UIC - I - 8-1, 2 & 3

WDWs-1, 2 & 3 PERMITS, RENEWALS, & MODS (1 of 18)

2017

Affidavit of Publication

No. 24409

State of New Mexico

County of Eddy:

Danny Scott

being duly sworn says that she is the **Publisher**

of the Artesia Daily Press, a daily newspaper of General circulation, published in English at Artesia, said county and state, and that the hereto attached

Legal Ad

was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for

1 Consecutive weeks/day on the same day as follows:

First Publication	September 10, 2017
Second Publication	
Third Publication	
Fourth Publication	
Fifth Publication	
Sixth Publication	
Seventh Publication	

Subscribed and sworn before me this

12th day of September 2017

OFFICIAL SEAL
Latisha Romine
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 5/12/2019

Latisha Romine

Latisha Romine

Notary Public, Eddy County, New Mexico

Copy of Publication:

Legal Notice

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES
DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations (20.6.2.3108 NMAC), the following discharge permit renewal application(s) has been submitted to the Director of the New Mexico Oil Conservation Division ("OCD"), 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3441:

(UICI-8-1; UICI-8-2; and UICI-8-3) HollyFrontier Navajo Refining, LLC is located at 501 E. Main Street, Artesia, New Mexico 88210. Mr. Randy Dade at (575) 746-5281 gives public notice on its application to renew three OCD Underground Injection Control (UIC) discharge permits to inject treated oil field exempt and non-exempt non-hazardous wastewater effluent from the Artesia Refinery's on-site wastewater treatment plant. Wastewater from the refinery is generated from the treatment of water streams from the processing of crude oil, including the removal of water entrained in crude oil, the washing of crude oil to remove salts and sediment, water used for heating and cooling during refining, boiler blowdown, Reverse Osmosis reject water, and stormwater collected from process areas of the refinery. Effluent is routed via subsurface pipeline into three Class I injection wells located approximately 13 miles E-SE of the refinery, and are listed below:

Mewbourne Well No. 1 (WDW-1), API No. 30-015-27592 (UICI-8-1) UL: O, Section 31 Township 17 South, Range 28 East, NMPM, Eddy County, 660 FSL 2310 FEL, Lat. 32.78517, Long. -104.21376

WDW-1 is located approximately 11 miles SE of the intersection of I-285 and Hwy 82 or approximately 1 mile SW of the intersection of Hwy 82 and CR 206. Underground injection at WDW-1 occurs within the interval from 7,924 to 8,476 feet (below ground surface- bgs). The injection rate will not exceed 500 gallons per minute- gpm and the maximum allowable surface injection pressure is 1,585 pounds per square inch gauge- psig.

Chukka Well No. 2 (WDW-2), API No. 30-015-20894 (UICI-8-2) UL: E, Section 12 Township 18 South, Range 27 East, NMPM, Eddy County, 1980 FNL 660 FWL, Lat. 32.76366, Long. -104.23848

WDW- 2 is located approximately 10 miles SE of the intersection of US-285 and Hwy 82 or approximately 3 miles South of the intersection of Hwy 82 and CR 204 (Hilltop Road). Underground injection at WDW-2 occurs within the interval from 7,570 to 8,399 feet bgs. The injection rate will not exceed 500 gpm and the maximum allowable surface injection pressure is 1,510 psig.

Gaines Well No. 3 (WDW-3), API No. 30-015-26575 (UICI-8-3) UL: N, Section 1 Township 18 South, Range 27 East, NMPM, Eddy County 790 FSL 2250 FWL, Lat. 32.77121, Long. -104.23328

WDW-3 is located approximately 14 miles E-SE of the intersection of I-285 and Hwy 82 (Navajo Refinery) or approximately 2.75 miles S of Hwy 82 and CR 225. Underground injection at WDW-3 occurs within the injection interval from 7,660 to 8,620 feet bgs. The injection rate into WDW-3 will not exceed 500 gpm and the maximum allowable surface injection pressure of 1,530 psig.

Underground injection for each of the wells occurs within the

refinery wastewater quality is approximately 3,400 ppm Total Dissolved Solids- TDS. Formation fluids within the permitted injection intervals exceed 10,000 ppm TDS and is not protectable. Groundwater is first encountered around the wells at a depth of approximately 50 - 100 feet below land surface. The shallow groundwater quality ranges from about 1,500 to 2,200 ppm TDS.

The OCD has determined that the applications are administratively complete and has prepared draft permit renewals. OCD will accept comments and statements of interest regarding these applications and will create a facility-specific mailing list for persons who wish to receive future notices. Persons interested in obtaining further information, submitting comments or requesting to be on a facility-specific mailing list for future notices may contact the Environmental Bureau Chief of the Oil Conservation Division at the address given above. The administrative completeness determination and draft permits may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, or may also be viewed at the OCD website: http://www.emnrd.state.nm.us/ocd/. Persons interested in obtaining a copy of the application and draft permits may contact the OCD at the address given above. Prior to ruling on any proposed discharge permit renewal or major modification, the Director shall allow a period of at least thirty (30) days after the date of publication of this notice, during which interested persons may submit comments or request that OCD hold a public hearing. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines that there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit renewal based on information available, including all comments received. If a public hearing is held, the director will approve or disapprove the proposed renewal based on information in the application and information submitted at the hearing.

Para obtener más información sobre esta solicitud en español, sirvase comunicarse por favor: New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservacio´n Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Laura Tulk, 575-748-1283).

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 10th day of September 2017.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

S E A L
David R. Catanach, Director

Published in the Artesia Daily Press, Artesia, N.M., Sept. 10, 2017 Legal No. 24409.

Chavez, Carl J, EMNRD

From: Denton, Scott <Scott.Denton@HollyFrontier.com>
Sent: Wednesday, March 22, 2017 2:47 PM
To: Chavez, Carl J, EMNRD
Cc: Griswold, Jim, EMNRD; O'Brien, Robert (Bob) K.; Holder, Mike; Moore, Graciela (mooreg2@pbworld.com); Dade, Lewis (Randy); Denton, Scott
Subject: HollyFrontier Navajo Refining LLC (UICI-8) WDWs 1, 2 & 3 DP Renewal - Response to Comments
Attachments: 2017-03-22 Navajo Response to Comments for WDWs 1 2 & 3.pdf

Carl,

Attached is Navajo's response to comments on the Permit Renewal Application. Randy will upload to OCD site.

Thanks,

SMD

Scott M. Denton
Environmental Manager

The HollyFrontier Companies
P.O. Box 159
Artesia, NM 88211-0159
575-746-5487 (o)
970-581-7268 (c)

Scott.Denton@HollyFrontier.com

HOLLYFRONTIER.

March 22, 2017

Mr. Carl Chavez
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Permit Renewal Application for Class I Injection Wells WDW-1, WDW-2, and WDW-3
HollyFrontier Navajo Refining LLC, Artesia, New Mexico
Response to comments from OCD dated February 24, 2017

Dear Mr. Chavez:

We received your administrative comments for the Permit Renewal for WDW-1, -2, and -3. Below are the ODC's comments followed by Navajo's response:

1) Complete and sign OCD Application Forms as required in 20.6.2.3108(A) NMAC. The C-108 Forms were unsigned.

   The signed OCD Application Form and C-108 for each of the wells are attached.

2) Provide OCD with draft public notices (20.6.2.3108(F) NMAC) in English for each WOW. Once approved, Navajo will need to publish in English and Spanish.

   The draft public notice in English was provided as Appendix P in the draft application package. However, based on comments below, the notice has been updated and is attached for your review.

3) Propose location(s) and newspaper(s) for providing public notice 20.6.2.3108(A).

   The public notice will be published in the *Albuquerque Journal* and the *Artesia Daily Press*. Per 20.6.2.3108(C)(2), the notice will be published in English and in Spanish within 30 days of receiving notice of the permit renewal being deemed administrative completeness in a display ad at least two inches by three inches, not in the classified or legal advertisements section, in a newspaper of general circulation in the location of the discharge.

4) Provide accurate discharge locations per 20.6.2.3108(F)(2) NMAC, i.e., UL, Section, Township, and Range with accurate latitude/longitude location coordinates with more descriptive footage from major intersections or landmarks to locate the wells. This shall also include a map of the pipeline transect to the WDWs for potential releases from the pipeline along the transect of the pipeline to the WDWs.

The discharge locations are described with footage and landmarks to locate the wells in Section 3.0 of the re-permit application package, Form C-108 for each of the wells on page 3, and in the draft newspaper notice.

The injection fluid is routed from the refinery process areas via pipeline to each injection well as illustrated on the attached revised Figure 1.

5) Provide accurate brief description of the activities must be representative of the actual situation per well 20.6.2.3108(F)(3) NMAC.

The draft public notice provided in Appendix P provides description of activities as it applies to each of the wells. However, the draft notice is attached for your review and approval.

6) Provide a more accurate updated description of the expected sources and effluent quality (recent data) with accurate injection volumes per well 20.6.2.3108(F)(4) NMAC. There was 1 WDW-3 surface injection pressure and rate graph, but not for WDWs 1 and 2. The text description should qualify information in the graphs.

Updated effluent data (2016) is attached and should replace the previously submitted Appendix D of the permit renewal. Also, injection pressure graphs for WDW-1, WDW-2, and WDW-3 are attached and should replace he previously submitted single WDW-3 graph (Appendix E-1) in the permit renewal.

7) Provide the depth to and total dissolved solids concentration of the groundwater most likely to be affected by each discharge.

The draft public notice provided in Appendix P provides the depth to and TDS concentration of the groundwater for each of the wells.

If you have any questions or comments regarding this response, please feel free to contact me at 575-746-5281 or Scott Denton at 575-746-5487.

Sincerely,

Randy Dade
Environmental Specialist
HollyFrontier Navajo Refining LLC

cc: OCD: J. Griswold
HF: R. O'Brien, S. Denton, M. Holder
WSP: G. Moore

DATE IN	SUSPENSE	ENGINEER	LOGGED IN	TYPE	APP NO.

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify Class I – Non-Hazardous

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or ☐ Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☒ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Lewis R. Dade	LRDade	Env. Specialist	3/22/2017
Print or Type Name	Signature	Title	Date

Lewis.Dade@hollyfrontier.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance ___X___Disposal _____Storage
Application qualifies for administrative approval? _____Yes _____No

II. OPERATOR: HollyFrontier Navajo Refining LLC

ADDRESS: 501 East Main, Artesia, NM 88210

CONTACT PARTY: Randy Dade PHONE: (575) 746-5281

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____Yes ____X____No
If yes, give the Division order number authorizing the project: _____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Lewis R. Dade TITLE: Env. Specialist

SIGNATURE: LRDade DATE: 3/22/2017

E-MAIL ADDRESS: Lewis.Dade@hollyfrontier.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Side 1

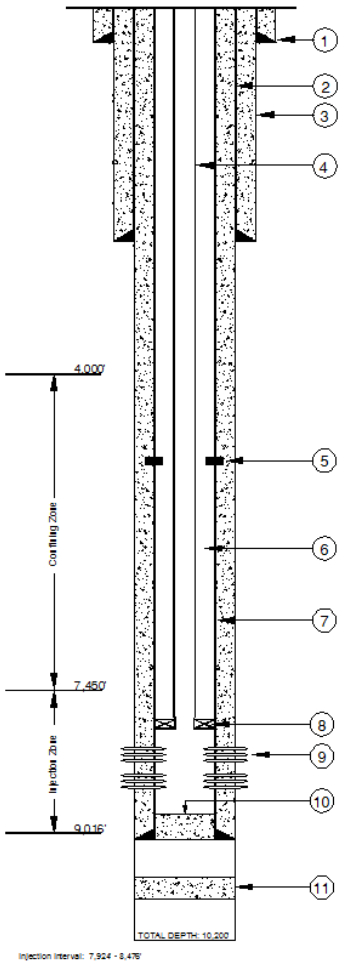
INJECTION WELL DATA SHEET

OPERATOR: **Facility**: HollyFrontier Navajo Refining LLC, 501 East Main, Artesia, New Mexico 88210;
Contact: Randy Dade, Environmental Specialist, (575) 746-5281, Lewis.Dade@HollyFrontier.com

WELL NAME & NUMBER: WDW-1

WELL LOCATION: 660 feet from the south line and 2,310 feet from the east line of SW/4, SE/4 31 17 South 28 East
FOOTAGE LOCATION UNIT LETTER SECTION TOWNSHIP RANGE

WELLBORE SCHEMATIC



BELOW GROUND DETAILS

All depths are referenced to the Kelly bushing elevation of 12.5' above ground level. Ground level elevation is 3,678' above mean sea level.

1. Surface Casing: 13 3/8", 48 lb/ft, J-55, ST&C set at 390' in a 17 ½" hole. Cemented with 150 sx Class C with 3% calcium chloride, 375 sx Class C Litewate w/3% calcium chloride and ¼ lb/sx flocele. Circulated 86 sx to surface.
2. Intermediate Casing: 9 5/8", 36 lb/ft, J-55, ST&C set at 2,555' in a 12¼" hole. Cemented w/800 sx of Class C Lite w/¼ lb/sx flocele and 2 lb/sx Gilsonite and 12% salt. Followed by 200 sx of Class C w/2% calcium chloride. Circulated 133 sx to surface.
3. Base of the USDW at 493'.
4. Injection Tubing: 4½", 11.6 lb/ft, N-80, SMLS, R3, LT&C set at 7,879'.
5. DV Tool: at 5,498'.
6. Annulus Fluid: 8.7 lb/gal brine water mixed w/UniChem Techni-Hib 370 corrosion inhibitor.
7. Protection Casing: 7", 29 lb/ft, N-80, LT&C: 9094' to 7031'. 7", 29 lb/ft, P-110, LT&C: 7031' to 5845'. 7", 26 lb/ft, P-110, LT&C; 5,845' to surface. Casing set in 8 ¾" hole and cemented in two stages as follows:

   First Stage - 600 sx modified Class H w/0.4% CFR-3, 5 lb/sx Gilsonite, 0.5% Halad-344, and 1 lb/sx salt mixed at 13.0 ppg. Opened DV tool at 5,498' and circulated 142 sx to surface.

   Second Stage - Lead Slurry: 220 sx Interfill "C" (35:65:6) mixed at 11.7 ppg. Tail Slurry: 550 sx modified Class H w/0.4% CFR-3, 5 lb/sx, Gilsonite, 0.5% Halad-344, 0.1% HR-7, and 1 lb/sx mixed at 13.0 ppg. Circulated 75 sx to surface. Topped out w/20 sx premium plus 3% calcium chloride.
8. Packer: 7" x 3.5" EVI Oil Tools (Arrow), Model X-1 retrievable packer set at 7,879'. Minimum I.D. is 3.0". Wireline re-entry guide on bottom. To release: turn ¼ turn to the right and pick up.
9. Perforations (2 SPF):

   Upper Zone - 7,924 - 7,942', 7,974 - 8,030', 8,050 - 8,056', 8,066 - 8,080', 8,118 - 8,127', 8,132 - 8,140', 8,160 - 8,164', 8,170 - 8,188'.

   Lower Zone - 8,220 - 8,254', 8,260 - 8,270', 8,280 - 8,302', 8,360 - 8,366', 8,370 - 8,378', 8,400 - 8,410', 8,419 - 8,423', 8,430 - 8,446', 8,460 - 8,464', 8,470 - 8,476'.
10. PBTD: 9,004'.
11. Cement Plug: 45 sx Class H from 9624' to 9734'.

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17.5-inches Casing Size: 13-3/8-inch

Cemented with: 525 sx. ***or*** _____ ft^3

Top of Cement: surface Method Determined: NMOCD

Intermediate Casing

Hole Size: 12.25-inches Casing Size: 9-5/8-inch

Cemented with: 1,000 sx. ***or*** _____ ft^3

Top of Cement: surface Method Determined: NMOCD

Production Casing

Hole Size: 8.75-inches Casing Size: 7-inch

Cemented with: 1,370 sx. ***or*** _____ ft^3

Top of Cement: surface Method Determined: NMOCD

Total Depth: 9,004 feet

Injection Interval

7,924 feet to 8,188 feet (Perforated)

8,220 feet to 8,476 feet (Perforated)

INJECTION WELL DATA SHEET

Tubing Size: 4 ½-inch Lining Material: steel construction

Type of Packer: Arrow X-1, 7-inch by 3 1/2-inch

Packer Setting Depth: 7,879-feet

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? _____Yes ___X__No

   If no, for what purpose was the well originally drilled? Originally for oil and gas production___

   _____

2. Name of the Injection Formation: __Lower Wolfcamp, Cisco, and Canyon Formations _____

3. Name of Field or Pool (if applicable): _____

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. The original oil and gas well was drilled to a total depth of 10,200 feet. When the well was converted to an injection well in 1999, a cement plug was set from 9,624 to 9,734 feet and 7-inch protection casing was set at 9,094 feet. A bottom plug was installed into the base of the 7-inch casing with the top of the plug tagged at 9,004 feet. The 7-inch protection casing was perforated with a 0.5-inch diameter hole at 2 shots per foot on a 60° phasing. The perforations are located between 7,924 feet and 8,188 feet and from 8,220 feet to 8,476 feet.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: The **Abo Formation** overlies the Wolfcamp and extends from 5,400 feet to 6,890 feet in WDW-1, from 5,506 feet to 6,728 feet in WDW-2, and from 5,380 feet to 6,745 feet in WDW-3. Although the Abo is well known as a major oil producer in the AOR, the producing intervals lie in the upper Abo, whose equivalents are above 6,100 feet in WDW-1 and above 6,200 feet in WDW-2. The deepest Abo test well in the area is located 6,000 feet east (downdip) of WDW-3 and was drilled to 6,412 feet.

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance ___X___Disposal _____Storage
Application qualifies for administrative approval? _____Yes _____No

II. OPERATOR: HollyFrontier Navajo Refining LLC

ADDRESS: 501 East Main, Artesia, NM 88210

CONTACT PARTY: Randy Dade PHONE: (575) 746-5281

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____Yes ____X____No
If yes, give the Division order number authorizing the project: _____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Lewis R. Dade TITLE: Env. Specialist

SIGNATURE: L R Dade DATE: 3/22/2017

E-MAIL ADDRESS: Lewis.Dade@hollyfrontier.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Side 1

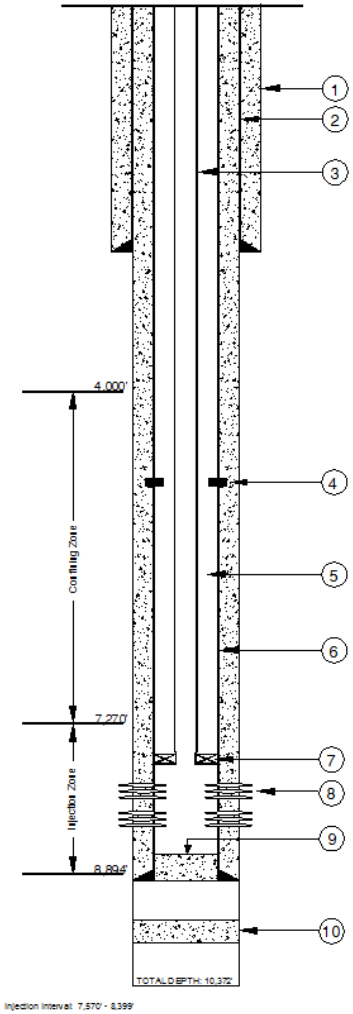
INJECTION WELL DATA SHEET

OPERATOR: **Facility**: HollyFrontier Navajo Refining LLC, 501 East Main, Artesia, New Mexico 88210;
Contact: Randy Dade, Environmental Specialist, (575) 746-5281, Lewis.Dade@HollyFrontier.com

WELL NAME & NUMBER: WDW-2

WELL LOCATION: 1,980 feet from the north line and 660 feet from the west line of SW/4, NW/4 | 12 | 18 South | 27 East
FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC



BELOW GROUND DETAILS

All depths are referenced to the Kelly bushing elevation of 13' above ground level. Ground level elevation is 3610' above mean sea level.

1. Base of the USDW at 473'.
2. Surface Casing: 8 5/8", 32 lb/ft, set at 1995' in an 11" hole. Cemented to surface with 800 sacks of cement.
3. Injection Tubing: 3½", 9.2 lb/ft, J-55, smls, NUE 10rd set at 7,528'.
4. DV Tool: at 5,785'.
5. Annulus Fluid: 8.7 lb/gal brine water mixed w/UniChem Techni-Hib 370 corrosion inhibitor.
6. Protection Casing: 5 ½", 17 lb/ft, L-80, LT&C: 8,869' to the surface and set in a 7 7/8" hole. Casing cemented in two stages as follows:

   First Stage - 575 sacks of modified Class "H" with 0.4% CFR-3, 5 lb/sk Gilsonite, 0.5% Halad-344, and 3 lb/sk salt. Mixed at 13.0 ppg. DV tool opened at 5,785 and 20 sacks circulated to surface.

   Second Stage - Lead Slurry: 300 sacks of Interfill "C" (35:65:6) mixed at 11.7 ppg. Tail slurry: 695 sacks modified Class "H" with 0.4% CFR-3, 5 lb/sk Gilsonite, 0.5% Halad-344 and 3 lb/sk salt mixed at 13.0 ppg. Circulated 150 sacks to surface. Topped out with 10 yards of Redi-mix.
7. Packer: 5 ½" x 2 7/8" Weatherford Completion Tools (Arrow) Model X-1 retrievable packer set at 7,528'. Minimum ID is 2.4375". Wireline re-entry guide is on bottom. To release: turn ¼ turn to the right and pick up.
8. Perforations (2 SPF):

   Zone 1: 7,570-7,620'; 7,676-7,736'

   Zone 2: 7,826-7,834'; 7,858-7,880'; 7,886-7,904'; 7,916-7,936'; 7,944-7,964'; 7,990-8,042'; 8,096-8,116'; 8,191-8,201'; 8,304-8,319'; 8,395-8,399'.
9. PBTD: 8,770'
10. Cement Plug: 45 sacks from 9,675' to 9,775'.

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 11-inches | Casing Size: 8-5/8-inch

Cemented with: 800 sx. | ***or*** _____ ft^3

Top of Cement: surface | Method Determined: NMOCD

Intermediate Casing

Hole Size: 7-7/8-inches | Casing Size: 5-1/2-inch

Cemented with: 1,570 sx. | ***or*** _____ ft^3

Top of Cement: surface | Method Determined: NMOCD

Production Casing

Hole Size: _____ | Casing Size: _____

Cemented with: _____ sx. | ***or*** _____ ft^3

Top of Cement: _____ | Method Determined: NMOCD

Total Depth: 8,770 feet

Injection Interval

7,570 feet to 7,736 feet (Perforated)
7,826 feet to 8,399 feet (Perforated)

INJECTION WELL DATA SHEET

Tubing Size: 3 ½-inch_____Lining Material: steel construction_____

Type of Packer: Arrow X-1, 5 1/2-inch by 2 7/8-inch _____

Packer Setting Depth: _7,528-feet _____

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? _____Yes ___X__No

   If no, for what purpose was the well originally drilled? Originally for oil and gas production___

   _____

2. Name of the Injection Formation: __Lower Wolfcamp, Cisco, and Canyon Formations _____

3. Name of Field or Pool (if applicable): _____

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. The original oil and gas well was drilled to a total depth of 10,200 feet. When the well was converted to an injection well in 1999, a cement plug was set from 9,624 to 9,734 feet and 7-inch protection casing was set at 9,094 feet. A bottom plug was installed into the base of the 7-inch casing with the top of the plug tagged at 9,004 feet. The 7-inch protection casing was perforated with a 0.5-inch diameter hole at 2 shots per foot on a 60° phasing. The perforations are located between 7,924 feet and 8,188 feet and from 8,220 feet to 8,476 feet.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: The **Abo Formation** overlies the Wolfcamp and extends from 5,400 feet to 6,890 feet in WDW-1, from 5,506 feet to 6,728 feet in WDW-2, and from 5,380 feet to 6,745 feet in WDW-3. Although the Abo is well known as a major oil producer in the AOR, the producing intervals lie in the upper Abo, whose equivalents are above 6,100 feet in WDW-1 and above 6,200 feet in WDW-2. The deepest Abo test well in the area is located 6,000 feet east (downdip) of WDW-3 and was drilled to 6,412 feet.

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance ___X___Disposal _____Storage
Application qualifies for administrative approval? _____Yes _____No

II. OPERATOR: HollyFrontier Navajo Refining LLC

ADDRESS: 501 East Main, Artesia, NM 88210

CONTACT PARTY: Randy Dade PHONE: (575) 746-5281

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____Yes _____X____No
If yes, give the Division order number authorizing the project: _____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Lewis R. Dade TITLE: Env. Specialist

SIGNATURE: LRDade DATE: 3/22/2017

E-MAIL ADDRESS: Lewis.Dade@hollyfrontier.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Side 1

INJECTION WELL DATA SHEET

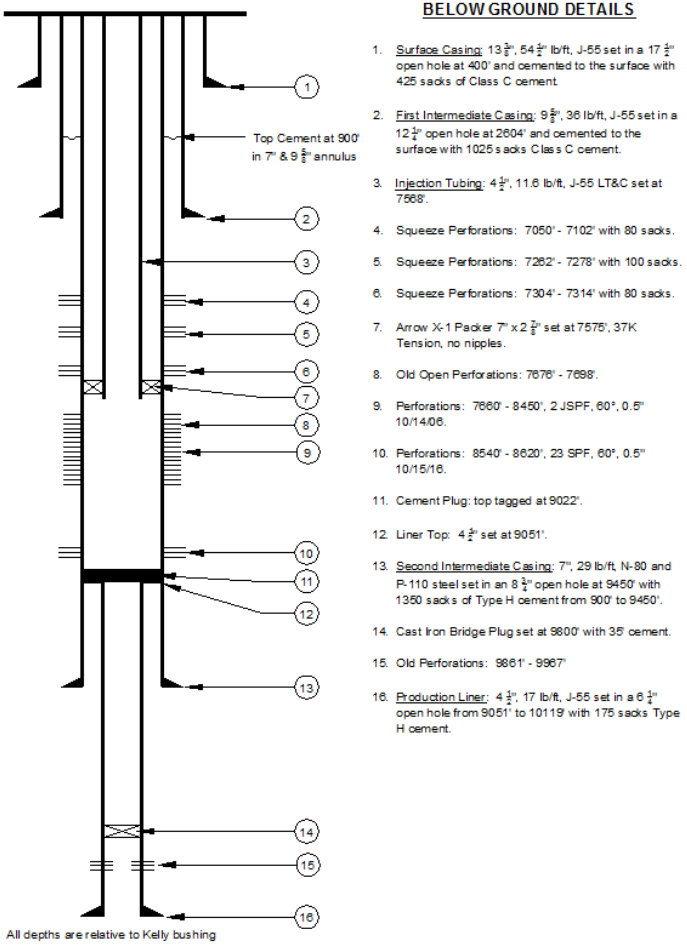
OPERATOR: **Facility**: HollyFrontier Navajo Refining LLC, 501 East Main, Artesia, New Mexico 88210;
Contact: Randy Dade, Environmental Specialist, (575) 746-5281, Lewis.Dade@HollyFrontier.com

WELL NAME & NUMBER: WDW-3

WELL LOCATION: _____ 1 18 South 27 East

FOOTAGE LOCATION	UNIT LETTER	SECTION	TOWNSHIP	RANGE

WELLBORE SCHEMATIC



BELOW GROUND DETAILS

1. Surface Casing: 13 3/8", 54 1/2# lb/ft, J-55 set in a 17 1/2" open hole at 400' and cemented to the surface with 425 sacks of Class C cement.
2. First Intermediate Casing: 9 5/8", 36 lb/ft, J-55 set in a 12 1/4" open hole at 2604' and cemented to the surface with 1025 sacks Class C cement.
3. Injection Tubing: 4 1/2", 11.6 lb/ft, J-55 LT&C set at 7568'.
4. Squeeze Perforations: 7050' - 7102' with 80 sacks.
5. Squeeze Perforations: 7262' - 7278' with 100 sacks.
6. Squeeze Perforations: 7304' - 7314' with 80 sacks.
7. Arrow X-1 Packer 7" x 2 7/8" set at 7575', 37K Tension, no nipples.
8. Old Open Perforations: 7676' - 7698'.
9. Perforations: 7660' - 8450', 2 JSPF, 60°, 0.5" 10/14/06.
10. Perforations: 8540' - 8620', 23 SPF, 60°, 0.5" 10/15/16.
11. Cement Plug: top tagged at 9022'.
12. Liner Top: 4 1/2" set at 9051'.
13. Second Intermediate Casing: 7", 29 lb/ft, N-80 and P-110 steel set in an 8 1/2" open hole at 9450' with 1350 sacks of Type H cement from 900' to 9450'.
14. Cast Iron Bridge Plug set at 9800' with 35' cement.
15. Old Perforations: 9861' - 9967'
16. Production Liner: 4 1/2", 17 lb/ft, J-55 set in a 6 1/4" open hole from 9051' to 10119' with 175 sacks Type H cement.

