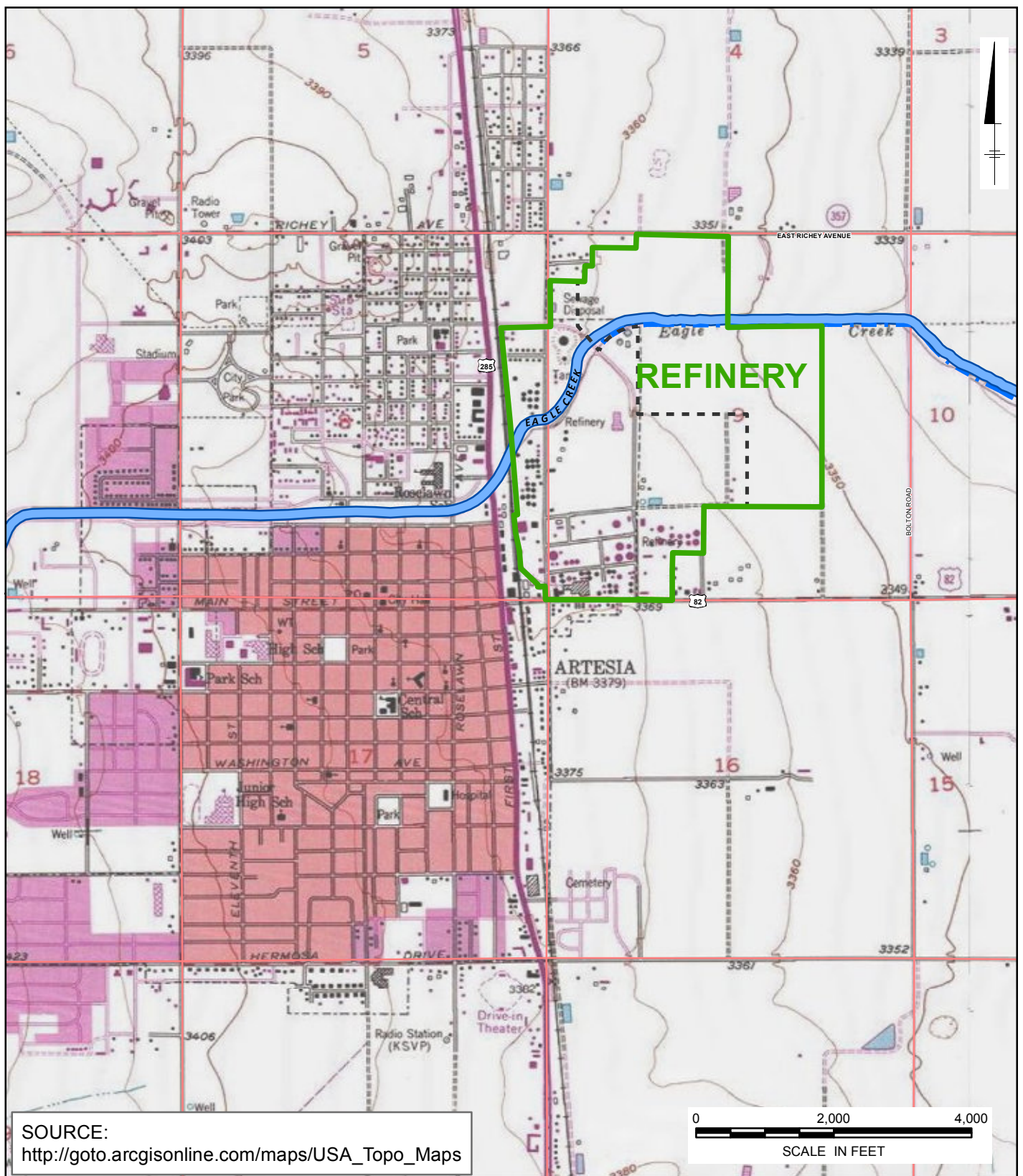
Screening level for radium is for combined Radium-226 and Radium-228.
Detected values were added to obtain the combined value for screening. Non-detect results were treated as a value of 0.

Total PAHs are defined in NMAC 20.6.2.3103 as naphthalene plus mono-methylnaphthalenes.
Although no detected values were present, if concentrations had been reported for 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene, the values would have been added to obtain the Total PAHs concentration.

Abbreviations:

--- = not available
CGWSL = Critical Groundwater Screening Level
H = analyzed outside of holding time
J = estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
LCS = laboratory control sample
LT = the sample has a detection above the achieved minimum detectable concentration but below the requested.
MCL = maximum contaminant level
mg/L = milligrams per liter
NA = not applicable
NMAC = New Mexico Administrative Code
NMED RAG = 2012 New Mexico Environment Department Risk Assessment Guidance
PAHs = polycyclic aromatic hydrocarbons
pci/L = average picocuries per liter
Qual = qualifier from laboratory or data validation
RL = laboratory reporting limit
SVOC = semivolatile organic compounds
VOC = volatile organic compounds
TPH = total petroleum hydrocarbons
U = indicates the compound was analyzed for but not detected
USEPA = United States Environmental Protection Agency

Figures



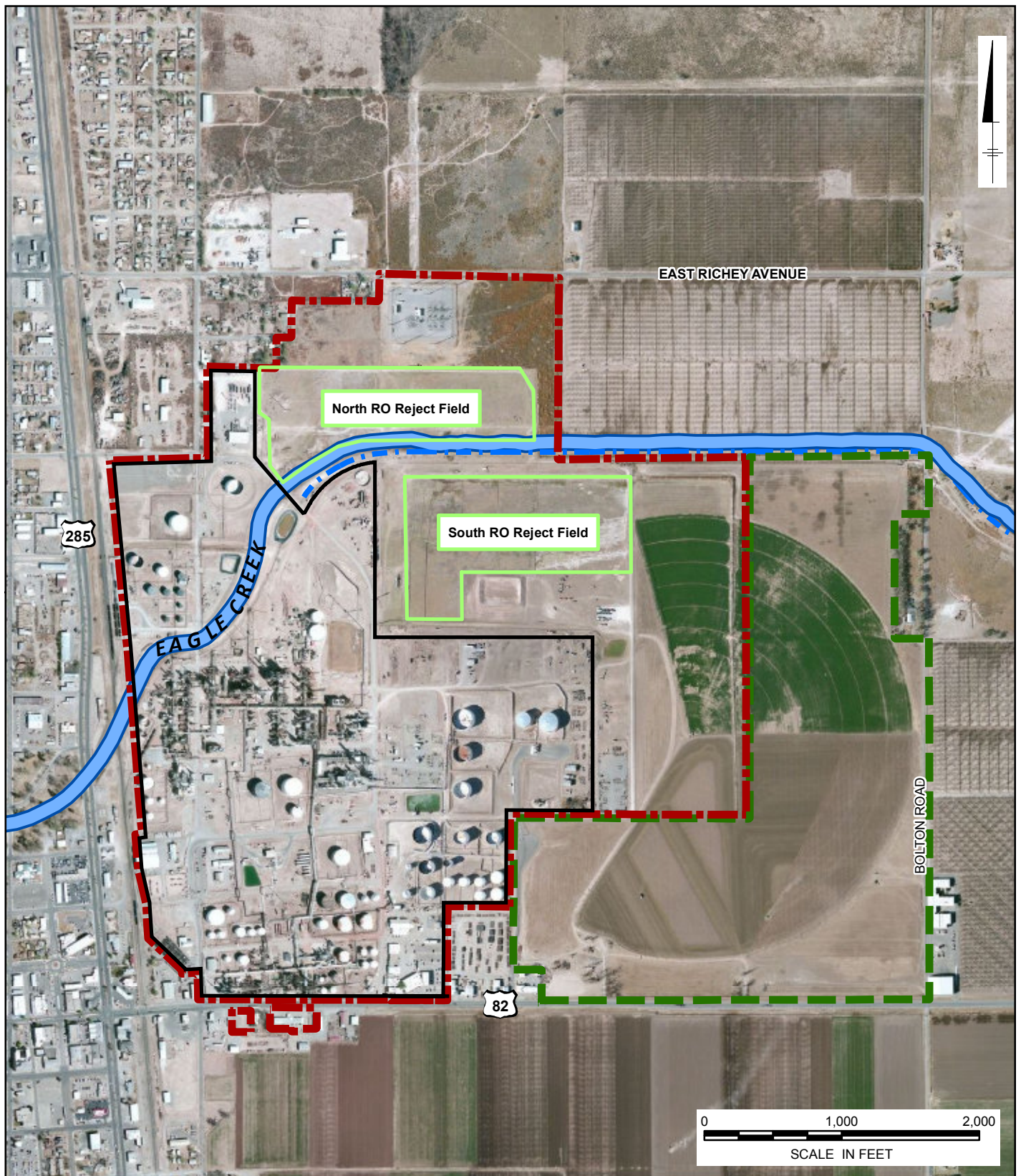
NAVAJO REFINING COMPANY
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

SITE LOCATION MAP



FIGURE

1



LEGEND:

-  REFINERY FENCELINE
-  REJECT FIELD
-  NAVAJO REFINING PROPERTY LINE
-  MONTANA REFINING PROPERTY LINE
-  APPROXIMATE LOCATION OF FORMER THREE-MILE DITCH AND EXISTING UNDERGROUND DISCHARGE PIPING
-  WATERWAYS

NAVAJO REFINING COMPANY
 ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

RO REJECT FIELDS SITE INVESTIGATION

SITE FEATURES



FIGURE

2



Appendix A

Groundwater Sampling Field Data
Sheets



Project No. _____ Well ID MW-11

Date 9/4/12
Weather Sunny / 10W90S

Project Name/Location NAVAJO / RO REJECT FIELDS

Measuring Pt. Description	Screen Setting (ft-bmp)	Casing Diameter (in.)
		2"

Well Material PVC
SS

Static Water Level (ft-bmp) 6.09 Total Depth (ft-bmp) 26.49 Water Column/ Gallons in Well

MP Elevation _____ Pump Intake (ft-bmp) _____ Purge Method: peristaltic

Pump On/Off 0835/1011 Volumes Purged ~ 3 gal Centrifugal
Submersible

Sample Time: Label 0950 Replicate/
Start 0930 Code No. N/A
End 1011

Sample Method *Low Flow*

Sampled by Mrs

[illegible]

Turbine
= 0.2

Constituents Sampled	Container	Number	Preservative
RADIUM	1 L PLASTIC	2	HNO ₃
TOTAL DISSOLVED SOLIDS/ANIONS/pH	1 L PLASTIC	1	—
SEMIVOLATILES	1 L AMBER	2	—
CYANIDE	250 ML PLASTIC	1	NaOH
TPH DRO/DRO	40 ML VOA VIAL	3	—
GR	40 ML VOA VIAL	3	HCl
VOLATILES	40 ML VOA VIAL	3	HCl
DISSOLVED METALS	500 ML PLASTIC	1	HNO ₃

Well Casing Volumes

Gallons/Foot	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location:	NORTH RO FIELD	Well Locked at Arrival:	Yes	/	No
Condition of Well:	GOOD	Well Locked at Departure:	Yes	/	No
Well Completion:	Flush Mount / Stick Up	Key Number To Well:	N/A		GW Samp Fr



Groundwater Sampling Form

Page 1 of 1

Well ID

MW-119

9/4/13

NAVAJO / RO REJECT ~~FIELD~~²² FIELDS

Weather

Screen
Setting (ft-bmp)

Casing
Diameter (in.)

Well Material X PVC
SS

10.72

Total Depth (ft-bmp) 27.67

Water Column/
Gallons in Well

MP Elevation

Pump Intake (ft-bmp)

Purge Method: Densitatic

Sample _____

Pump On/Off

124 11356

Volumes Purged *~2 gal*

Centrifuga
Submersib
Other

Sample Time:

Label 1330

Replicate/

11/15

Sampled by *MS*

[illegible]

Constituents Sampled	Container	Number	Preservative
RADIUM	1 L PLASTIC	2	HNO ₃
TOTAL DISSOLVED SOLIDS/AMMONIA/pH	1 L PLASTIC	1	=
SEMI-VOLATILES	1 L AMBER	2	=
CYANIDE	250 ML PLASTIC	1	NaOH
TPH DRO/GR	40 ML AMBER	3	—
GR	40 ML VOA VIAL	3	H ₂ O
VOLATILES	40 ML VOA VIAL	3	HCl
DISSOLVED METALS	500 ML PLASTIC	1	HNO ₃

Well Casing Volumes

Gallons/Foot	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location: SOUT. NORTH RO FIELDS

Well Locked at Arrival: Yes / No

Condition of Well: *Good*

Well Locked at Departure: Yes / No

Well Completion: ☒ Flush Mount / ☒ Stick Up

Key Number To Well: N/A

GW Samp Form



Groundwater Sampling Form

Project No. _____

Well ID

MW-116

Page 1 of 1

Date

9/4/13

Project Name/Location

NAVAJUI RO REJECT FIELDS

Weather

Sunny/low 90's

Measuring Pt.

Screen

Casing

Well Material

Description

Setting (ft-bmp)

Diameter (in.)

☒ PVC
☐ SS

Static Water

Total Depth (ft-bmp)

Water Column/
Gallons in Well

Level (ft-bmp)

12.21

27.39

MP Elevation

Pump Intake (ft-bmp)

Purge Method: peristaltic

Sample

Pump On/Off

1426/1609

Volumes Purged

2 gal

Centrifugal

Submersible

Other

Method

low flow

Sample Time: Label

1520

Replicate/

Start 1510

Code No.

DUP-01

End 1609

Sampled by MS

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (µMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance	
											Color	Odor
1430	4	~100	12.22	~1/4	7.10	3.763	0.53	6.85	20.43	32.6	Clear	none
1433	7	~95	12.21	<1/2	7.06	3.812	0.57	3.60	21.03	29.7		
1436	10	~95	12.21	<3/4	7.04	3.857	4.15	1.45	21.68	25.7		
1439	13	~95	12.22	3/4	7.01	3.963	4.91	0.71	22.76	21.5		
1442	16	~95	12.22	<1	6.99	3.883	3.36	0.67	21.19	22.7		
1445	19	~95	12.21	1	6.98	3.745	1.83	0.48	20.15	23.0		
1448	22	~95	12.21	<1 1/4	6.92	3.737	2.30	0.36	20.16	24.3		
1451	25	~95	12.21	1 1/4	6.92	3.759	2.29	0.30	20.54	21.2		
1454	28	~95	12.21	1 1/2	6.93	3.748	0.38	0.29	20.16	20.3		
1457	31	~95	12.21	1 1/2	6.93	3.764	1.92	0.26	20.46	18.4		
1500	34	~95	12.21	<2 1/4	6.94	3.801	0.68	0.25	21.04	17.5		
1503	37	~95	12.21	1 3/4	6.93	3.825	1.08	0.25	21.27	17.9		
1506	40	~95	12.21	<2	6.93	3.833	0.46	0.24	21.24	17.4		

Constituents Sampled

Container

Number

Preservative

RADIUM

1L PLASTIC

2

HNO₃

TOTAL DISSOLVED SOLIDS/ANIONS/PH

1L PLASTIC

1

—

SEMIVOLATILES

1L AMBER

2

—

CYANIDE

250 ML PLASTIC

1

NaOH

TPH DRO/ORO

40 ML AMBER

3

—

GRO

40 ML VOA VIAL

3

HCl

VOLATILES

40 ML VOA VIAL

3

HCl

DISSOLVED METALS

500 ML PLASTIC

1

HNO₃

Well Casing Volumes

Gallons/Foot

1" = 0.04
1.25" = 0.061.5" = 0.09
2" = 0.162.5" = 0.26
3" = 0.373.5" = 0.50
4" = 0.65

6" = 1.47

Well Information

Well Location:

South RO Fields

Well Locked at Arrival:

Yes

No

Condition of Well:

good

Well Locked at Departure:

Yes

No

Well Completion:

Flush Mount

/

Stick Up

Key Number To Well:

N/A

GW Samp Form

8/30/2013



Appendix B

Laboratory Analytical Reports



08-Oct-2013

Robert Combs
Navajo Refining Company
PO Box 159
Artesia, NM 88211

Tel: (575) 746-5382
Fax: (575) 746-5421

Re: RO Discharge Sampling

Work Order: **1309249**

Dear Robert,

ALS Environmental received 12 samples on 06-Sep-2013 09:40 AM for the analyses presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

The total number of pages in this revised report is 88.

Regards,

A handwritten signature in black ink that reads "Sonia West".

Electronically approved by: Sonia West

Sonia West
Project Manager



Certificate No: T104704231-13-12

ADDRESS 10450 Stancliff Rd, Suite 210 Houston, Texas 77099-4338 | PHONE (281) 530-5656 | FAX (281) 530-5887

ALS GROUP USA, CORP. Part of the ALS Group An ALS Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Navajo Refining Company
Project: RO Discharge Sampling
Work Order: 1309249

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1309249-01	MW-114	Water		9/5/2013 09:30	9/6/2013 09:40	☐
1309249-02	MW-115	Water		9/4/2013 17:10	9/6/2013 09:40	☐
1309249-03	MW-116	Water		9/4/2013 15:20	9/6/2013 09:40	☐
1309249-04	MW-117	Water		9/4/2013 09:50	9/6/2013 09:40	☐
1309249-05	MW-118	Water		9/4/2013 12:00	9/6/2013 09:40	☐
1309249-06	MW-119	Water		9/4/2013 13:30	9/6/2013 09:40	☐
1309249-07	RO DISCHARGE	Water		9/5/2013 11:00	9/6/2013 09:40	☐
1309249-08	DUP-01	Water		9/4/2013	9/6/2013 09:40	☐
1309249-09	TRIP BLANKS-1	Water		9/4/2013	9/6/2013 09:40	☐
1309249-10	TRIP BLANKS-2	Water		9/4/2013	9/6/2013 09:40	☐
1309249-11	TRIP BLANKS-3	Water		9/4/2013	9/6/2013 09:40	☐
1309249-12	TRIP BLANKS	Water		9/4/2013	9/6/2013 09:40	☐

Client: Navajo Refining Company
Project: RO Discharge Sampling
Work Order: 1309249

Case Narrative

Due to a laboratory error, this report has been revised to add Nitrate-Nitrite by method 300.0.

The analyses for Radium 226 and Radium 228 were subcontracted to ALS Environmental in Ft. Collins, CO.

Batch 72948, TPH DRO/ORO 8015M, Sample LLCSDW-130910: The LCSD surrogate RPD was outside of the control limits. However, the surrogate recoveries were within the control limits for the LCS and LCSD.

Batch 73040, Dissolved Metals 6020, Sample 1309411-01L: MS/MSD are for an unrelated sample.

Batch 72927, Semivolatile Organics 8270, Sample SLCSW3-130910: Insufficient sample for MS/MSD.

