GW - 040

PARTIAL CLOSURE REQUEST

2019

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, July 19, 2019 4:34 PM
To: Robinson, Kelly
Cc: McCartney, Gregory J.; Griswold, Jim, EMNRD
Subject: RE: PRIORITY - Request Permission to Plug GBR-51 (Permit GW-40)

Kelly:

Approved. OCD will update the New Mexico Oil Conservation Division (OCD) administrative record for "GW-40" to reflect this monitoring well change.

Thank you for notifying OCD.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

From: Robinson, Kelly <Kelly.Robinson@andeavor.com>
Sent: Friday, July 19, 2019 4:28 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>
Subject: [EXT] PRIORITY - Request Permission to Plug GBR-51 (Permit GW-40)

Good Afternoon Sir!

Thank you for talking with me this afternoon. As discussed, Western Refining is requesting permission to plug and abandon GBR-51 to accommodate the on-going NMDOT construction activities near the former GBR Facility. Western was contacted by NMDOT this afternoon to inform us that monitoring well GBR-51 is within the active construction area and needs to be plugged immediately so as to not impede field activities. Western has been provided approval by the New Mexico Office of the State Engineer (OSE) to perform the field work. The plugging and abandonment work will be conducted in accordance with OSE requirements.

Western appreciates NMOCD's consideration of this request. Please let me know if you have any questions or need additional information.

Thank you for your time!

Kelly R. Robinson | **Environmental Supervisor– Terminalling, Transportation and Storage**
Andeavor | 111 County Road 4990, Bloomfield, NM 87413
Office: 505.632.4166 | Mobile: 505.801.5616 | Kelly.Robinson@andeavor.com

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, May 9, 2019 3:21 PM
To: Devin Hencmann
Cc: gjmccartney@marathonpetroleum.com; Ashley Ager; Griswold, Jim, EMNRD
Subject: RE: [EXT] Correspondence Letter For GW-040 Partial Remediation System Closure Request Meeting
Attachments: 20.006.0002New Final.pdf

Mr. Hencmann:

The New Mexico Oil Conservation Division (OCD) hereby concurs with the "Partial Remediation System Closure Request" of 3/22/2019 below.

To address the intent to establish "background" concentrations for constituents of concern, OCD requires additional supporting statistical documentation for Table 1 Constituents of Concern background groundwater values. In addition, OCD requires that another similar statistical evaluation be performed and submitted with supporting statistical documentation with "ND" values defaulting to the "Quantitation Limit" instead of the Table 1 values for comparison and further evaluation of background levels.

Please submit the above to OCD within 30 days of receipt of this message or by COB on 6/10/19. I have attached the WQCC Regulations containing the 20.6.2.3103 NMAC water quality standards.

Please contact me if you have questions. Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
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From: Devin Hencmann <dhencmann@ltenv.com>
Sent: Friday, March 22, 2019 4:42 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: gjmccartney@marathonpetroleum.com; Ashley Ager <aager@ltenv.com>
Subject: [EXT] Correspondence Letter For GW-040 Partial Remediation System Closure Request Meeting

Carl,

The attached letter is being submitted in response to our meeting on February 26, 2019 discussing the Giant Former Refinery (GW-040) Partial Remediation System Closure Request.
Please let me know if you have any questions.

Thank you,
Devin

LT Environmental, Inc.
Advancing Opportunity

Devin Hencmann
Project Geologist
(970) 385-1096 office
(970) 403-6023 cell
848 East 2nd Avenue, Durango CO 81301
www.ltenv.com

Chavez, Carl J, EMNRD

From: Devin Hencmann <dhencmann@ltenv.com>
Sent: Friday, March 22, 2019 4:42 PM
To: Chavez, Carl J, EMNRD
Cc: gjmccartney@marathonpetroleum.com; Ashley Ager
Subject: [EXT] Correspondence Letter For GW-040 Partial Remediation System Closure Request Meeting
Attachments: 2019 NMOCD GW-040 Correspondence letter.pdf

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The attached letter is being submitted in response to our meeting on February 26, 2019 discussing the Giant Former Refinery (GW-040) Partial Remediation System Closure Request.
Please let me know if you have any questions.

Thank you,
Devin

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LT Environmental, Inc.
848 East 2nd Avenue
Durango, Colorado 81301
970.385.1096

March 22, 2019

Mr. Carl Chavez
Environmental Engineer, New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: GW-040 Partial Remediation System Closure Request Meeting Correspondence

Dear Mr. Chavez:

This correspondence is in response to the meeting held on February 26, 2019, attended by Ashley Ager (LT Environmental), Devin Hencmann (LT Environmental), Greg McCartney (Marathon Petroleum and Western Refining Southwest, Inc.) via telephone, and Carl Chavez (New Mexico Oil Conservation Division), regarding the Partial Remediation System Closure Request dated November 27, 2018 and submitted to the New Mexico Oil Conservation Division (NMOCD) on February 15, 2019 for discharge permit GW-040 associated with the Giant former Bloomfield Refinery. In the partial closure request, Western Refining Southwest, Inc. (Western) requested permission to remove all infrastructure associated with a portion of the remediation system located south of United States (US) Highway 64, and to plug and abandon monitoring wells SHS-6, SHS-8, SHS-9, SHS-10, SHS-12, SHS-13, SHS-14, SHS-15, SHS-16, SHS-17, SHS-18, and SHS-19. NMOCD was in general agreement with the proposed actions, including decommissioning of the remediation infrastructure and plugging and abandoning most of the monitoring wells. NMOCD requested that Western leave two monitoring points in place and consider a statistical analysis of background conditions to propose analytical parameters for future monitoring.

During the meeting, the NMOCD expressed concern about constituents exceeding New Mexico Water Quality Control Commission (NMWQCC) standards in historical groundwater samples. Constituents that exceeded NMWQCC standards included chloride, sulfate, iron, manganese, chromium, and total dissolved solids. These constituents are observed in excess of NMWQCC standards in upgradient monitoring wells GBR-32, GBR-48, GBR-49, and GBR-50 (Figure 1). LTE conducted a statistical analysis of laboratory analytical results from ten years of groundwater monitoring in the upgradient wells for the following analytes: chloride, iron, sulfate, total dissolved solids, chromium, and manganese. ProUCL, a software developed by the Environmental Protection Agency (EPA) for use with nondetect data samples, was applied to calculate statistical limits of the historical data and establish a background concentration value.

The data were evaluated for fit to normal, lognormal, or non-parametric (if neither normal or lognormal) distributions. That information was then used to calculate the Upper Tolerance Limit at 95% Confidence Level (95% UTL), based on distribution and presence of non-detects, to be used as not-to-exceed background concentrations for each of the six analytes. Results of the statistical analysis and proposed background concentrations are presented in Table 1. No detected concentrations in historical samples collected from SHS wells exceeded the background 95% UTL for the six analytes.

The NMOCD also noted detections of total petroleum hydrocarbons (TPH) observed in groundwater samples collected from monitoring wells SHS-8, SHS-9, and SHS-13 on January 23, 2018. Based on those detections, maintaining at least two monitoring points was recommended. In response, LTE proposes leaving SHS-9 and SHS-13 in place and sampling groundwater from each well on a semi-annual basis. SHS-8 contains obstructions in the well which prevent accurate data collection. SHS-9 is located in close proximity to SHS-8 (Figure 1) and will serve as an adequate monitoring point for the area immediately south of Highway 64. Monitoring of SHS-9 and SHS-13 will allow for the detection of any residual groundwater impact. Since there is no NMWQCC regulatory standard for TPH and all other parameters that have historically exceeded NMWQCC standards are below the statistically derived background concentrations, LTE proposes analyzing those groundwater samples for volatiles according to EPA method 8260B.

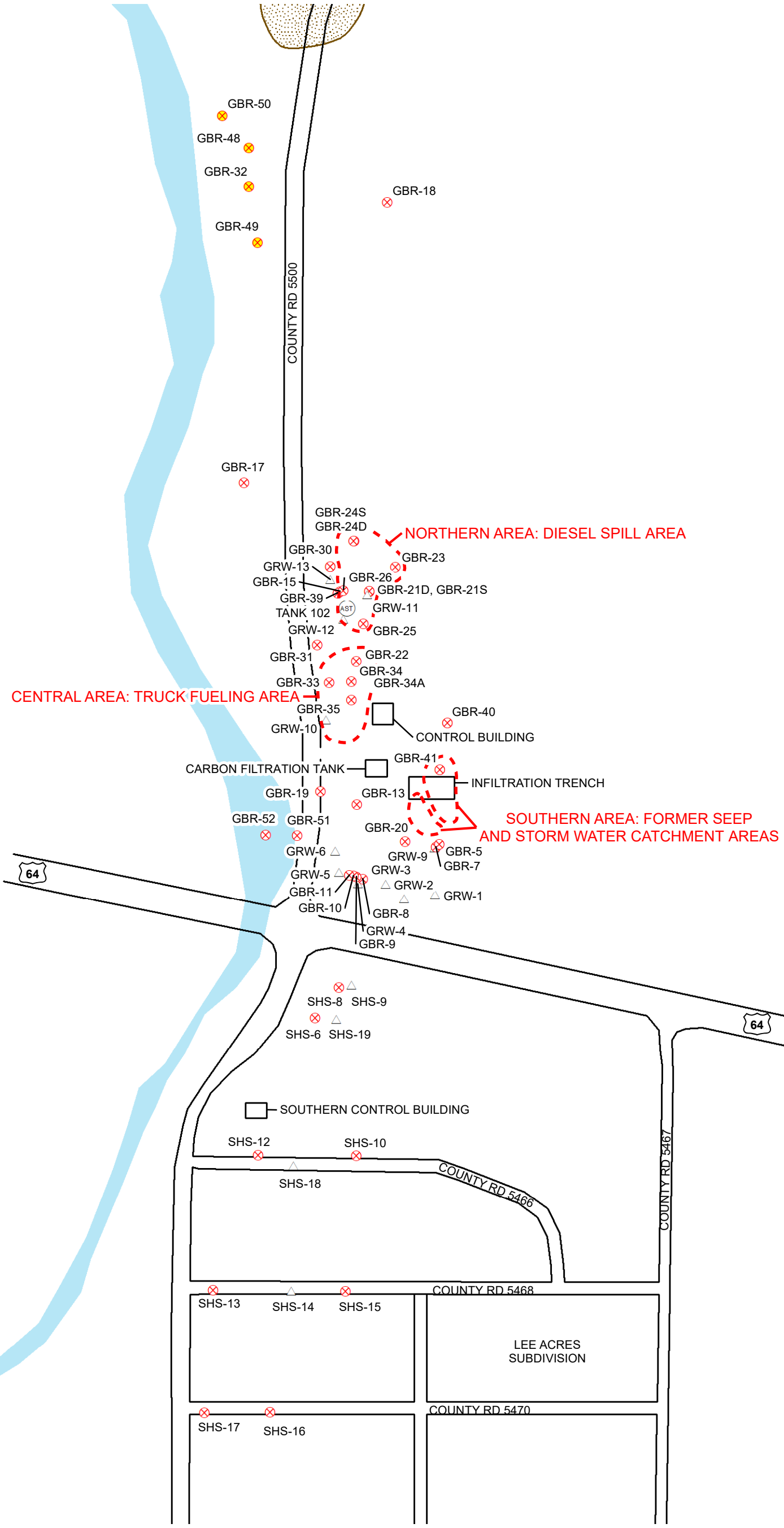
Upon approval of the revisions proposed above, all SHS monitoring wells except SHS-9 and SHS-13 will be plugged in accordance with 19.27.4.30 NMAC. All remediation infrastructure will be abandoned and removed as detailed in the Partial Remediation Closure Request dated November 27th, 2019.

If you have any questions or comments regarding this correspondence, do not hesitate to contact me at (970) 385-1096 or via email at dhencmann@ltenv.com

Sincerely,

LT ENVIRONMENTAL, INC.