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17.5-inches Casing Size: 13-3/8-inch

Cemented with: 425 sx. ***or*** _____ ft^3

Top of Cement: surface Method Determined: NMOCD

Intermediate Casing

Hole Size: 12.25-inches Casing Size: 9-5/8-inch

Cemented with: 1,025 sx. ***or*** _____ ft^3

Top of Cement: surface Method Determined: NMOCD

Production Casing

Hole Size: 8.75-inches Casing Size: 7-inch

Cemented with: 1,350 sx. ***or*** _____ ft^3

Top of Cement: surface Method Determined: NMOCD

Total Depth: 9,022 feet

Injection Interval

7,650 feet to 8,450 feet (Perforated)

8,540 feet to 8,620 feet (Perforated)

INJECTION WELL DATA SHEET

Tubing Size: 4 ½-inch Lining Material: steel construction

Type of Packer: Arrow X-1, 7-inch by 2-7/8-inch

Packer Setting Depth: 7,575-feet

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? _____Yes ___X__No

   If no, for what purpose was the well originally drilled? Originally for oil and gas production___

   _____

2. Name of the Injection Formation: __Lower Wolfcamp, Cisco, and Canyon Formations _____

3. Name of Field or Pool (if applicable): _____

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. The original oil and gas well was drilled to a total depth of 10,200 feet. When the well was converted to an injection well in 1999, a cement plug was set from 9,624 to 9,734 feet and 7-inch protection casing was set at 9,094 feet. A bottom plug was installed into the base of the 7-inch casing with the top of the plug tagged at 9,004 feet. The 7-inch protection casing was perforated with a 0.5-inch diameter hole at 2 shots per foot on a 60° phasing. The perforations are located between 7,924 feet and 8,188 feet and from 8,220 feet to 8,476 feet.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: The **Abo Formation** overlies the Wolfcamp and extends from 5,400 feet to 6,890 feet in WDW-1, from 5,506 feet to 6,728 feet in WDW-2, and from 5,380 feet to 6,745 feet in WDW-3. Although the Abo is well known as a major oil producer in the AOR, the producing intervals lie in the upper Abo, whose equivalents are above 6,100 feet in WDW-1 and above 6,200 feet in WDW-2. The deepest Abo test well in the area is located 6,000 feet east (downdip) of WDW-3 and was drilled to 6,412 feet.

PUBLIC NOTICE

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

In accordance with 20.6.2.3108.F NMAC, HollyFrontier Navajo Refining LLC, located at 501 E. Main Street, Artesia, New Mexico, hereby gives public notice of its application to renew the New Mexico Oil Conservation Division (OCD) discharge permit to inject treated non-hazardous waste water effluent from the refinery's on-site wastewater treatment plant into three Class I (nonhazardous) injection wells listed below:

- WDW-1 (API# 30-015-27592). The WDW-1 is located in the SW/4, SE/4 of Section 31, Township 17 South, Range 28 East, NMPM, Eddy County, New Mexico. The WDW-1 is located approximately 11 miles SE of the intersection of I-285 and Hwy 82 or approximately 1 mile SW of the intersection of Hwy 82 and CR-206.

- WDW-2 (API# 30-015-20894). The WDW-2 is located in the SW/4, NW/4 of Section 12, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The WDW- 2 is located approximately 10 miles SE of the intersection of US-285 and Hwy 82 or approximately 3 miles South of the intersection of Hwy 82 and CR-204 (Hilltop Road).

- WDW-3 (API# 30-015-26575). The WDW-3 is located in the SE/4, SW/4 of Section 1, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The WDW-3 is located approximately 14 miles E-SE of the intersection of I-285 and Hwy 82 (Navajo Refinery) or approximately 2.75 miles S of Hwy 82 and CR-225.

Waste water from the refinery is generated from the treatment of waters from the processing of crude oil, including the removal of water entrained in crude oil, the washing of crude oil to remove salts and sediment, water used for heating and cooling during refining, boiler blowdown, and stormwater collected from process portions of the refinery. Underground injection for each of the wells occurs within the Lower Wolfcamp, Cisco and Canyon Formations.

- Underground injection at WDW-1 occurs within the injection interval from 7,924 to 8,476 feet (log depth). The injection rate into WDW-1 will not exceed 500 gpm and the maximum allowable surface injection pressure is 1,585 psig. The injected refinery waste water quality is approximately 3,400 mg/L total dissolved solids (TDS).

- Underground injection at WDW-2 occurs within the injection interval from 7,570 to 8,399 feet (log depth). The injection rate into WDW-2 will not exceed 500 gpm and

the maximum allowable surface injection pressure is 1,514 psig. The injected refinery waste water quality is approximately 3,400 mg/L TDS.

- Underground injection at WDW-3 occurs within the injection interval from 7,660 to 8,620 feet (log depth). The injection rate into WDW-3 will not exceed 500 gpm and the maximum allowable surface injection pressure of 1,530 psig.

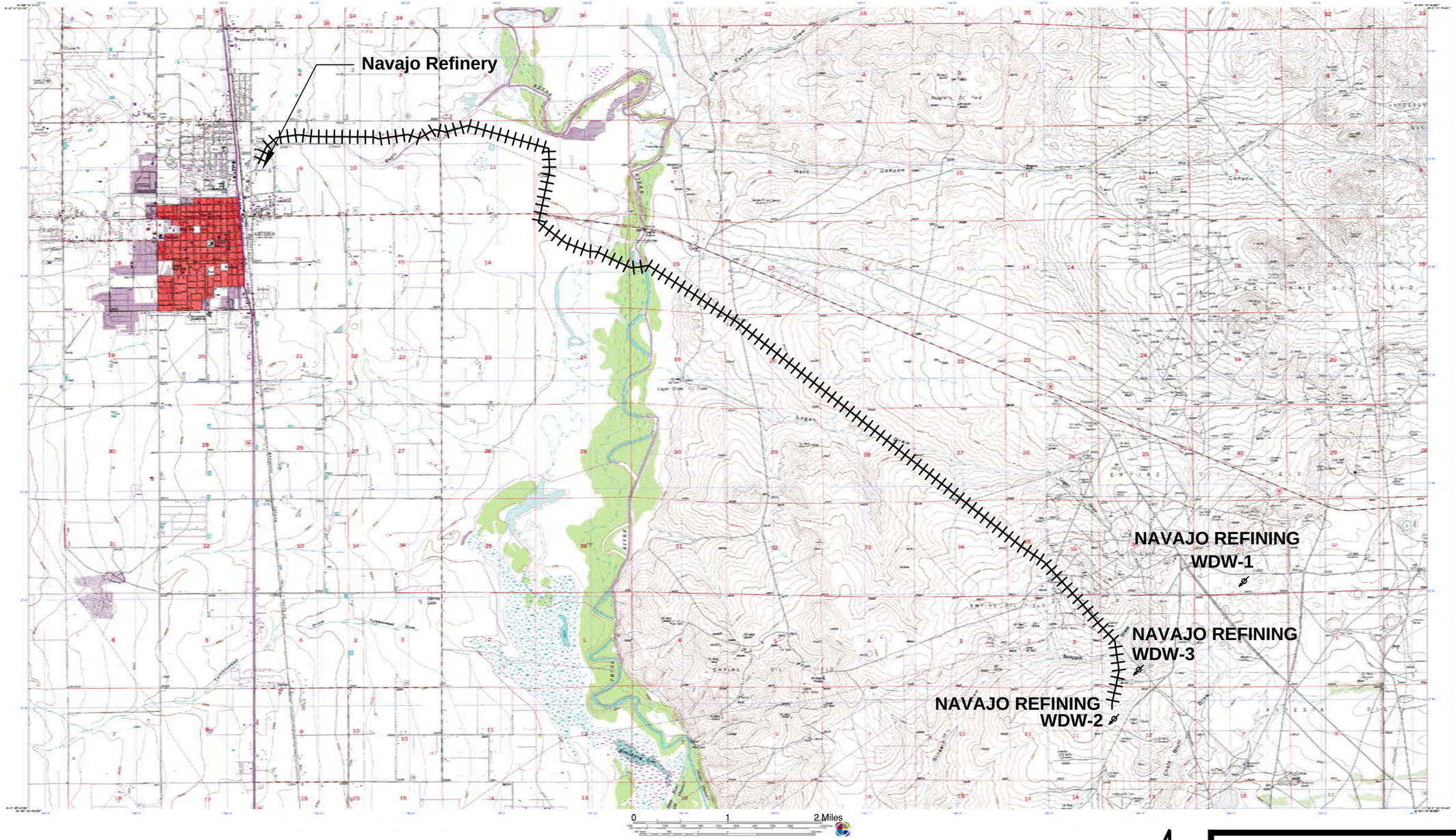
The injected refinery waste water quality is approximately 3,400 mg/L TDS. Formation fluids within the permitted injection interval exceeds 10,000 mg/L TDS. Groundwater is first encountered in the area of the wells is at a depth range of approximately 50 to 150 feet below land surface. The groundwater quality ranges from about 1,500 to 2,200 mg/L TDS.

Persons interested in obtaining further information, submitting comments, or requesting to be on a facility-specific mailing list for future notices may contact the Environmental Bureau Chief of the New Mexico Oil Conservation Division.

Comments and inquiries on regulations should be directed to:

Director
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
Telephone: (505) 476-3440

When corresponding, please reference the name of the applicant and the well name.



Pipeline

N

NEW MEXICO

QUADRANGLE LOCATION

Maps compiled from USGS Quads: Artesia, NM; Spring Lake, NM; Red Lake, NM; Illinois Camp, NM; Dayton, NM; Lake Mcmillan N, NM

WSP | PARSONS BRINCKERHOFF

FIGURE 1

HOLLYFRONTIER NAVAJO REFINING, L.L.C.
ARTESIA, NEW MEXICO

SITE LOCATION MAP

DATE: 03/22/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG. NO:

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

August 01, 2016

Scott Denton

Navajo Refining Company
P.O. Box 159
Artesia, NM 88211-0159
TEL: (575) 748-3311
FAX

RE: Quarterly WDW-1, 2, &3 Inj Well OrderNo.: 1607300

Dear Scott Denton:

Hall Environmental Analysis Laboratory received 2 sample(s) on 7/7/2016 for the analyses presented in the following report.

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. In order to properly interpret your results it is imperative that you review this report in its entirety. 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. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 7/5/2016 8:30:00 AM
Lab ID: 1607300-001
Matrix: AQUEOUS
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **LGT**
Fluoride	8.9	2.0	*	mg/L	20	7/8/2016 1:28:08 AM
Chloride	400	10		mg/L	20	7/8/2016 1:28:08 AM
Bromide	0.78	0.10		mg/L	1	7/8/2016 1:15:44 AM
Phosphorus, Orthophosphate (As P)	ND	10	H	mg/L	20	7/8/2016 1:28:08 AM
Sulfate	1700	50		mg/L	100	7/8/2016 11:57:26 PM
Nitrate+Nitrite as N	ND	1.0		mg/L	5	7/8/2016 2:05:22 AM
EPA METHOD 7470: MERCURY						Analyst: **pmf**
Mercury	ND	0.00020		mg/L	1	7/15/2016 10:35:40 AM
MERCURY, TCLP						Analyst: **ELS**
Mercury	ND	0.020		mg/L	1	7/21/2016 2:26:41 PM
EPA METHOD 6010B: TCLP METALS						Analyst: **ELS**
Arsenic	ND	5.0		mg/L	1	7/20/2016 6:42:47 AM
Barium	ND	100		mg/L	1	7/20/2016 6:42:47 AM
Cadmium	ND	1.0		mg/L	1	7/20/2016 6:42:47 AM
Chromium	ND	5.0		mg/L	1	7/20/2016 6:42:47 AM
Lead	ND	5.0		mg/L	1	7/20/2016 6:42:47 AM
Selenium	ND	1.0		mg/L	1	7/20/2016 6:42:47 AM
Silver	ND	5.0		mg/L	1	7/20/2016 6:42:47 AM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**
Aluminum	0.87	0.10		mg/L	5	7/21/2016 11:41:44 AM
Antimony	ND	0.050		mg/L	1	7/21/2016 11:36:00 AM
Arsenic	0.038	0.020		mg/L	1	7/21/2016 11:36:00 AM
Barium	ND	0.020		mg/L	1	7/21/2016 11:36:00 AM
Beryllium	ND	0.0030		mg/L	1	7/21/2016 11:36:00 AM
Cadmium	ND	0.0020		mg/L	1	7/21/2016 11:36:00 AM
Calcium	150	20		mg/L	20	7/21/2016 11:48:56 AM
Chromium	ND	0.0060		mg/L	1	7/21/2016 11:36:00 AM
Cobalt	ND	0.0060		mg/L	1	7/21/2016 11:36:00 AM
Copper	ND	0.0060		mg/L	1	7/21/2016 11:36:00 AM
Iron	0.23	0.050		mg/L	1	7/21/2016 11:36:00 AM
Lead	ND	0.0050		mg/L	1	7/21/2016 11:36:00 AM
Magnesium	45	1.0		mg/L	1	7/21/2016 11:36:00 AM
Manganese	0.096	0.0020		mg/L	1	7/21/2016 11:36:00 AM
Nickel	ND	0.010		mg/L	1	7/21/2016 11:36:00 AM
Potassium	69	5.0		mg/L	5	7/21/2016 11:41:44 AM
Selenium	ND	0.050		mg/L	1	7/21/2016 11:36:00 AM
Silver	ND	0.0050		mg/L	1	7/21/2016 11:36:00 AM

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 7/5/2016 8:30:00 AM
Lab ID: 1607300-001
Matrix: AQUEOUS
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**
Sodium	760	20		mg/L	20	7/21/2016 11:48:56 AM
Strontium	2.3	0.20		mg/L	20	7/21/2016 11:48:56 AM
Thallium	ND	0.25		mg/L	5	7/21/2016 11:41:44 AM
Zinc	0.042	0.020		mg/L	1	7/21/2016 11:36:00 AM
Silica	18	5.4		mg/L	5	7/21/2016 11:41:44 AM
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**
Acetonitrile	110	0.50		µg/L	1	7/19/2016
Allyl chloride	ND	0.50		µg/L	1	7/19/2016
Chloroprene	ND	0.50		µg/L	1	7/19/2016
Cyclohexane	ND	0.50		µg/L	1	7/19/2016
Diethyl ether	ND	0.50		µg/L	1	7/19/2016
Diisopropyl ether	ND	0.50		µg/L	1	7/19/2016
Epichlorohydrin	ND	5.0		µg/L	1	7/19/2016
Ethyl acetate	ND	0.50		µg/L	1	7/19/2016
Ethyl methacrylate	ND	2.5		µg/L	1	7/19/2016
Ethyl tert-butyl ether	ND	0.50		µg/L	1	7/19/2016
Freon-113	ND	0.50		µg/L	1	7/19/2016
Isobutanol	ND	10		µg/L	1	7/19/2016
Isopropyl acetate	ND	0.50		µg/L	1	7/19/2016
Methacrylonitrile	ND	2.5		µg/L	1	7/19/2016
Methyl acetate	ND	0.50		µg/L	1	7/19/2016
Methyl ethyl ketone	ND	2.5		µg/L	1	7/19/2016
Methyl isobutyl ketone	ND	2.5		µg/L	1	7/19/2016
Methyl methacrylate	ND	2.5		µg/L	1	7/19/2016
Methylcyclohexane	ND	1.0		µg/L	1	7/19/2016
n-Amyl acetate	ND	0.50		µg/L	1	7/19/2016
n-Hexane	ND	0.50		µg/L	1	7/19/2016
Nitrobenzene	ND	5.0		µg/L	1	7/19/2016
Pentachloroethane	ND	5.0		µg/L	1	7/19/2016
p-isopropyltoluene	ND	0.50		µg/L	1	7/19/2016
Propionitrile	ND	2.5		µg/L	1	7/19/2016
Tetrahydrofuran	ND	0.50		µg/L	1	7/19/2016
Benzene	ND	0.50		µg/L	1	7/19/2016
Toluene	2.4	0.50		µg/L	1	7/19/2016
Ethylbenzene	ND	0.50		µg/L	1	7/19/2016
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	7/19/2016
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	7/19/2016
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	7/19/2016
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	7/19/2016

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 7/5/2016 8:30:00 AM
Lab ID: 1607300-001
Matrix: AQUEOUS
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	7/19/2016
Naphthalene	ND	0.50		µg/L	1	7/19/2016
Acetone	4.6	2.5		µg/L	1	7/19/2016
Bromobenzene	ND	0.50		µg/L	1	7/19/2016
Bromodichloromethane	ND	0.50		µg/L	1	7/19/2016
Bromoform	ND	0.50		µg/L	1	7/19/2016
Bromomethane	ND	0.50		µg/L	1	7/19/2016
2-Butanone	ND	2.5		µg/L	1	7/19/2016
Carbon disulfide	ND	0.50		µg/L	1	7/19/2016
Carbon Tetrachloride	ND	0.50		µg/L	1	7/19/2016
Chlorobenzene	ND	0.50		µg/L	1	7/19/2016
Chloroethane	ND	0.50		µg/L	1	7/19/2016
Chloroform	ND	0.50		µg/L	1	7/19/2016
Chloromethane	1.4	0.50		µg/L	1	7/19/2016
2-Chlorotoluene	ND	0.50		µg/L	1	7/19/2016
4-Chlorotoluene	ND	0.50		µg/L	1	7/19/2016
cis-1,2-DCE	ND	0.50		µg/L	1	7/19/2016
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	7/19/2016
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	7/19/2016
Dibromochloromethane	ND	0.50		µg/L	1	7/19/2016
Dibromomethane	ND	0.50		µg/L	1	7/19/2016
1,2-Dichlorobenzene	ND	0.50		µg/L	1	7/19/2016
1,3-Dichlorobenzene	ND	0.50		µg/L	1	7/19/2016
1,4-Dichlorobenzene	ND	0.50		µg/L	1	7/19/2016
Dichlorodifluoromethane	ND	0.50		µg/L	1	7/19/2016
1,1-Dichloroethane	ND	0.50		µg/L	1	7/19/2016
1,1-Dichloroethene	ND	0.50		µg/L	1	7/19/2016
1,2-Dichloropropane	ND	0.50		µg/L	1	7/19/2016
1,3-Dichloropropane	ND	0.50		µg/L	1	7/19/2016
2,2-Dichloropropane	ND	0.50		µg/L	1	7/19/2016
1,1-Dichloropropene	ND	0.50		µg/L	1	7/19/2016
Hexachlorobutadiene	ND	0.50		µg/L	1	7/19/2016
2-Hexanone	ND	0.50		µg/L	1	7/19/2016
Isopropylbenzene	ND	0.50		µg/L	1	7/19/2016
Methylene Chloride	ND	2.5		µg/L	1	7/19/2016
n-Butylbenzene	ND	0.50		µg/L	1	7/19/2016
n-Propylbenzene	ND	0.50		µg/L	1	7/19/2016
sec-Butylbenzene	ND	0.50		µg/L	1	7/19/2016
Styrene	ND	0.50		µg/L	1	7/19/2016

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 7/5/2016 8:30:00 AM
Lab ID: 1607300-001
Matrix: AQUEOUS
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**
tert-Butylbenzene	ND	0.50		µg/L	1	7/19/2016
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	7/19/2016
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	7/19/2016
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	7/19/2016
trans-1,2-DCE	ND	0.50		µg/L	1	7/19/2016
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	7/19/2016
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	7/19/2016
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	7/19/2016
1,1,1-Trichloroethane	ND	0.50		µg/L	1	7/19/2016
1,1,2-Trichloroethane	ND	0.50		µg/L	1	7/19/2016
Trichloroethene (TCE)	ND	0.50		µg/L	1	7/19/2016
Trichlorofluoromethane	ND	0.50		µg/L	1	7/19/2016
1,2,3-Trichloropropane	ND	0.50		µg/L	1	7/19/2016
Vinyl chloride	ND	0.50		µg/L	1	7/19/2016
mp-Xylenes	ND	1.0		µg/L	1	7/19/2016
o-Xylene	ND	0.50		µg/L	1	7/19/2016
tert-Amyl methyl ether	ND	0.50		µg/L	1	7/19/2016
tert-Butyl alcohol	ND	0.50		µg/L	1	7/19/2016
Acrolein	ND	2.5		µg/L	1	7/19/2016
Acrylonitrile	ND	2.5		µg/L	1	7/19/2016
Bromochloromethane	ND	0.50		µg/L	1	7/19/2016
2-Chloroethyl vinyl ether	ND	0.50		µg/L	1	7/19/2016
Iodomethane	ND	0.50		µg/L	1	7/19/2016
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	7/19/2016
Vinyl acetate	ND	0.50		µg/L	1	7/19/2016
1,4-Dioxane	ND	20		µg/L	1	7/19/2016
Surr: 1,2-Dichlorobenzene-d4	98.8	70-130		%Rec	1	7/19/2016
Surr: 4-Bromofluorobenzene	95.6	70-130		%Rec	1	7/19/2016
Surr: Toluene-d8	101	70-130		%Rec	1	7/19/2016
EPA 8270C: SEMIVOLATILES/MOD						Analyst: **SUB**
1,1-Biphenyl	ND	2.5		µg/L	1	7/15/2016
Atrazine	ND	2.5		µg/L	1	7/15/2016
Benzaldehyde	ND	2.5		µg/L	1	7/15/2016
Caprolactam	ND	2.5		µg/L	1	7/15/2016
N-Nitroso-di-n-butylamine	ND	2.5		µg/L	1	7/15/2016
Acetophenone	ND	25		µg/L	1	7/15/2016
1-Methylnaphthalene	ND	25		µg/L	1	7/15/2016
2,3,4,6-Tetrachlorophenol	ND	25		µg/L	1	7/15/2016
2,4,5-Trichlorophenol	ND	25		µg/L	1	7/15/2016

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 7/5/2016 8:30:00 AM
Lab ID: 1607300-001
Matrix: AQUEOUS
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA 8270C: SEMIVOLATILES/MOD						Analyst: **SUB**
2,4,6-Trichlorophenol	ND	25		µg/L	1	7/15/2016
2,4-Dichlorophenol	ND	25		µg/L	1	7/15/2016
2,4-Dimethylphenol	ND	25		µg/L	1	7/15/2016
2,4-Dinitrophenol	ND	25		µg/L	1	7/15/2016
2,4-Dinitrotoluene	ND	25		µg/L	1	7/15/2016
2,6-Dinitrotoluene	ND	25		µg/L	1	7/15/2016
2-Chloronaphthalene	ND	25		µg/L	1	7/15/2016
2-Chlorophenol	ND	25		µg/L	1	7/15/2016
2-Methylnaphthalene	ND	25		µg/L	1	7/15/2016
2-Methylphenol	ND	25		µg/L	1	7/15/2016
2-Nitroaniline	ND	25		µg/L	1	7/15/2016
2-Nitrophenol	ND	25		µg/L	1	7/15/2016
3,3´-Dichlorobenzidine	ND	25		µg/L	1	7/15/2016
3-Nitroaniline	ND	25		µg/L	1	7/15/2016
4,6-Dinitro-2-methylphenol	ND	25		µg/L	1	7/15/2016
4-Bromophenyl phenyl ether	ND	25		µg/L	1	7/15/2016
4-Chloro-3-methylphenol	ND	25		µg/L	1	7/15/2016
4-Chloroaniline	ND	25		µg/L	1	7/15/2016
4-Chlorophenyl phenyl ether	ND	25		µg/L	1	7/15/2016
4-Nitroaniline	ND	25		µg/L	1	7/15/2016
4-Nitrophenol	ND	25		µg/L	1	7/15/2016
Acenaphthene	ND	25		µg/L	1	7/15/2016
Acenaphthylene	ND	25		µg/L	1	7/15/2016
Anthracene	ND	25		µg/L	1	7/15/2016
Benzo(g,h,i)perylene	ND	25		µg/L	1	7/15/2016
Benz(a)anthracene	ND	0.50		µg/L	1	7/15/2016
Benzo(a)pyrene	ND	0.50		µg/L	1	7/15/2016
Benzo(b)fluoranthene	ND	0.50		µg/L	1	7/15/2016
Benzo(k)fluoranthene	ND	0.50		µg/L	1	7/15/2016
Bis(2-chloroethoxy)methane	ND	25		µg/L	1	7/15/2016
Bis(2-chloroethyl)ether	ND	25		µg/L	1	7/15/2016
Bis(2-chloroisopropyl)ether	ND	25		µg/L	1	7/15/2016
Bis(2-ethylhexyl)phthalate	ND	25		µg/L	1	7/15/2016
Butyl benzyl phthalate	ND	25		µg/L	1	7/15/2016
Carbazole	ND	25		µg/L	1	7/15/2016
Chrysene	ND	0.50		µg/L	1	7/15/2016
Dibenz(a,h)anthracene	ND	0.50		µg/L	1	7/15/2016
Dibenzofuran	ND	25		µg/L	1	7/15/2016
Diethyl phthalate	ND	25		µg/L	1	7/15/2016