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-114
Collection Date: 9/5/2013 09:30 AM

Work Order: 1309249
Lab ID: 1309249-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO 8015C Method: SW8015M Prep: SW3511 / 9/10/13 Analyst: RPM							
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	9/11/2013 10:12
TPH (Oil Range)	U		0.041	0.10	mg/L	1	9/11/2013 10:12
Surr: 2-Fluorobiphenyl	62.9			60-135	%REC	1	9/11/2013 10:12
GASOLINE RANGE ORGANICS - SW8015C Method: SW8015 Analyst: KKP							
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	9/12/2013 17:18
Surr: 4-Bromofluorobenzene	104			70-130	%REC	1	9/12/2013 17:18
DISSOLVED MERCURY BY 7470A Method: SW7470 Prep: SW7470 / 9/13/13 Analyst: OFO							
Mercury	U		0.000042	0.000200	mg/L	1	9/13/2013 16:49
DISSOLVED METALS Method: SW6020 Prep: SW3010A / 9/13/13 Analyst: ALR							
Aluminum	0.00848	J	0.0040	0.0100	mg/L	1	9/13/2013 23:53
Arsenic	0.00502		0.0010	0.00500	mg/L	1	9/13/2013 23:53
Barium	0.0170		0.00090	0.00500	mg/L	1	9/13/2013 23:53
Boron	0.132		0.020	0.0500	mg/L	1	9/13/2013 23:53
Cadmium	U		0.00080	0.00200	mg/L	1	9/13/2013 23:53
Calcium	672		0.86	5.00	mg/L	10	9/17/2013 13:34
Chromium	U		0.0010	0.00500	mg/L	1	9/13/2013 23:53
Cobalt	0.00718		0.00080	0.00500	mg/L	1	9/13/2013 23:53
Copper	0.00197	J	0.0010	0.00500	mg/L	1	9/13/2013 23:53
Iron	U		0.078	0.200	mg/L	1	9/13/2013 23:53
Lead	U		0.00070	0.00500	mg/L	1	9/13/2013 23:53
Manganese	1.42		0.0025	0.00500	mg/L	1	9/13/2013 23:53
Molybdenum	0.0116		0.0015	0.00500	mg/L	1	9/13/2013 23:53
Nickel	0.00558		0.0010	0.00500	mg/L	1	9/13/2013 23:53
Potassium	2.94		0.084	0.200	mg/L	1	9/13/2013 23:53
Selenium	0.00245	J	0.0010	0.00500	mg/L	1	9/13/2013 23:53
Silver	U		0.00080	0.00500	mg/L	1	9/13/2013 23:53
Sodium	138		0.085	0.200	mg/L	1	9/13/2013 23:53
Uranium	0.0138		0.0050	0.00500	mg/L	1	9/13/2013 23:53
Zinc	U		0.0025	0.00500	mg/L	1	9/13/2013 23:53
LOW-LEVEL SEMIVOLATILES Method: SW8270 Prep: SW3510 / 9/10/13 Analyst: LG							
1-Methylnaphthalene	U		0.000030	0.00020	mg/L	1	9/13/2013 11:57
2-Methylnaphthalene	U		0.000034	0.00020	mg/L	1	9/13/2013 11:57
Benzo(a)pyrene	U		0.000030	0.00020	mg/L	1	9/13/2013 11:57
Naphthalene	U		0.000050	0.00020	mg/L	1	9/13/2013 11:57
Surr: 2,4,6-Tribromophenol	84.9			34-129	%REC	1	9/13/2013 11:57
Surr: 2-Fluorobiphenyl	73.1			40-125	%REC	1	9/13/2013 11:57

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-114
Collection Date: 9/5/2013 09:30 AM

Work Order: 1309249
Lab ID: 1309249-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	63.7			20-120	%REC	1	9/13/2013 11:57
Surr: 4-Terphenyl-d14	78.2			40-135	%REC	1	9/13/2013 11:57
Surr: Nitrobenzene-d5	75.9			41-120	%REC	1	9/13/2013 11:57
Surr: Phenol-d6	68.5			20-120	%REC	1	9/13/2013 11:57

LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/9/2013 23:41
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/9/2013 23:41
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
Benzene	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/9/2013 23:41
Chloroform	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/9/2013 23:41
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/9/2013 23:41
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/9/2013 23:41
Toluene	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/9/2013 23:41
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/9/2013 23:41
Surr: 1,2-Dichloroethane-d4	112			71-125	%REC	1	9/9/2013 23:41
Surr: 4-Bromofluorobenzene	90.5			70-125	%REC	1	9/9/2013 23:41
Surr: Dibromofluoromethane	113			74-125	%REC	1	9/9/2013 23:41
Surr: Toluene-d8	114			75-125	%REC	1	9/9/2013 23:41

MISCELLANEOUS ANALYSIS			Method: NA			Analyst: SUB	
Miscellaneous Analysis	See Attached		0			1	9/25/2013

ANIONS - EPA 300.0 (1993)			Method: E300			Analyst: JKP	
Chloride	198	E	0.20	0.500	mg/L	1	9/16/2013 07:09
Chloride	199		10	25.0	mg/L	50	9/16/2013 12:13
Fluoride	1.82		0.050	0.100	mg/L	1	9/16/2013 07:09
Nitrogen, Nitrate (As N)	0.0550	JH	0.030	0.100	mg/L	1	9/16/2013 07:09
Nitrogen, Nitrite (As N)		U	0.030	0.100	mg/L	1	9/16/2013 07:09
Sulfate	2,000	E	0.20	0.500	mg/L	1	9/16/2013 07:09
Sulfate	1,950		10	25.0	mg/L	50	9/16/2013 12:13
Nitrate/Nitrite (as N)	0.0550	JH	0.030	0.200	mg/L	1	9/16/2013 07:09

CYANIDE - SM4500CN E			Method: M4500CN E&G			Analyst: EDG	
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Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-114
Collection Date: 9/5/2013 09:30 AM

Work Order: 1309249
Lab ID: 1309249-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Cyanide	U		0.0050	0.0200	mg/L	1	9/13/2013 10:15
PH - SM4500H+ B		Method: SM4500H+ B				Analyst: KL	
pH	7.07	H	0.10	0.100	pH Units	1	9/8/2013 11:16
Temp Deg C @pH	23.7	H	0		°C	1	9/8/2013 11:16
TOTAL DISSOLVED SOLIDS		Method: M2540C				Analyst: KAH	
Total Dissolved Solids (Residue, Filterable)	3,870		5.0	10.0	mg/L	1	9/11/2013 18:55

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-115
Collection Date: 9/4/2013 05:10 PM

Work Order: 1309249
Lab ID: 1309249-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO 8015C Method: SW8015M Prep: SW3511 / 9/10/13 Analyst: RPM							
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	9/11/2013 10:39
TPH (Oil Range)	U		0.041	0.10	mg/L	1	9/11/2013 10:39
Surr: 2-Fluorobiphenyl	60.4			60-135	%REC	1	9/11/2013 10:39
GASOLINE RANGE ORGANICS - SW8015C Method: SW8015 Analyst: KKP							
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	9/12/2013 17:36
Surr: 4-Bromofluorobenzene	103			70-130	%REC	1	9/12/2013 17:36
DISSOLVED MERCURY BY 7470A Method: SW7470 Prep: SW7470 / 9/13/13 Analyst: OFO							
Mercury	U		0.000042	0.000200	mg/L	1	9/13/2013 16:51
DISSOLVED METALS Method: SW6020 Prep: SW3010A / 9/13/13 Analyst: ALR							
Aluminum	0.00648	J	0.0040	0.0100	mg/L	1	9/13/2013 23:58
Arsenic	0.00467	J	0.0010	0.00500	mg/L	1	9/13/2013 23:58
Barium	0.0106		0.00090	0.00500	mg/L	1	9/13/2013 23:58
Boron	0.782		0.020	0.0500	mg/L	1	9/13/2013 23:58
Cadmium	U		0.00080	0.00200	mg/L	1	9/13/2013 23:58
Calcium	622		0.86	5.00	mg/L	10	9/17/2013 13:36
Chromium	U		0.0010	0.00500	mg/L	1	9/13/2013 23:58
Cobalt	U		0.00080	0.00500	mg/L	1	9/13/2013 23:58
Copper	U		0.0010	0.00500	mg/L	1	9/13/2013 23:58
Iron	U		0.078	0.200	mg/L	1	9/13/2013 23:58
Lead	U		0.00070	0.00500	mg/L	1	9/13/2013 23:58
Manganese	0.0362		0.0025	0.00500	mg/L	1	9/13/2013 23:58
Molybdenum	0.00663		0.0015	0.00500	mg/L	1	9/13/2013 23:58
Nickel	0.00208	J	0.0010	0.00500	mg/L	1	9/13/2013 23:58
Potassium	0.782		0.084	0.200	mg/L	1	9/13/2013 23:58
Selenium	0.00568		0.0010	0.00500	mg/L	1	9/13/2013 23:58
Silver	U		0.00080	0.00500	mg/L	1	9/13/2013 23:58
Sodium	247		0.85	2.00	mg/L	10	9/17/2013 13:36
Uranium	0.0936		0.0050	0.00500	mg/L	1	9/13/2013 23:58
Zinc	U		0.0025	0.00500	mg/L	1	9/13/2013 23:58
LOW-LEVEL SEMIVOLATILES Method: SW8270 Prep: SW3510 / 9/10/13 Analyst: LG							
1-Methylnaphthalene	U		0.000030	0.00020	mg/L	1	9/13/2013 12:17
2-Methylnaphthalene	U		0.000034	0.00020	mg/L	1	9/13/2013 12:17
Benzo(a)pyrene	U		0.000030	0.00020	mg/L	1	9/13/2013 12:17
Naphthalene	U		0.000050	0.00020	mg/L	1	9/13/2013 12:17
Surr: 2,4,6-Tribromophenol	47.8			34-129	%REC	1	9/13/2013 12:17
Surr: 2-Fluorobiphenyl	49.8			40-125	%REC	1	9/13/2013 12:17

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-115
Collection Date: 9/4/2013 05:10 PM

Work Order: 1309249
Lab ID: 1309249-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	53.1			20-120	%REC	1	9/13/2013 12:17
Surr: 4-Terphenyl-d14	67.5			40-135	%REC	1	9/13/2013 12:17
Surr: Nitrobenzene-d5	70.6			41-120	%REC	1	9/13/2013 12:17
Surr: Phenol-d6	60.1			20-120	%REC	1	9/13/2013 12:17

LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 00:06
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 00:06
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 00:06
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 00:06
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 00:06
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 00:06
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 00:06
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 00:06
Surr: 1,2-Dichloroethane-d4	112			71-125	%REC	1	9/10/2013 00:06
Surr: 4-Bromofluorobenzene	91.2			70-125	%REC	1	9/10/2013 00:06
Surr: Dibromofluoromethane	112			74-125	%REC	1	9/10/2013 00:06
Surr: Toluene-d8	111			75-125	%REC	1	9/10/2013 00:06

MISCELLANEOUS ANALYSIS			Method: NA			Analyst: SUB	
Miscellaneous Analysis	See Attached		0			1	9/25/2013

ANIONS - EPA 300.0 (1993)			Method: E300			Analyst: JKP	
Chloride	530		10	25.0	mg/L	50	9/16/2013 12:39
Fluoride	0.845		0.050	0.100	mg/L	1	9/16/2013 07:35
Nitrogen, Nitrate (As N)	0.174	H	0.030	0.100	mg/L	1	9/16/2013 07:35
Nitrogen, Nitrite (As N)	U	H	0.030	0.100	mg/L	1	9/16/2013 07:35
Sulfate	2,900		10	25.0	mg/L	50	9/16/2013 12:39
Nitrate/Nitrite (as N)	0.174	JH	0.030	0.200	mg/L	1	9/16/2013 07:35

CYANIDE - SM4500CN E			Method: M4500CN E&G			Analyst: EDG	
Cyanide	U		0.0050	0.0200	mg/L	1	9/13/2013 10:15

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-115
Collection Date: 9/4/2013 05:10 PM

Work Order: 1309249
Lab ID: 1309249-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PH - SM4500H+ B	Method: SM4500H+ B						Analyst: KL
pH	7.07	H	0.10	0.100	pH Units	1	9/8/2013 11:19
Temp Deg C @pH	23.6	H	0		°C	1	9/8/2013 11:19
TOTAL DISSOLVED SOLIDS	Method: M2540C						Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	6,130		5.0	10.0	mg/L	1	9/11/2013 18:55

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-116
Collection Date: 9/4/2013 03:20 PM

Work Order: 1309249
Lab ID: 1309249-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO 8015C Method: SW8015M Prep: SW3511 / 9/10/13 Analyst: RPM							
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	9/11/2013 11:06
TPH (Oil Range)	U		0.042	0.10	mg/L	1	9/11/2013 11:06
Surr: 2-Fluorobiphenyl	63.6			60-135	%REC	1	9/11/2013 11:06
GASOLINE RANGE ORGANICS - SW8015C Method: SW8015 Analyst: KKP							
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	9/12/2013 17:54
Surr: 4-Bromofluorobenzene	100			70-130	%REC	1	9/12/2013 17:54
DISSOLVED MERCURY BY 7470A Method: SW7470 Prep: SW7470 / 9/13/13 Analyst: OFO							
Mercury	0.0000610	J	0.000042	0.000200	mg/L	1	9/13/2013 16:53
DISSOLVED METALS Method: SW6020 Prep: SW3010A / 9/13/13 Analyst: ALR							
Aluminum	0.0126		0.0040	0.0100	mg/L	1	9/14/2013 00:03
Arsenic	0.00535		0.0010	0.00500	mg/L	1	9/14/2013 00:03
Barium	0.00928		0.00090	0.00500	mg/L	1	9/14/2013 00:03
Boron	0.304		0.020	0.0500	mg/L	1	9/14/2013 00:03
Cadmium	U		0.00080	0.00200	mg/L	1	9/14/2013 00:03
Calcium	588		0.86	5.00	mg/L	10	9/17/2013 13:39
Chromium	U		0.0010	0.00500	mg/L	1	9/14/2013 00:03
Cobalt	U		0.00080	0.00500	mg/L	1	9/14/2013 00:03
Copper	U		0.0010	0.00500	mg/L	1	9/14/2013 00:03
Iron	U		0.078	0.200	mg/L	1	9/14/2013 00:03
Lead	U		0.00070	0.00500	mg/L	1	9/14/2013 00:03
Manganese	0.00478	J	0.0025	0.00500	mg/L	1	9/14/2013 00:03
Molybdenum	0.00304	J	0.0015	0.00500	mg/L	1	9/14/2013 00:03
Nickel	0.00115	J	0.0010	0.00500	mg/L	1	9/14/2013 00:03
Potassium	1.21		0.084	0.200	mg/L	1	9/14/2013 00:03
Selenium	0.00493	J	0.0010	0.00500	mg/L	1	9/14/2013 00:03
Silver	U		0.00080	0.00500	mg/L	1	9/14/2013 00:03
Sodium	235		0.85	2.00	mg/L	10	9/17/2013 13:39
Uranium	0.0400		0.0050	0.00500	mg/L	1	9/14/2013 00:03
Zinc	U		0.0025	0.00500	mg/L	1	9/14/2013 00:03
LOW-LEVEL SEMIVOLATILES Method: SW8270 Prep: SW3510 / 9/10/13 Analyst: LG							
1-Methylnaphthalene	U		0.000030	0.00020	mg/L	1	9/10/2013 23:28
2-Methylnaphthalene	U		0.000034	0.00020	mg/L	1	9/10/2013 23:28
Benzo(a)pyrene	U		0.000030	0.00020	mg/L	1	9/10/2013 23:28
Naphthalene	U		0.000050	0.00020	mg/L	1	9/10/2013 23:28
Surr: 2,4,6-Tribromophenol	35.3			34-129	%REC	1	9/10/2013 23:28
Surr: 2-Fluorobiphenyl	47.6			40-125	%REC	1	9/10/2013 23:28

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-116
Collection Date: 9/4/2013 03:20 PM

Work Order: 1309249
Lab ID: 1309249-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	38.3			20-120	%REC	1	9/10/2013 23:28
Surr: 4-Terphenyl-d14	58.1			40-135	%REC	1	9/10/2013 23:28
Surr: Nitrobenzene-d5	49.8			41-120	%REC	1	9/10/2013 23:28
Surr: Phenol-d6	39.8			20-120	%REC	1	9/10/2013 23:28

LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 06:21
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 06:21
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 06:21
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 06:21
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 06:21
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 06:21
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 06:21
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 06:21
Surr: 1,2-Dichloroethane-d4	106			71-125	%REC	1	9/10/2013 06:21
Surr: 4-Bromofluorobenzene	91.4			70-125	%REC	1	9/10/2013 06:21
Surr: Dibromofluoromethane	107			74-125	%REC	1	9/10/2013 06:21
Surr: Toluene-d8	108			75-125	%REC	1	9/10/2013 06:21

MISCELLANEOUS ANALYSIS			Method: NA			Analyst: SUB	
Miscellaneous Analysis	See Attached		0			1	9/25/2013

ANIONS - EPA 300.0 (1993)			Method: E300			Analyst: JKP	
Chloride	344		10	25.0	mg/L	50	9/16/2013 13:05
Fluoride	1.17		0.050	0.100	mg/L	1	9/16/2013 08:01
Nitrogen, Nitrate (As N)	0.418	H	0.030	0.100	mg/L	1	9/16/2013 08:01
Nitrogen, Nitrite (As N)	U	H	0.030	0.100	mg/L	1	9/16/2013 08:01
Sulfate	2,180		10	25.0	mg/L	50	9/16/2013 13:05
Nitrate/Nitrite (as N)	0.418	H	0.030	0.200	mg/L	1	9/16/2013 08:01

CYANIDE - SM4500CN E			Method: M4500CN E&G			Analyst: EDG	
Cyanide	U		0.0050	0.0200	mg/L	1	9/13/2013 10:15

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-116
Collection Date: 9/4/2013 03:20 PM

Work Order: 1309249
Lab ID: 1309249-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PH - SM4500H+ B	Method: SM4500H+ B						Analyst: KL
pH	7.20	H	0.10	0.100	pH Units	1	9/8/2013 11:21
Temp Deg C @pH	23.5	H	0		°C	1	9/8/2013 11:21
TOTAL DISSOLVED SOLIDS	Method: M2540C						Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	4,440		5.0	10.0	mg/L	1	9/11/2013 18:55

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-117
Collection Date: 9/4/2013 09:50 AM

Work Order: 1309249
Lab ID: 1309249-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO 8015C Method: SW8015M Prep: SW3511 / 9/10/13 Analyst: RPM							
TPH (Diesel Range)	U		0.020	0.051	mg/L	1	9/11/2013 11:32
TPH (Oil Range)	U		0.041	0.10	mg/L	1	9/11/2013 11:32
Surr: 2-Fluorobiphenyl	62.7			60-135	%REC	1	9/11/2013 11:32
GASOLINE RANGE ORGANICS - SW8015C Method: SW8015 Analyst: KKP							
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	9/12/2013 18:13
Surr: 4-Bromofluorobenzene	100			70-130	%REC	1	9/12/2013 18:13
DISSOLVED MERCURY BY 7470A Method: SW7470 Prep: SW7470 / 9/13/13 Analyst: OFO							
Mercury	U		0.000042	0.000200	mg/L	1	9/13/2013 16:54
DISSOLVED METALS Method: SW6020 Prep: SW3010A / 9/13/13 Analyst: ALR							
Aluminum	0.0169		0.0040	0.0100	mg/L	1	9/14/2013 00:08
Arsenic	0.00559		0.0010	0.00500	mg/L	1	9/14/2013 00:08
Barium	0.0108		0.00090	0.00500	mg/L	1	9/14/2013 00:08
Boron	0.202		0.020	0.0500	mg/L	1	9/14/2013 00:08
Cadmium	U		0.00080	0.00200	mg/L	1	9/14/2013 00:08
Calcium	550		0.86	5.00	mg/L	10	9/17/2013 13:41
Chromium	U		0.0010	0.00500	mg/L	1	9/14/2013 00:08
Cobalt	U		0.00080	0.00500	mg/L	1	9/14/2013 00:08
Copper	U		0.0010	0.00500	mg/L	1	9/14/2013 00:08
Iron	U		0.078	0.200	mg/L	1	9/14/2013 00:08
Lead	U		0.00070	0.00500	mg/L	1	9/14/2013 00:08
Manganese	0.00502		0.0025	0.00500	mg/L	1	9/14/2013 00:08
Molybdenum	0.0140		0.0015	0.00500	mg/L	1	9/14/2013 00:08
Nickel	0.00189	J	0.0010	0.00500	mg/L	1	9/14/2013 00:08
Potassium	8.92		0.084	0.200	mg/L	1	9/14/2013 00:08
Selenium	0.00316	J	0.0010	0.00500	mg/L	1	9/14/2013 00:08
Silver	U		0.00080	0.00500	mg/L	1	9/14/2013 00:08
Sodium	118		0.085	0.200	mg/L	1	9/14/2013 00:08
Uranium	0.0224		0.0050	0.00500	mg/L	1	9/14/2013 00:08
Zinc	0.00266	J	0.0025	0.00500	mg/L	1	9/14/2013 00:08
LOW-LEVEL SEMIVOLATILES Method: SW8270 Prep: SW3510 / 9/10/13 Analyst: LG							
1-Methylnaphthalene	U		0.000030	0.00020	mg/L	1	9/13/2013 12:36
2-Methylnaphthalene	U		0.000034	0.00020	mg/L	1	9/13/2013 12:36
Benzo(a)pyrene	U		0.000030	0.00020	mg/L	1	9/13/2013 12:36
Naphthalene	U		0.000050	0.00020	mg/L	1	9/13/2013 12:36
Surr: 2,4,6-Tribromophenol	40.4			34-129	%REC	1	9/13/2013 12:36
Surr: 2-Fluorobiphenyl	42.4			40-125	%REC	1	9/13/2013 12:36