Devin Hencmann
Project Geologist



LEGEND

- MONITORING WELL
- UPGRADIENT WELL
- INACTIVE RECOVERY WELL
- ABOVEGROUND STORAGE TANK (AST)
- ARROYO
- FORMER LEE ACRES LANDFILL
- SOURCE AREA

0 300 600
Feet

N

FIGURE 1
SITE MAP
FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

P:\Western Refining\GIS\MXD\029518010_GBR\029518010_GIANT_FIG01_SITE.mxd

TABLE 1
BACKGROUND THRESHOLD VALUES FOR ANALYTES OBSERVED IN UPGRADIENT WELLS

GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Analyte	Units	N	% ND	Non-Detects	Detections	ND EM	Distribution	Mean	Std Deviaion	95% UTL
Chloride	mg/L	40	0	0	40	NA	Non-Parametric\Max	232.3	153.4	560
Chromium	mg/L	32	3	1	31	ROS	Lognormal	0.318	0.379	4.46
Iron	mg/L	33	6	2	31	ROS	Lognormal	16.62	33.37	261.7
Manganese	mg/L	24	0	0	24	NA	Lognormal	0.765	1.578	10.63
Sulfate	mg/L	40	0	0	40	NA	Normal	1,801	351.9	2,546
Total Dissolved Solids	mg/L	40	0	0	40	NA	Normal	3,234	629	4,566

% - percent
mg/L - miligram per litre
ND - Non-detect
ND EM - Non-detect estimation method
N - total number of observations
ROS - Regression on order statistics
UTL - Upper Tolerance Limit

Western Refining

WNR LISTED NYSE

February 15, 2019

Jim Griswold
New Mexico Oil Conservation Division
Environmental Bureau
1220 South St. Francis Dr.
Santa Fe, NM 87505

FEDEX delivery to OCD

Re: 2018 Annual Report and Partial Remediation System Closure Request
Former Giant Bloomfield Refinery
Bloomfield, New Mexico
OCD Discharge Permit GW-040

Dear Mr. Griswold:

Western Refining Southwest, Inc. (WRSWI) submits the 2018 Annual Report and Partial Remediation System Closure Request for the former Giant Bloomfield Refinery. The Annual Report summarizes groundwater monitoring and remediation activities in 2018.

As discussed previously, the remediation system located south of the US Highway 64 was shutdown prior to 2007 because cleanup goals had been achieved. NMDOT plans to improve the highway intersection. The Partial Remediation System Closure Request proposes to abandon the system under the highway and in the neighborhood to the south.

If you have questions or would like to discuss any aspect of the submittals, please contact Gregory McCartney at (419) 421-2338.

Sincerely,

Allen S. Hains

ALLEN S. HAINS
Manager Remediation Projects
Western Refining Southwest, Inc.

Enc.

LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
970.385.1096

November 27, 2018

Mr. Allen Hains
Western Refining Southwest, Inc.
212 N. Clark Street
El Paso, Texas 79905

RE: Partial Remediation System Closure Request
Former Giant Bloomfield Refinery
Discharge Permit GW-040
Western Refining Southwest, Inc.
Bloomfield, San Juan County, New Mexico

Dear Mr. Hains:

LT Environmental, Inc. (LTE) is providing the following information to support a request for closure of a portion of a remediation system at the above-referenced site on behalf of Western Refining Southwest, Inc. (Western). This request relates to the former Giant Bloomfield Refinery (Site) in Bloomfield, San Juan County, New Mexico. The Site is operated by Western and currently regulated by the New Mexico Oil Conservation Division (NMOCD) under a Discharge Permit (GW-040). This request is for closure of a portion of the remediation system located south of United States (US) Highway 64 and south of the Site and referred to as the SHS Area of the remediation system.

SITE DESCRIPTION

The Site is on the northeast corner of US Highway 64 and County Road 350, approximately five miles west of Bloomfield, New Mexico, in the southwest quarter of Section 22 and the northwest quarter of Section 27, Township 29 North, Range 12 West in San Juan County, New Mexico (Figure 1). Components of the former remediation system remaining on site include two control buildings, two carbon filtration tanks, an aboveground storage tank, an infiltration trench, groundwater monitoring wells, and groundwater recovery wells (Figure 2). The SHS Area of the remediation system at the Site consists of monitoring wells, fluid recovery wells, piping, and a small control building housing a piping manifold.

The SHS Area system was operated to recover free-phase petroleum hydrocarbons and impacted groundwater detected historically south of US Highway 64. The system components are located along the south side of US Highway 64 within New Mexico Department of Transportation (NMDOT) and San Juan County road right-of-ways and on private property not owned by Western. The area is referred to as the Lee Acres Subdivision and is a residential area comprised of single-family homes. Recovered fluid was previously pumped from recovery wells and

transferred to storage and treatment system components located north of US Highway 64. Included in the SHS Area system were 4 recovery wells and 13 monitoring wells. The remediation/groundwater recovery system was shut down in August 2015 and static monitoring has occurred since that time. During 2017, due to highway construction activity being conducted by NMDOT, monitoring wells SHS-1 through SHS-5 located in the construction area immediately south of US Highway 64 were abandoned. Details of the abandonment of monitoring wells SHS-1 through SHS-5 are in the *2017 Annual Report* for the Giant Bloomfield Refinery. This closure request includes 4 recovery wells, the remaining 8 monitoring wells, subsurface interconnecting piping, piping connecting the SHS Area system wells to the treatment components located north of US Highway 64, and the piping manifold control building with associated components.

Groundwater monitoring and fluid elevation monitoring have been conducted at monitoring wells and recovery wells SHS-1 through SHS-19 periodically over the period of system operations and during post-shutdown monitoring. Sampling was completed in SHS-1 through SHS-5 in June 2017 prior to well abandonment. Additional sampling of the SHS Area wells was completed in January 2018 to support system closure.

SITE HISTORY AND BACKGROUND

The former refinery, under ownership of Giant Industries (Giant), Arizona, produced leaded and unleaded gasoline, diesel, kerosene, and other refined petroleum products from 1974 to 1982 and is currently inactive. Petroleum released from the refining operations and truck loading and unloading activities impacted groundwater, which was identified and investigated as part of the site closure requirements prescribed by the NMOCD in 1986. Details of a subsurface investigation and initial remediation efforts are included in a 1987 report entitled, *Soil and Groundwater Investigations and Remedial Action Plan, Giant Industries, Inc. Bloomfield Refinery, Bloomfield, New Mexico*. The investigation identified three source areas (Figure 2).

- Northern Area (Diesel Spill Area): 10,000 to 15,000 gallons of diesel fuel were released from a pipeline in 1985;
- Central Area (Truck Fueling Area): 15,000 gallons of diesel fuel were released from a pipeline in 1986; and
- Southern Area: Historical releases from a former firefighting drill area east and upgradient of the Site that may have collected in a former seep and a stormwater catchment area.

Concurrent with refinery operations, the former Lee Acres Landfill located upgradient of the Site operated as a San Juan County landfill from 1962 to 1986 (Figure 1). Landfill operations included solid waste disposal in trenches and a series of lagoons used for disposal of a variety of liquid wastes. The NMOCD sampled the lagoons in 1985 and demonstrated that the liquids in the impoundments contained a variety of chlorinated solvents, petroleum hydrocarbon constituents,

heavy metals, and salts. In April 1985, a breach in the dike retaining the lagoons released liquid wastes into an arroyo west of the Site. The arroyo drains south toward the Lee Acres Subdivision, where the NMOCD and the New Mexico Environment Department (NMED) identified impacted groundwater in domestic water wells in 1988. In response, the NMOCD required Giant to investigate petroleum hydrocarbon impacts to groundwater downgradient of the refinery in the Lee Acres Subdivision, and the NMED conducted a separate investigation to identify potential impacts from the landfill. The results of the subsurface investigation conducted by Giant south of the refinery are in three volumes of the 1992 report, *Remedial Investigation Report for Lee Acres Landfill*. The NMED, in conjunction with the Bureau of Land Management (BLM) and the United States Geological Survey (USGS), published their results in three reports referenced in Attachment 1 of this report.

The investigations identified two separate plumes of impacted groundwater that commingled across the refinery and flowed downgradient into the Lee Acres Subdivision. Groundwater contaminants detected in the refinery plume included phase-separated hydrocarbons (PSH) and dissolved-phase petroleum hydrocarbons. The dissolved-phase constituents included benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, and 1,2 dichloroethane (EDC). The landfill contaminant plume contained total dissolved solids (TDS), chloride, sulfate, manganese, metals, BTEX, naphthalene, 1,1 dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, tetrachloroethene (PCE), 1,1,1-trichloroethane, and trichloroethene (TCE).

Beginning in 1988, Giant installed a groundwater recovery, treatment, and disposal system in stages to restrict migration of contaminants and to remediate groundwater impacts caused by Giant's former operations. A total of 45 monitoring wells were initially installed and designated GBR monitoring wells (Figure 2). Of these 45 monitoring wells, 11 were converted to recovery wells and re-named with GRW designations. An additional 17 monitoring wells were installed in the Lee Acres Subdivision and designated as SHS Area monitoring and recovery wells. Four SHS Area wells initially operated as recovery wells. Giant pumped groundwater from the recovery wells into storage tanks, then treated the groundwater with an air stripper and carbon filtration and re-injected treated groundwater into the subsurface through two infiltration trenches. Western acquired the Site from Giant in June 2007.

As groundwater quality improved over time, the remediation system was gradually simplified and eventually shut down following extensive assessment of site conditions. The air stripper was eliminated in the 1980s once product accumulation declined. In 2008, Western conducted a supplemental evaluation of the remedial operations, which included shutting down the remediation system and sampling groundwater wells under static conditions to redefine the area of impact and assess effectiveness of the remediation system. Existing equipment was inspected and repaired to optimize performance. Results from the sampling event were included in the *2008 Annual Report* submitted to the NMOCD. Pumping and treating operations were resumed in February 2009.

Western stopped recovering groundwater south of Highway 64 in 2009 as groundwater sampling results indicated no change to contaminant concentrations. Aboveground storage of groundwater was eliminated in 2014 based on reduced groundwater recovery volumes. By 2015, the system consisted of only 9 active groundwater recovery wells that pumped groundwater directly into the carbon filtration tanks. The water then passed through the treated water infiltration trench.

Following 13 years of regular influent and effluent sampling without the detection of volatile organic compounds (VOCs), Western conducted a subsequent assessment of site groundwater conditions in 2015. Western sampled and monitored select wells to characterize groundwater under active pumping conditions, then shut down the recovery system in August 2015 to allow groundwater to equilibrate. A second sampling and monitoring event was conducted on the same groundwater monitoring wells to compare active groundwater recovery to static conditions. Assessment results indicated the remediation system had successfully remediated the groundwater impact it was originally designed to address but was no longer an effective method for remediating residual impact at the Site. As such, Western did not turn the recovery system back on, focusing instead on monitoring existing site conditions to better characterize the residual impact. Results of the assessment were included in the *2015 Annual Report*. Follow-up samples were collected after the system was turned off and groundwater conditions were allowed to equilibrate. Sampling from 11 monitoring wells under equilibrium conditions continued in March, July, and October of 2016 and were documented in the *2016 Annual Report*. These results included sampling of SHS-2, SHS-8, and SHS-19 and results indicated compliance with New Mexico Water Quality Control Commission (NMWQCC) standards for BTEX for all wells sampled, with benzene, toluene and xylenes reported below laboratory detection limits and ethylbenzene reported an order of magnitude lower than the NMWQCC standard for the SHS Area wells.

