March 22, 2021

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

Re: OCD Discharge Permit Renewal Application
Class I Waste Injection Well "WDW-2"
Bloomfield Terminal
OCD Discharge Permit UICI-011
OGRD Number: 267595; API: 30-045-35747

Dear Mr. Chavez,

Western Refining Southwest, Inc. (Western) submits the enclosed application to renew OCD Discharge Permit UICI-0011 for its Bloomfield Terminal Class I Waste Injection Well, WDW-2. WDW-2 is within the property boundary of the Bloomfield Terminal located at #50 Country Road 4990 in Bloomfield, New Mexico. The Discharge Permit will expire on July 20, 2021. Pursuant to Section 20.6.2.5101.F of the New Mexico Administrative Code (NMAC), Western is required to apply for renewal of the permit no later than 120 days before the expiration date, or by March 22, 2021.

Western will publish in the Farmington Daily Times (Sunday edition) the Public Notice of the Administrative Completeness Determination and Draft Permit by ENMRD-OCD.

Western is in the process of transferring its ownership to Western Refining Terminals, LLC (WRT). WRT will apply for a new OGRD and is aware of the NMAC Section 20.6.2.3111 requirements to complete the Transfer of Discharge Permit.

If you have any questions regarding the attached OCD Discharge Permit Renewal Application, please contact me at (602) 286-1517 (MGarza4@marathonpetroleum.com) and Ed Lee, P.E., with Trinity Consultants at (504) 828-5845 (elee@trinityconsultants.com).

Sincerely,

Margaret A. Garza

Margaret A. Garza
Environmental Professional

Cc: Daniel Sanchez, EMNRD – OCD, (daniel.sanchez@state.nm.us)
Kelly Robinson, Western, (KRobinson3@Marathonpetroleum.com)
Gary Russell, Western, (GFRussell@Marathonpetroleum.com)
Ed Lee, Trinity Consultants,

DISCHARGE PLAN RENEWAL APPLICATION FOR UIC CLASS I NON-HAZARDOUS INJECTION WELL

Western Refining Southwest, Inc. – Bloomfield Products Terminal

Prepared By:
Rachel Reese, Senior Consultant
Edward Lee, P.E., Managing Consultant
Xavier Chavez, Associate Consultant

TRINITY CONSULTANTS
9400 Holly Avenue NE, Bldg. 3, Suite 300
Albuquerque, NM 87122
March 2021

Project 213201.0047

Trinity Consultants

TABLE OF CONTENTS

1. INTRODUCTION

Western Refining Southwest, Inc.'s Bloomfield Products Terminal (BPT) is permitted to dispose of non-hazardous (RCRA exempt and RCRA non-exempt non-hazardous) treated wastewater into Wastewater Disposal Well #2 (WDW-2). WDW-2 (AP #30-045-29002) commenced operation in 2016 under Discharge Permit No. UICI-011, which will expire on July 20, 2021.

Pursuant to Section 20.6.2.3106.G of the New Mexico Administrative Code , an application must be submitted at least 120 days before the discharge permit expires. Therefore, an application for renewal of the permit is due by no later than March 22, 2021. BPT is herein submitting this application to renew Discharge Permit No. UICI-011.

Section 2 is the Discharge Plan Application for Renewal. The attachments for this application are included in the appendices of this application document. Section 3 includes the Application for Authorization to Inject. The attachments for the application are also in the appendices of this application document. Section 4 is the Administrative Application Checklist.

2. DISCHARGE PLAN APPLICATION

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

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

Revised August 1, 2011

Submit Original
Plus 1 Copy
to Santa Fe
1 Copy to Appropriate
District Office

DISCHARGE PLAN APPLICATION FOR SERVICE COMPANIES,GAS PLANTS, REFINERIES, COMPRESSOR, GEOTHERMAL FACILITES AND CRUDE OIL PUMP STATIONS

(Refer to the OCD Guidelines for assistance in completing the application)

☐ New ☒ Renewal ☐ Modification

1. Type: UIC Class I Non-Hazardous Injection Well (WDW #2)
2. Operator: Western Refining Southwest, Inc.

   Address: #50 County Road 4990 (PO Box 159), Bloomfield, NM 87413

   Contact Person: Levi Sancedo, Terminal Manager Phone: 505-863-0929
3. Location: SE /4 NE /4 Section 27 Township 29N Range 11W
   Submit large scale topographic map showing exact location.
4. Attach the name, telephone number and address of the landowner of the facility site.
5. Attach the description of the facility with a diagram indicating location of fences, pits, dikes and tanks on the facility.
6. Attach a description of all materials stored or used at the facility.
7. Attach a description of present sources of effluent and waste solids. Average quality and daily volume of waste water must be included.
8. Attach a description of current liquid and solid waste collection/treatment/disposal procedures.
9. Attach a description of proposed modifications to existing collection/treatment/disposal systems.
10. Attach a routine inspection and maintenance plan to ensure permit compliance.
11. Attach a contingency plan for reporting and clean-up of spills or releases.
12. Attach geological/hydrological information for the facility. Depth to and quality of ground water must be included.
13. Attach a facility closure plan, and other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.
14. CERTIFICATIONI hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Angela S. Brown Title: Vice President

Signature: X Angela Brown Date: 3/22/2021

E-mail Address: asbrown@marathonpetroleum.com

From: Saucedo, Levi
To: Chavez, Carl J, EMNRD
Subject: [EXT] Levi Saucedo
Date: Tuesday, April 6, 2021 4:22:22 PM
Attachments: image001.png

Thanks,

Levi Saucedo
Terminal Manager – Bloomfield, NM

Office 505-632-4195
Cell 505-879-3908

Marathon Petroleum Company LP

Western Refining Southwest, Inc. - Bloomfield Products Terminal

Waste Disposal Well #2 (WDW-2) Discharge Plan Application Attachments

4. Landowner of the Facility Site

San Juan Refining Company
539 South Main Street
Findlay, OH 45840

5. Description of the Facility with a Diagram with Site Map

The subject facility is an UIC Class I Non-hazardous Injection Well (WDW-2) located at the Bloomfield Products Terminal, a bulk storage petroleum terminal with a total storage capacity of greater than 300,000 barrels of petroleum products. The terminal receives materials via a loading rack, pipelines, or trucks.

The purpose of WDW-2 is to dispose of excessive treated wastewater that isn't evaporated in the evaporation ponds.

WDW-2 is located within the fence line of Bloomfield Products Terminal. See the figure in Appendix A of this Discharge Plan Renewal Application.

6. Description of All Materials Stored or Used at the Facility

The injection well is not be used to for material storage.

7. Description of Present Sources of Effluent and Waste Solids

During workover (maintenance) operations, the injection well WDW-2 is used a source of wastewater and possibly waste solids. The wastewater will be re-injected into the WDW #2. The waste solids will be characterized and disposed properly.

8. Description of Current Liquid and Solid Waste Collection/Treatment/Disposal Procedures

The injection well is used to dispose of non-exempt non-hazardous wastewater. An Injection Fluid Analytical is included as Appendix B of this Discharge Plan Renewal Application.

9. Description of Proposed Modifications to Existing Collection/Treatment/Disposal Systems

The current design allows treated wastewater to be injected directly into the WDW-2 or directed to the evaporation ponds before injection into WDW-2. No modifications to the existing systems are proposed.

10. Routine Inspection and Maintenance Plan to Ensure Permit Compliance

The WDW #2 surface completion and associated flanges, pumps, piping are visually inspected daily.

Mechanical Integrity Testing (MIT) is conducted pursuant to 20.6.2.5204 NMAC. At a minimum, the program includes:

- A MIT at least once every five years or every time a well workover is performed, and
- An annual Bradenhead test.

Appendix C presents the most recent MIT and Bradenhead test report.

11. Contingency Plan for Reporting and Clean-up of Spill or Releases

The Bloomfield Products Terminal has an Emergency and Facility Response Plan in place to respond to product releases, including treated wastewater. If a reportable quantity (5 bbl.) of treated wastewater is released from the injection well, NMOCD and NMED Hazardous Waste Bureau will be notified in accordance with applicable regulations. Containment, clean-up and reporting will commence as soon as practicable. A copy of the Emergency and Facility Response Plan is available at the site.

12. Geological/Hydrological Information for the Facility (Include Depth to and Quality of Ground Water)

Geological and hydrological information about the injection zone is included in Appendix D of this Discharge Plan Renewal Application.

13. Facility Closure Plan and Other Information to Demonstrate Compliance with any other Rules, Regulations, and/or Orders

A Closure Plan for WDW-2 is included as Appendix E of this Discharge Plan Renewal Application. The closure plan includes an estimate for Financial Assurance.

3. APPLICATION FOR AUTHORIZATION TO INJECT

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? __X__ Yes _____ No

II. OPERATOR: Western Refining Southwest, Inc.

ADDRESS: #50 County Road 4990 (PO Box 159), Bloomfield, NM 87413

CONTACT PARTY: Margaret A. Garza PHONE: 602-286-1517

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: Angela S. Brown TITLE: Vice President

SIGNATURE: X Angela Brown DATE: 3/22/2021

E-MAIL ADDRESS: asbrown@marathonpetroleum.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: Submitted in March 2016 when WDW#2 was applied for.

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

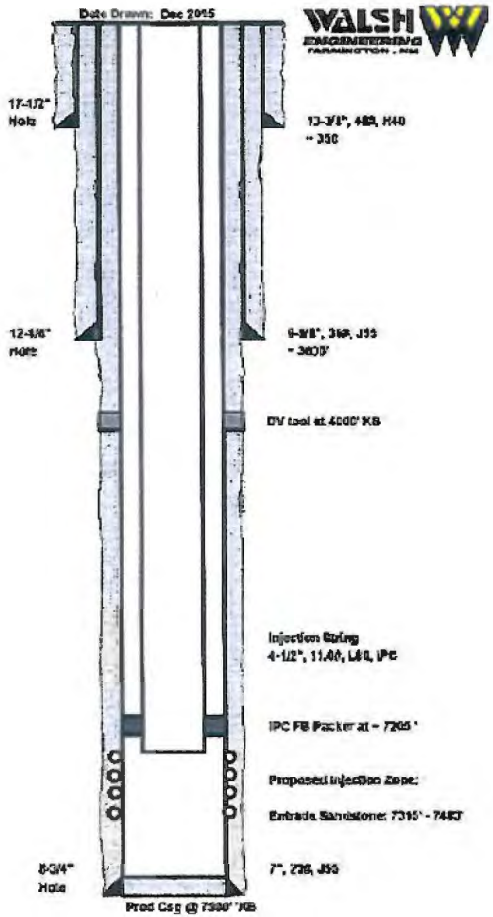
INJECTION WELL DATA SHEET

OPERATOR: Western Refining Southern, Inc.

WELL NAME & NUMBER: Waste Disposal Well (WDW) #2

WELL LOCATION:	2028' FNL & 111' FEL	H	27	T29N	R11W
	FOOTAGE LOCATION	UNIT LETTER	SECTION	TOWNSHIP	RANGE

WELLBORE SCHEMATIC



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17-1/2" Casing Size: 13-3/8", 48 ppf, H40

Cemented with: 394 sx. *or* 548 ft^3

Top of Cement: Surface Method Determined: _____

Intermediate Casing

Hole Size: 12-1/4" Casing Size: 9-5/8", 36#, J55

Cemented with: 857 sx. *or* 1693 ft^3

Top of Cement: Surface Method Determined: _____

Production Casing

Hole Size: 8-3/4" Casing Size: 9-5/8", 36#, J55

Cemented with: 868 sx. *or* 1692 ft^3

Top of Cement: Surface Method Determined:

Total Depth:
~ 7500'

Injection Interval

7315' feet to 7483' (perforated 4 spf)

(Perforated or Open Hole; indicate which)

7315' feet to 7483' (perforated 4 spf)

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: 4-1.2", 10.5 ppf Lining Material: Plastic Lined

Type of Packer: 7" Baker "FAB-1" (or similar model)

Packer Setting Depth: ~7265'

Other Type of Tubing/Casing Seal (if applicable): Baker Model "KBH-22" Anchor tubing seal assemhly, landed in packer

Additional Data

1. Is this a new well drilled for injection? Yes X No

   If no, for what purpose was the well originally drilled? Wastewater disposal

2. Name of the Injection Formation: Entrada

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. No

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: Pictured Cliffs, Chacra, Mesaverde, Gallup, & Dakota

ATTACHMENTS FOR AUTHORIZATION TO INJECT

V. A map that identifies all wells and leases within one mile of the injection well (WDW-2) is included in Appendix F.

VI. A tabulation of wells within the area of review are presented in Appendix F. The tabulation includes the well type, date drilled, location, depth, record of completion and status.

VII. Operating data for WDW-2 are submitted to NMOCD on a quarterly basis. The maximum and average injection pressure for 2020 were 1391 psig and 683 psig, respectively. The maximum and average injection rate for 2020 were 37 gpm and 24 gpm, respectively. A summary of the quarterly 2020 operating reports is included in Appendix G.

2020	Injection Pressure		Injection Rate	
Month	Max psig	Avg psig	Max gpm	Avg gpm
Jan	1382	753	34	28
Feb	1378	762	34	29
Mar	1391	705	34	31
Apr	1376	711	33	29
May	1384	755	31	27
Jun	1357	674	37	32
Jul	906	611	0	0
Aug	567	550	0	0
Sep	1291	635	27	22
Oct	1351	794	34	28
Nov	1376	671	29	28
Dec	813	569	35	35
2020 Max	**1391**		**37**	
2020 Avg		**683**		**24**

IX. The description of the stimulation program was presented in the initial application (2016) for injection for WDW-2.

XIII. Western Refining Southwest, Inc. will provide Proof of Notice (affidavit of mailing and property owner's name, proof of publication, and an affidavit of posting) to OCD after the notice is published.

4. ADMINISTRATIVE APPLICATION CHECKLIST

Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Geological & 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

Applicant: Western Refining Southwest, Inc. **OGRID Number:** 267595
Well Name: WDW#2 **API:** 300453747
Pool: _____ **Pool Code:** _____

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

B. Check one only for [I] or [II]
[I] Commingling – Storage – Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
[II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR **Note: Only treated wastewater is injected.**

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
3) ☐ Offset operators or lease holders
A. ☐ Royalty, overriding royalty owners, revenue owners
B. ☒ Application requires published notice
C. ☐ Notification and/or concurrent approval by SLO
D. ☐ Notification and/or concurrent approval by BLM
E. ☐ Surface owner
F. ☐ For all of the above, proof of notification or publication is attached, and/or,
G. ☐ No notice required

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

4) **CERTIFICATION:** I hereby certify that the information submitted with this application far administrative approval is **accurate** and **complete** ta the best of my knowledge. I also understand that **no action** will be taken an 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.

Angela S. Brown
Print or Type Name

X Angela Brown
Signature

3/22/2021
Date

(419) 421-2629
Phone Number

asbrown@marathonpetroleum.com
e-mail Address

APPENDIX A. MAPS AND DIAGRAMS

Figure 1 – Vicinity Aerial Map

Figure 2 - Plot Plan

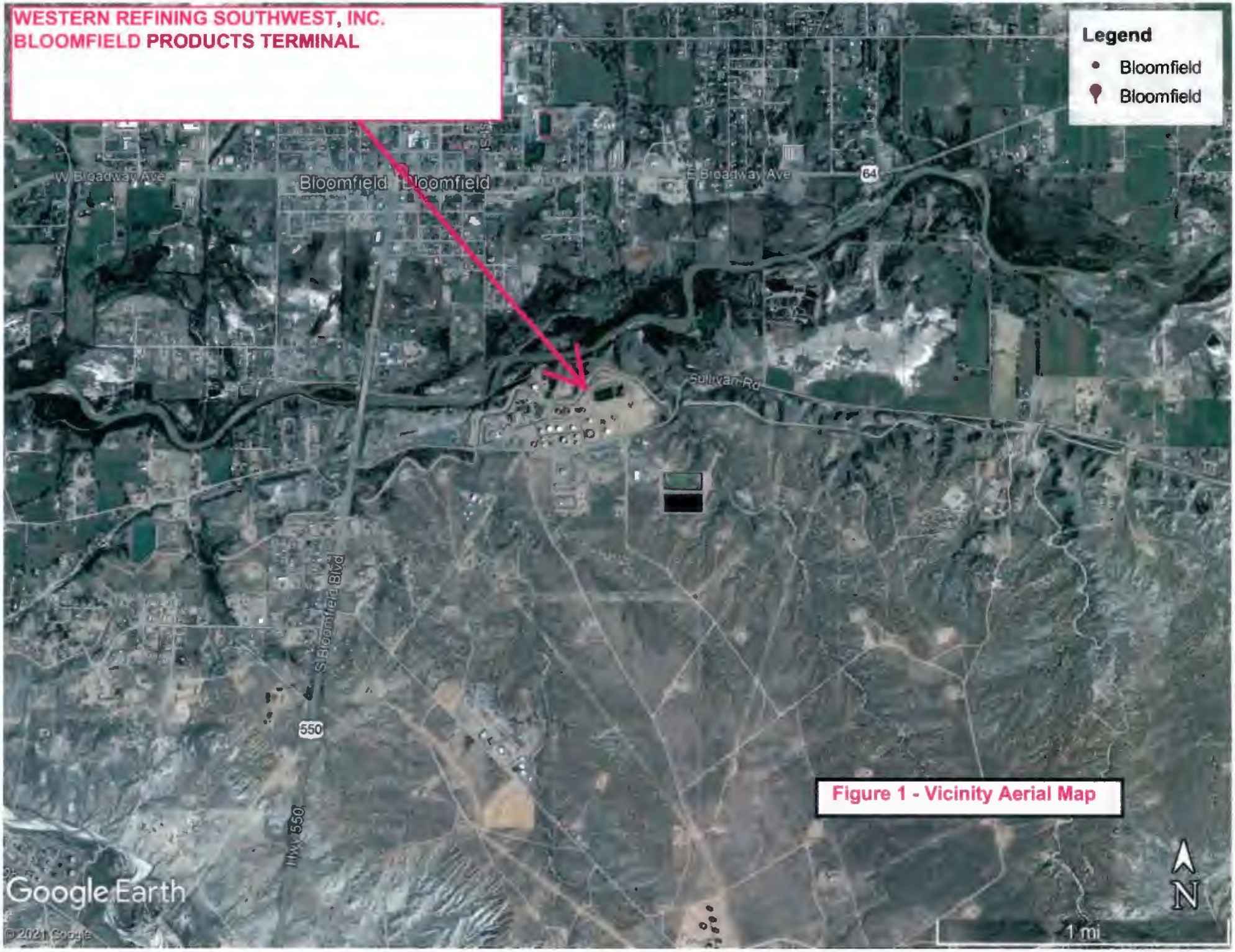
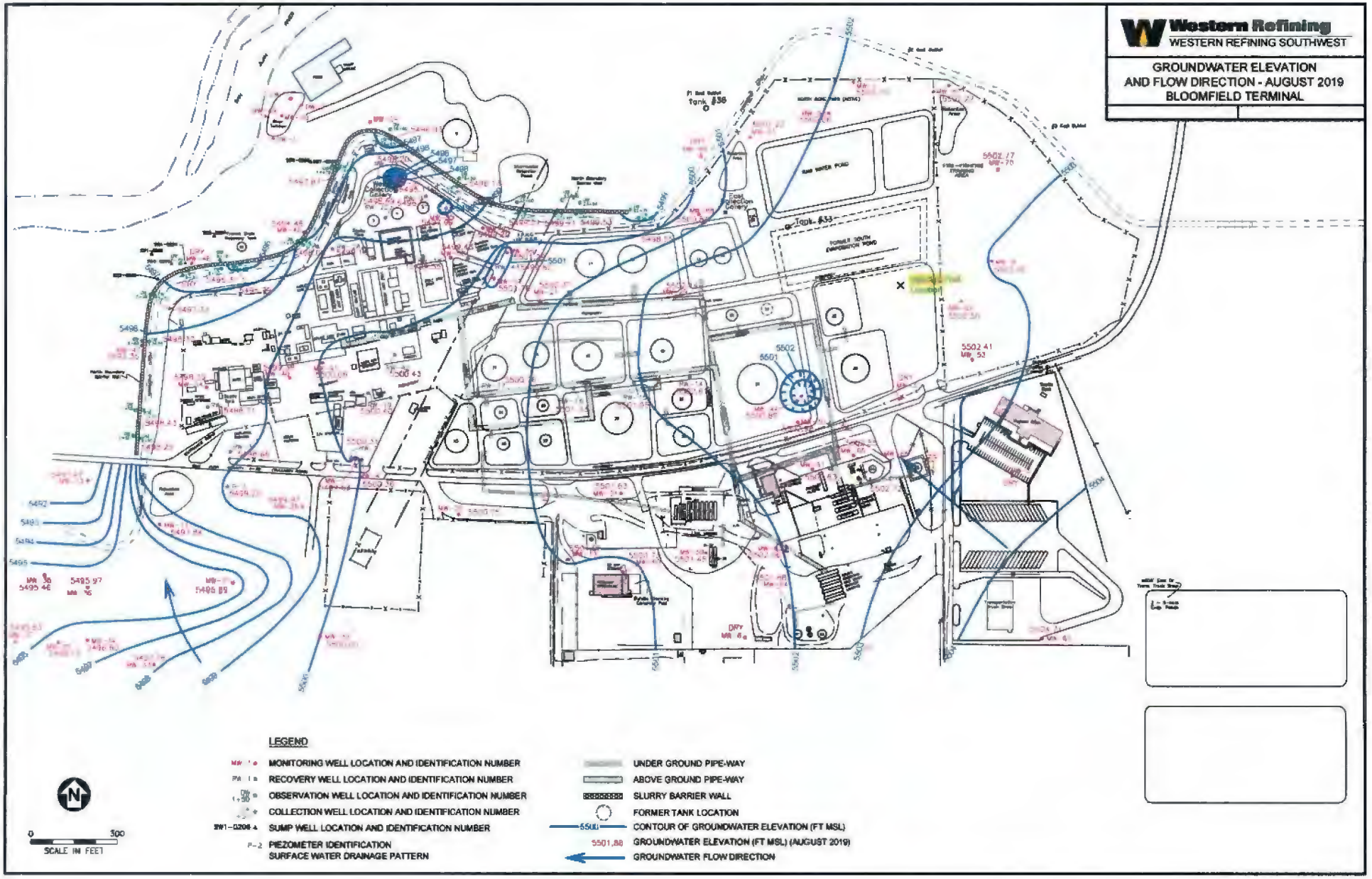


Figure 1 - Vicinity Aerial Map


Western Refining
WESTERN REFINING SOUTHWEST
GROUNDWATER ELEVATION
AND FLOW DIRECTION - AUGUST 2019
BLOOMFIELD TERMINAL
LEGEND
MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
RECOVERY WELL LOCATION AND IDENTIFICATION NUMBER
OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
COLLECTION WELL LOCATION AND IDENTIFICATION NUMBER
SUMP WELL LOCATION AND IDENTIFICATION NUMBER
PIEZOMETER IDENTIFICATION
SURFACE WATER DRAINAGE PATTERN
UNDER GROUND PIPE-WAY
ABOVE GROUND PIPE-WAY
SLURRY BARRIER WALL
FORMER TANK LOCATION
CONTOUR OF GROUNDWATER ELEVATION (FT MSL)
GROUNDWATER ELEVATION (FT MSL) (AUGUST 2019)
GROUNDWATER FLOW DIRECTION
0
300
SCALE IN FEET

APPENDIX B. INJECTION FLUID ANALYTICAL RESULTS

Attachment B - Analytical Summary

		Toxicity Characteristics (40 CFR261.24)	WQCC (20.6.2.3103 NMAC)	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Volatile Organic Compounds *(mg/L)*				**3/25/2020**	**6/30/2020**	**9/18/2020**	**12/18/2020**
D029	1,1-Dichloroethene	0.70	5	< 0.20	<0.70	<0.70	<0.70
D028	1,2-Dichloroethane (EDC)	0.50	10	< 0.20	<0.50	<0.50	<0.50
D027	1,4-Dichlorobenzene	7.5		< 0.20	<7.5	<7.5	<7.5
D035	2-Butanone (MEK)	200		< 2.0	<200	<200	<200
D018	Benzene	0.50	10	< 0.50	<0.50	<0.50	<0.50
D019	Carbon Tetrachloride	0.50	10	< 0.20	<0.50	<0.50	<0.50
D021	Chlorobenzene	100		< 0.20	<100	<100	<100
D022	Chloroform	6.0	100	< 0.20	<6.0	<6.0	<6.0
D033	Hexachlorobutadiene	0.50		< 0.20	<5.0	<5.0	<5.0
D039	Tetrachloroethene (PCE)	0.70	20	< 0.20	<0.70	<0.70	<0.70
D040	Trichloroethene (TCE)	0.50	100	< 0.20	<0.50	<0.50	<0.50
D043	Vinyl chloride	0.20	1	< 0.20	<0.20	<0.20	<0.20
Semi-Volatile Organic Compounds *(mgL)*							
D027	1,4-Dichlorobenzene	7.5		<0.01	<7.5	<7.5	<7.5
D041	2,4,5-Trichlorophenol	400		<0.01	<4000	<400	<400
D042	2,4,6-Trichlorophenol	2.0		<0.01	<20	<2.0	<2.0
D030	2,4-Dinitrotoluene	0.13		<0.01	<1.3	<1.3	<0.13
D023	2-Methylphenol (o-Cresol)	200		<0.01	<2000	<200	<200
D024, D025	3+4-Methylphenol (m, p-Cresol)	200		<0.01	<2000	<200	<200
D032	Hexachlorobenzene	0.13		<0.01	<1.3	<0.13	<0.13
D033	Hexachlorobutadiene	0.50		<.020	<5.0	<0.50	<0.50
D034	Hexachloroethane	3.0		<0.01	<30	<3.0	<3.0
D036	Nitrobenzene	2.0		<0.01	<20	<2.0	<2.0
D037	Pentachlorophenol	100		<0.020	<1000	<100	<100
D038	Pyridine	5.0		<0.03	<50	<5.0	<5.0
General Chemistry *(mg/L unless otherwise stated)*							
	Specific Conductance *(umhos/cm3)*			4500	4500	3800	3400
	Bromide			4	4.0	3.2	1.6
	Chloride		250 *	**1200**	**1200**	**830**	**890**
	Fluoride			<2.0	< 0.50	<0.50	<0.50
	Nitrate + Nitrite as N			<0.50	< 0.50	<1.0	<1.0
	Phosphorus, Orthophosphate (As P)			<2.5	< 2.5	<2.5	<2.5
	Sulfate		600 *	87	78	86	72
	Total Dissolved Solids		10,000	2920	2870	2190	1950
	pH *(pH Units)*			7.27	7.77	7.71	7.96
	Bicarbonate (As CaCO3)			569	647.1	626.3	349.6
	Carbonate (As CaCO3)			<2.0	<2.0	<2.0	<2.0
	Total Alkalinity (as CaCO3)			569	647.1	626.3	349.6
	Oxidation-Reduction Potential (mV)			6.2	37.7	179	24
	Specific Gravity			0.993	0.9946	0.9958	0.999
Total Metals *(mg/L)*							
D004	Arsenic	5.0		< 0.030	< 0.030	<0.030	<5.0
D005	Barium	100		0.32	0.22	0.27	<100
D006	Cadmium	1.0		< 0.0020	< 0.0020	<0.0020	<1.0
D007	Chromium	5.0		< 0.0060	< 0.0060	<0.0060	<5.0
D008	Lead	5.0		< 0.020	< 0.020	<0.020	<5.0
D010	Selenium	1.0		< 0.050	< 0.050	<0.050	<1.0
D011	Silver	5.0		< 0.0050	< 0.0050	<0.0050	<5.0
D009	Mercury	0.2	0.002	< 0.00020	<0.0010	<0.00020	<0.020
Dissolved Metals *(mg/L)*							
	Calcium		0.01	**90**	**73**	**79**	**87**
	Magnesium			53	52	43	22
	Potassium			< 20	13	13	55
	Sodium			830	910	650	500
Ignitability, Corrosivity, and Reactivity							
D003	Reactive Cyanide *(mg/L)*			<0.005	<0.005	<0.00500	<0.00500
D003	Reactive Sulfide *(mg/L)*			0.32	0.833	<0.0500	0.213
D001	Ignitability *(° F)*	< 140° F		>170	>170	>170	>170
D002	Corrosivity (ph Units)	≤ 2 or ≥ 12.5	6-9	7.27	7.63	7.82	7.36
Pesticides (mg/L)							
	Chlordane	0.03		<0.002	<0.20	<0.30	<0.030
Field Parameters							
	pH			7.59	7.63	7.73	7.96

APPENDIX C. MIT & BRADENHEAD TEST REPORTS

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

MECHANICAL INTEGRITY TEST REPORT

(TA OR UIC)

Date of Test 6-8-17 Operator Western Ref. SW Inc. API # 30-0 45-35747

Property Name Waste Disp. Well Well # 2 Location: Unit H Sec 27 Twn 29 Rge 11

Land Type:
State ____
Federal ____
Private ✓
Indian ____

Well Type:
Water Injection ____
Salt Water Disposal ✓
Gas Injection ____
Producing Oil/Gas ____
Pressure obervation ____

Temporarily Abandoned Well (Y/N): N TA Expires: ____

Casing Pres. 0
Bradenhead Pres. 0
Tubing Pres. 610
Int. Casing Pres. 0

Tbg. SI Pres. ____
Tbg. Inj. Pres. ____

Max. Inj. Pres. ____

Pressured annulus up to 510 psi. for 30 mins. Test passed/failed

REMARKS:
Packer Set 7230
Top Perf 7312 - 7470
dropped to 505 held last 15 min.

By [signature] (Wells Engineer) Witness Monica Kuehling
(Operator Representative) (NMOCD)

(Position)

Revised 02-11-02

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE
1000 RIO BRAZOS ROAD
AZTEC NM 87410
(505) 334-6178 FAX: (505) 334-6170
http://emnrd.state.nm.us/ocd/District III/3district.htm

BRADENHEAD TEST REPORT

(submit 1 copy to above address)

Date of Test 6-8-17 Operator Western Ref. API #30-0 45-35747

Property Name Waste Disp. Well Well No. 2 Location: Unit H Section 27 Township 29 Range 11

Well Status(Shut-In or Producing) Initial PSI: Tubing 600 Intermediate 0 Casing 100 Bradenhead 0

OPEN BRADENHEAD AND INTERMEDIATE TO ATMOSPHERE INDIVIDUALLY FOR 15 MINUTES EACH

PRESSURE

Testing	Bradenhead			INTERM	
	BH	Int	Csg	Int	Csg
TIME 5 min	0	0	100	0	100
10 min	0	0	100	0	100
15 min	0	0	100	0	100
20 min					
25 min					
30 min					

FLOW CHARACTERISTICS

	BRADENHEAD	INTERMEDIATE
Steady Flow		
Surges		
Down to Nothing	✓	✓
Nothing		
Gas	✓	✓
Gas & Water		
Water		

If bradenhead flowed water, check all of the descriptions that apply below:

CLEAR____ FRESH____ SALTY____ SULFUR____ BLACK____

5 MINUTE SHUT-IN PRESSURE BRADENHEAD 0 INTERMEDIATE 0

REMARKS: BH- Puff when opened. Nothing when opened after 5 min shut in. Int. light blow to cleanup 5 seconds. Nothing when opened after 5 min shut in

By [signature] Witness Monica Kuehling

site Supervisor
(Position)

E-mail address ____

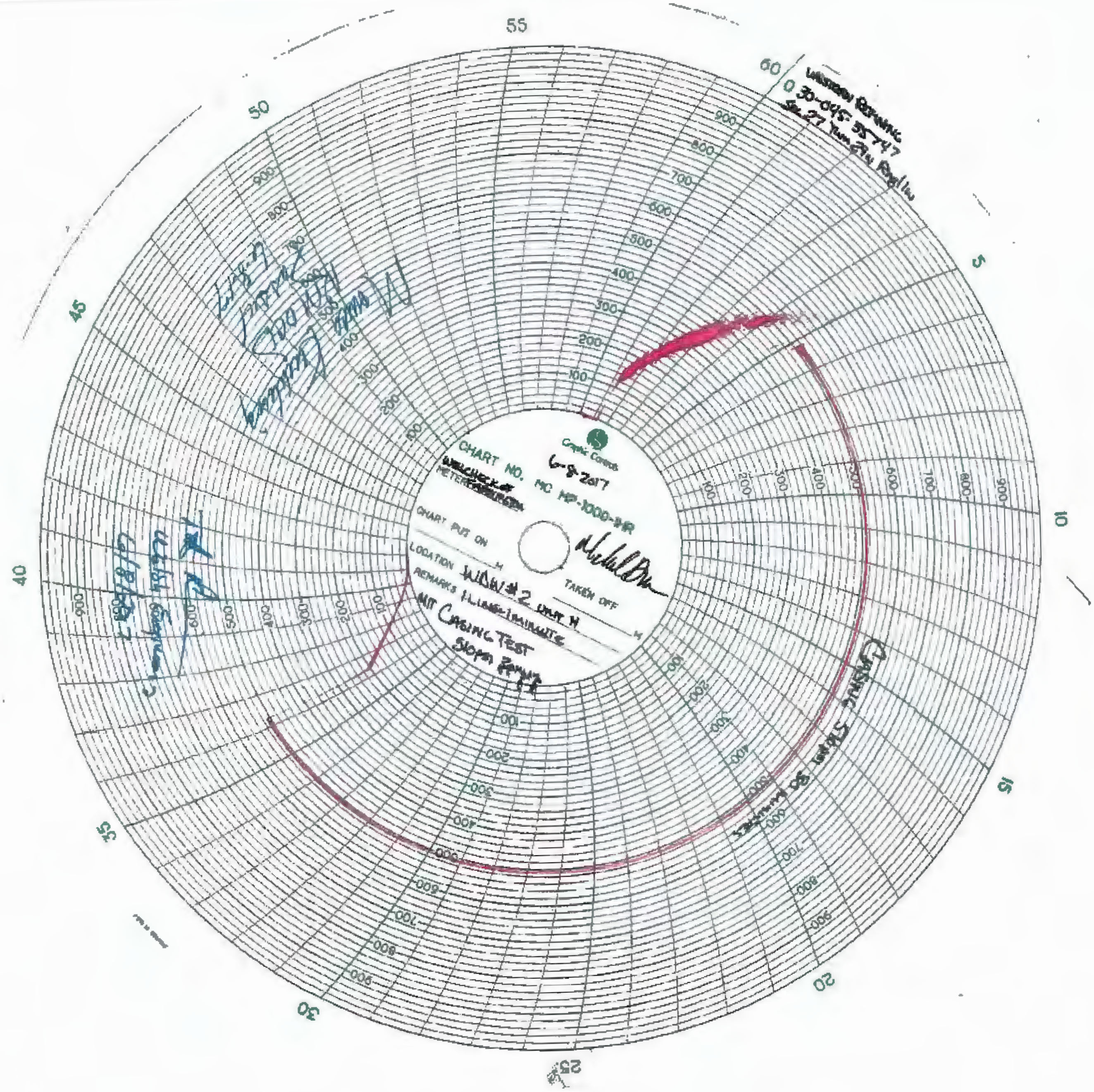


CHART NO. MC MP-1000-1HR
6-8-2017
CHART PUT ON
LOCATION WDW #2 Unit H
REMARKS
MIT Casing Test
TAKEN OFF

Submit 1 Copy To Appropriate District Office
District I (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised July 18, 2013

WELL API NO.
30-045-35747

5. Indicate Type of Lease
STATE ☐ FEE ☒

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name

1. Type of Well: Oil Well ☐ Gas Well ☒ Other Wastewater Disposal Well

8. Well Number: WDW #2

2. Name of Operator
Western Refining Southwest, Inc.

9. OGRID Number 267595

3. Address of Operator
50 County Road 4990 (PO Box 159) Bloomfield, NM 87413

10. Pool name or Wildcat
Entrada

4. Well Location
Unit Letter H : 2028 feet from the North line and East feet from the line
Section 27 Township 29N Range 11W NMPM San Juan County

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
CLOSED-LOOP SYSTEM	☐						
OTHER	☐			OTHER:	☒ Bradenhead Test Report		

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Pursuant to Condition 3.D.1 of the Bloomfield Terminal Injection Well Discharge Permit (UIC-011), Western Refining Southwest, Inc. conducted a pressure test on the Bradenhead and Intermediate casings of WDW #2 on Friday, September 18, 2020. A representative of NMOCD observed the testing via face-time in the field.

Spud Date: Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE: Kelly Robinson TITLE: Environmental Supervisor DATE: 09/18/2020

Type or print name Kelly Robinson E-mail address: krobinson3@marathonpetroleum.com PHONE: (505) 801-5616

For State Use Only

APPROVED BY: TITLE: DATE:
Conditions of Approval (if any):

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE
1000 RIO BRAZOS ROAD
AZTEC NM 87410
(505) 334-6178 FAX: (505) 334-6170
http://emnrd.state.nm.us/ocd/District III/3district.htm

BRADENHEAD TEST REPORT

(submit 1 copy to above address)

Date of Test 9-18-20 Operator Western Refining Southwest, Inc API #30-045-35747

Property Name Waste Disposal Well Well No. 2 Location: Unit H Section 27 Township 29 Range 11

Well Status(Shut-In or Producing) Initial PSI: Tubing 650 Intermediate Ø Casing Ø Bradenhead 43

OPEN BRADENHEAD AND INTERMEDIATE TO ATMOSPHERE INDIVIDUALLY FOR 15 MINUTES EACH

PRESSURE

Testing	Bradenhead			INTERM	
	BH	Int	Csg	Int	Csg
TIME 5 min	Ø	Ø	Ø	Ø	Ø
10 min	Ø	Ø	Ø	Ø	Ø
15 min	Ø	Ø	Ø	Ø	Ø
20 min					
25 min					
30 min					

Ø = zero

FLOW CHARACTERISTICS

	BRADENHEAD	INTERMEDIATE
Steady Flow		
Surges		
Down to Nothing	✓	✓
Nothing		
Gas	✓	✓
Gas & Water		
Water		

If bradenhead flowed water, check all of the descriptions that apply below:

CLEAR ____ FRESH ____ SALTY ____ SULFUR ____ BLACK ____

5 MINUTE SHUT-IN PRESSURE → Light puff when opened after 5 minutes BRADENHEAD Ø INTERMEDIATE Ø

REMARKS: The intermediate and bradenhead have not been opened prior to testing. Bradenhead pressure to 0psi in 4 seconds. Intermediate to Ø psi in 14 seconds. Intermediate had no puff after 5 minute shut-in.