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-117
Collection Date: 9/4/2013 09:50 AM

Work Order: 1309249
Lab ID: 1309249-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	40.1			20-120	%REC	1	9/13/2013 12:36
Surr: 4-Terphenyl-d14	65.4			40-135	%REC	1	9/13/2013 12:36
Surr: Nitrobenzene-d5	52.3			41-120	%REC	1	9/13/2013 12:36
Surr: Phenol-d6	46.3			20-120	%REC	1	9/13/2013 12:36

LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 06:46
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 06:46
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 06:46
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 06:46
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 06:46
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 06:46
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 06:46
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 06:46
Surr: 1,2-Dichloroethane-d4	105			71-125	%REC	1	9/10/2013 06:46
Surr: 4-Bromofluorobenzene	88.1			70-125	%REC	1	9/10/2013 06:46
Surr: Dibromofluoromethane	106			74-125	%REC	1	9/10/2013 06:46
Surr: Toluene-d8	106			75-125	%REC	1	9/10/2013 06:46

MISCELLANEOUS ANALYSIS			Method: NA			Analyst: SUB	
Miscellaneous Analysis	See Attached		0			1	9/25/2013

ANIONS - EPA 300.0 (1993)			Method: E300			Analyst: JKP	
Chloride	71.0		0.20	0.500	mg/L	1	9/16/2013 08:27
Fluoride	2.80		0.050	0.100	mg/L	1	9/16/2013 08:27
Nitrogen, Nitrate (As N)	U	H	0.030	0.100	mg/L	1	9/16/2013 08:27
Nitrogen, Nitrite (As N)	U	H	0.030	0.100	mg/L	1	9/16/2013 08:27
Sulfate	2,020		10	25.0	mg/L	50	9/16/2013 14:20
Nitrate/Nitrite (as N)	U	H	0.030	0.200	mg/L	1	9/16/2013 08:27

CYANIDE - SM4500CN E			Method: M4500CN E&G			Analyst: EDG	
Cyanide	U		0.0050	0.0200	mg/L	1	9/13/2013 10:15

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-117
Collection Date: 9/4/2013 09:50 AM

Work Order: 1309249
Lab ID: 1309249-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PH - SM4500H+ B	Method: SM4500H+ B						Analyst: KL
pH	7.10	H	0.10	0.100	pH Units	1	9/8/2013 11:24
Temp Deg C @pH	23.5	H	0		°C	1	9/8/2013 11:24
TOTAL DISSOLVED SOLIDS	Method: M2540C						Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	3,970		5.0	10.0	mg/L	1	9/9/2013 11:00

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-118
Collection Date: 9/4/2013 12:00 PM

Work Order: 1309249
Lab ID: 1309249-05
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO 8015C		Method: SW8015M		Prep: SW3511 / 9/10/13		Analyst: RPM	
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	9/11/2013 11:59
TPH (Oil Range)	U		0.041	0.10	mg/L	1	9/11/2013 11:59
Surr: 2-Fluorobiphenyl	60.7			60-135	%REC	1	9/11/2013 11:59
GASOLINE RANGE ORGANICS - SW8015C		Method: SW8015		Prep: SW7470 / 9/13/13		Analyst: KKP	
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	9/12/2013 18:31
Surr: 4-Bromofluorobenzene	100			70-130	%REC	1	9/12/2013 18:31
DISSOLVED MERCURY BY 7470A		Method: SW7470		Prep: SW3010A / 9/13/13		Analyst: OFO	
Mercury	U		0.000042	0.000200	mg/L	1	9/13/2013 16:56
DISSOLVED METALS		Method: SW6020		Prep: SW3010A / 9/13/13		Analyst: ALR	
Aluminum	0.00992	J	0.0040	0.0100	mg/L	1	9/14/2013 00:13
Arsenic	0.0156		0.0010	0.00500	mg/L	1	9/14/2013 00:13
Barium	0.00990		0.00090	0.00500	mg/L	1	9/14/2013 00:13
Boron	0.307		0.020	0.0500	mg/L	1	9/14/2013 00:13
Cadmium	U		0.00080	0.00200	mg/L	1	9/14/2013 00:13
Calcium	543		0.86	5.00	mg/L	10	9/17/2013 13:43
Chromium	U		0.0010	0.00500	mg/L	1	9/14/2013 00:13
Cobalt	U		0.00080	0.00500	mg/L	1	9/14/2013 00:13
Copper	U		0.0010	0.00500	mg/L	1	9/14/2013 00:13
Iron	U		0.078	0.200	mg/L	1	9/14/2013 00:13
Lead	U		0.00070	0.00500	mg/L	1	9/14/2013 00:13
Manganese	U		0.0025	0.00500	mg/L	1	9/14/2013 00:13
Molybdenum	0.0162		0.0015	0.00500	mg/L	1	9/14/2013 00:13
Nickel	0.00131	J	0.0010	0.00500	mg/L	1	9/14/2013 00:13
Potassium	7.69		0.084	0.200	mg/L	1	9/14/2013 00:13
Selenium	0.0129		0.0010	0.00500	mg/L	1	9/14/2013 00:13
Silver	U		0.00080	0.00500	mg/L	1	9/14/2013 00:13
Sodium	215		0.85	2.00	mg/L	10	9/17/2013 13:43
Uranium	0.0395		0.0050	0.00500	mg/L	1	9/14/2013 00:13
Zinc	U		0.0025	0.00500	mg/L	1	9/14/2013 00:13
LOW-LEVEL SEMIVOLATILES		Method: SW8270		Prep: SW3510 / 9/10/13		Analyst: LG	
1-Methylnaphthalene	U		0.000030	0.00020	mg/L	1	9/13/2013 12:56
2-Methylnaphthalene	U		0.000034	0.00020	mg/L	1	9/13/2013 12:56
Benzo(a)pyrene	U		0.000030	0.00020	mg/L	1	9/13/2013 12:56
Naphthalene	U		0.000050	0.00020	mg/L	1	9/13/2013 12:56
Surr: 2,4,6-Tribromophenol	55.5			34-129	%REC	1	9/13/2013 12:56
Surr: 2-Fluorobiphenyl	57.3			40-125	%REC	1	9/13/2013 12:56

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-118
Collection Date: 9/4/2013 12:00 PM

Work Order: 1309249
Lab ID: 1309249-05
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	57.6			20-120	%REC	1	9/13/2013 12:56
Surr: 4-Terphenyl-d14	78.1			40-135	%REC	1	9/13/2013 12:56
Surr: Nitrobenzene-d5	67.8			41-120	%REC	1	9/13/2013 12:56
Surr: Phenol-d6	61.9			20-120	%REC	1	9/13/2013 12:56

LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 07:11
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 07:11
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 07:11
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 07:11
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 07:11
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 07:11
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 07:11
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 07:11
Surr: 1,2-Dichloroethane-d4	106			71-125	%REC	1	9/10/2013 07:11
Surr: 4-Bromofluorobenzene	90.3			70-125	%REC	1	9/10/2013 07:11
Surr: Dibromofluoromethane	105			74-125	%REC	1	9/10/2013 07:11
Surr: Toluene-d8	109			75-125	%REC	1	9/10/2013 07:11

MISCELLANEOUS ANALYSIS			Method: NA			Analyst: SUB	
Miscellaneous Analysis	See Attached		0			1	9/25/2013

ANIONS - EPA 300.0 (1993)			Method: E300			Analyst: JKP	
Chloride	132		10	25.0	mg/L	50	9/16/2013 14:45
Fluoride	4.48		0.050	0.100	mg/L	1	9/16/2013 08:53
Nitrogen, Nitrate (As N)	0.325	H	0.030	0.100	mg/L	1	9/16/2013 08:53
Nitrogen, Nitrite (As N)	U	H	0.030	0.100	mg/L	1	9/16/2013 08:53
Sulfate	2,310		10	25.0	mg/L	50	9/16/2013 14:45
Nitrate/Nitrite (as N)	0.325	H	0.030	0.200	mg/L	1	9/16/2013 08:53

CYANIDE - SM4500CN E			Method: M4500CN E&G			Analyst: EDG	
Cyanide	U		0.0050	0.0200	mg/L	1	9/13/2013 10:15

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-118
Collection Date: 9/4/2013 12:00 PM

Work Order: 1309249
Lab ID: 1309249-05
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PH - SM4500H+ B	Method: SM4500H+ B						Analyst: KL
pH	7.10	H	0.10	0.100	pH Units	1	9/8/2013 11:27
Temp Deg C @pH	23.5	H	0		°C	1	9/8/2013 11:27
TOTAL DISSOLVED SOLIDS	Method: M2540C						Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	4,550		5.0	10.0	mg/L	1	9/9/2013 11:00

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-119
Collection Date: 9/4/2013 01:30 PM

Work Order: 1309249
Lab ID: 1309249-06
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO 8015C		Method: SW8015M		Prep: SW3511 / 9/10/13		Analyst: RPM	
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	9/11/2013 12:25
TPH (Oil Range)	U		0.042	0.10	mg/L	1	9/11/2013 12:25
Surr: 2-Fluorobiphenyl	63.6			60-135	%REC	1	9/11/2013 12:25
GASOLINE RANGE ORGANICS - SW8015C		Method: SW8015		Prep: SW7470 / 9/13/13		Analyst: KKP	
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	9/12/2013 18:50
Surr: 4-Bromofluorobenzene	98.3			70-130	%REC	1	9/12/2013 18:50
DISSOLVED MERCURY BY 7470A		Method: SW7470		Prep: SW3010A / 9/13/13		Analyst: OFO	
Mercury	U		0.000042	0.000200	mg/L	1	9/13/2013 16:58
DISSOLVED METALS		Method: SW6020		Prep: SW3010A / 9/13/13		Analyst: ALR	
Aluminum	0.0113		0.0040	0.0100	mg/L	1	9/14/2013 00:18
Arsenic	0.00595		0.0010	0.00500	mg/L	1	9/14/2013 00:18
Barium	0.00864		0.00090	0.00500	mg/L	1	9/14/2013 00:18
Boron	0.183		0.020	0.0500	mg/L	1	9/14/2013 00:18
Cadmium	U		0.00080	0.00200	mg/L	1	9/14/2013 00:18
Calcium	635		0.86	5.00	mg/L	10	9/17/2013 13:46
Chromium	U		0.0010	0.00500	mg/L	1	9/14/2013 00:18
Cobalt	U		0.00080	0.00500	mg/L	1	9/14/2013 00:18
Copper	U		0.0010	0.00500	mg/L	1	9/14/2013 00:18
Iron	U		0.078	0.200	mg/L	1	9/14/2013 00:18
Lead	U		0.00070	0.00500	mg/L	1	9/14/2013 00:18
Manganese	U		0.0025	0.00500	mg/L	1	9/14/2013 00:18
Molybdenum	0.00846		0.0015	0.00500	mg/L	1	9/14/2013 00:18
Nickel	0.00140	J	0.0010	0.00500	mg/L	1	9/14/2013 00:18
Potassium	0.993		0.084	0.200	mg/L	1	9/14/2013 00:18
Selenium	0.00660		0.0010	0.00500	mg/L	1	9/14/2013 00:18
Silver	U		0.00080	0.00500	mg/L	1	9/14/2013 00:18
Sodium	133		0.085	0.200	mg/L	1	9/14/2013 00:18
Uranium	0.0275		0.0050	0.00500	mg/L	1	9/14/2013 00:18
Zinc	U		0.0025	0.00500	mg/L	1	9/14/2013 00:18
LOW-LEVEL SEMIVOLATILES		Method: SW8270		Prep: SW3510 / 9/10/13		Analyst: LG	
1-Methylnaphthalene	U		0.000030	0.00020	mg/L	1	9/12/2013 22:40
2-Methylnaphthalene	U		0.000034	0.00020	mg/L	1	9/12/2013 22:40
Benzo(a)pyrene	U		0.000030	0.00020	mg/L	1	9/12/2013 22:40
Naphthalene	U		0.000050	0.00020	mg/L	1	9/12/2013 22:40
Surr: 2,4,6-Tribromophenol	55.3			34-129	%REC	1	9/12/2013 22:40
Surr: 2-Fluorobiphenyl	58.9			40-125	%REC	1	9/12/2013 22:40

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-119
Collection Date: 9/4/2013 01:30 PM

Work Order: 1309249
Lab ID: 1309249-06
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	47.0			20-120	%REC	1	9/12/2013 22:40
Surr: 4-Terphenyl-d14	80.5			40-135	%REC	1	9/12/2013 22:40
Surr: Nitrobenzene-d5	58.6			41-120	%REC	1	9/12/2013 22:40
Surr: Phenol-d6	56.5			20-120	%REC	1	9/12/2013 22:40

LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 07:36
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 07:36
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 07:36
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 07:36
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 07:36
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 07:36
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 07:36
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 07:36
Surr: 1,2-Dichloroethane-d4	110			71-125	%REC	1	9/10/2013 07:36
Surr: 4-Bromofluorobenzene	91.9			70-125	%REC	1	9/10/2013 07:36
Surr: Dibromofluoromethane	108			74-125	%REC	1	9/10/2013 07:36
Surr: Toluene-d8	110			75-125	%REC	1	9/10/2013 07:36

MISCELLANEOUS ANALYSIS			Method: NA			Analyst: SUB	
Miscellaneous Analysis	See Attached		0			1	9/25/2013

ANIONS - EPA 300.0 (1993)			Method: E300			Analyst: JKP	
Chloride	244		10	25.0	mg/L	50	9/16/2013 15:11
Fluoride	2.28		0.050	0.100	mg/L	1	9/16/2013 10:46
Nitrogen, Nitrate (As N)	0.228	H	0.030	0.100	mg/L	1	9/16/2013 10:46
Nitrogen, Nitrite (As N)	U	H	0.030	0.100	mg/L	1	9/16/2013 10:46
Sulfate	1,940		10	25.0	mg/L	50	9/16/2013 15:11
Nitrate/Nitrite (as N)	0.228	H	0.030	0.200	mg/L	1	9/16/2013 10:46

CYANIDE - SM4500CN E			Method: M4500CN E&G			Analyst: EDG	
Cyanide	U		0.0050	0.0200	mg/L	1	9/13/2013 10:15

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: MW-119
Collection Date: 9/4/2013 01:30 PM

Work Order: 1309249
Lab ID: 1309249-06
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PH - SM4500H+ B	Method: SM4500H+ B						Analyst: KL
pH	7.30	H	0.10	0.100	pH Units	1	9/8/2013 11:30
Temp Deg C @pH	23.5	H	0		°C	1	9/8/2013 11:30
TOTAL DISSOLVED SOLIDS	Method: M2540C						Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	4,030		5.0	10.0	mg/L	1	9/9/2013 11:00

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: RO DISCHARGE
Collection Date: 9/5/2013 11:00 AM

Work Order: 1309249
Lab ID: 1309249-07
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO 8015C Method: SW8015M Prep: SW3511 / 9/10/13 Analyst: RPM							
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	9/11/2013 12:52
TPH (Oil Range)	U		0.042	0.10	mg/L	1	9/11/2013 12:52
Surr: 2-Fluorobiphenyl	64.4			60-135	%REC	1	9/11/2013 12:52
GASOLINE RANGE ORGANICS - SW8015C Method: SW8015 Analyst: KKP							
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	9/12/2013 19:26
Surr: 4-Bromofluorobenzene	98.2			70-130	%REC	1	9/12/2013 19:26
DISSOLVED MERCURY BY 7470A Method: SW7470 Prep: SW7470 / 9/13/13 Analyst: OFO							
Mercury	U		0.000042	0.000200	mg/L	1	9/13/2013 16:59
DISSOLVED METALS Method: SW6020 Prep: SW3010A / 9/13/13 Analyst: ALR							
Aluminum	0.00809	J	0.0040	0.0100	mg/L	1	9/14/2013 00:23
Arsenic	0.00244	J	0.0010	0.00500	mg/L	1	9/14/2013 00:23
Barium	0.0553		0.00090	0.00500	mg/L	1	9/14/2013 00:23
Boron	0.0934		0.020	0.0500	mg/L	1	9/14/2013 00:23
Cadmium	U		0.00080	0.00200	mg/L	1	9/14/2013 00:23
Calcium	410		0.86	5.00	mg/L	10	9/17/2013 13:53
Chromium	0.00114	J	0.0010	0.00500	mg/L	1	9/14/2013 00:23
Cobalt	U		0.00080	0.00500	mg/L	1	9/14/2013 00:23
Copper	U		0.0010	0.00500	mg/L	1	9/14/2013 00:23
Iron	U		0.078	0.200	mg/L	1	9/14/2013 00:23
Lead	U		0.00070	0.00500	mg/L	1	9/14/2013 00:23
Manganese	U		0.0025	0.00500	mg/L	1	9/14/2013 00:23
Molybdenum	0.00604		0.0015	0.00500	mg/L	1	9/14/2013 00:23
Nickel	0.00329	J	0.0010	0.00500	mg/L	1	9/14/2013 00:23
Potassium	2.72		0.084	0.200	mg/L	1	9/14/2013 00:23
Selenium	0.00669		0.0010	0.00500	mg/L	1	9/14/2013 00:23
Silver	U		0.00080	0.00500	mg/L	1	9/14/2013 00:23
Sodium	45.7		0.085	0.200	mg/L	1	9/14/2013 00:23
Uranium	U		0.0050	0.00500	mg/L	1	9/14/2013 00:23
Zinc	0.00672		0.0025	0.00500	mg/L	1	9/14/2013 00:23
LOW-LEVEL SEMIVOLATILES Method: SW8270 Prep: SW3510 / 9/10/13 Analyst: LG							
1-Methylnaphthalene	U		0.000030	0.00020	mg/L	1	9/13/2013 13:36
2-Methylnaphthalene	U		0.000034	0.00020	mg/L	1	9/13/2013 13:36
Benzo(a)pyrene	U		0.000030	0.00020	mg/L	1	9/13/2013 13:36
Naphthalene	U		0.000050	0.00020	mg/L	1	9/13/2013 13:36
Surr: 2,4,6-Tribromophenol	72.0			34-129	%REC	1	9/13/2013 13:36
Surr: 2-Fluorobiphenyl	65.0			40-125	%REC	1	9/13/2013 13:36

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: RO DISCHARGE
Collection Date: 9/5/2013 11:00 AM

Work Order: 1309249
Lab ID: 1309249-07
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	68.2			20-120	%REC	1	9/13/2013 13:36
Surr: 4-Terphenyl-d14	85.3			40-135	%REC	1	9/13/2013 13:36
Surr: Nitrobenzene-d5	81.7			41-120	%REC	1	9/13/2013 13:36
Surr: Phenol-d6	72.8			20-120	%REC	1	9/13/2013 13:36

LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 08:01
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 08:01
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 08:01
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 08:01
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 08:01
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 08:01
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 08:01
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 08:01
Surr: 1,2-Dichloroethane-d4	111			71-125	%REC	1	9/10/2013 08:01
Surr: 4-Bromofluorobenzene	90.5			70-125	%REC	1	9/10/2013 08:01
Surr: Dibromofluoromethane	110			74-125	%REC	1	9/10/2013 08:01
Surr: Toluene-d8	111			75-125	%REC	1	9/10/2013 08:01

MISCELLANEOUS ANALYSIS			Method: NA			Analyst: SUB	
Miscellaneous Analysis	See Attached		0			1	9/25/2013