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 7/5/2016 8:30:00 AM
Lab ID: 1607300-001
Matrix: AQUEOUS
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA 8270C: SEMIVOLATILES/MOD						Analyst: **SUB**
Dimethyl phthalate	ND	25		µg/L	1	7/15/2016
Di-n-butyl phthalate	ND	25		µg/L	1	7/15/2016
Di-n-octyl phthalate	ND	25		µg/L	1	7/15/2016
Fluoranthene	ND	25		µg/L	1	7/15/2016
Fluorene	ND	25		µg/L	1	7/15/2016
Hexachlorobenzene	ND	5.0		µg/L	1	7/15/2016
Hexachlorobutadiene	ND	25		µg/L	1	7/15/2016
Hexachlorocyclopentadiene	ND	25		µg/L	1	7/15/2016
Hexachloroethane	ND	25		µg/L	1	7/15/2016
Indeno(1,2,3-cd)pyrene	ND	0.50		µg/L	1	7/15/2016
Isophorone	ND	25		µg/L	1	7/15/2016
Naphthalene	ND	25		µg/L	1	7/15/2016
Nitrobenzene	ND	25		µg/L	1	7/15/2016
N-Nitrosodi-n-propylamine	ND	25		µg/L	1	7/15/2016
N-Nitrosodiphenylamine	ND	10		µg/L	1	7/15/2016
Pentachlorophenol	ND	25		µg/L	1	7/15/2016
Phenanthrene	ND	25		µg/L	1	7/15/2016
Phenol	ND	25		µg/L	1	7/15/2016
Pyrene	ND	25		µg/L	1	7/15/2016
o-Toluidine	ND	10		µg/L	1	7/15/2016
Pyridine	ND	25		µg/L	1	7/15/2016
1,2,4,5-Tetrachlorobenzene	ND	25		µg/L	1	7/15/2016
Surr: 2,4,6-Tribromophenol	98.8	63-110		%Rec	1	7/15/2016
Surr: 2-Fluorobiphenyl	83.2	58-112		%Rec	1	7/15/2016
Surr: 2-Fluorophenol	61.0	47-109		%Rec	1	7/15/2016
Surr: Nitrobenzene-d5	91.2	58-110		%Rec	1	7/15/2016
Surr: Phenol-d5	75.6	52-105		%Rec	1	7/15/2016
Surr: Terphenyl-d14	51.2	22-133		%Rec	1	7/15/2016
CORROSIVITY						Analyst: **SUB**
pH	7.54			pH Units	1	7/13/2016
IGNITABILITY METHOD 1010						Analyst: **SUB**
Ignitability	>200	0		°F	1	7/21/2016
CYANIDE, REACTIVE						Analyst: **SUB**
Cyanide, Reactive	ND	0.0100		mg/L	1	7/19/2016
SULFIDE, REACTIVE						Analyst: **SUB**
Reactive Sulfide	ND	0.46		mg/L	1	7/14/2016
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 7/5/2016 8:30:00 AM
Lab ID: 1607300-001
Matrix: AQUEOUS
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**
Conductivity	4600	1.0		µmhos/cm	1	7/8/2016 12:37:31 PM
SM4500-H+B: PH						Analyst: **JRR**
pH	7.61	1.68	H	pH units	1	7/8/2016 12:37:31 PM
SM2320B: ALKALINITY						Analyst: **JRR**
Bicarbonate (As CaCO3)	271.4	20.00		mg/L CaCO3	1	7/8/2016 12:37:31 PM
Carbonate (As CaCO3)	ND	2.000		mg/L CaCO3	1	7/8/2016 12:37:31 PM
Total Alkalinity (as CaCO3)	271.4	20.00		mg/L CaCO3	1	7/8/2016 12:37:31 PM
SPECIFIC GRAVITY						Analyst: **JRR**
Specific Gravity	1.004	0			1	7/8/2016 12:11:00 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	3160	20.0	*	mg/L	1	7/8/2016 4:07:00 PM

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1607300-002
Matrix: TRIP BLANK
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**
Acetonitrile	ND	0.50		µg/L	1	7/19/2016
Allyl chloride	ND	0.50		µg/L	1	7/19/2016
Chloroprene	ND	0.50		µg/L	1	7/19/2016
Cyclohexane	ND	0.50		µg/L	1	7/19/2016
Diethyl ether	ND	0.50		µg/L	1	7/19/2016
Diisopropyl ether	ND	0.50		µg/L	1	7/19/2016
Epichlorohydrin	ND	5.0		µg/L	1	7/19/2016
Ethyl acetate	ND	0.50		µg/L	1	7/19/2016
Ethyl methacrylate	ND	2.5		µg/L	1	7/19/2016
Ethyl tert-butyl ether	ND	0.50		µg/L	1	7/19/2016
Freon-113	ND	0.50		µg/L	1	7/19/2016
Isobutanol	ND	10		µg/L	1	7/19/2016
Isopropyl acetate	ND	0.50		µg/L	1	7/19/2016
Methacrylonitrile	ND	2.5		µg/L	1	7/19/2016
Methyl acetate	ND	0.50		µg/L	1	7/19/2016
Methyl ethyl ketone	ND	2.5		µg/L	1	7/19/2016
Methyl isobutyl ketone	ND	2.5		µg/L	1	7/19/2016
Methyl methacrylate	ND	2.5		µg/L	1	7/19/2016
Methylcyclohexane	ND	1.0		µg/L	1	7/19/2016
n-Amyl acetate	ND	0.50		µg/L	1	7/19/2016
n-Hexane	ND	0.50		µg/L	1	7/19/2016
Nitrobenzene	ND	5.0		µg/L	1	7/19/2016
Pentachloroethane	ND	5.0		µg/L	1	7/19/2016
p-isopropyltoluene	ND	0.50		µg/L	1	7/19/2016
Propionitrile	ND	2.5		µg/L	1	7/19/2016
Tetrahydrofuran	ND	0.50		µg/L	1	7/19/2016
Benzene	ND	0.50		µg/L	1	7/19/2016
Toluene	ND	0.50		µg/L	1	7/19/2016
Ethylbenzene	ND	0.50		µg/L	1	7/19/2016
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	7/19/2016
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	7/19/2016
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	7/19/2016
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	7/19/2016
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	7/19/2016
Naphthalene	ND	0.50		µg/L	1	7/19/2016
Acetone	ND	2.5		µg/L	1	7/19/2016
Bromobenzene	ND	0.50		µg/L	1	7/19/2016
Bromodichloromethane	ND	0.50		µg/L	1	7/19/2016
Bromoform	ND	0.50		µg/L	1	7/19/2016

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1607300-002
Matrix: TRIP BLANK
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**
Bromomethane	ND	0.50		µg/L	1	7/19/2016
2-Butanone	ND	2.5		µg/L	1	7/19/2016
Carbon disulfide	ND	0.50		µg/L	1	7/19/2016
Carbon Tetrachloride	ND	0.50		µg/L	1	7/19/2016
Chlorobenzene	ND	0.50		µg/L	1	7/19/2016
Chloroethane	ND	0.50		µg/L	1	7/19/2016
Chloroform	ND	0.50		µg/L	1	7/19/2016
Chloromethane	ND	0.50		µg/L	1	7/19/2016
2-Chlorotoluene	ND	0.50		µg/L	1	7/19/2016
4-Chlorotoluene	ND	0.50		µg/L	1	7/19/2016
cis-1,2-DCE	ND	0.50		µg/L	1	7/19/2016
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	7/19/2016
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	7/19/2016
Dibromochloromethane	ND	0.50		µg/L	1	7/19/2016
Dibromomethane	ND	0.50		µg/L	1	7/19/2016
1,2-Dichlorobenzene	ND	0.50		µg/L	1	7/19/2016
1,3-Dichlorobenzene	ND	0.50		µg/L	1	7/19/2016
1,4-Dichlorobenzene	ND	0.50		µg/L	1	7/19/2016
Dichlorodifluoromethane	ND	0.50		µg/L	1	7/19/2016
1,1-Dichloroethane	ND	0.50		µg/L	1	7/19/2016
1,1-Dichloroethene	ND	0.50		µg/L	1	7/19/2016
1,2-Dichloropropane	ND	0.50		µg/L	1	7/19/2016
1,3-Dichloropropane	ND	0.50		µg/L	1	7/19/2016
2,2-Dichloropropane	ND	0.50		µg/L	1	7/19/2016
1,1-Dichloropropene	ND	0.50		µg/L	1	7/19/2016
Hexachlorobutadiene	ND	0.50		µg/L	1	7/19/2016
2-Hexanone	ND	0.50		µg/L	1	7/19/2016
Isopropylbenzene	ND	0.50		µg/L	1	7/19/2016
Methylene Chloride	ND	2.5		µg/L	1	7/19/2016
n-Butylbenzene	ND	0.50		µg/L	1	7/19/2016
n-Propylbenzene	ND	0.50		µg/L	1	7/19/2016
sec-Butylbenzene	ND	0.50		µg/L	1	7/19/2016
Styrene	ND	0.50		µg/L	1	7/19/2016
tert-Butylbenzene	ND	0.50		µg/L	1	7/19/2016
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	7/19/2016
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	7/19/2016
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	7/19/2016
trans-1,2-DCE	ND	0.50		µg/L	1	7/19/2016
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	7/19/2016

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1607300-002
Matrix: TRIP BLANK
Received Date: 7/7/2016 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	7/19/2016
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	7/19/2016
1,1,1-Trichloroethane	ND	0.50		µg/L	1	7/19/2016
1,1,2-Trichloroethane	ND	0.50		µg/L	1	7/19/2016
Trichloroethene (TCE)	ND	0.50		µg/L	1	7/19/2016
Trichlorofluoromethane	ND	0.50		µg/L	1	7/19/2016
1,2,3-Trichloropropane	ND	0.50		µg/L	1	7/19/2016
Vinyl chloride	ND	0.50		µg/L	1	7/19/2016
mp-Xylenes	ND	1.0		µg/L	1	7/19/2016
o-Xylene	ND	0.50		µg/L	1	7/19/2016
tert-Amyl methyl ether	ND	0.50		µg/L	1	7/19/2016
tert-Butyl alcohol	ND	0.50		µg/L	1	7/19/2016
Acrolein	ND	2.5		µg/L	1	7/19/2016
Acrylonitrile	ND	2.5		µg/L	1	7/19/2016
Bromochloromethane	ND	0.50		µg/L	1	7/19/2016
2-Chloroethyl vinyl ether	ND	0.50		µg/L	1	7/19/2016
Iodomethane	ND	0.50		µg/L	1	7/19/2016
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	7/19/2016
Vinyl acetate	ND	0.50		µg/L	1	7/19/2016
1,4-Dioxane	ND	20		µg/L	1	7/19/2016
Surr: 1,2-Dichlorobenzene-d4	99.6	70-130		%Rec	1	7/19/2016
Surr: 4-Bromofluorobenzene	94.0	70-130		%Rec	1	7/19/2016
Surr: Toluene-d8	100	70-130		%Rec	1	7/19/2016

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R35519**	RunNo: **35519**
Prep Date:	Analysis Date: **7/7/2016**	SeqNo: **1099779** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R35519**	RunNo: **35519**
Prep Date:	Analysis Date: **7/7/2016**	SeqNo: **1099780** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.50	0.10	0.5000	0	100	90	110			
Chloride	4.7	0.50	5.000	0	93.8	90	110			
Bromide	2.4	0.10	2.500	0	96.6	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	96.3	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.1	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A35552**	RunNo: **35552**
Prep Date:	Analysis Date: **7/8/2016**	SeqNo: **1100904** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A35552**	RunNo: **35552**
Prep Date:	Analysis Date: **7/8/2016**	SeqNo: **1100905** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.7	0.50	10.00	0	96.9	90	110			

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R36111**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R36111**	RunNo: **36111**
Prep Date:	Analysis Date: **7/19/2016**	SeqNo: **1118577** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetonitrile	ND	0.50								
Allyl chloride	ND	0.50								
Chloroprene	ND	0.50								
Ethyl methacrylate	ND	2.5								
Isobutanol	ND	10								
Methacrylonitrile	ND	2.5								
Methyl ethyl ketone	ND	2.5								
Methyl isobutyl ketone	ND	2.5								
Methyl methacrylate	ND	2.5								
Propionitrile	ND	2.5								
Benzene	ND	0.50								
Toluene	ND	0.50								
Ethylbenzene	ND	0.50								
1,2-Dichloroethane (EDC)	ND	0.50								
1,2-Dibromoethane (EDB)	ND	0.50								
Acetone	ND	2.5								
Bromodichloromethane	ND	0.50								
Bromoform	ND	0.50								
Bromomethane	ND	0.50								
2-Butanone	ND	2.5								
Carbon disulfide	ND	0.50								
Carbon Tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.50								
Chloromethane	ND	0.50								
cis-1,2-DCE	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
1,2-Dibromo-3-chloropropane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dibromomethane	ND	0.50								
1,2-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2-Dichloropropane	ND	0.50								
1,3-Dichloropropane	ND	0.50								
2,2-Dichloropropane	ND	0.50								

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R36111**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R36111**	RunNo: **36111**
Prep Date:	Analysis Date: **7/19/2016**	SeqNo: **1118577** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.50								
2-Hexanone	ND	0.50								
Methylene Chloride	ND	2.5								
Styrene	ND	0.50								
1,1,1,2-Tetrachloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	0.50								
trans-1,3-Dichloropropene	ND	0.50								
1,1,1-Trichloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.50								
Trichloroethene (TCE)	ND	0.50								
Trichlorofluoromethane	ND	0.50								
1,2,3-Trichloropropane	ND	0.50								
Vinyl chloride	ND	0.50								
mp-Xylenes	ND	1.0								
o-Xylene	ND	0.50								
Acrolein	ND	2.5								
Acrylonitrile	ND	2.5								
Bromochloromethane	ND	0.50								
Iodomethane	ND	0.50								
trans-1,4-Dichloro-2-butene	ND	0.50								
Vinyl acetate	ND	0.50								

Sample ID **LCS-R36111**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R36111**	RunNo: **36111**
Prep Date:	Analysis Date: **7/19/2016**	SeqNo: **1118578** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	9.6	0	10.00	0	95.9	80	120			
Toluene	9.9	0	10.00	0	98.8	80	120			
Ethylbenzene	9.8	0	10.00	0	98.4	80	120			
Chlorobenzene	9.6	0	10.00	0	96.2	80	120			
1,1-Dichloroethene	9.8	0	10.00	0	98.3	80	120			
Tetrachloroethene (PCE)	9.2	0	10.00	0	92.5	80	120			
Trichloroethene (TCE)	9.5	0	10.00	0	95.2	80	120			
o-Xylene	11	0	10.00	0	107	80	120			

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R36111**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R36111**	RunNo: **36111**
Prep Date:	Analysis Date: **7/15/2016**	SeqNo: **1118582** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetophenone	ND	5.0								
1-Methylnaphthalene	ND	5.0								
2,3,4,6-Tetrachlorophenol	ND	5.0								
2,4,5-Trichlorophenol	ND	5.0								
2,4,6-Trichlorophenol	ND	5.0								
2,4-Dichlorophenol	ND	5.0								
2,4-Dimethylphenol	ND	5.0								
2,4-Dinitrophenol	ND	5.0								
2,4-Dinitrotoluene	ND	5.0								
2,6-Dinitrotoluene	ND	5.0								
2-Chloronaphthalene	ND	5.0								
2-Chlorophenol	ND	5.0								
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	5.0								
2-Nitroaniline	ND	5.0								
2-Nitrophenol	ND	5.0								
3,3´-Dichlorobenzidine	ND	5.0								
3-Nitroaniline	ND	5.0								
4,6-Dinitro-2-methylphenol	ND	5.0								
4-Bromophenyl phenyl ether	ND	5.0								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	5.0								
4-Chlorophenyl phenyl ether	ND	5.0								
4-Nitroaniline	ND	5.0								
4-Nitrophenol	ND	5.0								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benz(a)anthracene	ND	0.10								
Benzo(a)pyrene	ND	0.10								
Benzo(b)fluoranthene	ND	0.10								
Benzo(k)fluoranthene	ND	0.10								
Bis(2-chloroethoxy)methane	ND	5.0								
Bis(2-chloroethyl)ether	ND	5.0								
Bis(2-chloroisopropyl)ether	ND	5.0								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	5.0								
Carbazole	ND	5.0								

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R36111**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R36111**	RunNo: **36111**
Prep Date:	Analysis Date: **7/15/2016**	SeqNo: **1118582** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chrysene	ND	0.10								
Dibenz(a,h)anthracene	ND	0.10								
Dibenzofuran	ND	5.0								
Diethyl phthalate	ND	5.0								
Dimethyl phthalate	ND	5.0								
Di-n-butyl phthalate	ND	5.0								
Di-n-octyl phthalate	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Hexachlorobenzene	ND	1.0								
Hexachlorobutadiene	ND	5.0								
Hexachlorocyclopentadiene	ND	5.0								
Hexachloroethane	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	0.10								
Isophorone	ND	5.0								
Naphthalene	ND	5.0								
Nitrobenzene	ND	5.0								
N-Nitrosodi-n-propylamine	ND	5.0								
N-Nitrosodiphenylamine	ND	2.0								
Pentachlorophenol	ND	5.0								
Phenanthrene	ND	1.0								
Phenol	ND	5.0								
Pyrene	ND	5.0								
o-Toluidine	ND	2.0								
Pyridine	ND	5.0								
1,2,4,5-Tetrachlorobenzene	ND	5.0								

Sample ID **LCS-R36111**	SampType: **LCS**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **LCSW**	Batch ID: **R36111**	RunNo: **36111**
Prep Date:	Analysis Date: **7/15/2016**	SeqNo: **1118583** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	5.4	0	5.000	0	107	49	134			
2-Chlorophenol	3.2	0	5.000	0	64.6	50	131			
4-Chloro-3-methylphenol	3.5	0	5.000	0	69.4	42	139			
4-Nitrophenol	1.9	0	5.000	0	38.2	19	137			
Acenaphthene	4.9	0	5.000	0	97.4	36	122			
Bis(2-ethylhexyl)phthalate	6.2	0	5.000	0	124	43	142			
N-Nitrosodi-n-propylamine	4.2	0	5.000	0	84.4	46	140			

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**LCS-R36111**	SampType:	**LCS**	TestCode:	**EPA 8270C: Semivolatiles/Mod**					
Client ID:	**LCSW**	Batch ID:	**R36111**	RunNo:	**36111**					
Prep Date:		Analysis Date:	**7/15/2016**	SeqNo:	**1118583**	Units:	**µg/L**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Pentachlorophenol		3.4	0	5.000	0	68.6	22	138			
Phenol		3.8	0	5.000	0	75.8	45	134			
Pyrene		5.2	0	5.000	0	105	45	138			

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
R	RPD outside accepted recovery limits	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#: **1607300**
01-Aug-16

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **1607300-001a dup** SampType: **dup** TestCode: **SM2510B: Specific Conductance**
Client ID: **WDW-1,2,&3 Effluen** Batch ID: **R35550** RunNo: **35550**
Prep Date: Analysis Date: **7/8/2016** SeqNo: **1100752** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	4700	1.0						0.603	20	

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-26407**	SampType:	**MBLK**	TestCode:	**EPA Method 7470: Mercury**					
Client ID:	**PBW**	Batch ID:	**26407**	RunNo:	**35726**					
Prep Date:	**7/14/2016**	Analysis Date:	**7/15/2016**	SeqNo:	**1105600**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID	**LCS-26407**	SampType:	**LCS**	TestCode:	**EPA Method 7470: Mercury**					
Client ID:	**LCSW**	Batch ID:	**26407**	RunNo:	**35726**					
Prep Date:	**7/14/2016**	Analysis Date:	**7/15/2016**	SeqNo:	**1105601**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0052	0.00020	0.005000	0	103	80	120			

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-26510**	SampType:	**MBLK**	TestCode:	**MERCURY, TCLP**					
Client ID:	**PBW**	Batch ID:	**26510**	RunNo:	**35874**					
Prep Date:	**7/20/2016**	Analysis Date:	**7/21/2016**	SeqNo:	**1110461**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020								

Sample ID	**LCS-26510**	SampType:	**LCS**	TestCode:	**MERCURY, TCLP**					
Client ID:	**LCSW**	Batch ID:	**26510**	RunNo:	**35874**					
Prep Date:	**7/20/2016**	Analysis Date:	**7/21/2016**	SeqNo:	**1110462**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.005000	0	104	80	120			

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-26475**	SampType:	**MBLK**	TestCode:	**EPA Method 6010B: TCLP Metals**
Client ID:	**PBW**	Batch ID:	**26475**	RunNo:	**35810**
Prep Date:	**7/19/2016**	Analysis Date:	**7/20/2016**	SeqNo:	**1108224** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								
Silver	ND	5.0								

Sample ID	**LCS-26475**	SampType:	**LCS**	TestCode:	**EPA Method 6010B: TCLP Metals**
Client ID:	**LCSW**	Batch ID:	**26475**	RunNo:	**35810**
Prep Date:	**7/19/2016**	Analysis Date:	**7/20/2016**	SeqNo:	**1108225** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0	105	80	120			
Barium	ND	100	0.5000	0	95.4	80	120			
Cadmium	ND	1.0	0.5000	0	99.9	80	120			
Chromium	ND	5.0	0.5000	0	95.8	80	120			
Lead	ND	5.0	0.5000	0	93.5	80	120			
Selenium	ND	1.0	0.5000	0	107	80	120			
Silver	ND	5.0	0.1000	0	98.7	80	120			

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-26511**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **PBW**	Batch ID: **26511**	RunNo: **35864**
Prep Date: **7/20/2016**	Analysis Date: **7/21/2016**	SeqNo: **1110316** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Antimony	ND	0.050								
Arsenic	ND	0.020								
Barium	ND	0.020								
Beryllium	ND	0.0030								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.050								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	ND	0.0050								
Sodium	ND	1.0								
Strontium	ND	0.010								
Thallium	ND	0.050								
Zinc	ND	0.020								
Silica	ND	1.1								

Sample ID **LCS-26511**	SampType: **LCS**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW**	Batch ID: **26511**	RunNo: **35864**
Prep Date: **7/20/2016**	Analysis Date: **7/21/2016**	SeqNo: **1110317** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.53	0.020	0.5000	0	106	80	120			
Antimony	0.52	0.050	0.5000	0	103	80	120			
Arsenic	0.50	0.020	0.5000	0	100	80	120			
Barium	0.50	0.020	0.5000	0	99.6	80	120			
Beryllium	0.52	0.0030	0.5000	0	103	80	120			
Cadmium	0.49	0.0020	0.5000	0	97.5	80	120			
Calcium	50	1.0	50.00	0	99.2	80	120			
Chromium	0.49	0.0060	0.5000	0	98.1	80	120			
Cobalt	0.47	0.0060	0.5000	0	94.8	80	120			
Copper	0.51	0.0060	0.5000	0	102	80	120			

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**LCS-26511**	SampType: **LCS**		TestCode: **EPA 6010B: Total Recoverable Metals**						
Client ID:	**LCSW**	Batch ID: **26511**		RunNo: **35864**						
Prep Date:	**7/20/2016**	Analysis Date: **7/21/2016**		SeqNo: **1110317**		Units: **mg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.48	0.050	0.5000	0	96.1	80	120			
Lead	0.48	0.0050	0.5000	0	95.7	80	120			
Magnesium	50	1.0	50.00	0	99.2	80	120			
Manganese	0.49	0.0020	0.5000	0	98.2	80	120			
Nickel	0.48	0.010	0.5000	0	95.8	80	120			
Potassium	48	1.0	50.00	0	95.3	80	120			
Selenium	0.48	0.050	0.5000	0	97.0	80	120			
Silver	0.10	0.0050	0.1000	0	100	80	120			
Sodium	48	1.0	50.00	0	96.1	80	120			
Strontium	0.11	0.010	0.1000	0	112	80	120			
Thallium	0.49	0.050	0.5000	0	98.7	80	120			
Zinc	0.48	0.020	0.5000	0	96.4	80	120			
Silica	5.6	1.1	5.350	0	105	80	120			

Sample ID	**1607300-001BMS**	SampType: **MS**		TestCode: **EPA 6010B: Total Recoverable Metals**						
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **26511**		RunNo: **35864**						
Prep Date:	**7/20/2016**	Analysis Date: **7/21/2016**		SeqNo: **1110319**		Units: **mg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.50	0.050	0.5000	0	101	75	125			
Arsenic	0.54	0.020	0.5000	0.03838	99.6	75	125			
Barium	0.49	0.020	0.5000	0.01824	95.1	75	125			
Beryllium	0.49	0.0030	0.5000	0.0001500	97.2	75	125			
Cadmium	0.48	0.0020	0.5000	0	95.7	75	125			
Chromium	0.47	0.0060	0.5000	0	94.2	75	125			
Cobalt	0.47	0.0060	0.5000	0.002470	92.9	75	125			
Copper	0.54	0.0060	0.5000	0.001890	107	75	125			
Iron	0.68	0.050	0.5000	0.2264	90.4	75	125			
Lead	0.46	0.0050	0.5000	0	92.8	75	125			
Magnesium	90	1.0	50.00	45.07	90.4	75	125			
Manganese	0.56	0.0020	0.5000	0.09587	93.0	75	125			
Nickel	0.46	0.010	0.5000	0.003580	91.1	75	125			
Selenium	0.48	0.050	0.5000	0	96.3	75	125			
Silver	0.097	0.0050	0.1000	0	96.9	75	125			
Zinc	0.50	0.020	0.5000	0.04167	90.8	75	125			

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **1607300-001BMSD** SampType: **MSD** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **WDW-1,2,&3 Effluen** Batch ID: **26511** RunNo: **35864**

Prep Date: **7/20/2016** Analysis Date: **7/21/2016** SeqNo: **1110320** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.50	0.050	0.5000	0	100	75	125	0.483	20	
Arsenic	0.54	0.020	0.5000	0.03838	99.9	75	125	0.203	20	
Barium	0.49	0.020	0.5000	0.01824	95.0	75	125	0.111	20	
Beryllium	0.49	0.0030	0.5000	0.0001500	97.3	75	125	0.0781	20	
Cadmium	0.47	0.0020	0.5000	0	94.4	75	125	1.32	20	
Chromium	0.46	0.0060	0.5000	0	92.8	75	125	1.49	20	
Cobalt	0.46	0.0060	0.5000	0.002470	91.5	75	125	1.51	20	
Copper	0.54	0.0060	0.5000	0.001890	108	75	125	0.211	20	
Iron	0.71	0.050	0.5000	0.2264	96.0	75	125	4.06	20	
Lead	0.46	0.0050	0.5000	0	91.8	75	125	1.00	20	
Magnesium	91	1.0	50.00	45.07	92.8	75	125	1.31	20	
Manganese	0.56	0.0020	0.5000	0.09587	93.5	75	125	0.393	20	
Nickel	0.46	0.010	0.5000	0.003580	91.3	75	125	0.194	20	
Selenium	0.49	0.050	0.5000	0	97.8	75	125	1.56	20	
Silver	0.097	0.0050	0.1000	0	97.3	75	125	0.350	20	
Zinc	0.50	0.020	0.5000	0.04167	92.4	75	125	1.56	20	

Sample ID **1607300-001BMS** SampType: **MS** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **WDW-1,2,&3 Effluen** Batch ID: **26511** RunNo: **35864**

Prep Date: **7/20/2016** Analysis Date: **7/21/2016** SeqNo: **1110322** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	1.4	0.10	0.5000	0.8700	99.2	75	125			
Potassium	110	5.0	50.00	68.56	86.8	75	125			
Thallium	0.58	0.25	0.5000	0	116	75	125			

Sample ID **1607300-001BMSD** SampType: **MSD** TestCode: **EPA 6010B: Total Recoverable Metals**

Client ID: **WDW-1,2,&3 Effluen** Batch ID: **26511** RunNo: **35864**

Prep Date: **7/20/2016** Analysis Date: **7/21/2016** SeqNo: **1110323** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	1.4	0.10	0.5000	0.8700	96.3	75	125	1.09	20	
Potassium	110	5.0	50.00	68.56	82.1	75	125	2.13	20	
Thallium	0.57	0.25	0.5000	0	114	75	125	1.89	20	

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
R	RPD outside accepted recovery limits	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#: **1607300**
01-Aug-16

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**1607300-001a dup**	SampType:	**dup**	TestCode:	**SM4500-H+B: pH**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID:	**R35550**	RunNo:	**35550**					
Prep Date:		Analysis Date:	**7/8/2016**	SeqNo:	**1100761**	Units:	**pH units**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.62	1.68								H

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-R36111**	SampType:	**MBLK**	TestCode:	**CYANIDE, Reactive**					
Client ID:	**PBW**	Batch ID:	**R36111**	RunNo:	**36111**					
Prep Date:		Analysis Date:	**7/19/2016**	SeqNo:	**1118586**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	ND	1.00								

Sample ID	**LCS-R36111**	SampType:	**LCS**	TestCode:	**CYANIDE, Reactive**					
Client ID:	**LCSW**	Batch ID:	**R36111**	RunNo:	**36111**					
Prep Date:		Analysis Date:	**7/19/2016**	SeqNo:	**1118587**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	0.551		0.5000	0	110	80	120			

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
R	RPD outside accepted recovery limits	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#: **1607300**
01-Aug-16

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-R36111**	SampType:	**MBLK**	TestCode:	**SULFIDE, Reactive**					
Client ID:	**PBW**	Batch ID:	**R36111**	RunNo:	**36111**					
Prep Date:		Analysis Date:	**7/14/2016**	SeqNo:	**1118597**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	ND	1.0								

Sample ID	**LCS-R36111**	SampType:	**LCS**	TestCode:	**SULFIDE, Reactive**					
Client ID:	**LCSW**	Batch ID:	**R36111**	RunNo:	**36111**					
Prep Date:		Analysis Date:	**7/14/2016**	SeqNo:	**1118598**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	0.18		0.2000	0	90.0	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
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **mb-1**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R35550**	RunNo: **35550**							
Prep Date:	Analysis Date: **7/8/2016**	SeqNo: **1100788**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-1**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R35550**	RunNo: **35550**							
Prep Date:	Analysis Date: **7/8/2016**	SeqNo: **1100789**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.36	20.00	80.00	0	96.7	90	110			

Sample ID **mb-2**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R35550**	RunNo: **35550**							
Prep Date:	Analysis Date: **7/8/2016**	SeqNo: **1100812**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-2**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R35550**	RunNo: **35550**							
Prep Date:	Analysis Date: **7/8/2016**	SeqNo: **1100813**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	78.56	20.00	80.00	0	98.2	90	110			

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
R	RPD outside accepted recovery limits	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#: **1607300**
01-Aug-16

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **1607300-001ADUP** SampType: **DUP** TestCode: **Specific Gravity**
Client ID: **WDW-1,2,&3 Effluen** Batch ID: **R35525** RunNo: **35525**
Prep Date: Analysis Date: **7/8/2016** SeqNo: **1100039** Units:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	0.9991	0						0.489	20	

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
R	RPD outside accepted recovery limits	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#: **1607300**

01-Aug-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-26273**	SampType:	**MBLK**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**PBW**	Batch ID:	**26273**	RunNo:	**35537**					
Prep Date:	**7/7/2016**	Analysis Date:	**7/8/2016**	SeqNo:	**1100261**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	**LCS-26273**	SampType:	**LCS**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**LCSW**	Batch ID:	**26273**	RunNo:	**35537**					
Prep Date:	**7/7/2016**	Analysis Date:	**7/8/2016**	SeqNo:	**1100262**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

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
R	RPD outside accepted recovery limits	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
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: NAVAJO REFINING CO Work Order Number: 1607300 RcptNo: 1

Received by/date: AS 07/07/16

Logged By: Lindsay Mangin 7/7/2016 10:15:00 AM

Completed By: Lindsay Mangin 7/7/2016 12:11:31 PM

Reviewed By: 07/07/16

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: 2 (<2 or >12 unless noted)

Adjusted? No

Checked by: AJ

Special Handling (if applicable)

16. 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: ____

17. Additional remarks:

18. 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: Navajo Refining Co.