By Kelly Robinson & Frank Dooley Witness Monica Kuehling (Via Face-Time)

WNR Personnel
(Position)

E-mail address Krobinson3@marathonpetroleum.com

APPENDIX D. GEOLOGICAL INFORMATION

VIII. Geology

Underground Drinking Water Sources

The known fresh water zones for the immediate area of the injection well are the Nacimiento and Ojo Alamo Formations of the Tertiary Age. The Nacimiento occurs at the surface and is about 570 feet thick in the immediate area. The Ojo Alamo is about 165 feet thick at an approximate depth of 569 to 734 feet.

Most of the water wells in the surrounding area are concentrated along the San Juan River flood plain and terraces north of the river and Bloomfield Terminal. These wells are completed in the Quaternary sand and gravels at depth of approximately 25 to 75 feet. These sand and gravels rest upon the Nacimiento.

One well (POD# SJ 02148) in the SE quarter of Section 27, T29N, R11W was drilled to a depth of 305 feet intersecting a water bearing sand within the Nacimiento at 225 to 285 feet with an estimated yield of 10gpm. The surface elevation is approximately 20 feet above the surface at proposed injection well location. The total depth of the well is at an approximate elevation of 5,250 feet. This is the deepest water well drilled in the study area according to the NM State Engineer's Office online records. The Point of Diversion Summary for the well is included (below).

New Mexico Office of the State Engineer
Point of Diversion Summary

	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest)						(NAD83 UTM in meters)	
POD Number	Q64	Q16	Q4	Sec	Twn	Rng	X	Y
SJ 02148		2	4	27	29N	11W	234448	4065184*

Driller License: 847
Driller Name: SAVAGE, BOB

Drill Start Date:	10/20/1987	**Drill Finish Date:**	11/16/1987	**Plug Date:**	
Log File Date:	11/19/1987	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	10 GPM
Casing Size:	7.00	**Depth Well:**	305 feet	**Depth Water:**	186 feet

Water Bearing Stratifications:	Top	Bottom	Description
	225	285	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	266	305

*UTM location was derived from PLSS - see Help

Injection Zone

The Entrada Sandstone formation is Jurassic in age and is described as a wind blown deposit with fine to coarse-grained sandstone particles, clean and well sorted. Generally, the Entrada Sandstone formation is 200 to 280 ft thick throughout the San Juan Basin. Natural fractures are few to nonexistent. The overlaying formation is the Todilto Limestone. Cores from the oil bearing portion of the Entrada formation indicate high porosities and permeability's with averages ranging from 22 – 26 percent and 150 – 450 millidarcies respectively.

The Bluff Sandstone maybe considered as a future injection zone and is not part of this application.

The geologic prognosis and a cross section showing the regional thickness and log characteristics are included (below).

Waste Disposal Well (WDW) #2

Geologic Prognosis — **Entrada & Bluff WDW, San Juan County**

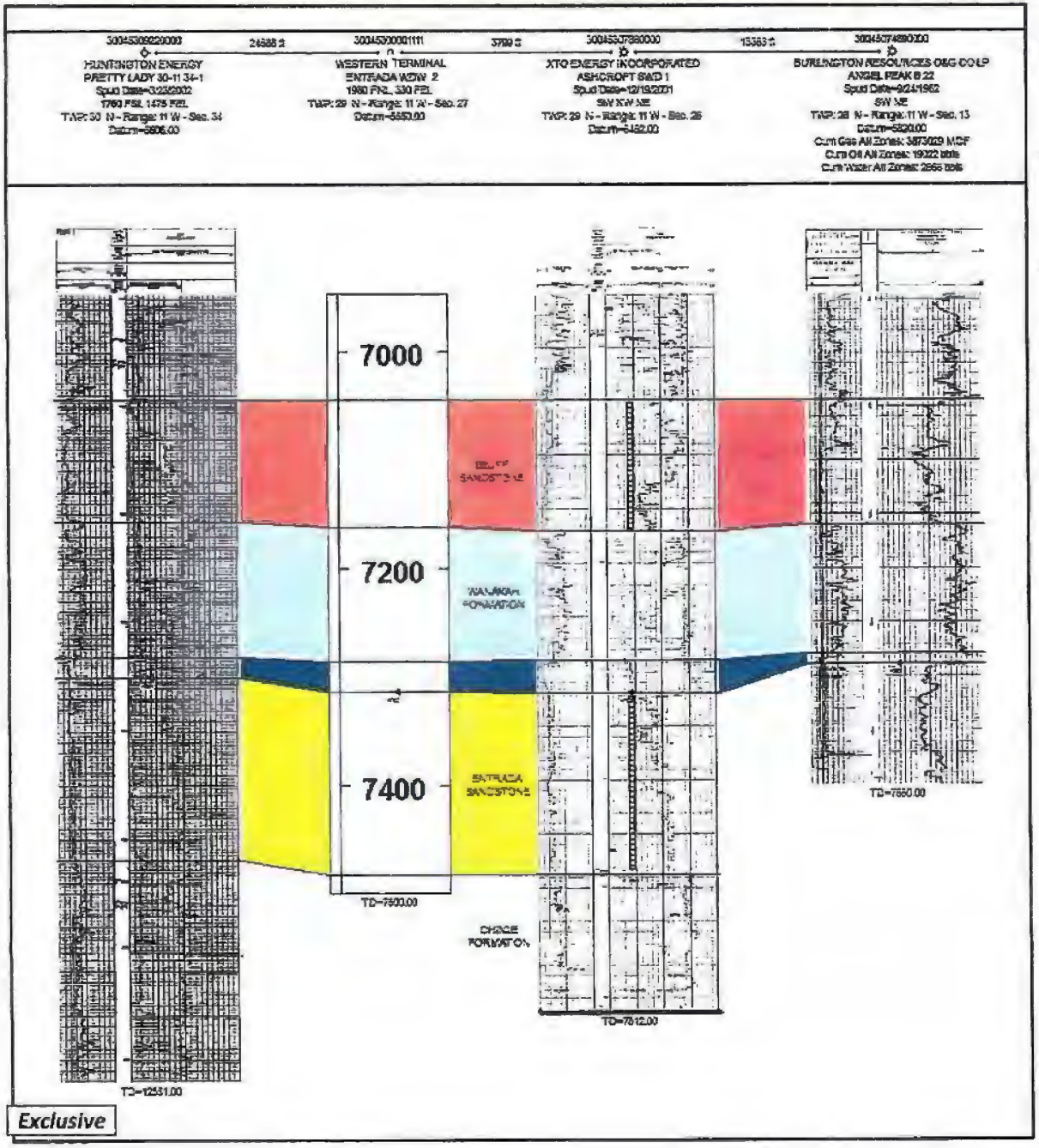
Header

Well Name & Number: Waste Disposal Well (WDW) #2
API: Pending Latitude (NAD 83): 36.695499 Objective: Entrada & Bluff FM Water Disposal Longitude (NAD 83): -107.971156 Location: TWP: 29 N - Range: 11 W - Sec. 27 Field: Basin
Surface Location Footage: 1950 FNL, 330 FEL County: San Juan
Bottom Hole Location Footage: Same as Surface State: New Mexico Lease: GL Elevation: 5538
Surface Owner: KB Elevation: 5550
Type: Proposed TD: 7500 November 25, 2015
Expiration Date: Proposed Plugback: Geologist: Peter Kondrat Depth:

Formation Tops	Top MD (KB)	Top Subsea (KB)	Thickness (FT)	Rock Type	Drilling Notes	Depositional Environment
Quaternary Alluvium	0	5550	10	Unconsolidated Gravels	Boulders, water, lost circulation	Continental Rivers
Nacimento FM	10	5540	505	Shale & Sandstone	Water, gas	Continental Rivers
Ojo Alamo Sandstone	515	5035	110	Sandstone & Shale	Water, gas	Continental Rivers
Kirtland Shale	625	4925	578	Interbeddded Shale, sandstone	Water, gas	Coastal to Alluvial Plain
Fruitland FM	1203	4347	515	Interbeddded Shale, sandstone & coal	Coalbed methane	Coastal Plain
Pictured Cliffs Sandstone	1718	3832	162	Sandstone	Gas, water	Regressive Marine Beach
Lewis Shale	1880	3670	780	Shale, thin limestones	Gas	Offshore Marine
Huerfanito Bentonite Bed	2660	2890	28	Altered volcanic ash, bentonite bed	Swelling clay	Volcanic Ash Layers
Chacra FM	2688	2862	189	Sandstone, siltstone	Gas, Water	Offshore Marine Sands
Lower Lewis Shale	2877	2673	458	Shale, thin limestones	Gas, Water	Offshore Marine
Cliff House Sandstone	3335	2215	59	Sandstone	Gas, Water, Oil	Transgressive Marine Beach
Menefee Member	3394	2156	643	Interbeddded Shale, sandstone & coal	Gas, Water, Oil	Coastal Plain
Point Lookout Sandstone	4037	1513	366	Sandstone	Gas, Water, Oil	Regressive Marine Beach
Mancos Shale	4425	1127	888	Shale, thin sandstones & siltstones	Gas, Water, Oil	Offshore Marine
Niobrara A	5282	268	102	Interbeddded Shale, sandstone	Oil, Gas, Water	Offshore Marine Sands
Niobrara B	5394	156	123	Interbeddded Shale, sandstone	Oil, Gas, Water	Offshore Marine Sands
Niobrara C	5517	33	82	Interbeddded Shale, sandstone	Oil, Gas, Water	Offshore Marine Sands
Gallup FM	5599	-49	243	Interbeddded Shale, sandstone	Oil, Gas, Water	Regressive Marine to Coastal Deposit
Juana Lopez FM	5842	-292	123	Shale, thin limestones	Oil, Gas, Water	Offshore Marine
Carlile Shale	5965	-415	95	Shale, thin limestones	Oil, Gas, Water	Offshore Marine
Greenhorn Limestone	6060	-510	58	Limestone	Oil, Gas, Water	Offshore Marine
Graneros Shale	6118	-568	33	Shale	Oil, Gas, Water	Offshore Marine
Dakota FM	6148	-599	216	Sandstone, shale & coals	Oil, Gas, Water	Transgressive Coastal Plain to Marine
Burro Canyon FM	6365	-815	48	Sandstones, some conglomerate & mudstone	Oil, Gas, Water	Braided Fluvial Fill
Morrison FM	6411	-861	635	Mudstones, sandstone	Oil, Gas, Water	Continental Rivers
Bluff Sandstone (aka Junction Creek Sandstone), Morrison FM Member	7046	-1496	118	Sandstone	Oil, Gas, Water	Alluvial Plain and Eolian
Wanakah FM	7164	-1614	123	Siltstone, Sandstone	Oil, Gas, Water	Alluvial Plain and Eolian
Todilto Limestone & Anhydrite	7287	-1737	28	Interbedded Limestone & Anhydrite	Oil, Gas, Water, Anyhydrite	Alluvial Plain and Eolian
Entrada Sandstone	7315	-1765	168	Sandstone	Oil, Gas, Water	Eolian Sand Dunes
Chinle FM	7483	-1933	17	Interbeddded Shale, sandstone	Oil, Gas, Water	Continental Rivers
Proposed TD	7500	-1950		TD designed for complete log covergage over Entrada Sandstone.		

Notes: Any significant flow rates, abnormal pressures, lost circulation, sticking, fluid loss or gain immediately notify company men, drilling superintendent and/or drilling engineer.

Regional Bluff & Entrada Sandstones Cross-Section



Exclusive

IX. After the well is drilled, cased and perforated an injectivity test will be performed. If the injection rate is less than 6 BPM prior to parting pressure, the well will be stimulated w/ approximately 222,000 lbs of 20/40 white sand in 110,000 gals of 30# cross linked gel at 50 bpm. Note: actual job design (if needed) will be based on actual results of the injectivity test.

X. All open hole and cased hole logs will be filed with NMOCD once the well is drilled and completed.

XII. Available geologic and engineering data has been examined and no evidence of open faults or any other hydrological connection between the disposal zone, the Entrada Formation, and any underground sources of drinking water, the Nacimiento Formation.

XIII. Based on the information available online as well as information from the "Four Corners Geological Society" there are no known faults located in the area of the proposed well. Natural fractures are few to nonexistent in the Entrada formation. The overlaying formation is the relatively impermeable Todilto Limestone. The closest off set is the Ashcroft SWD #1 (API# 30-045-30788) located approximately ¼ of mile to the east of the proposed injection well. The Ashcroft SWD #1 is a SWD well operated by XTO Energy and is completed in the Bluff and Entrada formations and has no evidence of water migrating out of the injection zones.

XIII. Public Notice will follow NMOCD review of this application.

APPENDIX E. CLOSURE PLAN

Western Refinery Southwest Inc.
Bloomfield Terminal
Waste Disposal Well (WDW) #2

Closure Plan

In accordance with Rule 19.15.25 NMAC the following information describes the possible closure plan which would entail plugging and abandoning the proposed well bore and reclaiming the surface location to pre-drill status. This is Western's standard closure procedure.

All closure activities will include proper documentation and be available for review upon request. All required paperwork (sundry notices) will be submitted to NMOCD for approval prior to any field work taking place. All plug and abandon activities are intended to protect fresh water, public health and the environment.

General Plan

1. Notify NMOCD
2. Note: verify all cement volumes based on actual slurry to be pumped.
3. Review any COA's from NMOCD

Procedure

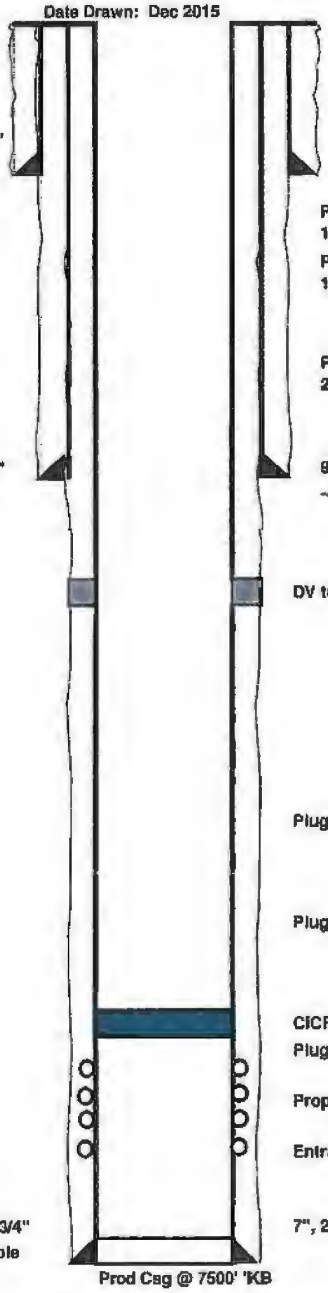
1 Move-in, rig up pulling unit. Pump & pit. Half tank for cement returns.
2 Hold safety meeting with rig crew and related personnel explaining the procedure and outlining potential hazards.
3 ND WH & NU BOP
4 TIH w/ CICR & set at ~ 7265'.
5 Load hole and circulate clean with fresh water.
6 Load tubing and pressure test tubing to 1000 psi.
7 Pull stinger out of CICR enough to load hole w/ water and circulate clean. Test casing to 500 psi.
8 Plug #1 (7265'-7483'). Mix & pump 85 sx (100 cf) of Class B neat cement. Sting out of retainer leaving 50' of cement on top of retainer. Note. Cement volumes will be adjusted if alternate but comparable cement is used (based on vendor selection). Volumes estimated using 100% excess.
9 Pull up hole.
10 Spot plug #2 in a balanced plug. Plug #2 Dakota: (6099'–6199'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.

11 Pull up hole & WOC. TIH & tag TOC.
12 Spot plug #3 in a balanced plug. Plug #3 Gallup (5549'-5649'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
13 Pull up hole & WOC. TIH & tag TOC.
14 Spot plug #4 in a balanced plug. Plug #4 Mesaverde (3285'-4087'). Mix & pump 150 sx (177 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
15 Pull up hole & WOC. TIH & tag TOC.
16 Spot plug #5 in a balanced plug. Plug #5 Chacra (2638'-2738'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
17 Pull up hole & WOC. TIH & tag TOC.
18 Spot plug #6 in a balanced plug. Plug #6 Pictured Cliffs (1668'-1768'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
19 Pull up hole & WOC. TIH & tag TOC.
20 Spot plug #7 in a balanced plug. Plug #7 Fruitland (1153'-11253'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
21 Pull up hole & WOC. TIH & tag TOC.
22 Spot plug #8 in a balanced plug. Plug #8 Surface Plug (350'-surface). Mix & pump 66 sx (77.9 cf) of Class B neat cement.
23 Fill up inside of casing w/ additional cement as needed to top off.
24 ND BOP & cut off well head.
25 Install P&A marker and cut off anchors.
26 RD & release rig and related equipment.
27 Remove all surface/production equipment.
28 Re-contour and re-claim surface/location as per NMOCD approved Reclamation plan.

Well/Facility:	WDW #2	Well Status:	
Operator:	Western Refinery	Orig Oper:	
Lease/Op Agmt:		Inj Interval:	
Field:	Entrada	API #:	
County:	San Juan	GR/KB:	
State:	NM	TD:	Proposed 7500'
Spud:		PBTD:	
Comp. Date:		WI:	
1st Prod:		NRI:	
Xmas tree:			
Surface Loc:	2028' fnl & 111' fel		
Sec-Twn-Rge:	Sec 27/T29N/11W		
Comments:			

Date Drawn: Dec 2015

WALSH ENGINEERING FARMINGTON, NM



	Geologic Markers		
		MD	Formation
		Surface	Quaternary Alluv
		10'	Nacimiento
		515'	Ojo Alamo
		625'	Kirtland
		1203'	Fruitland
		1718'	Pictured Cliffs
		1880'	Lewis
		2660'	Huerfanito Bentonite
		2688'	Chacra
		2877'	Lower Lewis
		3335'	Cliff House
		3394'	Menefee
		4037'	Point Lookout
		4423'	Mancos Shale
		5292'	Niobrara A
		5394'	Niobrara B
		5517'	Niobrara C
		5599'	Gallup
		5842'	Juana Lopez
		5965'	Carlile
		6060'	Greenhorn
		6116'	Graneros
		6149'	Dakota
		6365'	Burro Canyon
		6411'	Morrison
		7046'	Bluff Sandstone
		7164'	Wanakah
		7287'	Todilto
		7315'	Endrada
		7483'	Chinle
		7500'	Proposed TD

Injection String Detail - PL 4-1/2", 10.5 ppf, J55			
	Length	Top	Bottom
KB Adjustment	15.00	0	15.00
4-1/2" PL casing/tubing		15.00	15.00

WALSH ENGINEERING & PRODUCTION CORP.

Workover Cost Estimate

Western Refinery Southwest, Inc.
AUTHORITY FOR EXPENDITURE

Date: 2/2/2016

***Well Name*: WDW #2**
***Location*: Sec 27, T29N, R11W, San Juan, NM** ***Objective*: Permanently P&A Wellbore**

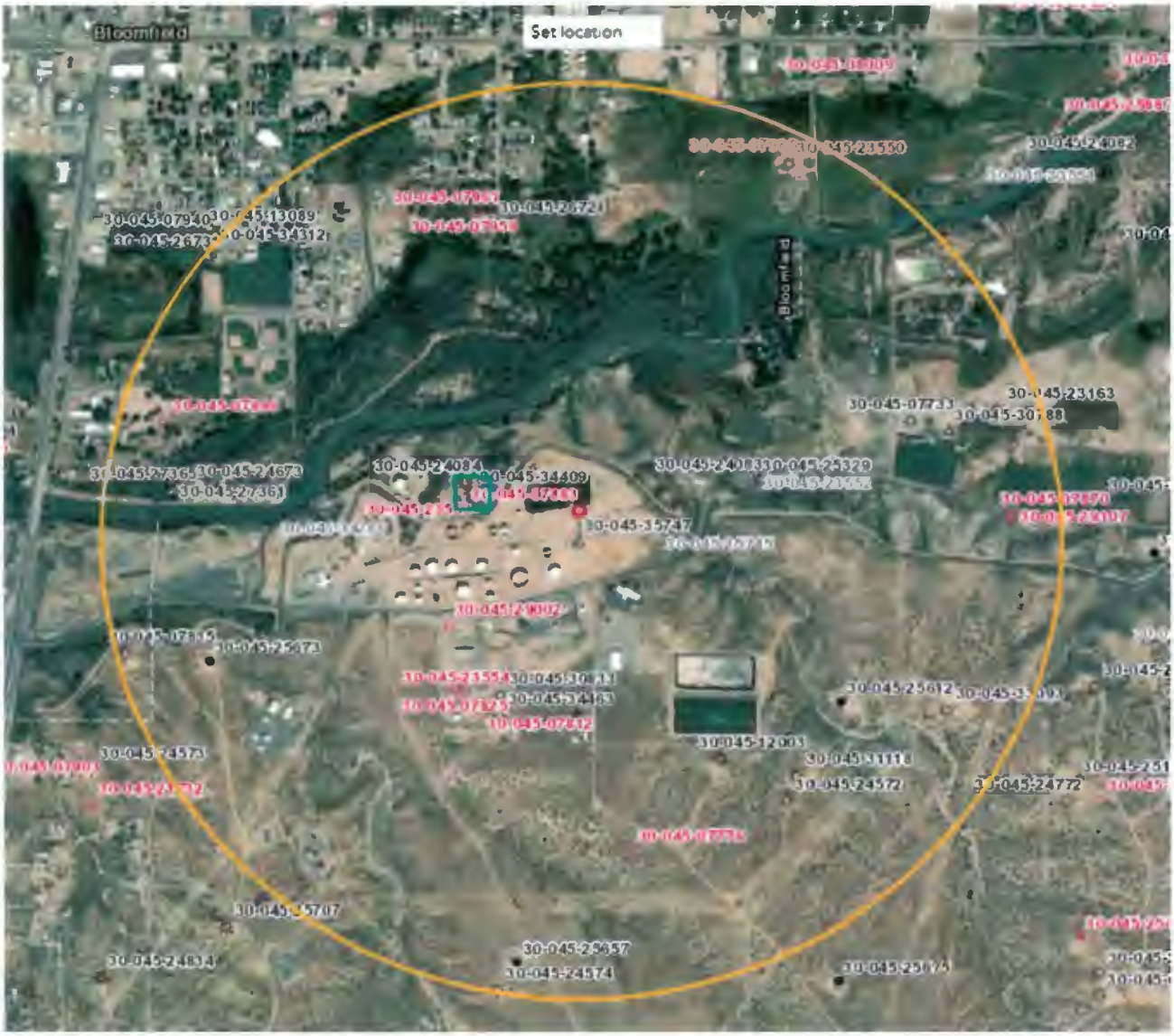
	Tangible	Intangible	Total
I. Workover Costs			
Anchors, and Misc.			
Completion Rig (18 hrs @ $250/hr, includes Mob-de-Mob, crew travel)		29,500	29,500
Completion Fluids/Water hauling (pump truck)			
Cased Hole Services (including CICR)		7,200	7,200
Cement		24,650	24,650
Tubing Head and Well Connection Fittings			
Tubing (480 ft @ 3.30 $/ft.)			
Sucker Rods (50 rods @ 60 $/rod)			
Down hole pump			
Pumping equipment (Polish rod, tbg anchor, ect)			
Rentals (tanks, etc)		1,720	1,720
Trucking		5,100	5,100
Surface Facility Installation			
Restore Location			
Well Site Supervision		4,100	4,100
Engineering		1,000	1,000
Bits			
Labor & Trucking to remove surface equipment			
Pipelines and Installation			
Tank and Fittings			
Disposal Costs		1,250	1,250
Meter			
Surface Reclamation		5,125	5,125
P&A marker		135	135
Workover Costs	**0**	**79,780**	**79,780**
10% Contingency	0	7,978	7,978
Total Workover Costs	**0**	**87,758**	**87,758**

Prepared By: John C. Thompson
Date: 2/2/2016

Working Interest Owners

ESTIMATED COSTS ONLY--Each participating Owner to pay Proportionate Share of Actual Well Costs Subject to Operating Agreement

APPENDIX F. WELLS WITHIN THE VICINITY OF WDW-2



Wells within One-Mile Radius of Bloomfield Terminal Disposal Well WDW-2

Western Refining Southwest, Inc.
Bloomfield Terminal
Waste Disposal Well (WDW) #2
Well List for 1 Mile Area of Review (AOR)

Name	API #	Well Type	Date Drilled	Location (Lat, Long)	Depth(FT)	Record of Completion
PREONGARD WELL #1	30-045-25745	GAS	N/A	36.6985, -107.9679	0	Never Drilled
JACQUE #002	30-045-34409	GAS	9/7/2007	36.6998,-107.9735	1897	Active
PRE-ONGARD WELL #001	30-045-23553	GAS	N/A	36.6998,-107.9738	0	Never Drilled
DAVIS GAS COM F #001E	30-045-24084	GAS	9/7/1980	36.7000,-107.9737	6392	Active
PRE-ONGARD WELL #002	30-045-07883	GAS	N/A	36.7001,-107.9738	0	Never Drilled
DISPOSAL #001	30-045-29002	Salt Water Disposal	12/17/1993	36.6964,-107.9742	3601	Plugged, Site Released
DAVIS GAS COM F #001R	30-045-30833	GAS	11/28/2001	36.6946,-107.9726	6700	Active
DAVIS GAS COM J #001	30-045-25329	GAS	10/29/1982	36.7001,-107.9650	4331	Active
PRE-ONGARD WELL #1	30-045-23552	GAS	N/A	36.7001,-107.9650	0	Never Drilled
SULLIVAN GAS COM D #001E	30-045-24083	GAS	01/19/1980	36.7001,-107.9648	6329	Active
DAVIS GAS COM F #001	30-045-07825	GAS	10/4/1960	36.6948,-107.9740	6365	Plugged, Site Released
DAVIS GAS COM G #001	30-045-23554	GAS	10/11/1979	36.6947,-107.9738	2951	Plugged, Site Released
JACQUE #001	30-045-34463	GAS	10/31/2007	36.6941,-107.9727	1890	Active
PRE-ONGARD WELL #001	30-045-07812	GAS	12/10/1952	36.6943,-107.9733	1804	Plugged, Site Released
CALVIN #001	30-045-12003	GAS	10/24/1962	36.6930,-107.9660	6450	Active
MANGUM #001S	30-045-34266	GAS	N/A	36.6985,-107.9796	0	Never Drilled
CALVIN #003	30-045-25612	OIL	4/29/1983	36.6945,-107.9624	5970	Active
CALVIN #100	30-045-31118	GAS	1/8/2003	36.6926,-107.9637	1970	Active
PRE-ONGARD WELL #001	30-045-07776	GAS	N/A	36.6907,-107.9688	0	Plugged, Site Released
NANCY HARTMAN #002	30-045-26721	GAS	7/26/1986	36.7066,-107.9729	2824	Active
CONGRESS #009	30-045-24572	GAS	3/1/1981	36.6920,-107.9640	2960	Active
SULLIVAN GAS COM D #001	30-045-07733	GAS	11/10/1964	36.7016,-107.9603	6260	Active
HARTMAN #001	30-045-07961	GAS	03/03/1960	36.7068,-107.9734	6310	Plugged, Site Released
GRACE PEARCE #001	30-045-07959	GAS	06/19/1958	36.7068,-107.9756	1620	Plugged, Site Released
ASHCROFT SWD #001	30-045-30788	Salt Water Disposal	12/19/2001	36.7014,-107.9592	7512	Active
CONGRESS #018	30-045-25673	OIL	5/7/1983	36.6955,-107.9815	6150	Active
MANGUM #001E	30-045-24673	GAS	2/27/1981	36.6999,-107.9821	6240	Active
CALVIN #001F	30-045-33093	GAS	10/2/2005	36.6943,-107.9593	6525	Active
MARIAN S #001	30-045-27365	GAS	9/16/1989	36.6998,-107.9826	2840	Active
LAUREN KELLY #001	30-045-27361	GAS	9/14/1989	36.7000,-107.9826	1500	Active
PRE-ONGARD WELL #001X	30-045-29107	GAS	11/1/1953	36.6991,-107.9573	0	Plugged, Site Released
PRE-ONGARD WELL #00X	30-045-07870	GAS	6/14/1953	36.6992,-107.9573	1442	Plugged, Site Released
PRE-ONGARD WELL #001	30-045-07896	GAS	N/A	36.7016,-107.9828	0	Never Drilled
EARL B SULLIVAN #001	30-045-23163	GAS	12/23/1978	36.7019,-107.9577	2861	Active
CONGRESS #016	30-045-25657	OIL	5/7/1983	36.6879,-107.9721	6200	Active
STATE GAS COM BS #001	30-045-23550	GAS	11/11/1979	36.7081,-107.9640	2954	Active
PEARCE GAS COM #001	30-045-07985	GAS	06/19/1965	36.7082,-107.9639	6274	Plugged, Site Released
MANGUM #001	30-045-07835	GAS	12/6/1962	36.6957,-107.9840	6350	Active
MARY JANE #001	30-045-26731	GAS	08/26/1986	36.7057,-107.9815	2845	Active
SUMMIT #009	30-045-24574	GAS	11/06/1980	36.6872,-107.9727	2985	Active
ROYAL FLUSH #001	30-045-34312	GAS	06/12/2007	36.7059,-107.9814	2045	Active

APPENDIX G. SUMMARY OF 2020 WELL OPERATION DATA FOR WDW-2

ATTACHMENT A

WESTERN REFINING SOUTHWEST, INC. - BLOOMFIELD TERMINAL
P.O. BOX 159
BLOOMFIELD, NEW MEXICO 87413

QUARTERLY INJECTION WELL REPORT
DISCHARGE PERMIT UICI-011 (WDW #2)
U.L: H, SEC 27, T29N, R11W
API #: 30-045-35747

PERIOD 2020	AMOUNT OF WATER FROM RIVER (GALLONS)	AMOUNT FROM WWTP (GALLONS)	TOTALIZER AMOUNT INJECTED (GALLONS)	DOWN-TIME (HRS)	INJECTION PRESSURE MAX (PSIA)	INJECTION PRESSURE MIN (PSIA)	INJECTION PRESSURE AVG (PSIA)	ANNULAR PRESSURE MAX (PSIA)	ANNULAR PRESSURE MIN (PSIA)	ANNULAR PRESSURE AVG (PSIA)	ON-LINE FLOW RATES MAX (GPM)	ON-LINE FLOW RATES MIN (GPM)	ON-LINE FLOW RATES AVG (GPM)
JAN	0	1,262,000	282,210	576	1,382	514	753	92	<-3	61	34	23	28
FEB	0	888,000	171,612	600	1,378	601	762	65	<-6	34	34	26	29
MAR	0	1,134,000	83,244	699	1,391	597	705	55	<-6	29	34	28	31
APR	0	1,149,000	109,368	658	1,376	702	711	44	<-6	23	33	25	29
MAY	0	1,472,000	179,634	633	1,384	595	755	65	<-6	40	31	24	27
JUN	0	1,689,000	76,230	681	1,357	596	674	73	<-6	42	37	4	32
JUL	0	2,068,000	0	745	906	567	611	94	<-6	64	0	0	0
AUG	64,554	1,962,000	0	745	567	536	550	115	93	105	0	0	0
SEP	76,062	1,908,000	99,792	648	1,291	524	635	119	<-6	84	27	20	22
OCT	0	1,985,000	274,925	581	1,351	589	794	85	<-6	50	34	25	28
NOV	0	1,636,000	20,923	709	1,376	591	671	110	<-6	70	29	25	28
DEC	0	1,220,000	588	744	813	550	569	114	22	108	35	35	35

The total amount injected in 2020 is: **1,298,526** gallons

CERTIFICATION: Kelly Robinson DATE: 2/15/2021

Note: Well officially brought on-line full time March 8, 2017.

Western Refining

WNR LISTED NYSE

Mr. Jim Griswold, Bureau Chief
NM Oil Conservation Division (OCD)
Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Discharge Plan Application for UIC Class I Non-Hazardous Injection Well
Proposed Waste Disposal Well (WDW) #2
Bloomfield Terminal
Western Refining Southwest, Inc. (Western)
Bloomfield, New Mexico

Dear Mr. Griswold:

The enclosed *Discharge Plan Application for UIC Class I Non-Hazardous Injection Well* revised pursuant to the conference call with the OCD staff on January 22nd, 2016. The purpose of the application for Waste Disposal Well #2 is to replace Disposal #1 (API # 30-045-29002) which was abandoned in 2015. The fluids to be disposed in the proposed injection well will be waste water system effluent, evaporation pond contact storm water and injection well stimulation/ maintenance liquids.

Western appreciates your assistance with this urgent matter. If there are any questions regarding the enclosed Discharge Plan Application, please contact Mr. Randy Schmaltz at (505) 632-4171.

Sincerely,

Mr. Mark Smith
President
Western Refining Southwest, Inc.

cc Carl Chavez NMOCD
Brandon Powell, NMOCD
Phillip Goetze, NMOCD

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

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

Revised August 1, 2011

Submit Original
Plus 1 Copy
to Santa Fe
1 Copy to Appropriate
District Office

DISCHARGE PLAN APPLICATION FOR SERVICE COMPANIES,GAS PLANTS, REFINERIES, COMPRESSOR, GEOTHERMAL FACILITES AND CRUDE OIL PUMP STATIONS

(Refer to the OCD Guidelines for assistance in completing the application)

☒ New ☐ Renewal ☐ Modification

1. Type: UIC Class I Non-Hazardous Injection Well (WDW #2)
2. Operator: Western Refining Southwest, Inc.

   Address: #50 County Road 4990 (PO Box 159), Bloomfield, NM 87413

   Contact Person: Class I Non-Hazardous Injection Well Phone: 505-632-8013
3. Location: SE /4 NE /4 Section 27 Township 29N Range 11W
   Submit large scale topographic map showing exact location.
4. Attach the name, telephone number and address of the landowner of the facility site.
5. Attach the description of the facility with a diagram indicating location of fences, pits, dikes and tanks on the facility.
6. Attach a description of all materials stored or used at the facility.
7. Attach a description of present sources of effluent and waste solids. Average quality and daily volume of waste water must be included.
8. Attach a description of current liquid and solid waste collection/treatment/disposal procedures.
9. Attach a description of proposed modifications to existing collection/treatment/disposal systems.
10. Attach a routine inspection and maintenance plan to ensure permit compliance.
11. Attach a contingency plan for reporting and clean-up of spills or releases.
12. Attach geological/hydrological information for the facility. Depth to and quality of ground water must be included.
13. Attach a facility closure plan, and other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

14. CERTIFICATIONI hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Bruce D. Davis Title: Director

Signature: Bruce D. R Date: 3-2-16

E-mail Address: bruce.davis@WNR.com

Western Refining Southwest, Inc.
Bloomfield Terminal
Waste Disposal Well #2 (WDW #2)
Discharge Plan Application Attachment

4. Landowner of facility site.

San Juan Refining Company
Attn: Western Refining Southwest, Inc.
1250 W. Washington St.
Suite 101
Tempe, AZ 85281
Ron Weaver
505-632-8013

5. Description of the facility.

The proposed facility is an UIC Class I Non-hazardous Injection Well (WDW #2).

Purpose

The purpose of WDW #2 is to replace Disposal #1 (API# 30-045-29002) which was abandoned in 2015.

Location

The proposed well location is within the fence line of Bloomfield Terminal. See the figure and survey in Appendix A of this Discharge Plan Application.

Application for Permit to Drill

The Application for Permit to Drill (Form C-101) is included as Appendix A of this Discharge Plan Application. Form C-101 is also typically submitted under the Oil and Gas regulations, the format presents information also common for Class I injection wells under the Water Quality regulations. The Form C-101 includes general well data, well location survey (Form C-102), well design information including cement slurry details and a well drilling program.

Application for Authorization to Inject

The Application for Authorization to Inject (Form C-108) is included as Appendix B of this Discharge Plan Application. Although Form C-108 is typically submitted under the Oil and Gas regulations, the format presents information also common for Class I injection wells under the Water Quality regulations. The Form C-108 includes general well data, area of review information, proposed operation information, geologic data on the injection zone, the proposed stimulation program and other information.

6. Description of stored materials stored and used.

The proposed injection well will not be used to for material storage.

Western Refining Southwest, Inc.
Bloomfield Terminal
Waste Disposal Well #2 (WDW #2)
Discharge Plan Application Attachment

7. Description of present sources of effluent and waste solids.

During workover (maintenance) operations, the proposed injection well WDW #2 will be a source of waste water and possibly waste solids. The waste water will be re-injected into the WDW #2. The waste solids will be characterized and disposed properly.

8. Curreut liquid and solid waste collection/treatment/disposal procedures.

The proposed injection well will be used to dispose of non-exempt non-hazardous waste water. A Injection Fluid Analytical is included as Appendix C of this Discharge Plan Application.