Additional monthly monitoring efforts were implemented to assess the effectiveness of remediation activities. These efforts continued in 2017 as part of an additional site investigation to understand the remaining impact at the Site. Monthly monitoring activities included measuring depth to water, depth to product, field headspace, and observing for the presence of sheen and odor in monitoring wells and former recovery wells within the facility boundary and within the SHS Area. Groundwater samples were collected from monitoring wells SHS-1, SHS-2, SHS-4, and SHS-5 prior to well abandonment. Annual groundwater compliance sampling of wells specified in Discharge Permit GW-040 were collected in December 2017 and results for the listed data collection events were documented in the *2017 Annual Report*. Sampling conducted in 2018 is described below.

SITE HYDROLOGY

The Site is located on weathered outcrops of the Nacimiento Formation, which is comprised of shales, sandstones, and siltstones of Cretaceous-Tertiary age. The San Juan River is approximately

2,000 feet south of the Site. Immediately west is a large unnamed arroyo, which is underlain by 30 feet to 60 feet of Quaternary alluvial sediments. Older Quaternary terrace deposits of cobbles and boulders were observed on the interfluvial ridges adjacent to the arroyo. These terrace deposits may have been used as fill on the Site. The outcropping surfaces of the Nacimiento Formation have been eroded to form a paleo channel that appears to be similar in morphology to the existing surface arroyo located west of the Site. The bedrock is overlain by recent alluvial deposits (gravel, sand, silt, and clay), which thicken toward the south-southwest as illustrated on the cross section on Figure 3.

The subsurface geology is a controlling feature for groundwater flow direction and potential contaminant migration. Shallow groundwater is generally unconfined with some local areas potentially under semi-confined conditions. There are two aquifers of concern that are in direct hydraulic communication: a shallow aquifer composed of recent alluvial materials and a bedrock aquifer that exists in the underlying Nacimiento Formation (Figures 3 and 4, respectively). The alluvial aquifer generally has the higher permeability of the two aquifers, and recovery wells completed within this aquifer have higher yields with larger radii of influence.

ADDITIONAL SHS AREA GROUNDWATER MONITORING 2018

To further evaluate site conditions prior to the closure request, LTE conducted sampling of SHS Area monitoring wells January 22 and 23, 2018, on behalf of Western. Fluid elevation gauging events were conducted in January and October 2018.

LTE measured depth to groundwater at 53 monitoring/recovery wells with a Keck oil-water interface probe on January 22 and 23, 2018 and in 56 monitoring wells October 10, 2018. The interface probe was decontaminated with Alconox™ soap and rinsed with de-ionized water before each measurement. Depth to groundwater measurements were used to calculate groundwater elevations at the Site to determine direction of groundwater flow.

Groundwater samples were collected on January 22 and 23, 2018, with the goal of collecting a sample from each of the remaining SHS Area wells. Samples were collected from 6 SHS Area groundwater monitoring wells and 4 SHS Area recovery wells south of Highway 64. Monitoring wells SHS-10 and SHS-12 were dry or had insufficient volume to collect a representative groundwater sample. Samples were collected from SHS-6, SHS-8, SHS-9, and SHS-13 through SHS-19.

The volume of groundwater in the wells was calculated and a minimum of three well casing volumes of groundwater was purged from each well using a small electric pump, and samples were collected using a disposable bailer. As groundwater was extracted, pH, electrical conductivity (EC), and temperature were monitored. Wells were purged until these properties stabilized or the well was bailed dry, indicating the purge water was representative of aquifer conditions. Stabilization was defined as three consecutive stable readings for each water

property (plus or minus (±) 0.4 units for pH, ±10 percent for EC, and ±2 degrees Celsius for temperature). Once each well was properly purged, groundwater samples were collected in bottles or vials and shipped to Hall Environmental Analysis Laboratory (HEAL) of Albuquerque, New Mexico.

Groundwater samples were analyzed for VOCs according to United States Environmental Protection Agency (EPA) Method 8260B, total petroleum hydrocarbon (TPH)-gasoline range organics (GRO) by EPA Method 8015D, and TPH-diesel range organics (DRO) by EPA Method 8015M/D.

JANUARY 2018 MONITORING RESULTS

PSH was not measured in the SHS Area monitoring wells in January 2018 or October 2018. Measurable PSH was observed in monitoring wells GBR-7, GBR-22, and GBR-41. The 2018 results are summarized in Table 1.

A groundwater elevation map for January 2018 is provided as Figure 5. The groundwater elevation and flow direction were consistent with historical information for the Site.

January 2018 groundwater analytical results for the SHS Area well sampling event indicated the following. The January 2018 analytical results are summarized in Table 2.

- VOCs were detected in the groundwater samples in trace concentrations that did not exceed NMWQCC standards.
    - Ethylbenzene was detected in groundwater from monitoring well SHS-9 at a concentration of 32 micrograms per liter (µg/L), more than an order of magnitude below the NMWQCC value of 750 µg/L;
    - Five petroleum-related VOCs for which a standard has not been established were detected in groundwater from monitoring well SHS-9, and one similar result was detected for SHS-19; and
    - The remaining VOC concentrations were lower than the laboratory detection limit.
- TPH-DRO was detected in the groundwater from SHS-8, SHS-9, SHS-13, and SHS-19 at concentrations ranging from 0.32 milligrams per liter (mg/L) to 13 mg/L. TPH-GRO was detected at 0.38 mg/L in groundwater from SHS-9, and TPH-MRO was not detected in any of these samples. There is no established NMWQCC standard for TPH.

PETROLEUM HYDROCARBON OCCURRENCE, RISK EVALUATION FOR SHS AREA

The groundwater recovery system that was in operation for approximately 27 years significantly improved groundwater conditions over that time. As noted in previous annual reports, the influent to the treatment system had not detected the presence of VOCs during the final 13 years of system operation.

PSH has diminished to isolated source area locations north of US Highway 64 where PSH is sorbed to soil, and fluctuating groundwater elevations result in desorption and accumulation of PSH in wells where the lowest subsurface pressure exists. Through years of pumping, the original transportation mechanisms that resulted in PSH observations in the SHS Area have collapsed. The transmissivity of the PSH is reduced, and it is no longer mobile. In the SHS Area, PSH was historically measured in SHS-1, SHS-2, SHS-8, SHS-9, SHS-11, SHS-14, SHS-18, and SHS-19 (SHS-7). PSH measurements indicated that by 2004, the mobile PSH in the SHS Area had been removed, as only inconsistent PSH observations were made after 2004 in two monitoring wells (SHS-2 and SHS-8) and one recovery well (SHS-9). PSH has not been observed in any SHS Area well since April 2013 when 0.18 feet was measured in SHS-9. This was an anomalous event as PSH measurements from 2004 through 2013 typically ranged from not detected to 0.05 feet. A series of monitoring wells/recovery wells that can be used to monitor for PSH exist between the remaining site source areas where PSH remains and the downgradient SHS Area. Historical PSH thickness measurements for the SHS Area wells that were typically obtained on a quarterly basis are summarized in Table 3.

TPH concentrations in SHS Area wells were evaluated along with VOC concentrations in January 2018. No NMWQCC standard exists for TPH, and TPH monitoring was conducted as a means to generally evaluate the potential for PSH to occur in the well. TPH results indicated concentrations below a value where free product would be anticipated. The higher TPH-DRO value measured for SHS-9 of 13 mg/L is likely related to using the well as a recovery well for many years. Residual impact surrounding the well resulted from pumping PSH toward the well and larger fluctuations in groundwater elevation, but the higher TPH-DRO detected at SHS-9 is limited in extent as evidenced by the lower concentrations detected in nearby wells.

The analytical results indicate continued compliance with groundwater quality standards for petroleum-related impacts. For the detected VOCs for which a NMWQCC standards exist (BTEX and 1,2,4-trimethylbenzene), results have indicated compliance with these standards for all of the SHS Area monitoring wells for samples obtained after 1990. Occasionally, detectable concentrations were lower than the NMWQCC standard, and within an order of magnitude of the laboratory method detection limit. Analysis of PAH compounds indicates compliance with cleanup standards for the two PAH analytes that have a NMWQCC standard: naphthalene and benzo(a)pyrene. Annual groundwater sampling events conducted following recovery system shutdown in 2015 have indicated occasional detections of petroleum hydrocarbons within an order of magnitude of the laboratory method detection limits for analytes that do not have

established standards. Historical laboratory analytical results from 2010 through January 2018 for monitoring well SHS-8 are summarized in Table 4. The historical analytical trends indicate decreasing PSH and contaminant concentrations in the SHS Area.

Iron and manganese continue to be detected at concentrations exceeding cleanup goals in several monitoring wells including upgradient wells. The designated total metals analyses include both dissolved-phase and particulate iron and manganese and likely vary based on the sediment within the samples. The values for metals, chloride, sulfate, and TDS that exceeded NMWQCC standards are unrelated to the petroleum impact, as evidenced by upgradient wells that demonstrate these analytes at more elevated concentrations. Operations of the groundwater recovery and treatment system would not improve these conditions. Western does not believe they are responsible to address these impacts, and these are not further evaluated.

The residual petroleum impacts have been demonstrated to be stable and decreasing in magnitude under natural attenuation processes. No measurable changes have been observed since shutting down the remediation system fluid recovery system.

RECOMMENDATION FOR SHS AREA CLOSURE

It is apparent that the remediation system successfully remediated petroleum hydrocarbon impacts as designed. Following the reduction in petroleum hydrocarbon concentrations, the remediation system's primary purpose was to provide hydraulic control and restrict migration of potential contaminants off site. By shutting down the system to re-establish equilibrium conditions, Western has demonstrated the remediation system has no effect on existing hydrocarbon groundwater impacts or the migration of impacts off site. Residual impacts at the Site consist of PSH accumulations, which based on thicknesses measured and locations consistent with original source areas, are likely a result of desorption of petroleum from soil, which are again adsorbed by soil in the three original source areas during period of groundwater elevation fluctuation. With no active source, the residual contaminants are not likely to migrate with or without the hydraulic barrier introduced by the remediation system.

There is no likely benefit to subsurface conditions that could occur through continued operation of recovery wells in the SHS Area. Because other monitoring wells remain that are closer to source areas, the SHS Area monitoring wells are no longer valuable for continued petroleum plume monitoring purposes. Wells and infrastructure represent a liability to Western, and wells that are not in use should be abandoned and infrastructure abandoned or removed.

LTE recommends abandoning all the recovery wells and monitoring wells and system infrastructure located south of US Highway 64 in the SHS Area and seeks concurrence from NMOCD prior to completing these tasks.

RECOMMENDATION FOR ONGOING MONITORING

Because PSH was observed at source area wells periodically during following remediation system shutdown, including 2018, the remaining wells located north of US Highway 64 can continue to be used to confirm that no further migration of the PSH is occurring. Continued PSH monitoring in monitoring wells GBR-9 and GBR-10 and recovery wells GRW-1, GRW-2, GRW-3, and GRW-10 will provide sufficient information to indicate that no PSH migration is occurring. Ongoing annual groundwater monitoring in GRW-3 will provide for a suitable location to monitor any changes in VOCs, such that ongoing monitoring in SHS-8 can be eliminated.

REVIEW OF PROJECT INFRASTRUCTURE

LTE conducted an investigation into the former remediation system at the SHS Area of the Site. The goal of this investigation was to identify the location and configuration of the former remediation system and develop a plan to remove the inactive components. The investigation results indicated the southern control building includes fluid lines that transferred fluid north to tanks and treatment facilitates located on the refinery property. One of these lines was discovered to have fluid in the line and hydraulic pressure on the line at the low spot within the southern control building. LTE recovered the fluid in the line and released the hydraulic pressure in 2018. To account for the possible occurrence of PSH within existing buried lines the procedures described below will be used to abandon the system.

ABANDONMENT PROCEDURES

Western will coordinate, conduct oversight, and document the removal of piping, surface equipment, and plugging and abandonment of the SHS Area. The goal of this work will be to abandon and remove inactive components of the former remediation system. The following activities will be included.