Mailing Address: P.O. Box 159 Artesia,

NM 88211-0159

Phone #: 575-748-3311

email or Fax#: 575-746-5451

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:

X Standard ☐ Rush

Project Name:

Quarterly WDW-1, 2, & 3 Inj Well

Project #: P.O. # 167796

Project Manager:

Micki Schultz / Scott Denton / Mike Holder

Sampler: Brady Hubbard

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.0°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1607300	Specific Gravity,HCO3, CO3, Cl, SO4, TDS, pH, cond.,Fl, Cation/anion bal., Br, Eh/40	VOCs/SW-846 Method 8260C (see attached list 'VOCs')	SVOCs/SW-846 Method 8270D (see attached list 'SVOCs')	R,C,I/40 CFR part 261	Metals/SW-846 Mthd 6010, 7470 (see attached list 'Metals')	Ca, K, Mg, Na/40 CFR 136.3	TCLP Metals, only /40 CFR Part 261/ SW-846 Method 1311
7/5/16	8:30	Liquid	WDW-1, 2, & 3 Effluent	3	Neat/H2SO4	-001	X						X
7/5/16	8:30	Liquid	WDW-1, 2, & 3 Effluent	1	HNO3	-001					X	X	
7/5/16	8:30	Liquid	WDW-1, 2, & 3 Effluent	3	HCL	-001		X					
7/5/16	8:30	Liquid	WDW-1, 2, & 3 Effluent	2	Neat	-001			X				
7/5/16	8:30	Liquid	WDW-1, 2, & 3 Effluent	2	Neat	-001				X			
7/5/16	8:30	Liquid	Trip Blank	2	Neat	-002		X					
7/5/16	8:30	Liquid	Temperature Blank	1	Neat								

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date	Time
7-6-16	10:30	Brady Hubbard		7-7-16	1015
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Send results to Scott Denton, Mike Holder, Robert Combs and Andrew Contreras.

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.

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

November 16, 2016

Scott Denton

Navajo Refining Company
P.O. Box 159
Artesia, NM 88211-0159
TEL: (575) 748-3311
FAX

RE: Quarterly WDW-1, 2, &3 Inj Well OrderNo.: 1610612

Dear Scott Denton:

Hall Environmental Analysis Laboratory received 2 sample(s) on 10/13/2016 for the analyses presented in the following report.

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. In order to properly interpret your results it is imperative that you review this report in its entirety. 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. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

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

Case Narrative

WO#: **1610612**
Date: **11/16/2016**

CLIENT: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Analytical Comments for WDW-1,2, & 3 Effluent:
The above referenced water sample was analyzed by EPA 8260C and the corresponding analytical report is attached in the following pages. The analyst also performed an NIST library review of the sample and the tentatively identified compounds (TIC's) are listed with estimated concentrations; 3-chloro-2-methyl-1-propene (~1 ppb), dibromofluoromethane (~9 ppb) and dimethyl disulfide (~1 ppb).
The above referenced water sample was also analyzed by EPA 8270D and the corresponding analytical report is attached in the following pages.

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 10/11/2016 9:00:00 AM
Lab ID: 1610612-001
Matrix: AQUEOUS
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
IGNITABILITY METHOD 1010						Analyst: **SUB**	
Ignitability	>200	0		°F	1	10/18/2016	R38745
SULFIDE, REACTIVE						Analyst: **SUB**	
Reactive Sulfide	ND	0.40		mg/L	1	10/18/2016	R38745
SPECIFIC GRAVITY						Analyst: **LGT**	
Specific Gravity	0.9997	0			1	10/27/2016 10:52:00 AM	R38258
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Fluoride	35	2.0	*	mg/L	20	10/14/2016 12:19:11 AM	R37942
Chloride	360	25		mg/L	50	10/25/2016 9:50:38 PM	R38187
Bromide	0.72	0.10		mg/L	1	10/14/2016 12:06:47 AM	R37942
Phosphorus, Orthophosphate (As P)	ND	10	H	mg/L	20	10/14/2016 12:19:11 AM	R37942
Sulfate	1500	25		mg/L	50	10/25/2016 9:50:38 PM	R38187
Nitrate+Nitrite as N	ND	1.0		mg/L	5	10/14/2016 1:21:13 AM	R37942
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	4900	1.0		µmhos/cm	1	10/18/2016 4:54:00 PM	R38048
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	288.8	20.00		mg/L CaCO3	1	10/18/2016 4:54:00 PM	R38048
Carbonate (As CaCO3)	ND	2.000		mg/L CaCO3	1	10/18/2016 4:54:00 PM	R38048
Total Alkalinity (as CaCO3)	288.8	20.00		mg/L CaCO3	1	10/18/2016 4:54:00 PM	R38048
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	3210	20.0	*	mg/L	1	10/18/2016 6:58:00 PM	28098
CORROSIVITY						Analyst: **SUB**	
pH	8.23			pH Units	1	10/17/2016	R38745
CYANIDE, REACTIVE						Analyst: **SUB**	
Cyanide, Reactive	0.0250	0.0100		mg/L	1	10/25/2016	R38745
SM4500-H+B: PH						Analyst: **JRR**	
pH	8.10	1.68	H	pH units	1	10/18/2016 4:54:00 PM	R38048
EPA METHOD 7470: MERCURY						Analyst: **DBD**	
Mercury	ND	0.00020		mg/L	1	10/18/2016 5:17:17 PM	28113
MERCURY, TCLP						Analyst: **DBD**	
Mercury	ND	0.020		mg/L	1	10/19/2016 5:06:28 PM	28165
EPA METHOD 6010B: TCLP METALS						Analyst: **MED**	
Arsenic	ND	5.0		mg/L	1	10/24/2016 8:45:55 AM	28191
Barium	ND	100		mg/L	1	10/24/2016 8:45:55 AM	28191

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 10/11/2016 9:00:00 AM
Lab ID: 1610612-001
Matrix: AQUEOUS
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 6010B: TCLP METALS						Analyst: **MED**	
Cadmium	ND	1.0		mg/L	1	10/24/2016 8:45:55 AM	28191
Chromium	ND	5.0		mg/L	1	10/24/2016 8:45:55 AM	28191
Lead	ND	5.0		mg/L	1	10/24/2016 8:45:55 AM	28191
Selenium	ND	1.0		mg/L	1	10/24/2016 8:45:55 AM	28191
Silver	ND	5.0		mg/L	1	10/24/2016 8:45:55 AM	28191
EPA 6010B: METALS						Analyst: **MED**	
Aluminum	0.31	0.020		mg/L	1	10/31/2016 10:15:38 AM	28190
Antimony	ND	0.050		mg/L	1	10/31/2016 10:15:38 AM	28190
Arsenic	0.040	0.020		mg/L	1	10/31/2016 10:15:38 AM	28190
Barium	ND	0.020		mg/L	1	10/31/2016 10:15:38 AM	28190
Beryllium	ND	0.0030		mg/L	1	10/31/2016 10:15:38 AM	28190
Cadmium	ND	0.0020		mg/L	1	10/31/2016 10:15:38 AM	28190
Calcium	96	5.0		mg/L	5	11/7/2016 12:08:14 PM	28190
Chromium	ND	0.0060		mg/L	1	10/31/2016 10:15:38 AM	28190
Cobalt	ND	0.0060		mg/L	1	10/31/2016 10:15:38 AM	28190
Copper	0.017	0.0060		mg/L	1	10/31/2016 10:15:38 AM	28190
Iron	0.14	0.050		mg/L	1	10/31/2016 10:15:38 AM	28190
Lead	ND	0.0050		mg/L	1	10/31/2016 10:15:38 AM	28190
Magnesium	36	1.0		mg/L	1	11/7/2016 12:04:39 PM	28190
Manganese	0.052	0.0020		mg/L	1	10/31/2016 10:15:38 AM	28190
Nickel	ND	0.010		mg/L	1	10/31/2016 10:15:38 AM	28190
Potassium	120	5.0		mg/L	5	10/31/2016 10:22:16 AM	28190
Selenium	ND	0.050		mg/L	1	10/31/2016 10:15:38 AM	28190
Silver	ND	0.0050		mg/L	1	10/31/2016 10:15:38 AM	28190
Sodium	800	10		mg/L	10	11/7/2016 12:15:14 PM	28190
Thallium	ND	0.050		mg/L	1	10/31/2016 10:15:38 AM	28190
Vanadium	ND	0.050		mg/L	1	10/31/2016 10:15:38 AM	28190
Zinc	0.027	0.020		mg/L	1	10/31/2016 10:15:38 AM	28190
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
2-isopropyltoluene	ND	0.50		µg/L	1	10/20/2016	R38745
Acetonitrile	58	5.0		µg/L	1	10/20/2016	R38745
Allyl chloride	ND	0.50		µg/L	1	10/20/2016	R38745
Chloroprene	ND	0.50		µg/L	1	10/20/2016	R38745
Cyclohexane	ND	0.50		µg/L	1	10/20/2016	R38745
Diethyl ether	ND	0.50		µg/L	1	10/20/2016	R38745
Epichlorohydrin	ND	100		µg/L	1	10/20/2016	R38745
Ethyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
Ethyl methacrylate	ND	2.5		µg/L	1	10/20/2016	R38745

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 10/11/2016 9:00:00 AM
Lab ID: 1610612-001
Matrix: AQUEOUS
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
Ethyl tert-butyl ether	ND	0.50		µg/L	1	10/20/2016	R38745
Freon-113	ND	0.50		µg/L	1	10/20/2016	R38745
Isobutanol	ND	100		µg/L	1	10/20/2016	R38745
Isopropyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
Methacrylonitrile	ND	2.5		µg/L	1	10/20/2016	R38745
Methyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
Methyl ethyl ketone	ND	2.5		µg/L	1	10/20/2016	R38745
Methyl isobutyl ketone	ND	2.5		µg/L	1	10/20/2016	R38745
Methyl methacrylate	ND	2.5		µg/L	1	10/20/2016	R38745
Methylcyclohexane	ND	1.0		µg/L	1	10/20/2016	R38745
n-Amyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
n-Hexane	ND	0.50		µg/L	1	10/20/2016	R38745
Nitrobenzene	ND	5.0		µg/L	1	10/20/2016	R38745
Pentachloroethane	ND	5.0		µg/L	1	10/20/2016	R38745
p-isopropyltoluene	ND	0.50		µg/L	1	10/20/2016	R38745
Propionitrile	ND	2.5		µg/L	1	10/20/2016	R38745
Tetrahydrofuran	ND	0.50		µg/L	1	10/20/2016	R38745
Benzene	ND	0.50		µg/L	1	10/20/2016	R38745
Toluene	ND	0.50		µg/L	1	10/20/2016	R38745
Ethylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	10/20/2016	R38745
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	10/20/2016	R38745
Naphthalene	ND	0.50		µg/L	1	10/20/2016	R38745
Acetone	4.2	2.5		µg/L	1	10/20/2016	R38745
Bromobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Bromodichloromethane	ND	0.50		µg/L	1	10/20/2016	R38745
Bromoform	ND	0.50		µg/L	1	10/20/2016	R38745
Bromomethane	ND	0.50		µg/L	1	10/20/2016	R38745
2-Butanone	ND	2.5		µg/L	1	10/20/2016	R38745
Carbon disulfide	0.96	0.50		µg/L	1	10/20/2016	R38745
Carbon Tetrachloride	ND	0.50		µg/L	1	10/20/2016	R38745
Chlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Chloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
Chloroform	ND	0.50		µg/L	1	10/20/2016	R38745
Chloromethane	1.1	0.50		µg/L	1	10/20/2016	R38745
2-Chlorotoluene	ND	0.50		µg/L	1	10/20/2016	R38745

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 10/11/2016 9:00:00 AM
Lab ID: 1610612-001
Matrix: AQUEOUS
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
4-Chlorotoluene	ND	0.50		µg/L	1	10/20/2016	R38745
cis-1,2-DCE	ND	0.50		µg/L	1	10/20/2016	R38745
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
Dibromochloromethane	ND	0.50		µg/L	1	10/20/2016	R38745
Dibromomethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,3-Dichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,4-Dichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Dichlorodifluoromethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1-Dichloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1-Dichloroethene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dichloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
1,3-Dichloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
2,2-Dichloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1-Dichloropropene	ND	0.50		µg/L	1	10/20/2016	R38745
Hexachlorobutadiene	ND	0.50		µg/L	1	10/20/2016	R38745
2-Hexanone	ND	0.50		µg/L	1	10/20/2016	R38745
Isopropylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Methylene Chloride	ND	2.5		µg/L	1	10/20/2016	R38745
n-Butylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
n-Propylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
sec-Butylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Styrene	ND	0.50		µg/L	1	10/20/2016	R38745
tert-Butylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	10/20/2016	R38745
trans-1,2-DCE	ND	0.50		µg/L	1	10/20/2016	R38745
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,1,1-Trichloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1,2-Trichloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
Trichloroethene (TCE)	ND	0.50		µg/L	1	10/20/2016	R38745
Trichlorofluoromethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,2,3-Trichloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
Vinyl chloride	ND	0.50		µg/L	1	10/20/2016	R38745
mp-Xylenes	ND	1.0		µg/L	1	10/20/2016	R38745

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 10/11/2016 9:00:00 AM
Lab ID: 1610612-001
Matrix: AQUEOUS
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
o-Xylene	ND	0.50		µg/L	1	10/20/2016	R38745
tert-Amyl methyl ether	ND	0.50		µg/L	1	10/20/2016	R38745
tert-Butyl alcohol	ND	0.50		µg/L	1	10/20/2016	R38745
Acrolein	ND	2.5		µg/L	1	10/20/2016	R38745
Acrylonitrile	ND	2.5		µg/L	1	10/20/2016	R38745
Bromochloromethane	ND	0.50		µg/L	1	10/20/2016	R38745
2-Chloroethyl vinyl ether	ND	0.50		µg/L	1	10/20/2016	R38745
Iodomethane	ND	0.50		µg/L	1	10/20/2016	R38745
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	10/20/2016	R38745
Vinyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
Surr: 1,2-Dichlorobenzene-d4	105	0-0	S	%Rec	1	10/20/2016	R38745
Surr: 4-Bromofluorobenzene	96.8	70-130		%Rec	1	10/20/2016	R38745
Surr: Toluene-d8	100	70-130		%Rec	1	10/20/2016	R38745
EPA 8270C: SEMIVOLATILES/MOD						Analyst: **SUB**	
1,1-Biphenyl	ND	1.0		µg/L	1	10/29/2016	R38745
Atrazine	ND	1.0		µg/L	1	10/29/2016	R38745
Benzaldehyde	2.5	1.0		µg/L	1	10/29/2016	R38745
Caprolactam	ND	1.0		µg/L	1	10/29/2016	R38745
N-Nitroso-di-n-butylamine	ND	1.0		µg/L	1	10/29/2016	R38745
Acetophenone	ND	5.0		µg/L	1	10/29/2016	R38745
1-Methylnaphthalene	ND	5.0		µg/L	1	10/29/2016	R38745
2,3,4,6-Tetrachlorophenol	ND	5.0		µg/L	1	10/29/2016	R38745
2,4,5-Trichlorophenol	ND	5.0		µg/L	1	10/29/2016	R38745
2,4,6-Trichlorophenol	ND	5.0		µg/L	1	10/29/2016	R38745
2,4-Dichlorophenol	ND	5.0		µg/L	1	10/29/2016	R38745
2,4-Dimethylphenol	ND	5.0		µg/L	1	10/29/2016	R38745
2,4-Dinitrophenol	ND	5.0		µg/L	1	10/29/2016	R38745
2,4-Dinitrotoluene	ND	5.0		µg/L	1	10/29/2016	R38745
2,6-Dinitrotoluene	ND	5.0		µg/L	1	10/29/2016	R38745
2-Chloronaphthalene	ND	5.0		µg/L	1	10/29/2016	R38745
2-Chlorophenol	ND	5.0		µg/L	1	10/29/2016	R38745
2-Methylnaphthalene	ND	5.0		µg/L	1	10/29/2016	R38745
2-Methylphenol	ND	5.0		µg/L	1	10/29/2016	R38745
2-Nitroaniline	ND	5.0		µg/L	1	10/29/2016	R38745
2-Nitrophenol	ND	5.0		µg/L	1	10/29/2016	R38745
3,3´-Dichlorobenzidine	ND	5.0		µg/L	1	10/29/2016	R38745
3-Nitroaniline	ND	5.0		µg/L	1	10/29/2016	R38745
4,6-Dinitro-2-methylphenol	ND	5.0		µg/L	1	10/29/2016	R38745
4-Bromophenyl phenyl ether	ND	5.0		µg/L	1	10/29/2016	R38745

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 10/11/2016 9:00:00 AM
Lab ID: 1610612-001
Matrix: AQUEOUS
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD						Analyst: **SUB**	
4-Chloro-3-methylphenol	ND	5.0		µg/L	1	10/29/2016	R38745
4-Chloroaniline	ND	5.0		µg/L	1	10/29/2016	R38745
4-Chlorophenyl phenyl ether	ND	5.0		µg/L	1	10/29/2016	R38745
4-Nitroaniline	ND	5.0		µg/L	1	10/29/2016	R38745
4-Nitrophenol	ND	5.0		µg/L	1	10/29/2016	R38745
Acenaphthene	ND	5.0		µg/L	1	10/29/2016	R38745
Acenaphthylene	ND	5.0		µg/L	1	10/29/2016	R38745
Anthracene	ND	5.0		µg/L	1	10/29/2016	R38745
Benzo(g,h,i)perylene	ND	5.0		µg/L	1	10/29/2016	R38745
Benz(a)anthracene	ND	0.10		µg/L	1	10/29/2016	R38745
Benzo(a)pyrene	ND	0.10		µg/L	1	10/29/2016	R38745
Benzo(b)fluoranthene	ND	0.10		µg/L	1	10/29/2016	R38745
Benzo(k)fluoranthene	ND	0.10		µg/L	1	10/29/2016	R38745
Bis(2-chloroethoxy)methane	ND	5.0		µg/L	1	10/29/2016	R38745
Bis(2-chloroethyl)ether	ND	5.0		µg/L	1	10/29/2016	R38745
Bis(2-chloroisopropyl)ether	ND	5.0		µg/L	1	10/29/2016	R38745
Bis(2-ethylhexyl)phthalate	ND	5.0		µg/L	1	10/29/2016	R38745
Butyl benzyl phthalate	ND	5.0		µg/L	1	10/29/2016	R38745
Carbazole	ND	5.0		µg/L	1	10/29/2016	R38745
Chrysene	ND	0.10		µg/L	1	10/29/2016	R38745
Dibenz(a,h)anthracene	ND	0.10		µg/L	1	10/29/2016	R38745
Dibenzofuran	ND	5.0		µg/L	1	10/29/2016	R38745
Diethyl phthalate	ND	5.0		µg/L	1	10/29/2016	R38745
Dimethyl phthalate	ND	5.0		µg/L	1	10/29/2016	R38745
Di-n-butyl phthalate	ND	5.0		µg/L	1	10/29/2016	R38745
Di-n-octyl phthalate	ND	5.0		µg/L	1	10/29/2016	R38745
Fluoranthene	ND	5.0		µg/L	1	10/29/2016	R38745
Fluorene	ND	5.0		µg/L	1	10/29/2016	R38745
Hexachlorobenzene	ND	1.0		µg/L	1	10/29/2016	R38745
Hexachlorobutadiene	ND	5.0		µg/L	1	10/29/2016	R38745
Hexachlorocyclopentadiene	ND	5.0		µg/L	1	10/29/2016	R38745
Hexachloroethane	ND	5.0		µg/L	1	10/29/2016	R38745
Indeno(1,2,3-cd)pyrene	ND	0.10		µg/L	1	10/29/2016	R38745
Isophorone	ND	5.0		µg/L	1	10/29/2016	R38745
Naphthalene	ND	5.0		µg/L	1	10/29/2016	R38745
Nitrobenzene	ND	5.0		µg/L	1	10/29/2016	R38745
N-Nitrosodi-n-propylamine	ND	5.0		µg/L	1	10/29/2016	R38745
N-Nitrosodiphenylamine	ND	2.0		µg/L	1	10/29/2016	R38745
Pentachlorophenol	ND	5.0		µg/L	1	10/29/2016	R38745

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: WDW-1,2,&3 Effluent
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date: 10/11/2016 9:00:00 AM
Lab ID: 1610612-001
Matrix: AQUEOUS
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 8270C: SEMIVOLATILES/MOD						Analyst: **SUB**	
Phenanthrene	ND	5.0		µg/L	1	10/29/2016	R38745
Phenol	ND	5.0		µg/L	1	10/29/2016	R38745
Pyrene	ND	5.0		µg/L	1	10/29/2016	R38745
o-Toluidine	ND	2.0		µg/L	1	10/29/2016	R38745
Pyridine	ND	5.0		µg/L	1	10/29/2016	R38745
1,2,4,5-Tetrachlorobenzene	ND	5.0		µg/L	1	10/29/2016	R38745
Surr: 2,4,6-Tribromophenol	103	63-110		%Rec	1	10/29/2016	R38745
Surr: 2-Fluorobiphenyl	92.4	58-112		%Rec	1	10/29/2016	R38745
Surr: 2-Fluorophenol	87.2	47-109		%Rec	1	10/29/2016	R38745
Surr: Nitrobenzene-d5	83.6	58-110		%Rec	1	10/29/2016	R38745
Surr: Phenol-d5	85.4	52-105		%Rec	1	10/29/2016	R38745
Surr: Terphenyl-d14	46.0	22-133		%Rec	1	10/29/2016	R38745

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1610612-002
Matrix: TRIP BLANK
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
Acetonitrile	ND	5.0		µg/L	1	10/20/2016	R38745
Allyl chloride	ND	0.50		µg/L	1	10/20/2016	R38745
Chloroprene	ND	0.50		µg/L	1	10/20/2016	R38745
Cyclohexane	ND	0.50		µg/L	1	10/20/2016	R38745
Diethyl ether	ND	0.50		µg/L	1	10/20/2016	R38745
Epichlorohydrin	ND	100		µg/L	1	10/20/2016	R38745
Ethyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
Ethyl methacrylate	ND	2.5		µg/L	1	10/20/2016	R38745
Ethyl tert-butyl ether	ND	0.50		µg/L	1	10/20/2016	R38745
Freon-113	ND	0.50		µg/L	1	10/20/2016	R38745
Isobutanol	ND	100		µg/L	1	10/20/2016	R38745
Isopropyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
Methacrylonitrile	ND	2.5		µg/L	1	10/20/2016	R38745
Methyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
Methyl ethyl ketone	ND	2.5		µg/L	1	10/20/2016	R38745
Methyl isobutyl ketone	ND	2.5		µg/L	1	10/20/2016	R38745
Methyl methacrylate	ND	2.5		µg/L	1	10/20/2016	R38745
Methylcyclohexane	ND	1.0		µg/L	1	10/20/2016	R38745
n-Amyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
n-Hexane	ND	0.50		µg/L	1	10/20/2016	R38745
Nitrobenzene	ND	5.0		µg/L	1	10/20/2016	R38745
Pentachloroethane	ND	5.0		µg/L	1	10/20/2016	R38745
p-isopropyltoluene	ND	0.50		µg/L	1	10/20/2016	R38745
Propionitrile	ND	2.5		µg/L	1	10/20/2016	R38745
Tetrahydrofuran	ND	0.50		µg/L	1	10/20/2016	R38745
Benzene	ND	0.50		µg/L	1	10/20/2016	R38745
Toluene	ND	0.50		µg/L	1	10/20/2016	R38745
Ethylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	1	10/20/2016	R38745
1,2,4-Trimethylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,3,5-Trimethylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dichloroethane (EDC)	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dibromoethane (EDB)	ND	0.50		µg/L	1	10/20/2016	R38745
Naphthalene	ND	0.50		µg/L	1	10/20/2016	R38745
Acetone	ND	2.5		µg/L	1	10/20/2016	R38745
Bromobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Bromodichloromethane	ND	0.50		µg/L	1	10/20/2016	R38745
Bromoform	ND	0.50		µg/L	1	10/20/2016	R38745
Bromomethane	ND	0.50		µg/L	1	10/20/2016	R38745

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1610612-002
Matrix: TRIP BLANK
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
2-Butanone	ND	2.5		µg/L	1	10/20/2016	R38745
Carbon disulfide	ND	0.50		µg/L	1	10/20/2016	R38745
Carbon Tetrachloride	ND	0.50		µg/L	1	10/20/2016	R38745
Chlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Chloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
Chloroform	ND	0.50		µg/L	1	10/20/2016	R38745
Chloromethane	ND	0.50		µg/L	1	10/20/2016	R38745
2-Chlorotoluene	ND	0.50		µg/L	1	10/20/2016	R38745
4-Chlorotoluene	ND	0.50		µg/L	1	10/20/2016	R38745
cis-1,2-DCE	ND	0.50		µg/L	1	10/20/2016	R38745
cis-1,3-Dichloropropene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dibromo-3-chloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
Dibromochloromethane	ND	0.50		µg/L	1	10/20/2016	R38745
Dibromomethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,3-Dichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,4-Dichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Dichlorodifluoromethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1-Dichloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1-Dichloroethene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2-Dichloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
1,3-Dichloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
2,2-Dichloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1-Dichloropropene	ND	0.50		µg/L	1	10/20/2016	R38745
Hexachlorobutadiene	ND	0.50		µg/L	1	10/20/2016	R38745
2-Hexanone	ND	0.50		µg/L	1	10/20/2016	R38745
Isopropylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Methylene Chloride	ND	2.5		µg/L	1	10/20/2016	R38745
n-Butylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
n-Propylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
sec-Butylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
Styrene	ND	0.50		µg/L	1	10/20/2016	R38745
tert-Butylbenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,1,1,2-Tetrachloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1,2,2-Tetrachloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	10/20/2016	R38745
trans-1,2-DCE	ND	0.50		µg/L	1	10/20/2016	R38745
trans-1,3-Dichloropropene	ND	0.50		µg/L	1	10/20/2016	R38745
1,2,3-Trichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745