ANIONS - EPA 300.0 (1993)			Method: E300			Analyst: JKP	
Chloride	61.1		0.20	0.500	mg/L	1	9/16/2013 11:12
Fluoride	2.26		0.050	0.100	mg/L	1	9/16/2013 11:12
Nitrogen, Nitrate (As N)	1.56	H	0.030	0.100	mg/L	1	9/16/2013 11:12
Nitrogen, Nitrite (As N)	U	H	0.030	0.100	mg/L	1	9/16/2013 11:12
Sulfate	1,030		10	25.0	mg/L	50	9/16/2013 15:37
Nitrate/Nitrite (as N)	1.56	H	0.030	0.200	mg/L	1	9/16/2013 11:12

CYANIDE - SM4500CN E			Method: M4500CN E&G			Analyst: EDG	
Cyanide	U		0.0050	0.0200	mg/L	1	9/13/2013 10:15

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: RO DISCHARGE
Collection Date: 9/5/2013 11:00 AM

Work Order: 1309249
Lab ID: 1309249-07
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PH - SM4500H+ B	Method: SM4500H+ B						Analyst: KL
pH	7.82	H	0.10	0.100	pH Units	1	9/8/2013 11:33
Temp Deg C @pH	23.6	H	0		°C	1	9/8/2013 11:33
TOTAL DISSOLVED SOLIDS	Method: M2540C						Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	2,290		5.0	10.0	mg/L	1	9/11/2013 18:55

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: DUP-01
Collection Date: 9/4/2013

Work Order: 1309249
Lab ID: 1309249-08
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
TPH DRO/ORO 8015C Method: SW8015M Prep: SW3511 / 9/10/13 Analyst: RPM							
TPH (Diesel Range)	U		0.021	0.052	mg/L	1	9/11/2013 13:18
TPH (Oil Range)	U		0.041	0.10	mg/L	1	9/11/2013 13:18
Surr: 2-Fluorobiphenyl	63.4			60-135	%REC	1	9/11/2013 13:18
GASOLINE RANGE ORGANICS - SW8015C Method: SW8015 Analyst: KKP							
Gasoline Range Organics	U		0.020	0.0500	mg/L	1	9/12/2013 19:44
Surr: 4-Bromofluorobenzene	97.1			70-130	%REC	1	9/12/2013 19:44
DISSOLVED MERCURY BY 7470A Method: SW7470 Prep: SW7470 / 9/13/13 Analyst: OFO							
Mercury	0.0000600	J	0.000042	0.000200	mg/L	1	9/13/2013 17:01
DISSOLVED METALS Method: SW6020 Prep: SW3010A / 9/13/13 Analyst: ALR							
Aluminum	0.0118		0.0040	0.0100	mg/L	1	9/14/2013 00:28
Arsenic	0.00467	J	0.0010	0.00500	mg/L	1	9/14/2013 00:28
Barium	0.00946		0.00090	0.00500	mg/L	1	9/14/2013 00:28
Boron	0.281		0.020	0.0500	mg/L	1	9/14/2013 00:28
Cadmium	U		0.00080	0.00200	mg/L	1	9/14/2013 00:28
Calcium	631		0.86	5.00	mg/L	10	9/17/2013 13:55
Chromium	U		0.0010	0.00500	mg/L	1	9/14/2013 00:28
Cobalt	U		0.00080	0.00500	mg/L	1	9/14/2013 00:28
Copper	U		0.0010	0.00500	mg/L	1	9/14/2013 00:28
Iron	U		0.078	0.200	mg/L	1	9/14/2013 00:28
Lead	U		0.00070	0.00500	mg/L	1	9/14/2013 00:28
Manganese	0.00366	J	0.0025	0.00500	mg/L	1	9/14/2013 00:28
Molybdenum	0.00300	J	0.0015	0.00500	mg/L	1	9/14/2013 00:28
Nickel	0.00112	J	0.0010	0.00500	mg/L	1	9/14/2013 00:28
Potassium	1.22		0.084	0.200	mg/L	1	9/14/2013 00:28
Selenium	0.00558		0.0010	0.00500	mg/L	1	9/14/2013 00:28
Silver	U		0.00080	0.00500	mg/L	1	9/14/2013 00:28
Sodium	230		0.85	2.00	mg/L	10	9/17/2013 13:55
Uranium	0.0388		0.0050	0.00500	mg/L	1	9/14/2013 00:28
Zinc	U		0.0025	0.00500	mg/L	1	9/14/2013 00:28
LOW-LEVEL SEMIVOLATILES Method: SW8270 Prep: SW3510 / 9/10/13 Analyst: LG							
1-Methylnaphthalene	U		0.000030	0.00020	mg/L	1	9/13/2013 13:55
2-Methylnaphthalene	U		0.000034	0.00020	mg/L	1	9/13/2013 13:55
Benzo(a)pyrene	U		0.000030	0.00020	mg/L	1	9/13/2013 13:55
Naphthalene	U		0.000050	0.00020	mg/L	1	9/13/2013 13:55
Surr: 2,4,6-Tribromophenol	36.2			34-129	%REC	1	9/13/2013 13:55
Surr: 2-Fluorobiphenyl	43.5			40-125	%REC	1	9/13/2013 13:55

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: DUP-01
Collection Date: 9/4/2013

Work Order: 1309249
Lab ID: 1309249-08
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 2-Fluorophenol	38.5			20-120	%REC	1	9/13/2013 13:55
Surr: 4-Terphenyl-d14	64.0			40-135	%REC	1	9/13/2013 13:55
Surr: Nitrobenzene-d5	54.3			41-120	%REC	1	9/13/2013 13:55
Surr: Phenol-d6	45.4			20-120	%REC	1	9/13/2013 13:55

LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 08:26
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 08:26
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 08:26
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 08:26
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 08:26
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 08:26
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 08:26
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 08:26
Surr: 1,2-Dichloroethane-d4	107			71-125	%REC	1	9/10/2013 08:26
Surr: 4-Bromofluorobenzene	90.2			70-125	%REC	1	9/10/2013 08:26
Surr: Dibromofluoromethane	109			74-125	%REC	1	9/10/2013 08:26
Surr: Toluene-d8	111			75-125	%REC	1	9/10/2013 08:26

MISCELLANEOUS ANALYSIS			Method: NA			Analyst: SUB	
Miscellaneous Analysis	See Attached		0			1	9/25/2013

ANIONS - EPA 300.0 (1993)			Method: E300			Analyst: JKP	
Chloride	339		10	25.0	mg/L	50	9/16/2013 16:10
Fluoride	1.11		0.050	0.100	mg/L	1	9/16/2013 11:38
Nitrogen, Nitrate (As N)	0.450	H	0.030	0.100	mg/L	1	9/16/2013 11:38
Nitrogen, Nitrite (As N)	U	H	0.030	0.100	mg/L	1	9/16/2013 11:38
Sulfate	2,140		10	25.0	mg/L	50	9/16/2013 16:10
Nitrate/Nitrite (as N)	0.450	H	0.030	0.200	mg/L	1	9/16/2013 11:38

CYANIDE - SM4500CN E			Method: M4500CN E&G			Analyst: EDG	
Cyanide	U		0.0050	0.0200	mg/L	1	9/13/2013 10:15

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: DUP-01
Collection Date: 9/4/2013

Work Order: 1309249
Lab ID: 1309249-08
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PH - SM4500H+ B	Method: SM4500H+ B						Analyst: KL
pH	7.19	H	0.10	0.100	pH Units	1	9/8/2013 11:36
Temp Deg C @pH	23.6	H	0		°C	1	9/8/2013 11:36
TOTAL DISSOLVED SOLIDS	Method: M2540C						Analyst: KAH
Total Dissolved Solids (Residue, Filterable)	4,470		5.0	10.0	mg/L	1	9/9/2013 11:00

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: TRIP BLANKS-1
Collection Date: 9/4/2013

Work Order: 1309249
Lab ID: 1309249-09
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 03:01
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 03:01
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 03:01
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 03:01
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 03:01
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 03:01
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 03:01
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 03:01
Surr: 1,2-Dichloroethane-d4	106			71-125	%REC	1	9/10/2013 03:01
Surr: 4-Bromofluorobenzene	90.1			70-125	%REC	1	9/10/2013 03:01
Surr: Dibromofluoromethane	107			74-125	%REC	1	9/10/2013 03:01
Surr: Toluene-d8	107			75-125	%REC	1	9/10/2013 03:01

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: TRIP BLANKS-2
Collection Date: 9/4/2013

Work Order: 1309249
Lab ID: 1309249-10
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 03:26
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 03:26
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 03:26
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 03:26
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 03:26
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 03:26
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 03:26
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 03:26
Surr: 1,2-Dichloroethane-d4	106			71-125	%REC	1	9/10/2013 03:26
Surr: 4-Bromofluorobenzene	89.7			70-125	%REC	1	9/10/2013 03:26
Surr: Dibromofluoromethane	107			74-125	%REC	1	9/10/2013 03:26
Surr: Toluene-d8	108			75-125	%REC	1	9/10/2013 03:26

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: TRIP BLANKS-3
Collection Date: 9/4/2013

Work Order: 1309249
Lab ID: 1309249-11
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 03:51
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 03:51
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 03:51
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 03:51
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 03:51
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 03:51
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 03:51
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 03:51
Surr: 1,2-Dichloroethane-d4	110			71-125	%REC	1	9/10/2013 03:51
Surr: 4-Bromofluorobenzene	92.5			70-125	%REC	1	9/10/2013 03:51
Surr: Dibromofluoromethane	111			74-125	%REC	1	9/10/2013 03:51
Surr: Toluene-d8	114			75-125	%REC	1	9/10/2013 03:51

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

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Project: RO Discharge Sampling
Sample ID: TRIP BLANKS
Collection Date: 9/4/2013

Work Order: 1309249
Lab ID: 1309249-12
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
LOW LEVEL VOLATILES - SW8260C			Method: SW8260			Analyst: AKP	
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	9/10/2013 04:16
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	9/10/2013 04:16
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
1,2-Dibromoethane	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
Benzene	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	9/10/2013 04:16
Chloroform	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
Ethylbenzene	U		0.00030	0.0010	mg/L	1	9/10/2013 04:16
Methylene chloride	U		0.00040	0.0020	mg/L	1	9/10/2013 04:16
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	9/10/2013 04:16
Toluene	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
Trichloroethene	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
Vinyl chloride	U		0.00020	0.0010	mg/L	1	9/10/2013 04:16
Xylenes, Total	U		0.00050	0.0010	mg/L	1	9/10/2013 04:16
Surr: 1,2-Dichloroethane-d4	105			71-125	%REC	1	9/10/2013 04:16
Surr: 4-Bromofluorobenzene	89.5			70-125	%REC	1	9/10/2013 04:16
Surr: Dibromofluoromethane	106			74-125	%REC	1	9/10/2013 04:16
Surr: Toluene-d8	108			75-125	%REC	1	9/10/2013 04:16

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

Work Order: 1309249
Client: Navajo Refining Company
Project: RO Discharge Sampling

DATES REPORT

Sample ID	Client Sample ID	Matrix	Collection Date	TCLP Date	Prep Date	Analysis Date
<u>Batch ID 72927</u> <u>Test Name:</u> <u>Low-Level Semivolatiles</u>						
1309249-01G	MW-114	Water	9/5/2013 9:30:00 AM		9/10/2013 10:00 AM	9/13/2013 11:57 AM
1309249-02G	MW-115		9/4/2013 5:10:00 PM		9/10/2013 10:00 AM	9/13/2013 12:17 PM
1309249-03G	MW-116		9/4/2013 3:20:00 PM		9/10/2013 10:00 AM	9/10/2013 11:28 PM
1309249-04G	MW-117		9/4/2013 9:50:00 AM		9/10/2013 10:00 AM	9/13/2013 12:36 PM
1309249-05G	MW-118		9/4/2013 12:00:00 PM		9/10/2013 10:00 AM	9/13/2013 12:56 PM
1309249-06G	MW-119		9/4/2013 1:30:00 PM		9/10/2013 10:00 AM	9/12/2013 10:40 PM
1309249-07G	RO DISCHARGE		9/5/2013 11:00:00 AM		9/10/2013 10:00 AM	9/13/2013 01:36 PM
1309249-08G	DUP-01		9/4/2013		9/10/2013 10:00 AM	9/13/2013 01:55 PM
<u>Batch ID 72948</u> <u>Test Name:</u> <u>TPH DRO/ORO 8015C</u>						
1309249-01C	MW-114	Water	9/5/2013 9:30:00 AM		9/10/2013 02:08 PM	9/11/2013 10:12 AM
1309249-02C	MW-115		9/4/2013 5:10:00 PM		9/10/2013 02:08 PM	9/11/2013 10:39 AM
1309249-03C	MW-116		9/4/2013 3:20:00 PM		9/10/2013 02:08 PM	9/11/2013 11:06 AM
1309249-04C	MW-117		9/4/2013 9:50:00 AM		9/10/2013 02:08 PM	9/11/2013 11:32 AM
1309249-05C	MW-118		9/4/2013 12:00:00 PM		9/10/2013 02:08 PM	9/11/2013 11:59 AM
1309249-06C	MW-119		9/4/2013 1:30:00 PM		9/10/2013 02:08 PM	9/11/2013 12:25 PM
1309249-07C	RO DISCHARGE		9/5/2013 11:00:00 AM		9/10/2013 02:08 PM	9/11/2013 12:52 PM
1309249-08C	DUP-01		9/4/2013		9/10/2013 02:08 PM	9/11/2013 01:18 PM

Work Order: 1309249
Client: Navajo Refining Company
Project: RO Discharge Sampling

DATES REPORT

Sample ID	Client Sample ID	Matrix	Collection Date	TCLP Date	Prep Date	Analysis Date
<u>Batch ID</u> 73032	<u>Test Name:</u> Dissolved Mercury by 7470A					
1309249-01E	MW-114	Water	9/5/2013 9:30:00 AM		9/13/2013 11:23 AM	9/13/2013 04:49 PM
1309249-02E	MW-115		9/4/2013 5:10:00 PM		9/13/2013 11:23 AM	9/13/2013 04:51 PM
1309249-03E	MW-116		9/4/2013 3:20:00 PM		9/13/2013 11:23 AM	9/13/2013 04:53 PM
1309249-04E	MW-117		9/4/2013 9:50:00 AM		9/13/2013 11:23 AM	9/13/2013 04:54 PM
1309249-05E	MW-118		9/4/2013 12:00:00 PM		9/13/2013 11:23 AM	9/13/2013 04:56 PM
1309249-06E	MW-119		9/4/2013 1:30:00 PM		9/13/2013 11:23 AM	9/13/2013 04:58 PM
1309249-07E	RO DISCHARGE		9/5/2013 11:00:00 AM		9/13/2013 11:23 AM	9/13/2013 04:59 PM
1309249-08E	DUP-01		9/4/2013		9/13/2013 11:23 AM	9/13/2013 05:01 PM

Work Order: 1309249
Client: Navajo Refining Company
Project: RO Discharge Sampling

DATES REPORT

Sample ID	Client Sample ID	Matrix	Collection Date	TCLP Date	Prep Date	Analysis Date
<u>Batch ID</u> 73040		<u>Test Name:</u> Dissolved Metals				
1309249-01E	MW-114	Water	9/5/2013 9:30:00 AM		9/13/2013 10:00 AM	9/13/2013 11:53 PM
					9/13/2013 10:00 AM	9/17/2013 01:34 PM
1309249-02E	MW-115		9/4/2013 5:10:00 PM		9/13/2013 10:00 AM	9/13/2013 11:58 PM
					9/13/2013 10:00 AM	9/17/2013 01:36 PM
1309249-03E	MW-116		9/4/2013 3:20:00 PM		9/13/2013 10:00 AM	9/14/2013 12:03 AM
					9/13/2013 10:00 AM	9/17/2013 01:39 PM
1309249-04E	MW-117		9/4/2013 9:50:00 AM		9/13/2013 10:00 AM	9/14/2013 12:08 AM
					9/13/2013 10:00 AM	9/17/2013 01:41 PM
1309249-05E	MW-118		9/4/2013 12:00:00 PM		9/13/2013 10:00 AM	9/14/2013 12:13 AM
					9/13/2013 10:00 AM	9/17/2013 01:43 PM
1309249-06E	MW-119		9/4/2013 1:30:00 PM		9/13/2013 10:00 AM	9/14/2013 12:18 AM
					9/13/2013 10:00 AM	9/17/2013 01:46 PM
1309249-07E	RO DISCHARGE		9/5/2013 11:00:00 AM		9/13/2013 10:00 AM	9/14/2013 12:23 AM
					9/13/2013 10:00 AM	9/17/2013 01:53 PM
1309249-08E	DUP-01		9/4/2013		9/13/2013 10:00 AM	9/14/2013 12:28 AM
					9/13/2013 10:00 AM	9/17/2013 01:55 PM

Work Order: 1309249
Client: Navajo Refining Company
Project: RO Discharge Sampling

DATES REPORT

Sample ID	Client Sample ID	Matrix	Collection Date	TCLP Date	Prep Date	Analysis Date
<u>Batch ID R153357</u> <u>Test Name: pH - SM4500H+ B</u>						
1309249-01F	MW-114	Water	9/5/2013 9:30:00 AM			9/8/2013 11:16 AM
1309249-02F	MW-115		9/4/2013 5:10:00 PM			9/8/2013 11:19 AM
1309249-03F	MW-116		9/4/2013 3:20:00 PM			9/8/2013 11:21 AM
1309249-04F	MW-117		9/4/2013 9:50:00 AM			9/8/2013 11:24 AM
1309249-05F	MW-118		9/4/2013 12:00:00 PM			9/8/2013 11:27 AM
1309249-06F	MW-119		9/4/2013 1:30:00 PM			9/8/2013 11:30 AM
1309249-07F	RO DISCHARGE		9/5/2013 11:00:00 AM			9/8/2013 11:33 AM
1309249-08F	DUP-01		9/4/2013			9/8/2013 11:36 AM
<u>Batch ID R153431</u> <u>Test Name: Low Level Volatiles - SW8260C</u>						
1309249-01A	MW-114	Water	9/5/2013 9:30:00 AM			9/9/2013 11:41 PM
1309249-02A	MW-115		9/4/2013 5:10:00 PM			9/10/2013 12:06 AM
<u>Batch ID R153436</u> <u>Test Name: Low Level Volatiles - SW8260C</u>						
1309249-03A	MW-116	Water	9/4/2013 3:20:00 PM			9/10/2013 06:21 AM
1309249-04A	MW-117		9/4/2013 9:50:00 AM			9/10/2013 06:46 AM
1309249-05A	MW-118		9/4/2013 12:00:00 PM			9/10/2013 07:11 AM
1309249-06A	MW-119		9/4/2013 1:30:00 PM			9/10/2013 07:36 AM
1309249-07A	RO DISCHARGE		9/5/2013 11:00:00 AM			9/10/2013 08:01 AM
1309249-08A	DUP-01		9/4/2013			9/10/2013 08:26 AM
1309249-09A	TRIP BLANKS-1					9/10/2013 03:01 AM
1309249-10A	TRIP BLANKS-2					9/10/2013 03:26 AM
1309249-11A	TRIP BLANKS-3					9/10/2013 03:51 AM
1309249-12A	TRIP BLANKS					9/10/2013 04:16 AM

Work Order: 1309249
Client: Navajo Refining Company
Project: RO Discharge Sampling