- Any remaining pumps and equipment associated with the recovery wells, the well vaults, and the southern control building will be removed and transferred to the pump building located on the southern portion of the Site.
- The remaining 8 groundwater monitoring wells and 4 recovery wells will be abandoned by a New Mexico state-licensed driller to comply with the standards for plugging wells. Well casing will be cut to at least 1-foot below grade, and wells will be filled with bentonite and/or cement grout from total depth to top of casing.
- LTE will file appropriate paperwork with the New Mexico Office of the State Engineer including a well plugging plan of operations in advance of plugging operations.
- The southern control building will be removed, and materials will be disposed of or recycled as applicable.

- Subsurface lines will be flushed using water to remove residual product prior to piping closure. The water will be collected and transferred to the water/oil holding tank at the Bloomfield Products Terminal Facility for processing.
- Subsurface lines will be cut approximately 1-foot below ground surface, and the vertical riser portion of the pipe will be filled with grout.
- Lateral lines crossing US Highway 64 will be plugged on each side of the highway, and the lines crossing the highway via a 3-inch culvert will be removed and disposed of.
- Recovery well vaults and monitoring well covers will be removed and disposed of/recycled, and the areas will be brought to surface grade using suitable backfill material.

The abandonment procedures will be initiated following approval by NMOCD that the abandonment plans for monitoring wells and recovery wells is acceptable and no further monitoring in this area will be required as part of the groundwater remediation monitoring and discharge permit for the Site.

Please contact Mr. Devin Hencmann at 970-385-1096 should you have any questions or if you would like to discuss this abandonment plan.

Sincerely,

LT ENVIRONMENTAL, INC.

Devin Hencmann
Project Geologist

Chris Shephard
Chief Engineer

cc: Allen Hains, Western Refining Southwest, Inc.

Attachments:

Figure 1	Site Location Map
Figure 2	Site Map
Figure 3	Cross Section A-A’
Figure 4	Cross Section B-B’
Figure 5	Groundwater Potentiometric Surface Map (January 2018)
Table 1	2018 Groundwater Elevations and Thickness of Phase-Separated Hydrocarbons
Table 2	2018 SHS Well Closure Sampling – Groundwater Laboratory Analytical Results
Table 3	SHS Area Phase-Separated Hydrocarbon Occurrence
Table 4	Groundwater Laboratory Analytical Results for SHS-8 (2010-2017)
Attachment 1	References

Attachment 2 January 2018 Laboratory Analytical Reports

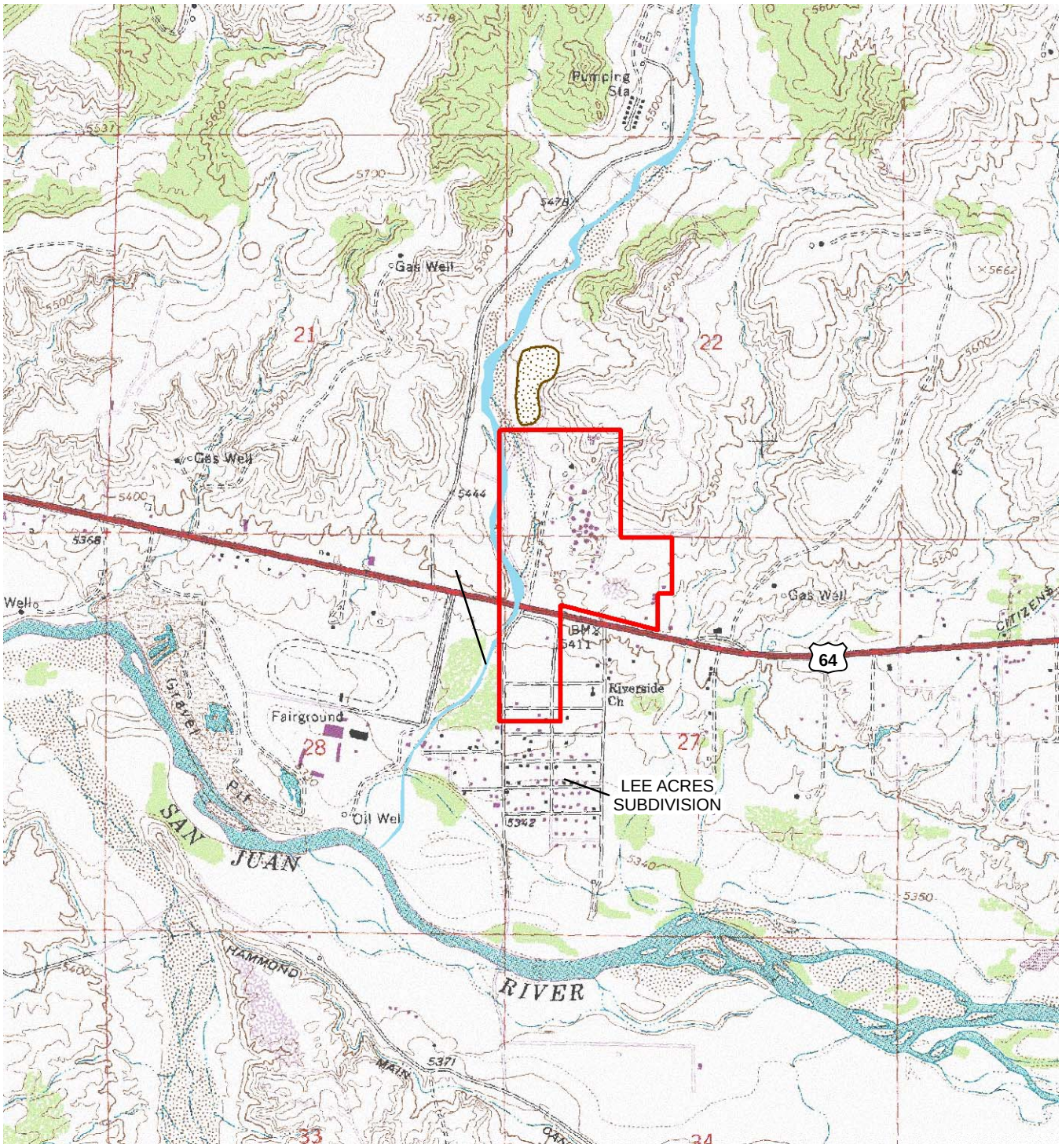


IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

0 2,000 4,000

Feet

N

LEGEND

- SITE LOCATION
- ARROYO
- FORMER LEE ACRES LANDFILL

FIGURE 1
SITE LOCATION MAP
FORMER GIANT BLOOMFIELD REFINERY
SWSW SEC 22 & WNW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

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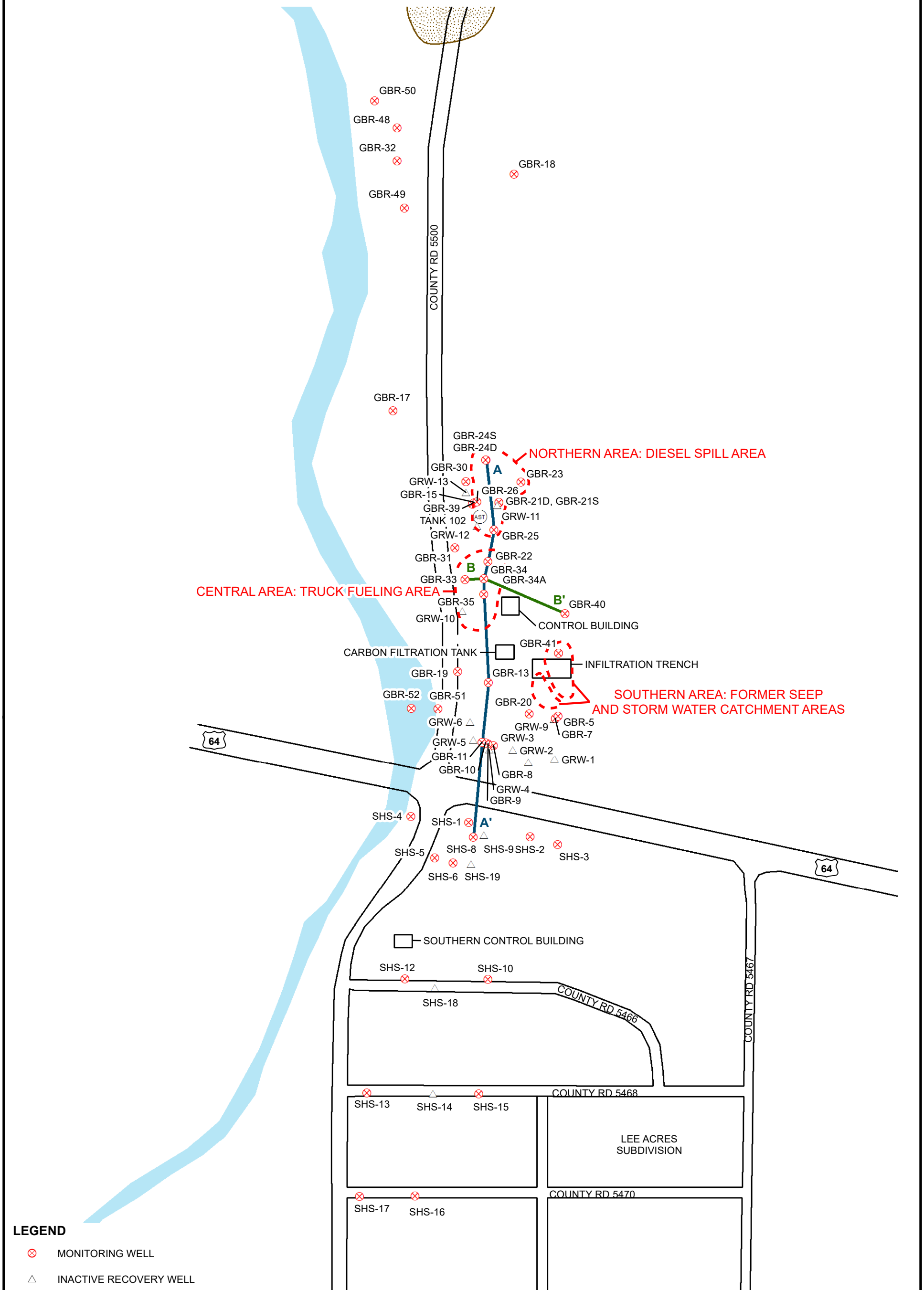

FIGURE 2
SITE MAP
FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

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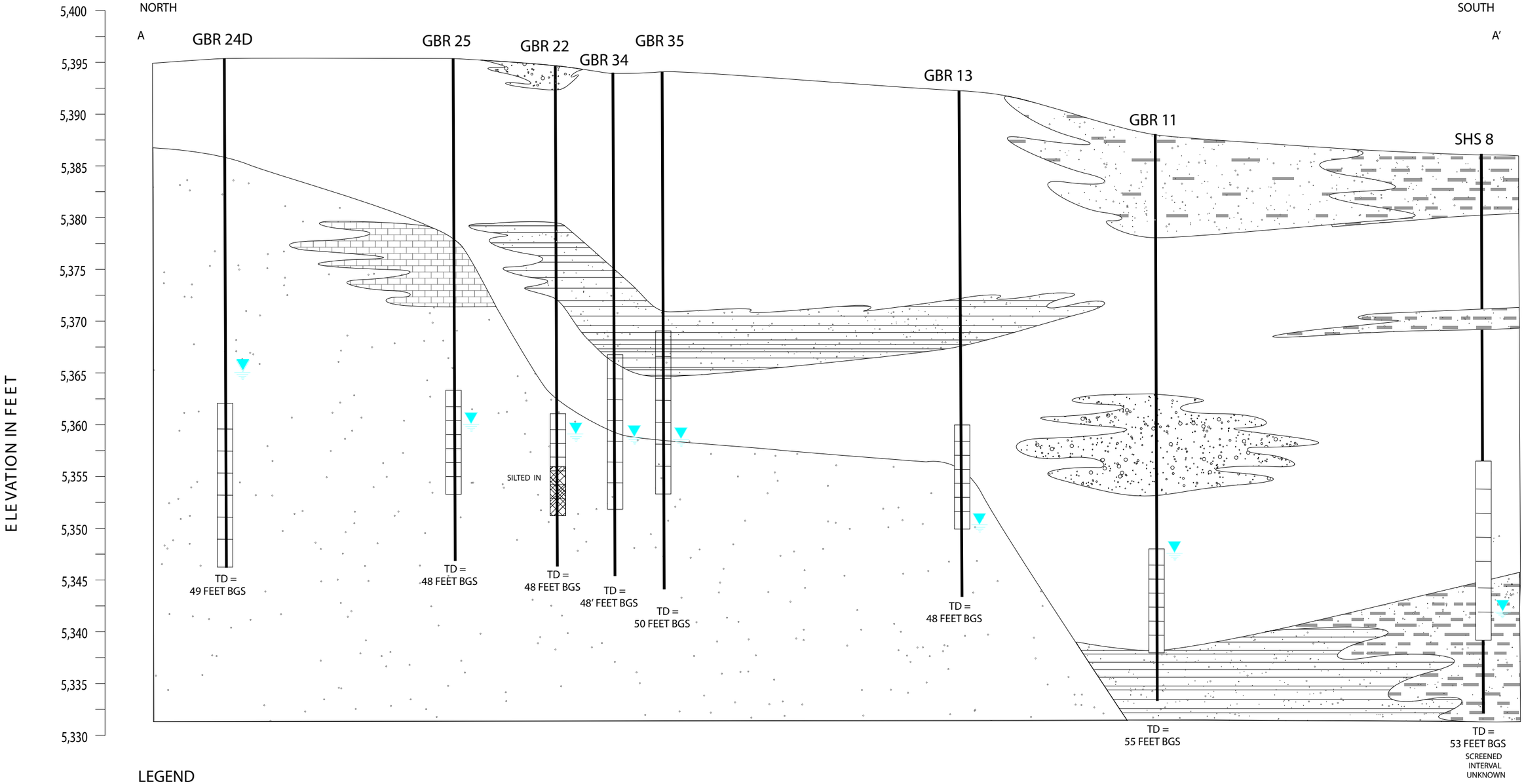


LEGEND

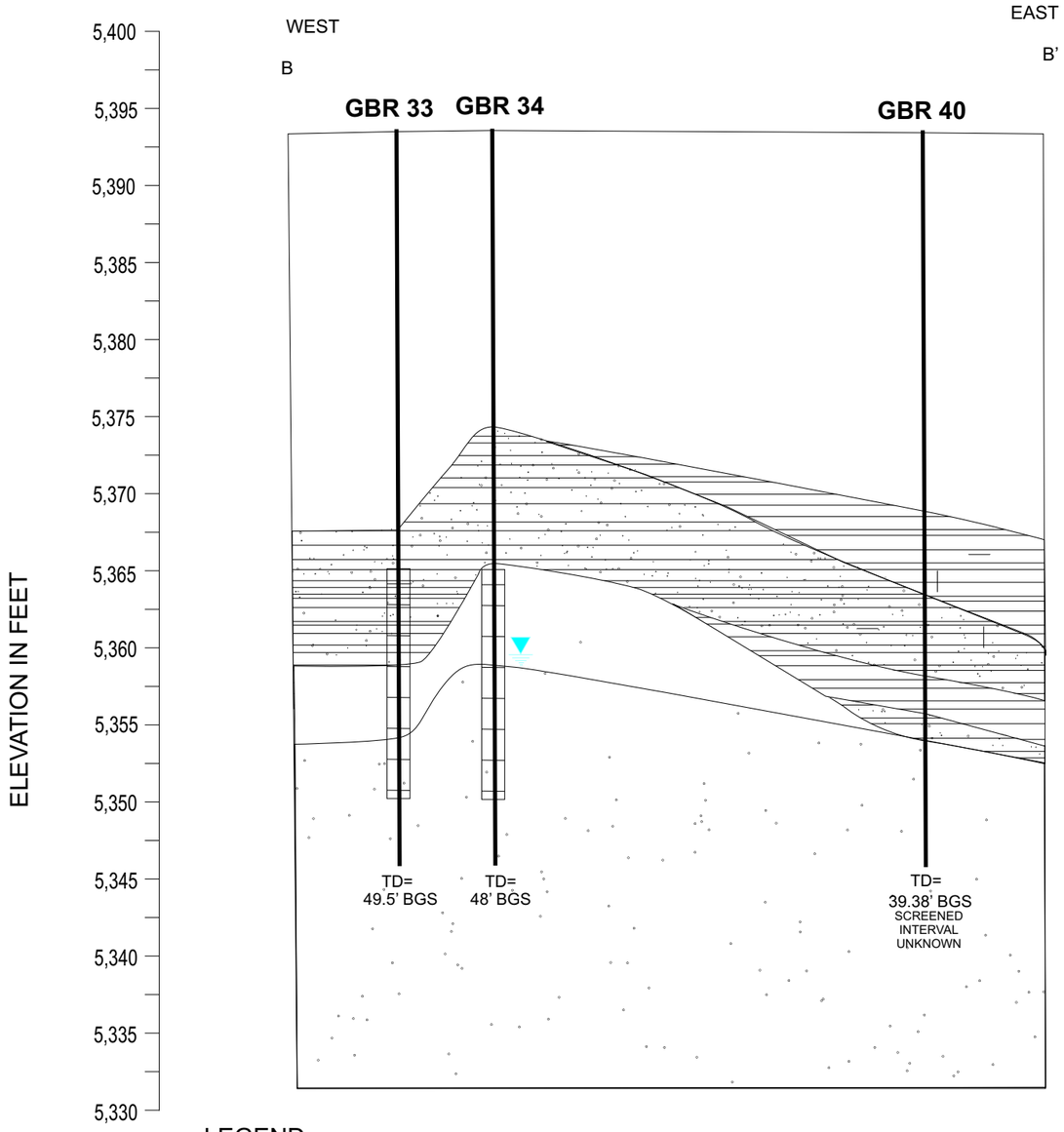
- SANDY SILT
- CLAYEY SAND
- SILTY SAND
- SAND
- PEBBLES/GRAVEL
- NACIMIENTO SHALE
- NACIMIENTO SANDSTONE
- BOREHOLE
- SCREENED INTERVAL
- BGS — BELOW GROUND SURFACE
- TD — TOTAL DEPTH IN FEET
- GROUNDWATER ELEVATION FROM OCTOBER 2017

HORIZONTAL SCALE
1" = 10 FEET

VERTICAL SCALE
1" = 90 FEET

FIGURE 3
CROSS SECTION A-A'
FORMER GIANT BLOOMFIELD REFINERY
SWSW SEC 22 &WNW SEC 27 T29N R12W
WESTERN REFINING SOUTHWEST, INC.

WR1009 1/16



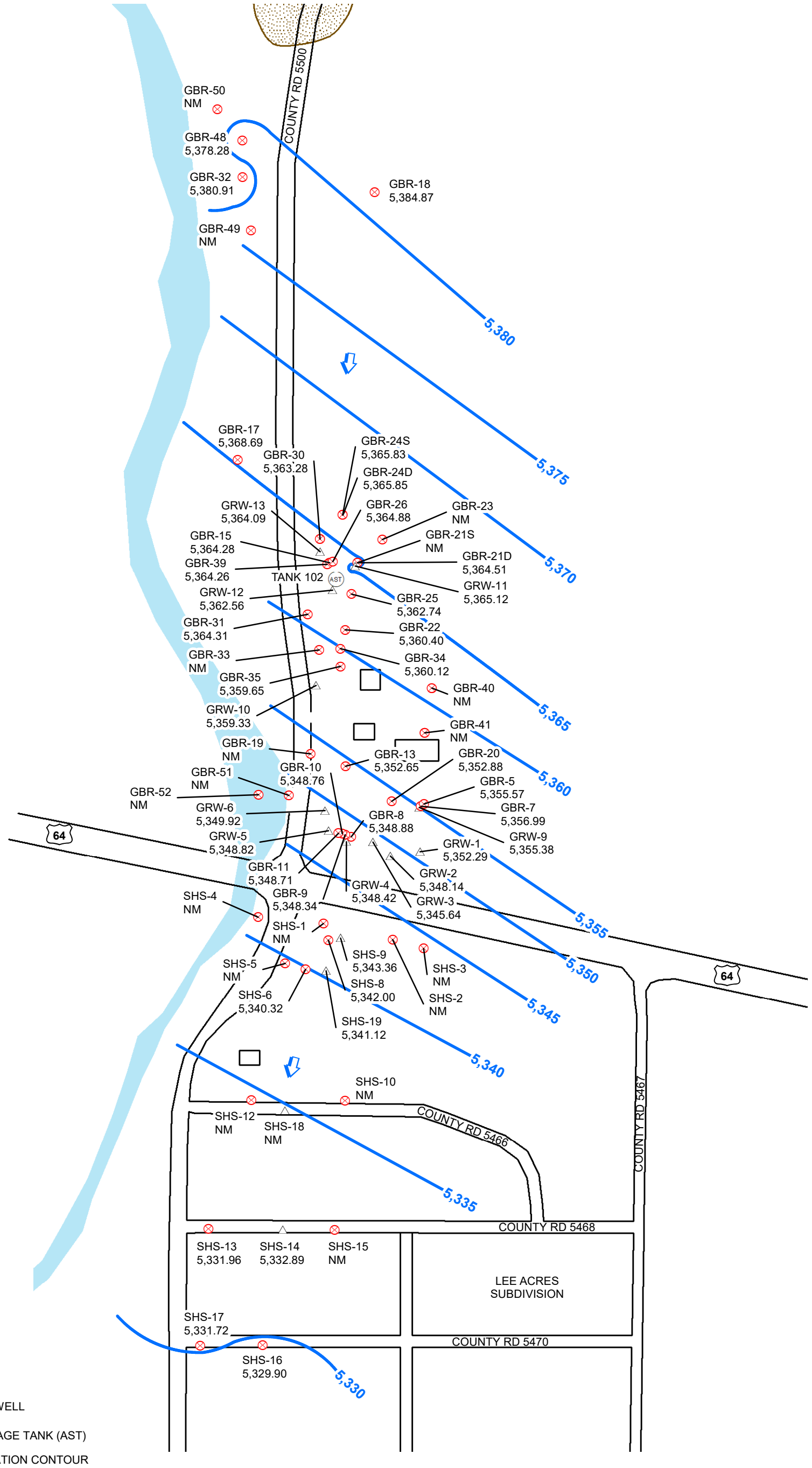
LEGEND

- CLAYEY SAND
- CLAY
- SAND
- NACIMIENTO SANDSTONE
- DRY
- BOREHOLE
- SCREENED INTERVAL
- BGS BELOW GROUND SURFACE
- TD TOTAL DEPTH IN FEET
- GROUNDWATER ELEVATION OCTOBER 2017

HORIZONTAL SCALE
1" = 10 FEET

VERTICAL SCALE
1" = 90 FEET

FIGURE 4
CROSS SECTION B-B'
FORMER GIANT BLOOMFIELD REFINERY
SWSW SEC 22 &WNW SEC 27 T29N R12W
WESTERN REFINING SOUTHWEST, INC.



LEGEND

NM: NOT MEASURED

PO: PAVED OVER

- MONITORING WELL
- INACTIVE RECOVERY WELL
- ABOVEGROUND STORAGE TANK (AST)
- GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 5 FEET
  GROUNDWATER ELEVATION MEASURED IN FEET
  ABOVE MEAN SEA LEVEL IN JANUARY, 2018
- ARROYO
- FORMER LEE ACRES LANDFILL
- ESTIMATED GROUNDWATER FLOW DIRECTION

FIGURE 5
GROUNDWATER POTENTIOMETRIC SURFACE MAP (JANUARY 2018)
FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

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TABLE 1
2018 GROUNDWATER ELEVATIONS AND THICKNESS OF PHASE-SEPARATED HYDROCARBONS

FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, INC.
SAN JUAN COUNTY, NEW MEXICO

Well Number	Wellhead Elevation (feet)	Total Depth (feet)	January 2018				October 2018			
			Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)	Depth to Water (feet) BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)
GRW-1	5,394.30	73.35	42.01	-	-	5,352.29	44.30	-	-	5,350.00
GRW-2	5,391.28	61.00	43.14	-	-	5,348.14	43.80	-	-	5,347.48
GRW-3	5,388.77	58.30	43.13	-	-	5,345.64	44.63	-	-	5,344.14
GRW-4	5,390.02	60.00	41.60	-	-	5,348.42	42.17	-	-	5,347.85
GRW-5	5,390.56	68.30	41.74	-	-	5,348.82	42.33	-	-	5,348.23
GRW-6	5,390.81	53.80	40.89	-	-	5,349.92	41.47	-	-	5,349.34
GRW-9	5,395.70	54.40	40.32	-	-	5,355.38	40.93	-	-	5,354.77
GRW-10	5,395.02	66.02	35.69	-	-	5,359.33	36.26	-	-	5,358.76
GRW-11	5,397.85	64.00	32.73	-	-	5,365.12	33.86	-	-	5,363.99
GRW-12	5,397.24	48.00	34.68	-	-	5,362.56	35.33	-	-	5,361.91
GRW-13	5,396.90	61.30	32.81	-	-	5,364.09	33.43	-	-	5,363.47
GBR-5	5,395.07	47.08	39.50	-	-	5,355.57	40.26	-	-	5,354.81
GBR-7	5,395.85	51.65	38.86	-	-	5,356.99	41.94	41.71	0.23	5,353.91
GBR-8	5,390.50	50.90	41.62	-	-	5,348.88	42.19	-	-	5,348.31
GBR-9	5,389.92	67.22	41.58	-	-	5,348.34	42.13	-	-	5,347.79
GBR-10	5,390.57	47.56	41.81	-	-	5,348.76	42.26	-	-	5,348.31
GBR-11	5,389.43	51.87	40.72	-	-	5,348.71	42.28	-	-	5,347.15
GBR-13	5,393.04	45.47	40.39	-	-	5,352.65	40.96	-	-	5,352.08
GBR-15	5,397.99	58.42	33.71	-	-	5,364.28	34.17	-	-	5,363.82
GBR-17	5,402.69	43.20	34.00	-	-	5,368.69	34.70	-	-	5,367.99
GBR-18	5,421.68	47.85	36.81	-	-	5,384.87	37.16	-	-	5,384.52
GBR-19* **	5,393.83	46.23	-	-	-	-	-	-	-	-
GBR-20	5,393.47	54.57	40.59	-	-	5,352.88	41.46	-	-	5,352.01
GBR-21D	5,400.19	49.77	35.68	-	-	5,364.51	36.16	-	-	5,364.03
GBR-21S	5,400.65	49.77	Dry		-	-	DRY @ 34.89	-	-	-
GBR-22	5,395.91	38.73	35.51	-	-	5,360.40	37.63	37.60	0.03	5,358.28
GBR-23** **	-	39.45	-	-	-	-	37.33	-	-	-
GBR-24D	5,396.77	51.40	30.92	-	-	5,365.85	31.28	-	-	5,365.49
GBR-24S	5,396.08	37.05	30.25	-	-	5,365.83	30.58	-	-	5,365.50
GBR-25	5,397.03	37.12	34.29	-	-	5,362.74	34.82	-	-	5,362.21
GBR-26	5,396.72	41.29	31.84	-	-	5,364.88	32.39	-	-	5,364.33
GBR-30	5,395.59	41.66	32.31	-	-	5,363.28	32.95	-	-	5,362.64
GBR-31	5,396.58	43.50	32.27	-	-	5,364.31	DRY @ 33.35	-	-	-
GBR-32	5,414.86	47.83	33.95	-	-	5,380.91	34.58	-	-	5,380.28
GBR-33	5,396.28	45.72	Dry	-	-	-	34.44	-	-	-
GBR-34	5,394.00	42.20	33.88	-	-	5,360.12	35.62			5,358.38
GBR-35	5,393.66	42.35	34.01	-	-	5,359.65	34.57	-	-	5,359.09
GBR-39	5,397.55	41.42	33.29	-	-	5,364.26	33.77	-	-	5,363.78
GBR-40	5,400.76	39.38	Dry @ 34.90	-	-	-	DRY @ 34.93	-	-	-
GBR-41	5,396.35	34.28	34.31	34.28	-	-	34.37	34.25	0.12	5,361.98
GBR-48	5,413.90	43.54	35.62	-	-	5,378.28	32.25	-	-	5,381.65
GBR-49	*	40.30	32.06	-	-	-	32.71	-	-	-
GBR-50	*	44.37	31.26	-	-	-	31.94	-	-	-

TABLE 1
2018 GROUNDWATER ELEVATIONS AND THICKNESS OF PHASE-SEPARATED HYDROCARBONS

FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, INC.
SAN JUAN COUNTY, NEW MEXICO

Well Number	Wellhead Elevation (feet)	Total Depth (feet)	January 2018				October 2018			
			Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)	Depth to Water (feet) BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)
GBR-51	5,389.68	57.07	-	-	-	-	39.92	-	-	5,349.76
GBR-52	5,387.74	52.73	-	-	-	-	37.59	-	-	5,350.15
SHS-1******	5,383.54	50.40	-	-	-	-	P&A	-	-	-
SHS-2	5,381.66	44.56	-	-	-	-	P&A	-	-	-
SHS-3**	5,383.33	-	-	-	-	-	P&A	-	-	-
SHS-4	5,383.62	52.16	-	-	-	-	P&A	-	-	-
SHS-5	5,378.36	47.85	-	-	-	-	P&A	-	-	-
SHS-6	5,378.17	52.78	37.85	-	-	5,340.32	38.31	-	-	5,339.86
SHS-8	5,380.25	50.92	38.25	-	-	5,342.00	38.74	-	-	5,341.51
SHS-9	5,380.79	46.25	37.43	-	-	5,343.36	DRY @ 37.89	-	-	-
SHS-10	5,373.80	45.80	Dry	-	-	-	DRY @ 35.43	-	-	-
SHS-12	5,373.94	52.41	Dry	-	-	-	DRY @ 38.92	-	-	-
SHS-13	5,367.81	47.51	35.85	-	-	5,331.96	36.55	-	-	5,331.26
SHS-14	5,367.07	52.71	34.18	-	-	5,332.89	35.02	-	-	5,332.05
SHS-15***	5,366.21	47.78	33.00	-	-	-	33.93	-	-	5,332.28
SHS-16	5,362.58	42.20	32.68	-	-	5,329.90	31.54	-	-	5,331.04
SHS-17	5,364.35	46.21	32.63	-	-	5,331.72	33.42	-	-	5,330.93
SHS-18	5,373.64	47.36	39.24	-	-	-	40.03	-	-	5,333.61
SHS-19	5,378.89	52.40	37.77	-	-	5,341.12	38.25	-	-	5,340.64

Notes:
BTOC - below top of casing
D - designates that the well screen is deep
GWEL - groundwater elevation
P&A - plugged and abandoned
PSH - phase-separated hydrocarbon
S - designates that the well screen is shallow
* Top-of-casing elevation is unknown
** Well is damaged by a tree root
*** Well was paved over in June 2010
**** Well hit by a vehicle May 2014
***** Well visibly broken/buried January 2016
****** Well buried and unable to locate May 2016
- indicates no GWEL or PSH measured
When PSH is detected, the GWEL is corrected using an estimated density correction factor of 0.88.

TABLE 2
2018 SHS WELL CLOSURE SAMPLING - GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Analyte	NMWQCC Standard	Unit	SHS-6	SHS-8	SHS-9	SHS-13	SHS-14	SHS-15	SHS-16	SHS-17	SHS-18	SHS-19
			23-Jan	23-Jan	23-Jan	22-Jan	22-Jan	23-Jan	22-Jan	22-Jan	23-Jan	23-Jan
USEPA Method 8015M/D - Diesel Range												
Diesel Range Organics (DRO)	NE	mg/L	<0.20	5.8	13	1.2	<1.0	<0.20	<1.0	<1.0	<0.20	0.32
Motor Oil Range Organics (MRO)	NE	mg/L	<2.5	<2.5	<2.5	<5.0	<5.0	<2.5	<5.0	<5.0	<2.5	<2.5
USEPA Method 8015D - Gasoline Range												
Gasoline Range Organics (GRO)	NE	mg/L	<0.05	<0.050	0.38	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
USEPA Method 8260B - Volatiles												
benzene	10	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
toluene	750	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
ethylbenzene	750	µg/L	<1.0	<1.0	32	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
methyl tert-butyl ether (MTBE)	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trimethylbenzene	620	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trimethylbenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloroethane (EDC)	10	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromoethane (EDB)	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
naphthalene	NE	µg/L	<2.0	<2.0	5.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1-methylnaphthalene	NE	µg/L	<4.0	<4.0	12	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2-methylnaphthalene	NE	µg/L	<4.0	<4.0	<10	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
acetone	NE	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
bromobenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromodichloromethane	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromoform	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromomethane	NE	µg/L	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-butanone	NE	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
carbon disulfide	NE	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
carbon tetrachloride	10	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chlorobenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloroethane	NE	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
chloroform	100	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloromethane	NE	µg/L	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-chlorotoluene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-chlorotoluene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-DCE	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-dichloropropene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromo-3-chloropropane	NE	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
dibromochloromethane	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dibromomethane	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

TABLE 2
2018 SHS WELL CLOSURE SAMPLING - GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Analyte	NMWQCC Standard	Unit	SHS-6	SHS-8	SHS-9	SHS-13	SHS-14	SHS-15	SHS-16	SHS-17	SHS-18	SHS-19
			23-Jan	23-Jan	23-Jan	22-Jan	22-Jan	23-Jan	22-Jan	22-Jan	23-Jan	23-Jan
1,2-dichlorobenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichlorobenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-dichlorobenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dichlorodifluoromethane	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethane	25	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethene	5	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloropropane	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichloropropane	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,2-dichloropropane	NE	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-dichloropropene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
hexachlorobutadiene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-hexanone	NE	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
isopropylbenzene	NE	µg/L	<1.0	<1.0	6.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-isopropytoluene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-methyl-2-pentanone	NE	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
methylene chloride	100	µg/L	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-butylbenzene	NE	µg/L	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-propylbenzene	NE	µg/L	<1.0	<1.0	8.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
sec-butylbenzene	NE	µg/L	<1.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
styrene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
tert-butylbenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5
1,1,1,2-tetrachloroethane	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-tetrachloroethane	10	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
tetrachloroethene (PCE)	20	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-DCE	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-dichloropropene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichlorobenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-trichloroethane	60	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-trichloroethane	10	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichloroethene (TCE)	100	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichlorofluoromethane	NE	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichloropropane	NE	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
vinyl chloride	1	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
xylenes, total	620	µg/L	<1.5	<1.5	<3.8	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5

Notes:
mg/L - miligrams per liter
NE - not established
NMWQCC - New Mexico Water Quality Control Commission
USEPA - United States Environmental Protection Agency
µg/L - micrograms per liter

TABLE 3
SHS AREA PHASE-SEPARATED HYDROCARBON OCCURRENCE

FORMER GIANT REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Well Number	January 1991	April 1991	July 1991	October 1991	November 1991	December 1991	July 1992	October 1992	January 1993	April 1993	July 1993	October 1993	April 1994	July 1994	October 1994	December 1995	July 1996	January 1997	April 1997	July 1997	October 1997
	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)
SHS-1	0.13	0.15	0.02	0.08	0.12	0.10	ND	0.01	ND	0.02	0.20	0.13	0.01	0.15	0.12	0.14	0.18	0.12	ND	0.15	0.13
SHS-2	0.68	0.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.39	ND	ND	ND	ND
SHS-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-7	0.55	0.98	0.55	0.80	0.92	0.84	0.34	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND
SHS-8	0.02	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.05	2.65
SHS-9	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07	0.06	ND	ND	ND
SHS-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-14	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-17	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-18	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	0.30	ND	ND	0.14	ND	0.05	ND
SHS-19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 3
SHS AREA PHASE-SEPARATED HYDROCARBON OCCURRENCE

FORMER GIANT REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Well Number	January 2000	January 2001	April 2001	July 2001	October 2001	January 2002	April 2002	July 2002	October 2002	January 2003	April 2003	July 2003	October 2003	January 2004	April 2004	July 2004	October 2004	January 2004	April 2004	July 2004	October 2004
	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)
SHS-1	0.02	0.09	0.10	0.02	ND	0.08	ND	0.05	ND	0.05	ND	0.06	0.03	0.07	0.16	ND	ND	0.07	0.16	ND	ND
SHS-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-7	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SHS-8	1.51	1.54	1.61	1.52	ND	0.97	ND	1.02	ND	9.82	0.83	0.48	1.06	1.05	1.03	0.05	0.01	1.05	1.03	0.05	0.01
SHS-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-19	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 3
SHS AREA PHASE-SEPARATED HYDROCARBON OCCURRENCE

FORMER GIANT REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Well Number	January 2005	April 2005	Obtober 2005	Four Quarters 2006	Four Quarters 2007	Four Quarters 2008	Four Quarters 2009	Four Quarters 2010	Four Quarters 2011	January 2012	April 2012	July 2012	October 2012	January 2013	April 2013	July 2013	October 2013	January 2014	April 2014	July 2014	October 2014
	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)
SHS-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	0.01	ND	ND	ND	ND	ND	ND
SHS-3	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SHS-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SHS-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND
SHS-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.18	ND	ND	ND	ND	ND	ND
SHS-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND
SHS-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND
SHS-14	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 3
SHS AREA PHASE-SEPARATED HYDROCARBON OCCURRENCE

FORMER GIANT REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Well Number	January 2015	April 2015	July 2015	October 2015	January 2016	April 2016	July 2016	October 2016	January 2017	April 2017	July 2017	October 2017	January 2018	October 2018
	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)	PSH (feet)
SHS-1	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	NA	NA	NA	NA
SHS-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
SHS-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SHS-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
SHS-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
SHS-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SHS-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-10	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SHS-12	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
SHS-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-15	ND	ND	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND
SHS-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHS-19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

SHS-7 was replaced with SHS-19 in 2001

SHS-1 through SHS-5 were abandoned in JUNE 2017

NA: Not Available - well not installed, abandoned, damaged, buried or otherwise inaccessible

ND: Not detected

Where quarterly events did not detect PSH, the quarterly results are summarized for that year

PSH: Phase Separated Hydrocarbon thickness measured in well

TABLE 4
GROUNDWATER LABORATORY ANALYTICAL RESULTS FOR SHS-8 (2010-2017)

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Analyte	NMWQCC Standard	Unit	01/01/10	01/01/11	01/01/12	01/01/13	11/01/14	08/03/15	01/13/17	12/08/17
Volatiles										
benzene	10	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
toluene	750	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
ethylbenzene	750	µg/L	<1.0	**1.4**	<1.0	<10	**2.8**	**14**	**1.1**	<1.0
methyl tert-butyl ether (MTBE)	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,2,4-trimethylbenzene	620	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,3,5-trimethylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,2-dichloroethane (EDC)	10	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	.<1.0
1,2-dibromoethane (EDB)	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
naphthalene	NE	µg/L	<2.0	<2.0	<2.0	<20	<4.0	**5.6**	<2.0	<2.0
1-methylnaphthalene	NE	µg/L	<4.0	<4.0	<4.0	<40	<8.0	**24**	<4.0	<4.0
2-methylnaphthalene	NE	µg/L	<4.0	<4.0	<4.0	<40	<8.0	**8.5**	<4.0	<4.0
acetone	NE	µg/L	<10	<10	**11**	<100	<20	<10	<10	<10
bromobenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
bromodichloromethane	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
bromoform	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
bromomethane	NE	µg/L	<1.0	<3.0	<3.0	<30	<6.0	<3.0	<3.0	<3.0
2-butanone	NE	µg/L	<10	<10	<10	<100	<20	<10	<10	<10
carbon disulfide	NE	µg/L	<10	<10	<10	<100	<20	<10	<10	<10
carbon tetrachloride	10	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
chlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
chloroethane	NE	µg/L	<2.0	<2.0	<2.0	<20	<4.0	<2.0	<2.0	<2.0
chloroform	100	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
Chloromethane	NE	µg/L	NT	<3.0	<3.0	<30	<6.0	<3.0	<3.0	<3.0
2-chlorotoluene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
4-chlorotoluene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
cis-1,2-DCE	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
cis-1,3-dichloropropene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,2-dibromo-3-chloropropane	NE	µg/L	<2.0	<2.0	<2.0	<20	<4.0	<2.0	<2.0	<2.0
dibromochloromethane	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
dibromomethane	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,3-dichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,4-dichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
dichlorodifluoromethane	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,1-dichloroethane	25	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,1-dichloroethene	5	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,2-dichloropropane	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,3-dichloropropane	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
2,2-dichloropropane	NE	µg/L	<2.0	<2.0	<2.0	<20	<4.0	<2.0	<2.0	<2.0

GROUNDWATER LABORATORY ANALYTICAL RESULTS FOR SHS-8 (2010-2017)

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Analyte	NMWQCC Standard	Unit	01/01/10	01/01/11	01/01/12	01/01/13	11/01/14	08/03/15	01/13/17	12/08/17
1,1-dichloropropene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
hexachlorobutadene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
2-hexanone	NE	µg/L	<10	<10	<10	<100	<20	<10	<10	<1.0
isopropylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	**9.6**	<1.0	<1.0
4-isopropytoluene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
4-methyl-2-pentanone	NE	µg/L	<10	<10	<10	<100	<20	<10	<10	<10
methylene chloride	100	µg/L	<3.0	<3.0	<3.0	<30	<6.0	<3.0	<3.0	<3.0
n-butylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<30	<6.0	<3.0	<3.0	<3.0
n-propylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	**9.0**	<1.0	<1.0
sec-butylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	**3.6**	<1.0	<1.0
styrene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
tert-butylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	**1.1**	<1.0	<1.0
1,1,1,2-tetrachloroethane	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,1,2,2-tetrachloroethane	10	µg/L	<2.0	<2.0	<2.0	<20	<4.0	<2.0	<2.0	<2.0
tetrachloroethene (PCE)	20	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
trans-1,2-DCE	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
trans-1,3-dichloropropene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,2,3-trichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,1,1-trichloroethane	60	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,1,2-trichloroethane	10	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
trichloroethene (TCE)	100	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
trichlorofluoromethane	NE	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
1,2,3-trichloropropane	NE	µg/L	<2.0	<2.0	<2.0	<20	<4.0	<2.0	<2.0	<2.0
vinyl chloride	1	µg/L	<1.0	<1.0	<1.0	<10	<2.0	<1.0	<1.0	<1.0
xylenes, total	620	µg/L	<1.5	<1.5	<1.5	<15	<3.0	<1.5	<1.5	<1.5
Anions										
Bromide	NE	mg/L	NT	NT	<0.10	<0.50	**0.71**	0.89	**0.94**	**0.78**
Chloride	250	mg/L	NT	**150**	**170**	**120**	**110**	**120**	**100**	**110**
Sulfate	600	mg/L	NT	**150**	**430**	**770**	**350**	**47**	**720**	**1,200**
Fluoride	1.6	mg/L	NT	NT	**1.9**	**1.3**	**1.5**	1.1	**0.76**	**0.37**
nitrate + nitrite as N	NE	mg/L	NT	NT	<1.0	<0.50	<0.50	0.5	<1.0	<1.0
Phosphate, Orthophosphate (As P)	NE	mg/L	NT	NT	**0.823**	<2.5	<2.5	<2.5	<0.50	<10 H
Metals										
Barium	NE	mg/L	NT	NT	NT	**2.2**	NT	NT	NT	NT
Beryllium	NE	mg/L	NT	<0.0020	NT	**0.0067**	NT	NT	NT	NT
Cadmium	0.01	mg/L	NT	<0.0020	NT	<0.0020	NT	NT	NT	NT
Calcium	NE	mg/L	NT	**110**	**150**	**190**	**210**	73	**260**	**320**
Chromium	0.05	mg/L	NT	**0.0063**	NT	**0.099**	NT	NT	NT	NT
Copper	1.0	mg/L	NT	**0.023**	NT	**0.36**	NT	NT	NT	NT
Iron	1.0	mg/L	NT	NT	**15**	**100**	**260**	**8.6**	**66**	**10**
Lead	0.05	mg/L	NT	**0.026**	NT	**0.19**	NT	NT	NT	NT
Magnesium	NE	mg/L	NT	**15**	**19**	**36**	**42**	11	**35**	**49**
Manganese	0.2	mg/L	NT	NT	**2.3**	**4.7**	**5.0**	**0.41**	**3.0**	**3.6**
Nickel	0.2	mg/L	NT	**0.052**	NT	**0.13**	NT	NT	NT	NT
Potassium	NE	mg/L	NT	**2.8**	**3.5**	**12**	**14**	**1.4**	**7.4**	**2.1**
Silver	0.05	mg/L	NT	<0.0050	NT	<0.0050	NT	NT	NT	NT

GROUNDWATER LABORATORY ANALYTICAL RESULTS FOR SHS-8 (2010-2017)

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Analyte	NMWQCC Standard	Unit	01/01/10	01/01/11	01/01/12	01/01/13	11/01/14	08/03/15	01/13/17	12/08/17
Sodium	NE	mg/L	NT	<480	**590**	**470**	**430**	410	**520**	**520**
Zinc	10	mg/L	NT	**0.033**	NT	**0.36**	NT	NT	NT	NT
Antimony	NE	mg/L	NT	<0.0025	NT	<0.0025	NT	NT	NT	NT
Arsenic	0.1	mg/L	NT	**0.0075**	NT	**0.025**	NT	NT	NT	NT
Selenium	0.05	mg/L	NT	**0.0090**	NT	**0.0029**	NT	NT	NT	NT
Thallium	NE	mg/L	NT	<0.0025	NT	<0.0025	NT	NT	NT	NT
Mercury	0.002	mg/L	NT	<0.00020	NT	<0.00020	NT	NT	NT	NT
Hardness										
Hardness (as CaCO3)	NE	mg/L	NT	**320**	**460**	**630**	**700**	**230**	**800**	**1000**
Alkalinity										
Alkalinity, Total (As CaCO3)	NE	mg/L CaCO3	NT	**980**	**1,100**	**710**	**760**	**939.6**	**984.3**	**751.8**
Carbonate	NE	mg/L CaCO4	NT	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bicarbonate	NE	mg/L CaCO5	NT	**980**	**1,100**	**710**	**760**	939.6	**984.3**	**751.8**
Specific Conductance										
Specific Conductance	NE	µmhos/cm	NT	**2,300**	**2,900**	**2,600**	**1,900**	**2100**	**3,000**	**3500**
PH										
pH	6-9	pH units	NT	**7.42**	**7.22**	**7.05**	**7.12**	7.21	**7.62**	**7.22**
Total Dissolved Solids										
Total Dissolved Soilds	1,000	mg/L	NT	**1,440**	**2,040**	**1,800**	**1,400**	**1300**	**2210**	**2730**

Notes:

RED HIGHLIGHT indicates concentration exceeds the NMWQCC standard, **Bold** indicates detected

µg/L - micrograms per liter

µmhos/cm -micromhos per centimeter

mg/L - milligrams per liter

ND - non detect

NE - not established

NMWQCC - New Mexico Water Quality Control Commission

NT - not tested

USEPA - United States Environmental Protection Agency

REFERENCES

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Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 06, 2018

Devin Hencmann

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX (505) 632-3911

RE: GBR SHS Well Sampling OrderNo.: 1801A88

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 6 sample(s) on 1/24/2018 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued January 31, 2018.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-15
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 11:30:00 AM
Lab ID: 1801A88-001 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/25/2018 3:15:10 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 3:15:10 PM	36182
Surr: DNOP	123	79.2-146		%Rec	1	1/25/2018 3:15:10 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 1:44:22 PM	G48661
Surr: BFB	92.5	69.3-150		%Rec	1	1/24/2018 1:44:22 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-15
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 11:30:00 AM
Lab ID: 1801A88-001 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 5:06:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	85.0	70-130		%Rec	1	1/27/2018 5:06:00 AM	B48749
Surr: 4-Bromofluorobenzene	79.8	70-130		%Rec	1	1/27/2018 5:06:00 AM	B48749
Surr: Dibromofluoromethane	88.0	70-130		%Rec	1	1/27/2018 5:06:00 AM	B48749
Surr: Toluene-d8	89.1	70-130		%Rec	1	1/27/2018 5:06:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-18
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 12:30:00 PM
Lab ID: 1801A88-002 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/25/2018 4:21:24 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 4:21:24 PM	36182
Surr: DNOP	128	79.2-146		%Rec	1	1/25/2018 4:21:24 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 2:08:16 PM	G48661
Surr: BFB	92.4	69.3-150		%Rec	1	1/24/2018 2:08:16 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-18
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 12:30:00 PM
Lab ID: 1801A88-002 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 5:29:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	84.9	70-130		%Rec	1	1/27/2018 5:29:00 AM	B48749
Surr: 4-Bromofluorobenzene	79.0	70-130		%Rec	1	1/27/2018 5:29:00 AM	B48749
Surr: Dibromofluoromethane	86.7	70-130		%Rec	1	1/27/2018 5:29:00 AM	B48749
Surr: Toluene-d8	88.3	70-130		%Rec	1	1/27/2018 5:29:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-9
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 1:15:00 PM
Lab ID: 1801A88-003 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	13	0.20		mg/L	1	1/25/2018 4:43:40 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 4:43:40 PM	36182
Surr: DNOP	98.3	79.2-146		%Rec	1	1/25/2018 4:43:40 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.38	0.25		mg/L	5	1/25/2018 10:19:50 AM	G48661
Surr: BFB	112	69.3-150		%Rec	5	1/25/2018 10:19:50 AM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Toluene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Ethylbenzene	32	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2,4-Trimethylbenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,3,5-Trimethylbenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Naphthalene	5.1	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1-Methylnaphthalene	12	10	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2-Methylnaphthalene	ND	10	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Acetone	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Bromobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Bromodichloromethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Bromoform	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Bromomethane	ND	7.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2-Butanone	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Carbon disulfide	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Carbon Tetrachloride	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Chlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Chloroethane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Chloroform	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Chloromethane	ND	7.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2-Chlorotoluene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
4-Chlorotoluene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
cis-1,2-DCE	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
cis-1,3-Dichloropropene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Dibromochloromethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Dibromomethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-9
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 1:15:00 PM
Lab ID: 1801A88-003 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,4-Dichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Dichlorodifluoromethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1-Dichloroethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1-Dichloroethene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dichloropropane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,3-Dichloropropane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2,2-Dichloropropane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1-Dichloropropene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Hexachlorobutadiene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2-Hexanone	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Isopropylbenzene	6.6	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
4-Isopropyltoluene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
4-Methyl-2-pentanone	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Methylene Chloride	ND	7.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
n-Butylbenzene	ND	7.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
n-Propylbenzene	8.4	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
sec-Butylbenzene	2.8	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Styrene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
tert-Butylbenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Tetrachloroethene (PCE)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
trans-1,2-DCE	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
trans-1,3-Dichloropropene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2,3-Trichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2,4-Trichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1,1-Trichloroethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1,2-Trichloroethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Trichloroethene (TCE)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Trichlorofluoromethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2,3-Trichloropropane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Vinyl chloride	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Xylenes, Total	ND	3.8	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	82.6	70-130	D	%Rec	5	1/27/2018 5:52:00 AM	B48749
Surr: 4-Bromofluorobenzene	83.3	70-130	D	%Rec	5	1/27/2018 5:52:00 AM	B48749
Surr: Dibromofluoromethane	85.8	70-130	D	%Rec	5	1/27/2018 5:52:00 AM	B48749
Surr: Toluene-d8	89.7	70-130	D	%Rec	5	1/27/2018 5:52:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-8
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 1:45:00 PM
Lab ID: 1801A88-004 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	5.8	0.20		mg/L	1	1/25/2018 5:05:47 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 5:05:47 PM	36182
Surr: DNOP	124	79.2-146		%Rec	1	1/25/2018 5:05:47 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 4:14:35 PM	G48661
Surr: BFB	96.9	69.3-150		%Rec	1	1/24/2018 4:14:35 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-8
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 1:45:00 PM
Lab ID: 1801A88-004 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 6:14:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	83.8	70-130		%Rec	1	1/27/2018 6:14:00 AM	B48749
Surr: 4-Bromofluorobenzene	80.9	70-130		%Rec	1	1/27/2018 6:14:00 AM	B48749
Surr: Dibromofluoromethane	86.5	70-130		%Rec	1	1/27/2018 6:14:00 AM	B48749
Surr: Toluene-d8	88.4	70-130		%Rec	1	1/27/2018 6:14:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-6
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 2:40:00 PM
Lab ID: 1801A88-005 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/25/2018 5:27:50 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 5:27:50 PM	36182
Surr: DNOP	118	79.2-146		%Rec	1	1/25/2018 5:27:50 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 4:38:38 PM	G48661
Surr: BFB	94.4	69.3-150		%Rec	1	1/24/2018 4:38:38 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-6
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 2:40:00 PM
Lab ID: 1801A88-005 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 6:37:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	83.8	70-130		%Rec	1	1/27/2018 6:37:00 AM	B48749
Surr: 4-Bromofluorobenzene	80.7	70-130		%Rec	1	1/27/2018 6:37:00 AM	B48749
Surr: Dibromofluoromethane	86.6	70-130		%Rec	1	1/27/2018 6:37:00 AM	B48749
Surr: Toluene-d8	87.8	70-130		%Rec	1	1/27/2018 6:37:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-19
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 3:30:00 PM
Lab ID: 1801A88-006 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	0.32	0.20		mg/L	1	1/25/2018 5:49:55 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 5:49:55 PM	36182
Surr: DNOP	118	79.2-146		%Rec	1	1/25/2018 5:49:55 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 5:02:43 PM	G48661
Surr: BFB	97.6	69.3-150		%Rec	1	1/24/2018 5:02:43 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-19
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 3:30:00 PM
Lab ID: 1801A88-006 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
tert-Butylbenzene	1.5	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 7:00:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	85.3	70-130		%Rec	1	1/27/2018 7:00:00 AM	B48749
Surr: 4-Bromofluorobenzene	81.1	70-130		%Rec	1	1/27/2018 7:00:00 AM	B48749
Surr: Dibromofluoromethane	87.7	70-130		%Rec	1	1/27/2018 7:00:00 AM	B48749
Surr: Toluene-d8	88.8	70-130		%Rec	1	1/27/2018 7:00:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**
06-Feb-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **1801A88-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **SHS-15**	Batch ID: **36182**	RunNo: **48688**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566496** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.9	0.20	2.500	0	117	89.6	145			
Surr: DNOP	0.29		0.2500		114	79.2	146			

Sample ID **1801A88-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **SHS-15**	Batch ID: **36182**	RunNo: **48688**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566497** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.0	0.20	2.500	0	119	89.6	145	2.31	20	
Surr: DNOP	0.28		0.2500		113	79.2	146	0	0	

Sample ID **LCS-36182**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **36182**	RunNo: **48688**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566498** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.3	0.20	2.500	0	90.8	76.5	158			
Surr: DNOP	0.23		0.2500		93.7	79.2	146			

Sample ID **MB-36182**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **36182**	RunNo: **48688**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566499** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.60		0.5000		120	79.2	146			

Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**

06-Feb-18

Client: Western Refining Southwest, Inc.

Project: GBR SHS Well Sampling

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G48661**	RunNo: **48661**
Prep Date:	Analysis Date: **1/24/2018**	SeqNo: **1565743** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		89.0	69.3	150			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G48661**	RunNo: **48661**
Prep Date:	Analysis Date: **1/24/2018**	SeqNo: **1565744** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.45	0.050	0.5000	0	90.3	75.8	123			
Surr: BFB	19		20.00		94.6	69.3	150			

Sample ID **1801A88-003AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SHS-9**	Batch ID: **G48661**	RunNo: **48707**
Prep Date:	Analysis Date: **1/25/2018**	SeqNo: **1566585** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	2.7	0.25	2.500	0.3800	93.4	52.5	149			
Surr: BFB	120		100.0		119	69.3	150			

Sample ID **1801A88-003AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SHS-9**	Batch ID: **G48661**	RunNo: **48707**
Prep Date:	Analysis Date: **1/25/2018**	SeqNo: **1566586** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	2.7	0.25	2.500	0.3800	92.7	52.5	149	160	20	R
Surr: BFB	120		100.0		119	69.3	150	0	0	

Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**
06-Feb-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568655** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.8	70	130			
Toluene	20	1.0	20.00	0	102	70	130			
Chlorobenzene	21	1.0	20.00	0	105	70	130			
1,1-Dichloroethene	22	1.0	20.00	0	110	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	95.1	70	130			
Surr: 1,2-Dichloroethane-d4	8.8		10.00		88.0	70	130			
Surr: 4-Bromofluorobenzene	8.0		10.00		80.5	70	130			
Surr: Dibromofluoromethane	8.8		10.00		88.0	70	130			
Surr: Toluene-d8	9.0		10.00		90.4	70	130			

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**
06-Feb-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**
06-Feb-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.7		10.00		86.6	70	130			
Surr: 4-Bromofluorobenzene	8.0		10.00		79.6	70	130			
Surr: Dibromofluoromethane	8.8		10.00		88.2	70	130			
Surr: Toluene-d8	8.8		10.00		88.2	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1801A88 RcptNo: 1

Received By: Anne Thorne 1/24/2018 7:00:00 AM Anne Thorne
Completed By: Anne Thorne 1/24/2018 8:48:49 AM Anne Thorne
Reviewed By: JMO 1/24/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: Allen Hains
Western Refining
Mailing Address: 111 CR 4990
Bloomfield, NM
Phone #: 505-632-8013
email or Fax#: allen.s.hains@andeavor.com
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____
Project Name: GBR SHS well sampling
Project #: Western PO = 12623210
Project Manager: Devin Hencmann
Sampler:
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	8260 VOC	TPH GRO	TPH DRO extended	Air Bubbles (Y or N)
1-23-18	1130	GW	SHS-15	5 VOA's 1 250 amber	HCl, ice	1801A88 001												X	X	X	
	1230		SHS-18			002												X	X	X	
	1315		SHS-9			003												X	X	X	
	1345		SHS-8			004												X	X	X	
	1440		SHS-6			005												X	X	X	
	1530		SHS-A			006												X	X	X	

Date	Time	Relinquished by	Received by	Date	Time
1-23-18	1600			1/23/18	1600
1/23/18	1720			01/24/18	0700

Remarks: Bill western PO
cc: dhencmann@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.