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
R	RPD outside accepted recovery limits	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: Navajo Refining Company
Client Sample ID: TRIP BLANK
Project: Quarterly WDW-1, 2, &3 Inj Well
Collection Date:
Lab ID: 1610612-002
Matrix: TRIP BLANK
Received Date: 10/13/2016 8:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **SUB**	
1,2,4-Trichlorobenzene	ND	0.50		µg/L	1	10/20/2016	R38745
1,1,1-Trichloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,1,2-Trichloroethane	ND	0.50		µg/L	1	10/20/2016	R38745
Trichloroethene (TCE)	ND	0.50		µg/L	1	10/20/2016	R38745
Trichlorofluoromethane	ND	0.50		µg/L	1	10/20/2016	R38745
1,2,3-Trichloropropane	ND	0.50		µg/L	1	10/20/2016	R38745
Vinyl chloride	ND	0.50		µg/L	1	10/20/2016	R38745
mp-Xylenes	ND	1.0		µg/L	1	10/20/2016	R38745
o-Xylene	ND	0.50		µg/L	1	10/20/2016	R38745
tert-Amyl methyl ether	ND	0.50		µg/L	1	10/20/2016	R38745
tert-Butyl alcohol	ND	0.50		µg/L	1	10/20/2016	R38745
Acrolein	ND	2.5		µg/L	1	10/20/2016	R38745
Acrylonitrile	ND	2.5		µg/L	1	10/20/2016	R38745
Bromochloromethane	ND	0.50		µg/L	1	10/20/2016	R38745
2-Chloroethyl vinyl ether	ND	0.50		µg/L	1	10/20/2016	R38745
Iodomethane	ND	0.50		µg/L	1	10/20/2016	R38745
trans-1,4-Dichloro-2-butene	ND	0.50		µg/L	1	10/20/2016	R38745
Vinyl acetate	ND	0.50		µg/L	1	10/20/2016	R38745
Surr: 1,2-Dichlorobenzene-d4	102	0-0	S	%Rec	1	10/20/2016	R38745
Surr: 4-Bromofluorobenzene	96.4	70-130		%Rec	1	10/20/2016	R38745
Surr: Toluene-d8	98.0	70-130		%Rec	1	10/20/2016	R38745

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R37942**	RunNo: **37942**
Prep Date:	Analysis Date: **10/13/2016**	SeqNo: **1182401** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R37942**	RunNo: **37942**
Prep Date:	Analysis Date: **10/13/2016**	SeqNo: **1182402** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.54	0.10	0.5000	0	107	90	110			
Bromide	2.6	0.10	2.500	0	103	90	110			
Phosphorus, Orthophosphate (As P	4.7	0.50	5.000	0	93.6	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	97.3	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R38187**	RunNo: **38187**
Prep Date:	Analysis Date: **10/25/2016**	SeqNo: **1193019** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R38187**	RunNo: **38187**
Prep Date:	Analysis Date: **10/25/2016**	SeqNo: **1193020** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	96.7	90	110			
Sulfate	9.9	0.50	10.00	0	99.1	90	110			

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
R	RPD outside accepted recovery limits	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#: **1610612**
16-Nov-16

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R38745**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R38745**	RunNo: **38745**
Prep Date:	Analysis Date: **10/20/2016**	SeqNo: **1210379** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetonitrile	ND	0.50								
Allyl chloride	ND	0.50								
Chloroprene	ND	0.50								
Ethyl methacrylate	ND	2.5								
Isobutanol	ND	10								
Methacrylonitrile	ND	2.5								
Methyl ethyl ketone	ND	2.5								
Methyl isobutyl ketone	ND	2.5								
Methyl methacrylate	ND	2.5								
Propionitrile	ND	2.5								
Benzene	ND	0.50								
Toluene	ND	0.50								
Ethylbenzene	ND	0.50								
1,2-Dichloroethane (EDC)	ND	0.50								
1,2-Dibromoethane (EDB)	ND	0.50								
Acetone	ND	2.5								
Bromodichloromethane	ND	0.50								
Bromoform	ND	0.50								
Bromomethane	ND	0.50								
2-Butanone	ND	2.5								
Carbon disulfide	ND	0.50								
Carbon Tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.50								
Chloromethane	ND	0.50								
cis-1,2-DCE	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
1,2-Dibromo-3-chloropropane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dibromomethane	ND	0.50								
1,2-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2-Dichloropropane	ND	0.50								
1,3-Dichloropropane	ND	0.50								
2,2-Dichloropropane	ND	0.50								

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R38745**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R38745**	RunNo: **38745**
Prep Date:	Analysis Date: **10/20/2016**	SeqNo: **1210379** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.50								
2-Hexanone	ND	0.50								
Methylene Chloride	ND	2.5								
Styrene	ND	0.50								
1,1,1,2-Tetrachloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	0.50								
trans-1,3-Dichloropropene	ND	0.50								
1,1,1-Trichloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.50								
Trichloroethene (TCE)	ND	0.50								
Trichlorofluoromethane	ND	0.50								
1,2,3-Trichloropropane	ND	0.50								
Vinyl chloride	ND	0.50								
mp-Xylenes	ND	1.0								
o-Xylene	ND	0.50								
Acrolein	ND	2.5								
Acrylonitrile	ND	2.5								
Bromochloromethane	ND	0.50								
Iodomethane	ND	0.50								
trans-1,4-Dichloro-2-butene	ND	0.50								
Vinyl acetate	ND	0.50								

Sample ID **LCS-R38745**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R38745**	RunNo: **38745**
Prep Date:	Analysis Date: **10/20/2016**	SeqNo: **1210380** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	9.7	0	10.00	0	96.7	80	120			
Toluene	9.7	0	10.00	0	97.2	80	120			
Ethylbenzene	9.8	0	10.00	0	98.0	80	120			
Chlorobenzene	9.8	0	10.00	0	97.8	80	120			
1,1-Dichloroethene	9.7	0	10.00	0	96.7	80	120			
Tetrachloroethene (PCE)	9.5	0	10.00	0	95.0	80	120			
Trichloroethene (TCE)	9.7	0	10.00	0	96.6	80	120			
o-Xylene	10	0	10.00	0	102	80	120			

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R38745**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R38745**	RunNo: **38745**
Prep Date:	Analysis Date: **10/29/2016**	SeqNo: **1210383** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acetophenone	ND	5.0								
1-Methylnaphthalene	ND	5.0								
2,3,4,6-Tetrachlorophenol	ND	5.0								
2,4,5-Trichlorophenol	ND	5.0								
2,4,6-Trichlorophenol	ND	5.0								
2,4-Dichlorophenol	ND	5.0								
2,4-Dimethylphenol	ND	5.0								
2,4-Dinitrophenol	ND	5.0								
2,4-Dinitrotoluene	ND	5.0								
2,6-Dinitrotoluene	ND	5.0								
2-Chloronaphthalene	ND	5.0								
2-Chlorophenol	ND	5.0								
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	5.0								
2-Nitroaniline	ND	5.0								
2-Nitrophenol	ND	5.0								
3,3´-Dichlorobenzidine	ND	5.0								
3-Nitroaniline	ND	5.0								
4,6-Dinitro-2-methylphenol	ND	5.0								
4-Bromophenyl phenyl ether	ND	5.0								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	5.0								
4-Chlorophenyl phenyl ether	ND	5.0								
4-Nitroaniline	ND	5.0								
4-Nitrophenol	ND	5.0								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benz(a)anthracene	ND	0.10								
Benzo(a)pyrene	ND	0.10								
Benzo(b)fluoranthene	ND	0.10								
Benzo(k)fluoranthene	ND	0.10								
Bis(2-chloroethoxy)methane	ND	5.0								
Bis(2-chloroethyl)ether	ND	5.0								
Bis(2-chloroisopropyl)ether	ND	5.0								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	5.0								
Carbazole	ND	5.0								

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R38745**	SampType: **MBLK**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **PBW**	Batch ID: **R38745**	RunNo: **38745**
Prep Date:	Analysis Date: **10/29/2016**	SeqNo: **1210383** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chrysene	ND	0.10								
Dibenz(a,h)anthracene	ND	0.10								
Dibenzofuran	ND	5.0								
Diethyl phthalate	ND	5.0								
Dimethyl phthalate	ND	5.0								
Di-n-butyl phthalate	ND	5.0								
Di-n-octyl phthalate	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Hexachlorobenzene	ND	1.0								
Hexachlorobutadiene	ND	5.0								
Hexachlorocyclopentadiene	ND	5.0								
Hexachloroethane	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	0.10								
Isophorone	ND	5.0								
Naphthalene	ND	5.0								
Nitrobenzene	ND	5.0								
N-Nitrosodi-n-propylamine	ND	2.0								
N-Nitrosodiphenylamine	ND	2.0								
Pentachlorophenol	ND	5.0								
Phenanthrene	ND	1.0								
Phenol	ND	5.0								
Pyrene	ND	5.0								
o-Toluidine	ND	5.0								
Pyridine	ND	5.0								
1,2,4,5-Tetrachlorobenzene	ND	5.0								

Sample ID **LCS-R38745**	SampType: **LCS**	TestCode: **EPA 8270C: Semivolatiles/Mod**
Client ID: **LCSW**	Batch ID: **R38745**	RunNo: **38745**
Prep Date:	Analysis Date: **10/29/2016**	SeqNo: **1210384** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	5.5	0	5.000	0	110	49	134			
2-Chlorophenol	4.6	0	5.000	0	91.4	50	131			
4-Chloro-3-methylphenol	5.1	0	5.000	0	102	42	139			
4-Nitrophenol	5.5	0	5.000	0	110	19	137			
Acenaphthene	5.0	0	5.000	0	101	36	122			
Bis(2-ethylhexyl)phthalate	4.9	0	5.000	0	98.6	43	142			
N-Nitrosodi-n-propylamine	4.3	0	5.000	0	86.8	46	140			

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**LCS-R38745**	SampType:	**LCS**	TestCode:	**EPA 8270C: Semivolatiles/Mod**					
Client ID:	**LCSW**	Batch ID:	**R38745**	RunNo:	**38745**					
Prep Date:		Analysis Date:	**10/29/2016**	SeqNo:	**1210384**	Units:	**µg/L**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Pentachlorophenol		5.5	0	5.000	0	111	22	138			
Phenol		4.7	0	5.000	0	94.4	45	134			
Pyrene		4.5	0	5.000	0	90.8	45	138			

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-28113**	SampType:	**MBLK**	TestCode:	**EPA Method 7470: Mercury**					
Client ID:	**PBW**	Batch ID:	**28113**	RunNo:	**38030**					
Prep Date:	**10/17/2016**	Analysis Date:	**10/18/2016**	SeqNo:	**1185736**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID	**LCS-28113**	SampType:	**LCS**	TestCode:	**EPA Method 7470: Mercury**					
Client ID:	**LCSW**	Batch ID:	**28113**	RunNo:	**38030**					
Prep Date:	**10/17/2016**	Analysis Date:	**10/18/2016**	SeqNo:	**1185737**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0047	0.00020	0.005000	0	93.6	80	120			

Sample ID	**1610612-001BMS**	SampType:	**MS**	TestCode:	**EPA Method 7470: Mercury**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID:	**28113**	RunNo:	**38030**					
Prep Date:	**10/17/2016**	Analysis Date:	**10/18/2016**	SeqNo:	**1185804**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0061	0.00020	0.005000	0.0001625	118	75	125			

Sample ID	**1610612-001BMSD**	SampType:	**MSD**	TestCode:	**EPA Method 7470: Mercury**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID:	**28113**	RunNo:	**38030**					
Prep Date:	**10/17/2016**	Analysis Date:	**10/18/2016**	SeqNo:	**1185805**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0059	0.00020	0.005000	0.0001625	114	75	125	3.16	20	

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-28165**	SampType:	**MBLK**	TestCode:	**MERCURY, TCLP**					
Client ID:	**PBW**	Batch ID:	**28165**	RunNo:	**38056**					
Prep Date:	**10/19/2016**	Analysis Date:	**10/19/2016**	SeqNo:	**1186813**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020								

Sample ID	**LCS-28165**	SampType:	**LCS**	TestCode:	**MERCURY, TCLP**					
Client ID:	**LCSW**	Batch ID:	**28165**	RunNo:	**38056**					
Prep Date:	**10/19/2016**	Analysis Date:	**10/19/2016**	SeqNo:	**1186814**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.005000	0	104	80	120			

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-28191**	SampType:	**MBLK**	TestCode:	**EPA Method 6010B: TCLP Metals**					
Client ID:	**PBW**	Batch ID:	**28191**	RunNo:	**38144**					
Prep Date:	**10/20/2016**	Analysis Date:	**10/24/2016**	SeqNo:	**1190360**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								
Silver	ND	5.0								

Sample ID	**LCS-28191**	SampType:	**LCS**	TestCode:	**EPA Method 6010B: TCLP Metals**					
Client ID:	**LCSW**	Batch ID:	**28191**	RunNo:	**38144**					
Prep Date:	**10/20/2016**	Analysis Date:	**10/24/2016**	SeqNo:	**1190361**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0	108	80	120			
Barium	ND	100	0.5000	0	96.0	80	120			
Cadmium	ND	1.0	0.5000	0	101	80	120			
Chromium	ND	5.0	0.5000	0	97.0	80	120			
Lead	ND	5.0	0.5000	0	93.2	80	120			
Selenium	ND	1.0	0.5000	0	106	80	120			
Silver	ND	5.0	0.1000	0	106	80	120			

Sample ID	**TCLP FL#2-2661**	SampType:	**MBLK**	TestCode:	**EPA Method 6010B: TCLP Metals**					
Client ID:	**PBW**	Batch ID:	**28191**	RunNo:	**38144**					
Prep Date:	**10/20/2016**	Analysis Date:	**10/24/2016**	SeqNo:	**1190451**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								
Silver	ND	5.0								

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-28190**	SampType: **MBLK**	TestCode: **EPA 6010B: Metals**
Client ID: **PBW**	Batch ID: **28190**	RunNo: **38332**
Prep Date: **10/20/2016**	Analysis Date: **10/31/2016**	SeqNo: **1196520** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Antimony	ND	0.050								
Arsenic	ND	0.020								
Barium	ND	0.020								
Beryllium	ND	0.0030								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.050								
Lead	ND	0.0050								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	ND	0.0050								
Thallium	ND	0.050								
Vanadium	ND	0.050								
Zinc	ND	0.020								

Sample ID **LCS-28190**	SampType: **LCS**	TestCode: **EPA 6010B: Metals**
Client ID: **LCSW**	Batch ID: **28190**	RunNo: **38332**
Prep Date: **10/20/2016**	Analysis Date: **10/31/2016**	SeqNo: **1196521** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.55	0.020	0.5000	0	109	80	120			
Antimony	0.49	0.050	0.5000	0	98.4	80	120			
Arsenic	0.52	0.020	0.5000	0	104	80	120			
Barium	0.50	0.020	0.5000	0	100	80	120			
Beryllium	0.53	0.0030	0.5000	0	106	80	120			
Cadmium	0.51	0.0020	0.5000	0	101	80	120			
Chromium	0.50	0.0060	0.5000	0	99.5	80	120			
Cobalt	0.49	0.0060	0.5000	0	97.7	80	120			
Copper	0.50	0.0060	0.5000	0	99.6	80	120			
Iron	0.50	0.050	0.5000	0	101	80	120			
Lead	0.50	0.0050	0.5000	0	99.5	80	120			
Manganese	0.50	0.0020	0.5000	0	100	80	120			
Nickel	0.50	0.010	0.5000	0	99.9	80	120			
Potassium	50	1.0	50.00	0	100	80	120			

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**LCS-28190**	SampType: **LCS**		TestCode: **EPA 6010B: Metals**						
Client ID:	**LCSW**	Batch ID: **28190**		RunNo: **38332**						
Prep Date:	**10/20/2016**	Analysis Date: **10/31/2016**		SeqNo: **1196521**		Units: **mg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	0.49	0.050	0.5000	0	99.0	80	120			
Silver	0.10	0.0050	0.1000	0	103	80	120			
Thallium	0.49	0.050	0.5000	0	98.9	80	120			
Vanadium	0.53	0.050	0.5000	0	105	80	120			
Zinc	0.50	0.020	0.5000	0	101	80	120			

Sample ID	**1610612-001BMS**	SampType: **MS**		TestCode: **EPA 6010B: Metals**						
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **28190**		RunNo: **38332**						
Prep Date:	**10/20/2016**	Analysis Date: **10/31/2016**		SeqNo: **1196523**		Units: **mg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.89	0.020	0.5000	0.3134	115	75	125			
Antimony	0.47	0.050	0.5000	0	94.3	75	125			
Arsenic	0.57	0.020	0.5000	0.04017	106	75	125			
Barium	0.50	0.020	0.5000	0.01602	96.0	75	125			
Beryllium	0.51	0.0030	0.5000	0	102	75	125			
Cadmium	0.50	0.0020	0.5000	0	99.7	75	125			
Chromium	0.47	0.0060	0.5000	0	94.3	75	125			
Cobalt	0.47	0.0060	0.5000	0.003260	93.6	75	125			
Copper	0.53	0.0060	0.5000	0.01704	103	75	125			
Iron	0.63	0.050	0.5000	0.1353	98.3	75	125			
Lead	0.47	0.0050	0.5000	0	94.8	75	125			
Manganese	0.53	0.0020	0.5000	0.05227	95.7	75	125			
Nickel	0.49	0.010	0.5000	0.006520	95.7	75	125			
Selenium	0.52	0.050	0.5000	0	103	75	125			
Silver	0.10	0.0050	0.1000	0	104	75	125			
Thallium	0.46	0.050	0.5000	0.01260	89.8	75	125			
Vanadium	0.52	0.050	0.5000	0.006120	103	75	125			
Zinc	0.53	0.020	0.5000	0.02719	99.6	75	125			

Sample ID	**1610612-001BMSD**	SampType: **MSD**		TestCode: **EPA 6010B: Metals**						
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **28190**		RunNo: **38332**						
Prep Date:	**10/20/2016**	Analysis Date: **10/31/2016**		SeqNo: **1196524**		Units: **mg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.88	0.020	0.5000	0.3134	114	75	125	0.858	20	
Antimony	0.45	0.050	0.5000	0	90.8	75	125	3.77	20	
Arsenic	0.55	0.020	0.5000	0.04017	103	75	125	2.57	20	
Barium	0.49	0.020	0.5000	0.01602	94.6	75	125	1.42	20	
Beryllium	0.51	0.0030	0.5000	0	101	75	125	1.17	20	

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**1610612-001BMSD**	SampType:	**MSD**		TestCode:	**EPA 6010B: Metals**				
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID:	**28190**		RunNo:	**38332**				
Prep Date:	**10/20/2016**	Analysis Date:	**10/31/2016**		SeqNo:	**1196524**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	0.49	0.0020	0.5000	0	98.2	75	125	1.47	20	
Chromium	0.46	0.0060	0.5000	0	92.6	75	125	1.81	20	
Cobalt	0.46	0.0060	0.5000	0.003260	91.8	75	125	1.92	20	
Copper	0.54	0.0060	0.5000	0.01704	104	75	125	0.996	20	
Iron	0.64	0.050	0.5000	0.1353	102	75	125	2.59	20	
Lead	0.47	0.0050	0.5000	0	93.8	75	125	1.05	20	
Manganese	0.52	0.0020	0.5000	0.05227	94.4	75	125	1.23	20	
Nickel	0.48	0.010	0.5000	0.006520	94.3	75	125	1.45	20	
Selenium	0.51	0.050	0.5000	0	102	75	125	1.76	20	
Silver	0.10	0.0050	0.1000	0	103	75	125	1.49	20	
Thallium	0.45	0.050	0.5000	0.01260	86.9	75	125	3.22	20	
Vanadium	0.51	0.050	0.5000	0.006120	101	75	125	1.60	20	
Zinc	0.52	0.020	0.5000	0.02719	98.2	75	125	1.35	20	

Sample ID	**1610612-001BMS**	SampType:	**MS**		TestCode:	**EPA 6010B: Metals**				
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID:	**28190**		RunNo:	**38332**				
Prep Date:	**10/20/2016**	Analysis Date:	**10/31/2016**		SeqNo:	**1196526**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	180	5.0	50.00	123.0	104	75	125			

Sample ID	**1610612-001BMSD**	SampType:	**MSD**		TestCode:	**EPA 6010B: Metals**				
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID:	**28190**		RunNo:	**38332**				
Prep Date:	**10/20/2016**	Analysis Date:	**10/31/2016**		SeqNo:	**1196527**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	180	5.0	50.00	123.0	123	75	125	5.31	20	

Sample ID	**MB-28190**	SampType:	**MBLK**		TestCode:	**EPA 6010B: Metals**				
Client ID:	**PBW**	Batch ID:	**28190**		RunNo:	**38490**				
Prep Date:	**10/20/2016**	Analysis Date:	**11/7/2016**		SeqNo:	**1202197**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Sodium	ND	1.0								

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**LCS-28190**	SampType: **LCS**		TestCode: **EPA 6010B: Metals**					
Client ID:	**LCSW**	Batch ID: **28190**		RunNo: **38490**					
Prep Date:	**10/20/2016**	Analysis Date: **11/7/2016**		SeqNo: **1202198**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	51	1.0	50.00	0	102	80	120			
Magnesium	52	1.0	50.00	0	103	80	120			
Sodium	51	1.0	50.00	0	102	80	120			

Sample ID	**1610612-001BMS**	SampType: **MS**		TestCode: **EPA 6010B: Metals**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **28190**		RunNo: **38490**					
Prep Date:	**10/20/2016**	Analysis Date: **11/7/2016**		SeqNo: **1202200**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	86	1.0	50.00	35.82	100	75	125			

Sample ID	**1610612-001BMSD**	SampType: **MSD**		TestCode: **EPA 6010B: Metals**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **28190**		RunNo: **38490**					
Prep Date:	**10/20/2016**	Analysis Date: **11/7/2016**		SeqNo: **1202201**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	86	1.0	50.00	35.82	101	75	125	0.560	20	

Sample ID	**1610612-001BMS**	SampType: **MS**		TestCode: **EPA 6010B: Metals**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **28190**		RunNo: **38490**					
Prep Date:	**10/20/2016**	Analysis Date: **11/7/2016**		SeqNo: **1202203**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	140	5.0	50.00	95.77	95.5	75	125			

Sample ID	**1610612-001BMSD**	SampType: **MSD**		TestCode: **EPA 6010B: Metals**					
Client ID:	**WDW-1,2,&3 Effluen**	Batch ID: **28190**		RunNo: **38490**					
Prep Date:	**10/20/2016**	Analysis Date: **11/7/2016**		SeqNo: **1202211**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	150	5.0	50.00	95.77	105	75	125	3.14	20	

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-R38745**	SampType:	**MBLK**	TestCode:	**CYANIDE, Reactive**					
Client ID:	**PBW**	Batch ID:	**R38745**	RunNo:	**38745**					
Prep Date:		Analysis Date:	**10/25/2016**	SeqNo:	**1210388**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	ND	1.00								

Sample ID	**LCS-R38745**	SampType:	**LCS**	TestCode:	**CYANIDE, Reactive**					
Client ID:	**LCSW**	Batch ID:	**R38745**	RunNo:	**38745**					
Prep Date:		Analysis Date:	**10/25/2016**	SeqNo:	**1210389**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide, Reactive	0.542		0.5000	0	108	80	120			

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **MB-R38745**	SampType: **MBLK**	TestCode: **SULFIDE, Reactive**							
Client ID: **PBW**	Batch ID: **R38745**	RunNo: **38745**							
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1210391**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	ND	1.0								

Sample ID **LCS-R38745**	SampType: **LCS**	TestCode: **SULFIDE, Reactive**							
Client ID: **LCSW**	Batch ID: **R38745**	RunNo: **38745**							
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1210392**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Reactive Sulfide	0.16		0.2000	0	80.0	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
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	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#: **1610612**
16-Nov-16

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **mb-1**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R38048**	RunNo: **38048**							
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1186486**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-1**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R38048**	RunNo: **38048**							
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1186487**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80.60	20.00	80.00	0	101	90	110			

Sample ID **mb-2**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R38048**	RunNo: **38048**							
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1186510**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-2**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R38048**	RunNo: **38048**							
Prep Date:	Analysis Date: **10/18/2016**	SeqNo: **1186511**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	81.52	20.00	80.00	0	102	90	110			

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID **1610612-001ADUP**	SampType: **DUP**			TestCode: **Specific Gravity**						
Client ID: **WDW-1,2,&3 Effluen**	Batch ID: **R38258**			RunNo: **38258**						
Prep Date:	Analysis Date: **10/27/2016**			SeqNo: **1193976**		Units:				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	0.9993	0						0.0400	20	

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
R	RPD outside accepted recovery limits	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#: **1610612**

16-Nov-16

Client: Navajo Refining Company

Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID	**MB-28098**	SampType:	**MBLK**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**PBW**	Batch ID:	**28098**	RunNo:	**38034**					
Prep Date:	**10/17/2016**	Analysis Date:	**10/18/2016**	SeqNo:	**1185818**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	**LCS-28098**	SampType:	**LCS**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**LCSW**	Batch ID:	**28098**	RunNo:	**38034**					
Prep Date:	**10/17/2016**	Analysis Date:	**10/18/2016**	SeqNo:	**1185819**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1050	20.0	1000	0	105	80	120			

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
R	RPD outside accepted recovery limits	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

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: NAVAJO REFINING CO Work Order Number: 1610612 RcptNo: 1

Received by/date: AC 10/13/16

Logged By: Ashley Gallegos 10/13/2016 8:30:00 AM

Completed By: Ashley Gallegos 10/13/2016 11:20:49 AM

Reviewed By: JC 10/23/16 JC 10/13/16

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: 2 2 (<2 or >12 unless noted)

Adjusted? No

Checked by: AJS

Special Handling (if applicable)

16. 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:

17. Additional remarks:

18. **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: Navajo Refining Co.