9. Description of proposed modifications to the existing collection/treatment/disposal systems.

The pumps and piping to injection well WDW #2 will be redesigned as needed to meet the pressure and flow demands determined during the injectivity testing. This redesign will allow treated waste water to be injected directly into the WDW #2 or directed to the evaporation ponds before injection into WDW #2.

10. Routine inspection and maintenance plan

The WDW #2 surface completion and associated flanges/pumps/piping will be visually inspected daily.

Mechanical Integrity Testing (MIT) will be conducted pursuant to 20.6.2.5204 NMAC. At a minimum, the program will include:

- A MIT at least once every five years or every time a well workover is performed, and
- An annual Bradenhead test.

11. Contingency Plan for Reporting and clean-up of Spills or releases.

The Bloomfield Terminal has an Emergency and Facility Response Plans in place respond releases including treated waste water. If a reportable quantity (5 bbl.) of treated waste water is released from the injection well, NMOCD and NMED Hazardous Waste Bureau will notified in accordance with applicable regulations. Containment, clean-up and reporting will commence as soon as practicable.

12. Geologic/Hydrological information.

Geologic information about the injection zone is included in Appendix B of this Discharge Plan Application.

Western Refining Southwest, Inc.
Bloomfield Terminal
Waste Disposal Well #2 (WDW #2)
Discharge Plan Application Attachment

13. Facility Closure Plan.

A Closure Plan for WDW #2 is included as Appendix D of this Discharge Plan Application. The closure plan includes an estimate for Financial Assurance.

Appendix A
Application for Permit to Drill

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-101
Revised July 18, 2013

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address	2. OGRID Number
Western Refining Southwest, Inc #50 County Road 4990 (PO Box 159) Bloomfield, NM 87413	267595
	3. API Number

4. Property Code	5. Property Name	6. Well No.
	Waste Disposal Well (WDW)	#2

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
H	27	29N	11W		2028'	North	111'	East	San Juan

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County

9. Pool Information

Pool Name	Pool Code

Additional Well Information

11. Work Type	12. Well Type	13. Cable/Rotary	14. Lease Type	15. Ground Level Elevation
N	S	R	P	5535' GL
16. Multiple	**17. Proposed Depth**	**18. Formation**	**19. Contractor**	**20. Spud Date**
NO	~ 7500'	Entrada	TBD	Est Marc 2016

Depth to Ground water	Distance from nearest fresh water well	Distance to nearest surface water
Less than 50'	660 '	1334'

☐ **We will be using a closed-loop system in lieu of lined pits**

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	17-1/2"	13-3/8"	48 ppf – H40	~ 300'	464 sx	Surface
Int	12- ¼"	9-5/8"	36 ppf – J55	~ 3600'	857 sx	Surface
Prod	8-3/4"	7"	26 ppf – L80	~ 7500'	850 sx	Surface

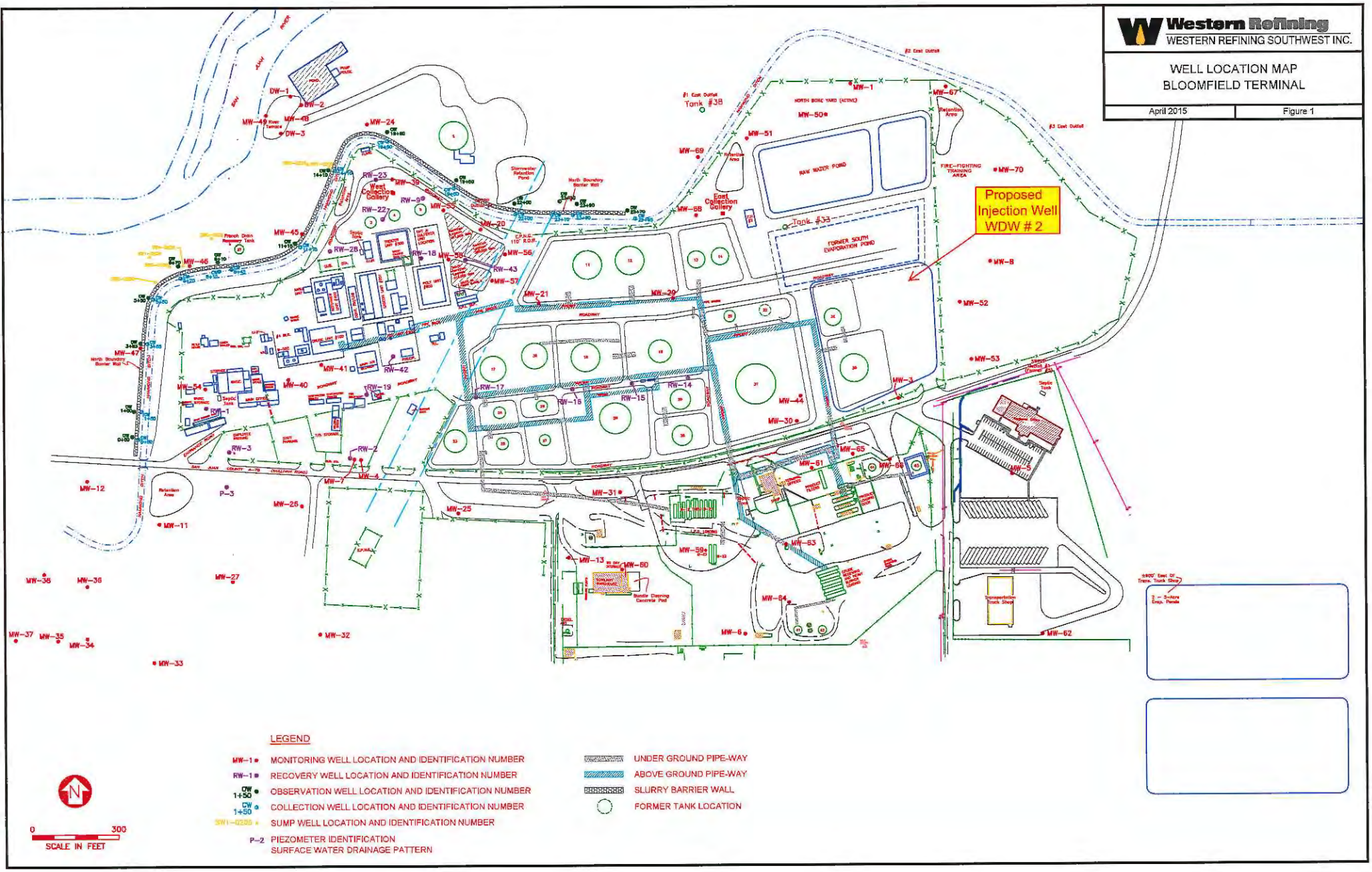
Casing/Cement Program: Additional Comments

Will utilize a 2 stage cement job on the 7" casing w/ DV tool at ~ 4000'

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
2M	2000 psi	2000 psi	Schaffer

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. **I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☐, if applicable.** Signature:	OIL CONSERVATION DIVISION Approved By:
Printed name: Bruce O. Davis	Title:
Title: Director	Approved Date: / Expiration Date:
E-mail Address: bruce.davis@WNR.com	
Date: 3-2-16 Phone: 602-286-1929	Conditions of Approval Attached


Western Refining
WESTERN REFINING SOUTHWEST INC.
WELL LOCATION MAP
BLOOMFIELD TERMINAL
April 2015
Figure 1
Proposed Injection Well WDW # 2
Tank #38
Tank #33
FORMER SOUTH EVAPORATION POND
RAW WATER POND
NORTH BORE YARD (ACTIVE)
FIRE-FIGHTING TRAINING AREA
Stormwater Retention Pond
West Collection Gallery
East Collection Gallery
North Boundary Barrier Wall
Retention Area
Transportation Truck Shop
Bundle Cleaning Concrete Pad
LEGEND
MW-1 • MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
RW-1 • RECOVERY WELL LOCATION AND IDENTIFICATION NUMBER
OW 1+50 • OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
CW 1+50 • COLLECTION WELL LOCATION AND IDENTIFICATION NUMBER
SW1-0255 • SUMP WELL LOCATION AND IDENTIFICATION NUMBER
P-2 PIEZOMETER IDENTIFICATION
SURFACE WATER DRAINAGE PATTERN
UNDER GROUND PIPE-WAY
ABOVE GROUND PIPE-WAY
SLURRY BARRIER WALL
FORMER TANK LOCATION
N
0
300
SCALE IN FEET

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
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1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name

[4] Property Code	[5] Property Name	[6] Well Number
	Waste Disposal Well (WDW)	2

[7] OGRID No.	[8] Operator Name	[9] Elevation
267595	Western Refining Southwest, Inc.	5535'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	27	29-N	11-W		2028'	NORTH	111'	EAST	SAN JUAN

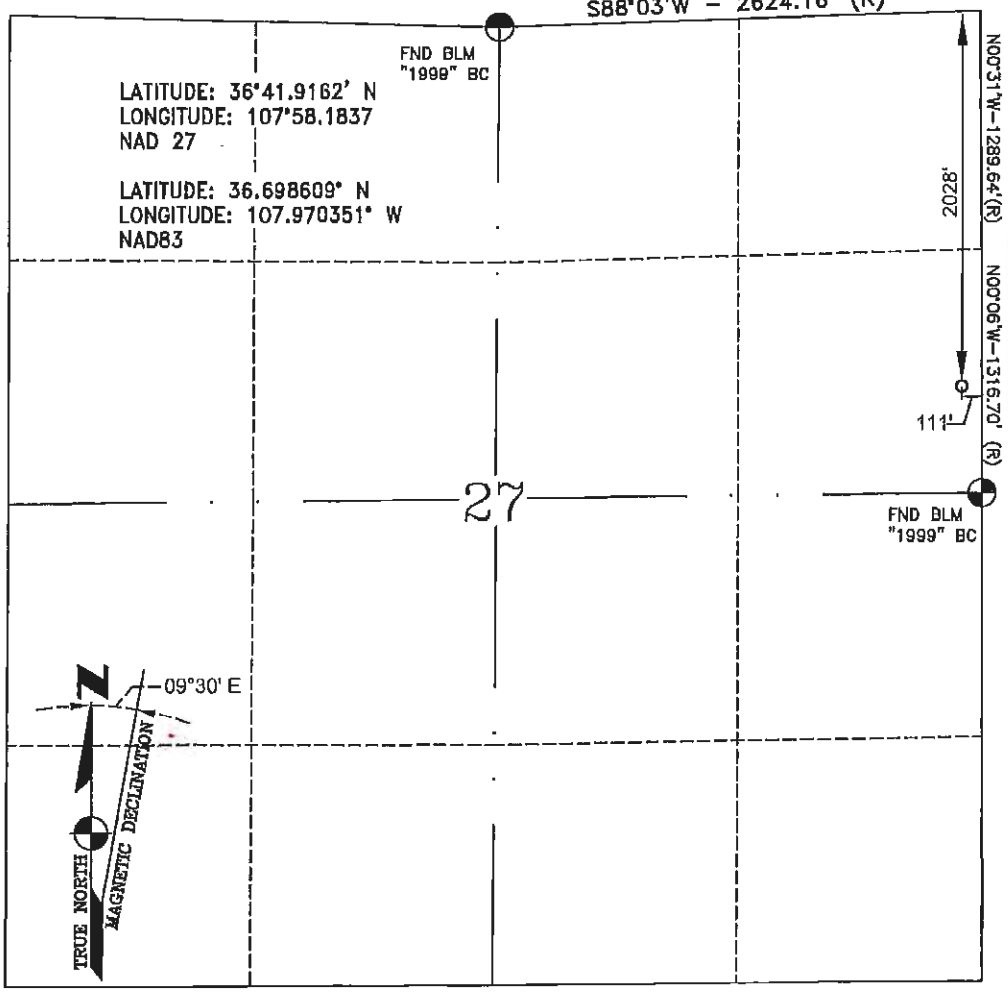
[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

16



[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or a working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature 12/23/15 Date

John C. Thompson
Printed Name

johnew@shaw.net
E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

DECEMBER 12, 20[illegible]
Date of Survey

Signature and Seal of Professional Surveyor:

GLEN W. RUSSELL NEW MEXICO 15703 LICENSED PROFESSIONAL SURVEYOR

GLEN W. RUSSELL

Certificate Number 15703

Well Control Equipment Schematic for 2M Service

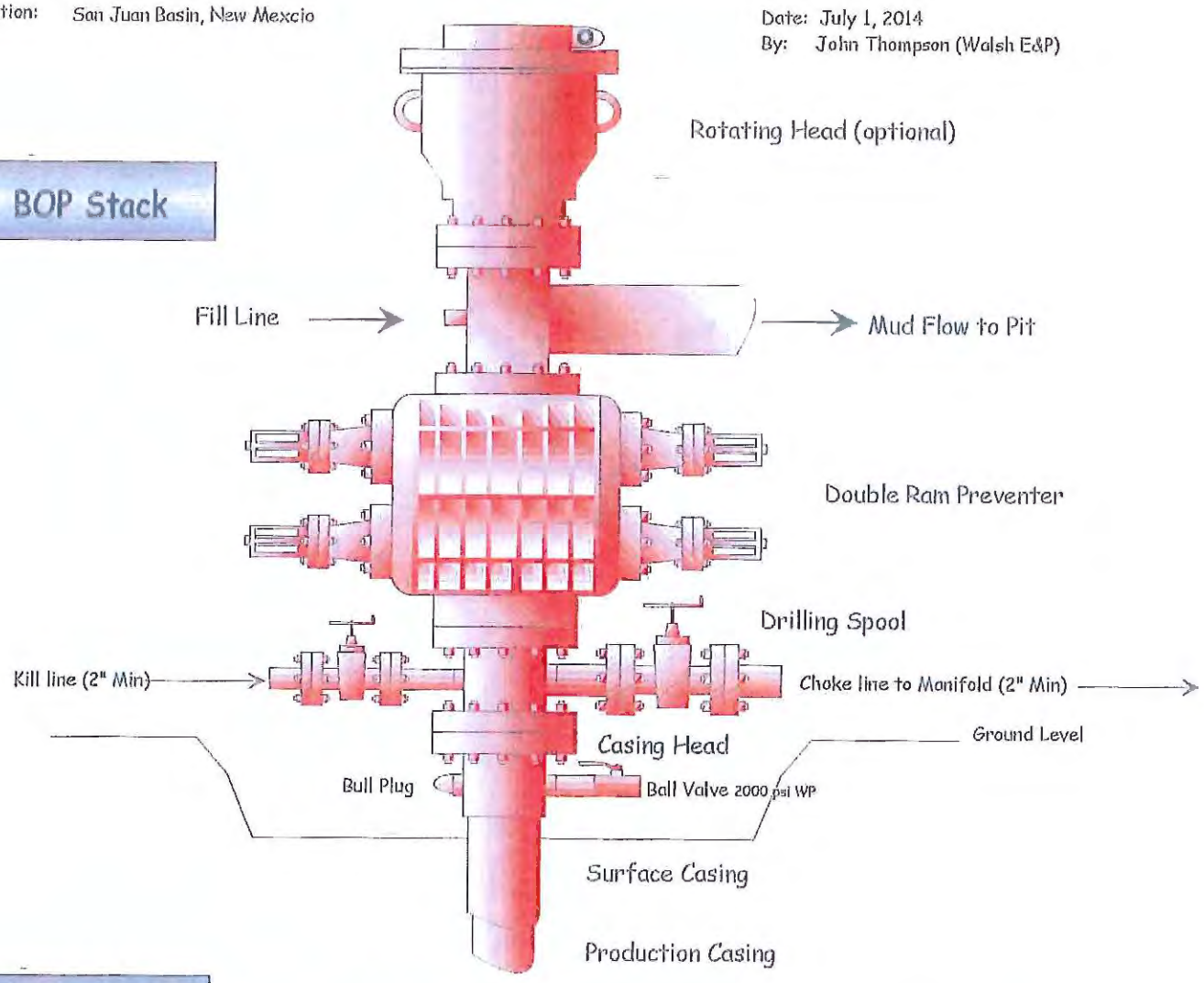
Attachment to Drilling Technical Program

Exhibit #1
Typical BOP setup

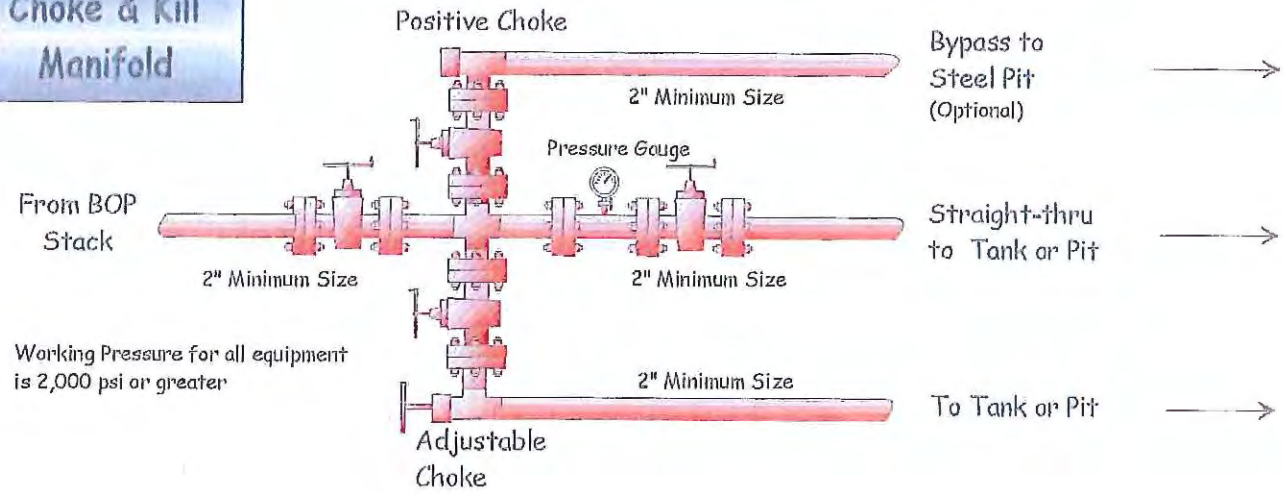
Location: San Juan Basin, New Mexcio

Date: July 1, 2014
By: John Thompson (Walsh E&P)

BOP Stack



Choke & Kill Manifold



Working Pressure for all equipment is 2,000 psi or greater

Western Refining Southwest, Inc. – WDW #2

Cement Slurry Details (Attachment for NMOCD – APD)

Note: Actual Slurry Design will vary depending upon vendor selection and actual hole conditions.

17-1/2" Hole – 13-3/8", 40 ppf, J55 casing at ~ 300 ft

394 (548 cf) sacks Type III Cement, 2% bwoc Calcium Chloride, 0.25 lbs/sack Cello Flake, 59.2% Fresh Water

Yield:1.39 cf/sx
Slurry wt 14.60 ppg

12-1/4" Hole - 9-5/8", 36 ppf, J55 casing at ~ 3600 ft

Lead:
806 sacks (1621 cf) (20:80) poz L:Type III cement w/ 0.1 gps FP-6L, 0.25 lbs/sack Cello Flake, 0.3% bwoc CD-32, 5 lbs/sx Kol-Seal, 0.5 % bwoc Sodium Metasilicate, 0.35% bwoc MPA-170, 5 lbs/sx CSE-2, 102.5% Fresh Water

Yield: 2.01 cf/sx
Slurry wt: 12.50 ppg

Tail:
50 sacks (70.5 cf) Type III Cement, 2.25% bwoc Calcium Chloride, 0.25 lbs/sack Cello Flake, 0.02% gps FP-6L, 60.4% Fresh Water

Yield: 1.41 cf/sx
Slurry Wt: 14.5 ppg

8-3/4" Hole - 7", 26 ppf, L80 casing at ~ 7500 ft

Stage Tool (DV) at ~ 4000'

Stage no. 1

Lead:
224 sacks (450 cf) (20:80) poz L:Type III cement w/ 0.1 gps FP-6L, 0.25 lbs/sack Cello Flake, 0.3% bwoc CD-32, 5 lbs/sx Kol-Seal, 0.5 % bwoc Sodium Metasilicate, 0.35% bwoc MPA-170, 5 lbs/sx CSE-2, 102.5% Fresh Water

Yield: 2.01 cf/sx

Slurry wt: 12.50 ppg

Tail:

180 sacks (338 cf) (10:90) Poz L:Type III Cement, 0.25% bwoc Calcium Chloride, 0.3% bwoc CD-32, 0.02 gps FP-6L, 0.5% bwoc Sodium Metasilicate, 0.35% bwoc MPA-170, 5 lbs/sx CSE-2, 5 lbs/sx Kol-Seal, 87.8% Fresh Water

Yield: 1.88 cf/sx
Slurry Wt: 13.0 ppg

Stage no. 2

Lead:

414 sacks (832 cf) (20:80) poz L:Type III cement w/ 0.1 gps FP-6L, 0.25 lbs/sack Cello Flake, 0.3% bwoc CD-32, 5 lbs/sx Kol-Seal, 0.5 % bwoc Sodium Metasilicate, 0.35% bwoc MPA-170, 5 lbs/sx CSE-2, 102.5% Fresh Water

Yield: 2.01 cf/sx

Slurry wt: 12.50 ppg

Tail:

50 sacks (70.5 cf) Type III Cement, 2.25% bwoc Calcium Chloride, 0.25 lbs/sack Cello Flake, 0.02% gps FP-6L, 60.4% Fresh Water

Yield: 1.41 cf/sx
Slurry Wt: 14.5 ppg

DRILLING PROGRAM
Western Refining Southwest, Inc.
Waste Disposal Well (WDW) #2
San Juan County, NM

Surface Location
2028' FNL & 111' FEL
Section 27, T29N, R11W
Graded Elevation 5535'

SHL Geographical Coordinates (NAD-83)
Latitude 36.698609° N
Longitude 107.970351° W

Bottom Hole Location (Vertical Well)
Same as Surface

DIRECTIONS TO Western Refining - WDW #2

- From Bloomfield NM, go on South on HWY 550 to CR 4990
- Turn left and go easterly on CR 4990 for ~ 1.0 mi.
- Turn left (north) for 0.1 miles to new location.

Pre-Spud

- Identify Safe Briefing Areas on location. Prevailing wind is NW to SE. Attempt to locate briefing areas upwind in the corners of location. Note location of access road and provide for alternate exit if not up wind.
- Conduct rig inspection and pre-spud. Record "Rig-On-Daywork" and the Time & Date of well spud on both the Daily Drilling Report and the IADC Daily Drilling Report.
- Ensure regulatory notifications are made - Notify the NMOCD, 24 hours prior to spudding the well, testing BOPE, casing, and cement jobs. The following information must be included: well name, legal location, permit number, drilling contractor, company representative, date & time of spud.
- Contact NMOCD Field Inspector Supervisor Brandon Powell 505-320-0200. Record time & date of notification on reports.
- Review and post NMOCD permits and conditions of approval. Ensure 100% compliance with all regulations and conditions.

Well Plan

- Drill 17-1/2" surface hole from 0' to 350'.
- Drill surface with a fresh water gel mud system.
- 8.3 -9.4 ppg, 32-75 vis, NC fluid loss, <5% LGS.
- Perform a deviation surveys at 100', 250' and TD.

- Control deviation as necessary.
- Run and cement 13-3/8" casing and cement to the surface.
- Contact NMOCD if cement is not circulated to surface to get remediation approved prior to 1" cement. If cement is below 200' from surface, a CBL may have to be run to determine cement top.
- Nipple up BOP and test BOPE
- Ensure all drill pipe has casing friendly hardbanding.
- Install ditch magnets and measure metal cuttings in a vis cup every tour.
- Drill 12-1/4" intermediate to ~ 3600' with a fresh water LSND mud.
- Short trip to surface casing to prepare hole for 9-5/8" casing.
- Run 9-5/8", 36 ppf J-55 casing to Intermediate TD (Clean threads & drift casing once it's on location, prior to running).
- Cement 9-5/8" casing in single stage. Calculate cement volumes to circulate cement to surface.
- Drill 8-3/4" to ~ 7500' w/ fresh water LSND mud.
- Short trip to intermediate to prepare hole for logs and 7" casing.
- Run triple combo open hole logs.
- Run 7", 26 ppf, L80 casing to TD (clean threads & drift casing once it's on location prior to running)
- Nipple down BOP, clean mud tanks.
- Release rig.

Geology

MD	Formation
Surface	Quatermary Alluvium
10'	Nacimiento
515'	Ojo Alamo
625'	Kirtland
1718'	Pictured Cliffs
1880'	Lewis
2688'	Chacra
3335'	Cliffhouse
3394'	Menefee
4037'	Point Lookout
4423'	Mancos Shale
5599'	Gallup
6060'	Greenhorn
6149'	Dakota
6365'	Burro Canyon
6411'	Morrison
7287'	Todilto
7315'	Entrada
7483'	Chinle

Casing Program:

Casing & Hole Size	Weight	Grade	Coupling	Setting Depth (MD)	Top of Cement
13-3/8" (17-1/2")	48 ppf	H-40	LT&C	0-350 ft	To surface
9-5/8" (12-1/4")	36 ppf	J-55	LT&C	0-3600 ft	To surface
7" (8-3/4")	26 ppf	L-80	LT&C	0-7500	To surface

Mud logging: Commences at 300', 30-ft samples to TD, or as required to pick formation tops to TD

Open-Hole Logs: Triple Combo

Cased-Hole Logs: CBL

Rig-up

During rig-up, ensure that the following items are properly rigged up:

- Hydraulic remote choke and control panel (ensure that the choke manifold is configured properly to NMOCD standards)
- Trip tank (including piping, valves, etc.)
- Reliable wet-system bulk barite hopper (ensure that it is rigged up so that barite can be mixed prior to the suction tank and also so that barite can be mixed in the pre-mix tank)

Rig items to be taken care of the following issues prior to spud:

- Change seats and valves in mud pumps, redress relief valves, check pre-charge pressures of pulsation dampeners
- Repair all suction valves, etc., in mud tanks as required
- Check all centrifugal pumps, including charger pumps, mud mixing pumps, desander/desilter pumps, etc.

17 1/2" Surface Hole

MIRU During rig-up and while drilling surface hole, ensure that the following items are properly rigged up:.

Conduct rig inspection and pre-spud. Record "Rig-On-Daywork" and well spud time/date on Daily Report and on IADC Daily Drilling Report.

- Ensure regulatory notifications are made – NMOCD, 24 hours prior to spudding the well, testing BOPE, casing, and cement jobs. The following information must be included: well name, legal location, permit number, drilling contractor, company representative, date & time of spud.

- Contact NMOCD Field Inspector. Record name of government personnel contacted and time & date of notification on reports.

Procedure

Bottom-Hole Assembly (BHA) is to consist of the following:

1. PU 17-1/2" BHA
   - 17-1/2" surface hole bit
   - Bit sub (ported for float) 7-5/8" reg x 6-5/8" reg
   - Shock Sub
   - 4 ea. 8" DC's
   - Cross over 6-5/8" x 4-1/2"
   - 8 ea. 6" DC's
2. Drill 17-1/2" surface hole from 0' to 350'.
3. Drill surface with fresh water gel mud system. Drill surface with a fresh water gel mud system containing fresh water gel, poly-plus RD, detergent and 2% KCL
4. 8.3 -9.4 ppg, 32-75 vis, NC fluid loss, <5% LGS
5. Control deviation as necessary by varying RPM & WOB.
6. Install ditch magnets and measure metal cuttings in a vis cup every tour.
   a. Take survey at 100', if the hole is straight take a second survey halfway to TD and at 13-3/8" casing point.
7. Ensure that all rig solids control equipment are working properly.

   Target mud properties:

MW (PPG)	Funnel Viscosity Sec	PV	YP	Gels 10s/10m	MBT	Ca	Cl-	LGS
8.3 – 9.4	38 - 45	<12	8 - 18	½	<15 ppb	800-1200 mg/l	<1200 mg/l	ALAP

8. Drill to a minimum of 350-ft RKB. Adjust TD depth as required to fit the casing to the hole. Circulate and pump high viscosity sweeps as required. Make a wiper trip if any drag coming off bottom, otherwise continue POOH to run pipe.
9. RU and run 13-3/8" 48# H-40 LT&C casing.
   a. Clean, visually inspect, and drift the casing on the rack.
   b. Test slurries with actual mix water in advance. Ensure that Cement Company provides pumping time data from lab tests based on actual mix water and bulk cement as loaded for the job.
   c. Run casing as follows:
      - Float Shoe
      - One (1) joint of 9-5/8" 36# J-55 LT&C casing
      - Float Collar
      - 13-3/8" 48# H-40 LT&C casing to surface.
   d. Thread-lock the float shoe and float collar with equivalent thread-lock compound. Make up remaining joints with API modified thread compound. Ensure the float equipment is PDC friendly. Run 5 bow-spring centralizers with one 10-ft from the shoe, then on every jt to surface.
   e. Fill the pipe as it is run.
   f. Follow Wellhead Recommended Installation Procedure.
10. With the 13-3/8" casing run to bottom, circulate a minimum of one complete hole volume (casing volume + annular volume) before cementing as follows:

a. Pump schedule (based on 125% excess)

- 10-bbls Freshwater spacer
- 394 sx (548 cf) 15.6 ppg
- Drop top plug
- Displace with surface drilling mud

b. Bump the plug with 500 psi over final circulating pressure. Release pressure and then check the integrity of the float equipment.

Note: Pressure test casing to 1500 psi for 30 minutes. Pressure test the casing when pressure testing the BOPE.

c. **Ensure that 13-3/8" landing joint is centered in rotary table when Casing Head is landed.**

d. Report the following on the daily drilling report:

- Spacer and cement slurry volumes, compositions, and properties (density, yield, etc.)
- Displacement volume, fluid type, and density
- Circulating pressure before bumping the plug and pressure that plug was bumped
- Volume of fluid bled back and whether float equipment held or not
- Whether cement was returned to surface and estimated volume of cement returns
- Any other pertinent information about the cement job.

e. If the cement falls back or does not return to surface, perform a top job with 1" tubing. Top Job Cement Slurry to consist of Class "G" Premium w/ 2% $CaCl_2$ (or similar cement).

f. **REGULATORY APPROVAL MUST BE GIVEN PRIOR TO PUMPING TOP JOB.**

g. WOC for a minimum 12 hours before drilling out.

h. While waiting on cement, remove landing joint, nipple up BOPE,

11. Follow Wellhead Recommended Wellhead Installation Procedure for 13-5/8" 3,000 psi wellhead. The technician should remove plugs from side outlets, install side outlet valves, and confirm proper installation of entire 3M wellhead assembly equipment prior to pressure testing BOPE.

12. Nipple up 13-5/8" 3M BOPE, :

a. See attachment showing 2M BOPE (NOTE: Will test per NMOCD specs for 2M System as per APD)

14. Ensure that third party pressure test company personnel perform function and accumulator draw down tests by shutting off air and electric power to accumulator.

- Check nitrogen pre-charge pressure for each accumulator bottle.
- Record initial accumulator manifold pressure, open and shut all BOP equipment and hydraulic valves, and record final accumulator manifold pressure.
- Ensure that results of function and accumulator draw down tests and any equipment deficiencies are noted on the Daily Drilling Report and the IADC Daily Drilling Report. Third party pressure test company personnel should provide report of accumulator unit inspection, including nitrogen pre-charge pressures for each accumulator bottle, to the rig supervisor.

15. Set 13-5/8" 3M BOP test plug (C22) in Casing Head bowl and open lower valve on Casing Head.

Note: Ensure that third party pressure test company personnel test all BOP equipment, choke manifold, and all surface equipment to low pressure of 250 psi and rated working pressure (2000 psi) for 10 minutes each test.

Note: Third party pressure test personnel should record and annotate all BOPE pressure tests on calibrated chart recorder with appropriate scale for test

pressures. One set of pressure recorder charts should be left onsite with drilling foreman and another set of pressure recorder charts should be submitted to the State Inspectors.

16. Remove 3M BOP test plug. Install retrievable long bowl protector (wear bushing) as required.

12-1/4" Section

Important Notes:

- **This interval will be drilled with fresh water-base mud (WBM) LSND system. Weight up as required, 8.5 – 9.4 ppg, 42-60 sec/qt vis, 4-6cc WL, YP 8-18, maintain less than 2% LGS, pH 9.0-9.8.**
- No mud materials should be mixed without explicit instructions from the mud engineer. Also ensure that good housekeeping is practiced on the top of the mud tanks to minimize the possibility of paper, plastic, or some other foreign object being dropped into the mud tanks, which could interfere with the pumps or be pumped down the hole.
- Wiper trip to surface to prepare for casing run.
- Adjust mud weight and LCM as necessary to prevent losses and gains.

Procedure

1. PU 12-1/4" BHA
   - 12-1/4" NOV
   - NOV Mud Motor 7/8 5.0 .28 Revs per gallon
   - 3 pt String IBS (Stabilizer)
   - 2 ea. 6-1/2" DC's
   - 3 pt String IBS (Stabilizer)
   - 12 ea. 6-1/2" DC's
   - 4 ea. 4-1/2" HWDP
   - 4 ½" DP to surface
2. TIH and drill out float equipment
3. Drill 12-1/4" intermediate hole to TD ~ 3600'
   - Record all pressure tests on chart or Pason.
   - Drill out with fresh water based mud system as described above
   - Perform a deviation surveys every 500'
4. Continue to drill ahead with 12-1/4" PDC bit.
   a. The 12-1/4" hole will be drilled with LSND WBM (reference mud program).
   b. Record bit on bottom hours and record mud motor hours daily in remarks section of morning report.
5. Drill to Intermediate TD of ~3600'
6. Circulate hole clean and **Strap Out of Hole.**
7. While circulating prior to POOH, work pipe to assist in solids removal.
8. POOH to Surface Casing Point. If there is any drag, make wiper trip back to bottom and circulate and condition hole before POOH again.

9. Run 9-5/8", 36#, J55 LT&C casing.

- Casing Running Order:
- One (1) Float Shoe
- One (1) joint 9-5/8", 36#, J55 LT&C casing
- One (1) Float Collar
- 9-5/8", 36#, J55 LT&C casing
- If necessary run DV tool to ensure cement to surface (Note: verify DV tool placement with Engineer prior to running casing)
- 9-5/8", 36#, J55 LT&C casing, as required, to surface
- Centralizers:
- One Bow Spring centralizer on bottom 10 jts.
- One Bow Spring centralizer on each 4th joint of casing to surface casing
- Two Bow Spring centralizers above and below each DV tool
- Clean threads, drift & visually inspect the casing on the rack.
- Torque each joint of casing to optimum make-up torque.
- Thread-lock the float collar and float shoe with thread lock compound.
- Use API modified pipe dope for remaining casing joints.
- Utilize a safety clamp (dog collar) on approximately first 10 joints of casing until enough weight is run to ensure casing slips are engaging properly. Upon reaching surface casing shoe, swap out elevators for minimum of 250-ton slip-type elevators and ensure circulating swage is ready to be picked up in the event difficulty is encountered running casing through open hole.

10. Wash casing down as required. Space out and land casing in wellhead with mandrel-type casing hanger.

Note: Record weight that casing is landed in bowl with mandrel-type casing hanger in Daily Drilling Report.

11. Once casing is landed, circulate a minimum of two full bottoms-up or until hole cleans up, whichever is greater, before cementing. Gradually stage pump rate up to 8-10 bpm while circulating to ensure that cavings and/or shale fragments are circulated out of the hole to minimize risk of packing off during the cement operations. Carefully monitor hole for losses while circulating.

12. Cement casing in single stage (if heavy losses or hole conditions dictate install DV tool as needed) Note: verify cement volumes with Engineer prior to ordering cement. Refer to vendor Cement Recommendations for cement details.

a. Pump schedule:

- Pump 10-bbls fresh water to fill lines and prime pumps
- Pressure test lines to 2,000 psi
- Pump 5 bbls of fresh water then 10 bbls of mud clean prior to pumping cement.
- Mix and pump 12.5 ppg lead cement slurry: 806 sx (1621 cf)
- Mix and pump 14.5 ppg tail cement slurry: 50 sx (70.5 cf)

b. Displace with drilling fluid at 6-8 bpm. Carefully observe well for losses, and adjust displacement rate if required. Bump the plug with 500 psi over final circulating pressure.

c. Release pressure and check pressure integrity of the float equipment. NDBOPE. Lift stack.

13. Set slips on 9-5/8" casing. Energize slips with jam bolts.

14. LD 13-5/8" BOPE

15. NUBOPE (9-5/8"*2,000 psi)

16. Test BOPE

    a. Test rams, HCR, manual valves and wellhead to 250 psi low and 2,000 psi high
    b. Test manual chokes to 250 psi low and 2,000 psi high
    c. Test kill line, choke line, choke manifold and all surface tools (TIW's, inside bop, etc) to 250 psi low and 2,000 psi high
    d. Test 9-5/8" casing to 2,000 psi / 20 minutes.
    e. Install wear bushing.

8 ¾" Section

Important Notes:

- **This interval will be drilled with fresh water-base mud (WBM) LSND system. Weight up as required, 8.5 – 9.4 ppg, 42-60 sec/qt vis, 4-6cc WL, YP 8-18, maintain less than 2% LGS, pH 9.0-9.8.**

- No mud materials should be mixed without explicit instructions from the mud engineer. Also ensure that good housekeeping is practiced on the top of the mud tanks to minimize the possibility of paper, plastic, or some other foreign object being dropped into the mud tanks, which could interfere with the pumps or be pumped down the hole.

- Wiper trip to Intermediate to prepare for casing run.

- Adjust mud weight and LCM as necessary to prevent losses and gains.

Procedure

13. PU 8 ¾" BHA
    - 8 ¾" NOV DSHI516G-G2
    - NOV Mud Motor 7/8 5.0 .28 Revs per gallon
    - 3 pt String IBS (Stabilizer)
    - 2 ea. 6-1/2" DC's
    - 3 pt String IBS (Stabilizer)
    - 12 ea. 6-1/2" DC's
    - 4 ea. 4-1/2" HWDP
    - 4 ½" DP to surface
14. TIH and drill out float equipment
15. Drill 8-3/4" hole
    - Record all pressure tests on chart or Pason.
    - Drill out with fresh water based mud system as described above
    - Perform a deviation surveys every 500'
16. Continue to drill ahead with 8 ¾" PDC bit to a TD of ~ 7500'.

    c. The 8 ¾" hole will be drilled with LSND WBM (reference mud program).

d. Record bit on bottom hours and record mud motor hours daily in remarks section of morning report.

17. Plan on bit trip at or near top of Dakota formation. Change out bit to 8-3/4" SKHI616D-D2 and fresh mud motor.

18. Continue drilling to TD of ~7500' (10' to 15' into Chinle Formation)

19. Circulate hole clean and **Strap Out of Hole.**

20. While circulating prior to POOH, work pipe to assist in solids removal.

21. POOH to Intermediate Casing Point. If there is any drag, make wiper trip back to bottom and circulate and condition hole before POOH again.

22. TOH & Run Open Hole Logs

23. TIH to TD, circulate & condition hole as necessary. TOH, LDDP & DC's

24. Run 7" 26# L-80 LT&C casing.

- Casing Running Order:
- One (1) Float Shoe
- One (1) joint 7" 26# L-80 LT&C casing
- One (1) Float Collar
- 7" 26# L80 LT&C casing
- Place DV tool at 4000' (Note: verify DV tool placement with Engineer prior to running casing)
- 7" 26# N80 LT&C casing, as required, to surface
- Centralizers:
- One Bow Spring centralizer on bottom 10 jts.
- One Bow Spring centralizer on each 4th joint of casing to surface casing
- Two Bow Spring centralizers above and below each DV tool
- Clean threads, drift & visually inspect the casing on the rack.
- Torque each joint of casing to optimum make-up torque.
- Thread-lock the float collar and float shoe with thread lock compound.
- Use API modified pipe dope for remaining casing joints.
- Utilize a safety clamp (dog collar) on approximately first 10 joints of casing until enough weight is run to ensure casing slips are engaging properly. Upon reaching surface casing shoe, swap out elevators for minimum of 250-ton slip-type elevators and ensure circulating swage is ready to be picked up in the event difficulty is encountered running casing through open hole.

25. Wash casing down as required. Space out and land casing in wellhead with mandrel-type casing hanger.

Note: Record weight that casing is landed in bowl with mandrel-type casing hanger in Daily Drilling Report.

26. Once casing is landed, circulate a minimum of two full bottoms-up or until hole cleans up, whichever is greater, before cementing. Gradually stage pump rate up to 8-10 bpm while circulating to ensure that cavings and/or shale fragments are circulated out of the hole to minimize risk of packing off during the cement operations. Carefully monitor hole for losses while circulating.

27. Cement casing in 2 stages as follows: (Note: verify cement volumes with Engineer prior to ordering cement). Refer to vendor Cement Recommendations for cement details.

First Stage:

f. Pump schedule:

- Pump 10-bbls fresh water to fill lines and prime pumps
- Pressure test lines to 2,000 psi
- Pump 5 bbls of fresh water then 10 bbls of mud clean prior to pumping cement.
- Mix and pump 12.5 ppg lead cement slurry: 224 sx (450 cf)
- Mix and pump 13.0 ppg tail cement slurry: 180 sx (338 cf)
- Drop first-stage shutoff plug (top plug)
- Pump 10-bbls fresh water
- Displace with drilling fluid at 6-8 bpm. Carefully observe well for losses, and adjust displacement rate if required. Be sure to slow down displacement rate to 3 bpm or less for 15-20 bbl before and for 15-20 bbl after the first-stage shutoff plug reaches the DV tool at approximately 4,000'.

g. Bump the plug with 500 psi over final circulating pressure.

h. Release pressure and check pressure integrity of the float equipment.

i. Drop opening plug.

j. Wait required time for opening plug to fall inside casing to top of 2nd DV tool. This time will likely be required to put the cap back on the cement head after dropping the opening plug.

k. Pressure up to required pressure to open 1st stage tool.

l. Break circulation and continue to circulate while WOC. Carefully bring up pump rate and monitor returns for losses. Record volume of cement returned to surface. Circulate and WOC for 4 hours or longer before pumping second stage cement slurry, if samples indicate additional WOC time would be beneficial.

Second Stage:

a. Pump schedule:

- Pump 20-bbls water-based spacer mixed at 8.4 lb/gal.
- Mix and pump 12.5 ppg lead cement slurry: 414 sx (832 cf).
- Mix and pump 14.5 ppg tail cement slurry: 50 sx (70.5 cf)
- Drop closing plug
- Pump 10-bbls freshwater
- Displace with drilling fluid at 6-8 bpm then slow down displacement rate to 3 bpm before bumping plug.

b. Bump the plug with 500 psi over final circulating pressure, then slowly bring pressure up to closing pressure, which will be approximately the final circulating pressure plus required pressure to close 1st DV tool. Release pressure and check for flow back to ensure that the 1st stage tool is closed.

c. Report the estimated volume of cement returns.

m. Release pressure and check pressure integrity of the float equipment.

28. Lay down landing joint. Install the mandrel pack-off using a stand of HWDP and test pack-off seals to 2000 psi.

29. ND 11" 3M BOP Stack. NU 7-1/16" 5M x 4-1/16" Tubing Head Assembly. Be sure that bowl of Tubing Head Assembly is well greased to prevent corrosion while waiting on workover rig to complete well for SWD disposal.

30. NU 4-1/16" 5M Gate Valve, in order to secure well.

31. Release and RD drilling rig.

John Thompson
Engineer

Appendix B
Application for Authorization to Inject

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 Injection Well

[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.

Bruce D. Davis	Bruce D. Davis	Director	3-2-16
Print or Type Name	Signature	Title	Date

bruce.davis@WNR.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: Western Refining Southwest, Inc.

ADDRESS: #50 County Road 4990 (PO Box 159) , Bloomfield, NM 87413

CONTACT PARTY: Ron Weaver PHONE: 505-632-8013

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 iuformation submitted with this application is true aud correct to the best of my knowledge and belief.

NAME: Bruce D. Davis TITLE: Director

SIGNATURE: B D R DATE: 3-2-16

E-MAIL ADDRESS: bruce.davis@WNR.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 uext 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 Sectiou, 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

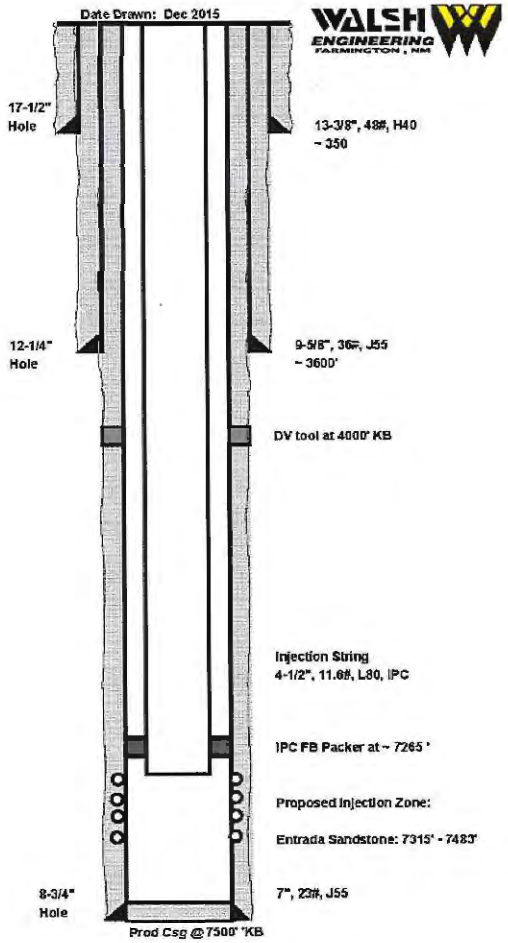
INJECTION WELL DATA SHEET

OPERATOR: Western Refining Southwest, Inc.

WELL NAME & NUMBER: Waste Disposal Well (WDW) #2

WELL LOCATION: 2028' FNL & 111' FEL (FOOTAGE LOCATION) H (UNIT LETTER) 27 (SECTION) T29N (TOWNSHIP) R11W (RANGE)

WELLBORE SCHEMATIC



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17-1/2" Casing Size: 13-3/8, 48 ppf, H40

Cemented with: 394 sx. *or* 548 ft^3

Top of Cement: Surface Method Determined: _____

Intermediate Casing

Hole Size: 12-1/4" Casing Size: 9-5/8", 36#, J55

Cemented with: 857 sx *or* 1693 ft^3

Top of Cement: Surface Method Determined: _____

Production Casing

Hole Size: 8-3/4" Casing Size: 7", 26 ppf, L80

Cemented with: 868 sx. *or* 1692 ft^3

Top of Cement: Surface Method Determined: _____

Total Depth: ~ 7500'

Injection Interval (Proposed)

7315' feet to 7483' (perforated 4 spf)

(Perforated or Open Hole; indicate which)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 4-1/2", 10.5 ppf Lining Material: Plastic Lined

Type of Packer: 7" Baker "FAB-1" (or similar model"

Packer Setting Depth: ~ 7265'

Other Type of Tubing/Casing Seal (if applicable):Baker Model "KBH-22" Anchor tubing seal assembly, landed in packer

Additional Data

1. Is this a new well drilled for injection? X Yes _____ No

   If no, for what purpose was the well originally drilled? _____

2. Name of the Injection Formation: Entrada

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. _____

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: Pictured Cliffs, Chacra, Mesaverde, Gallup, Dakota

Western Refining Southwest, Inc.

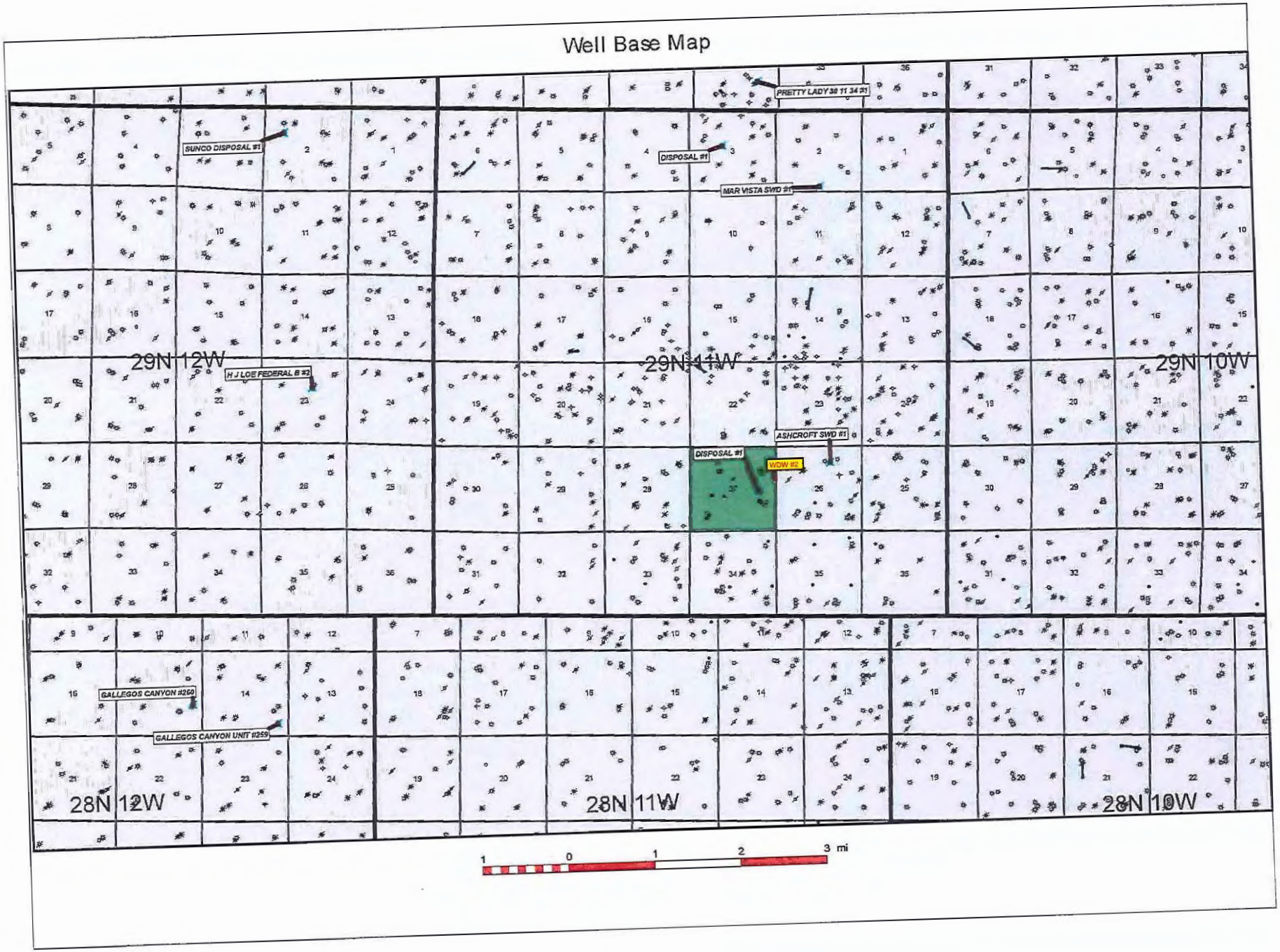
Waste Disposal Well (WDW) #2

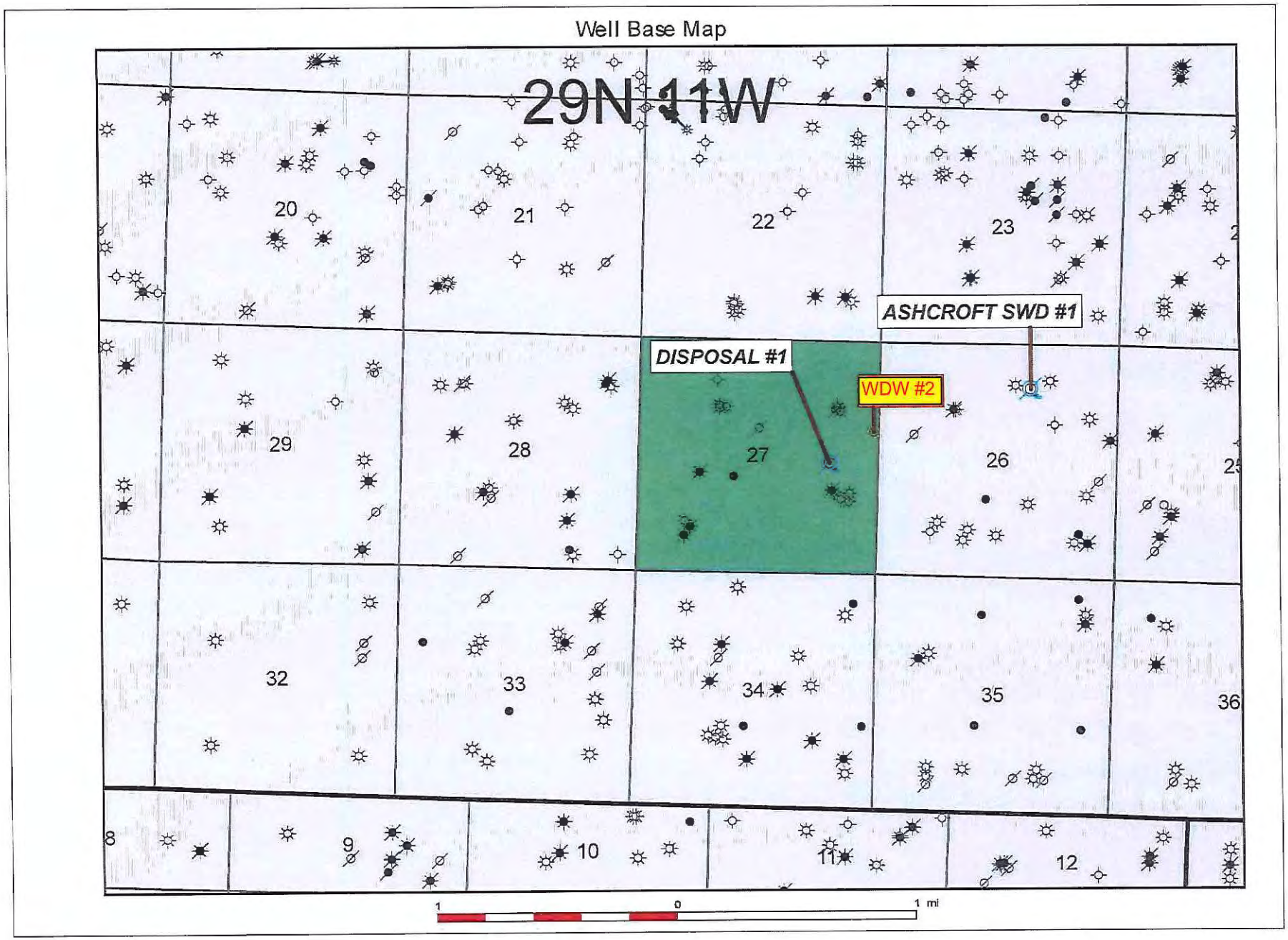
C-108 Data Sheet

V. Maps identifying all wells within 2 ½ miles of proposed injection well and Area of Review (AOR) of 1-mile radius.

The maps are below.

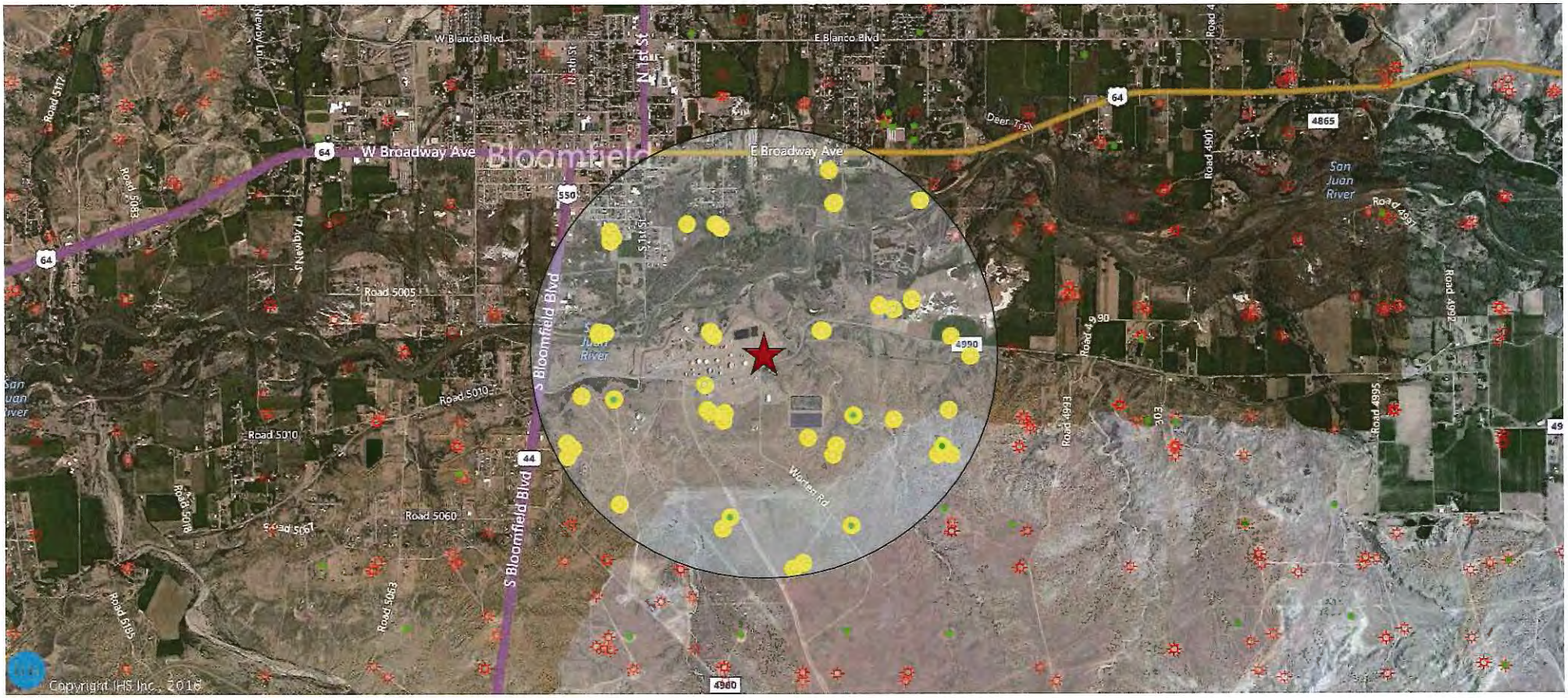
Well Base Map




Well Base Map
29N-11W
20
21
22
23
ASHCROFT SWD #1
DISPOSAL #1
WDW #2
29
28
27
26
32
33
34
35
36
8
9
10
11
12
1
0
1 mi

Western Refining Southwest Inc.

Area of Review 1 mile radius



Enerdeq Browser Date: Jan 29, 2016 Author: JOHN THOMPSON

VI. Tabulation of data of all wells of public record within the AOR which penetrate the proposed injection zone.

The only well that penetrates the proposed injection zone is the Ashcroft 5WD #1 (API# 30-045-30788) located approximately 3/4 miles to the east. The Ashcroft is a SWD well operated by XTO Energy Resources and is completed in the Entrada and Bluff formations.

Tabulation of wells within the 1-mile AOR is below.

Western Refining Southwest, Inc.
Bloomfield Terminal
Waste Disposal Well (WDW) #2
Well List for 1-Mile Area of Review (AOR)

Map Symbol	Production ID	Primary API	Lease Name	Well Num	Operator Name	Location	Latitude	Longitude	Field Name	County Name	Status Name	Prod Zone Name	Lease Code	Oil Cum	Gas Cum	Wtr Cum	TD
O	1300430452519502290	30045251950000	CALVIN	2	BURLINGTON RESOURCES O&G CO LP	29N 11W 26P NW SE SE	36.69244745	-107.9548384	ARMENTA	SAN JUAN	ACTIVE	GALLUP /SD/	006883	56,157	714,731	1,291	5,950
O	1300430452561202290	30045256120000	CALVIN	3	BURLINGTON RESOURCES O&G CO LP	29N 11W 26K SE NE SW	36.69445794	-107.9618893	ARMENTA	SAN JUAN	ACTIVE	GALLUP /SD/	006883	65,478	602,470	1,472	5,970
O	1300430452565702290	30045256570000	CONGRESS	16	BURLINGTON RESOURCES O&G CO LP	29N 11W 34A C NE NE	36.68790014	-107.9716743	ARMENTA	SAN JUAN	ACTIVE	GALLUP /SD/	006918	36,820	464,380	1,283	6,200
O	1300430452567302290	30045256730000	CONGRESS	18	BURLINGTON RESOURCES O&G CO LP	29N 11W 27K NW NE SW	36.69549308	-107.9808835	ARMENTA	SAN JUAN	ACTIVE	GALLUP /SD/	006918	63,095	318,931	1,964	6,150
O	1300430452567377200	30045256730001	CONGRESS	18	BURLINGTON RESOURCES O&G CO LP	29N 11W 27K NW NE SW	36.69549308	-107.9808835	FULCHER KUTZ	SAN JUAN	ACTIVE	PICTURED CLIFFS			95,176	1,056	
O	1300430452567502290	30045256750000	CONGRESS	15	BURLINGTON RESOURCES O&G CO LP	29N 11W 35C SE NE NW	36.6874019	-107.9620229	ARMENTA	SAN JUAN	ACTIVE	GALLUP /SD/	006918	7,534	255,800	1,172	6,030
I	1300430452900296160	30045290020000	DISPOSAL	1	SAN JUAN REFINING COMPANY	29N 11W 27I NW NE SE	36.69640689	-107.9736785	SWD	SAN JUAN	ACTIVE	MESAVERDE					
I	1300430453078896162	30045307880000	ASHCROFT SWD	1	XTO ENERGY INCORPORATED	29N 11W 26B SW NW NE	36.70129353	-107.9586722	SWD	SAN JUAN	ACTIVE	MORROW					
G	2300430450773371599	30045077330000	SULLIVAN GAS COM D	1	XTO ENERGY INCORPORATED	29N 11W 26B SW NW NE	36.70149705	-107.9598182	BASIN	SAN JUAN	ACTIVE	DAKOTA	022839	22,497	2,820,296	4,546	6,260
G	2300430450782571599	30045078250000	DAVIS GAS COM F	1	BP AMERICA PRODUCTION COMPANY	29N 11W 27I SW NE SE	36.69478221	-107.9734791	BASIN	SAN JUAN	INACTIVE	DAKOTA	000410	16,714	2,573,971	211	6,365
G	2300430450783571599	30045078350000	MANGUM	1	BURLINGTON RESOURCES O&G CO LP	29N 11W 27L NE NW SW	36.69567609	-107.9834612	BASIN	SAN JUAN	INACTIVE	DAKOTA	007282	15,187	2,646,060		6,350
G	2300430450783571629	30045078350001	MANGUM	1	BURLINGTON RESOURCES O&G CO LP	29N 11W 27L NE NW SW	36.69567609	-107.9834612	BASIN	SAN JUAN	ACTIVE	FRUITLAND COAL			189,125	25,920	6,350
G	2300430450786871200	30045078680000	SULLIVAN	2	HOLCOMB OIL & GAS INCORPORATED	29N 11W 26H NW SE NE	36.69953095	-107.9541735	AZTEC	SAN JUAN	INACTIVE	FRUITLAND	015829		368,487	716	1,487
G	2300430450790377200	30045079030000	GARLAND B	1	SOUTHERN UNION PRODUCTION COMPANY	29N 11W 27M NE SW SW	36.69234828	-107.9841029	FULCHER KUTZ	SAN JUAN	INACTIVE	PICTURED CLIFFS	251550	10	355,978		1,747
G	2300430450794071599	30045079400000	COOK	1	MANANA GAS INCORPORATED	29N 11W 22N SW SE SW	36.70608404	-107.9811406	BASIN	SAN JUAN	ACTIVE	DAKOTA	006258	41,071	4,343,480	6,176	6,314
G	2300430450795971200	30045079590000	GRACE PEARCE	1	PICKETT JOHN C	29N 11W 22O NE SW SE	36.70664386	-107.9750193	AZTEC	SAN JUAN	INACTIVE	FRUITLAND	009267		804,069		1,620
G	2300430450796171599	30045079610000	HARTMAN	1	MANANA GAS INCORPORATED	29N 11W 22P SE SE	36.70664763	-107.972768	BASIN	SAN JUAN	INACTIVE	DAKOTA	006262	45,556	5,456,777	9,059	6,309
G	2300430450798571200	30045080090000	PAN AMERICAN STATE COM	1	COOK ROY L	29N 11W 23K NE SW	36.71005755	-107.9637286	AZTEC	SAN JUAN	INACTIVE	FRUITLAND	570540		31,853		1,523
G	2300430450798571599	30045079850000	PEARCE GAS COM	1	BP AMERICA PRODUCTION COMPANY	29N 11W 23K NE SW	36.70802867	-107.9633365	BASIN	SAN JUAN	INACTIVE	DAKOTA	000949	12,630	1,695,598	2,187	6,274
G	2300430451200371599	30045120030000	CALVIN	1	BURLINGTON RESOURCES O&G CO LP	29N 11W 26M SW SW	36.6929968	-107.9655043	BASIN	SAN JUAN	ACTIVE	DAKOTA	006883	25,759	3,648,517	7,941	6,450
G	2300430451308971200	30045130890000	COOK	2	MANANA GAS INCORPORATED	29N 11W 22N SE SW	36.70619366	-107.981141	AZTEC	SAN JUAN	ACTIVE	FRUITLAND	006258		845,491	650	1,440
G	2300430452075277200	30045207520000	LEA ANN	1	CHAPARRAL OIL & GAS COMPANY	29N 11W 35E NE SW NW	36.68464683	-107.9667053	FULCHER KUTZ	SAN JUAN	INACTIVE	PICTURED CLIFFS	002529		266,925		1,900
G	2300430452145782329	30045214570000	DELO	10	SOUTHLAND ROYALTY COMPANY LLC	29N 11W 26I SW NE SE	36.69480938	-107.9543218	OTERO	SAN JUAN	ACTIVE	CHACRA	021202		966,707	80	2,908
G	2300430452173277200	30045217320000	GARLAND B	1R	BURLINGTON RESOURCES O&G CO LP	29N 11W 27M NE SW SW	36.69179563	-107.9845498	FULCHER KUTZ	SAN JUAN	INACTIVE	PICTURED CLIFFS	007059	10	863,208	553	
G	2300430452263966627	30045226390000	DELO	11	GENERAL MINERALS CORPORATION	29N 11W 26P NW SE SE	36.69189786	-107.954158	UNDESIGNATED	SAN JUAN	INACTIVE	FARMINGTON	004502	162	124	110	1,945
G	2300430452316382329	30045231630000	EARL B SULLIVAN	1	XTO ENERGY INCORPORATED	29N 11W 26B SE NW NE	36.70182344	-107.9572261	OTERO	SAN JUAN	ACTIVE	CHACRA	022841		745,746	966	2,861
G	2300430452355071629	30045235500001	STATE GAS COM BS	1	HOLCOMB OIL & GAS INCORPORATED	29N 11W 23K SW NE SW	36.7079731	-107.9634048	BASIN	SAN JUAN	ACTIVE	FRUITLAND COAL			672,850	2,934	2,954
G	2300430452355082329	30045235500000	STATE GAS COM BS	1	HOLCOMB OIL & GAS INCORPORATED	29N 11W 23K SW NE SW	36.7079731	-107.9634048	OTERO	SAN JUAN	INACTIVE	CHACRA	022826	505	550,835	3,326	2,954
G	2300430452355482329	30045235540000	DAVIS GAS COM G	1	XTO ENERGY INCORPORATED	29N 11W 27I SW NE SE	36.69465987	-107.9732919	OTERO	SAN JUAN	INACTIVE	CHACRA	022685		337,989	747	2,951
G	2300430452408271599	30045240820000	PEARCE GAS COM	1E	XTO ENERGY INCORPORATED	29N 11W 23J SE NW SE	36.70815961	-107.9565825	BASIN	SAN JUAN	ACTIVE	DAKOTA	022629	3,328	474,351	5,412	6,365
G	2300430452408371599	30045240830000	SULLIVAN GAS COM D	1E	XTO ENERGY INCORPORATED	29N 11W 26F NW SE NW	36.69993082	-107.9642882	BASIN	SAN JUAN	ACTIVE	DAKOTA	022839	6,902	1,458,755	7,940	6,329
G	2300430452408471599	30045240840000	DAVIS GAS COM F	1E	XTO ENERGY INCORPORATED	29N 11W 27H NW SE NE	36.69983513	-107.9731903	BASIN	SAN JUAN	ACTIVE	DAKOTA	023416	4,262	905,546	8,033	6,386
G	2300430452408482329	30045240840000	DAVIS GAS COM F	1E	XTO ENERGY INCORPORATED	29N 11W 27H NW SE NE	36.69983513	-107.9731903	OTERO	SAN JUAN	ACTIVE	CHACRA	023416		451,277	2,457	6,386
G	2300430452457282329	30045245720000	CONGRESS	9	SOUTHLAND ROYALTY COMPANY LLC	29N 11W 26N NW SE SW	36.69192545	-107.9635484	OTERO	SAN JUAN	ACTIVE	CHACRA	021193		233,679	1,485	2,962
G	2300430452457382329	30045245730000	GARLAND	3	SOUTHLAND ROYALTY COMPANY LLC	29N 11W 27M NE SW SW	36.69270239	-107.9844958	OTERO	SAN JUAN	ACTIVE	CHACRA	021914		305,435	1,140	2,905
G	2300430452457482329	30045245740000	SUMMIT	9	BURLINGTON RESOURCES O&G CO LP	29N 11W 34A SW NE NE	36.687182	-107.9722658	OTERO	SAN JUAN	ACTIVE	CHACRA	007557		350,082	1,220	2,992
G	2300430452467371599	30045246730000	MANGUM	1E	BURLINGTON RESOURCES O&G CO LP	29N 11W 27F NW SE NW	36.69973724	-107.9815395	BASIN	SAN JUAN	ACTIVE	DAKOTA	007282	4,830	474,439	2,506	6,240
G	2300430452477271599	30045247720000	CALVIN	1E	BURLINGTON RESOURCES O&G CO LP	29N 11W 26P NW SE SE	36.69192559	-107.9551454	BASIN	SAN JUAN	ACTIVE	DAKOTA	006883	2,986	1,095,534	8,346	6,502
G	2300430452483771599	30045248370000	CONGRESS	4E	BURLINGTON RESOURCES O&G CO LP	29N 11W 35E NE SW NW	36.6849902	-107.9659406	BASIN	SAN JUAN	ACTIVE	DAKOTA	006918	370	160,434	1,661	6,508
G	2300430452483782329	30045248370000	CONGRESS	4E	BURLINGTON RESOURCES O&G CO LP	29N 11W 35E NE SW NW	36.6849902	-107.9659406	OTERO	SAN JUAN	ACTIVE	CHACRA	006918		152,025	2,536	6,508
G	2300430452532971629	30045253290000	DAVIS GAS COM J	1	HOLCOMB OIL & GAS INCORPORATED	29N 11W 26F NW SE NW	36.69991548	-107.9644588	BASIN	SAN JUAN	ACTIVE	FRUITLAND COAL			330,236	27,028	
G	2300430452532972319	30045253290000	DAVIS GAS COM J	1	BP AMERICA PRODUCTION COMPANY	29N 11W 26F NW SE NW	36.69991548	-107.9644588	BLANCO	SAN JUAN	INACTIVE	MESAVERDE	000412	150	619	1,390	4,331
G	2300430452532982329	30045253290000	DAVIS GAS COM J	1	XTO ENERGY INCORPORATED	29N 11W 26F NW SE NW	36.69991548	-107.9644588	OTERO	SAN JUAN	INACTIVE	CHACRA	022601		181,392	893	4,331
G	2300430452562102290	30045256210000	EARL B SULLIVAN	2	HOLCOMB OIL & GAS INCORPORATED	29N 11W 26H SE SE NE	36.69824062	-107.9525892	ARMENTA	SAN JUAN	INACTIVE	GALLUP /SD/	022841	2,426	73,691	657	5,760
G	2300430452562171629	30045256210001	EARL B SULLIVAN	2	HOLCOMB OIL & GAS INCORPORATED	29N 11W 26H SE SE NE	36.69824062	-107.9525892	BASIN	SAN JUAN	ACTIVE	FRUITLAND COAL			320,803	2,137	
G	2300430452570702290	30045257070000	SUMMIT	15	SOUTHLAND ROYALTY COMPANY LLC	29N 11W 34C NE NE NW	36.68874761	-107.9804042	ARMENTA	SAN JUAN	ACTIVE	GALLUP /SD/	021407	5,765	142,149	1,247	6,216
G	2300430452672182329	30045267210000	NANCY HARTMAN	2	MANANA GAS INCORPORATED	29N 11W 22P NW SE SE	36.70637919	-107.9723245	OTERO	SAN JUAN	ACTIVE	CHACRA	006264		325,500	1,244	2,830
G	2300430452673182329	30045267310000	MARY JANE	1	MANANA GAS INCORPORATED	29N 11W 22N SW SE SW	36.70553482	-107.9810701	OTERO	SAN JUAN	ACTIVE	CHACRA	006270		434,028	1,556	2,850
G	2300430452736171200	30045273610000	LAUREN KELLY	1	MANANA GAS INCORPORATED	29N 11W 27F NW SE NW	36.69885569	-107.9820557	AZTEC	SAN JUAN	ACTIVE	FRUITLAND	006268		151,744	1,120	1,500
G	2300430452736582329	30045273650000	MARIAN S	1	MANANA GAS INCORPORATED	29N 11W 27F NW SE NW	36.69966343	-107.9820563	OTERO	SAN JUAN	ACTIVE	CHACRA	006269		166,541	1,900	2,840
I	2300430453078896436	30045307880000	ASHCROFT SWD	1	XTO ENERGY INCORPORATED	29N 11W 26B SW NW NE	36.70129353	-107.9586722	SWD	SAN JUAN	ACTIVE	ENTRADA					
G	2300430453083302290	30045308330001	DAVIS GAS COM F	1R	XTO ENERGY INCORPORATED	29N 11W 27I SW NE SE	36.69461272	-107.9721325	ARMENTA	SAN JUAN	ACTIVE	GALLUP /SD/		3,866	46,691	8,653	
G	2300430453083371599	30045308330000	DAVIS GAS COM F	1R	XTO ENERGY INCORPORATED	29N 11W 27I SW NE SE	36.69461272	-107.9721325	BASIN	SAN JUAN	ACTIVE	DAKOTA		823	226,581	107,818	
G	2300430453111871629	30045311180000	CALVIN	100	BURLINGTON RESOURCES O&G CO LP	29N 11W 26N NW SE SW	36.69257114	-107.9632207	BASIN	SAN JUAN	ACTIVE	FRUITLAND COAL			200,914	9,116	
G	2300430453309371599	30045330930000	CALVIN	1F	BURLINGTON RESOURCES O&G CO LP	29N 11W 26J SW NW SE	36.6942192	-107.9587095	BASIN	SAN JUAN	ACTIVE	DAKOTA		2,529	300,103	15,362	6,525
G	2300430453431271629	30045343120000	ROYAL FLUSH	1	MANANA GAS INCORPORATED	29N 11W 22N W2 SE SW	36.70572753	-107.9808151	BASIN	SAN JUAN	ACTIVE	FRUITLAND COAL			116,412	6,720	1,810
G	2300430453440971629	30045344090000	JACQUE	2	HOLCOMB OIL & GAS INCORPORATED	29N 11W 27H NW SE NE	36.69957456	-107.9729694	BASIN	SAN JUAN	ACTIVE	FRUITLAND COAL			62,853	3,225	1,897
G	2300430453446371629	30045344630000	JACQUE	1	HOLCOMB OIL & GAS INCORPORATED	29N 11W 27L	36.69410423	-107.9721853	BASIN	SAN JUAN	ACTIVE	FRUITLAND COAL			75,123	8,922	1,890

VII. Operation Data

1. A. Average Daily Injection Rate = 3,500 bbls.
   B. Maximum Daily Injection Rate = 8,500 bbls.

2. The system is closed (water will be collected onsite as part of the Bloomfield Terminal's process and pumped over to the injection well).

3. Proposed pressures
   A. The average and maximum injection pressures will be determined from a step rate test run after the well is completed. The anticipated injection pressures are ~ 2000 psi.

4. The fluid to be disposed in the proposed injection well will be Waste Water Treatment System effluent, Evaporation Ponds contact storm water and Injection Well Stimulation and Maintenance fluids. Table 1 contains information about the injection fluid including source, waste type, frequency and discharge volume. Table 2 contains information about the sources on Waste Water Treatment Plant influent. An Analytical Summary of the fluids disposed in Disposal #1 2014 Annual report is presented in Table 3. This summary best characterizes the fluid to be disposed.

Bloomfield Terminal
Western Refining Southwest, Inc.
Proposed Waste Disposal Well (WDW) #2
Sources of Injection Fluids
Table 1

Waste Water Source	Description	Waste Type	Frequency	Discharge Volume
Waste Water Treatment System Effluent	The waste water treatment system processes waste water from terminal. The system consists of three stages : an API Separator, Benzene Strippers and Aeration Lagoons (aka. Aggressive Biological Treatment).[1,2]	Non-Exempt	Routine	October to April - 20 to 50 GPM April to October - 50 to 100 GPM
Contact Storm Water - Evaporation Ponds	Precipitation (storm water) that falls into the evaporation ponds is contained and discharged directly to the WDW #2 injection well.	Non-Exempt	Non-Routine	Dependent on Precipitation
Injection Well Stimulation and Maintenance	Fluids produced from the injection well during stimulation and maintenance operations.	Non-Exempt	Non-Routine	Dependent on scope of work

1. Final waste water treatment consists of Aggressive Biological Treatment (ABT).

2. Process Sewer System conveys waste water from various collection points to the waste water treatment system.

Bloomfield Terminal
Western Refining Southwest, Inc.
Proposed Waste Disposal Well (WDW) #2
Waste Water Treatment Plant Influent
Table 2

Waste Water Source	Description	Waste Type	Frequency	Discharge Volume
Recovered Ground Water	Ground water remediation efforts includes pump and treat remedies. Hydrocarbon impacted water is recovered from multiple recovery wells and the Hammond Ditch French Drain Recovery System. Recovered water containing trace hydrocarbons is discharged to the process sewer system.[1,2]	Non-Exempt	Routine	October to April - 15 to 45 GPM April to October - 30 to 90 GPM
Boiler	Boiler blowdown waste water containing dissolved solids is discharged to the terminal process sewer system.	Non-Exempt	Routine	1,200 gallons per day
Heater Treater at Terminals	Steam is used to separate water from crude oil. Waste water containing trace hydrocarbons and dissolved solids is discharged to process sewer system.	Non-Exempt[3]	Routine	150 gallons per day
Boiler Feed Water Treatment System	Raw water is treated by this system to remove impurities before being supplied as feed water to the boiler system. Waste water from water softening units containing dissolved solids is routinely discharged to the process sewer system.[1]	Non-Exempt	Routine	280 gallons per day
Storage Tanks	Crude and product storage tanks are occasionally drained of bottom/decanted water. Waste water containing trace hydrocarbons and dissolved solids is discharged to the process sewer system.	Non-Exempt[3]	Non-Routine	Dependent on Crude/Product Quality
Recoverable Material	The recoverable material is processed by the API Separator to recover the oil from water.	Non-Exempt[3]	Non-Routine	Dependent of Water Fraction
Process Equipment Cleaning	Wash water used in maintenance of process equipment. Waste water containing trace hydrocarbons and dissolved solids is discharged to the process sewer system.	Non-Exempt	Non-Routine	Dependent on Maintenance Scope and Schedule
Hydrotest Water	Water used for Mechanical Integrity Testing (MIT) of equipment such as Tanks, piping, etc. Waste water containing trace hydrocarbons and dissolved solids is discharged to the process sewer system.	Non-Exempt[3]	Non-Routine	Dependent of MIT Scope and Schedule
Contact Storm Water	Storm water exposed to contaminants by contact with process equipment is contained and discharged to the process sewer system. Contact storm water may contain trace hydrocarbons and dissolved solids.	Non-Exempt	Non-Routine	Dependent on Precipitation

1. Process Sewer System conveys waste water from various collection points to the waste water treatment system.

2. The River Terrace recovered groundwater is treated using a Granular Activated Carbon (GAC) System . The GAC effluent is recycled in the terminal process water system.

3. Bloomfield Terminal is a transportation facility. The exemption of oil and gas exploration and production wastes does not apply to transportation facilities.

Table 3

Injection Well
2014 Quarterly Analytical Summary

	Toxicity Characteristics	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Volatile Organic Compounds *(ug/L)*		1/23/2014		7/28/2014	10/1/2014
1,1,1,2-Tetrachloroethane		< 10	na	< 2.0	< 5.0
1,1,1-Trichloroethane		< 10	na	< 2.0	< 5.0
1,1,2,2-Tetrachloroethane		< 20	na	< 4.0	< 10
1,1,2-Trichloroethane		< 10	na	< 2.0	< 5.0
1,1-Dichloroethane		< 10	na	< 2.0	< 5.0
1,1-Dichloroethene		< 10	na	< 2.0	< 5.0
1,1-Dichloropropene		< 10	na	< 2.0	< 5.0
1,2,3-Trichlorobenzene		< 10	na	< 2.0	< 5.0
1,2,3-Trichloropropane		< 20	na	< 4.0	< 10
1,2,4-Trichlorobenzene		< 10	na	< 2.0	< 5.0
1,2,4-Trimethylbenzene		< 10	na	< 2.0	< 5.0
1,2-Dibromo-3-chloropropane		< 20	na	< 4.0	< 10
1,2-Dibromoethane (EDB)		< 10	na	< 2.0	< 5.0
1,2-Dichlorobenzene		< 10	na	< 2.0	< 5.0
1,2-Dichloroethane (EDC)	500	< 10	na	< 2.0	< 5.0
1,2-Dichloropropane		< 10	na	< 2.0	< 5.0
1,3,5-Trimethylbenzene		< 10	na	< 2.0	< 5.0
1,3-Dichlorobenzene		< 10	na	< 2.0	< 5.0
1,3-Dichloropropane		< 10	na	< 2.0	< 5.0
1,4-Dichlorobenzene	7500	< 10	na	< 2.0	< 5.0
1-Methylnaphthalene		< 40	na	< 8.0	< 20
2,2-Dichloropropane		< 20	na	< 4.0	< 10
2-Butanone		200	na	< 20	< 50
2-Chlorotoluene		< 10	na	< 2.0	< 5.0
2-Hexanone		< 100	na	< 20	< 50
2-Methylnaphthalene		< 40	na	< 8.0	< 20
4-Chlorotoluene		< 10	na	< 2.0	< 5.0
4-Isopropyltoluene		< 10	na	< 2.0	< 5.0
4-Methyl-2-pentanone		< 100	na	< 20	< 50
Acetone		1400	na	85	120
Benzene	500	< 10	na	< 2.0	< 5.0
Bromobenzene		< 10	na	< 2.0	< 5.0
Bromodichloromethane		< 10	na	< 2.0	< 5.0
Bromoform		< 10	na	< 2.0	< 5.0
Bromomethane		< 30	na	< 6.0	< 15
Carbon disulfide		< 100	na	< 20	< 50
Carbon Tetrachloride	500	< 10	na	< 2.0	< 5.0
Chlorobenzene	100000	< 10	na	< 2.0	< 5.0
Chloroethane		< 20	na	< 4.0	< 10
Chloroform	6000	< 10	na	< 2.0	< 5.0
Chloromethane		< 30	na	< 6.0	< 15
cis-1,2-DCE		< 10	na	< 2.0	< 5.0
cis-1,3-Dichloropropene		< 10	na	< 2.0	< 5.0
Dibromochloromethane		< 10	na	< 2.0	< 5.0
Dibromomethane		< 10	na	< 2.0	< 5.0
Dichlorodifluoromethane		< 10	na	< 2.0	< 5.0
Ethylbenzene		< 10	na	< 2.0	< 5.0
Hexachlorobutadiene	500	< 10	na	< 2.0	< 5.0
Isopropylbenzene		< 10	na	< 2.0	< 5.0
Methyl tert-butyl ether (MTBE)		< 10	na	< 2.0	< 5.0
Methylene Chloride		< 30	na	< 6.0	< 15
Naphthalene		< 30	na	< 4.0	< 10
n-Butylbenzene		< 10	na	< 6.0	< 15
n-Propylbenzene		< 20	na	< 2.0	< 5.0
sec-Butylbenzene		< 10	na	< 2.0	< 5.0
Styrene		< 10	na	< 2.0	< 5.0
tert-Butylbenzene		< 10	na	< 2.0	< 5.0
Tetrachloroethene (PCE)		< 10	na	< 2.0	< 5.0
Toluene		< 10	na	< 2.0	< 5.0
trans-1,2-DCE		< 10	na	< 2.0	< 5.0
trans-1,3-Dichloropropene		< 10	na	< 2.0	< 5.0
Trichloroethene (TCE)		< 10	na	< 2.0	< 5.0
Trichlorofluoromethane		< 10	na	< 2.0	< 5.0
Vinyl chloride	200	< 10	na	< 2.0	< 5.0
Xylenes, Total		< 15	na	< 3.0	< 7.5

Table 3

Injection Well
2014 Quarterly Analytical Summary

	Toxicity Characteristics	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Semi-Volatile Organic Compounds *(ug/L)*					
1,2,4-Trichlorobenzene		< 50	na	< 100	< 10
1,2-Dichlorobenzene		< 50	na	< 100	< 10
1,3-Dichlorobenzene		< 50	na	< 100	< 10
1,4-Dichlorobenzene	7500	< 50	na	< 100	< 10
1-Methylnaphthalene		< 50	na	< 100	< 10
2,4,5-Trichlorophenol		< 50	na	< 100	< 10
2,4,6-Trichlorophenol	2000	< 50	na	< 100	< 10
2,4-Dichlorophenol		< 100	na	< 200	< 20
2,4-Dimethylphenol		< 50	na	< 100	< 10
2,4-Dinitrophenol		< 100	na	< 200	< 20
2,4-Dinitrotoluene	130	< 50	na	< 100	< 10
2,6-Dinitrotoluene		< 50	na	< 100	< 10
2-Chloronaphthalene		< 50	na	< 100	< 10
2-Chlorophenol		< 50	na	< 100	< 10
2-Methylnaphthalene		< 50	na	< 100	< 10
2-Methylphenol		< 50	na	< 200	< 20
2-Nitroaniline		< 50	na	< 100	< 10
2-Nitrophenol		< 50	na	< 100	< 10
3,3'-Dichlorobenzidine		< 50	na	210	< 10
3+4-Methylphenol		< 50	na	< 100	< 10
3-Nitroaniline		< 50	na	< 100	< 10
4,6-Dinitro-2-methylphenol		< 100	na	< 200	< 20
4-Bromophenyl phenyl ether		< 50	na	< 100	< 10
4-Chloro-3-methylphenol		< 50	na	< 100	< 10
4-Chloroaniline		< 50	na	< 100	< 10
4-Chlorophenyl phenyl ether		< 50	na	< 100	< 10
4-Nitroaniline		< 50	na	< 100	< 10
4-Nitrophenol		< 50	na	< 100	< 10
Acenaphthene		< 50	na	< 100	< 10
Acenaphthylene		< 50	na	< 100	< 10
Aniline		< 50	na	< 100	< 10
Anthracene		< 50	na	< 100	< 10
Azobenzene		< 50	na	< 100	< 10
Benz(a)anthracene		< 50	na	< 100	< 10
Benzo(a)pyrene		< 50	na	< 100	< 10
Benzo(b)fluoranthene		< 50	na	< 100	< 10
Benzo(g,h,i)perylene		< 50	na	< 100	< 10
Benzo(k)fluoranthene		< 50	na	< 100	< 10
Benzoic acid		< 100	na	< 200	< 40
Benzyl alcohol		< 50	na	< 100	< 10
Bis(2-chloroethoxy)methane		< 50	na	< 100	< 10
Bis(2-chloroethyl)ether		< 50	na	< 100	< 10
Bis(2-chloroisopropyl)ether		< 50	na	< 100	< 10
Bis(2-ethylhexyl)phthalate		< 50	na	< 100	< 10
Butyl benzyl phthalate		< 50	na	< 100	< 10
Carbazole		< 50	na	< 100	< 10
Chrysene		< 50	na	< 100	< 10
Dibenz(a,h)anthracene		< 50	na	< 100	< 10
Dibenzofuran		< 50	na	< 100	< 10
Diethyl phthalate		< 50	na	< 100	< 10
Dimethyl phthalate		< 50	na	< 100	< 10
Di-n-butyl phthalate		< 50	na	< 100	< 10
Di-n-octyl phthalate		< 50	na	< 100	< 20
Fluoranthene		< 50	na	< 100	< 10
Fluorene		< 50	na	< 100	< 10
Hexachlorobenzene	130	< 50	na	< 100	< 10
Hexachlorobutadiene	500	< 50	na	< 100	< 10
Hexachlorocyclopentadiene		< 50	na	< 100	< 10
Hexachloroethane	3000	< 50	na	< 100	< 10
Indeno(1,2,3-cd)pyrene		< 50	na	< 100	< 10
Isophorone		< 50	na	< 100	< 10
Naphthalene		< 50	na	< 100	< 10
Nitrobenzene	2000	< 50	na	< 100	< 10
N-Nitrosodimethylamine		< 50	na	< 100	< 10
N-Nitrosodi-n-propylamine		< 50	na	< 100	< 10
N-Nitrosodiphenylamine		< 50	na	< 100	< 10
Pentachlorophenol	100000	< 100	na	< 200	< 20
Phenanthrene		< 50	na	< 100	< 10
Phenol		< 50	na	< 100	< 10
Pyrene		< 50	na	< 100	< 10
Pyridine	5000	< 50	na	< 100	< 10

Table 3

Injection Well
2014 Quarterly Analytical Summary

	Toxicity Characteristics	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
General Chemistry *(mg/L unless otherwise stated)*					
Specific Conductance *(umhos/cm)*		7100	na	1900	1100
Chloride		2400	na	510	220
Sulfate		35	na	41	26
Total Dissolved Solids		5240	na	1380	742
pH *(pH Units)*		6.25	na	7.10	7.08
Bicarbonate (As CaCO3)		380	na	220	150
Carbonate (As CaCO3)		<2.0	na	<2.0	<2.0
Calcium		490	na	480	110
Magnesium		75	na	99	23
Potassium		37	na	36	8.2
Sodium		1000	na	1100	220
Total Alkalinity (as CaCO3)		380	na	220	150
Total Metals *(mg/L)*					
Arsenic	5.0	< 0.020	na	< 0.020	< 0.020
Barium	100.0	0.56	na	0.63	0.20
Cadmium	1.0	< 0.0020	na	< 0.0020	< 0.0020
Chromium	5.0	< 0.0060	na	< 0.0060	< 0.0060
Lead	5	< 0.0050	na	< 0.0050	< 0.0050
Selenium	1	< 0.050	na	< 0.050	< 0.050
Silver	5	< 0.0050	na	< 0.0050	< 0.0050
Mercury	0.2	< 0.0010	na	< 0.00020	< 0.00020
Ignitability, Corrosivity, and Reactivity					
Reactive Cyanide *(mg/L)*		<1.0	na	<1.0	<1.0
Reactive Sulfide *(mg/kg)*		1.6	na	<1.0	3.0
Ignitability *(° F)*	< 140° F	>200	na	>200	>200
Corrosivity (ph Units)	≤ 2 or ≥ 12.5	6.25	na	7.44	6.82

Notes:
na = A water sample was not collected during the 2nd quarter of 2014 because the well was not operational.

5. A water sample and corresponding water analysis will be provided once the well is perforated and a water sample can be obtained. The closest off set is the Ashcroft SWD #1 (API# 30-045-30788) located approximately 3/4 miles to the east. The Ashcroft is a SWD well operated by XTO Energy Resources and is completed in the Entrada and Bluff formations. The NMOCD records did not containing any data regarding the in-situ water quality found in the Ashcroft SWD #1 prior to injection.

VIII. Geology

Underground Drinking Water Sources

The known fresh water zones for the immediate area of the injection well are the Nacimiento and Ojo Alamo Formations of the Tertiary Age. The Nacimiento occurs at the surface and is about 570 feet thick in the immediate area. The Ojo Alamo is about 165 feet thick at an approximate depth of 569 to 734 feet.

Most of the water wells in the surrounding area are concentrated along the San Juan River flood plain and terraces north of the river and Bloomfield Terminal. These wells are completed in the Quaternary sand and gravels at depth of approximately 25 to 75 feet. These sand and gravels rest upon the Nacimiento.

One well (POD# SJ 02148) in the SE quarter of Section 27, T29N, R11W was drilled to a depth of 305 feet intersecting a water bearing sand within the Nacimiento at 225 to 285 feet with an estimated yield of 10gpm. The surface elevation is approximately 20 feet above the surface at proposed injection well location. The total depth of the well is at an approximate elevation of 5,250 feet. This is the deepest water well drilled in the study area according to the NM State Engineer's Office online records. The Point of Diversion Summary for the well is included (below).

New Mexico Office of the State Engineer
Point of Diversion Summary

POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
	(quarters are 1=NW 2=NE 3=SW 4=SE)						(NAD83 UTM in meters)	
	(quarters are smallest to largest)							
SJ 02148		2	4	27	29N	11W	234448	4065184*

Driller License: 847
Driller Name: SAVAGE, BOB

Drill Start Date:	10/20/1987	**Drill Finish Date:**	11/16/1987	**Plug Date:**	
Log File Date:	11/19/1987	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	10 GPM
Casing Size:	7.00	**Depth Well:**	305 feet	**Depth Water:**	186 feet

Water Bearing Stratifications:	Top	Bottom	Description
	225	285	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	266	305

***UTM location was derived from PLSS - see Help**

Injection Zone

The Entrada Sandstone formation is Jurassic in age and is described as a wind blown deposit with fine to coarse-grained sandstone particles, clean and well sorted. Generally, the Entrada Sandstone formation is 200 to 280 ft thick throughout the San Juan Basin. Natural fractures are few to nonexistent. The overlaying formation is the Todilto Limestone. Cores from the oil bearing portion of the Entrada formation indicate high porosities and permeability's with averages ranging from 22 – 26 percent and 150 – 450 millidarcies respectively. The geologic prognosis and a cross section showing the regional thickness and log characteristics are included (below).

Injection Zone

The Entrada Sandstone formation is Jurassic in age and is described as a wind blown deposit with fine to coarse-grained sandstone particles, clean and well sorted. Generally, the Entrada Sandstone formation is 200 to 280 ft thick throughout the San Juan Basin. Natural fractures are few to nonexistent. The overlaying formation is the Todilto Limestone. Cores from the oil bearing portion of the Entrada formation indicate high porosities and permeability's with averages ranging from 22 – 26 percent and 150 – 450 millidarcies respectively.

The Bluff Sandstone maybe considered as a future injection zone and is not part of this application.

The geologic prognosis and a cross section showing the regional thickness and log characteristics are included (below).

Waste Disposal Well (WDW) #2

Geologic Prognosis **Entrada & Bluff WDW, San Juan County**

Header

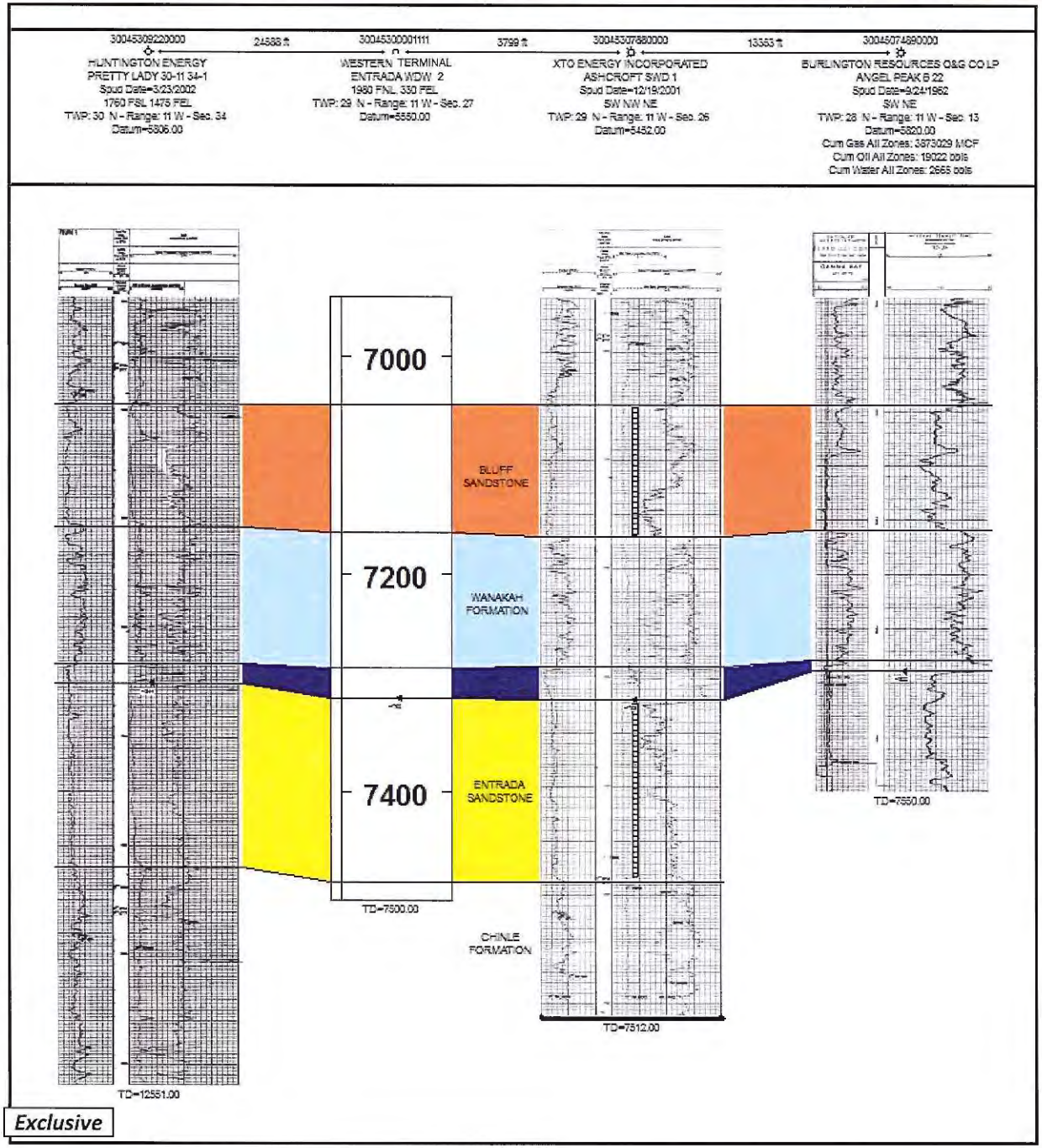
Well Name & Number: **Waste Disposal Well (WDW) #2**
API: Pending Latitude (NAD 83): 36.698499 Objective: **Entrada & Bluff FM Water Disposal** Longitude (NAD 83): -107.971156 Location: TWP: 29 N - Range: 11 W - Sec. 27 Field: Basin
Surface Location Footage: 1980 FNL, 330 FEL County: San Juan
Bottom Hole Location Footage: Same as Surface State: New Mexico Lease: GL Elevation: 5538
Surface Owner: KB Elevation: 5550
Type: **Proposed TD:** 7500 November 25, 2015
Expiration Date: Proposed Plugback: Geologist: Peter Kondrat Depth:

Formation Tops	Top MD (KB)	Top Subsea (KB)	Thickness (FT)	Rock Type	Drilling Notes	Depositional Environment
Quaternary Alluvium	0	5550	10	Unconsolidated Gravels	Boulders, water, lost circulation	Continental Rivers
Naciemento FM	10	5540	505	Shale & Sandstone	Water, gas	Continental Rivers
Ojo Alamo Sandstone	515	5035	110	Sandstone & Shale	Water, gas	Continental Rivers
Kirtland Shale	625	4925	578	Interbeddded Shale, sandstone	Water, gas	Coastal to Alluvial Plain
Fruitland FM	1203	4347	515	Interbeddded Shale, sandstone & coal	Coalbed methane	Coastal Plain
Pictured Cliffs Sandstone	1718	3832	162	Sandstone	Gas, water	Regressive Marine Beach
Lewis Shale	1880	3670	780	Shale, thin limestones	Gas	Offshore Marine
Huerfanito Bentonite Bed	2660	2890	28	Alterted volcanic ash, bentonite bed	Swelling clay	Volcanic Ash Layers
Chacra FM	2688	2862	189	Sandstone, siltstone	Gas, Water	Offshore Marine Sands
Lower Lewis Shale	2877	2673	458	Shale, thin limestones	Gas, Water	Offshore Marine
Cliff House Sandstone	3335	2215	59	Sandstone	Gas, Water, Oil	Transgressive Marine Beach
Menefee Member	3394	2156	643	Interbeddded Shale, sandstone & coal	Gas, Water, Oil	Coastal Plain
Point Lookout Sandstone	4037	1513	386	Sandstone	Gas, Water, Oil	Regressive Marine Beach
Mancos Shale	4423	1127	869	Shale, thin sandstones & siltstones	Gas, Water, Oil	Offshore Marine
Niobrara A	5292	258	102	Interbeddded Shale, sandstone	Oil, Gas, Water	Offshore Marine Sands
Niobrara B	5394	156	123	Interbeddded Shale, sandstone	Oil, Gas, Water	Offshore Marine Sands
Niobrara C	5517	33	82	Interbeddded Shale, sandstone	Oil, Gas, Water	Offshore Marine Sands
Gallup FM	5599	-49	243	Interbeddded Shale, sandstone	Oil, Gas, Water	Regressive Marine to Coastal Deposit
Juana Lopez FM	5842	-292	123	Shale, thin limestones	Oil, Gas, Water	Offshore Marine
Carlile Shale	5965	-415	95	Shale, thin limestones	Oil, Gas, Water	Offshore Marine
Greenhorn Limestone	6060	-510	56	Limestone	Oil, Gas, Water	Offshore Marine
Graneros Shale	6116	-566	33	Shale	Oil, Gas, Water	Offshore Marine
Dakota FM	6149	-599	216	Sandstone, shale & coals	Oil, Gas, Water	Transgressive Coastal Plain to Marine
Burro Canyon FM	6365	-815	46	Sandstones, some conglomerate & mudstone	Oil, Gas, Water	Braided Fluvial Fill
Morrison FM	6411	-861	635	Mudstones, sandstone	Oil, Gas, Water	Continental Rivers
Bluff Sandstone (aka Junction Creek Sandstone), Morrison FM Member	**7046**	**-1496**	**118**	**Sandstone**	**Oil, Gas, Water**	**Alluvial Plain and Eolian**
Wanakah FM	7164	-1614	123	Siltstone, Sandstone	Oil, Gas, Water	Alluvial Plain and Eolian
Todilto Limestone & Anhydrite	7287	-1737	28	Interbedded Limestone & Anhydrite	Oil, Gas, Water, Anyhydrite	Alluvial Plain and Eolian
Entrada Sandstone	**7315**	**-1765**	**168**	**Sandstone**	**Oil, Gas, Water**	**Eolian Sand Dunes**
Chinle FM	7483	-1933	17	Interbeddded Shale, sandstone	Oil, Gas, Water	Continental Rivers
Proposed TD	**7500**	**-1950**		**TD designed for complete log covergage over Entrada Sandstone.**		

Notes: Any significant flow rates, abnormal pressures, lost circulation, sticking, fluid loss or gain immediately notify company man, drilling superintendent and/or drilling engineer.

Regional Bluff & Entrada Sandstones Cross-Section

Western Refining



Exclusive

K4

IX. After the well is drilled, cased and perforated an injectivity test will be performed. If the injection rate is less than 6 BPM prior to parting pressure, the well will be stimulated w/ approximately 222,000 lbs of 20/40 white sand in 110,000 gals of 30# cross linked gel at 50 bpm. Note: actual job design (if needed) will be based on actual results of the injectivity test.

X. All open hole and cased hole logs will be filed with NMOCD once the well is drilled and completed.

XII. Available geologic and engineering data has been examined and no evidence of open faults or any other hydrological connection between the disposal zone, the Entrada Formation, and any underground sources of drinking water, the Nacimiento Formation.

XIII. Based on the information available online as well as information from the "Four Corners Geological Society" there are no known faults located in the area of the proposed well. Natural fractures are few to nonexistent in the Entrada formation. The overlaying formation is the relatively impermeable Todilto Limestone. The closest off set is the Ashcroft SWD #1 (API# 30-045-30788) located approximately ¾ of mile to the east of the proposed injection well. The Ashcroft SWD #1 is a SWD well operated by XTO Energy and is completed in the Bluff and Entrada formations and has no evidence of water migrating out of the injection zones.

XIII. Public Notice will follow NMOCD review of this application.

Appendix C
Injection Fluid Analytical

Table 3

Injection Well
2014 Quarterly Analytical Summary

	Toxicity Characteristics	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Volatile Organic Compounds *(ug/L)*		1/23/2014		7/28/2014	10/1/2014
1,1,1,2-Tetrachloroethane		< 10	na	< 2.0	< 5.0
1,1,1-Trichloroethane		< 10	na	< 2.0	< 5.0
1,1,2,2-Tetrachloroethane		< 20	na	< 4.0	< 10
1,1,2-Trichloroethane		< 10	na	< 2.0	< 5.0
1,1-Dichloroethane		< 10	na	< 2.0	< 5.0
1,1-Dichloroethene		< 10	na	< 2.0	< 5.0
1,1-Dichloropropene		< 10	na	< 2.0	< 5.0
1,2,3-Trichlorobenzene		< 10	na	< 2.0	< 5.0
1,2,3-Trichloropropane		< 20	na	< 4.0	< 10
1,2,4-Trichlorobenzene		< 10	na	< 2.0	< 5.0
1,2,4-Trimethylbenzene		< 10	na	< 2.0	< 5.0
1,2-Dibromo-3-chloropropane		< 20	na	< 4.0	< 10
1,2-Dibromoethane (EDB)		< 10	na	< 2.0	< 5.0
1,2-Dichlorobenzene		< 10	na	< 2.0	< 5.0
1,2-Dichloroethane (EDC)	500	< 10	na	< 2.0	< 5.0
1,2-Dichloropropane		< 10	na	< 2.0	< 5.0
1,3,5-Trimethylbenzene		< 10	na	< 2.0	< 5.0
1,3-Dichlorobenzene		< 10	na	< 2.0	< 5.0
1,3-Dichloropropane		< 10	na	< 2.0	< 5.0
1,4-Dichlorobenzene	7500	< 10	na	< 2.0	< 5.0
1-Methylnaphthalene		< 40	na	< 8.0	< 20
2,2-Dichloropropane		< 20	na	< 4.0	< 10
2-Butanone		200	na	< 20	< 50
2-Chlorotoluene		< 10	na	< 2.0	< 5.0
2-Hexanone		< 100	na	< 20	< 50
2-Methylnaphthalene		< 40	na	< 8.0	< 20
4-Chlorotoluene		< 10	na	< 2.0	< 5.0
4-Isopropyltoluene		< 10	na	< 2.0	< 5.0
4-Methyl-2-pentanone		< 100	na	< 20	< 50
Acetone		1400	na	85	120
Benzene	500	< 10	na	< 2.0	< 5.0
Bromobenzene		< 10	na	< 2.0	< 5.0
Bromodichloromethane		< 10	na	< 2.0	< 5.0
Bromoform		< 10	na	< 2.0	< 5.0
Bromomethane		< 30	na	< 6.0	< 15
Carbon disulfide		< 100	na	< 20	< 50
Carbon Tetrachloride	500	< 10	na	< 2.0	< 5.0
Chlorobenzene	100000	< 10	na	< 2.0	< 5.0
Chloroethane		< 20	na	< 4.0	< 10
Chloroform	6000	< 10	na	< 2.0	< 5.0
Chloromethane		< 30	na	< 6.0	< 15
cis-1,2-DCE		< 10	na	< 2.0	< 5.0
cis-1,3-Dichloropropene		< 10	na	< 2.0	< 5.0
Dibromochloromethane		< 10	na	< 2.0	< 5.0
Dibromomethane		< 10	na	< 2.0	< 5.0
Dichlorodifluoromethane		< 10	na	< 2.0	< 5.0
Ethylbenzene		< 10	na	< 2.0	< 5.0
Hexachlorobutadiene	500	< 10	na	< 2.0	< 5.0
Isopropylbenzene		< 10	na	< 2.0	< 5.0
Methyl tert-butyl ether (MTBE)		< 10	na	< 2.0	< 5.0
Methylene Chloride		< 30	na	< 6.0	< 15
Naphthalene		< 30	na	< 4.0	< 10
n-Butylbenzene		< 10	na	< 6.0	< 15
n-Propylbenzene		< 20	na	< 2.0	< 5.0
sec-Butylbenzene		< 10	na	< 2.0	< 5.0
Styrene		< 10	na	< 2.0	< 5.0
tert-Butylbenzene		< 10	na	< 2.0	< 5.0
Tetrachloroethene (PCE)		< 10	na	< 2.0	< 5.0
Toluene		< 10	na	< 2.0	< 5.0
trans-1,2-DCE		< 10	na	< 2.0	< 5.0
trans-1,3-Dichloropropene		< 10	na	< 2.0	< 5.0
Trichloroethene (TCE)		< 10	na	< 2.0	< 5.0
Trichlorofluoromethane		< 10	na	< 2.0	< 5.0
Vinyl chloride	200	< 10	na	< 2.0	< 5.0
Xylenes, Total		< 15	na	< 3.0	< 7.5

Table 3

Injection Well
2014 Quarterly Analytical Summary

	Toxicity Characteristics	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Semi-Volatile Organic Compounds *(ug/L)*					
1,2,4-Trichlorobenzene		< 50	na	< 100	< 10
1,2-Dichlorobenzene		< 50	na	< 100	< 10
1,3-Dichlorobenzene		< 50	na	< 100	< 10
1,4-Dichlorobenzene	7500	< 50	na	< 100	< 10
1-Methylnaphthalene		< 50	na	< 100	< 10
2,4,5-Trichlorophenol		< 50	na	< 100	< 10
2,4,6-Trichlorophenol	2000	< 50	na	< 100	< 10
2,4-Dichlorophenol		< 100	na	< 200	< 20
2,4-Dimethylphenol		< 50	na	< 100	< 10
2,4-Dinitrophenol		< 100	na	< 200	< 20
2,4-Dinitrotoluene	130	< 50	na	< 100	< 10
2,6-Dinitrotoluene		< 50	na	< 100	< 10
2-Chloronaphthalene		< 50	na	< 100	< 10
2-Chlorophenol		< 50	na	< 100	< 10
2-Methylnaphthalene		< 50	na	< 100	< 10
2-Methylphenol		< 50	na	< 200	< 20
2-Nitroaniline		< 50	na	< 100	< 10
2-Nitrophenol		< 50	na	< 100	< 10
3,3'-Dichlorobenzidine		< 50	na	210	< 10
3+4-Methylphenol		< 50	na	< 100	< 10
3-Nitroaniline		< 50	na	< 100	< 10
4,6-Dinitro-2-methylphenol		< 100	na	< 200	< 20
4-Bromophenyl phenyl ether		< 50	na	< 100	< 10
4-Chloro-3-methylphenol		< 50	na	< 100	< 10
4-Chloroaniline		< 50	na	< 100	< 10
4-Chlorophenyl phenyl ether		< 50	na	< 100	< 10
4-Nitroaniline		< 50	na	< 100	< 10
4-Nitrophenol		< 50	na	< 100	< 10
Acenaphthene		< 50	na	< 100	< 10
Acenaphthylene		< 50	na	< 100	< 10
Aniline		< 50	na	< 100	< 10
Anthracene		< 50	na	< 100	< 10
Azobenzene		< 50	na	< 100	< 10
Benz(a)anthracene		< 50	na	< 100	< 10
Benzo(a)pyrene		< 50	na	< 100	< 10
Benzo(b)fluoranthene		< 50	na	< 100	< 10
Benzo(g,h,i)perylene		< 50	na	< 100	< 10
Benzo(k)fluoranthene		< 50	na	< 100	< 10
Benzoic acid		< 100	na	< 200	< 40
Benzyl alcohol		< 50	na	< 100	< 10
Bis(2-chloroethoxy)methane		< 50	na	< 100	< 10
Bis(2-chloroethyl)ether		< 50	na	< 100	< 10
Bis(2-chloroisopropyl)ether		< 50	na	< 100	< 10
Bis(2-ethylhexyl)phthalate		< 50	na	< 100	< 10
Butyl benzyl phthalate		< 50	na	< 100	< 10
Carbazole		< 50	na	< 100	< 10
Chrysene		< 50	na	< 100	< 10
Dibenz(a,h)anthracene		< 50	na	< 100	< 10
Dibenzofuran		< 50	na	< 100	< 10
Diethyl phthalate		< 50	na	< 100	< 10
Dimethyl phthalate		< 50	na	< 100	< 10
Di-n-butyl phthalate		< 50	na	< 100	< 10
Di-n-octyl phthalate		< 50	na	< 100	< 20
Fluoranthene		< 50	na	< 100	< 10
Fluorene		< 50	na	< 100	< 10
Hexachlorobenzene	130	< 50	na	< 100	< 10
Hexachlorobutadiene	500	< 50	na	< 100	< 10
Hexachlorocyclopentadiene		< 50	na	< 100	< 10
Hexachloroethane	3000	< 50	na	< 100	< 10
Indeno(1,2,3-cd)pyrene		< 50	na	< 100	< 10
Isophorone		< 50	na	< 100	< 10
Naphthalene		< 50	na	< 100	< 10
Nitrobenzene	2000	< 50	na	< 100	< 10
N-Nitrosodimethylamine		< 50	na	< 100	< 10
N-Nitrosodi-n-propylamine		< 50	na	< 100	< 10
N-Nitrosodiphenylamine		< 50	na	< 100	< 10
Pentachlorophenol	100000	< 100	na	< 200	< 20
Phenanthrene		< 50	na	< 100	< 10
Phenol		< 50	na	< 100	< 10
Pyrene		< 50	na	< 100	< 10
Pyridine	5000	< 50	na	< 100	< 10

Table 3

Injection Well
2014 Quarterly Analytical Summary

	Toxicity Characteristics	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
General Chemistry *(mg/L unless otherwise stated)*					
Specific Conductance *(umhos/cm)*		7100	na	1900	1100
Chloride		2400	na	510	220
Sulfate		35	na	41	26
Total Dissolved Solids		5240	na	1380	742
pH *(pH Units)*		6.25	na	7.10	7.08
Bicarbonate (As CaCO3)		380	na	220	150
Carbonate (As CaCO3)		<2.0	na	<2.0	<2.0
Calcium		490	na	480	110
Magnesium		75	na	99	23
Potassium		37	na	36	8.2
Sodium		1000	na	1100	220
Total Alkalinity (as CaCO3)		380	na	220	150
Total Metals *(mg/L)*					
Arsenic	5.0	< 0.020	na	< 0.020	< 0.020
Barium	100.0	0.56	na	0.63	0.20
Cadmium	1.0	< 0.0020	na	< 0.0020	< 0.0020
Chromium	5.0	< 0.0060	na	< 0.0060	< 0.0060
Lead	5	< 0.0050	na	< 0.0050	< 0.0050
Selenium	1	< 0.050	na	< 0.050	< 0.050
Silver	5	< 0.0050	na	< 0.0050	< 0.0050
Mercury	0.2	< 0.0010	na	< 0.00020	< 0.00020
Ignitability, Corrosivity, and Reactivity					
Reactive Cyanide *(mg/L)*		<1.0	na	<1.0	<1.0
Reactive Sulfide *(mg/kg)*		1.6	na	<1.0	3.0
Ignitability *(°F)*	< 140° F	>200	na	>200	>200
Corrosivity (ph Units)	≤2 or ≥ 12.5	6.25	na	7.44	6.82

Notes:
na = A water sample was not collected during the 2nd quarter of 2014 because the well was not operational.

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

February 13, 2014

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

RE: Injection Well 1-23-2014 OrderNo.: 1401A07

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 1 sample(s) on 1/24/2014 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

Analytical Report
Lab Order **1401A07**
Date Reported: **2/13/2014**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Injection Well
Project: Injection Well 1-23-2014
Collection Date: 1/23/2014 8:35:00 AM
Lab ID: 1401A07-001 **Matrix:** AQUEOUS **Received Date:** 1/24/2014 10:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Chloride	2400	100		mg/L	200	1/27/2014 7:14:18 PM	R16337
Sulfate	35	5.0		mg/L	10	1/24/2014 8:01:43 PM	R16313
EPA METHOD 7470: MERCURY						Analyst: **DBD**	
Mercury	ND	0.0010		mg/L	5	1/30/2014 1:52:43 PM	11463
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Arsenic	ND	0.020		mg/L	1	1/29/2014 11:20:46 AM	11432
Barium	0.56	0.020		mg/L	1	1/29/2014 11:20:46 AM	11432
Cadmium	ND	0.0020		mg/L	1	1/29/2014 11:20:46 AM	11432
Calcium	490	5.0		mg/L	5	1/29/2014 11:22:17 AM	11432
Chromium	ND	0.0060		mg/L	1	1/29/2014 11:20:46 AM	11432
Lead	ND	0.0050		mg/L	1	1/29/2014 11:20:46 AM	11432
Magnesium	75	1.0		mg/L	1	1/29/2014 11:20:46 AM	11432
Potassium	37	1.0		mg/L	1	1/29/2014 11:20:46 AM	11432
Selenium	ND	0.050		mg/L	1	1/29/2014 11:20:46 AM	11432
Silver	ND	0.0050		mg/L	1	1/29/2014 11:20:46 AM	11432
Sodium	1000	20		mg/L	20	1/29/2014 11:50:27 AM	11432
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Acenaphthene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Acenaphthylene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Aniline	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Anthracene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Azobenzene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Benz(a)anthracene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Benzo(a)pyrene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Benzo(b)fluoranthene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Benzo(g,h,i)perylene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Benzo(k)fluoranthene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Benzoic acid	ND	100		µg/L	1	1/30/2014 7:14:30 PM	11420
Benzyl alcohol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Bis(2-chloroethoxy)methane	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Bis(2-chloroethyl)ether	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Bis(2-chloroisopropyl)ether	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Bis(2-ethylhexyl)phthalate	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
4-Bromophenyl phenyl ether	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Butyl benzyl phthalate	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Carbazole	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
4-Chloro-3-methylphenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
4-Chloroaniline	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 1-23-2014
Lab ID: 1401A07-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 1/23/2014 8:35:00 AM
Received Date: 1/24/2014 10:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
2-Chloronaphthalene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2-Chlorophenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
4-Chlorophenyl phenyl ether	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Chrysene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Di-n-butyl phthalate	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Di-n-octyl phthalate	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Dibenz(a,h)anthracene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Dibenzofuran	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
1,2-Dichlorobenzene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
1,3-Dichlorobenzene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
1,4-Dichlorobenzene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
3,3'-Dichlorobenzidine	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Diethyl phthalate	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Dimethyl phthalate	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2,4-Dichlorophenol	ND	100		µg/L	1	1/30/2014 7:14:30 PM	11420
2,4-Dimethylphenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
4,6-Dinitro-2-methylphenol	ND	100		µg/L	1	1/30/2014 7:14:30 PM	11420
2,4-Dinitrophenol	ND	100		µg/L	1	1/30/2014 7:14:30 PM	11420
2,4-Dinitrotoluene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2,6-Dinitrotoluene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Fluoranthene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Fluorene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Hexachlorobenzene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Hexachlorobutadiene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Hexachlorocyclopentadiene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Hexachloroethane	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Indeno(1,2,3-cd)pyrene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Isophorone	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
1-Methylnaphthalene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2-Methylnaphthalene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2-Methylphenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
3+4-Methylphenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
N-Nitrosodi-n-propylamine	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
N-Nitrosodimethylamine	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
N-Nitrosodiphenylamine	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Naphthalene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2-Nitroaniline	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
3-Nitroaniline	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
4-Nitroaniline	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420

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
- 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
- O RSD is greater than RSDlimit
- P Sample pH greater than 2.
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 1-23-2014
Lab ID: 1401A07-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 1/23/2014 8:35:00 AM
Received Date: 1/24/2014 10:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Nitrobenzene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2-Nitrophenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
4-Nitrophenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Pentachlorophenol	ND	100		µg/L	1	1/30/2014 7:14:30 PM	11420
Phenanthrene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Phenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Pyrene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Pyridine	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
1,2,4-Trichlorobenzene	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2,4,5-Trichlorophenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
2,4,6-Trichlorophenol	ND	50		µg/L	1	1/30/2014 7:14:30 PM	11420
Surr: 2-Fluorophenol	66.2	22.7-98		%REC	1	1/30/2014 7:14:30 PM	11420
Surr: Phenol-d5	54.5	23.4-74.9		%REC	1	1/30/2014 7:14:30 PM	11420
Surr: 2,4,6-Tribromophenol	97.6	23.3-111		%REC	1	1/30/2014 7:14:30 PM	11420
Surr: Nitrobenzene-d5	86.5	36.8-111		%REC	1	1/30/2014 7:14:30 PM	11420
Surr: 2-Fluorobiphenyl	86.4	38.3-110		%REC	1	1/30/2014 7:14:30 PM	11420
Surr: 4-Terphenyl-d14	73.7	52.1-116		%REC	1	1/30/2014 7:14:30 PM	11420
EPA METHOD 8260B: VOLATILES						Analyst: **DJF**	
Benzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Toluene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Ethylbenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2,4-Trimethylbenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,3,5-Trimethylbenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2-Dichloroethane (EDC)	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2-Dibromoethane (EDB)	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Naphthalene	ND	20		µg/L	10	1/31/2014 3:25:28 PM	R16441
1-Methylnaphthalene	ND	40		µg/L	10	1/31/2014 3:25:28 PM	R16441
2-Methylnaphthalene	ND	40		µg/L	10	1/31/2014 3:25:28 PM	R16441
Acetone	1400	100		µg/L	10	1/31/2014 3:25:28 PM	R16441
Bromobenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Bromodichloromethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Bromoform	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Bromomethane	ND	30		µg/L	10	1/31/2014 3:25:28 PM	R16441
2-Butanone	200	100		µg/L	10	1/31/2014 3:25:28 PM	R16441
Carbon disulfide	ND	100		µg/L	10	1/31/2014 3:25:28 PM	R16441
Carbon Tetrachloride	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Chlorobenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Chloroethane	ND	20		µg/L	10	1/31/2014 3:25:28 PM	R16441

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Injection Well
Project: Injection Well 1-23-2014
Collection Date: 1/23/2014 8:35:00 AM
Lab ID: 1401A07-001 **Matrix:** AQUEOUS **Received Date:** 1/24/2014 10:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **DJF**	
Chloroform	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Chloromethane	ND	30		µg/L	10	1/31/2014 3:25:28 PM	R16441
2-Chlorotoluene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
4-Chlorotoluene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
cis-1,2-DCE	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
cis-1,3-Dichloropropene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2-Dibromo-3-chloropropane	ND	20		µg/L	10	1/31/2014 3:25:28 PM	R16441
Dibromochloromethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Dibromomethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2-Dichlorobenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,3-Dichlorobenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,4-Dichlorobenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Dichlorodifluoromethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,1-Dichloroethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,1-Dichloroethene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2-Dichloropropane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,3-Dichloropropane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
2,2-Dichloropropane	ND	20		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,1-Dichloropropene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Hexachlorobutadiene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
2-Hexanone	ND	100		µg/L	10	1/31/2014 3:25:28 PM	R16441
Isopropylbenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
4-Isopropyltoluene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
4-Methyl-2-pentanone	ND	100		µg/L	10	1/31/2014 3:25:28 PM	R16441
Methylene Chloride	ND	30		µg/L	10	1/31/2014 3:25:28 PM	R16441
n-Butylbenzene	ND	30		µg/L	10	1/31/2014 3:25:28 PM	R16441
n-Propylbenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
sec-Butylbenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Styrene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
tert-Butylbenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,1,1,2-Tetrachloroethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,1,2,2-Tetrachloroethane	ND	20		µg/L	10	1/31/2014 3:25:28 PM	R16441
Tetrachloroethene (PCE)	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
trans-1,2-DCE	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
trans-1,3-Dichloropropene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2,3-Trichlorobenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2,4-Trichlorobenzene	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,1,1-Trichloroethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,1,2-Trichloroethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Injection Well
Project: Injection Well 1-23-2014
Collection Date: 1/23/2014 8:35:00 AM
Lab ID: 1401A07-001 **Matrix:** AQUEOUS **Received Date:** 1/24/2014 10:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **DJF**	
Trichloroethene (TCE)	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Trichlorofluoromethane	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
1,2,3-Trichloropropane	ND	20		µg/L	10	1/31/2014 3:25:28 PM	R16441
Vinyl chloride	ND	10		µg/L	10	1/31/2014 3:25:28 PM	R16441
Xylenes, Total	ND	15		µg/L	10	1/31/2014 3:25:28 PM	R16441
Surr: 1,2-Dichloroethane-d4	100	70-130		%REC	10	1/31/2014 3:25:28 PM	R16441
Surr: 4-Bromofluorobenzene	86.4	70-130		%REC	10	1/31/2014 3:25:28 PM	R16441
Surr: Dibromofluoromethane	98.8	70-130		%REC	10	1/31/2014 3:25:28 PM	R16441
Surr: Toluene-d8	101	70-130		%REC	10	1/31/2014 3:25:28 PM	R16441
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **SRM**	
Conductivity	7100	0.010		µmhos/cm	1	1/24/2014 5:53:17 PM	R16304
SM4500-H+B: PH						Analyst: **SRM**	
pH	6.25	1.68	H	pH units	1	1/24/2014 5:53:17 PM	R16304
SM2320B: ALKALINITY						Analyst: **SRM**	
Bicarbonate (As CaCO3)	380	20		mg/L CaCO3	1	1/24/2014 5:53:17 PM	R16304
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	1/24/2014 5:53:17 PM	R16304
Total Alkalinity (as CaCO3)	380	20		mg/L CaCO3	1	1/24/2014 5:53:17 PM	R16304
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	5240	100	*	mg/L	1	1/28/2014 5:33:00 PM	11406

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

Qualifiers:

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J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	140128036
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1401A07
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	140128036-001	**Sampling Date**	1/23/2014	**Date/Time Received**	1/28/2014 12:18 PM
Client Sample ID	1401A07-001E / INJECTION WELL			**Sampling Time**	8:35 AM
Matrix	Water	**Sample Location**			
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide (reactive)	ND	mg/L	1	2/12/2014	CRW	SW846 CH7	
Flashpoint	>200	°F		2/4/2014	KFG	EPA 1010	
pH	5.89	ph Units		1/31/2014	AJT	EPA 150.1	
Reactive sulfide	1.57	mg/L	1	1/29/2014	AJT	SW846 CH7	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; MT:CERT0026; NM: ID00013; OR:ID200001-002; WA:C585
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

13-Feb-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 1-23-2014

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R16313**	RunNo: **16313**
Prep Date:	Analysis Date: **1/24/2014**	SeqNo: **470380** 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: **R16313**	RunNo: **16313**
Prep Date:	Analysis Date: **1/24/2014**	SeqNo: **470381** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.6	0.50	10.00	0	96.0	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R16337**	RunNo: **16337**
Prep Date:	Analysis Date: **1/27/2014**	SeqNo: **471000** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R16337**	RunNo: **16337**
Prep Date:	Analysis Date: **1/27/2014**	SeqNo: **471001** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	92.6	90	110			

Qualifiers:

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- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

13-Feb-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 1-23-2014

Sample ID **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**	
Client ID: **PBW**	Batch ID: **R16441**	RunNo: **16441**	
Prep Date:	Analysis Date: **1/31/2014**	SeqNo: **474209**	Units: **µg/L**

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

Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

13-Feb-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 1-23-2014

Sample ID **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R16441**	RunNo: **16441**
Prep Date:	Analysis Date: **1/31/2014**	SeqNo: **474209** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	8.4		10.00		84.4	70	130			
Surr: Dibromofluoromethane	9.3		10.00		93.4	70	130			
Surr: Toluene-d8	9.3		10.00		93.0	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R16441**	RunNo: **16441**
Prep Date:	Analysis Date: **1/31/2014**	SeqNo: **474213** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	107	70	130			
Toluene	20	1.0	20.00	0	101	82.2	124			
Chlorobenzene	18	1.0	20.00	0	92.5	70	130			

Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1401A07**

Hall Environmental Analysis Laboratory, Inc.

13-Feb-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 1-23-2014

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R16441**	RunNo: **16441**
Prep Date:	Analysis Date: **1/31/2014**	SeqNo: **474213** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	24	1.0	20.00	0	119	83.5	155			
Trichloroethene (TCE)	19	1.0	20.00	0	93.4	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	8.8		10.00		88.1	70	130			
Surr: Dibromofluoromethane	8.1		10.00		80.7	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

13-Feb-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 1-23-2014

Sample ID **mb-11420**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBW**	Batch ID: **11420**	RunNo: **16402**	
Prep Date: **1/27/2014**	Analysis Date: **1/30/2014**	SeqNo: **473422**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzoic acid	ND	20								
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	10								
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3'-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1401A07**

Hall Environmental Analysis Laboratory, Inc.

13-Feb-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 1-23-2014

Sample ID **mb-11420**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBW**	Batch ID: **11420**	RunNo: **16402**	
Prep Date: **1/27/2014**	Analysis Date: **1/30/2014**	SeqNo: **473422**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	120		200.0		60.4	22.7	98			
Surr: Phenol-d5	91		200.0		45.4	23.4	74.9			
Surr: 2,4,6-Tribromophenol	150		200.0		74.9	23.3	111			
Surr: Nitrobenzene-d5	81		100.0		80.7	36.8	111			
Surr: 2-Fluorobiphenyl	77		100.0		76.6	38.3	110			
Surr: 4-Terphenyl-d14	74		100.0		73.9	52.1	116			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

13-Feb-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 1-23-2014

Sample ID **lcs-11420** SampType: **LCS** TestCode: **EPA Method 8270C: Semivolatiles**

Client ID: **LCSW** Batch ID: **11420** RunNo: **16402**

Prep Date: **1/27/2014** Analysis Date: **1/30/2014** SeqNo: **473423** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	72	10	100.0	0	72.4	48	101			
4-Chloro-3-methylphenol	130	10	200.0	0	67.2	47.9	109			
2-Chlorophenol	70	10	200.0	0	35.0	40	105			S
1,4-Dichlorobenzene	60	10	100.0	0	60.3	40.8	94.3			
2,4-Dinitrotoluene	63	10	100.0	0	63.2	28.3	131			
N-Nitrosodi-n-propylamine	80	10	100.0	0	79.7	46.2	119			
4-Nitrophenol	16	10	200.0	0	8.02	10.5	67.9			S
Pentachlorophenol	31	20	200.0	0	15.5	22.4	81.1			S
Phenol	67	10	200.0	0	33.4	21.4	72.9			
Pyrene	66	10	100.0	0	65.9	46.9	109			
1,2,4-Trichlorobenzene	68	10	100.0	0	67.8	43.1	98.4			
Surr: 2-Fluorophenol	36		200.0		18.0	22.7	98			S
Surr: Phenol-d5	65		200.0		32.3	23.4	74.9			
Surr: 2,4,6-Tribromophenol	72		200.0		36.2	23.3	111			
Surr: Nitrobenzene-d5	74		100.0		73.5	36.8	111			
Surr: 2-Fluorobiphenyl	74		100.0		73.9	38.3	110			
Surr: 4-Terphenyl-d14	80		100.0		80.0	52.1	116			

Sample ID **mb-11513** SampType: **MBLK** TestCode: **EPA Method 8270C: Semivolatiles**

Client ID: **PBW** Batch ID: **11513** RunNo: **16496**

Prep Date: **1/31/2014** Analysis Date: **2/3/2014** SeqNo: **475097** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 2-Fluorophenol	110		200.0		54.9	22.7	98			
Surr: Phenol-d5	93		200.0		46.5	23.4	74.9			
Surr: 2,4,6-Tribromophenol	130		200.0		65.6	23.3	111			
Surr: Nitrobenzene-d5	77		100.0		77.3	36.8	111			
Surr: 2-Fluorobiphenyl	71		100.0		70.6	38.3	110			
Surr: 4-Terphenyl-d14	72		100.0		71.6	52.1	116			

Sample ID **lcs-11513** SampType: **LCS** TestCode: **EPA Method 8270C: Semivolatiles**

Client ID: **LCSW** Batch ID: **11513** RunNo: **16496**

Prep Date: **1/31/2014** Analysis Date: **2/3/2014** SeqNo: **475098** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 2-Fluorophenol	100		200.0		49.8	22.7	98			
Surr: Phenol-d5	85		200.0		42.3	23.4	74.9			
Surr: 2,4,6-Tribromophenol	150		200.0		77.3	23.3	111			
Surr: Nitrobenzene-d5	82		100.0		81.7	36.8	111			
Surr: 2-Fluorobiphenyl	79		100.0		78.7	38.3	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

13-Feb-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 1-23-2014

Sample ID	**lcs-11513**	SampType:	**LCS**		TestCode:	**EPA Method 8270C: Semivolatiles**				
Client ID:	**LCSW**	Batch ID:	**11513**		RunNo:	**16496**				
Prep Date:	**1/31/2014**	Analysis Date:	**2/3/2014**		SeqNo:	**475098**	Units:	**%REC**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	61		100.0		61.4	52.1	116			

Sample ID	**lcsd-11513**	SampType:	**LCSD**		TestCode:	**EPA Method 8270C: Semivolatiles**				
Client ID:	**LCSS02**	Batch ID:	**11513**		RunNo:	**16496**				
Prep Date:	**1/31/2014**	Analysis Date:	**2/3/2014**		SeqNo:	**475099**	Units:	**%REC**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 2-Fluorophenol	110		200.0		54.1	22.7	98	0	0	
Surr: Phenol-d5	90		200.0		44.9	23.4	74.9	0	0	
Surr: 2,4,6-Tribromophenol	160		200.0		79.0	23.3	111	0	0	
Surr: Nitrobenzene-d5	89		100.0		88.8	36.8	111	0	0	
Surr: 2-Fluorobiphenyl	83		100.0		83.1	38.3	110	0	0	
Surr: 4-Terphenyl-d14	70		100.0		70.1	52.1	116	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1401A07**

Hall Environmental Analysis Laboratory, Inc.

13-Feb-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 1-23-2014

Sample ID **MB-11463**	SampType: **MBLK**	TestCode: **EPA Method 7470: Mercury**							
Client ID: **PBW**	Batch ID: **11463**	RunNo: **16401**							
Prep Date: **1/29/2014**	Analysis Date: **1/30/2014**	SeqNo: **473049**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID **LCS-11463**	SampType: **LCS**	TestCode: **EPA Method 7470: Mercury**							
Client ID: **LCSW**	Batch ID: **11463**	RunNo: **16401**							
Prep Date: **1/29/2014**	Analysis Date: **1/30/2014**	SeqNo: **473050**	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	94.3	80	120			

Sample ID **1401A07-001CMS**	SampType: **MS**	TestCode: **EPA Method 7470: Mercury**							
Client ID: **Injection Well**	Batch ID: **11463**	RunNo: **16401**							
Prep Date: **1/29/2014**	Analysis Date: **1/30/2014**	SeqNo: **473069**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0046	0.0010	0.005000	0	91.0	75	125			

Sample ID **1401A07-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 7470: Mercury**							
Client ID: **Injection Well**	Batch ID: **11463**	RunNo: **16401**							
Prep Date: **1/29/2014**	Analysis Date: **1/30/2014**	SeqNo: **473070**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0045	0.0010	0.005000	0	90.1	75	125	1.02	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1401A07**

Hall Environmental Analysis Laboratory, Inc.

13-Feb-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 1-23-2014

Sample ID **MB-11432**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **PBW**	Batch ID: **11432**	RunNo: **16372**
Prep Date: **1/28/2014**	Analysis Date: **1/29/2014**	SeqNo: **472096** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.020								
Barium	ND	0.020								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	ND	0.0050								
Sodium	ND	1.0								

Sample ID **LCS-11432**	SampType: **LCS**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW**	Batch ID: **11432**	RunNo: **16372**
Prep Date: **1/28/2014**	Analysis Date: **1/29/2014**	SeqNo: **472097** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.43	0.020	0.5000	0	85.6	80	120			
Barium	0.43	0.020	0.5000	0	85.5	80	120			
Cadmium	0.42	0.0020	0.5000	0	84.3	80	120			
Calcium	45	1.0	50.00	0	89.1	80	120			
Chromium	0.43	0.0060	0.5000	0	85.3	80	120			
Lead	0.42	0.0050	0.5000	0	84.4	80	120			
Magnesium	45	1.0	50.00	0	90.0	80	120			
Potassium	44	1.0	50.00	0	88.6	80	120			
Selenium	0.42	0.050	0.5000	0	83.4	80	120			
Silver	0.089	0.0050	0.1000	0	88.7	80	120			
Sodium	45	1.0	50.00	0	89.3	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1401A07**

Hall Environmental Analysis Laboratory, Inc.

13-Feb-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 1-23-2014

Sample ID **mb-1**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R16304**	RunNo: **16304**							
Prep Date:	Analysis Date: **1/24/2014**	SeqNo: **470197**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-1**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R16304**	RunNo: **16304**							
Prep Date:	Analysis Date: **1/24/2014**	SeqNo: **470198**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	82	20	80.00	0	103	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

13-Feb-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 1-23-2014

Sample ID **MB-11406**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **11406**	RunNo: **16349**
Prep Date: **1/27/2014**	Analysis Date: **1/28/2014**	SeqNo: **471302** 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-11406**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **11406**	RunNo: **16349**
Prep Date: **1/27/2014**	Analysis Date: **1/28/2014**	SeqNo: **471303** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1010	20.0	1000	0	101	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1401A07** RcptNo: **1**

Received by/date: LM 01/24/14

Logged By: **Michelle Garcia** 1/24/2014 10:15:00 AM Michelle Garcia

Completed By: **Michelle Garcia** 1/24/2014 12:54:49 PM Michelle Garcia

Reviewed By: AT 01/27/14

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 12 (<2 or >12 unless noted)

Adjusted? No

Checked by:

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	1.2	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

X Standard ☐ Level 4 (Full Validation)

☐ Other

X EDD (Type)

Turn-Around Time:

X Standard ☐ Rush

Project Name: **Injection Well**

1-23-2014

Project #:

Project Manager:

Sampler: Bob

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1401A07	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1) TDS	EDB (Method 504.1) Back-up	PAH (8310 or 8270SIMS)	RCRA 8 Metals Ca, Mg, Na, K	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Ignitability	Reactivity, Corrosivity	Ec, pH, SO_4, Alk, Cl	Sulfides	Air Bubbles (Y or N)
1-23-14	8:35	H_2O	Injection Well	5-VOA	HCl	-001										X						
		H_2O	Injection Well	1 - liter	Amber	-001											X					
		H_2O	Injection Well	1-500 ml	Amber	-001				X								X				
		H_2O	Injection Well	1-500 ml	Amber	-001														X		
		H_2O	Injection Well	1-250 ml	H_2SO_4	-001					X											
		H_2O	Injection Well	1-500 ml	HNO_3	-001							X									
		H_2O	Injection Well	1-500 ml	Na OH	-001													X			
		H_2O	Injection Well	1-500 ml	Zn Acutate	-001															X	

Date:	Time:	Relinquished by:	Received by:	Date	Time
1-23-14	1510	Robert Krakow	Christine Walker	1/23/14	1510
1/23/14	1710	Christine Walker		01/24/14	1015

Remarks:

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

August 15, 2014

Kelly Robinson
Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4166
FAX (505) 632-3911

RE: Injection Well 7-28-14 3rd QTR

OrderNo.: 1407D12

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 1 sample(s) on 7/29/2014 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

Analytical Report
Lab Order **1407D12**
Date Reported: **8/15/2014**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Injection Well
Project: Injection Well 7-28-14 3rd QTR
Collection Date: 7/28/2014 9:30:00 AM
Lab ID: 1407D12-001 **Matrix:** AQUEOUS **Received Date:** 7/29/2014 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGP**	
Chloride	510	25		mg/L	50	8/4/2014 5:04:09 PM	R20363
Sulfate	41	2.5		mg/L	5	7/29/2014 4:17:43 PM	R20236
EPA METHOD 7470: MERCURY						Analyst: **MMD**	
Mercury	ND	0.00020		mg/L	1	8/4/2014 2:43:32 PM	14571
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Arsenic	ND	0.020		mg/L	1	8/2/2014 2:09:02 PM	14549
Barium	0.63	0.020		mg/L	1	8/2/2014 2:09:02 PM	14549
Cadmium	ND	0.0020		mg/L	1	8/2/2014 2:09:02 PM	14549
Calcium	480	5.0		mg/L	5	8/2/2014 2:10:49 PM	14549
Chromium	ND	0.0060		mg/L	1	8/2/2014 2:09:02 PM	14549
Lead	ND	0.0050		mg/L	1	8/2/2014 2:09:02 PM	14549
Magnesium	99	1.0		mg/L	1	8/2/2014 2:09:02 PM	14549
Potassium	36	1.0		mg/L	1	8/2/2014 2:09:02 PM	14549
Selenium	ND	0.050		mg/L	1	8/2/2014 2:09:02 PM	14549
Silver	ND	0.0050		mg/L	1	8/2/2014 2:09:02 PM	14549
Sodium	1100	20		mg/L	20	8/2/2014 3:24:50 PM	14549
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Acenaphthene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Acenaphthylene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Aniline	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Anthracene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Azobenzene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Benz(a)anthracene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Benzo(a)pyrene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Benzo(b)fluoranthene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Benzo(g,h,i)perylene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Benzo(k)fluoranthene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Benzoic acid	ND	200		µg/L	1	7/31/2014 8:37:47 PM	14520
Benzyl alcohol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Bis(2-chloroethoxy)methane	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Bis(2-chloroethyl)ether	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Bis(2-chloroisopropyl)ether	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Bis(2-ethylhexyl)phthalate	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
4-Bromophenyl phenyl ether	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Butyl benzyl phthalate	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Carbazole	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
4-Chloro-3-methylphenol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
4-Chloroaniline	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 7-28-14 3rd QTR
Lab ID: 1407D12-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 7/28/2014 9:30:00 AM
Received Date: 7/29/2014 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
2-Chloronaphthalene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2-Chlorophenol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
4-Chlorophenyl phenyl ether	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Chrysene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Di-n-butyl phthalate	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Di-n-octyl phthalate	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Dibenz(a,h)anthracene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Dibenzofuran	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
1,2-Dichlorobenzene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
1,3-Dichlorobenzene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
1,4-Dichlorobenzene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
3,3'-Dichlorobenzidine	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Diethyl phthalate	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Dimethyl phthalate	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2,4-Dichlorophenol	ND	200		µg/L	1	7/31/2014 8:37:47 PM	14520
2,4-Dimethylphenol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
4,6-Dinitro-2-methylphenol	ND	200		µg/L	1	7/31/2014 8:37:47 PM	14520
2,4-Dinitrophenol	ND	200		µg/L	1	7/31/2014 8:37:47 PM	14520
2,4-Dinitrotoluene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2,6-Dinitrotoluene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Fluoranthene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Fluorene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Hexachlorobenzene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Hexachlorobutadiene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Hexachlorocyclopentadiene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Hexachloroethane	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Indeno(1,2,3-cd)pyrene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Isophorone	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
1-Methylnaphthalene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2-Methylnaphthalene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2-Methylphenol	ND	200		µg/L	1	7/31/2014 8:37:47 PM	14520
3+4-Methylphenol	210	100		µg/L	1	7/31/2014 8:37:47 PM	14520
N-Nitrosodi-n-propylamine	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
N-Nitrosodimethylamine	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
N-Nitrosodiphenylamine	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Naphthalene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2-Nitroaniline	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
3-Nitroaniline	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
4-Nitroaniline	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520

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
- 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
- O RSD is greater than RSDlimit
- P Sample pH greater than 2.
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 7-28-14 3rd QTR
Lab ID: 1407D12-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 7/28/2014 9:30:00 AM
Received Date: 7/29/2014 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Nitrobenzene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2-Nitrophenol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
4-Nitrophenol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Pentachlorophenol	ND	200		µg/L	1	7/31/2014 8:37:47 PM	14520
Phenanthrene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Phenol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Pyrene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Pyridine	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
1,2,4-Trichlorobenzene	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2,4,5-Trichlorophenol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
2,4,6-Trichlorophenol	ND	100		µg/L	1	7/31/2014 8:37:47 PM	14520
Surr: 2-Fluorophenol	0	12.1-85.8	S	%REC	1	7/31/2014 8:37:47 PM	14520
Surr: Phenol-d5	0	17.7-65.8	S	%REC	1	7/31/2014 8:37:47 PM	14520
Surr: 2,4,6-Tribromophenol	0	26-138	S	%REC	1	7/31/2014 8:37:47 PM	14520
Surr: Nitrobenzene-d5	0	47.5-119	S	%REC	1	7/31/2014 8:37:47 PM	14520
Surr: 2-Fluorobiphenyl	0	48.1-106	S	%REC	1	7/31/2014 8:37:47 PM	14520
Surr: 4-Terphenyl-d14	0	44-113	S	%REC	1	7/31/2014 8:37:47 PM	14520
EPA METHOD 8260B: VOLATILES						Analyst: **DJF**	
Benzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Toluene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Ethylbenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Methyl tert-butyl ether (MTBE)	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2,4-Trimethylbenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,3,5-Trimethylbenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2-Dichloroethane (EDC)	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2-Dibromoethane (EDB)	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Naphthalene	ND	4.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1-Methylnaphthalene	ND	8.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
2-Methylnaphthalene	ND	8.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Acetone	85	20		µg/L	2	7/31/2014 1:41:17 PM	R20298
Bromobenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Bromodichloromethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Bromoform	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Bromomethane	ND	6.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
2-Butanone	ND	20		µg/L	2	7/31/2014 1:41:17 PM	R20298
Carbon disulfide	ND	20		µg/L	2	7/31/2014 1:41:17 PM	R20298
Carbon Tetrachloride	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Chlorobenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Chloroethane	ND	4.0		µg/L	2	7/31/2014 1:41:17 PM	R20298

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Injection Well
Project: Injection Well 7-28-14 3rd QTR
Collection Date: 7/28/2014 9:30:00 AM
Lab ID: 1407D12-001 **Matrix:** AQUEOUS **Received Date:** 7/29/2014 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **DJF**	
Chloroform	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Chloromethane	ND	6.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
2-Chlorotoluene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
4-Chlorotoluene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
cis-1,2-DCE	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
cis-1,3-Dichloropropene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2-Dibromo-3-chloropropane	ND	4.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Dibromochloromethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Dibromomethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2-Dichlorobenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,3-Dichlorobenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,4-Dichlorobenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Dichlorodifluoromethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,1-Dichloroethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,1-Dichloroethene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2-Dichloropropane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,3-Dichloropropane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
2,2-Dichloropropane	ND	4.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,1-Dichloropropene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Hexachlorobutadiene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
2-Hexanone	ND	20		µg/L	2	7/31/2014 1:41:17 PM	R20298
Isopropylbenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
4-Isopropyltoluene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
4-Methyl-2-pentanone	ND	20		µg/L	2	7/31/2014 1:41:17 PM	R20298
Methylene Chloride	ND	6.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
n-Butylbenzene	ND	6.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
n-Propylbenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
sec-Butylbenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Styrene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
tert-Butylbenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,1,1,2-Tetrachloroethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,1,2,2-Tetrachloroethane	ND	4.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Tetrachloroethene (PCE)	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
trans-1,2-DCE	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
trans-1,3-Dichloropropene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2,3-Trichlorobenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2,4-Trichlorobenzene	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,1,1-Trichloroethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,1,2-Trichloroethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 7-28-14 3rd QTR
Lab ID: 1407D12-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 7/28/2014 9:30:00 AM
Received Date: 7/29/2014 7:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **DJF**	
Trichloroethene (TCE)	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Trichlorofluoromethane	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
1,2,3-Trichloropropane	ND	4.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Vinyl chloride	ND	2.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Xylenes, Total	ND	3.0		µg/L	2	7/31/2014 1:41:17 PM	R20298
Surr: 1,2-Dichloroethane-d4	92.4	70-130		%REC	2	7/31/2014 1:41:17 PM	R20298
Surr: 4-Bromofluorobenzene	95.4	70-130		%REC	2	7/31/2014 1:41:17 PM	R20298
Surr: Dibromofluoromethane	100	70-130		%REC	2	7/31/2014 1:41:17 PM	R20298
Surr: Toluene-d8	93.6	70-130		%REC	2	7/31/2014 1:41:17 PM	R20298
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	1900	0.010		µmhos/cm	1	7/29/2014 12:08:01 PM	R20245
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.10	1.68	H	pH units	1	7/29/2014 12:08:01 PM	R20245
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	220	20		mg/L CaCO3	1	7/29/2014 12:08:01 PM	R20245
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	7/29/2014 12:08:01 PM	R20245
Total Alkalinity (as CaCO3)	220	20		mg/L CaCO3	1	7/29/2014 12:08:01 PM	R20245
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1380	200	*	mg/L	1	7/30/2014 5:19:00 PM	14475

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	140730036
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1407D12
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	140730036-001	**Sampling Date**	7/28/2014	**Date/Time Received**	7/30/2014 12:25 PM
Client Sample ID	1407D12-001E / INJECTION WELL			**Sampling Time**	9:30 AM
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide (reactive)	ND	mg/L	1	8/12/2014	CRW	SW846 CH7	
Flashpoint	>200	°F		8/5/2014	KFG	EPA 1010	
pH	7.44	ph Units		8/5/2014	AJT	SM 4500pH-B	
Reactive sulfide	ND	mg/L	1	8/1/2014	AJT	SW846 CH7	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C586; MT:Cert0095; FL(NELAP): E871099

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 140730036
Project Name: 1407D12

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Reactive sulfide	0.16	mg/L	0.2	80.0	70-130	8/1/2014	8/1/2014
Cyanide (reactive)	0.505	mg/L	0.5	101.0	80-120	8/12/2014	8/12/2014

Lab Control Sample Duplicate

Parameter	LCSD Result	Units	LCSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Reactive sulfide	0.18	mg/L	0.2	90.0	11.8	0-25	8/1/2014	8/1/2014

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
140730036-001	Reactive sulfide	ND	0.22	mg/L	0.2	110.0	70-130	8/1/2014	8/1/2014
140730036-001	Cyanide (reactive)	ND	0.919	mg/L	1	91.9	80-120	8/12/2014	8/12/2014

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide (reactive)	0.906	mg/L	1	90.6	1.4	0-25	8/12/2014	8/12/2014

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide (reactive)	ND	mg/L	1	8/12/2014	8/12/2014
Reactive sulfide	ND	mg/L	1	8/1/2014	8/1/2014

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R20236**	RunNo: **20236**							
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **588153**	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: **R20236**	RunNo: **20236**							
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **588154**	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	97.4	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R20236**	RunNo: **20236**							
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **588211**	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: **R20236**	RunNo: **20236**							
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **588212**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.6	0.50	10.00	0	95.6	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R20363**	RunNo: **20363**							
Prep Date:	Analysis Date: **8/4/2014**	SeqNo: **592146**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R20363**	RunNo: **20363**							
Prep Date:	Analysis Date: **8/4/2014**	SeqNo: **592147**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.2	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R20363**	RunNo: **20363**
Prep Date:	Analysis Date: **8/5/2014**	SeqNo: **592208** Units: **mg/L**

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

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R20363**	RunNo: **20363**
Prep Date:	Analysis Date: **8/5/2014**	SeqNo: **592209** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	93.8	90	110			

Qualifiers:

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- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
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- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **5mL rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R20230**	RunNo: **20230**
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **587928** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.1		10.00		91.3	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		93.2	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.7		10.00		96.7	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R20230**	RunNo: **20230**
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **587930** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.6	70	130			
Surr: 4-Bromofluorobenzene	9.5		10.00		95.4	70	130			
Surr: Dibromofluoromethane	11		10.00		107	70	130			
Surr: Toluene-d8	9.4		10.00		94.3	70	130			

Sample ID **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R20298**	RunNo: **20298**
Prep Date:	Analysis Date: **7/31/2014**	SeqNo: **589943** Units: **µg/L**

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

Qualifiers:

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- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R20298**	RunNo: **20298**
Prep Date:	Analysis Date: **7/31/2014**	SeqNo: **589943** Units: **µg/L**

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

Qualifiers:

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- E Value above quantitation range
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- O RSD is greater than RSDlimit
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- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R20298**	RunNo: **20298**
Prep Date:	Analysis Date: **7/31/2014**	SeqNo: **589943** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.8		10.00		88.2	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.9	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.9		10.00		98.9	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R20298**	RunNo: **20298**
Prep Date:	Analysis Date: **7/31/2014**	SeqNo: **589945** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	102	70	130			
Toluene	21	1.0	20.00	0	107	80	120			
Chlorobenzene	20	1.0	20.00	0	99.3	70	130			
1,1-Dichloroethene	22	1.0	20.00	0	110	82.6	131			
Trichloroethene (TCE)	21	1.0	20.00	0	103	70	130			
Surr: 1,2-Dichloroethane-d4	9.2		10.00		91.6	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	9.4		10.00		94.3	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
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- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **mb-14520**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **14520**	RunNo: **20300**
Prep Date: **7/31/2014**	Analysis Date: **7/31/2014**	SeqNo: **590031** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzoic acid	ND	20								
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	10								
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3'-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								

Qualifiers:

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- B Analyte detected in the associated Method Blank
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QC SUMMARY REPORT

WO#: **1407D12**

Hall Environmental Analysis Laboratory, Inc.

15-Aug-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 7-28-14 3rd QTR

Sample ID **mb-14520**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBW**	Batch ID: **14520**	RunNo: **20300**	
Prep Date: **7/31/2014**	Analysis Date: **7/31/2014**	SeqNo: **590031**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexechloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
1-Methylnaphthelene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	20								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenenthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	130		200.0		66.7	12.1	85.8			
Surr: Phenol-d5	95		200.0		47.4	17.7	65.8			
Surr: 2,4,6-Tribromophenol	170		200.0		86.4	26	138			
Surr: Nitrobenzene-d5	84		100.0		83.6	47.5	119			
Surr: 2-Fluorobiphenyl	84		100.0		83.7	48.1	106			
Surr: 4-Terphenyl-d14	94		100.0		94.5	44	113			

Qualifiers:

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- J Analyte detected below quantitation limits
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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **lcs-14520**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **14520**	RunNo: **20300**
Prep Date: **7/31/2014**	Analysis Date: **7/31/2014**	SeqNo: **590032** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	87	10	100.0	0	87.0	50.3	109			
4-Chloro-3-methylphenol	200	10	200.0	0	99.0	51.2	113			
2-Chlorophenol	190	10	200.0	0	94.9	48.5	104			
1,4-Dichlorobenzene	80	10	100.0	0	79.5	39.5	106			
2,4-Dinitrotoluene	82	10	100.0	0	82.3	45.4	107			
N-Nitrosodi-n-propylamine	91	10	100.0	0	91.0	50.4	119			
4-Nitrophenol	110	10	200.0	0	53.6	15.5	62.2			
Pentachlorophenol	150	20	200.0	0	72.7	23.5	93.5			
Phenol	110	10	200.0	0	54.8	26.8	65.6			
Pyrene	96	10	100.0	0	95.5	54.4	108			
1,2,4-Trichlorobenzene	78	10	100.0	0	78.0	39.9	106			
Surr: 2-Fluorophenol	140		200.0		72.4	12.1	85.8			
Surr: Phenol-d5	100		200.0		52.5	17.7	65.8			
Surr: 2,4,6-Tribromophenol	170		200.0		87.0	26	138			
Surr: Nitrobenzene-d5	100		100.0		101	47.5	119			
Surr: 2-Fluorobiphenyl	96		100.0		96.0	48.1	106			
Surr: 4-Terphenyl-d14	91		100.0		90.9	44	113			

Sample ID **lcsd-14520**	SampType: **LCSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS02**	Batch ID: **14520**	RunNo: **20300**
Prep Date: **7/31/2014**	Analysis Date: **7/31/2014**	SeqNo: **590033** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	77	10	100.0	0	76.5	50.3	109	12.8	27.2	
4-Chloro-3-methylphenol	190	10	200.0	0	93.8	51.2	113	5.37	25.9	
2-Chlorophenol	170	10	200.0	0	84.4	48.5	104	11.7	22.5	
1,4-Dichlorobenzene	73	10	100.0	0	73.3	39.5	106	8.19	24.6	
2,4-Dinitrotoluene	73	10	100.0	0	73.1	45.4	107	11.9	25.3	
N-Nitrosodi-n-propylamine	85	10	100.0	0	84.9	50.4	119	6.98	23.6	
4-Nitrophenol	110	10	200.0	0	52.7	15.5	62.2	1.69	34.7	
Pentachlorophenol	150	20	200.0	0	72.9	23.5	93.5	0.275	32.8	
Phenol	100	10	200.0	0	51.6	26.8	65.6	6.05	25.5	
Pyrene	89	10	100.0	0	88.8	54.4	108	7.31	31.4	
1,2,4-Trichlorobenzene	68	10	100.0	0	68.4	39.9	106	13.1	25.9	
Surr: 2-Fluorophenol	140		200.0		68.8	12.1	85.8	0	0	
Surr: Phenol-d5	110		200.0		53.9	17.7	65.8	0	0	
Surr: 2,4,6-Tribromophenol	170		200.0		86.5	26	138	0	0	
Surr: Nitrobenzene-d5	88		100.0		88.1	47.5	119	0	0	
Surr: 2-Fluorobiphenyl	90		100.0		89.9	48.1	106	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID	**lcsd-14520**	SampType: **LCSD**		TestCode: **EPA Method 8270C: Semivolatiles**					
Client ID:	**LCSS02**	Batch ID: **14520**		RunNo: **20300**					
Prep Date:	**7/31/2014**	Analysis Date: **7/31/2014**		SeqNo: **590033**	Units: **µg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	90		100.0		90.0	44	113	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **1407d12-001b dup**	SampType: **DUP**			TestCode: **SM2510B: Specific Conductance**						
Client ID: **Injection Well**	Batch ID: **R20245**			RunNo: **20245**						
Prep Date:	Analysis Date: **7/29/2014**			SeqNo: **588403**		Units: **µmhos/cm**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	1800	0.010						4.30	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **MB-14571**	SampType: **MBLK**			TestCode: **EPA Method 7470: Mercury**						
Client ID: **PBW**	Batch ID: **14571**			RunNo: **20345**						
Prep Date: **8/4/2014**	Analysis Date: **8/4/2014**			SeqNo: **591482**		Units: **mg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID **LCS-14571**	SampType: **LCS**			TestCode: **EPA Method 7470: Mercury**						
Client ID: **LCSW**	Batch ID: **14571**			RunNo: **20345**						
Prep Date: **8/4/2014**	Analysis Date: **8/4/2014**			SeqNo: **591483**		Units: **mg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	98.9	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **MB-14549**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **PBW**	Batch ID: **14549**	RunNo: **20323**
Prep Date: **8/1/2014**	Analysis Date: **8/2/2014**	SeqNo: **590696** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.020								
Barium	ND	0.020								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	ND	0.0050								
Sodium	ND	1.0								

Sample ID **LCS-14549**	SampType: **LCS**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW**	Batch ID: **14549**	RunNo: **20323**
Prep Date: **8/1/2014**	Analysis Date: **8/2/2014**	SeqNo: **590697** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.50	0.020	0.5000	0	101	80	120			
Barium	0.50	0.020	0.5000	0	99.7	80	120			
Cadmium	0.50	0.0020	0.5000	0	99.7	80	120			
Calcium	ND	1.0	50.00	0	0	80	120			S
Chromium	0.50	0.0060	0.5000	0	100	80	120			
Lead	0.50	0.0050	0.5000	0	99.5	80	120			
Magnesium	ND	1.0	50.00	0	0	80	120			S
Potassium	ND	1.0	50.00	0	0	80	120			S
Selenium	0.52	0.050	0.5000	0	105	80	120			
Silver	0.085	0.0050	0.1000	0	84.9	80	120			
Sodium	ND	1.0	50.00	0	0	80	120			S

Sample ID **LCS Cat-14549**	SampType: **LCS**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW**	Batch ID: **14549**	RunNo: **20323**
Prep Date: **8/1/2014**	Analysis Date: **8/2/2014**	SeqNo: **590698** 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	51	1.0	50.00	0	101	80	120			
Potassium	49	1.0	50.00	0	97.3	80	120			
Sodium	50	1.0	50.00	0	101	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **1407d12-001b dup**	SampType: **DUP**			TestCode: **SM4500-H+B: pH**						
Client ID: **Injection Well**	Batch ID: **R20245**			RunNo: **20245**						
Prep Date:	Analysis Date: **7/29/2014**			SeqNo: **588388**		Units: **pH units**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.11	1.68								H

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **mb-1**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R20245**	RunNo: **20245**							
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **588355**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-1**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R20245**	RunNo: **20245**							
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **588356**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80	20	80.00	0	100	90	110			

Sample ID **mb-2**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R20245**	RunNo: **20245**							
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **588376**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-2**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R20245**	RunNo: **20245**							
Prep Date:	Analysis Date: **7/29/2014**	SeqNo: **588377**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80	20	80.00	0	100	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1407D12**

15-Aug-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-28-14 3rd QTR

Sample ID **MB-14475**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **14475**	RunNo: **20257**
Prep Date: **7/29/2014**	Analysis Date: **7/30/2014**	SeqNo: **588640** 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-14475**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **14475**	RunNo: **20257**
Prep Date: **7/29/2014**	Analysis Date: **7/30/2014**	SeqNo: **588641** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1407D12 RcptNo: 1

Received by/date: AT 07/29/14

Logged By: Anne Thorne 7/29/2014 7:55:00 AM Anne Thorne

Completed By: Anne Thorne 7/29/2014 Anne Thorne

Reviewed By: MG 07/29/14

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: CS

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: Western Refining

Mailing Address: #50 CR 4990
Bloomfield, NM 87413

Phone #: 505-632-4135

email or Fax#:

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush 7-28-14

Project Name: Injection Well 3rd QTR

Project #:

Project Manager:

Sampler: Bob

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. 1407613
7-28-14	9:30	H2O	Injection Well	3-VOA	HCl	-001
				1-liter	amber	-001
				1-500ml	—	-001
				1-500ml	—	-001
				1-250ml	H_2SO_4	-001
				1-500ml	HNO_3	-001
				1-500ml	NaOH	-001
				1-500ml	ZN Acetate	-001

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TDS	Backup	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals Ca, Mg, Na, K	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Ignitability, Corrosivity	Reactivity	Ec, pH, SO_4, Alk, Cl	Sulfides	Air Bubbles (Y or N)
									X						
										X					
											X				
				X									X		
					X										
						X									
												X			
														X	

Date:	Time:	Relinquished by:	Received by:	Date	Time
7-28-14	1452	Robert Krakow	Christine Walls	7/28/14	1452
7/28/14	1724	Christine Walls		07/29/14	0755

Remarks:

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

October 23, 2014

Kelly Robinson
Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4166
FAX (505) 632-3911

RE: Injection Well 4th QTR 10-1-14 OrderNo.: 1410102

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 1 sample(s) on 10/2/2014 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#: **1410102**
Date: **10/23/2014**

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 4th QTR 10-1-14

Analytical Notes Regarding EPA Method 8260:
The injection well sample was diluted due to a foamy matrix.

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 4th QTR 10-1-14
Lab ID: 1410102-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 10/1/2014 10:00:00 AM
Received Date: 10/2/2014 6:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGP**	
Chloride	220	10		mg/L	20	10/2/2014 4:07:13 PM	R21640
Sulfate	26	2.5		mg/L	5	10/2/2014 3:54:49 PM	R21640
EPA METHOD 7470: MERCURY						Analyst: **MMD**	
Mercury	ND	0.00020		mg/L	1	10/8/2014 3:02:49 PM	15770
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **ELS**	
Arsenic	ND	0.020		mg/L	1	10/10/2014 9:26:53 AM	15825
Barium	0.20	0.020		mg/L	1	10/10/2014 9:26:53 AM	15825
Cadmium	ND	0.0020		mg/L	1	10/10/2014 9:26:53 AM	15825
Calcium	110	5.0		mg/L	5	10/10/2014 9:28:28 AM	15825
Chromium	ND	0.0060		mg/L	1	10/10/2014 9:26:53 AM	15825
Lead	ND	0.0050		mg/L	1	10/10/2014 9:26:53 AM	15825
Magnesium	23	1.0		mg/L	1	10/10/2014 9:26:53 AM	15825
Potassium	8.2	1.0		mg/L	1	10/10/2014 9:26:53 AM	15825
Selenium	ND	0.050		mg/L	1	10/10/2014 9:26:53 AM	15825
Silver	ND	0.0050		mg/L	1	10/10/2014 9:26:53 AM	15825
Sodium	220	5.0		mg/L	5	10/10/2014 9:28:28 AM	15825
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Acenaphthene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Acenaphthylene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Aniline	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Anthracene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Azobenzene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Benz(a)anthracene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Benzo(a)pyrene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Benzo(b)fluoranthene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Benzo(k)fluoranthene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Benzoic acid	ND	40		µg/L	1	10/9/2014 9:16:21 PM	15747
Benzyl alcohol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Bis(2-chloroethyl)ether	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Bis(2-ethylhexyl)phthalate	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
4-Bromophenyl phenyl ether	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Butyl benzyl phthalate	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Carbazole	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
4-Chloro-3-methylphenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
4-Chloroaniline	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** Injection Well
Project: Injection Well 4th QTR 10-1-14 **Collection Date:** 10/1/2014 10:00:00 AM
Lab ID: 1410102-001 **Matrix:** AQUEOUS **Received Date:** 10/2/2014 6:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
2-Chloronaphthalene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2-Chlorophenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Chrysene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Di-n-butyl phthalate	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Di-n-octyl phthalate	ND	20		µg/L	1	10/9/2014 9:16:21 PM	15747
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Dibenzofuran	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
1,2-Dichlorobenzene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
1,3-Dichlorobenzene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
1,4-Dichlorobenzene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
3,3'-Dichlorobenzidine	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Diethyl phthalate	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Dimethyl phthalate	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2,4-Dichlorophenol	ND	20		µg/L	1	10/9/2014 9:16:21 PM	15747
2,4-Dimethylphenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
4,6-Dinitro-2-methylphenol	ND	20		µg/L	1	10/9/2014 9:16:21 PM	15747
2,4-Dinitrophenol	ND	20		µg/L	1	10/9/2014 9:16:21 PM	15747
2,4-Dinitrotoluene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2,6-Dinitrotoluene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Fluoranthene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Fluorene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Hexachlorobenzene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Hexachlorobutadiene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Hexachlorocyclopentadiene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Hexachloroethane	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Isophorone	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
1-Methylnaphthalene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2-Methylnaphthalene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2-Methylphenol	ND	20		µg/L	1	10/9/2014 9:16:21 PM	15747
3+4-Methylphenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
N-Nitrosodimethylamine	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
N-Nitrosodiphenylamine	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Naphthalene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2-Nitroaniline	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
3-Nitroaniline	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
4-Nitroaniline	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** Injection Well
Project: Injection Well 4th QTR 10-1-14 **Collection Date:** 10/1/2014 10:00:00 AM
Lab ID: 1410102-001 **Matrix:** AQUEOUS **Received Date:** 10/2/2014 6:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Nitrobenzene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2-Nitrophenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
4-Nitrophenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Pentachlorophenol	ND	20		µg/L	1	10/9/2014 9:16:21 PM	15747
Phenanthrene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Phenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Pyrene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Pyridine	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
1,2,4-Trichlorobenzene	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2,4,5-Trichlorophenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
2,4,6-Trichlorophenol	ND	10		µg/L	1	10/9/2014 9:16:21 PM	15747
Surr: 2-Fluorophenol	59.4	12.1-85.8		%REC	1	10/9/2014 9:16:21 PM	15747
Surr: Phenol-d5	52.8	17.7-65.8		%REC	1	10/9/2014 9:16:21 PM	15747
Surr: 2,4,6-Tribromophenol	83.8	26-138		%REC	1	10/9/2014 9:16:21 PM	15747
Surr: Nitrobenzene-d5	76.3	47.5-119		%REC	1	10/9/2014 9:16:21 PM	15747
Surr: 2-Fluorobiphenyl	68.0	48.1-106		%REC	1	10/9/2014 9:16:21 PM	15747
Surr: 4-Terphenyl-d14	69.3	44-113		%REC	1	10/9/2014 9:16:21 PM	15747
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Toluene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Ethylbenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2,4-Trimethylbenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,3,5-Trimethylbenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2-Dichloroethane (EDC)	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2-Dibromoethane (EDB)	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Naphthalene	ND	10		µg/L	5	10/3/2014 10:52:10 PM	R21653
1-Methylnaphthalene	ND	20		µg/L	5	10/3/2014 10:52:10 PM	R21653
2-Methylnaphthalene	ND	20		µg/L	5	10/3/2014 10:52:10 PM	R21653
Acetone	120	50		µg/L	5	10/3/2014 10:52:10 PM	R21653
Bromobenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Bromodichloromethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Bromoform	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Bromomethane	ND	15		µg/L	5	10/3/2014 10:52:10 PM	R21653
2-Butanone	ND	50		µg/L	5	10/3/2014 10:52:10 PM	R21653
Carbon disulfide	ND	50		µg/L	5	10/3/2014 10:52:10 PM	R21653
Carbon Tetrachloride	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Chlorobenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Chloroethane	ND	10		µg/L	5	10/3/2014 10:52:10 PM	R21653

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 4th QTR 10-1-14
Lab ID: 1410102-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 10/1/2014 10:00:00 AM
Received Date: 10/2/2014 6:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Chloroform	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Chloromethane	ND	15		µg/L	5	10/3/2014 10:52:10 PM	R21653
2-Chlorotoluene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
4-Chlorotoluene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
cis-1,2-DCE	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
cis-1,3-Dichloropropene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2-Dibromo-3-chloropropane	ND	10		µg/L	5	10/3/2014 10:52:10 PM	R21653
Dibromochloromethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Dibromomethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2-Dichlorobenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,3-Dichlorobenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,4-Dichlorobenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Dichlorodifluoromethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,1-Dichloroethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,1-Dichloroethene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2-Dichloropropane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,3-Dichloropropane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
2,2-Dichloropropane	ND	10		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,1-Dichloropropene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Hexachlorobutadiene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
2-Hexanone	ND	50		µg/L	5	10/3/2014 10:52:10 PM	R21653
Isopropylbenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
4-Isopropyltoluene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
4-Methyl-2-pentanone	ND	50		µg/L	5	10/3/2014 10:52:10 PM	R21653
Methylene Chloride	ND	15		µg/L	5	10/3/2014 10:52:10 PM	R21653
n-Butylbenzene	ND	15		µg/L	5	10/3/2014 10:52:10 PM	R21653
n-Propylbenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
sec-Butylbenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Styrene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
tert-Butylbenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,1,2,2-Tetrachloroethane	ND	10		µg/L	5	10/3/2014 10:52:10 PM	R21653
Tetrachloroethene (PCE)	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
trans-1,2-DCE	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
trans-1,3-Dichloropropene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2,3-Trichlorobenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2,4-Trichlorobenzene	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,1,1-Trichloroethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,1,2-Trichloroethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 4th QTR 10-1-14
Lab ID: 1410102-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 10/1/2014 10:00:00 AM
Received Date: 10/2/2014 6:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Trichloroethene (TCE)	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Trichlorofluoromethane	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
1,2,3-Trichloropropane	ND	10		µg/L	5	10/3/2014 10:52:10 PM	R21653
Vinyl chloride	ND	5.0		µg/L	5	10/3/2014 10:52:10 PM	R21653
Xylenes, Total	ND	7.5		µg/L	5	10/3/2014 10:52:10 PM	R21653
Surr: 1,2-Dichloroethane-d4	82.3	70-130		%REC	5	10/3/2014 10:52:10 PM	R21653
Surr: 4-Bromofluorobenzene	84.8	70-130		%REC	5	10/3/2014 10:52:10 PM	R21653
Surr: Dibromofluoromethane	79.9	70-130		%REC	5	10/3/2014 10:52:10 PM	R21653
Surr: Toluene-d8	84.8	70-130		%REC	5	10/3/2014 10:52:10 PM	R21653
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	1100	0.010		µmhos/cm	1	10/6/2014 5:51:56 PM	R21715
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.08	1.68	H	pH units	1	10/6/2014 5:51:56 PM	R21715
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	150	20		mg/L CaCO3	1	10/6/2014 5:51:56 PM	R21715
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	10/6/2014 5:51:56 PM	R21715
Total Alkalinity (as CaCO3)	150	20		mg/L CaCO3	1	10/6/2014 5:51:56 PM	R21715
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	742	40.0	*	mg/L	1	10/8/2014 4:42:00 PM	15759

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
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
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	141003043
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1410102
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	141003043-001	**Sampling Date**	10/1/2014	**Date/Time Received**	10/3/2014 1:30 PM
Client Sample ID	1410102-001E / INJECTION WELL			**Sampling Time**	10:00 AM
Matrix	Water	**Sample Location**			
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide (reactive)	ND	mg/L	1	10/15/2014	CRW	SW846 CH7	
Flashpoint	>200	°F		10/15/2014	KFG	EPA 1010	
pH	6.82	ph Units		10/8/2014	KJS	SM 4500pH-B	
Reactive sulfide	3.01	mg/L	1	10/15/2014	HSW	SW846 CH7	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	141003043
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1410102
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Reactive sulfide	0.180	mg/L	0.2	90.0	70-130	10/15/2014	10/15/2014
Cyanide (reactive)	0.519	mg/L	0.5	103.8	80-120	10/15/2014	10/15/2014

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
141003043-001	Reactive sulfide	3.01	3.77	mg/L	0.767	99.1	70-130	10/15/2014	10/15/2014
141003043-001	Cyanide (reactive)	ND	2.41	mg/L	2.5	96.4	80-120	10/15/2014	10/15/2014

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide (reactive)	2.41	mg/L	2.5	96.4	0.0	0-25	10/15/2014	10/15/2014

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide (reactive)	ND	mg/L	1	10/15/2014	10/15/2014
Reactive sulfide	ND	mg/L	1	10/15/2014	10/15/2014

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

QC SUMMARY REPORT

WO#: **1410102**

Hall Environmental Analysis Laboratory, Inc.

23-Oct-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 4th QTR 10-1-14

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R21640**	RunNo: **21640**							
Prep Date:	Analysis Date: **10/2/2014**	SeqNo: **634799**	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: **R21640**	RunNo: **21640**							
Prep Date:	Analysis Date: **10/2/2014**	SeqNo: **634800**	Units: **mg/L**						

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.0	90	110			
Sulfate	9.7	0.50	10.00	0	96.8	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **5ml-rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**	
Client ID: **PBW**	Batch ID: **R21653**	RunNo: **21653**	
Prep Date:	Analysis Date: **10/3/2014**	SeqNo: **636225**	Units: **µg/L**

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **5ml-rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R21653**	RunNo: **21653**
Prep Date:	Analysis Date: **10/3/2014**	SeqNo: **636225** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.0		10.00		80.4	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	8.0		10.00		80.5	70	130			
Surr: Toluene-d8	8.9		10.00		89.4	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R21653**	RunNo: **21653**
Prep Date:	Analysis Date: **10/3/2014**	SeqNo: **636227** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.4	70	130			
Toluene	20	1.0	20.00	0	98.8	80	120			
Chlorobenzene	20	1.0	20.00	0	97.9	70	130			

Qualifiers:

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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R21653**	RunNo: **21653**
Prep Date:	Analysis Date: **10/3/2014**	SeqNo: **636227** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	21	1.0	20.00	0	105	82.6	131			
Trichloroethene (TCE)	19	1.0	20.00	0	96.9	70	130			
Surr: 1,2-Dichloroethane-d4	8.5		10.00		84.9	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		97.7	70	130			
Surr: Dibromofluoromethane	8.0		10.00		79.7	70	130			
Surr: Toluene-d8	9.1		10.00		91.1	70	130			

Qualifiers:

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- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
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- P Sample pH greater than 2.
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QC SUMMARY REPORT

WO#: **1410102**

Hall Environmental Analysis Laboratory, Inc.

23-Oct-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 4th QTR 10-1-14

Sample ID **mb-15747**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBW**	Batch ID: **15747**	RunNo: **21803**	
Prep Date: **10/7/2014**	Analysis Date: **10/9/2014**	SeqNo: **640784**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzoic acid	ND	40								
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	10								
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	20								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3'-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								

Qualifiers:

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QC SUMMARY REPORT

WO#: **1410102**

Hall Environmental Analysis Laboratory, Inc.

23-Oct-14

Client: Western Refining Southwest, Inc.
Project: Injection Well 4th QTR 10-1-14

Sample ID **mb-15747**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **PBW**	Batch ID: **15747**	RunNo: **21803**	
Prep Date: **10/7/2014**	Analysis Date: **10/9/2014**	SeqNo: **640784**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	20								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	140		200.0		68.8	12.1	85.8			
Surr: Phenol-d5	130		200.0		64.5	17.7	65.8			
Surr: 2,4,6-Tribromophenol	130		200.0		66.6	26	138			
Surr: Nitrobenzene-d5	79		100.0		79.4	47.5	119			
Surr: 2-Fluorobiphenyl	75		100.0		75.3	48.1	106			
Surr: 4-Terphenyl-d14	74		100.0		74.3	44	113			

Qualifiers:

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- B Analyte detected in the associated Method Blank
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **lcs-15747** SampType: **LCS** TestCode: **EPA Method 8270C: Semivolatiles**

Client ID: **LCSW** Batch ID: **15747** RunNo: **21803**

Prep Date: **10/7/2014** Analysis Date: **10/9/2014** SeqNo: **640785** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	77	10	100.0	0	76.7	47.9	114			
4-Chloro-3-methylphenol	180	10	200.0	0	88.1	51.7	122			
2-Chlorophenol	170	10	200.0	0	83.0	40.7	113			
1,4-Dichlorobenzene	70	10	100.0	0	70.4	39.6	99.9			
2,4-Dinitrotoluene	69	10	100.0	0	68.9	40.8	113			
N-Nitrosodi-n-propylamine	81	10	100.0	0	81.2	51.2	111			
4-Nitrophenol	130	10	200.0	0	64.1	15.7	86.9			
Pentachlorophenol	120	20	200.0	0	59.2	21.6	104			
Phenol	140	10	200.0	0	71.0	28.6	71.7			
Pyrene	73	10	100.0	0	73.1	54.2	128			
1,2,4-Trichlorobenzene	71	10	100.0	0	71.2	40.9	101			
Surr: 2-Fluorophenol	150		200.0		73.2	12.1	85.8			
Surr: Phenol-d5	140		200.0		71.8	17.7	65.8			S
Surr: 2,4,6-Tribromophenol	140		200.0		70.9	26	138			
Surr: Nitrobenzene-d5	83		100.0		83.4	47.5	119			
Surr: 2-Fluorobiphenyl	0.46		100.0		0.460	48.1	106			S
Surr: 4-Terphenyl-d14	75		100.0		75.1	44	113			

Sample ID **lcsd-15747** SampType: **LCSD** TestCode: **EPA Method 8270C: Semivolatiles**

Client ID: **LCSS02** Batch ID: **15747** RunNo: **21803**

Prep Date: **10/7/2014** Analysis Date: **10/9/2014** SeqNo: **640786** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	79	10	100.0	0	78.8	47.9	114	2.60	27.2	
4-Chloro-3-methylphenol	190	10	200.0	0	94.7	51.7	122	7.26	25.9	
2-Chlorophenol	160	10	200.0	0	80.2	40.7	113	3.52	22.5	
1,4-Dichlorobenzene	74	10	100.0	0	73.7	39.6	99.9	4.50	24.6	
2,4-Dinitrotoluene	73	10	100.0	0	73.1	40.8	113	6.00	25.3	
N-Nitrosodi-n-propylamine	79	10	100.0	0	79.0	51.2	111	2.82	23.6	
4-Nitrophenol	140	10	200.0	0	69.4	15.7	86.9	7.95	34.7	
Pentachlorophenol	120	20	200.0	0	61.6	21.6	104	4.01	32.8	
Phenol	140	10	200.0	0	68.3	28.6	71.7	3.88	25.5	
Pyrene	79	10	100.0	0	78.8	54.2	128	7.56	31.4	
1,2,4-Trichlorobenzene	76	10	100.0	0	75.7	40.9	101	6.10	25.9	
Surr: 2-Fluorophenol	150		200.0		73.3	12.1	85.8	0	0	
Surr: Phenol-d5	140		200.0		72.3	17.7	65.8	0	0	S
Surr: 2,4,6-Tribromophenol	140		200.0		70.9	26	138	0	0	
Surr: Nitrobenzene-d5	88		100.0		88.0	47.5	119	0	0	
Surr: 2-Fluorobiphenyl	83		100.0		83.2	48.1	106	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **lcsd-15747**	SampType: **LCSD**	TestCode: **EPA Method 8270C: Semivolatiles**	
Client ID: **LCSS02**	Batch ID: **15747**	RunNo: **21803**	
Prep Date: **10/7/2014**	Analysis Date: **10/9/2014**	SeqNo: **640786**	Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	81		100.0		80.9	44	113	0	0	

Qualifiers:

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- B Analyte detected in the associated Method Blank
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- P Sample pH greater than 2.
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **MB-15770**	SampType: **MBLK**	TestCode: **EPA Method 7470: Mercury**
Client ID: **PBW**	Batch ID: **15770**	RunNo: **21753**
Prep Date: **10/7/2014**	Analysis Date: **10/8/2014**	SeqNo: **639033** Units: **mg/L**

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

Sample ID **LCS-15770**	SampType: **LCS**	TestCode: **EPA Method 7470: Mercury**
Client ID: **LCSW**	Batch ID: **15770**	RunNo: **21753**
Prep Date: **10/7/2014**	Analysis Date: **10/8/2014**	SeqNo: **639034** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0051	0.00020	0.005000	0	103	80	120			

Qualifiers:

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- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
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- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **MB-15825**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **PBW**	Batch ID: **15825**	RunNo: **21801**
Prep Date: **10/9/2014**	Analysis Date: **10/10/2014**	SeqNo: **640639** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.020								
Barium	ND	0.020								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	0.010	0.0050								
Sodium	ND	1.0								

Sample ID **LCS-15825**	SampType: **LCS**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW**	Batch ID: **15825**	RunNo: **21801**
Prep Date: **10/9/2014**	Analysis Date: **10/10/2014**	SeqNo: **640640** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.52	0.020	0.5000	0	104	80	120			
Barium	0.49	0.020	0.5000	0	98.9	80	120			
Cadmium	0.49	0.0020	0.5000	0	98.9	80	120			
Calcium	52	1.0	50.00	0	104	80	120			
Chromium	0.48	0.0060	0.5000	0	96.8	80	120			
Lead	0.49	0.0050	0.5000	0	97.6	80	120			
Magnesium	51	1.0	50.00	0	103	80	120			
Potassium	49	1.0	50.00	0	98.8	80	120			
Selenium	0.50	0.050	0.5000	0	100	80	120			
Silver	0.10	0.0050	0.1000	0	102	80	120			B
Sodium	51	1.0	50.00	0	101	80	120			

Qualifiers:

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- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **mb-1**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**
Client ID: **PBW**	Batch ID: **R21715**	RunNo: **21715**
Prep Date:	Analysis Date: **10/6/2014**	SeqNo: **637458** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-1**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**
Client ID: **LCSW**	Batch ID: **R21715**	RunNo: **21715**
Prep Date:	Analysis Date: **10/6/2014**	SeqNo: **637459** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	83	20	80.00	0	103	90	110			

Sample ID **mb-2**	SampType: **MBLK**	TestCode: **SM2320B: Alkalinity**
Client ID: **PBW**	Batch ID: **R21715**	RunNo: **21715**
Prep Date:	Analysis Date: **10/6/2014**	SeqNo: **637474** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID **lcs-2**	SampType: **LCS**	TestCode: **SM2320B: Alkalinity**
Client ID: **LCSW**	Batch ID: **R21715**	RunNo: **21715**
Prep Date:	Analysis Date: **10/6/2014**	SeqNo: **637475** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	81	20	80.00	0	102	90	110			

Qualifiers:

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- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
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- P Sample pH greater than 2.
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1410102**

23-Oct-14

Client: Western Refining Southwest, Inc.

Project: Injection Well 4th QTR 10-1-14

Sample ID **MB-15759**	SampType: **MBLK**			TestCode: **SM2540C MOD: Total Dissolved Solids**						
Client ID: **PBW**	Batch ID: **15759**			RunNo: **21752**						
Prep Date: **10/7/2014**	Analysis Date: **10/8/2014**			SeqNo: **638741**		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-15759**	SampType: **LCS**			TestCode: **SM2540C MOD: Total Dissolved Solids**						
Client ID: **LCSW**	Batch ID: **15759**			RunNo: **21752**						
Prep Date: **10/7/2014**	Analysis Date: **10/8/2014**			SeqNo: **638742**		Units: **mg/L**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1010	20.0	1000	0	101	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2.
- RL Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1410102 RcptNo: 1

Received by/date: LM 10/02/14

Logged By: Anne Thorne 10/2/2014 6:50:00 AM Anne Thorne

Completed By: Anne Thorne 10/2/2014 Anne Thorne

Reviewed By: 10/02/14

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: 2,12 (<2 or >12 unless noted)

Adjusted? NO

Checked by:

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	1.3	Good	Yes			

Chain-of-Custody Record

Client: Western Refining

Mailing Address: #50 CR 4990
Bloomfield NM 87413

Phone #: 505-632-4135

email or Fax#:

QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: 10-1-14
Injection Well 4th QTR

Project #:

Project Manager:

Sampler: Bob
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.5

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. 1410052
10-1-14	10:00	H_2O	Inj. well	3-VOA	HCl	-001
				1-Liter	amber	-002
				1-500ml		-003
				1-500ml		-004
				1-125 ml	H_2SO_4	-005
				1-500 ml	HNO_3	-006
				1-500ml	NaOH	-007
				1-500 ml	ZN-Acetate	-008

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	[redacted] TDS	[redacted] Back up	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals Ca, Mg, Na, K	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Ignitability, Corrosivity	Reactivity	Ec, pH, SO_4, Alk, Cl	Sulfides	Air Bubbles (Y or N)
									X						
										X					
											X				
				X									X		
					X										
						X									
												X			
														X	

Date:	Time:	Relinquished by:	Received by:	Date	Time
10-1-14	1421	Robert Krakow	Mustin Walter	10/1/14	1421
10/1/14	1815	Mustin Walter		10/02/14	0850

Remarks:

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.

Appendix D
Closure Plan

Western Refinery Southwest Inc.
Bloomfield Terminal
Waste Disposal Well (WDW) #2

Closure Plan

In accordance with Rule 19.15.25 NMAC the following information describes the possible closure plan which would entail plugging and abandoning the proposed well bore and reclaiming the surface location to pre-drill status. This is Western's standard closure procedure.

All closure activities will include proper documentation and be available for review upon request. All required paperwork (sundry notices) will be submitted to NMOCD for approval prior to any field work taking place. All plug and abandon activities are intended to protect fresh water, public health and the environment.

General Plan

1. Notify NMOCD
2. Note: verify all cement volumes based on actual slurry to be pumped.
3. Review any COA's from NMOCD

Procedure

1 Move-in, rig up pulling unit. Pump & pit. Half tank for cement returns.
2 Hold safety meeting with rig crew and related personnel explaining the procedure and outlining potential hazards.
3 ND WH & NU BOP
4 TIH w/ CICR & set at ~ 7265'.
5 Load hole and circulate clean with fresh water.
6 Load tubing and pressure test tubing to 1000 psi.
7 Pull stinger out of CICR enough to load hole w/ water and circulate clean. Test casing to 500 psi.
8 Plug #1 (7265'-7483'). Mix & pump 85 sx (100 cf) of Class B neat cement. Sting out of retainer leaving 50' of cement on top of retainer. Note. Cement volumes will be adjusted if alternate but comparable cement is used (based on vendor selection). Volumes estimated using 100% excess.
9 Pull up hole.
10 Spot plug #2 in a balanced plug. Plug #2 Dakota: (6099'–6199'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.

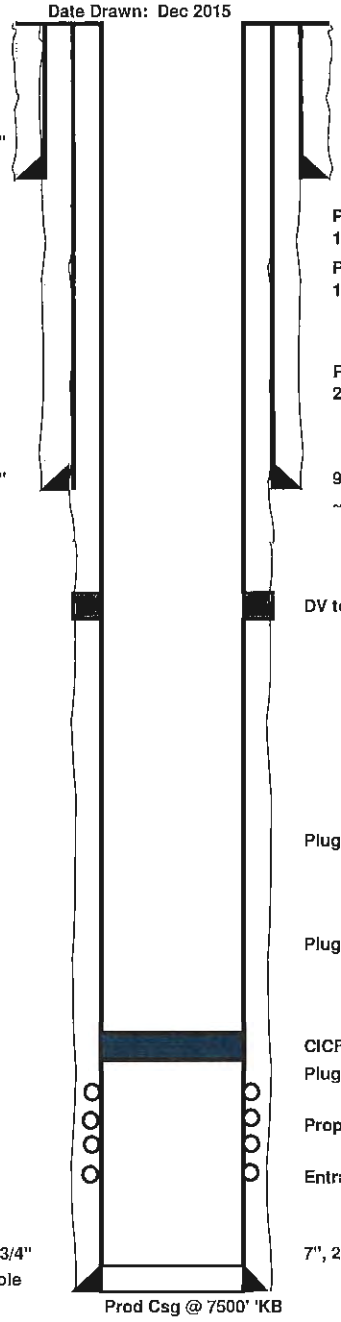
11 Pull up hole & WOC. TIH & tag TOC.
12 Spot plug #3 in a balanced plug. Plug #3 Gallup (5549'-5649'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
13 Pull up hole & WOC. TIH & tag TOC.
14 Spot plug #4 in a balanced plug. Plug #4 Mesaverde (3285'-4087'). Mix & pump 150 sx (177 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
15 Pull up hole & WOC. TIH & tag TOC.
16 Spot plug #5 in a balanced plug. Plug #5 Chacra (2638'-2738'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
17 Pull up hole & WOC. TIH & tag TOC.
18 Spot plug #6 in a balanced plug. Plug #6 Pictured Cliffs (1668'-1768'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
19 Pull up hole & WOC. TIH & tag TOC.
20 Spot plug #7 in a balanced plug. Plug #7 Fruitland (1153'-11253'). Mix & pump 30 sx (35.4 cf) of Class B neat cement. Calculated cement volumes to include extra 50' of cement.
21 Pull up hole & WOC. TIH & tag TOC.
22 Spot plug #8 in a balanced plug. Plug #8 Surface Plug (350'-surface). Mix & pump 66 sx (77.9 cf) of Class B neat cement.
23 Fill up inside of casing w/ additional cement as needed to top off.
24 ND BOP & cut off well head.
25 Install P&A marker and cut off anchors.
26 RD & release rig and related equipment.
27 Remove all surface/production equipment.
28 Re-contour and re-claim surface/location as per NMOCD approved Reclamation plan.

Well/Facility:	WDW #2	Well Status:	Proposed P&A
Operator:	Western Refinery	Orig Oper:	
Lease/Op Agmt:		Inj Interval:	
Field:	Entrada	API #:	
County:	San Juan	GR/KB:	
State:	NM	TD:	Proposed 7500'
Spud:		PBTD:	
Comp. Date:		WI:	
1st Prod:		NRI:	
Xmas tree:			
Surface Loc:	2028' fnl & 111' fel		
Sec-Twn-Rge:	Sec 27/T29N/11W		
Comments:			

Date Drawn: Dec 2015

WALSH ENGINEERING FARMINGTON, NM

	Geologic Markers	
	MD	Formation
	Surface	Quaternary Alluv
	10'	Nacimiento
	515'	Ojo Alamo
	625'	Kirtland
	1203'	Fruitland
	1718'	Pictured Cliffs
	1880'	Lewis
	2660'	Huerfanito Bentonite
	2688'	Chacra
	2877'	Lower Lewis
	3335'	Cliff House
	3394'	Menefee
	4037'	Point Lookout
	4423'	Mancos Shale
	5292'	Niobrara A
	5394'	Niobrara B
	5517'	Niobrara C
	5599'	Gallup
	5842'	Juana Lopez
	5965'	Carlile
	6060'	Greenhorn
	6116'	Graneros
	6149'	Dakota
	6365'	Burro Canyon
	6411'	Morrison
	7046'	Bluff Sandstone
	7164'	Wanakah
	7287'	Todilto
	7315'	Endrada
	7483'	Chinle
	7500'	Proposed TD



Plug #8 surface plug: 350' to surface (70 sx/82.6 cf)

13-3/8", 48#, H40 at ~ 350'

Plug #7 Fruitland: 1153'-1253' (30 sx/35.4 cf)

Plug #6 Pictured Cliffs: 1668'-1768' (30 sx/35.4 cf)

Plug #5 Chacra: 2638'-2738 (30 sx/35.4 cf)

9-5/8", 36#, J55 ~ 3600'

Plug #4 Mesaverde: 3285'-4087' (150 sx/177 cf)

DV tool at 4000' KB

Plug #3 Gallup: 5549-5649' (30 sx/35.4 cf)

Plug #2 Dakota: 6099'-6199' (30 sx/35.4 cf)

CICR: 7265

Plug #1 7265' - 7483' (85 sx/100 cf)

Proposed Injection Zone:

Entrada Sandstone: 7315' - 7483'

7", 23#, J55

Injection String Detail - PL 4-1/2", 10.5 ppf, J55			
	Length	Top	Bottom
KB Adjustment	15.00	0	15.00
4-1/2" PL casing/tubing		15.00	15.00

WALSH ENGINEERING & PRODUCTION CORP.

Workover Cost Estimate

Western Refinery Southwest, Inc.
AUTHORITY FOR EXPENDITURE

Date: 2/2/2016

***Well Name*: WDW #2**
***Location*: Sec 27, T29N, R11W, San Juan, NM**

***Objective*: Permanently P&A Wellbore**

	Tangible	Intangible	Total
I. Workover Costs			
Anchors, and Misc.			
Completion Rig (18 hrs @ $250/hr, includes Mob-de-Mob, crew travel)		29,500	29,500
Completion Fluids/Water hauling (pump truck)			
Cased Hole Services (Including CICR)		7,200	7,200
Cement		24,650	24,650
Tubing Head and Well Connection Fittings			
Tubing (480 ft @ 3.30 $/ft.)			
Sucker Rods (50 rods @ 60 $/rod)			
Down hole pump			
Pumping equipment (Polish rod, tbg anchor, ect)			
Rentals (tanks, etc)		1,720	1,720
Trucking		5,100	5,100
Surface Facility Installation			
Restore Location			
Well Site Supervision		4,100	4,100
Engineering		1,000	1,000
Bits			
Labor & Trucking to remove surface equipment			
Pipelines and Installation			
Tank and Fittings			
Disposal Costs		1,250	1,250
Meter			
Surface Reclamation		5,125	5,125
P&A marker		135	135
Workover Costs	**0**	**79,780**	**79,780**
10% Contingency	0	7,978	7,978
Total Workover Costs	**0**	**87,758**	**87,758**

Prepared By: John C. Thompson
Date: 2/2/2016

Working Interest Owners

ESTIMATED COSTS ONLY--Each participating Owner to pay Proportionate Share of Actual Well Costs Subject to Operating Agreement

Field Parameters									
Site	Sp. Cond. (uS/cm)	TDS (g/L)	DO (mg/L)	ORP (mV)	pH (Units)	Temp. (F)	Date	Time	Sampler
DWD#2	68,017	44,200	1.33	211.9	5.13	52.3	1/25/2017	11:00 AM	Matt Krakow

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

February 01, 2017

Kelly Robinson

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

RE: DWD #2 OrderNo.: 1701A75

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 1 sample(s) on 1/26/2017 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: Western Refining Southwest, Inc.
Client Sample ID: DWD 2 Formation Water
Project: DWD #2
Collection Date: 1/25/2017 11:00:00 AM
Lab ID: 1701A75-001 **Matrix:** AQUEOUS **Received Date:** 1/26/2017 7:05:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**MRA**
Fluoride	ND	2.0		mg/L	20	1/26/2017 6:37:17 PM	R40335
Chloride	23000	2500	*	mg/L	5E	1/27/2017 7:20:01 PM	R40361
Bromide	ND	2.0		mg/L	20	1/26/2017 6:37:17 PM	R40335
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	1/26/2017 6:37:17 PM	R40335
Sulfate	910	25	*	mg/L	50	1/27/2017 7:07:36 PM	R40361
Nitrate+Nitrite as N	ND	20		mg/L	100	1/27/2017 7:32:26 PM	R40361
SM2510B: SPECIFIC CONDUCTANCE						Analyst:	**JRR**
Conductivity	94000	50		µmhos/cm	50	1/30/2017 1:40:54 PM	R40366
SM2320B: ALKALINITY						Analyst:	**JRR**
Bicarbonate (As CaCO3)	255.3	20.00		mg/L CaCO3	1	1/30/2017 11:39:53 AM	R40366
Carbonate (As CaCO3)	ND	2.000		mg/L CaCO3	1	1/30/2017 11:39:53 AM	R40366
Total Alkalinity (as CaCO3)	255.3	20.00		mg/L CaCO3	1	1/30/2017 11:39:53 AM	R40366
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst:	**KS**
Total Dissolved Solids	48900	2000	*D	mg/L	1	2/1/2017 3:56:00 PM	29970
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst:	**pmf**
Calcium	1700	20		mg/L	20	1/30/2017 10:59:56 AM	29930
Magnesium	200	20		mg/L	20	1/30/2017 10:59:56 AM	29930
Potassium	450	20		mg/L	20	1/30/2017 10:59:56 AM	29930
Sodium	16000	500		mg/L	500	1/30/2017 11:06:12 AM	29930

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

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LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B17011690-001
Client Sample ID: 1701A75-001C DWD 2 Formation Water

Report Date: 01/27/17
Collection Date: 01/25/17 11:00
DateReceived: 01/27/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
CORROSIVITY							
pH	6.46	s.u.		0.10		SW9040C	01/27/17 10:54 / jmg

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 01/27/17
Work Order: B17011690

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW9040C**						Analytical Run: ORION 720A HZW_170127A			
Lab ID:	**ICV**	Initial Calibration Verification Standard								01/27/17 10:54
pH		8.11	s.u.	0.10	101	98	102			
Method:	**SW9040C**									Batch: R273874
Lab ID:	**B17011690-001ADUP**	Sample Duplicate				Run: ORION 720A HZW_170127A				01/27/17 10:54
pH		6.49	s.u.	0.10				0.5	3	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1701A75**

01-Feb-17

Client: Western Refining Southwest, Inc.

Project: DWD #2

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R40335**	RunNo: **40335**
Prep Date:	Analysis Date: **1/26/2017**	SeqNo: **1264291** 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								

Sample ID **LCSb**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R40335**	RunNo: **40335**
Prep Date:	Analysis Date: **1/26/2017**	SeqNo: **1264293** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	104	90	110			
Bromide	2.4	0.10	2.500	0	96.4	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	96.7	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R40361**	RunNo: **40361**
Prep Date:	Analysis Date: **1/27/2017**	SeqNo: **1265117** 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								
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R40361**	RunNo: **40361**
Prep Date:	Analysis Date: **1/27/2017**	SeqNo: **1265118** 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	95.5	90	110			
Sulfate	9.7	0.50	10.00	0	97.2	90	110			
Nitrate+Nitrite as N	3.5	0.20	3.500	0	98.8	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#: **1701A75**

01-Feb-17

Client: Western Refining Southwest, Inc.

Project: DWD #2

Sample ID	**MB-29930**	SampType:	**MBLK**	TestCode:	**EPA 6010B: Total Recoverable Metals**					
Client ID:	**PBW**	Batch ID:	**29930**	RunNo:	**40375**					
Prep Date:	**1/27/2017**	Analysis Date:	**1/30/2017**	SeqNo:	**1265583**	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								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID	**LCS-29930**	SampType:	**LCS**	TestCode:	**EPA 6010B: Total Recoverable Metals**					
Client ID:	**LCSW**	Batch ID:	**29930**	RunNo:	**40375**					
Prep Date:	**1/27/2017**	Analysis Date:	**1/30/2017**	SeqNo:	**1265584**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	49	1.0	50.00	0	98.3	80	120			
Magnesium	49	1.0	50.00	0	97.3	80	120			
Potassium	47	1.0	50.00	0	94.9	80	120			
Sodium	48	1.0	50.00	0	95.4	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#: **1701A75**

01-Feb-17

Client: Western Refining Southwest, Inc.

Project: DWD #2

Sample ID	**mb-1**	SampType:	**mblk**	TestCode:	**SM2320B: Alkalinity**					
Client ID:	**PBW**	Batch ID:	**R40366**	RunNo:	**40366**					
Prep Date:		Analysis Date:	**1/30/2017**	SeqNo:	**1266120**	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:	**R40366**	RunNo:	**40366**					
Prep Date:		Analysis Date:	**1/30/2017**	SeqNo:	**1266121**	Units:	**mg/L CaCO3**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	78.04	20.00	80.00	0	97.6	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#: **1701A75**

01-Feb-17

Client: Western Refining Southwest, Inc.

Project: DWD #2

Sample ID	**MB-29970**	SampType:	**MBLK**		TestCode:	**SM2540C MOD: Total Dissolved Solids**				
Client ID:	**PBW**	Batch ID:	**29970**		RunNo:	**40436**				
Prep Date:	**1/31/2017**	Analysis Date:	**2/1/2017**		SeqNo:	**1267368**	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-29970**	SampType:	**LCS**		TestCode:	**SM2540C MOD: Total Dissolved Solids**				
Client ID:	**LCSW**	Batch ID:	**29970**		RunNo:	**40436**				
Prep Date:	**1/31/2017**	Analysis Date:	**2/1/2017**		SeqNo:	**1267369**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1010	20.0	1000	0	101	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: Western Refining Southw Work Order Number: 1701A75 RcptNo: 1

Received by/date: AT 01/26/17

Logged By: Anne Thorne 1/26/2017 7:05:00 AM Anne Thorne

Completed By: Anne Thorne 1/26/2017 9:13:16 AM Anne Thorne

Reviewed By: 1/26/17

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: LA

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: Western Refining

Mailing Address: 50 CR 4990
Bloomfield, NM 87413

Phone #: 505-632-4169

email or Fax#:

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☒ Rush 2-day

Project Name:
DWD#2

Project #:
PO-12619031-2

Project Manager:
Kelly Robinson

Sampler: Matt Kraklow

On Ice: ☒ 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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1701A75	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See attachment				Air Bubbles (Y or N)
1-25-17	11:00	H_2O	DWD2 Formation Water	1-500ml	Poly	001												X				
				1-500ml	HNO_3	001												X				
				1-125ml	H_2SO_4	001												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
1/25/17	1447			1/25/17	1447
1/25/17	1806			01/26/17	0705

Remarks:

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.

All Anions	EPA Method 300.0	1-500ml unpreserved plastic 1-125 ml H_2SO_4 plastic
Alkalinity	SM2320 B	Volume will come from the 500ml unpreserved plastic
eC	SM 2510B	Volume will come from the 500ml unpreserved plastic
TDS	SM 2540 C	Volume will come from the 500ml unpreserved plastic
Cations	EPA Method 200.7	1-500ml HNO_3 Plastic
pH	EPA Method 9040	Volume will come from the 500ml unpreserved plastic

SM = Standard Methods
EPA Methods 310.1, 150.1, 160.1, 320.1 and 120.1 have been withdrawn by EPA. Most labs ha
We are accredited for all of the tests listed above and we perform these methods regularly for I

We will ship out one bottle set today as listed below. Fill all bottles to the neck and keep the sa
We can rush this work on a 1-2 business day TAT.
1-500ml unpreserved plastic
1-125ml H_2SO_4 Plastic
1-500ml HNO_3 plastic

From: Garza, Margaret A
To: Chavez, Carl J, EMNRD
Cc: Saucedo, Levi
Subject: [EXT] Revised changes to UICo11 WDW-2 Renewal Application
Date: Friday, April 9, 2021 12:36:43 PM
Attachments: image001.png
Broomfield Products Terminal - UICI-011 WDW-2 Renewal Application_2021_0407_1000 - Revised Pages.pdf
Response Letter to OCD Carl Chavez April 7_2021.pdf

Hi Carl,

In follow up to our conversation, attached are a couple changes I will attach to the submittal of the Public Notice letter. Per Levi's feedback, the PN will be published in the Farmington Daily Time Sunday publication.

Working on updating the PN letter. Completed and forwarded the C-146 Change of Operator Name Form to Levi for signature. Will try to get that sent today.

Thank you,

Margaret A. Garza
Environmental Professional
L&S Terminals
1250 W. Washington St., Suite 420; Tempe, AZ 85281
Office: 602-286-1517
Mobile: 480-532-1434
Email: **MGarza4@marathonpetroleum.com**

1. INTRODUCTION

Western Refining Southwest, Inc.'s Bloomfield Products Terminal (BPT) is permitted to dispose of non-hazardous (RCRA exempt and RCRA non-exempt non-hazardous) treated wastewater into Wastewater Disposal Well #2 (WDW-2). WDW-2 (AP #30-045-35747) commenced operation in 2016 under Discharge Permit No. UICI-011, which will expire on July 20, 2021.

Pursuant to Section 20.6.2.3106.G of the New Mexico Administrative Code , an application must be submitted at least 120 days before the discharge permit expires. Therefore, an application for renewal of the permit is due by no later than March 22, 2021. BPT is herein submitting this application to renew Discharge Permit No. UICI-011.

Section 2 is the Discharge Plan Application for Renewal. The attachments for this application are included in the appendices of this application document. Section 3 includes the Application for Authorization to Inject. The attachments for the application are also in the appendices of this application document. Section 4 is the Administrative Application Checklist.

RECEIVED:	REVIEWER:	TYPE:	APP NO:

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Geological & 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

Applicant: Western Refining Southwest, Inc. **OGRID Number:** 267595
Well Name: WDW#2 **API:** 30-045-35747
Pool: _____ **Pool Code:** _____

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

B. Check one only for [I] or [II]
[I] Commingling – Storage – Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
[II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR **Note: Only treated wastewater is injected.**

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
3) ☐ Offset operators or lease holders
A. ☐ Royalty, overriding royalty owners, revenue owners
B. ☒ Application requires published notice
C. ☐ Notification and/or concurrent approval by SLO
D. ☐ Notification and/or concurrent approval by BLM
E. ☐ Surface owner
F. ☐ For all of the above, proof of notification or publication is attached, and/or,
G. ☐ No notice required

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.

Angela S. Brown
Print or Type Name

Signature

Date

(419) 421-2629

asbrown@marathonpetroleum.com
e-mail Address

9400 Holly Avenue NE, Bldg. 3, Suite 300 | Albuquerque, NM 87122 / P 505.266.6611 / **trinityconsultants.com**

VIA E-MAIL: CarlJ.Chavez@state.nm.us

April 7, 2021

Mr. Carl J. Chavez, Environmental Specialist
Engineering Bureau
EMNRD – Oil Conservation Division
5200 Oakland Avenue, N.E. Suite 100
Albuquerque, NM 87113

Re: UICI-011 Class I (NH) WDW-2 (30-045-35747) Western Refining SW, Inc.- WQCC DP Renewal Application

Dear Mr. Chavez:

On behalf of Western Refining SW, Inc., Trinity Consultants is submitting to you the Total Dissolved Solids (TDS) values for the upstream monitoring wells MSs 52 and 53. The TDS concentrations for the injection water into WDW-2 (30-045-35747) were presented in Appendix B rather than Appendix D of the subject application. We apologize for the confusion. Per the attached data, you will observe that the TDS concentrations for the background wells are higher than the injection water into the WDW-2.

Ms. Margaret Garza will respond to your other April 6, 2021 questions. If you have any questions regarding the TDS, please contact me at (504) 828-5845 or elee@trinityconsultants.com or Ms. Garza at (602) 286-1517 or MGarza4@marathonpetroleum.com.

Sincerely,

TRINITY CONSULTANTS

Edward Lee, P.E.
Managing Consultant

CC: Margaret A. Garza, Marathon L&S Terminals

Attachment: 2020 Summary of Analytical Data with TDS

Attachment B - Analytical Summary

	WQCC Standards	WDW #2				MW-53	MW-52	MW-68	MW-29
		3/25/2020	6/30/2020	9/18/2020	12/18/2020	Upstream	Upstream	Downstream	Downstream
Chloride	250 *	**1200**	**1200**	**830**	**890**	**940**	**560**	20	65
Sulfate	600 *	87	78	86	72	**930**	**980**	230	340
Total Dissolved Solids	10,000	2920	2870	2190		3380	2660	651	970
pH *(pH Units)*		7.27	7.77	7.71					
Bicarbonate (As CaCO3)		569	647.1	626.3		235	246.4	202.6	
Carbonate (As CaCO3)		<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	
Total Alkalinity (as CaCO3)		569	647.1	626.3		235	246.4	202.6	
Oxidation-Reduction Potential		6.2	37.7	179					
Specific Gravity		0.993	0.9946	0.9958					
Arsenic		< 0.030	< 0.030	<0.030		0.00021	0.0017	0.0008	
Barium		0.32	0.22	0.27		0.016	0.013	0.016	
Cadmium		< 0.0020	< 0.0020	<0.0020		<0.0020	<0.0020	<0.0020	
Calcium		90							
Chromium		< 0.0060	< 0.0060	<0.0060		<0.006	<0.006	<0.0060	
Lead		< 0.020	< 0.020	<0.020		<0.0025	<0.0010	<0.00050	
Selenium		< 0.050	< 0.050	<0.050		0.06	0.066	0.0047	
Silver		< 0.0050	< 0.0050	<0.0050		0.0035	0.0056	0.0019	
Mercury	0.002	< 0.00020	<0.0010	<0.00020		<0.00020	<0.00020	<0.00012	
Calcium	0.01	**90**	**73**	**79**		270	230	80	99
Magnesium		53	52	43		70	54	21	
Potassium		< 20	13	13		4.9	4.1	2.2	
Sodium		830	910	650		780	540	100	
Reactive Cyanide *(mg/L)*		<0.005	<0.005	<0.00500					
Reactive Sulfide *(mg/L)*		0.32	0.833	<0.0500					
Ignitability *(^{o}F)*		>170	>170	>170					
Corrosivity (ph Units	6-9	7.27	7.63	7.82					
4,4´-DDD									
4,4´-DDE									
4,4´-DDT									
Aldrin									
alpha-BHC									
beta-BHC									
Chlordane		<0.002	<0.20	<0.30					
delta-BHC									
Dieldrin									
Endosulfan I									
Endosulfan II									
Endosulfan sulfate									
Endrin									
Endrin aldehyde									
gamma-BHC									
Heptachlor									
Heptachlor epoxide									
Methoxychlor									
Toxaphene									
Oxidation-Reduction Potential		268							
Specific Conductance (umhos/		12,110							
pH		7.59	7.63	7.73					
Temperature (^{o}C)		24.5							

Notes:

* = Screening level is to apply to dissolved phase result; therefore comparison is bias high.

Field Parameters collected

From:	Rachel Reese
To:	Chavez, Carl J, EMNRD
Cc:	Garza, Margaret A; Ed Lee
Subject:	[EXT] UICI-011 Public Notice Newspaper Ad for Review
Date:	Tuesday, April 13, 2021 9:46:41 AM
Attachments:	image001.png UICI-011 PN 4-12-2021.docx

Morning Carl,

The draft public notice newspaper advertisement for the renewal of discharge permit UICI-011 is attached for OCD review. Please let me know if you have any questions or comments, or if this is approved to publish in English and Spanish in the Farmington Daily Times.

Thanks,
Rachel

Rachel Reese
Senior Consultant

P 505.266.6611 M 505.920.2177
9400 Holly Avenue NE, Bldg. 3, Suite 300 | Albuquerque, NM 87122
Email: rreese@trinityconsultants.com

NOTICE OF PUBLICATION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations (20.6.2.3106 NMAC); the following discharge permit application has been submitted to the Director of the New Mexico Oil Conservation Division ("NMOCD"), 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

(UICI-011) Western Refining Southwest LLC, Mr. Levi Saucedo, Terminal Manager, #50 County Road 4990 (P.O. Box 159) Bloomfield, New Mexico 87413 at 505-632-4195, has submitted an application for Underground Injection Control (UIC) Class I (Non-Hazardous) Injection Well Discharge Permit Renewal (UICI-011) for Waste Disposal Well No. 2 - WDW-2 (API# 30-045-35747), located 2028 FNL and 111 FEL (SE/4, NE/4) in Section 27, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico. The injection well is located approximately 415 ft. N of the intersection of Sullivan Rd. and Wooten Rd. or approximately 1-mile E-NE of the intersection of Hwy 550 and Sullivan Rd. The San Juan River is within 1,320 ft. N-NW of the well at it closest point. Wastewater is derived from and routed from the Bloomfield Terminal (GW-1) to treated water from the Wastewater Treatment Plant (WWTP) before injection. The treated wastewaters are rendered non-hazardous as it is primarily derived from boiler blow-down, reverse osmosis reject water, as it flows through the API Separator (solids, sludge, and floating scum are removed), the Benzene Strippers (volatile organics are removed), and the three lined aeration lagoons (active biological treatment) before reaching either the evaporation ponds or the Class 1 injection well. Typically, the water is routinely pumped directly from the Terminal aeration lagoons to the Class 1 injection well, thereby bypassing the evaporation ponds. Wastewater consists of oil-field exempt and non-exempt, non-hazardous fluids to be disposed into the Entrada Formation at an injection interval from 7,315 ft. to 7,483 ft. below ground level (bgl) at a daily rate not to exceed 8,500 barrels per day and at a maximum surface injection pressure of 1,465 psig. The injection fluid contains approximately 2,660 ppm total dissolved solids (TDS). Groundwater most likely to be affected by a spill, leak or accidental discharge is at a depth of about 20 ft. bgl and has a TDS concentration of approximately 3,020 ppm. The TDS in the Entrada Formation or injection zone is about 48,900 ppm. The discharge permit addresses well construction, operation, monitoring of the well, associated surface facilities, and provides a contingency plan in the event of accidental spills, leaks, and other accidental discharges to protect fresh water.

The owner and operator of the facility is:

Western Refining Southwest, Inc.
#50 County Road 4990
P.O. Box 159
Bloomfield, New Mexico 87413
Telephone: (505) 632-8013

The NMOCD has determined that the application is administratively complete. The NMOCD will accept comments and statements of interest regarding this renewal application 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 below:

Environmental Bureau Chief
New Mexico Oil Conservation Division (NMOCD)

1220 S. Saint Francis Drive
Santa Fe, New Mexico 87505
Telephone: (505) 476-3440

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 x100).

From: Garza, Margaret A
To: Chavez, Carl J, EMNRD
Subject: [EXT] RE: [EXTERNAL] RE: Revised changes to UICo11 WDW-2 Renewal Application
Date: Friday, April 16, 2021 6:47:10 PM
Attachments: image001.png
TTS-BLM1-PLP-0002.pdf
Wastewater Block Flow Diagram.pdf
PN Final 4-16-2021.doc

Hi Carl,

Per our phone discussion, the attached wastewater flow diagram should provide clarification that after wastewater leaves the aeration lagoons, the wastewater is clean and that there is no further treatment. Furthermore, the connection to the injection well "T's off" the pipeline that connects the Aeration Pond effluent to the South Evaporation Pond. From the "T" is where the water feeds the injection well.

Also, per OCD's request, the attached Public Notice has been updated to describe wastewater from the Bloomfield Terminal to the Injection Well.

Please review and let me know if the submitted information is acceptable. Once I receive the previously submitted Contingency Plan with OCD comments, I will review, update, and resubmit.

Thank you and have a great weekend.

Kind regards,

Margaret A. Garza
Environmental Professional
L&S Terminals
1250 W. Washington St., Suite 420; Tempe, AZ 85281
Office: 602-286-1517
Mobile: 480-532-1434
Email: **MGarza4@marathonpetroleum.com**

From: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Sent: Thursday, April 15, 2021 7:43 AM
To: Garza, Margaret A <MGarza4@marathonpetroleum.com>
Subject: RE: [EXTERNAL] RE: Revised changes to UICo11 WDW-2 Renewal Application

Margaret,

Good morning!

I am still reviewing the Contingency Plan.

Regarding the PN, OCD has crafted "wastewater" language for the PN (please see below).

Wastewater is derived from and routed from the Bloomfield Terminal (GW-1) to the Wastewater Treatment Plant for treatment before injection. The treated wastewaters are rendered non-hazardous as it is primarily derived from boiler blow-down, reverse osmosis reject water, as it flows through the API Separator (solids, sludge, and floating scum are removed), the Benzene Strippers (volatile organics are removed), and the three lined aeration lagoons (active biological treatment) before reaching either the evaporation ponds or the Class 1 injection well. ~~Typically, the water is routinely pumped directly from the Terminal aeration lagoons to the Class 1 injection well, thereby bypassing the evaporation ponds~~.

OCD is requesting an updated wastewater flow diagram for the combined terminal and injection well facility. Does OCD have a map that displays all of the lagoons and evaporation ponds. Please submit it along with wastewater flow diagram for the administrative record.

Also, we should discuss the bypass to ensure there is no concerns about wastewater quality sampling and data submitted to the OCD on a quarterly basis. Not sure if the bypass should be occurring?

Thank you.

Carl J. Chavez ● Environmental Specialist
Engineering Bureau
EMNRD - Oil Conservation Division
5200 Oakland Avenue, N.E. Suite 100 | Albuquerque, NM 87113
505.660.7923 | CarlJ.Chavez@state.nm.us
http://www.emnrd.state.nm.us/OCD/

From: Garza, Margaret A <MGarza4@marathonpetroleum.com>
Sent: Monday, April 12, 2021 8:14 AM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Subject: [EXT] RE: [EXTERNAL] RE: Revised changes to UICo11 WDW-2 Renewal Application

Good morning Carl,

Forwarding the PN letter for your review prior to translating from English to Spanish. Let me know if anything else needs to be incorporated into the letter.

Thanks so much!

Margaret A. Garza
Environmental Professional
L&S Terminals
1250 W. Washington St., Suite 420; Tempe, AZ 85281
Office: 602-286-1517
Mobile: 480-532-1434
Email: **MGarza4@marathonpetroleum.com**

From: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Sent: Friday, April 09, 2021 12:00 PM
To: Garza, Margaret A <MGarza4@marathonpetroleum.com>
Cc: Saucedo, Levi <LLSaucedo@Marathonpetroleum.com>
Subject: [EXTERNAL] RE: Revised changes to UICo11 WDW-2 Renewal Application

Okay. Both Marathon and OCD must act on public notice only after the Admin. Complete Letter is issued.

Thank you.

Carl J. Chavez ● Environmental Specialist
Engineering Bureau
EMNRD - Oil Conservation Division
5200 Oakland Avenue, N.E. Suite 100 | Albuquerque, NM 87113
505.660.7923 | CarlJ.Chavez@state.nm.us
http://www.emnrd.state.nm.us/OCD/

From: Garza, Margaret A <MGarza4@marathonpetroleum.com>
Sent: Friday, April 9, 2021 12:36 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Saucedo, Levi <LLSaucedo@Marathonpetroleum.com>
Subject: [EXT] Revised changes to UICo11 WDW-2 Renewal Application

Hi Carl,

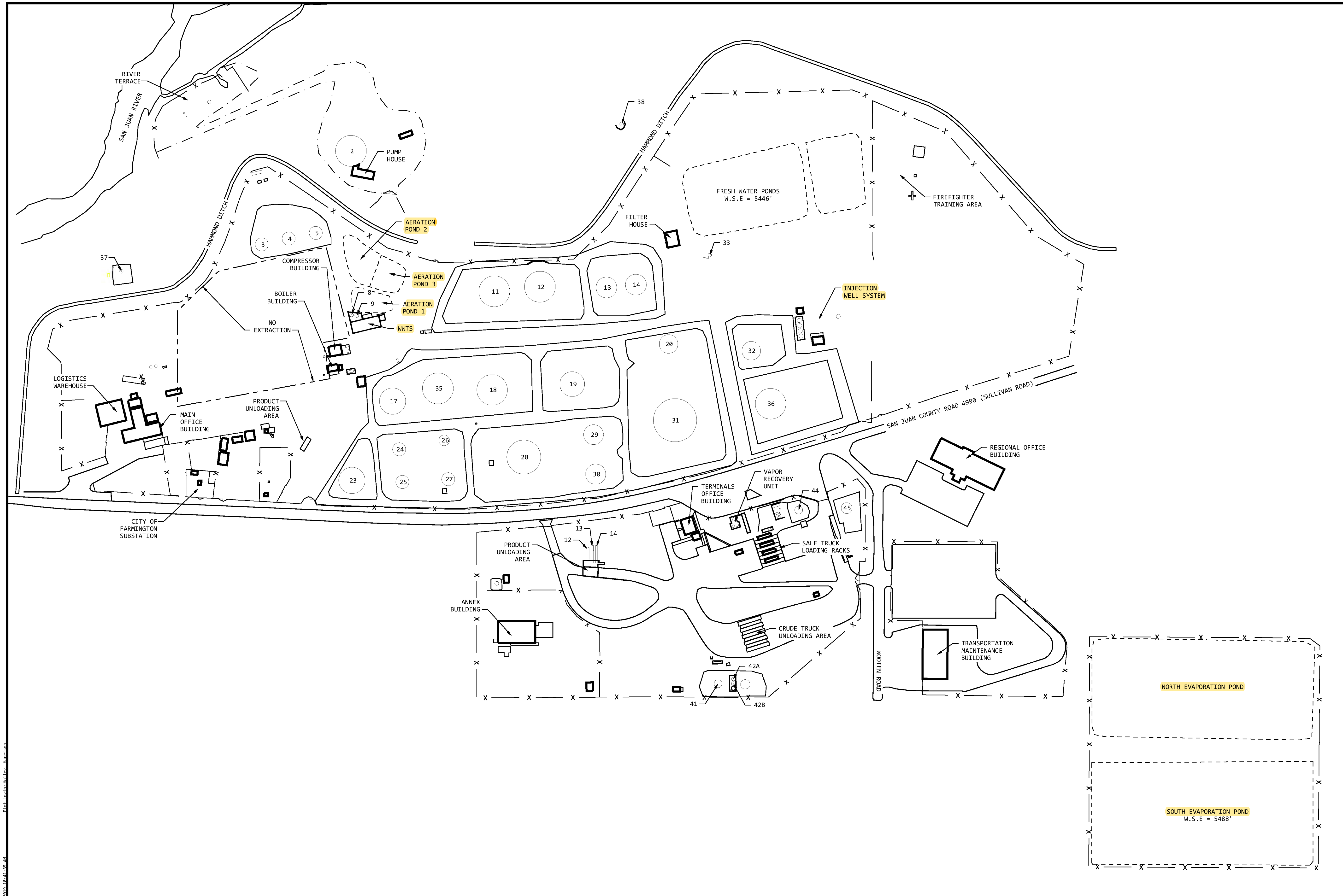
In follow up to our conversation, attached are a couple changes I will attach to the submittal of the Public Notice letter. Per Levi's feedback, the PN will be published in the Farmington

Daily Time Sunday publication.

Working on updating the PN letter. Completed and forwarded the C-146 Change of Operator Name Form to Levi for signature. Will try to get that sent today.

Thank you,

Margaret A. Garza
Environmental Professional
L&S Terminals
1250 W. Washington St., Suite 420; Tempe, AZ 85281
Office: 602-286-1517
Mobile: 480-532-1434
Email: **MGarza4@marathonpetroleum.com**



NOTES:

1. SELECT FEATURES OBTAINED FROM AERIAL IMAGERY SOURCED FROM AUTODESK GEOLOCATION MAPPING.

REFERENCE SHEET #	REFERENCE SHEET # CONTINUED	REV	STATUS	MOC	AFE	DESCRIPTION	DATE	BY	CHK	ENG	MGR
-	-	0	ASB	-	SW-190048	AS-BUILT	10-28-2019	HH	DW	GV	TR
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

SCALE: AS NOTED

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ASSET: BLOOMFIELD PROCESS TERMINAL

LOCATION: BLOOMFIELD - NM

PLOT PLAN

OVERALL SITE

TTS-BLM1-PLP-0002

REVISION 0

Location:P:\common\H-M\Marathon Petroleum Company LLC\117-7695010 - 117MPC-Products Trml-Bloomfld\07-CAD\SheetFiles\TTS-BLM1-PLP-0002.dwg
SAVE DATE: 10/24/2019
Printed On: Monday, October 28, 2019 10:41:35 AM
Plot Login: Holley, Harrison

Western Refining Southwest LLC
Bloomfield Terminal Wastewater Block Flow Diagram