DATES REPORT

Sample ID	Client Sample ID	Matrix	Collection Date	TCLP Date	Prep Date	Analysis Date
<u>Batch ID R153508</u> <u>Test Name: Total Dissolved Solids</u>						
1309249-04F	MW-117	Water	9/4/2013 9:50:00 AM			9/9/2013 11:00 AM
1309249-05F	MW-118		9/4/2013 12:00:00 PM			9/9/2013 11:00 AM
1309249-06F	MW-119		9/4/2013 1:30:00 PM			9/9/2013 11:00 AM
1309249-08F	DUP-01		9/4/2013			9/9/2013 11:00 AM
<u>Batch ID R153658</u> <u>Test Name: Gasoline Range Organics - SW8015C</u>						
1309249-01B	MW-114	Water	9/5/2013 9:30:00 AM			9/12/2013 05:18 PM
1309249-02B	MW-115		9/4/2013 5:10:00 PM			9/12/2013 05:36 PM
1309249-03B	MW-116		9/4/2013 3:20:00 PM			9/12/2013 05:54 PM
1309249-04B	MW-117		9/4/2013 9:50:00 AM			9/12/2013 06:13 PM
1309249-05B	MW-118		9/4/2013 12:00:00 PM			9/12/2013 06:31 PM
1309249-06B	MW-119		9/4/2013 1:30:00 PM			9/12/2013 06:50 PM
1309249-07B	RO DISCHARGE		9/5/2013 11:00:00 AM			9/12/2013 07:26 PM
1309249-08B	DUP-01		9/4/2013			9/12/2013 07:44 PM
<u>Batch ID R153690</u> <u>Test Name: Cyanide - SM4500CN E</u>						
1309249-01D	MW-114	Water	9/5/2013 9:30:00 AM			9/13/2013 10:15 AM
1309249-02D	MW-115		9/4/2013 5:10:00 PM			9/13/2013 10:15 AM
1309249-03D	MW-116		9/4/2013 3:20:00 PM			9/13/2013 10:15 AM
1309249-04D	MW-117		9/4/2013 9:50:00 AM			9/13/2013 10:15 AM
1309249-05D	MW-118		9/4/2013 12:00:00 PM			9/13/2013 10:15 AM
1309249-06D	MW-119		9/4/2013 1:30:00 PM			9/13/2013 10:15 AM
1309249-07D	RO DISCHARGE		9/5/2013 11:00:00 AM			9/13/2013 10:15 AM
1309249-08D	DUP-01		9/4/2013			9/13/2013 10:15 AM

Work Order: 1309249
Client: Navajo Refining Company
Project: RO Discharge Sampling

DATES REPORT

Sample ID	Client Sample ID	Matrix	Collection Date	TCLP Date	Prep Date	Analysis Date
<u>Batch ID</u> R153693 <u>Test Name:</u> Total Dissolved Solids						
1309249-01F	MW-114	Water	9/5/2013 9:30:00 AM			9/11/2013 06:55 PM
1309249-02F	MW-115		9/4/2013 5:10:00 PM			9/11/2013 06:55 PM
1309249-03F	MW-116		9/4/2013 3:20:00 PM			9/11/2013 06:55 PM
1309249-07F	RO DISCHARGE		9/5/2013 11:00:00 AM			9/11/2013 06:55 PM
<u>Batch ID</u> R153808 <u>Test Name:</u> Anions - EPA 300.0 (1993)						
1309249-01F	MW-114	Water	9/5/2013 9:30:00 AM			9/16/2013 07:09 AM
						9/16/2013 12:13 PM
1309249-02F	MW-115		9/4/2013 5:10:00 PM			9/16/2013 07:35 AM
						9/16/2013 12:39 PM
1309249-03F	MW-116		9/4/2013 3:20:00 PM			9/16/2013 08:01 AM
						9/16/2013 01:05 PM
1309249-04F	MW-117		9/4/2013 9:50:00 AM			9/16/2013 08:27 AM
						9/16/2013 02:20 PM
1309249-05F	MW-118		9/4/2013 12:00:00 PM			9/16/2013 08:53 AM
						9/16/2013 02:45 PM
1309249-06F	MW-119		9/4/2013 1:30:00 PM			9/16/2013 10:46 AM
						9/16/2013 03:11 PM
1309249-07F	RO DISCHARGE		9/5/2013 11:00:00 AM			9/16/2013 11:12 AM
						9/16/2013 03:37 PM
1309249-08F	DUP-01		9/4/2013			9/16/2013 11:38 AM
						9/16/2013 04:10 PM

Work Order: 1309249
Client: Navajo Refining Company
Project: RO Discharge Sampling

DATES REPORT

Sample ID	Client Sample ID	Matrix	Collection Date	TCLP Date	Prep Date	Analysis Date
<u>Batch ID</u> R154303 <u>Test Name:</u> Miscellaneous Analysis						
1309249-01H	MW-114	Water	9/5/2013 9:30:00 AM			9/25/2013
1309249-02H	MW-115		9/4/2013 5:10:00 PM			9/25/2013
1309249-03H	MW-116		9/4/2013 3:20:00 PM			9/25/2013
1309249-04H	MW-117		9/4/2013 9:50:00 AM			9/25/2013
1309249-05H	MW-118		9/4/2013 12:00:00 PM			9/25/2013
1309249-06H	MW-119		9/4/2013 1:30:00 PM			9/25/2013
1309249-07H	RO DISCHARGE		9/5/2013 11:00:00 AM			9/25/2013
1309249-08H	DUP-01		9/4/2013			9/25/2013

ALS Environmental

Date: 08-Oct-13

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **72948** Instrument ID **FID-16** Method: **SW8015M**

MBLK	Sample ID: LBLKW-130910-72948				Units: mg/L		Analysis Date: 9/11/2013 08:53 AM			
Client ID:	Run ID: FID-16_130910A				SeqNo: 3354458		Prep Date: 9/10/2013		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	U	0.050								
TPH (Oil Range)	U	0.10								
<i>Surr: 2-Fluorobiphenyl</i>	0.04011	0.0050	0.06061	0	66.2	60-135	0			

LCS	Sample ID: LLCSW-130910-72948				Units: mg/L		Analysis Date: 9/11/2013 09:19 AM			
Client ID:	Run ID: FID-16_130910A				SeqNo: 3354459		Prep Date: 9/10/2013		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.6152	0.050	0.6061	0	102	70-130				
TPH (Oil Range)	0.4856	0.10	0.6061	0	80.1	70-130				
<i>Surr: 2-Fluorobiphenyl</i>	0.03812	0.0050	0.06061	0	62.9	60-135	0			

LCSD	Sample ID: LLCSDW-130910-72948				Units: mg/L		Analysis Date: 9/11/2013 09:46 AM			
Client ID:	Run ID: FID-16_130910A				SeqNo: 3354460		Prep Date: 9/10/2013		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.6263	0.050	0.6061	0	103	70-130	0.6152	1.79	20	
TPH (Oil Range)	0.5252	0.10	0.6061	0	86.7	70-130	0.4856	7.84	20	
<i>Surr: 2-Fluorobiphenyl</i>	0.05009	0.0050	0.06061	0	82.6	60-135	0.03812	27.1	20	R

The following samples were analyzed in this batch:

1309249-01C	1309249-02C	1309249-03C
1309249-04C	1309249-05C	1309249-06C
1309249-07C	1309249-08C	

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

QC Page: 1 of 24

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153658** Instrument ID **FID-9** Method: **SW8015**

MBLK	Sample ID: GBLKW-130912-R153658				Units: mg/L		Analysis Date: 9/12/2013 05:00 PM			
Client ID:	Run ID: FID-9_130912A				SeqNo: 3354058		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	U	0.0500								
<i>Surr: 4-Bromofluorobenzene</i>	0.1049	0.00500	0.1	0	105	70-130	0			

LCS	Sample ID: GLCSW-130912-R153658				Units: mg/L		Analysis Date: 9/12/2013 04:23 PM			
Client ID:	Run ID: FID-9_130912A				SeqNo: 3354056		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8961	0.0500	1	0	89.6	70-130				
<i>Surr: 4-Bromofluorobenzene</i>	0.1176	0.00500	0.1	0	118	70-130	0			

MS	Sample ID: 1309249-08BMS				Units: mg/L		Analysis Date: 9/12/2013 08:02 PM			
Client ID: DUP-01	Run ID: FID-9_130912A				SeqNo: 3354068		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8614	0.0500	1	0	86.1	70-130				
<i>Surr: 4-Bromofluorobenzene</i>	0.09992	0.00500	0.1	0	99.9	70-130	0			

MSD	Sample ID: 1309249-08BMSD				Units: mg/L		Analysis Date: 9/12/2013 08:21 PM			
Client ID: DUP-01	Run ID: FID-9_130912A				SeqNo: 3354069		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8464	0.0500	1	0	84.6	70-130	0.8614	1.75	30	
<i>Surr: 4-Bromofluorobenzene</i>	0.09882	0.00500	0.1	0	98.8	70-130	0.09992	1.1	30	

The following samples were analyzed in this batch:

1309249-01B	1309249-02B	1309249-03B
1309249-04B	1309249-05B	1309249-06B
1309249-07B	1309249-08B	

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **73032** Instrument ID **HG03** Method: **SW7470** (**Dissolve**)

MBLK Sample ID: **GBLKW3-091313-73032** Units: **mg/L** Analysis Date: **9/13/2013 04:29 PM**
Client ID: Run ID: **HG03_130913A** SeqNo: **3354956** Prep Date: **9/13/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

LCS Sample ID: **GLCSW3-091313-73032** Units: **mg/L** Analysis Date: **9/13/2013 04:30 PM**
Client ID: Run ID: **HG03_130913A** SeqNo: **3354957** Prep Date: **9/13/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.0052	0.000200	0.005	0	104	80-120				

MS Sample ID: **1309408-01LMS** Units: **mg/L** Analysis Date: **9/13/2013 04:36 PM**
Client ID: Run ID: **HG03_130913A** SeqNo: **3354960** Prep Date: **9/13/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00491	0.000200	0.005	-0.000009	98.4	80-120				

MSD Sample ID: **1309408-01LMSD** Units: **mg/L** Analysis Date: **9/13/2013 04:37 PM**
Client ID: Run ID: **HG03_130913A** SeqNo: **3354961** Prep Date: **9/13/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00483	0.000200	0.005	-0.000009	96.8	80-120	0.00491	1.64	20	

DUP Sample ID: **1309408-01LDUP** Units: **mg/L** Analysis Date: **9/13/2013 04:34 PM**
Client ID: Run ID: **HG03_130913A** SeqNo: **3354959** Prep Date: **9/13/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200					-0.000009	0	20	

The following samples were analyzed in this batch:

1309249-01E	1309249-02E	1309249-03E
1309249-04E	1309249-05E	1309249-06E
1309249-07E	1309249-08E	

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **73040** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

MBLK Sample ID: **MBLKW5-091313-73040** Units: **mg/L** Analysis Date: **9/13/2013 11:04 PM**

Client ID: Run ID: **ICP7500_130913A** SeqNo: **3356450** Prep Date: **9/13/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	U	0.0100								
Arsenic	U	0.00500								
Barium	U	0.00500								
Boron	U	0.0500								
Cadmium	U	0.00200								
Calcium	U	0.500								
Chromium	U	0.00500								
Cobalt	U	0.00500								
Copper	U	0.00500								
Iron	U	0.200								
Lead	U	0.00500								
Manganese	U	0.00500								
Molybdenum	U	0.00500								
Nickel	U	0.00500								
Potassium	U	0.200								
Selenium	U	0.00500								
Silver	U	0.00500								
Sodium	U	0.200								
Uranium	U	0.00500								
Zinc	U	0.00500								

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **73040** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

LCS Sample ID: **MLCSW5-091313-73040** Units: **mg/L** Analysis Date: **9/13/2013 11:09 PM**

Client ID: Run ID: **ICP7500_130913A** SeqNo: **3356451** Prep Date: **9/13/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09845	0.0100	0.1	0	98.4	80-120				
Arsenic	0.04872	0.00500	0.05	0	97.4	80-120				
Barium	0.05042	0.00500	0.05	0	101	80-120				
Boron	0.4684	0.0500	0.5	0	93.7	80-120				
Cadmium	0.04889	0.00200	0.05	0	97.8	80-120				
Calcium	4.865	0.500	5	0	97.3	80-120				
Chromium	0.049	0.00500	0.05	0	98	80-120				
Cobalt	0.04923	0.00500	0.05	0	98.5	80-120				
Copper	0.05007	0.00500	0.05	0	100	80-120				
Iron	4.915	0.200	5	0	98.3	80-120				
Lead	0.04892	0.00500	0.05	0	97.8	80-120				
Manganese	0.04922	0.00500	0.05	0	98.4	80-120				
Molybdenum	0.04754	0.00500	0.05	0	95.1	80-120				
Nickel	0.04931	0.00500	0.05	0	98.6	80-120				
Potassium	4.995	0.200	5	0	99.9	80-120				
Selenium	0.0489	0.00500	0.05	0	97.8	80-120				
Silver	0.04891	0.00500	0.05	0	97.8	80-120				
Sodium	4.708	0.200	5	0	94.2	80-120				
Uranium	0.09781	0.00500	0.1	0	97.8	80-120				
Zinc	0.05241	0.00500	0.05	0	105	80-120				

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **73040** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

MS		Sample ID: 1309411-01LMS				Units: mg/L		Analysis Date: 9/13/2013 11:29 PM		
Client ID:		Run ID: ICP7500_130913A				SeqNo: 3356455		Prep Date: 9/13/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1192	0.0100	0.1	0.03002	89.2	75-125				
Arsenic	0.0613	0.00500	0.05	0.01119	100	75-125				
Barium	0.1092	0.00500	0.05	0.05874	101	75-125				
Boron	0.5297	0.0500	0.5	0.05887	94.2	75-125				
Cadmium	0.04973	0.00200	0.05	0.0003378	98.8	75-125				
Calcium	25.08	0.500	5	20.04	101	75-125				O
Chromium	0.04939	0.00500	0.05	0.00008956	98.6	75-125				
Cobalt	0.05155	0.00500	0.05	0.001474	100	75-125				
Copper	0.05207	0.00500	0.05	0.002172	99.8	75-125				
Iron	4.977	0.200	5	0.006766	99.4	75-125				
Lead	0.05044	0.00500	0.05	0.000449	100	75-125				
Manganese	0.4936	0.00500	0.05	0.4508	85.6	75-125				O
Molybdenum	0.04858	0.00500	0.05	0.00165	93.9	75-125				
Nickel	0.05377	0.00500	0.05	0.004889	97.8	75-125				
Potassium	30.22	0.200	5	25.69	90.6	75-125				O
Selenium	0.04976	0.00500	0.05	0.0005943	98.3	75-125				
Silver	0.04791	0.00500	0.05	-7.088E-06	95.8	75-125				
Sodium	6.327	0.200	5	1.725	92	75-125				
Uranium	0.101	0.00500	0.1	0.0006939	100	75-125				
Zinc	0.05405	0.00500	0.05	0.004301	99.5	75-125				

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **73040** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

MSD		Sample ID: 1309411-01LMSD				Units: mg/L		Analysis Date: 9/13/2013 11:33 PM		
Client ID:		Run ID: ICP7500_130913A				SeqNo: 3356456		Prep Date: 9/13/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1239	0.0100	0.1	0.03002	93.9	75-125	0.1192	3.87	25	
Arsenic	0.06101	0.00500	0.05	0.01119	99.6	75-125	0.0613	0.474	25	
Barium	0.1093	0.00500	0.05	0.05874	101	75-125	0.1092	0.0915	25	
Boron	0.5423	0.0500	0.5	0.05887	96.7	75-125	0.5297	2.35	25	
Cadmium	0.05158	0.00200	0.05	0.0003378	102	75-125	0.04973	3.65	25	
Calcium	24.84	0.500	5	20.04	96	75-125	25.08	0.962	25	O
Chromium	0.04911	0.00500	0.05	0.00008956	98	75-125	0.04939	0.569	25	
Cobalt	0.05177	0.00500	0.05	0.001474	101	75-125	0.05155	0.426	25	
Copper	0.05177	0.00500	0.05	0.002172	99.2	75-125	0.05207	0.578	25	
Iron	5.05	0.200	5	0.006766	101	75-125	4.977	1.46	25	
Lead	0.05132	0.00500	0.05	0.000449	102	75-125	0.05044	1.73	25	
Manganese	0.4875	0.00500	0.05	0.4508	73.4	75-125	0.4936	1.24	25	SO
Molybdenum	0.04966	0.00500	0.05	0.00165	96	75-125	0.04858	2.2	25	
Nickel	0.05335	0.00500	0.05	0.004889	96.9	75-125	0.05377	0.784	25	
Potassium	30.42	0.200	5	25.69	94.6	75-125	30.22	0.66	25	O
Selenium	0.04955	0.00500	0.05	0.0005943	97.9	75-125	0.04976	0.423	25	
Silver	0.04983	0.00500	0.05	-7.088E-06	99.7	75-125	0.04791	3.93	25	
Sodium	6.404	0.200	5	1.725	93.6	75-125	6.327	1.21	25	
Uranium	0.103	0.00500	0.1	0.0006939	102	75-125	0.101	1.96	25	
Zinc	0.05326	0.00500	0.05	0.004301	97.9	75-125	0.05405	1.47	25	

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **73040** Instrument ID **ICP7500** Method: **SW6020** **(Dissolve)**

DUP		Sample ID: 1309411-01LDUP				Units: mg/L		Analysis Date: 9/13/2013 11:19 PM		
Client ID:		Run ID: ICP7500_130913A				SeqNo: 3356453		Prep Date: 9/13/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.02774	0.0100					0.03002	7.89	25	
Arsenic	0.01174	0.00500					0.01119	4.8	25	
Barium	0.06055	0.00500					0.05874	3.03	25	
Boron	0.05881	0.0500					0.05887	0.102	25	
Cadmium	U	0.00200					0.0003378	0	25	
Calcium	20.29	0.500					20.04	1.24	25	
Chromium	U	0.00500					0.00008956	0	25	
Cobalt	0.001422	0.00500					0.001474	0	25	J
Copper	0.002179	0.00500					0.002172	0	25	J
Iron	U	0.200					0.006766	0	25	
Lead	U	0.00500					0.000449	0	25	
Manganese	0.457	0.00500					0.4508	1.37	25	
Molybdenum	U	0.00500					0.00165	0	25	
Nickel	0.005085	0.00500					0.004889	3.93	25	
Potassium	26.46	0.200					25.69	2.95	25	
Selenium	U	0.00500					0.0005943	0	25	
Silver	U	0.00500					-7.088E-06	0	25	
Sodium	1.77	0.200					1.725	2.58	25	
Uranium	U	0.00500					0.0006939	0	25	
Zinc	0.003776	0.00500					0.004301	0	25	J

The following samples were analyzed in this batch:

1309249-01E	1309249-02E	1309249-03E
1309249-04E	1309249-05E	1309249-06E
1309249-07E	1309249-08E	

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **72927** Instrument ID **SV-4** Method: **SW8270**

MBLK Sample ID: **SBLKW3-130910-72927** Units: **µg/L** Analysis Date: **9/10/2013 02:11 PM**
 Client ID: Run ID: **SV-4_130910B** SeqNo: **3354476** Prep Date: **9/10/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1-Methylnaphthalene	U	0.20								
2-Methylnaphthalene	U	0.20								
Benzo(a)pyrene	U	0.20								
Naphthalene	U	0.20								
Surr: 2,4,6-Tribromophenol	3.946	0.20	5	0	78.9	34-129	0			
Surr: 2-Fluorobiphenyl	3.674	0.20	5	0	73.5	40-125	0			
Surr: 2-Fluorophenol	3	0.20	5	0	60	20-120	0			
Surr: 4-Terphenyl-d14	4.077	0.20	5	0	81.5	40-135	0			
Surr: Nitrobenzene-d5	3.371	0.20	5	0	67.4	41-120	0			
Surr: Phenol-d6	3.134	0.20	5	0	62.7	20-120	0			

LCS Sample ID: **SLCSW3-130910-72927** Units: **µg/L** Analysis Date: **9/10/2013 02:32 PM**
 Client ID: Run ID: **SV-4_130910B** SeqNo: **3354477** Prep Date: **9/10/2013** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1-Methylnaphthalene	3.575	0.20	5	0	71.5	45-120				
2-Methylnaphthalene	3.263	0.20	5	0	65.3	50-120				
Benzo(a)pyrene	4.074	0.20	5	0	81.5	45-120				
Naphthalene	3.362	0.20	5	0	67.2	45-120				
Surr: 2,4,6-Tribromophenol	4.1	0.20	5	0	82	34-129	0			
Surr: 2-Fluorobiphenyl	3.555	0.20	5	0	71.1	40-125	0			
Surr: 2-Fluorophenol	3	0.20	5	0	60	20-120	0			
Surr: 4-Terphenyl-d14	4.133	0.20	5	0	82.7	40-135	0			
Surr: Nitrobenzene-d5	3.038	0.20	5	0	60.8	41-120	0			
Surr: Phenol-d6	3.128	0.20	5	0	62.6	20-120	0			

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **72927** Instrument ID **SV-4** Method: **SW8270**

LCSD		Sample ID: SLCSDW3-130910-72927				Units: µg/L		Analysis Date: 9/10/2013 02:53 PM		
Client ID:		Run ID: SV-4_130910B				SeqNo: 3354478		Prep Date: 9/10/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1-Methylnaphthalene	3.72	0.20	5	0	74.4	45-120	3.575	3.99	20	
2-Methylnaphthalene	3.437	0.20	5	0	68.7	50-120	3.263	5.18	20	
Benzo(a)pyrene	4.241	0.20	5	0	84.8	45-120	4.074	4.01	20	
Naphthalene	3.573	0.20	5	0	71.5	45-120	3.362	6.1	20	
Surr: 2,4,6-Tribromophenol	4.3	0.20	5	0	86	34-129	4.1	4.76	0	
Surr: 2-Fluorobiphenyl	3.718	0.20	5	0	74.4	40-125	3.555	4.48	0	
Surr: 2-Fluorophenol	2.88	0.20	5	0	57.6	20-120	3	4.09	0	
Surr: 4-Terphenyl-d14	4.357	0.20	5	0	87.1	40-135	4.133	5.28	0	
Surr: Nitrobenzene-d5	3.122	0.20	5	0	62.4	41-120	3.038	2.75	0	
Surr: Phenol-d6	3.095	0.20	5	0	61.9	20-120	3.128	1.07	0	

The following samples were analyzed in this batch:

1309249-01G	1309249-02G	1309249-03G
1309249-04G	1309249-05G	1309249-06G
1309249-07G	1309249-08G	

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153431** Instrument ID **VOA4** Method: **SW8260**

MBLK Sample ID: **VBLKW-130909-R153431** Units: **µg/L** Analysis Date: **9/9/2013 02:26 PM**

Client ID: Run ID: **VOA4_130909A** SeqNo: **3348366** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,2-Dibromoethane	U	1.0								
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Carbon tetrachloride	U	1.0								
Chloroform	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Tetrachloroethene	U	1.0								
Toluene	U	1.0								
Trichloroethene	U	1.0								
Vinyl chloride	U	1.0								
Xylenes, Total	U	3.0								
Surr: 1,2-Dichloroethane-d4	55.51	1.0	50	0	111	71-125	0			
Surr: 4-Bromofluorobenzene	49.3	1.0	50	0	98.6	70-125	0			
Surr: Dibromofluoromethane	54.82	1.0	50	0	110	74-125	0			
Surr: Toluene-d8	57.16	1.0	50	0	114	75-125	0			

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153431** Instrument ID **VOA4** Method: **SW8260**

LCS Sample ID: **VLCSW-130909-R153431** Units: **µg/L** Analysis Date: **9/9/2013 01:35 PM**

Client ID: Run ID: **VOA4_130909A** SeqNo: **3348365** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	57.98	1.0	50	0	116	75-130				
1,1,2,2-Tetrachloroethane	58.95	1.0	50	0	118	74-123				
1,1,2-Trichloroethane	51.83	1.0	50	0	104	80-120				
1,1-Dichloroethane	54.29	1.0	50	0	109	80-120				
1,1-Dichloroethene	56.75	1.0	50	0	113	75-130				
1,2-Dibromoethane	56.59	1.0	50	0	113	80-120				
1,2-Dichloroethane	53.38	1.0	50	0	107	79-120				
Benzene	52.59	1.0	50	0	105	80-120				
Carbon tetrachloride	53.55	1.0	50	0	107	75-125				
Chloroform	52.62	1.0	50	0	105	70-130				
Ethylbenzene	53.43	1.0	50	0	107	80-120				
Methylene chloride	50.16	2.0	50	0	100	65-133				
Tetrachloroethene	54.71	1.0	50	0	109	75-130				
Toluene	52.68	1.0	50	0	105	80-121				
Trichloroethene	54.42	1.0	50	0	109	75-125				
Vinyl chloride	56.52	1.0	50	0	113	70-135				
Xylenes, Total	162.2	3.0	150	0	108	80-124				
Surr: 1,2-Dichloroethane-d4	53.14	1.0	50	0	106	71-125	0			
Surr: 4-Bromofluorobenzene	55.46	1.0	50	0	111	70-125	0			
Surr: Dibromofluoromethane	54.93	1.0	50	0	110	74-125	0			
Surr: Toluene-d8	54.16	1.0	50	0	108	75-125	0			

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153431** Instrument ID **VOA4** Method: **SW8260**

MS Sample ID: **1309205-01AMS** Units: **µg/L** Analysis Date: **9/9/2013 04:08 PM**

Client ID: Run ID: **VOA4_130909A** SeqNo: **3348369** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	57.97	1.0	50	0	116	75-130				
1,1,2,2-Tetrachloroethane	54.96	1.0	50	0	110	74-123				
1,1,2-Trichloroethane	49.56	1.0	50	0	99.1	80-120				
1,1-Dichloroethane	53.26	1.0	50	0	107	80-120				
1,1-Dichloroethene	57.21	1.0	50	0	114	75-130				
1,2-Dibromoethane	53.32	1.0	50	0	107	80-120				
1,2-Dichloroethane	51.54	1.0	50	0	103	79-120				
Benzene	50.64	1.0	50	0	101	80-120				
Carbon tetrachloride	53.61	1.0	50	0	107	79-120				
Chloroform	52.05	1.0	50	0	104	70-130				
Ethylbenzene	52	1.0	50	0	104	80-120				
Methylene chloride	48.94	2.0	50	0	97.9	65-133				
Tetrachloroethene	52.85	1.0	50	0	106	75-130				
Toluene	51.15	1.0	50	0	102	80-121				
Trichloroethene	53.27	1.0	50	0	107	75-125				
Vinyl chloride	56.96	1.0	50	0	114	70-135				
Xylenes, Total	156.2	3.0	150	0	104	80-124				
Surr: 1,2-Dichloroethane-d4	52.29	1.0	50	0	105	71-125	0			
Surr: 4-Bromofluorobenzene	53.37	1.0	50	0	107	70-125	0			
Surr: Dibromofluoromethane	54.32	1.0	50	0	109	74-125	0			
Surr: Toluene-d8	52.34	1.0	50	0	105	75-125	0			

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153431** Instrument ID **VOA4** Method: **SW8260**

MSD		Sample ID: 1309205-01AMSD				Units: µg/L		Analysis Date: 9/9/2013 04:34 PM		
Client ID:		Run ID: VOA4_130909A				SeqNo: 3348370		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	58.41	1.0	50	0	117	75-130	57.97	0.757	20	
1,1,2,2-Tetrachloroethane	55.31	1.0	50	0	111	74-123	54.96	0.646	20	
1,1,2-Trichloroethane	49.76	1.0	50	0	99.5	80-120	49.56	0.415	20	
1,1-Dichloroethane	53.55	1.0	50	0	107	80-120	53.26	0.553	20	
1,1-Dichloroethene	56.43	1.0	50	0	113	75-130	57.21	1.37	20	
1,2-Dibromoethane	53.54	1.0	50	0	107	80-120	53.32	0.406	20	
1,2-Dichloroethane	51.85	1.0	50	0	104	79-120	51.54	0.602	20	
Benzene	51.56	1.0	50	0	103	80-120	50.64	1.79	20	
Carbon tetrachloride	53.77	1.0	50	0	108	75-125	53.61	0.287	20	
Chloroform	51.32	1.0	50	0	103	70-130	52.05	1.4	20	
Ethylbenzene	52.71	1.0	50	0	105	80-120	52	1.36	20	
Methylene chloride	48.15	2.0	50	0	96.3	65-133	48.94	1.64	20	
Tetrachloroethene	54.29	1.0	50	0	109	75-130	52.85	2.69	20	
Toluene	51.98	1.0	50	0	104	80-121	51.15	1.61	20	
Trichloroethene	53.71	1.0	50	0	107	75-120	53.27	0.825	20	
Vinyl chloride	57.58	1.0	50	0	115	70-135	56.96	1.07	20	
Xylenes, Total	159.4	3.0	150	0	106	80-124	156.2	2.06	20	
Surr: 1,2-Dichloroethane-d4	51.1	1.0	50	0	102	71-125	52.29	2.3	20	
Surr: 4-Bromofluorobenzene	54.25	1.0	50	0	108	70-125	53.37	1.63	20	
Surr: Dibromofluoromethane	53.47	1.0	50	0	107	74-125	54.32	1.58	20	
Surr: Toluene-d8	53.38	1.0	50	0	107	75-125	52.34	1.98	20	

The following samples were analyzed in this batch:

1309249-01A 1309249-02A

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153436** Instrument ID **VOA4** Method: **SW8260**

MBLK Sample ID: **VBLKW-130909-R153436** Units: **µg/L** Analysis Date: **9/10/2013 02:36 AM**

Client ID: Run ID: **VOA4_130909B** SeqNo: **3348577** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,2-Dibromoethane	U	1.0								
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Carbon tetrachloride	U	1.0								
Chloroform	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Tetrachloroethene	U	1.0								
Toluene	U	1.0								
Trichloroethene	U	1.0								
Vinyl chloride	U	1.0								
Xylenes, Total	U	3.0								
Surr: 1,2-Dichloroethane-d4	52.23	1.0	50	0	104	71-125	0			
Surr: 4-Bromofluorobenzene	45.28	1.0	50	0	90.6	70-125	0			
Surr: Dibromofluoromethane	52.05	1.0	50	0	104	74-125	0			
Surr: Toluene-d8	53.48	1.0	50	0	107	75-125	0			

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153436** Instrument ID **VOA4** Method: **SW8260**

LCS		Sample ID: VLCSW-130909-R153436				Units: µg/L		Analysis Date: 9/10/2013 01:46 AM		
Client ID:		Run ID: VOA4_130909B				SeqNo: 3348576		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	56.44	1.0	50	0	113	75-130				
1,1,2,2-Tetrachloroethane	50.9	1.0	50	0	102	74-123				
1,1,2-Trichloroethane	50.27	1.0	50	0	101	80-120				
1,1-Dichloroethane	53.71	1.0	50	0	107	80-120				
1,1-Dichloroethene	53.51	1.0	50	0	107	75-130				
1,2-Dibromoethane	53.93	1.0	50	0	108	80-120				
1,2-Dichloroethane	52.01	1.0	50	0	104	79-120				
Benzene	52.02	1.0	50	0	104	80-120				
Carbon tetrachloride	52	1.0	50	0	104	75-125				
Chloroform	52.39	1.0	50	0	105	70-130				
Ethylbenzene	52.21	1.0	50	0	104	80-120				
Methylene chloride	51.16	2.0	50	0	102	65-133				
Tetrachloroethene	53.48	1.0	50	0	107	75-130				
Toluene	51.99	1.0	50	0	104	80-121				
Trichloroethene	57	1.0	50	0	114	75-125				
Vinyl chloride	55.79	1.0	50	0	112	70-135				
Xylenes, Total	158.5	3.0	150	0	106	80-124				
<i>Surr: 1,2-Dichloroethane-d4</i>	50.74	1.0	50	0	101	71-125		0		
<i>Surr: 4-Bromofluorobenzene</i>	53.55	1.0	50	0	107	70-125		0		
<i>Surr: Dibromofluoromethane</i>	53.78	1.0	50	0	108	74-125		0		
<i>Surr: Toluene-d8</i>	53.31	1.0	50	0	107	75-125		0		

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153436** Instrument ID **VOA4** Method: **SW8260**

MS		Sample ID: 1309196-01AMS				Units: µg/L		Analysis Date: 9/10/2013 05:06 AM		
Client ID:		Run ID: VOA4_130909B				SeqNo: 3348583		Prep Date:		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	509.8	10	500	0	102	75-130				
1,1,2,2-Tetrachloroethane	467.1	10	500	0	93.4	74-123				
1,1,2-Trichloroethane	448.7	10	500	0	89.7	80-120				
1,1-Dichloroethane	495.7	10	500	8.87	97.4	80-120				
1,1-Dichloroethene	538.8	10	500	41.27	99.5	75-130				
1,2-Dibromoethane	473.8	10	500	0	94.8	80-120				
1,2-Dichloroethane	471.7	10	500	0	94.3	79-120				
Benzene	474.9	10	500	0	95	80-120				
Carbon tetrachloride	469.3	10	500	0	93.9	79-120				
Chloroform	474.3	10	500	0	94.9	70-130				
Ethylbenzene	471	10	500	0	94.2	80-120				
Methylene chloride	462.3	20	500	24.95	87.5	65-133				
Tetrachloroethene	476.7	10	500	0	95.3	75-130				
Toluene	471.8	10	500	0	94.4	80-121				
Trichloroethene	900.8	10	500	390.6	102	75-125				
Vinyl chloride	530.1	10	500	0	106	70-135				
Xylenes, Total	1438	30	1500	0	95.9	80-124				
Surr: 1,2-Dichloroethane-d4	492.5	10	500	0	98.5	71-125		0		
Surr: 4-Bromofluorobenzene	517.9	10	500	0	104	70-125		0		
Surr: Dibromofluoromethane	527.3	10	500	0	105	74-125		0		
Surr: Toluene-d8	512.5	10	500	0	103	75-125		0		

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153436** Instrument ID **VOA4** Method: **SW8260**

MSD		Sample ID: 1309196-01AMSD				Units: µg/L		Analysis Date: 9/10/2013 05:31 AM		
Client ID:		Run ID: VOA4_130909B				SeqNo: 3348584		Prep Date:		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	517.9	10	500	0	104	75-130	509.8	1.59	20	
1,1,2,2-Tetrachloroethane	509	10	500	0	102	74-123	467.1	8.58	20	
1,1,2-Trichloroethane	468.5	10	500	0	93.7	80-120	448.7	4.31	20	
1,1-Dichloroethane	503.6	10	500	8.87	99	80-120	495.7	1.59	20	
1,1-Dichloroethene	553.4	10	500	41.27	102	75-130	538.8	2.68	20	
1,2-Dibromoethane	493.7	10	500	0	98.7	80-120	473.8	4.12	20	
1,2-Dichloroethane	484.7	10	500	0	96.9	79-120	471.7	2.72	20	
Benzene	478.5	10	500	0	95.7	80-120	474.9	0.743	20	
Carbon tetrachloride	470.2	10	500	0	94	75-125	469.3	0.18	20	
Chloroform	490.1	10	500	0	98	70-130	474.3	3.27	20	
Ethylbenzene	482.3	10	500	0	96.5	80-120	471	2.37	20	
Methylene chloride	480.1	20	500	24.95	91	65-133	462.3	3.76	20	
Tetrachloroethene	486.9	10	500	0	97.4	75-130	476.7	2.11	20	
Toluene	477.9	10	500	0	95.6	80-121	471.8	1.28	20	
Trichloroethene	899.6	10	500	390.6	102	75-120	900.8	0.138	20	
Vinyl chloride	531.7	10	500	0	106	70-135	530.1	0.303	20	
Xylenes, Total	1456	30	1500	0	97.1	80-124	1438	1.22	20	
Surr: 1,2-Dichloroethane-d4	524.7	10	500	0	105	71-125	492.5	6.34	20	
Surr: 4-Bromofluorobenzene	537	10	500	0	107	70-125	517.9	3.62	20	
Surr: Dibromofluoromethane	542.2	10	500	0	108	74-125	527.3	2.78	20	
Surr: Toluene-d8	535	10	500	0	107	75-125	512.5	4.3	20	

The following samples were analyzed in this batch:

1309249-03A	1309249-04A	1309249-05A
1309249-06A	1309249-07A	1309249-08A
1309249-09A	1309249-10A	1309249-11A
1309249-12A		

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153357** Instrument ID **ManTech01** Method: **SM4500H+ B (Dissolve)**

LCS Sample ID: **LCS-PH-R153357** Units: **pH Units** Analysis Date: **9/8/2013 10:45 AM**
Client ID: Run ID: **MANTECH01_130908A** SeqNo: **3346657** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	6	0.100	6	0	100	90-110				

DUP Sample ID: **1309264-01ZDUP** Units: **pH Units** Analysis Date: **9/8/2013 11:03 AM**
Client ID: Run ID: **MANTECH01_130908A** SeqNo: **3346661** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	8.13	0.100					8.05	0.989	20	
Temp Deg C @pH	23.75	0					23.54	0.888		

The following samples were analyzed in this batch:

1309249-01F	1309249-02F	1309249-03F
1309249-04F	1309249-05F	1309249-06F
1309249-07F	1309249-08F	

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153508** Instrument ID **Balance1** Method: **M2540C** **(Dissolve)**

MBLK Sample ID: **WBLK-090913-R153508** Units: **mg/L** Analysis Date: **9/9/2013 11:00 AM**

Client ID: Run ID: **BALANCE1_130909E** SeqNo: **3349975** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	U	10.0								

LCS Sample ID: **WLCS-090913-R153508** Units: **mg/L** Analysis Date: **9/9/2013 11:00 AM**

Client ID: Run ID: **BALANCE1_130909E** SeqNo: **3349976** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	1008	10.0	1000	0	101	85-115				

DUP Sample ID: **1309061-01BDUP** Units: **mg/L** Analysis Date: **9/9/2013 11:00 AM**

Client ID: Run ID: **BALANCE1_130909E** SeqNo: **3349972** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	344	10.0					334	2.95	20	

DUP Sample ID: **1309249-06FDUP** Units: **mg/L** Analysis Date: **9/9/2013 11:00 AM**

Client ID: **MW-119** Run ID: **BALANCE1_130909E** SeqNo: **3351809** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	4020	10.0					4030	0.248	20	

The following samples were analyzed in this batch:

1309249-04F	1309249-05F	1309249-06F
1309249-08F		

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153690** Instrument ID **Gall01** Method: **M4500CN E&G (Dissolve)**

MBLK	Sample ID: WBLKW1-091313-R153690				Units: mg/L		Analysis Date: 9/13/2013 10:15 AM			
Client ID:	Run ID: GALL01_130913A				SeqNo: 3354600		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide	U	0.0200								

LCS	Sample ID: WLCSW1-091313-R153690				Units: mg/L		Analysis Date: 9/13/2013 10:15 AM			
Client ID:	Run ID: GALL01_130913A				SeqNo: 3354601		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide	0.187	0.0200	0.2	0	93.5	80-120				

MS	Sample ID: 1309232-07DMS				Units: mg/L		Analysis Date: 9/13/2013 10:15 AM			
Client ID:	Run ID: GALL01_130913A				SeqNo: 3354607		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide	0.1776	0.0200	0.2	0.00159	88	80-120				

MSD	Sample ID: 1309232-07DMSD				Units: mg/L		Analysis Date: 9/13/2013 10:15 AM			
Client ID:	Run ID: GALL01_130913A				SeqNo: 3354608		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide	0.1788	0.0200	0.2	0.00159	88.6	80-120	0.1776	0.684	20	

The following samples were analyzed in this batch:

1309249-01D	1309249-02D	1309249-03D
1309249-04D	1309249-05D	1309249-06D
1309249-07D	1309249-08D	

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153693** Instrument ID **Balance1** Method: **M2540C** (**Dissolve**)

MBLK Sample ID: **WBLK-091113-R153693** Units: **mg/L** Analysis Date: **9/11/2013 06:55 PM**
Client ID: Run ID: **BALANCE1_130911F** SeqNo: **3354688** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	U	10.0								

LCS Sample ID: **WLCS-091113-R153693** Units: **mg/L** Analysis Date: **9/11/2013 06:55 PM**
Client ID: Run ID: **BALANCE1_130911F** SeqNo: **3354689** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	1004	10.0	1000	0	100	85-115				

DUP Sample ID: **1309249-03FDUP** Units: **mg/L** Analysis Date: **9/11/2013 06:55 PM**
Client ID: **MW-116** Run ID: **BALANCE1_130911F** SeqNo: **3354678** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	4376	10.0					4438	1.41	20	

DUP Sample ID: **1309311-01BDUP** Units: **mg/L** Analysis Date: **9/11/2013 06:55 PM**
Client ID: Run ID: **BALANCE1_130911F** SeqNo: **3354686** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	368	10.0					362	1.64	20	

The following samples were analyzed in this batch:

1309249-01F	1309249-02F	1309249-03F
1309249-07F		

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153808** Instrument ID **ICS3000** Method: **E300** **(Dissolve)**

MBLK Sample ID: **WBLKW1-R153808** Units: **mg/L** Analysis Date: **9/15/2013 11:51 PM**

Client ID: Run ID: **ICS3000_130915A** SeqNo: **3357186** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Fluoride	U	0.100								
Nitrogen, Nitrate (As N)	U	0.100								
Nitrogen, Nitrite (As N)	U	0.100								
Sulfate	U	0.500								
Nitrate/Nitrite (as N)	U	0.200								

LCS Sample ID: **WLCSW1-R153808** Units: **mg/L** Analysis Date: **9/16/2013 12:16 AM**

Client ID: Run ID: **ICS3000_130915A** SeqNo: **3357187** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	21.23	0.500	20	0	106	90-110				
Fluoride	4.143	0.100	4	0	104	90-110				
Nitrogen, Nitrate (As N)	4.38	0.100	4	0	109	90-110				
Nitrogen, Nitrite (As N)	4.126	0.100	4	0	103	90-110				
Sulfate	20.51	0.500	20	0	103	90-110				
Nitrate/Nitrite (as N)	8.506	0.200	8	0	106	90-110				

MS Sample ID: **1309232-07EMS** Units: **mg/L** Analysis Date: **9/16/2013 05:52 AM**

Client ID: Run ID: **ICS3000_130915A** SeqNo: **3357200** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	73.98	0.500	10	65.32	86.7	80-120				O
Fluoride	2.868	0.100	2	0.979	94.4	80-120				
Nitrogen, Nitrate (As N)	1.843	0.100	2	0	92.2	80-120				H
Nitrogen, Nitrite (As N)	1.91	0.100	2	0	95.5	80-120				H
Sulfate	10.84	0.500	10	1.897	89.4	80-120				
Nitrate/Nitrite (as N)	3.753	0.200	4	0	93.8	80-120				H

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

Client: Navajo Refining Company
Work Order: 1309249
Project: RO Discharge Sampling

QC BATCH REPORT

Batch ID: **R153808** Instrument ID **ICS3000** Method: **E300** **(Dissolve)**

MSD Sample ID: **1309232-07EMSD** Units: **mg/L** Analysis Date: **9/16/2013 06:18 AM**

Client ID: Run ID: **ICS3000_130915A** SeqNo: **3357201** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	74.44	0.500	10	65.32	91.3	80-120	73.98	0.62	20	O
Fluoride	2.89	0.100	2	0.979	95.6	80-120	2.868	0.764	20	
Nitrogen, Nitrate (As N)	1.852	0.100	2	0	92.6	80-120	1.843	0.487	20	H
Nitrogen, Nitrite (As N)	1.921	0.100	2	0	96	80-120	1.91	0.574	20	H
Sulfate	10.93	0.500	10	1.897	90.4	80-120	10.84	0.836	20	
Nitrate/Nitrite (as N)	3.773	0.200	4	0	94.3	80-120	3.753	0.531	20	H

The following samples were analyzed in this batch:

1309249-01F	1309249-02F	1309249-03F
1309249-04F	1309249-05F	1309249-06F
1309249-07F	1309249-08F	

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

Client: Navajo Refining Company
Project: RO Discharge Sampling
WorkOrder: 1309249

QUALIFIERS, ACRONYMS, UNITS

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

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

<u>Units Reported</u>	<u>Description</u>
°C	Celsius degrees
mg/L	Milligrams per Liter
pH Units	

Sample Receipt Checklist

Client Name: **NAVAJO REFINING**

Date/Time Received: **06-Sep-13 09:40**

Work Order: **1309249**

Received by: **WTJ**

Checklist completed by William Jenkins
eSignature

07-Sep-13
Date

Reviewed by: Senia West
eSignature

10-Sep-13
Date

Matrices: **WATER**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☒	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☒	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
Sufficient sample volume for indicated test?	Yes ☒	No ☐	
All samples received within holding time?	Yes ☒	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☒	No ☐	
Temperature(s)/Thermometer(s):	4.6C/4.6C, 5.0C/5.0C, 5.3C/5.3C, 4.7C/4.7C C/U		IR1
Cooler(s)/Kit(s):	4208,4341,4312,2753		
Date/Time sample(s) sent to storage:	9/7/13 08:45		
Water - VOA vials have zero headspace?	Yes ☒	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☒	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☒
pH adjusted by:	-		

Login Notes:

Client Contacted:

Date Contacted:

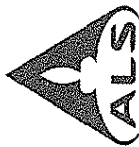
Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:



Cincinnati, OH
+1 513 733 5336
Everett, WA
+1 425 356 2600

Fort Collins, CO
+1 970 490 1511
Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 1
COC ID: 92127

1309249

NAVAJO REFINING: Navajo Refining Company

Project: RO Discharge Sampling

Environmental

Customer Information

Purchase Order	Project Name	RO Discharge/Sampling	ALS Project Manager:	
Work Order	Project Number			
Company Name	Bill To Company	Navajo Refining Company		
Send Report To	Invoice Attn	Robert Combs		
Address	Address	501 East Main		
City/State/Zip	City/State/Zip	Artesia, NM 88211		
Phone	Phone	(575) 746-5382		
Fax	Fax	(575) 746-5421		
e-Mail Address	e-Mail Address			

Project Information

A	VOC (8260) NM GW List
B	GRO (8015M)
C	DRO, ORO (8015M) LVI
D	LL SVOC (8270) NM GW List
E	Dissolved Metals (6020/7000) Select List
F	Anions (300) Cl, F, SO ₄
G	Total Cyanide (SM 4500)
H	pH
I	TDS
J	Radium 226/228

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-114	9/5/13	0930	WATER		10	X	X	X	X	X	X	X	X	X	X	
2	MW-115	9/4/13	1710	WATER		10	X	X	X	X	X	X	X	X	X	X	
3	MW-116	9/4/13	1520	WATER		10	X	X	X	X	X	X	X	X	X	X	
4	MW-117	9/4/13	0950	WATER		10	X	X	X	X	X	X	X	X	X	X	
5	MW-118	9/4/13	1200	WATER		10	X	X	X	X	X	X	X	X	X	X	
6	MW-119	9/4/13	1330	WATER		10	X	X	X	X	X	X	X	X	X	X	
7	RO DISCHARGE	9/5/13	1100	WATER		10	X	X	X	X	X	X	X	X	X	X	
8	DUP-01	9/4/13	0000	WATER		10	X	X	X	X	X	X	X	X	X	X	
9	TRIP BLANKS			WATER		4	X										
10																	

Sampler(s) Please Print & Sign	Shipment Method	Required Turnaround Time: (Check Box)	Results Due Date:
Mallory Bailey	FED-EX	☒ Std 10 WK Days ☐ 5 WK Days ☐ 2 WK Days ☐ 24 Hour	
Relinquished by: <u>Mallory Bailey</u>	Date: <u>9/5/13</u>	Time: <u>10:00</u>	Received by: <u>[Signature]</u>
Relinquished by: <u>[Signature]</u>	Date: <u>9/5/13</u>	Time: <u>10:00</u>	Received by (Laboratory): <u>[Signature]</u>
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035			

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

FedEx Package
Express US Airbill

FedEx
Tracking
Number

8041 1922 6986

Form ID No. 0215

1 From
Date 9/4/13
Sender's Name MALLORY BAILEY Phone 713 944 1450
Company ARCADIS US
Address 2929 ARCADIS PARK DR 300
City HOUSTON State TX ZIP 77042

2 Your Internal Billing Reference

3 To
Recipient's Name CLIENT SERVICES Phone 281 530-5656
Company ALS LABORATORY GROUP
Address 10450 STANCLIFF RD STE 210
We cannot deliver to P.O. boxes or P.O. ZIP codes.
Address
Use this line for the HOLD location address or for continuation of your shipping address.
City HOUSTON State TX ZIP 77099-4338

HOLD Weekday
FedEx location address
REQUIRED. NOT available for
FedEx First Overnight.

HOLD Saturday
FedEx location address
REQUIRED. Available ONLY for
FedEx Priority Overnight and
FedEx 2Day to select locations.

4 Express Package Service *To most locations.
NOTE: Service order has changed. Please select carefully.

Next Business Day

- ☐ FedEx First Overnight
Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☒ FedEx Priority Overnight
Next business morning. * Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx Standard Overnight
Next business afternoon. * Saturday Delivery NOT available.

2 or 3 Business Days

- ☐ FedEx 2Day A.M.
Second business morning. * Saturday Delivery NOT available.
- ☐ FedEx 2Day
Second business afternoon. * Thursday will be delivered on Monday unless S Delivery is selected.
- ☐ FedEx Express Saver
Third business day. * Saturday Delivery NOT available.

5 Packaging *Declared value limit \$500.

- ☐ FedEx Envelope* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube

6 Special Handling and Delivery Signature Options

☐ SATURDAY Delivery
NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

- ☐ No Signature Required
Package may be left without obtaining a signature for delivery.
- ☐ Direct Signature
Someone at recipient's address may sign for delivery. Fee applies.
- ☐ Indirect S
If no one is at address, some address may require residential del.

Does this shipment contain dangerous goods?

- One box must be checked.
- ☒ No ☐ Yes
As per attached Shipper's Declaration.
- ☐ Yes
Shipper's Declaration not required.
- ☐ Dry Ice
Dry ice, 9 UN 1845
- Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.
- ☐ Cargo Aircrat

7 Payment Bill to:

Enter FedEx Acct. No. or Credit Card No. below.

☐ Sender Acct. No. in Section I will be billed. ☒ Recipient ☐ Third Party ☐ Credit Card

Total Packages Total Weight

RS. Credit Card Auth.

Your liability is limited to US\$100 unless you declare a higher value. See the current FedEx Shipping Guide for details.

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8041 1922 6986



ALS Environmental

10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Date: 9/11/13 Time: 1600
Name: BERGERSEN
Company: ARCADIS

Seal Broken By:

Date:

36

30

FedEx Package
Express *US Airbill*

FedEx
Tracking
Number

8041 1922 7022

MUR3

Form 0215

1 From

Date

9/5/13

Sender's
Name

MALLORY BAILEY

Phone

713 494 1450

Company

ARCADIS US

Address

2929 BRIAR PARK DR.

300

Dept./Floor/Suite/Room

City

HOUSTON

State

TX

ZIP

77042

2 Your Internal Billing Reference

3 To

Recipient's
Name

CLIENT SERVICES

Phone

281 530-5656

Company

ALS LABORATORY GROUP

Address

10450 STANCLIFF RD STE 210

Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City

HOUSTON

State

TX

ZIP

77099-4338

HOLD Weekday

FedEx location address
REQUIRED. NOT available for
FedEx First Overnight.

HOLD Saturday

FedEx location address
REQUIRED. Available ONLY for
FedEx Priority Overnight and
FedEx 2Day to select locations.

4 Express Package Service

* To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lb.
For packages over 68 lbs., use
FedEx Express Freight US Air

Next Business Day

☐ FedEx First Overnight
Earliest next business morning delivery to select
locations. Friday shipments will be delivered on
Monday unless SATURDAY Delivery is selected.

☒ FedEx Priority Overnight
Next business morning. * Friday shipments will be
delivered on Monday unless SATURDAY Delivery
is selected.

☐ FedEx Standard Overnight
Next business afternoon. *
Saturday Delivery NOT available.

2 or 3 Business Days

☐ FedEx 2Day A.M.
Second business morning. *
Saturday Delivery NOT available.

☐ FedEx 2Day
Second business afternoon. * Thursday shipments
will be delivered on Monday unless SATURDAY
Delivery is selected.

☐ FedEx Express Saver
Third business day. *
Saturday Delivery NOT available.

5 Packaging

* Declared value limit \$500.

☐ FedEx Envelope*

☐ FedEx Pak*

☐ FedEx
Box

☐ FedEx
Tube

☒ 0

6 Special Handling and Delivery Signature Options

☐ SATURDAY Delivery
NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ No Signature Required
Package may be left without
obtaining a signature for delivery.

☐ Direct Signature
Someone at recipient's address
may sign for delivery. Fee applies.

☐ Indirect Signature
If no one is available at recipient
address, someone at a neighbor
address may sign for delivery. A
residential delivery only. Fee a

Does this shipment contain dangerous goods?

☒ No ☐ Yes
As per attached
Shipper's Declaration.

☐ Yes
Shipper's Declaration
not required.

☐ Dry Ice
Dry ice, 9 UN 1845

☐ Cargo Aircraft Only

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging
or placed in a FedEx Express Drop Box.

7 Payment Bill to:

Enter FedEx Acct. No. or Credit Card No. below.

Obtain recip.
Acct. No.

☐ Sender
Acct. No. in Section
1 will be billed.

☒ Recipient

☐ Third Party

☐ Credit Card

☐ Cash/

Total Packages

Total Weight

Credit Card Auth.

lbs.

*Our liability is limited to US\$100 unless you declare a higher value. See the current FedEx Service Guide for details.

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611



ALS Environmental

10450 Stancliff Rd., Suite 210

Houston, Texas 77099

Tel. +1 281 530 5656

Fax. +1 281 530 5887

2753

CUSTOMER

Date:

9/5/13

Name:

GERSEN

Company:

ARCADIS

BODY SEAL

Time:

1600

GERSEN

Seal Broken

Date:

9/5/13

FedEx
Tracking
Number

8041 1922 6997

Part
ID No. 0215

MON 2

February 13, 2013

From [Redacted]
Date 9/13/12
Sender's Name MALLORY BAILEY Phone 713 699-1100
Company ALCOA US
Address 724 BRIMFORD DR
City HOUSTON State TX ZIP 77042

2 Your Internal Billing Reference

3 To Recipient's Name CLIENT SERVICES Phone 281 530-5454
Company ALCO LABORATORY GROUP
Address 10450 STANCLIFF RD STE 210
We cannot deliver to P.O. boxes or P.O. ZIP codes.
Address [Redacted]
Use this line for the HOLD location address or for continuation of your shipping address.
City HOUSTON State TX ZIP 77059-4338

HOLD Weekday
FedEx location address
REQUIRED. NOT available for
FedEx First Overnight.

HOLD Saturday
FedEx location address
REQUIRED. Available ONLY for
FedEx Priority Overnight and
FedEx 2Day to select locations.



8041 1922 6997

4 Express Package Service

* To most locations

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs.
For packages over 150 lbs. use the
FedEx Express Freight US Airbill.

Next Business Day

☐ FedEx First Overnight
Earliest next business morning delivery to select
locations. Friday shipments will be delivered on
Monday unless SATURDAY Delivery is selected.

☐ FedEx Priority Overnight
Next business morning. Friday shipments will be
delivered on Monday unless SATURDAY Delivery
is selected.

☐ FedEx Standard Overnight
Next business afternoon. Saturday Delivery NOT available.

2 or 3 Business Days

☐ FedEx 2Day A.M.
Second business morning. Saturday Delivery NOT available.

☐ FedEx 2Day
Second business afternoon. Thursday shipments
will be delivered on Monday unless SATURDAY
Delivery is selected.

☐ FedEx Express Saver
Third business day. Saturday Delivery NOT available.

5 Packaging

* Declared value limit \$500.

☐ FedEx Envelope* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☐ Other

6 Special Handling and Delivery Signature Options

☐ SATURDAY Delivery
NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ No Signature Required
Package may be left without
obtaining a signature for delivery.

☐ Direct Signature
Recipient at recipient's address
may sign for delivery. Fee applies.

☐ Indirect Signature
If no one is available at recipient's
address, someone at a neighboring
address may sign for delivery. For
residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?

One box must be checked.
☐ No ☐ Yes As per attached Shipper's Declaration ☐ Yes Shipper's Declaration not required
Dry Ice, 9 UN 1845 ☐ X ☐ Cargo Aircraft Only
Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

7 Payment Bill to:

Enter FedEx Acct. No. or Credit Card No. below:

Sender ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check
Total Packages 13 Total Weight [Redacted] Credit Card Auth. [Redacted]

*Our liability is limited to \$5000 unless you declare a higher value. See the current FedEx Service Guide for details.



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ALS Environmental

10450 Stancliff Rd., Ste. 210
Houston, TX 77059-4338
Tel. +1 281 530 5887
Fax. +1 281 530 5887

CUS

Date: 9/15/13
Name: [Redacted]
Company: [Redacted]

TODY SEAL

Time: 1:00
RIGGERS
ARCADIS

JPB
9/15/13



Package
US Airbill

FedEx
Tracking
Number

8020 3307 1054

1 From
Date 5/15/13
Sender's Name MALLOREY BAILEY
Phone 713 999-1420
Company ARCADIS US
Address 2489 BRIARWALK DR.
HOUSTON TX 77042
City HOUSTON State TX ZIP 77042

2 Your Internal Billing Reference

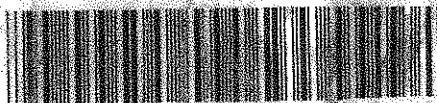
3 To
Recipient's Name CLIENT SERVICES
Phone 281 530-3656

Company ALS LABORATORY GROUP

Address 10450 STANCLIFF RD STE 210
Dept./Floor/Suite/Room

City HOUSTON State TX ZIP 77099-4335

HOLD Weekday
FedEx location address
REQUIRED. NOT available for
FedEx First Overnight.
HOLD Saturday
FedEx location address
REQUIRED. Available only for
FedEx Priority Overnight and
FedEx 2Day to select locations.



8020 3307 1054

0215 Recipient's Copy

4 Express Package Service
NOTE: Service order has changed. Please select carefully.
Packages up to 150 lbs.
For packages over 150 lbs., use the
FedEx Express Freight US Airbill.

Next Business Day
FedEx First Overnight
FedEx Priority Overnight
FedEx Standard Overnight
2nd Business Day
FedEx 2Day A.M.
FedEx 2Day
FedEx Express Saver

5 Packaging
Declared value limit \$500.
FedEx Envelope*
FedEx Pak*
FedEx Box
FedEx Tube
Other

6 Special Handling and Delivery Signature Options

SATURDAY Delivery
No Signature Required
Direct Signature
Indirect Signature

Does this shipment contain dangerous goods?
One box must be checked.
No
Yes
Dry Ice
Cargo Aircraft Only

7 Payment Bill to:

Sender
Recipient
Third Party
Credit Card
Cash/Check

Total Packages
Total Weight
Credit Card Auth.

Our liability is limited to \$500 unless you declare a higher value. See the current FedEx Service Guide for details.

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31
CUSTODY SEAL
Date: 5/15/13 Time: 11:00
Name: BERGERSEN
Company: ARCADIS

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel: 281 530 5656
Fax: 281 530 5857



September 25, 2013

Ms. Sonja West
ALS Environmental
10450 Stancliff Rd, Suite 210
Houston, TX 77099

Re: ALS Workorder: 13-09-098
Project Name: None Submitted
Project Number: 1309249

Dear Ms. West:

Eight water samples were received from ALS Environmental on September 10, 2013. The samples were scheduled for the following analyses:

Radium-226
Radium-228

The results for these analyses are contained in the enclosed report.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Jeff Kujawa
Project Manager

JRK/mlc
Enclosure (s): Report

ADDRESS 225 Commerce Drive, Fort Collins, Colorado, USA 80524 PHONE +1 970 490 1511 FAX +1 970 490 1522

ALS GROUP USA, CORP. Part of the ALS Laboratory Group An ALS Limited Company



www.alsglobal.com



1309098

Radium-228:

The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to the current revision of SOP 724.

All acceptance criteria were met.

Radium-226:

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Laboratory Certifications	
Accreditation Body	License or Certification Number
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Maryland (MD)	285
Missouri	175
Nebraska	NE-OS-24-13
Nevada (NV)	CO000782008A
New Jersey (NJ)	CO003
North Dakota (ND)	R-057
Oklahoma	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241-09-1
Utah (UT)	CO01099
Washington	C1280

Revised 8/15/2013

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1309098

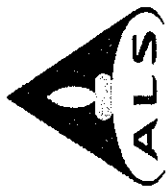
Client Name: ALS Environmental

Client Project Name:

Client Project Number: 1309249

Client PO Number: 10-1309249

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
MW-114	1309098-1		WATER	05-Sep-13	9:30
MW-115	1309098-2		WATER	04-Sep-13	17:10
MW-116	1309098-3		WATER	04-Sep-13	15:20
MW-117	1309098-4		WATER	04-Sep-13	9:50
MW-118	1309098-5		WATER	04-Sep-13	12:00
MW-119	1309098-6		WATER	04-Sep-13	13:30
RO-DISCHARGE	1309098-7		WATER	05-Sep-13	11:00
DUP-01	1309098-8		WATER	04-Sep-13	



Subcontractor:
ALS Environmental
225 Commerce Drive
Fort Collins, CO 80524

TEL: (800) 443-1511
FAX: (970) 490-1522
Acct #:

Salesperson Houston House Acct

CHAIN-OF-CUSTODY RECORD

Date: 07-Sep-13
COC ID: 14873
Due Date 13-Sep-13

Page 1 of 1
1309098

Customer Information		Project Information		Parameter/Method Request for Analysis												
Purchase Order	WO#1309249	Project Name	1309249	A Radium 226 228 Sub to ALS Ft. Collins												
Work Order		Project Number		B												
Company Name	ALS Group USA, Corp.	Bill To Company	ALS Group USA, Corp.	C												
Send Report To	Sonia West	Inv Attn	Accounts Payable	D												
Address	10450 Stancliff Rd, Suite 210	Address	10450 Stancliff Rd, Suite 210	E												
				F												
City/State/Zip	Houston, Texas 77099-4338	City/State/Zip	Houston, Texas 77099-4338	G												
Phone	(281) 530-5656	Phone	(281) 530-5656	H												
Fax	(281) 530-5887	Fax	(281) 530-5887	I												
eMail Address	Sonia.West@alsglobal.com	eMail CC	jumoke.lawal@alsglobal.com	J												
Sample ID	Matrix	Collection Date	24hr	Bottle	A	B	C	D	E	F	G	H	I	J		
1309249-01H (MW-114)	Water	5/Sep/2013	9:30	(2) 1LPHNO3	X											
1309249-02H (MW-115)	Water	4/Sep/2013	17:10	(2) 1LPHNO3	X											
1309249-03H (MW-116)	Water	4/Sep/2013	15:20	(2) 1LPHNO3	X											
1309249-04H (MW-117)	Water	4/Sep/2013	9:50	(2) 1LPHNO3	X											
1309249-05H (MW-118)	Water	4/Sep/2013	12:00	(2) 1LPHNO3	X											
1309249-06H (MW-119)	Water	4/Sep/2013	13:30	(2) 1LPHNO3	X											
1309249-07H (RO DISCHARGE)	Water	5/Sep/2013	11:00	(2) 1LPHNO3	X											
1309249-08H (DUP-01)	Water	4/Sep/2013		(2) 1LPHNO3	X											

Comments:

Wo#1309249. Due on 9/13/13. Please analyze for Radium 226/228.

Relinquished by:

Date/Time

Received by:

Date/Time

Cooler IDs

Report/QC Level

Relinquished by:

Date/Time

Received by:

Date/Time

Cooler IDs

Report/QC Level



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS-TX
Project Manager: JK

Workorder No: 1309098
Initials: CDT Date: 9-10-13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	☒ NO
2. Are custody seals on shipping containers intact?	NONE	☒ YES	NO
3. Are Custody seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		☒ YES	NO
5. Are the COC and bottle labels complete and legible?		☒ YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		☒ YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	☒ YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	☒ YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	☒ N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		☒ YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		☒ YES	NO
12. Are all samples within holding times for the requested analyses?		☒ YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		☒ YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	☒ N/A	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	☒ NO
16. Were the samples shipped on ice?		YES	☒ NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	☒ RAD ONLY	YES	☒ NO

Cooler #: 1
Temperature (°C): Am b
No. of custody seals on cooler: 2
External µR/hr reading: 11
Background µR/hr reading: 10

DOT Survey Acceptance Information

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? ☒ YES ☐ NO ☐ NA (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / ☒ NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: _____

JK 9-11-13

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE
ACTWGT: 50
CAD: 300130
DIMS: 26x14x
BILL SENDER

2911
09:10
A

TO **KEN CAMPBELL**
ALS ENVIRONMENTAL
225 COMMERCE DRIVE

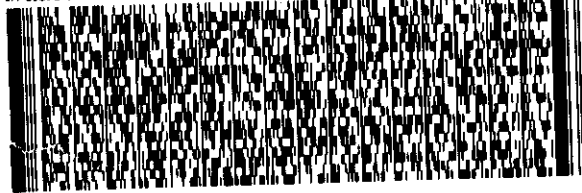
FORT COLLINS CO 80524

(970) 490-1511

REF: (SUBCONTRACT) PMG

1389098

11 2



FedEx
Express



J13111305230126

TRK# 4340 2177 2911
0201

TUE - 10 SEP 10:30A
PRIORITY OVERNIGHT

AG FTCA

80524
CO-US DEN

1389098-4340-2177-2911



F dhw= ALS Environmental

G dwh= 25-Sep-13

Sumhfw= 1309249

Z run R ughu= 1309098

Vdp sch IG= MW-114

Ode IG= 1309098-1

OhjdoOrfdwlrq=

P dwul{= WATER

F rdnfwlrq G dwh= 9/5/2013 09:30

ShufhwP r lwxuh=

D qdq vrv	U hvxow	T xdo	U hsrw O lp lw	X qlw	G lxxwlrq I dfvru	G dwhD qdq }hg
------------	---------	-------	-------------------	-------	----------------------	-----------------

RA-226 BY RADON EMANATION - METHOD 903.1**PAI 783**Prep Date: **9/16/2013**PrepBy: **PJW**

Ra-226 0.37 (+/- 0.24) LT

0.21 pCi/l

NA

9/24/2013 12:51

Carr: *BARIUM*

90.1

40-110 %REC

NA

9/24/2013 12:51

RADIUM-228 ANALYSIS BY GFPC**PAI 724**Prep Date: **9/14/2013**PrepBy: **JTL**

Ra-228 0.62 (+/- 0.3) LT

0.52 pCi/l

NA

9/17/2013 11:24

Carr: *BARIUM*

90.1

40-110 %REC

NA

9/17/2013 11:24

F dhw= ALS Environmental

G dhw= 25-Sep-13

Sumhfw= 1309249

Z run R ughu= 1309098

Vdp sch IG= MW-115

Ode IG= 1309098-2

OhjdoOrfdwlrq=

P dwul{= WATER

F rnfwrq G dhw= 9/4/2013 17:10

ShufhwP r lwxuh=

D qdq vrv	Uhxow	T xdo	Uhsruw Olp lw	Xqlw	G lxxwlrq Idfvru	G dhwD qdq hg
------------	-------	-------	------------------	------	---------------------	----------------

RA-226 BY RADON EMANATION - METHOD 903.1**PAI 783**Prep Date: **9/16/2013**PrepBy: **PJW**

Ra-226 ND (+/- 0.15) U

0.26 pCi/l

NA

9/24/2013 12:51

Carr: *BARIUM*

95.8

40-110 %REC

NA

9/24/2013 12:51

RADIUM-228 ANALYSIS BY GFPC**PAI 724**Prep Date: **9/14/2013**PrepBy: **JTL**

Ra-228 ND (+/- 0.22) U

0.47 pCi/l

NA

9/17/2013 11:24

Carr: *BARIUM*

95.8

40-110 %REC

NA

9/17/2013 11:24

F dhw= ALS Environmental
 Sumhfw= 1309249
 Vdp sch IG = MW-116
 OhjdoOrfdwlrq=
 F rnfwrq G dwh= 9/4/2013 15:20

G dwh= 25-Sep-13
 Z run Rughu= 1309098
 Ode IG = 1309098-3
 P dwl{= WATER
 ShufhwP rlxuh=

D qdq vrv	Uhxow	T xdo	Uhsruw Olp lw	Xqlw	G lxwlrq Idfvr	G dwhD qdq hg
------------	-------	-------	------------------	------	-------------------	----------------

RA-226 BY RADON EMANATION - METHOD 903.1

Ra-226 ND (+/- 0.17) U
 Carr: BARIUM 87

PAI 783

0.25 pCi/l
 40-110 %REC

Prep Date: **9/16/2013**PrepBy: **PJW**

NA 9/24/2013 12:51
 NA 9/24/2013 12:51

RADIUM-228 ANALYSIS BY GFPC

Ra-228 ND (+/- 0.26) U
 Carr: BARIUM 87

PAI 724

0.53 pCi/l
 40-110 %REC

Prep Date: **9/14/2013**PrepBy: **JTL**

NA 9/17/2013 11:24
 NA 9/17/2013 11:24

F d hq w= ALS Environmental

G d w= 25-Sep-13

Sum h f w= 1309249

Z run R ughu= 1309098

Vdp sch IG = MW-117

Ode IG = 1309098-4

Ohj do O r f d w l r q =

P d w l { = WATER

F r a n h f w l r q G d w = 9/4/2013 09:50

Shuf h q w P r l w x u h =

D q d d v i v	U h v x o w	T x d o	U h s r u w	O l p l w	X q l w	G l o x w l r q	I d f v r u	G d w h D q d d } h g
-----------------	-------------	---------	-------------	-----------	---------	-----------------	-------------	-------------------------

RA-226 BY RADON EMANATION - METHOD 903.1**PAI 783**Prep Date: **9/16/2013**PrepBy: **PJW**

Ra-226 0.2 (+/- 0.16) LT

0.08 pCi/l

NA

9/24/2013 12:51

Carr: *BARIUM*

93.6

40-110 %REC

NA

9/24/2013 12:51

RADIUM-228 ANALYSIS BY GFPC**PAI 724**Prep Date: **9/14/2013**PrepBy: **JTL**

Ra-228 0.74 (+/- 0.36) LT

0.62 pCi/l

NA

9/17/2013 11:41

Carr: *BARIUM*

93.6

40-110 %REC

NA

9/17/2013 11:41

F d hq w= ALS Environmental
 Sum hfw= 1309249
 Vdp sch IG= MW-118
 Ohj doO rfdw lrg=
 F r d hfw lrg G d h= 9/4/2013 12:00

G d h= 25-Sep-13
 Z run R ughu= 1309098
 Ode IG= 1309098-5
 P dw l{= WATER
 Shuf hq wP r l w kuh=

D q d d v h v	U h v x o w	T x d o	U h s r u w	O l p l w	X q l w	G l o x w l r g	I d f v r u	G d h D q d d h g
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RA-226 BY RADON EMANATION - METHOD 903.1

Ra-226 ND (+/- 0.14) U
 Carr: BARIUM 88.1

PAI 783

0.21 pCi/l
 40-110 %REC

Prep Date: **9/16/2013**PrepBy: **PJW**

NA 9/24/2013 12:51
 NA 9/24/2013 12:51

RADIUM-228 ANALYSIS BY GFPC

Ra-228 0.64 (+/- 0.34) LT
 Carr: BARIUM 88.1

PAI 724

0.6 pCi/l
 40-110 %REC

Prep Date: **9/14/2013**PrepBy: **JTL**

NA 9/17/2013 11:41
 NA 9/17/2013 11:41

F d hq w= ALS Environmental

G d w= 25-Sep-13

Sum h f w= 1309249

Z run R u g h u= 1309098

V d p s c h I G = MW-119

O d e I G = 1309098-6

O h j d o r f d w l r q =

P d w l { = WATER

F r a n f w l r q G d w = 9/4/2013 13:30

S h u f h q w P r l w x u h =

D q d d v i v	U h v x o w	T x d o	U h s r u w	O l p l w	X q l w	G l o x w l r q	I d f v r u	G d w h D q d d } h g
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RA-226 BY RADON EMANATION - METHOD 903.1**PAI 783**Prep Date: **9/16/2013**PrepBy: **PJW**

Ra-226 0.17 (+/- 0.15) LT

0.08 pCi/l

NA

9/24/2013 12:51

Carr: *BARIUM*

93.3

40-110 %REC

NA

9/24/2013 12:51

RADIUM-228 ANALYSIS BY GFPC**PAI 724**Prep Date: **9/14/2013**PrepBy: **JTL**

Ra-228 ND (+/- 0.28) U

0.64 pCi/l

NA

9/17/2013 11:41

Carr: *BARIUM*

93.3

40-110 %REC

NA

9/17/2013 11:41

F d h g w = ALS Environmental
 Sum h f w = 1309249
 V d p s c h I G = RO-DISCHARGE
 O h j d o r f d w l r g =
 F r a n f w l r g G d w h = 9/5/2013 11:00

G d w h = 25-Sep-13
 Z r u n R u g h u = 1309098
 O d e I G = 1309098-7
 P d w l { = WATER
 S h u f h g w P r l w x u h =

D q d d v i v	U h v x o w	T x d o	U h s r u w O l p l w	X q l w	G l o x w l r g I d f v r u	G d w h D q d d } h g
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RA-226 BY RADON EMANATION - METHOD 903.1

Ra-226 0.46 (+/- 0.28) LT
 Carr: BARIUM 90.5

PAI 783

0.23 pCi/l
 40-110 %REC

Prep Date: **9/16/2013**PrepBy: **PJW**

NA 9/24/2013 12:51
 NA 9/24/2013 12:51

RADIUM-228 ANALYSIS BY GFPC

Ra-228 ND (+/- 0.29) U
 Carr: BARIUM 90.5

PAI 724

0.57 pCi/l
 40-110 %REC

Prep Date: **9/14/2013**PrepBy: **JTL**

NA 9/17/2013 11:41
 NA 9/17/2013 11:41

F dhw= ALS Environmental
 Sumhfw= 1309249
 Vdp sch IG = DUP-01
 OhjdoOrfdwlrq=
 F rnfwrq G dwh= 9/4/2013

G dwh= 25-Sep-13
 Z run Rughu= 1309098
 Ode IG = 1309098-8
 P dwl{= WATER
 ShufhwP rlxuh=

D qdq vrv	Uhxow	T xdo	Uhsruw Olp lw	Xqlw	G lxwlrq Idfvru	G dwhD qdq hg
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RA-226 BY RADON EMANATION - METHOD 903.1

Ra-226 0.28 (+/- 0.22) LT
 Carr: BARIUM 91.5

PAI 783

0.26 pCi/l
 40-110 %REC

Prep Date: **9/16/2013**PrepBy: **PJW**

NA 9/24/2013 12:51
 NA 9/24/2013 12:51

RADIUM-228 ANALYSIS BY GFPC

Ra-228 ND (+/- 0.25) U
 Carr: BARIUM 91.5

PAI 724

0.54 pCi/l
 40-110 %REC

Prep Date: **9/14/2013**PrepBy: **JTL**

NA 9/17/2013 11:41
 NA 9/17/2013 11:41

F dhw= ALS Environmental
 Sumthfw= 1309249
 Vdp sch IG = DUP-01
 OhjdoOrfdwlrq=
 F rdnfwlrq G dwh= 9/4/2013

G dwh= 25-Sep-13
 Z run R ughu= 1309098
 Ode IG = 1309098-8
 P dwl{= WATER
 Shufhgwp r lwxuh=

D qdq vrv	U hvxow	T xdo	U hsrw O lp lw	X qlw	G lxwlrq I dfvru	G dwh D qdq }hg
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H {sdlqdwlrq ri T xddiluv

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

Diesel Range Organics:

F d hq w= ALS Environmental
 Sum h f w= 1309249
 V d p s c h I G = DUP-01
 O h j d o r f d w l r q =
 F r o n f w l r q G d w h= 9/4/2013

G d w h= 25-Sep-13
 Z r u n R u g h u= 1309098
 O d e I G = 1309098-8
 P d w l { = WATER
 S h u f h q w P r l w x u h =

D q d d \ v i v	U h v x o w	T x d o	U h s r u w	O l p l w	X q l w	G l o x w l r q	I d f v r u	G d w h D q d d \ } h g
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G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline

- JP-8

- diesel

- mineral spirits

- motor oil

- Stoddard solvent

- bunker C

ALS Environmental -- FC

G dwh= 9/25/2013 9:24:

F dhw= ALS Environmental
Z run R ughu= 1309098
Sumthfw= 1309249

T F EDWFK UHSRUW

Batch ID: **RE130916-1-1** Instrument ID: **Alpha Scin** Method: **Ra-226 by Radon Emanation - Me**

LCS	Sample ID: RE130916-1				Units: pCi/l		Analysis Date: 9/24/2013 12:51			
Client ID:	Run ID: RE130916-1A				Prep Date: 9/16/2013		DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-226	26.2 (+/- 6.7)	0.2	29.99		87.4	67-120				P
Carr: BARIUM	32620		34440		94.7	40-110				

LCSD	Sample ID: RE130916-1				Units: pCi/l		Analysis Date: 9/24/2013 13:07			
Client ID:	Run ID: RE130916-1A				Prep Date: 9/16/2013		DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-226	26 (+/- 6.6)	0.3	29.99		86.8	67-120	26.2	0.0202	2.13	P
Carr: BARIUM	31760		34430		92.2	40-110	32620			

MB	Sample ID: RE130916-1				Units: pCi/l		Analysis Date: 9/24/2013 12:51			
Client ID:	Run ID: RE130916-1A				Prep Date: 9/16/2013			DF: NA		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-226	ND	0.37								U
Carr: BARIUM	30200		34430		87.7	40-110				

The following samples were analyzed in this batch:

1309098-1	1309098-2	1309098-3
1309098-4	1309098-5	1309098-6
1309098-7	1309098-8	

F d h g w = ALS Environmental
Z r u n R u g h u = 1309098
S u m m f w = 1309249

T F E D W F K U H S R U W

Batch ID: **RA130912-1-2** Instrument ID: **LB4100-B** Method: **Radium-228 Analysis by GFPC**

LCS		Sample ID: RA130912-1				Units: pCi/l		Analysis Date: 9/17/2013 11:24			
Client ID:		Run ID: RA130912-1A				Prep Date: 9/14/2013		DF: NA			
Analyte		Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-228		10.1 (+/- 2.4)	0.5	9.511		106	70-130				P
Carr: BARIUM		32620		34440		94.7	40-110				

LCSD		Sample ID: RA130912-1				Units: pCi/l		Analysis Date: 9/17/2013 11:24			
Client ID:		Run ID: RA130912-1A				Prep Date: 9/14/2013		DF: NA			
Analyte		Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-228		10.6 (+/- 2.5)	0.5	9.511		112	70-130	10.1	0.152	2.13	P
Carr: BARIUM		31760		34430		92.2	40-110	32620			

MB		Sample ID: RA130912-1				Units: pCi/l		Analysis Date: 9/17/2013 11:41			
Client ID:		Run ID: RA130912-1A				Prep Date: 9/14/2013		DF: NA			
Analyte		Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	DER Ref Value	DER	DER Limit	Qual
Ra-228		ND	0.57								U
Carr: BARIUM		30200		34430		87.7	40-110				

The following samples were analyzed in this batch:

1309098-1	1309098-2	1309098-3
1309098-4	1309098-5	1309098-6
1309098-7	1309098-8	