Mailing Address: P.O. Box 159 Artesia,

NM 88211-0159

Phone #: 575-748-3311

email or Fax#: 575-746-5451

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:

X Standard ☐ Rush

Project Name:

Quarterly WDW-1, 2, & 3 Inj Well

Project #: P.O. # 167796

Project Manager:

Micki Schultz / Scott Denton / Mike Holder

Sampler: Brady Hubbard

On Ice: X Yes ☐ No

Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

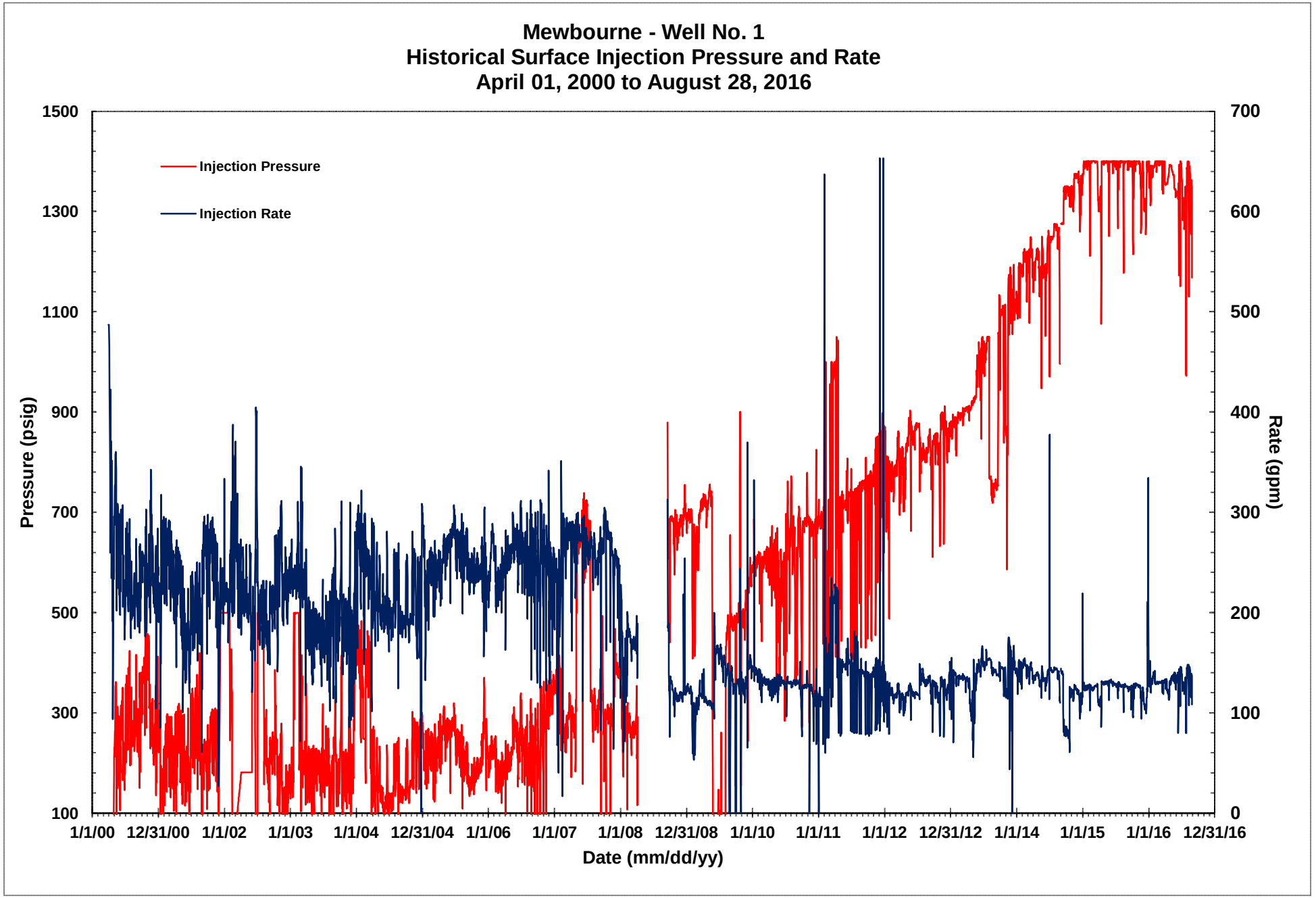
Tel. 505-345-3975 Fax 505-345-4107

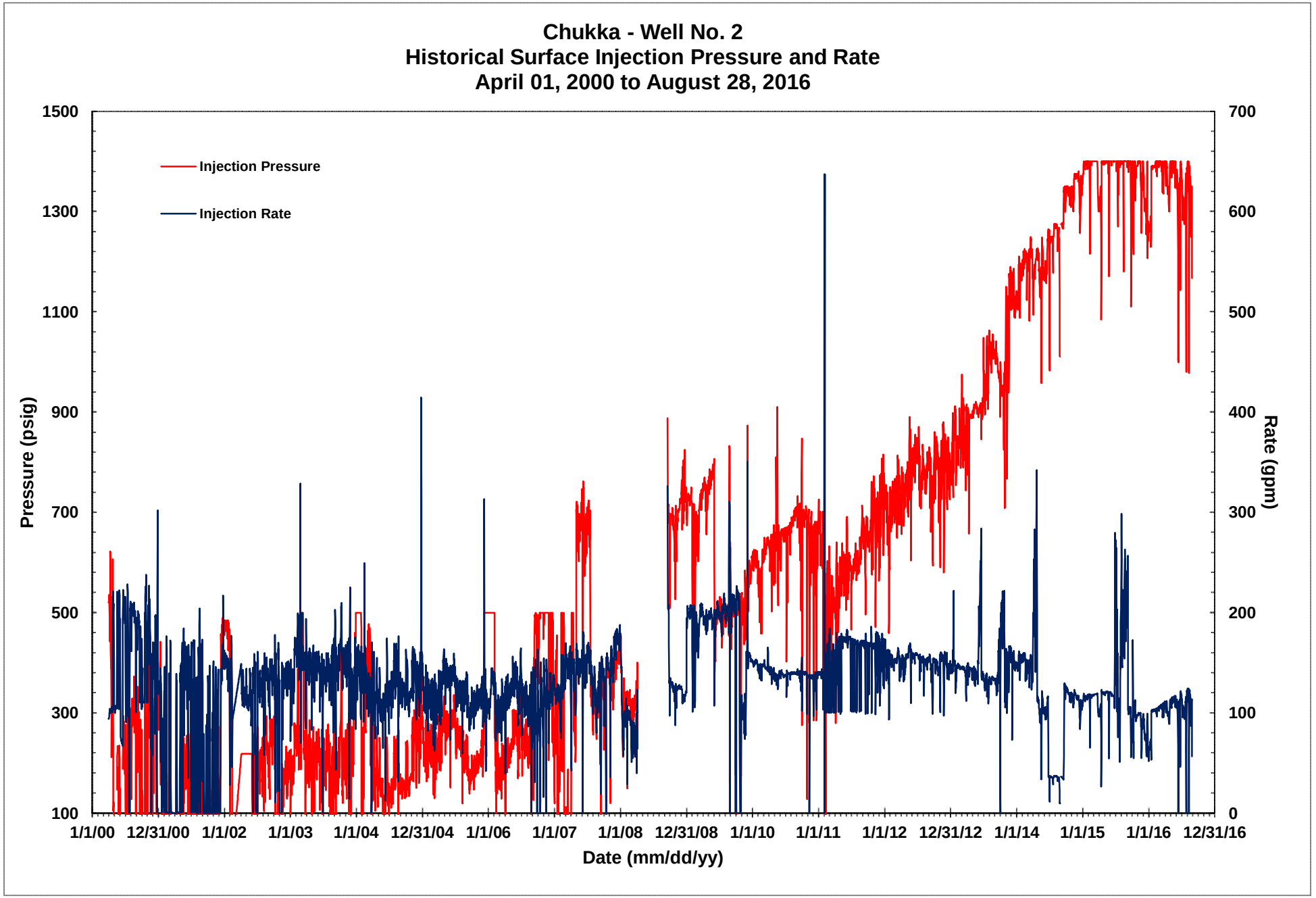
Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610612	Specific Gravity,HCO3, CO3, Cl, SO4, TDS, pH, cond.,Fl, Cation/anion bal., Br, Eh/40	VOCs/SW-846 Method 8260C (see attached list 'VOCs')	SVOCs/SW-846 Method 8270D (see attached list 'SVOCs')	R,C,I/40 CFR part 261	Metals/SW-846 Mthd 6010, 7470 (see attached list 'Metals')	Ca, K, Mg, Na/40 CFR 136.3	TCLP Metals, only /40 CFR Part 261/ SW-846 Method 1311
10/11/16	9:00	Liquid	WDW-1, 2, & 3 Effluent	3	Neat/H2SO4	-001	X						X
10/11/16	9:00	Liquid	WDW-1, 2, & 3 Effluent	1	HNO3						X	X	
10/11/16	9:00	Liquid	WDW-1, 2, & 3 Effluent	3	HCL			X					
10/11/16	9:00	Liquid	WDW-1, 2, & 3 Effluent	2	Neat				X				
10/11/16	9:00	Liquid	WDW-1, 2, & 3 Effluent	2	Neat					X			
10/11/16	9:00	Liquid	Trip Blank	2	Neat	-002		X					
10/11/16	9:00	Liquid	Temperature Blank	1	Neat								

Date:	Time:	Relinquished by:	Received by:	Date	Time
10-11-16	11:00	Brady Hubbard	Lindsey Coneha	10/13/16	0830
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Send results to Scott Denton, Mike Holder, Robert Combs and Andrew Contreras.

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.


Mewbourne - Well No. 1
Historical Surface Injection Pressure and Rate
April 01, 2000 to August 28, 2016
Injection Pressure
Injection Rate
Pressure (psig)
Rate (gpm)
Date (mm/dd/yy)
1500
1300
1100
900
700
500
300
100
700
600
500
400
300
200
100
0
1/1/00
12/31/00
1/1/02
1/1/03
1/1/04
12/31/04
1/1/06
1/1/07
1/1/08
12/31/08
1/1/10
1/1/11
1/1/12
12/31/12
1/1/14
1/1/15
1/1/16
12/31/16


Chukka - Well No. 2
Historical Surface Injection Pressure and Rate
April 01, 2000 to August 28, 2016
Injection Pressure
Injection Rate
Pressure (psig)
Rate (gpm)
Date (mm/dd/yy)
1500
1300
1100
900
700
500
300
100
700
600
500
400
300
200
100
0
1/1/00
12/31/00
1/1/02
1/1/03
1/1/04
12/31/04
1/1/06
1/1/07
1/1/08
12/31/08
1/1/10
1/1/11
1/1/12
12/31/12
1/1/14
1/1/15
1/1/16
12/31/16

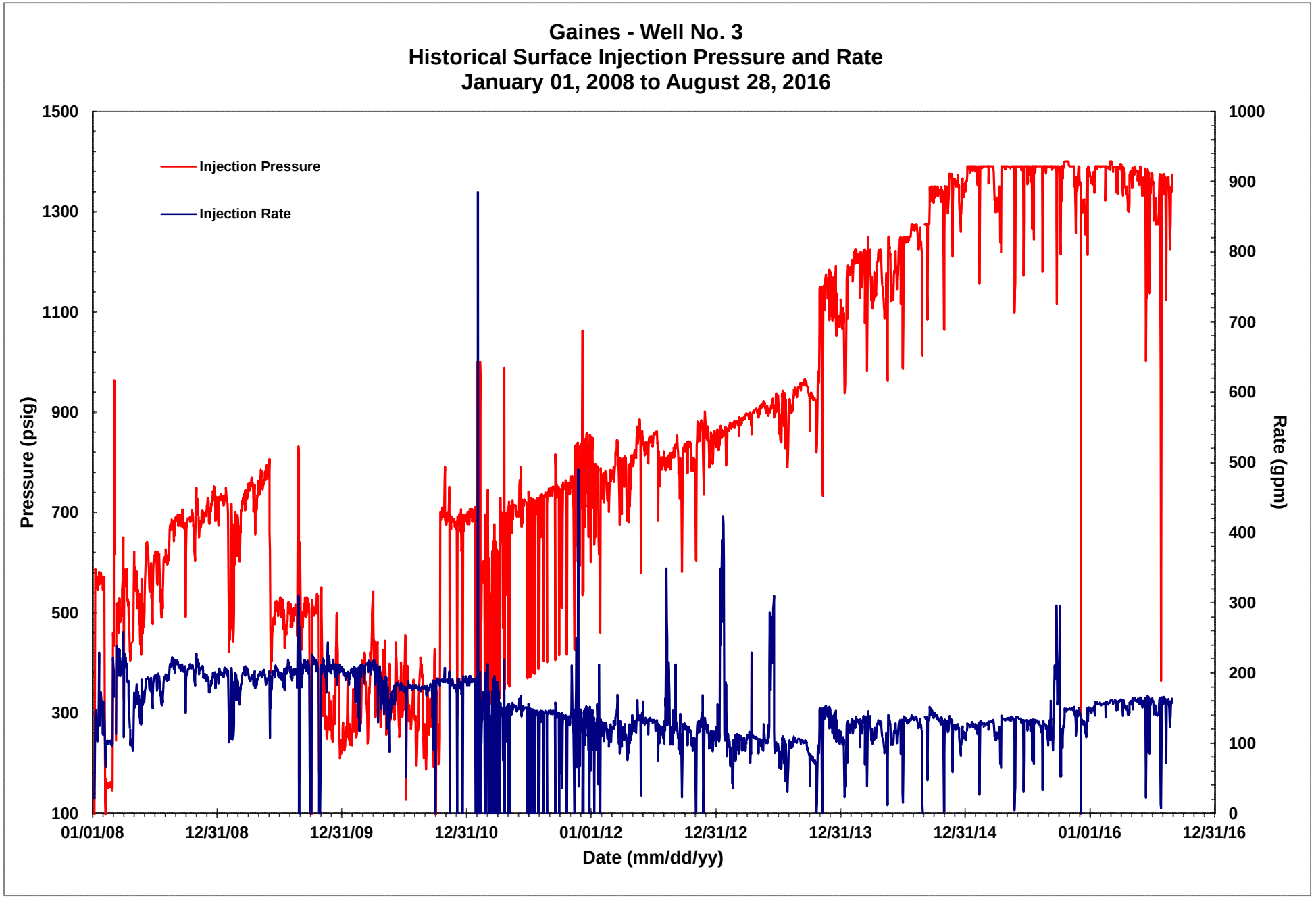

Gaines - Well No. 3
Historical Surface Injection Pressure and Rate
January 01, 2008 to August 28, 2016
Injection Pressure
Injection Rate
Pressure (psig)
Rate (gpm)
Date (mm/dd/yy)
1500
1300
1100
900
700
500
300
100
1000
900
800
700
600
500
400
300
200
100
0
01/01/08
12/31/08
12/31/09
12/31/10
01/01/12
12/31/12
12/31/13
12/31/14
01/01/16
12/31/16

FIGURE 12

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

David R. Catanach, Division Director
Oil Conservation Division

FEBRUARY 24, 2017

CERTIFIED MAIL
RETURN RECEIPT NO: 7913 8107

Mr. Randy Dade
Environmental Specialist
HollyFrontier Navajo Refining LLC
501 East Main
Artesia, New Mexico 88210

Re: Navajo Refining LLC, Artesia Refining LLC Permit Applications Discharge Permit Renewals for WDW-1 (UICI-8-1), WDW-2 (UICI-8-2) and WDW-3 (UICI-8-3) UIC Class I (Non-hazardous) Disposal Wells (February 2017), Eddy County, New Mexico

Mr. Dade,

The New Mexico Oil Conservation Division (OCD) or department is in receipt of Navajo Refining LLC's 3 disposal well applications for discharge permit renewals for the above subject wells with initial total fee of $300, received February 19, 2017 for the Navajo Refining LLC in Eddy County, New Mexico.

The department has determined based on 20.6.2.3108 NMAC that the application for discharge permit renewals request is **not administratively complete**. Therefore, the department hereby notifies the applicant of the deficiencies in writing within 15 days of receipt of the application.

The OCD has identified the following deficiencies:

1) Complete and sign OCD Application Forms as required in 20.6.2.3108(A) NMAC. The C-108 Forms were unsigned.
2) Provide OCD with draft public notices (20.6.2.3108(F) NMAC) in English for each WDW. Once approved, Navajo will need to publish in English and Spanish.
3) Propose location(s) and newspaper(s) for providing public notice 20.6.2.3108(A).
4) Provide accurate discharge locations per 20.6.2.3108(F)(2) NMAC, i.e., UL, Section, Township, and Range with accurate latitude/longitude location coordinates with more descriptive footage from major intersections or landmarks to locate the wells. This shall also include a map of the pipeline transect to the WDWs for potential releases from the pipeline along the transect of the pipeline to the WDWs.
5) Provide accurate brief description of the activities must be representative of the actual situation per well 20.6.2.3108(F)(3) NMAC.
6) Provide a more accurate updated description of the expected sources and effluent quality (recent data) with accurate injection volumes per well 20.6.2.3108(F)(4) NMAC. There was 1 WDW-3 surface injection pressure and rate graph, but not for WDWs 1 and 2. The text description should qualify information in the graphs.

7) Provide the depth to and total dissolved solids concentration of the groundwater most likely to be affected by each discharge.

The OCD is currently conducting a technical review of the applications. Therefore, the New Mexico Water Quality Control Commission regulations (WQCC) notice requirements of 20.6.2.3108 NMAC must be satisfied and demonstrated to the OCD. Upon receipt of the information requested above, OCD may deem the application administratively complete and provide public notice pursuant to the WQCC notice requirements of 20.6.2.3108 NMAC to determine if there is any public interest.

Please contact me at (505) 476-3490 or carlj.chavez@state.nm.us if you have questions. Thank you for your cooperation throughout the review of the applications and discharge permit renewals review process.

Respectfully,

Carl J. Chávez
Environmental Engineer

xc: Jim Griswold, OCD- Environmental Bureau Chief
OCD District II Office, Artesia
Scott Denton, Navajo Refining LLC

HOLLYFRONTIER

February 1, 2017

Mr. Carl Chaves
Oil Conservation Division
New Mexico Energy, Minerals & Natural Resources Department
1220 S. St. Francis Dr.
Santa Fe, New Mexico 87505

Re: Permit Renewal Application for Class I Injection Wells WDW-1, WDW-2, and WDW-3
HollyFrontier Navajo Refining LLC, Artesia, New Mexico

Dear Mr. Chaves:

HollyFrontier Navajo Refining LLC (Navajo), is submitting for your review a digital version plus two (2) paper copies of the renewal application package for the discharge permits for Class I Non-hazardous Waste Disposal Well No. 1 (WDW-1), Waste Disposal Well No. 2 (WDW-2), and Waste Disposal Well No. 3 (WDW-3). WDW-1, WDW-2, and WDW-3 were initially permitted by the Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department under the Water Quality Act in 1998 and have been operating under Permits UIC-CLI-008-1, UIC-CLI-008-2, and UIC-CLI-008-3.

In addition to the enclosed document:

1. Application forms (C-108) for each well are included in the application package.
2. A signed Administrative Application Checklist.

Under Separate Cover:

3. A check in the amount of $300, made payable to Water Quality Management Fund, filing fee for Class I Injection wells WDW-1, WDW-2, and WDW-3.
4. The Financial Assurance bonds included in the application package are in the process of being updated to the WQCC-1 forms.

If you need additional information, please do not hesitate to contact me at (575) 746-5281 or Scott Denton, Environmental Manager at (575) 746-5487.

Sincerely,

Randy Dade
Environmental Specialist

Enclosures

Cc: HF: R. O'Brien, S. Denton, M. Holder
WSP: G. Moore

DATE IN	SUSPENSE	ENGINEER	LOGGED IN	TYPE	APP NO.

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☒ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify Class I – Non-Hazardous

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or ☐ Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☒ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

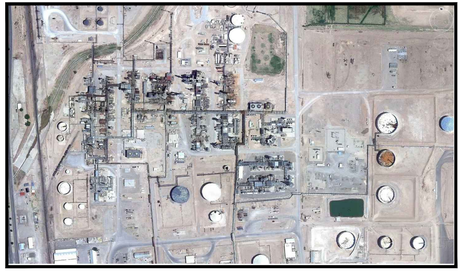
[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

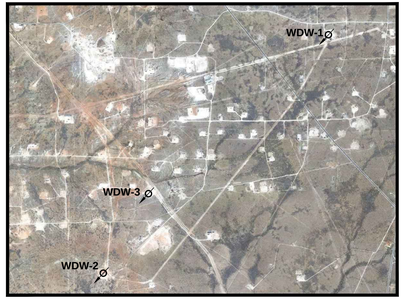
Lewis R. Dade	LRDade	Environmental Spec	2/1/2017
Print or Type Name	Signature	Title	Date

Lewis.Dade@hollyfrontier.com
e-mail Address

INSET A



INSET B



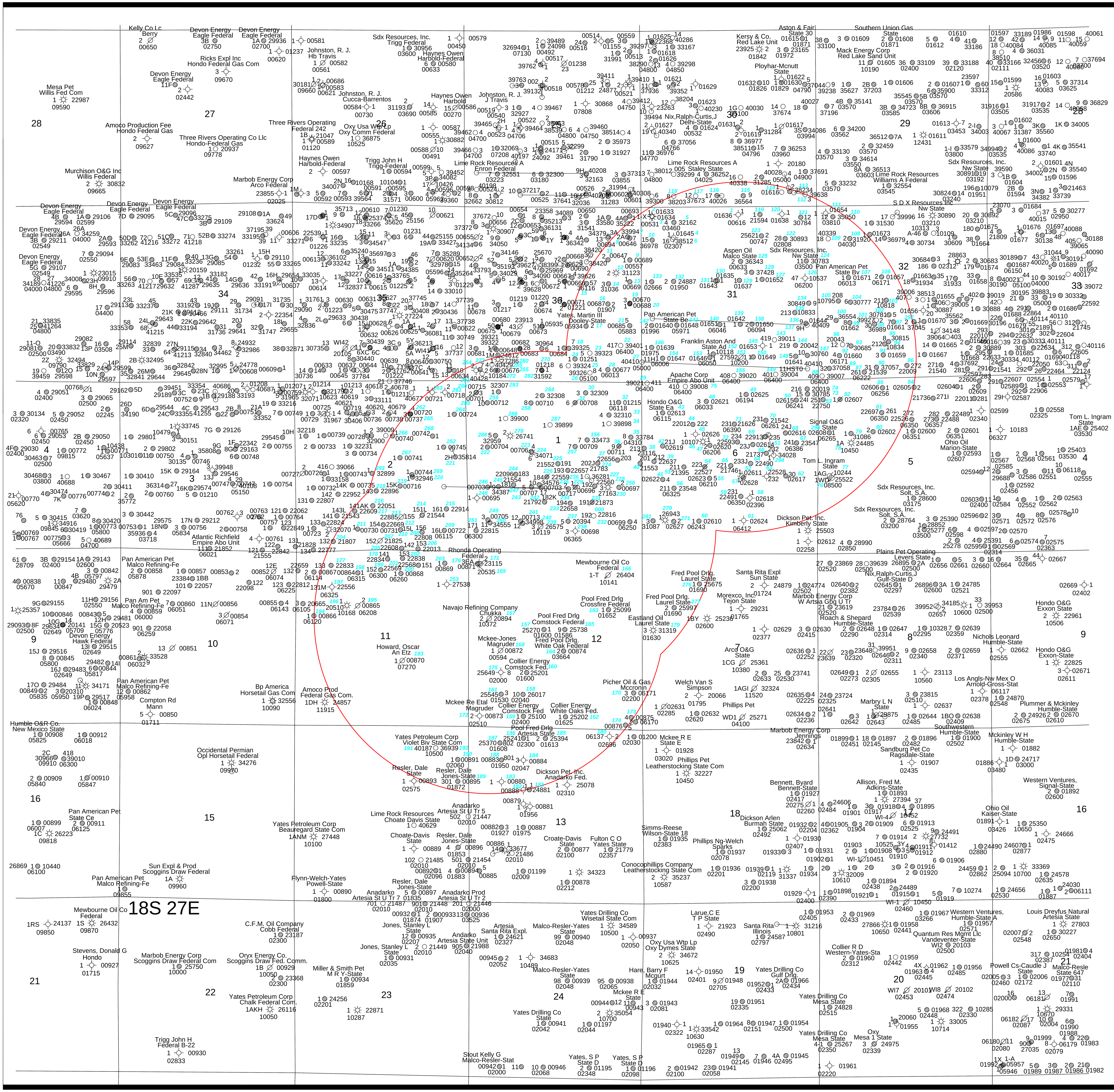
WSP | PARSONS BRINCKERHOFF

DRAWING 1

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

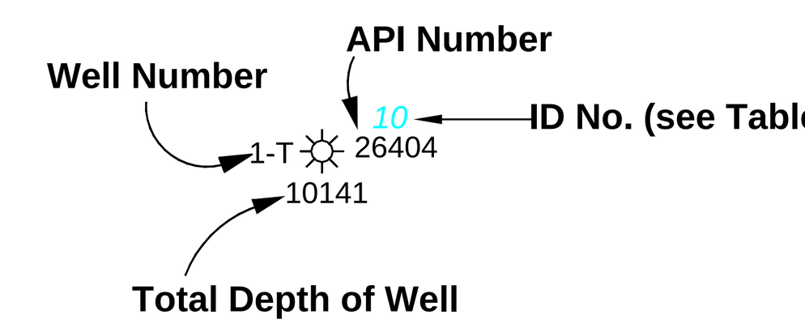
FACILITY MAP

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG. NO:



LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW



SCALE
(IN FEET)

0 1000 2000

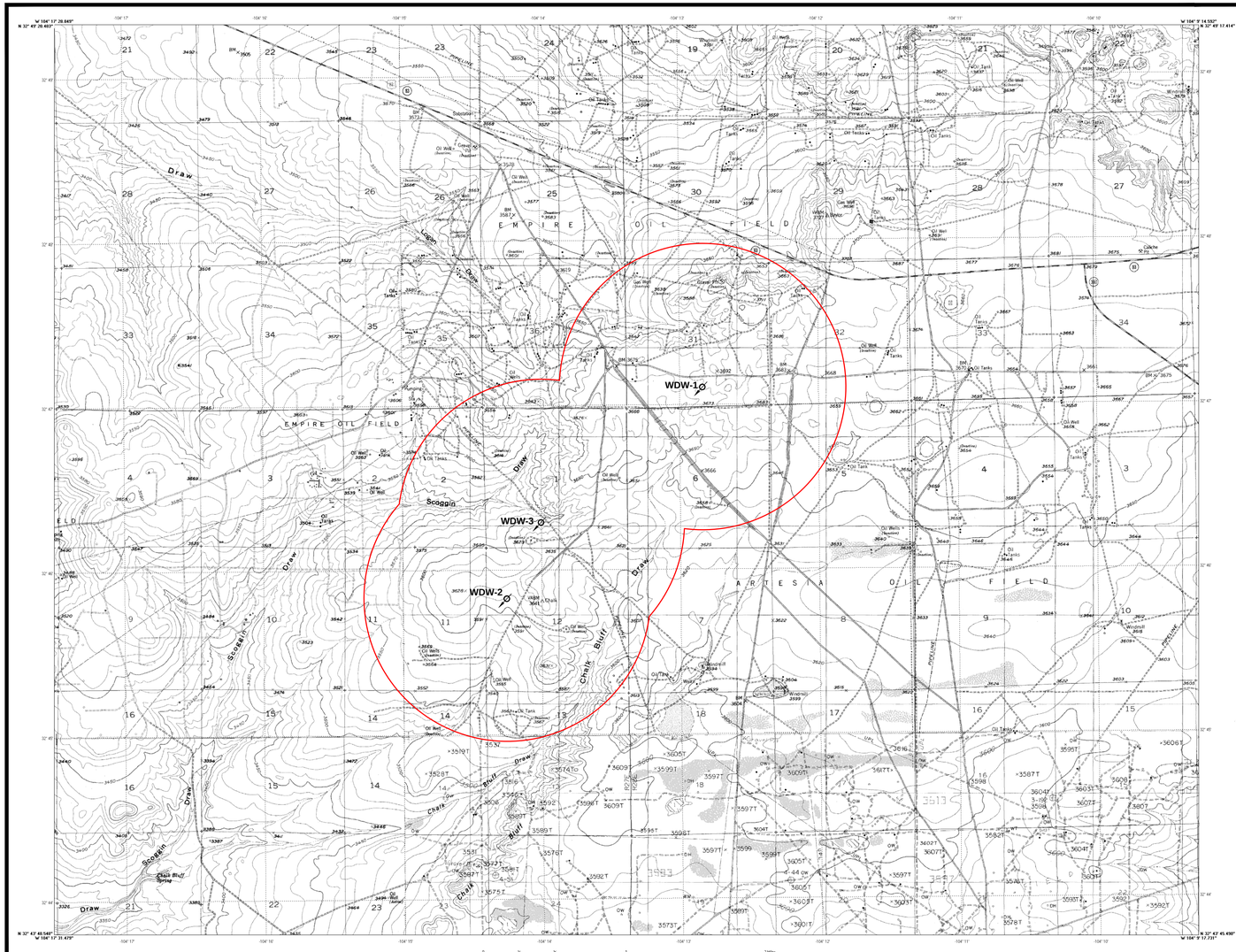
WSP | PARSONS BRINCKERHOFF

DRAWING 2

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

AREA OF REVIEW MAP

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG NO:



ROAD CLASSIFICATION

Heavy-duty ——— Light-duty ———

Medium-duty ——— Unimproved dirt - - - -

U. S. Route State Route

MN GN 0°26' E 12° 213 MILS

UTM GRID AND 1955 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

NEW MEXICO

QUADRANGLE LOCATION

Maps Compiled from USGS Quads: Spring Lake, NM; Red Lake, NM; Lake McMillan N, NM and Illinois Camp, NM

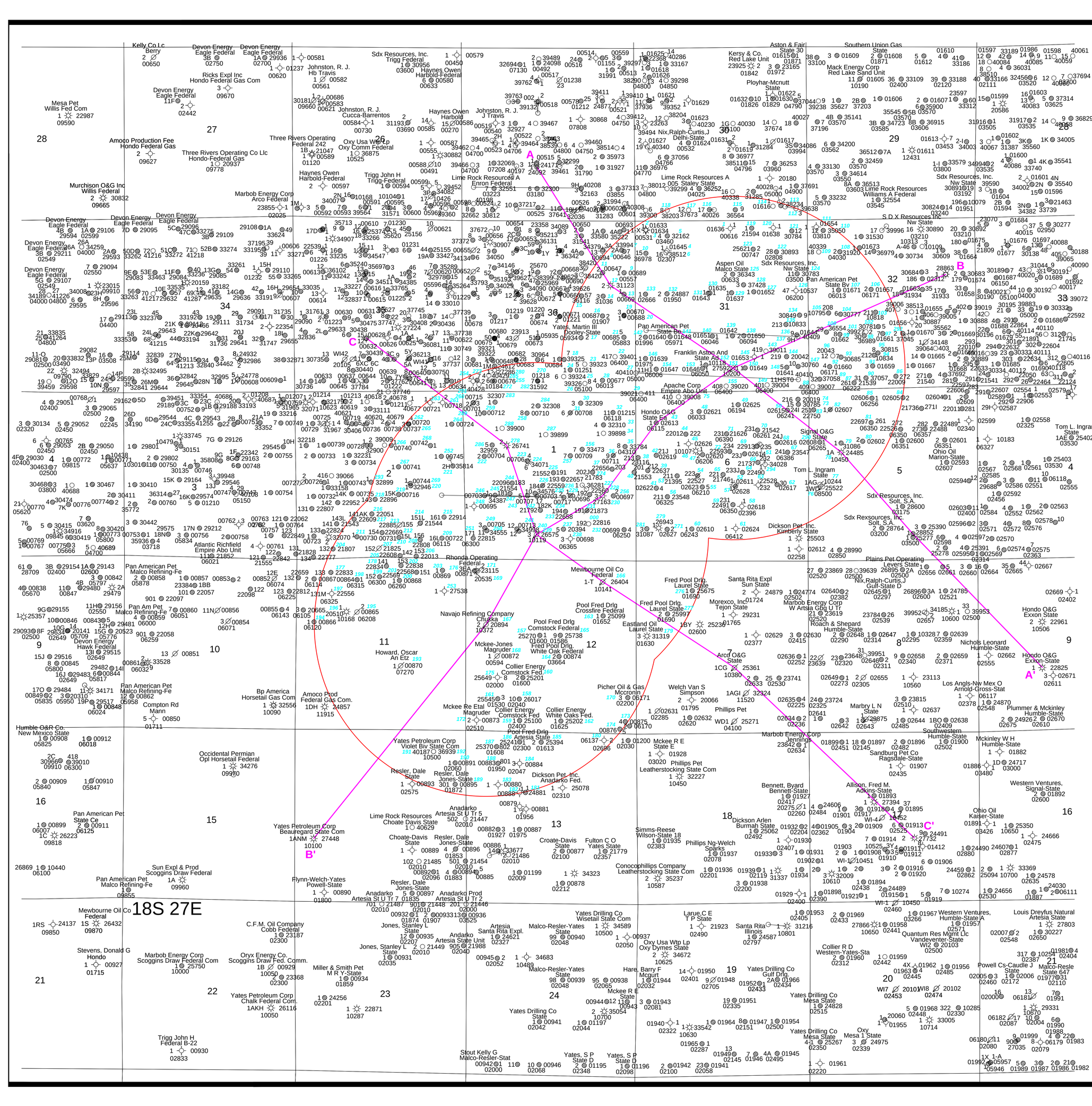
WSP | PARSONS BRINCKERHOFF

DRAWING 3

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

FRESHWATER WELLS IN AREA OF REVIEW

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG. NO:



N

LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- GEOLOGIC CROSS-SECTION LINES

Well Number — API Number — ID No. (see Table 1A)

1-T 26404 10 10141

Total Depth of Well

SCALE (IN FEET)

0 1000 2000

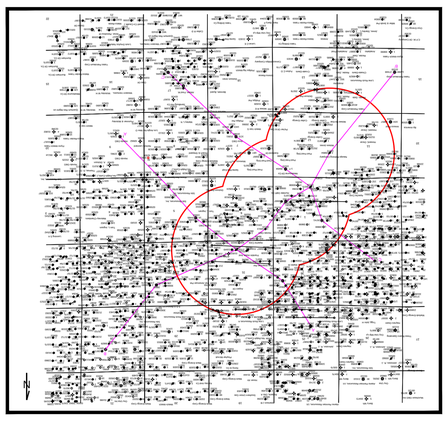
WSP | PARSONS BRINCKERHOFF

DRAWING 4

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

GEOLOGIC CROSS-SECTION INDEX MAP

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG NO:



(Refer to Drawing 4)

WSP | PARSONS BRINCKERHOFF

DRAWING 5

HOLLYFRONTIER NAVAJO REFINING LLC

ARTESIA, NEW MEXICO

NORTHWEST - SOUTHEAST DIP

GEOLOGIC CROSS-SECTION A - A'

DATE: 01/26/17	CHECKED BY:	JOB NO. 50904D
DRAWN BY: MDD	APPROVED BY:	DWG. NO.

VERTICAL SCALE
0
200

HORIZONTAL SCALE
0
1000 Feet

NORTHWEST
A

SOUTHEAST
A'

Elevation (ft msl)

COG OPERATING LLC
SPRUCE FEDERAL NO. 1
TD: 9,985' KB: 3582'
ACTIVE - GAS
API NUMBER 30-015-24092

4274'

LRE OPERATING, LLC
NO BLUFF 36 STATE COM NO. 2
TD: 10,050' KB: 3534'
ACTIVE - GAS
API NUMBER 30-015-31123

4582'

NAVAJO REFINING COMPANY
WDW NO. 1
31 17S R28E
TD: 10,200' KB: 3678'
ACTIVE - INJECTION
API NUMBER 30-015-27592

4423'

CONOCO PHILLIPS CO.
ILLINOIS CAMP A COM NO. 1
E-05 T18S R28E
TD: 10,450' KB: 3672'
ACTIVE - GAS
API NUMBER 30-015-24485

3291'

EOG RESOURCES INC.
EMPIRE 5 STATE COM NO. 1
O-05 T18S R28E
TD: 10,439' KB: 3640'
ACTIVE - GAS
API NUMBER 30-015-28852

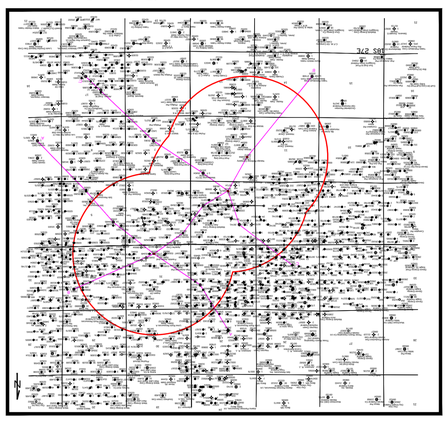
5503'

CHEVRON USA INC.
EXXON STATE NO. 1
K-09 T18S R28E
TD: 10,610' KB: 3646'
ACTIVE - GAS
API NUMBER 30-015-22825

ATOKA
STRAWN
CANYON
CISCO
LOWER WOLFCAMP
UPPER WOLFCAMP
ABO
YESO
TUBB
TOP OF CONFINING ZONE
GLORIETA
SAN ANDRES
GRAYBURG
BASE USDW
INJECTION ZONE
UPPER CONFINING ZONE

-6800' -6600' -6400' -6200' -6000' -5800' -5600' -5400' -5200' -5000' -4800' -4600' -4400' -4200' -4000' -3800' -3600' -3400' -3200' -3000' -2800' -2600' -2400' -2200' -2000' -1800' -1600' -1400' -1200' -1000' -800' -600' -400' -200' -0' 200' 400' 600' 800' 1000' 1200' 1400' 1600' 1800' 2000' 2200' 2400' 2600' 2800' 3000' 3200' 3400' 3600' 3800' 4000'

(Refer to Drawing 4)



VERTICAL SCALE
0
200
1000 Feet
HORIZONTAL SCALE

WSP | PARSONS BRINCKERHOFF

DRAWING 6

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

SOUTHWEST - NORTHEAST DIP
GEOLOGIC CROSS-SECTION B - B'

DATE: 01/26/17	CHECKED BY:	JOB NO: 590940
DRAWN BY: WDD	APPROVED BY:	DWG. NO:

SOUTHEAST **B**

YATES PETROLEUM CORP.
BEAVREGARD ANM ST COMM NO. 1
L-14 T18S R27E
TD: 10,100' KB: 3675'
ACTIVE - GAS
API NUMBER 30-015-27448

8415'

NAVAJO REFINING COMPANY
WDW NO. 2
E-12 T18S R27E
TD: 10,372' KB: 3607'
ACTIVE - INJECTION
API NUMBER 30-015-20894

3293'

NAVAJO REFINING COMPANY
WDW NO. 3
M-01 T18S R27E
TD: 10,119' KB: 3609'
ACTIVE - INJECTION
API NUMBER 30-015-26575

2268'

MEWBOURNE OIL CO.
CHALK BLUFF FED COM NO. 3
I-01 T18S R27E
TD: 10,350' KB: 3643'
ACTIVE - GAS
API NUMBER 30-015-27163

2755'

APACHE CORPORATION
EMPIRE ABO UNIT NO. 21B
D-06 T18S R28E
TD: 6,119' KB: 3673'
ACTIVE - OIL
API NUMBER 30-015-02613

2845'

NAVAJO REFINING COMPANY
WDW NO. 1
31 T17S R28E
TD: 10,200' KB: 3678'
ACTIVE - INJECTION
API NUMBER 30-015-27592

7204'

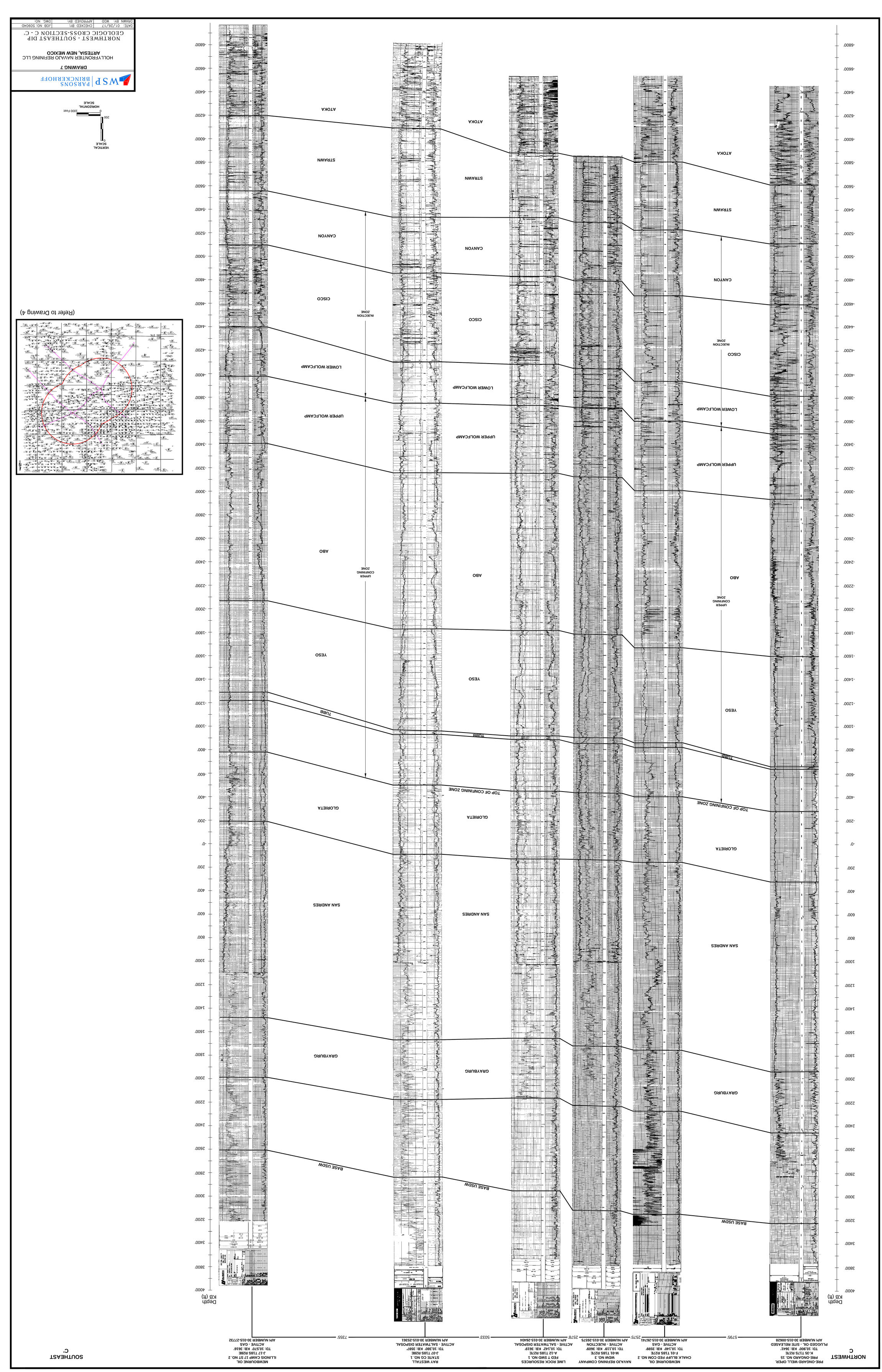
LRE OPERATING, LLC
NW STATE NO. 33
H-32 T17S R28E
TD: 10,610' KB: 3690'
ACTIVE - GAS
API NUMBER 30-015-28863

NORTHWEST **B'**

Depth KB (ft)
4000'
3800'
3600'
3400'
3200'
3000'
2800'
2600'
2400'
2200'
2000'
1800'
1600'
1400'
1200'
1000'
800'
600'
400'
200'
0'
-200'
-400'
-600'
-800'
-1000'
-1200'
-1400'
-1600'
-1800'
-2000'
-2200'
-2400'
-2600'
-2800'
-3000'
-3200'
-3400'
-3600'
-3800'
-4000'
-4200'
-4400'
-4600'
-4800'
-5000'
-5200'
-5400'
-5600'
-5800'
-6000'
-6200'
-6400'
-6600'
-6800'

ATOKA
STRAWN
CANYON
CISCO
LOWER WOLFCAMP
UPPER WOLFCAMP
ABO
YESO
TUBB
TOP OF CONFINING ZONE
GLORIETA
SAN ANDRES
GRAYBURG
BASE USDW

INJECTION ZONE
UPPER CONFINING ZONE



(Refer to Drawing 4)

(Refer to Drawing 4)

VERTICAL SCALE
0
200
HORIZONTAL SCALE
0
1000 Feet

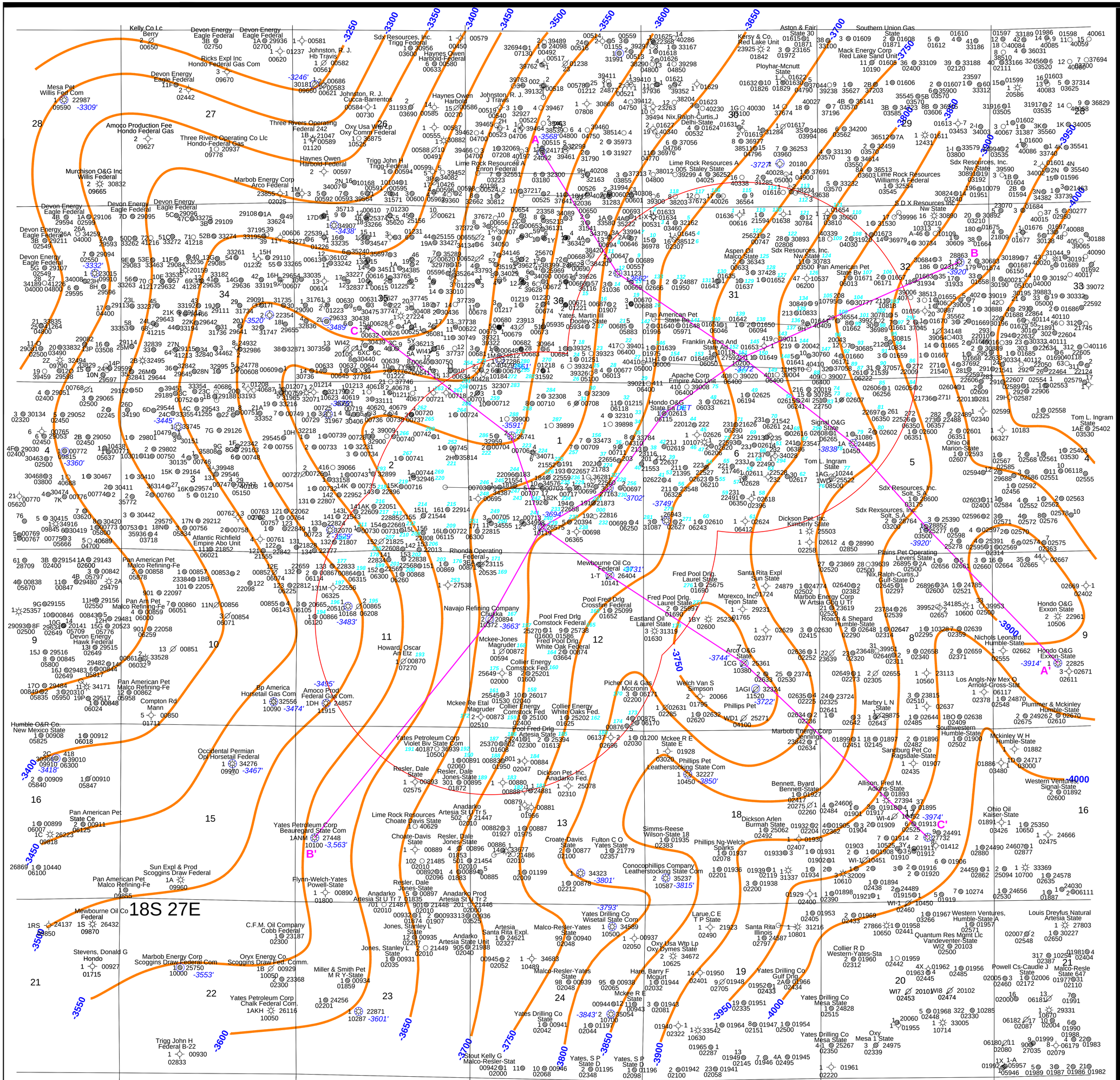
WSP | PARSONS BRINCKERHOFF

DRAWING 7

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

NORTHWEST - SOUTHEAST DIP
GEOLOGIC CROSS-SECTION C - C'

DATE: 01/26/17	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:
CHECKED BY:	DWG. NO:



LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- -3700 STRUCTURE CONTOUR OF TOP OF INJECTION ZONE

Well Number — API Number — ID No. (see Table 1A)

1-T 26404 — 10141 -3731' — Elevation Top of Injection Zone (ft msl)

Total Depth of Well

SCALE (IN FEET)

0 1000 2000

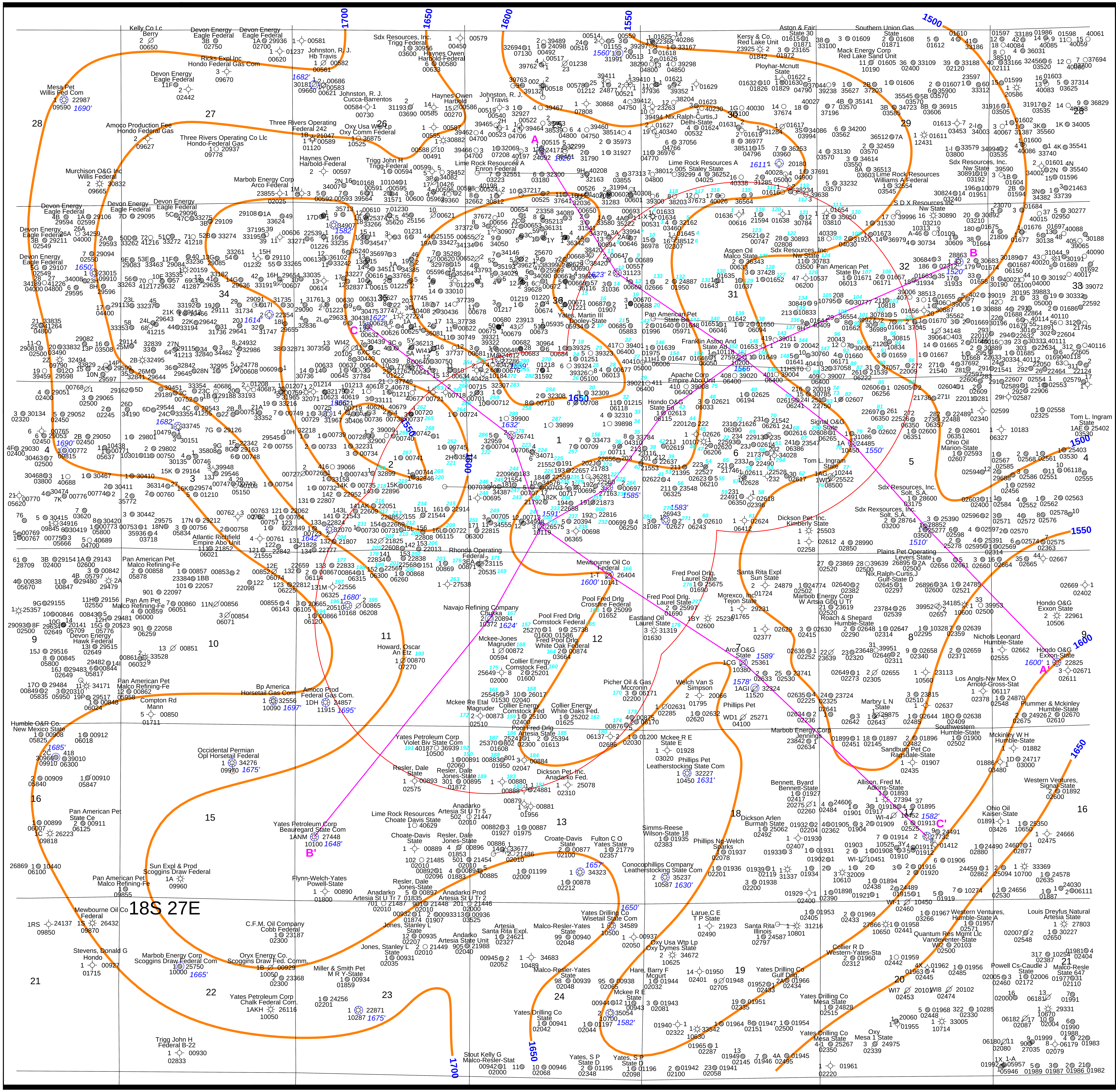
WSP | PARSONS BRINCKERHOFF

DRAWING 8

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

STRUCTURAL CONTOUR MAP TOP OF INJECTION ZONE

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG NO:



N

LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- 1650 ISOPACH CONTOUR OF THE INJECTION ZONE

Well Number
API Number
1-T 26404
10 ID No. (see Table 1A)
10141 1583' Thickness of the Injection Zone (ft)
Total Depth of Well

SCALE
(IN FEET)
0 1000 2000

CI = 50'

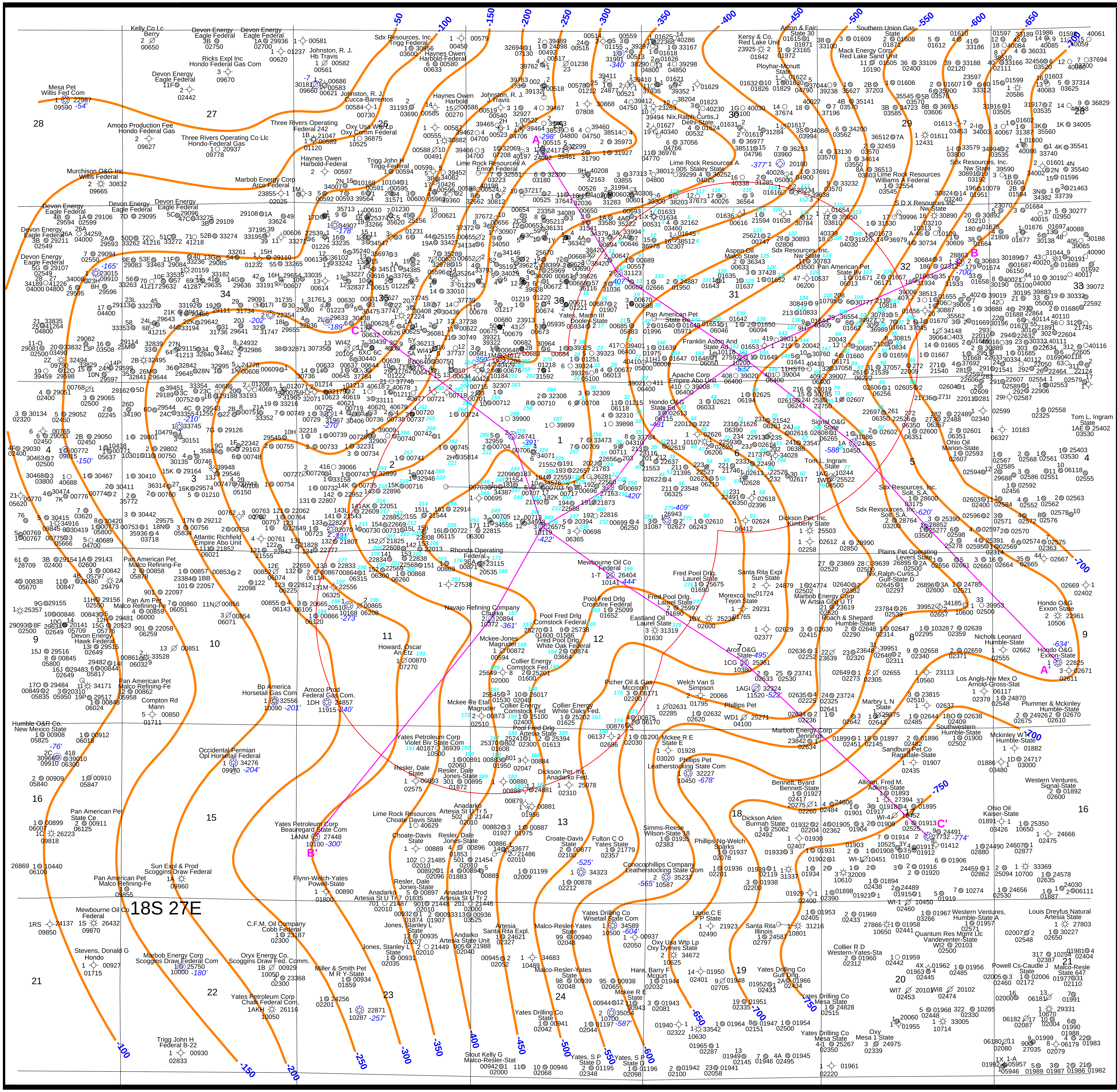
WSP | PARSONS BRINCKERHOFF

DRAWING 9

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

ISOPACH CONTOUR MAP OF THE INJECTION ZONE

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG NO:



N

LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- -700 STRUCTURE CONTOUR OF TOP OF UPPER CONFINING ZONE

Well Number
API Number
1-T 26404
10 ID No. (see Table 1A)
10141 -444' Elevation Top of Upper Confining Zone (ft msl)
Total Depth of Well

SCALE
(IN FEET)
0 1000 2000

CI = 50'

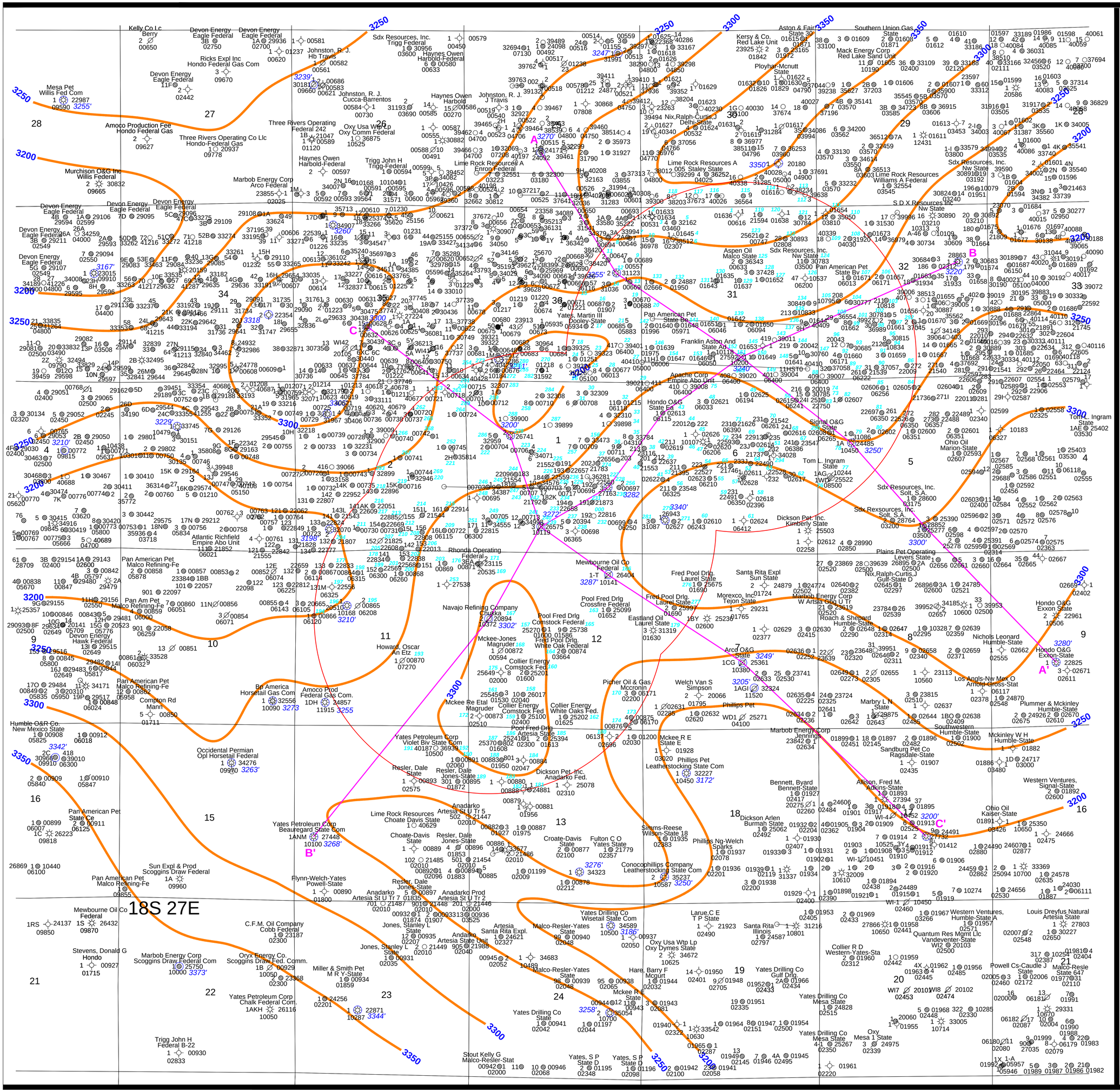
WSP | PARSONS BRINCKERHOFF

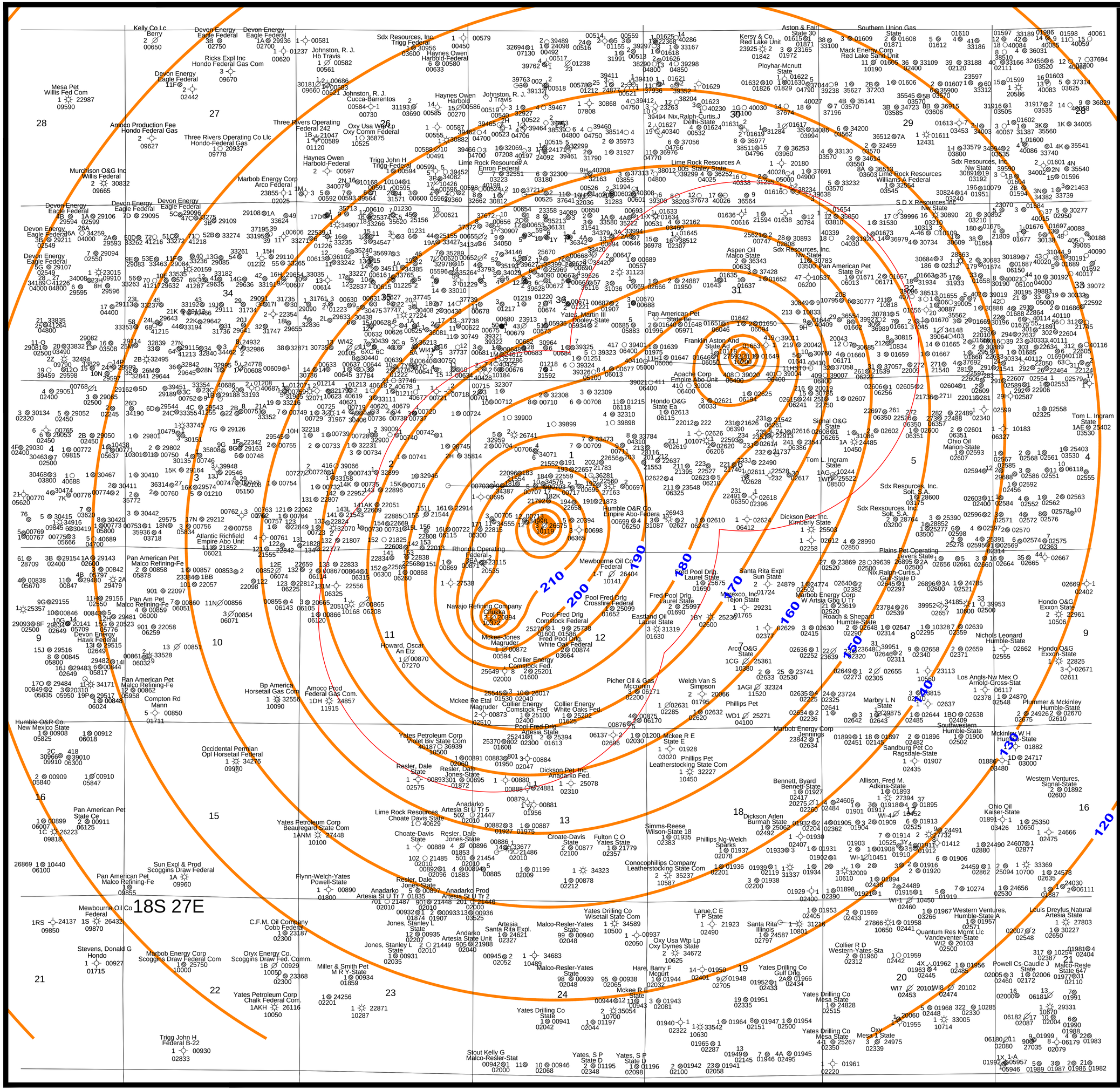
DRAWING 10

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

STRUCTURAL CONTOUR MAP
TOP OF UPPER CONFINING ZONE

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG NO:


18S 27E
A
A'
B
B'
C
C'
N
LEGEND
PERMITTED WELL
DRY HOLE
PLUGGED AND ABANDONED WELL
GAS WELL
OIL WELL
OIL & GAS WELL
ABANDONED GAS WELL
ABANDONED OIL WELL
ABANDONED OIL & GAS WELL
INJECTION WELL
PLUGGED & ABANDONED INJECTION WELL
SALTWATER DISPOSAL WELL
PLUGGED SALTWATER DISPOSAL WELL
1-MILE COMPOSITE AREA OF REVIEW
3300 ISOPACH CONTOUR OF THE UPPER CONFINING ZONE
Well Number
API Number
10 ID No. (see Table 1A)
1-T 26404
10141 3287' Thickness of the Upper Confining Zone (ft)
Total Depth of Well
SCALE (IN FEET)
0 1000 2000
CI = 50'
WSP | PARSONS BRINCKERHOFF
DRAWING 11
HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO
ISOPACH MAP OF UPPER CONFINING ZONE
DATE: 01/19/17
CHECKED BY:
JOB NO: 50904D
DRAWN BY: WDD
APPROVED BY:
DWG NO:



LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- 130 PRESSURE INCREASE CONTOURS AND LBS/PSI

Well Number / API Number
1-T 26404
10141
Total Depth of Well

SCALE (IN FEET)
0 1000 2000

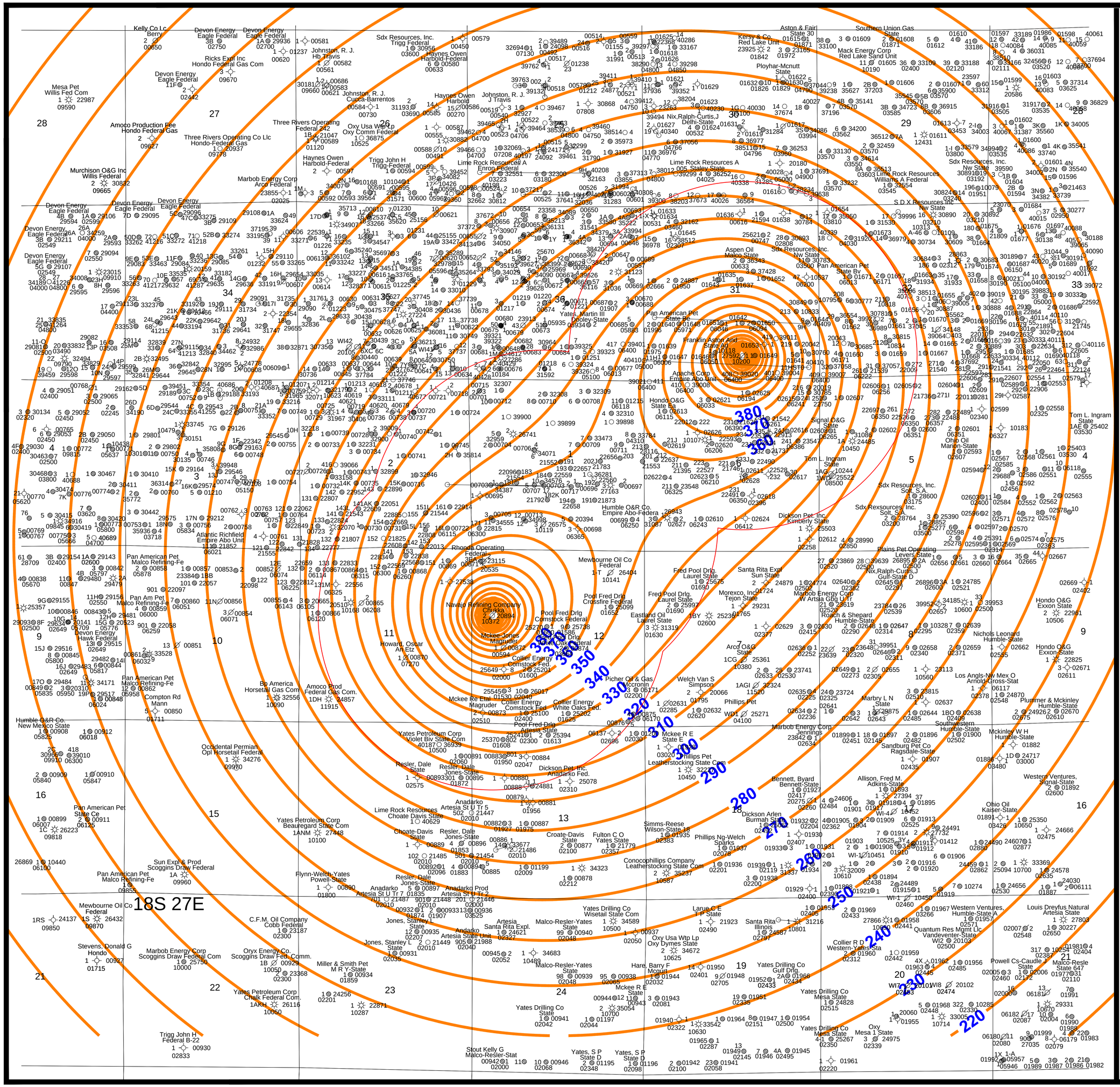
WSP | PARSONS BRINCKERHOFF

DRAWING 12

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

CURRENT PRESSURE INCREASE MODELING RESULTS, INJECTION INTO WDW-1, WDW-2 AND WDW-3

DATE: 01/18/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG NO:



LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- 240 PRESSURE INCREASE CONTOURS AND LBS/PSI

Well Number — API Number — 1-T 26404 — 10141 — Total Depth of Well

SCALE (IN FEET)

0 — 1000 — 2000

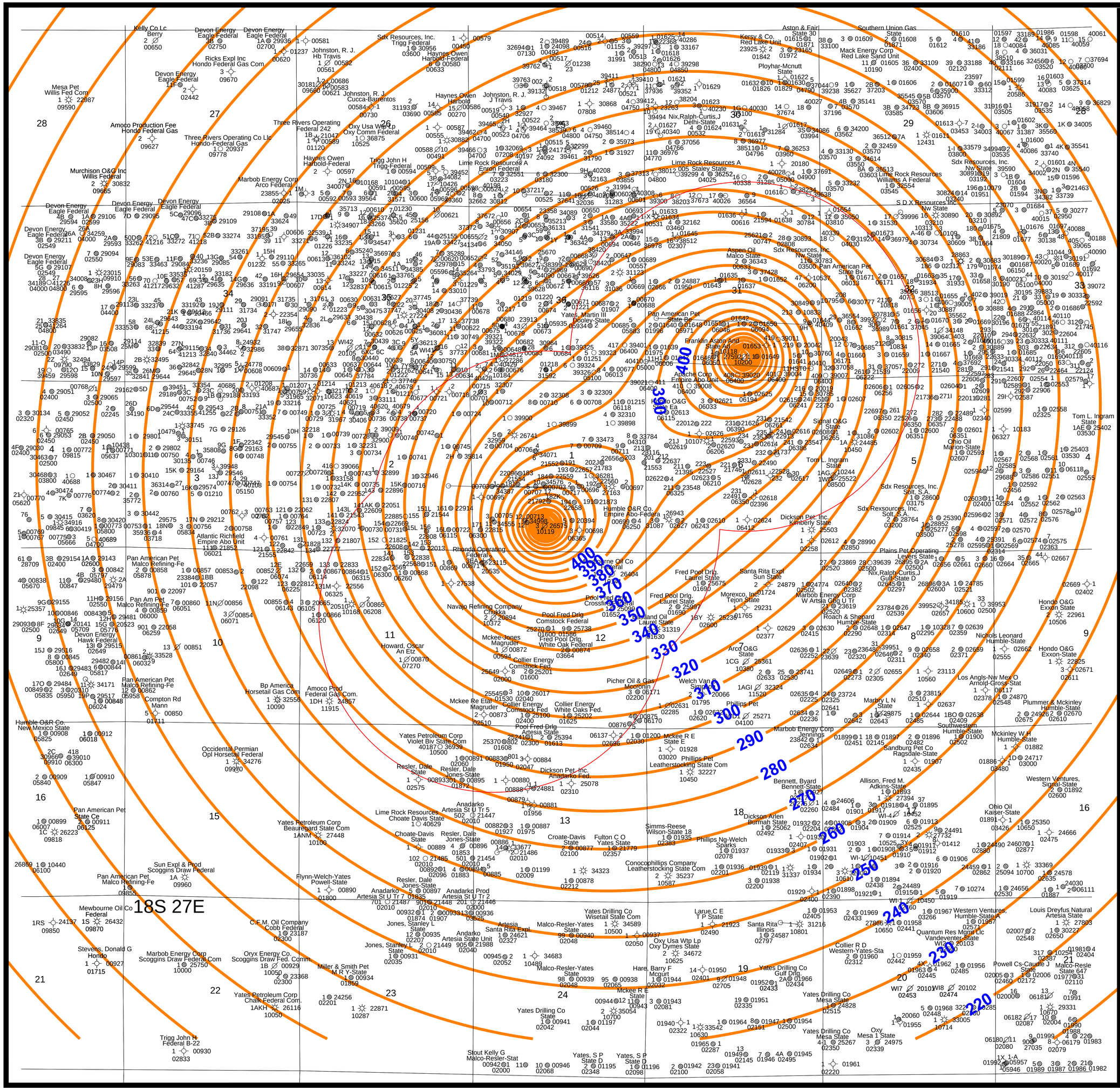
WSP | PARSONS BRINCKERHOFF

DRAWING 13

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

PREDICTED PRESSURE INCREASE MODELING RESULTS, INJECTION INTO WDW-1 AND WDW-2, NO INJECTION INTO WDW-3

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG NO:



LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- 340 — PRESSURE INCREASE CONTOURS AND LBS/PSI

Well Number — API Number

1-T 26404

10141

Total Depth of Well

SCALE
(IN FEET)

0 1000 2000

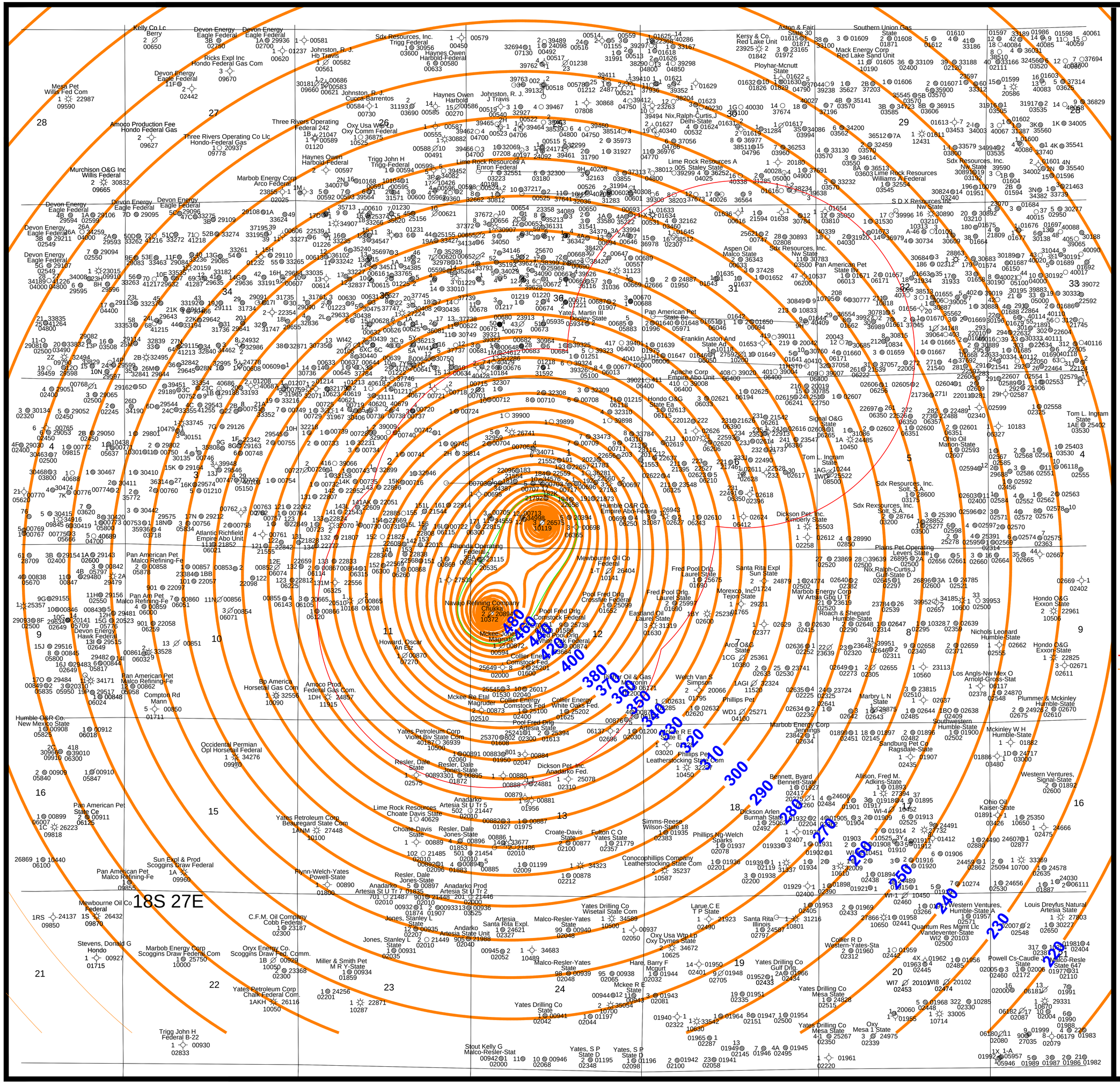
WSP | PARSONS BRINCKERHOFF

DRAWING 14

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

PREDICTED PRESSURE INCREASE MODELING RESULTS, INJECTION INTO WDW-1 AND WDW-3, NO INJECTION INTO WDW-2

DATE: 06/13/13	CHECKED BY:	JOB NO: 60D6945	
DRAWN BY: WDD	APPROVED BY:	DWG NO:	



LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- 340 PRESSURE INCREASE CONTOURS AND LBS/PSI
- CRITICAL PRESSURE CONTOUR OF 482 PSI

Well Number — API Number — 1-T 26404 — 10141 — Total Depth of Well

SCALE (IN FEET)

0 1000 2000

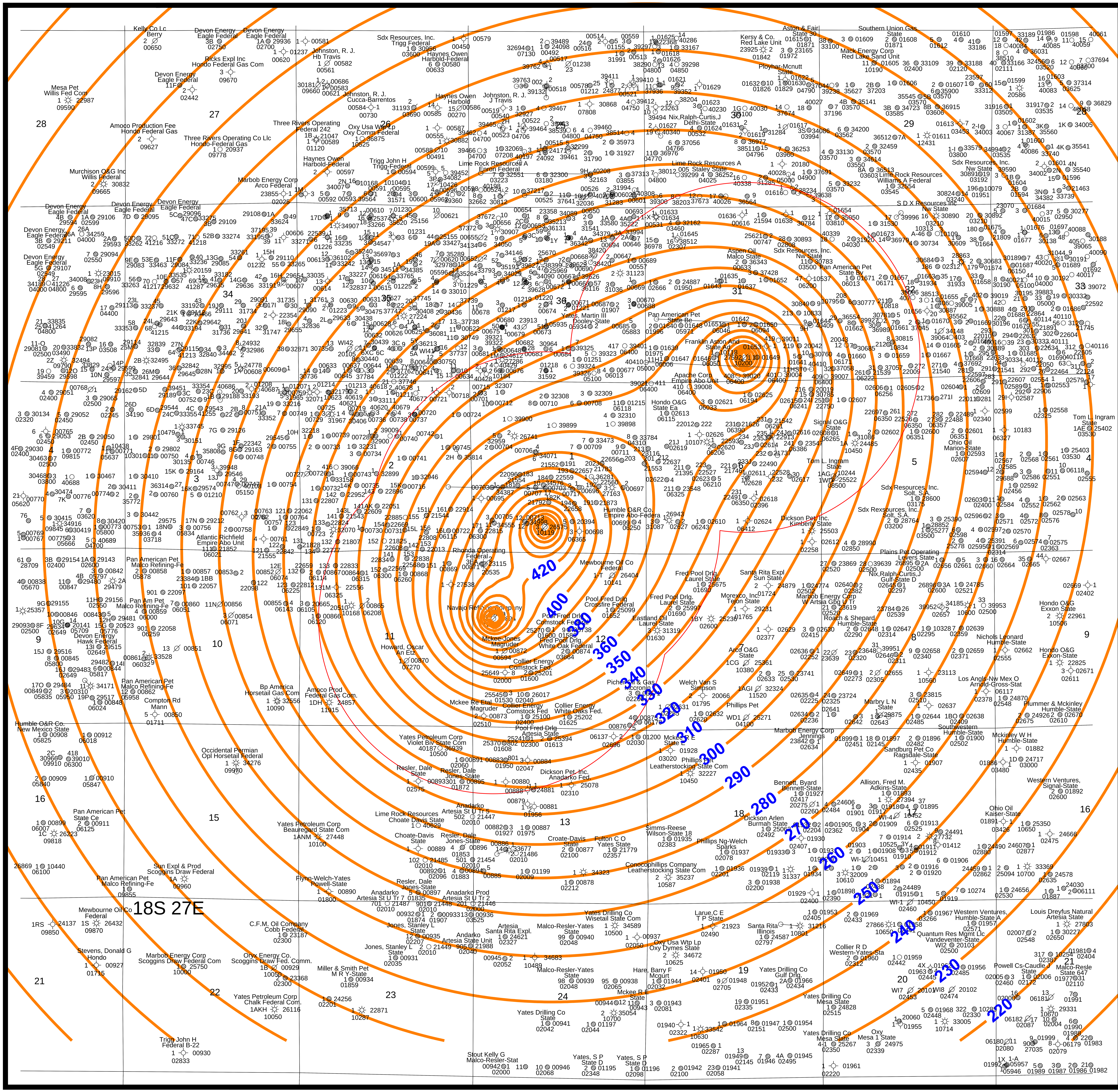
WSP | PARSONS BRINCKERHOFF

DRAWING 15

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

PREDICTED PRESSURE INCREASE MODELING RESULTS, INJECTION INTO WDW-2 AND WDW-3; NO INJECTION INTO WDW-1

DATE: 01/19/17	CHECKED BY:	JOB NO: 50904D
DRAWN BY: WDD	APPROVED BY:	DWG NO:



N

LEGEND

- PERMITTED WELL
- DRY HOLE
- PLUGGED AND ABANDONED WELL
- GAS WELL
- OIL WELL
- OIL & GAS WELL
- ABANDONED GAS WELL
- ABANDONED OIL WELL
- ABANDONED OIL & GAS WELL
- INJECTION WELL
- PLUGGED & ABANDONED INJECTION WELL
- SALTWATER DISPOSAL WELL
- PLUGGED SALTWATER DISPOSAL WELL
- 1-MILE COMPOSITE AREA OF REVIEW
- 300 PRESSURE INCREASE CONTOURS AND LBS/PSI

Well Number — 1-T 26404 — API Number
10141 — Total Depth of Well

SCALE
(IN FEET)
0 1000 2000

WSP | PARSONS BRINCKERHOFF

DRAWING 16

HOLLYFRONTIER NAVAJO REFINING LLC
ARETESIA, NEW MEXICO

PREDICTED PRESSURE INCREASE MODELING RESULTS, INJECTION INTO WDW-1, WDW-2 AND WDW-3

DATE: 06/13/13	CHECKED BY:	JOB NO: 60D6945
DRAWN BY: WDD	APPROVED BY:	DWG NO: