UIC - I - __011__

PERMITS, RENEWALS, & MODS (WDW-2)

2016

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, May 23, 2017 3:45 PM
To: Schmaltz, Randy (Randy.Schmaltz@wnr.com)
Cc: Griswold, Jim, EMNRD; Sanchez, Daniel J., EMNRD
Subject: Western Refining SW, Inc. WDW-2 (UICI-11) Permit Conditions Variance Request May 17, 2017

Mr. James R. Schmaltz:

The New Mexico Oil Conservation Division (OCD) is in receipt of the above subject request. Please find below OCD responses to Western's Variance Requests.

1) Quarterly Monitoring Requirements: Provide the environmental test type and methods that deviate from the discharge permit for OCD review.
2) Monitor and Piezometer Wells: Provide a map to scale with MWs and piezometric groundwater flow direction for OCD review.
3) Continuous Monitoring Device: OCD approves on the condition that Western provide monthly 24-hr. graphs of pressure and flow rate in the quarterly report and/or annual report.
4) Fall-Off Test: OCD approves on the condition that Western complete its UIC Class I (NH) Disposal Well Fall-Off Test on or before September 30, 2017.

Please contact me if you have questions. Thank you.

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

Western Refining

WNR LISTED NYSE

May 17, 2017

Carl Chavez
Environmental Bureau
New Mexico Energy, Minerals & Natural Resources Dept.
1220 South St. Francis Drive
Santa Fe, NM 87505

Certified Mailer #: 7016 2140 0000 3867 3529

RE: Permit Conditions Variance Request
Class I Waste Injection Well "WDW-2"
Bloomfield Terminal
OCD Discharge Permit UICI-0011

Dear Mr. Chavez,

Western Refining Southwest, Inc. (Western) requests the following variances to the OCD Discharge Permit UICI-0011 conditions:

- **Condition 2.A Quarterly Monitoring Requirements** – Western requests a permit variance to use the most up-to-date EPA approved methods for on-going sampling activities. The listed analytical methods in some cases do not reflect the most up-to-date EPA approved methods.

- **Condition 2.A.1 Monitor and Piezometer Wells** – Western proposes to use the existing ground water remediation and monitoring program to detect potential ground water contamination associated with WDW-2. This program includes monitoring frequency, chemical monitoring parameters and reporting requirements.

- **Condition 3.C Continuous Monitoring Device** – Western requests a permit variance to use the Terminal's data historian system to continuously record well injection parameters in real time. This system is more reliable than a chart recording system.

- **Condition 3.E Fall-Off Test** – Western requests a permit variance to complete the Fall-Off Test (FOT) within 90-days of commencement of injection operations. Prior to the FOT, the well injection parameters must be allowed to stabilize which will not be possible until the NMOCD approved well stimulation is completed. Western will provide NMOCD proper notice prior the FOT.

If you have any questions or prefer to discuss these topics in more detail, please feel free to contact me at (505) 632-4171 at your convenience.

Sincerely,

James R. Schmaltz
Western Refining HSER Manager – Logistics

cc: A. Hains (WNR)

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, February 7, 2017 9:22 AM
To: Griswold, Jim, EMNRD; Goetze, Phillip, EMNRD
Cc: 'Allen.Hains@wnr.com'
Subject: FW: Western WDW#2 Formation Water Analytical (UICI-011) API# 30-045-35747 Water Quality Data Entrada Fm.
Attachments: Western WDW#2 Formation Water Analytical.pdf

Gentlemen:

Western Refining SW, Inc. has submitted their environmental laboratory data results for the Entrada Fm. The TDS is 48,900 ppm.

It appears that Western has an acceptable injection zone.

Thank you.

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

From: Hains, Allen [mailto:Allen.Hains@wnr.com]
Sent: Tuesday, February 7, 2017 9:11 AM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Subject: Western WDW#2 Formation Water Analytical

Carl,

The WDW#2 formation water analysis is attached.

Thank you,

Allen S. Hains
Manager
Remediation Projects

Western Refining
212 N. Clark Street
El Paso, Texas 79905
915 534-1483
915 490-1594 (cell)

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.

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College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

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.	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 t

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

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, December 20, 2016 5:11 PM
To: 'Hains, Allen'
Cc: Griswold, Jim, EMNRD; Davis, Bruce; Schmaltz, Randy; Robinson, Kelly; Roberts, Dale; Dooling, Frank
Subject: RE: WNR Bloomfield Terminal Injection Well (UICI-11) Surface Equipment

Allen:

The New Mexico Oil Conservation Division (OCD) has completed its review of the attached drawings outlining planned construction of infrastructure near WDW-2.

Please be sure to construct a berm or firewall around the four 500 bbl. Capacity Tanks. OCD has recommended that tanks be placed on liner or impermeable material in the past. A sump to capture and dewater any leakage from tanks is also recommended.

Thank you.

From: Hains, Allen [mailto:Allen.Hains@wnr.com]
Sent: Wednesday, December 14, 2016 6:14 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>; Davis, Bruce <Bruce.Davis@wnr.com>; Schmaltz, Randy <Randy.Schmaltz@wnr.com>; Robinson, Kelly <Kelly.Robinson@wnr.com>; Roberts, Dale <Dale.Roberts@wnr.com>; Dooling, Frank <Frank.Dooling@wnr.com>
Subject: WNR Bloomfield Terminal Injection Well Surface Equipment

Carl,

As we discussed a few weeks ago, Western is sending information about the surface equipment for the WDW #2 injection well for the purposes of the Facility's OCD Discharge Permit renewal.

As you are aware, the injection well is located across the highway from the abandoned WDW #1 injection well. The well is located close to the existing piping route from the Aeration Lagoons to the Evaporation Ponds. Western will be building the surface infrastructure in the vicinity to WDW #2 and the existing pipeline.

The surface infrastructure will include:

- a one pump and an additional pump to installed in the future,
- 4 - tanks (to settle solids),
- Filtration,
- Insulated building, and
- Associated piping and instrumentation.

The attached documentation shows the location and preliminary design documents. After construction is complete, Western can provide as buils for your records.

Please Note: the Evaporation Pond Closure Plan is being reviewed by Western and should be submitted to you shortly.

Thank you,

Allen S. Hains
Manager
Remediation Projects

Western Refining
123 W. Mills Ave.
El Paso, Texas 79901
915 534-1483
915 490-1594 (cell)

Chavez, Carl J, EMNRD

From: Hains, Allen <Allen.Hains@wnr.com>
Sent: Wednesday, December 14, 2016 6:14 PM
To: Chavez, Carl J, EMNRD
Cc: Griswold, Jim, EMNRD; Davis, Bruce; Schmaltz, Randy; Robinson, Kelly; Roberts, Dale; Dooling, Frank
Subject: WNR Bloomfield Terminal Injection Well Surface Equipment
Attachments: WNR Bloomfield Terminal Injection Well Surface Equipment.pdf

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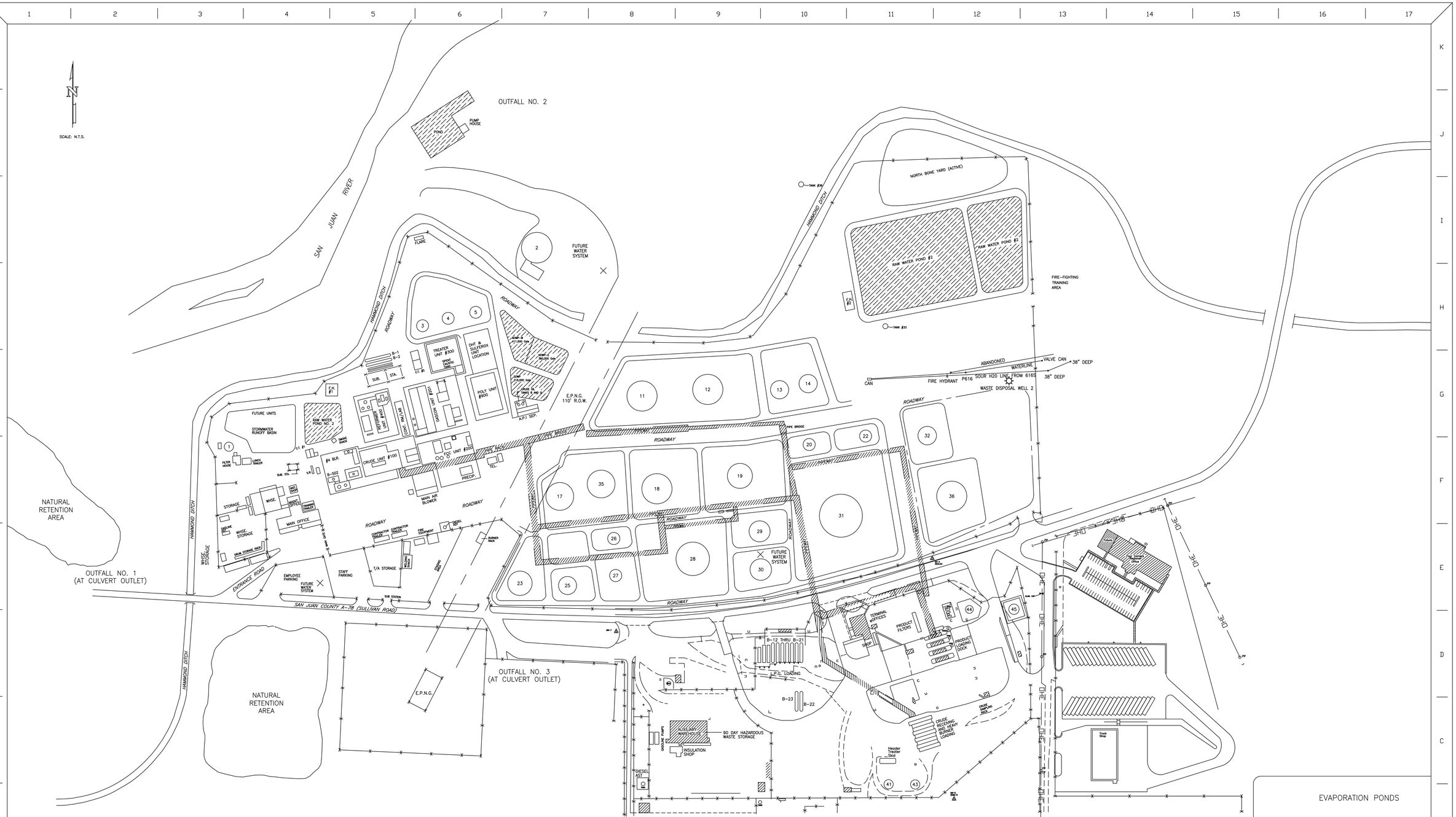


NOTES
1. ALL INTSTRU. TAG No. PREFIX = 500-

NO.	REVISION	JOB No.	DRAWN	CHECKED	APPROVED
2	Scanned & Redrawn, Added Injection Well, Tanks & Building.		VC 10/16		
1	General Revision		NHB 3/04		
A	ADDED DHT & SULFEROX UNIT TO PLANT AREA		BY DATE	BY DATE	BY DATE

REFERENCE DWGS.

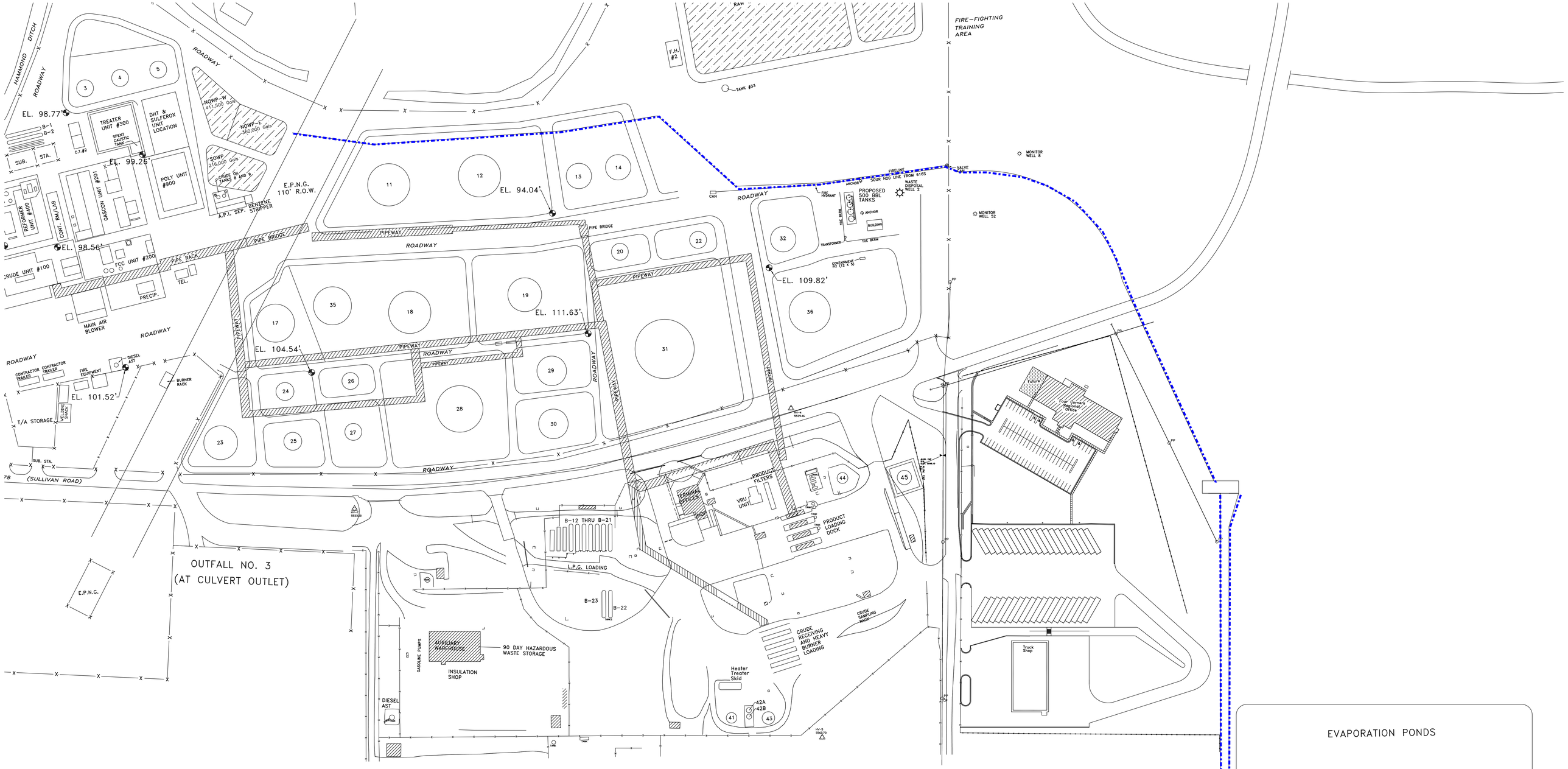
AFE/WO No.

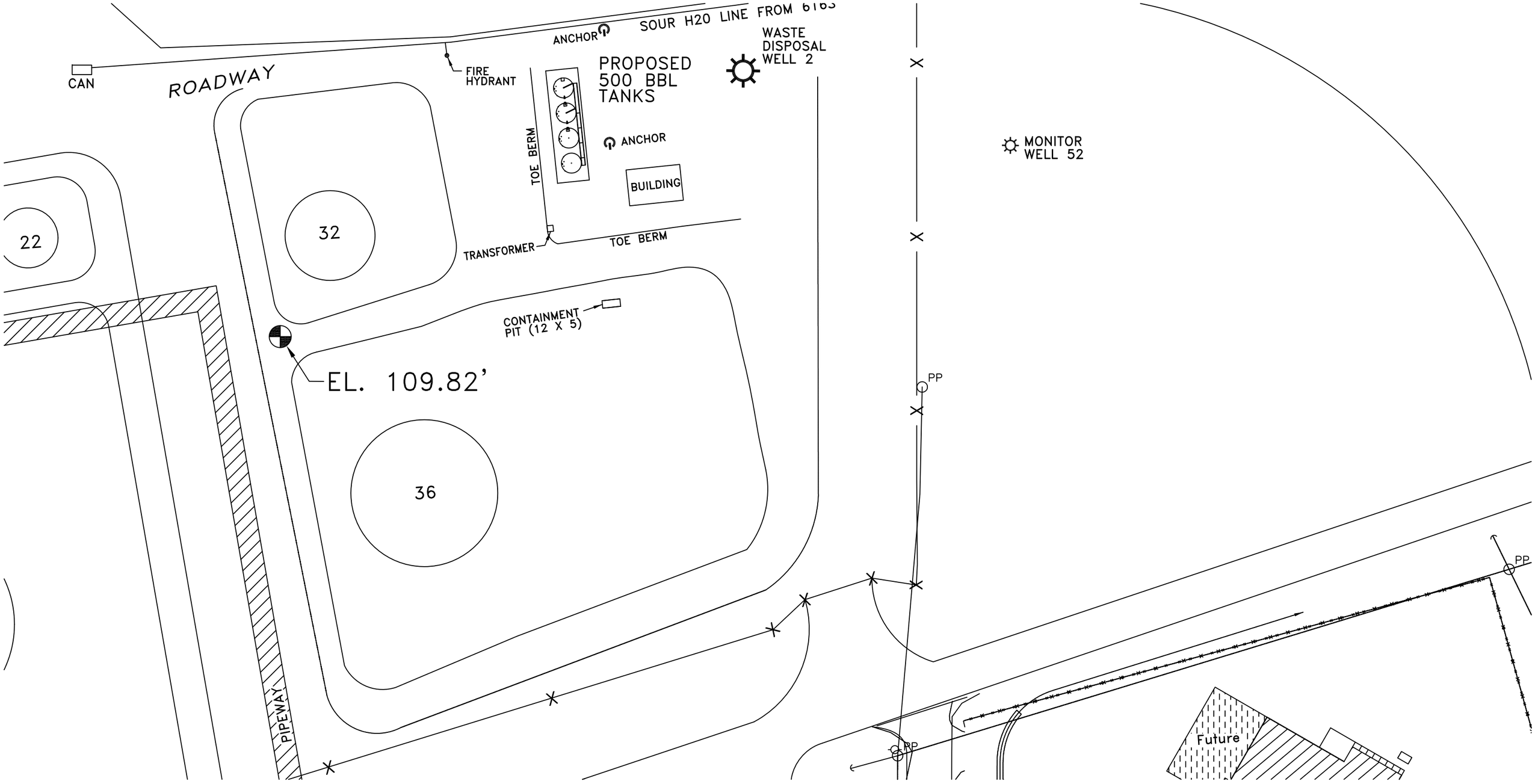
SCALE	As Noted	DATE.
DRAWN BY	NHB	5/03
REDRAWN BY	VC	10/16
FINAL CHK.		
ENGR.		
APPR. BY		

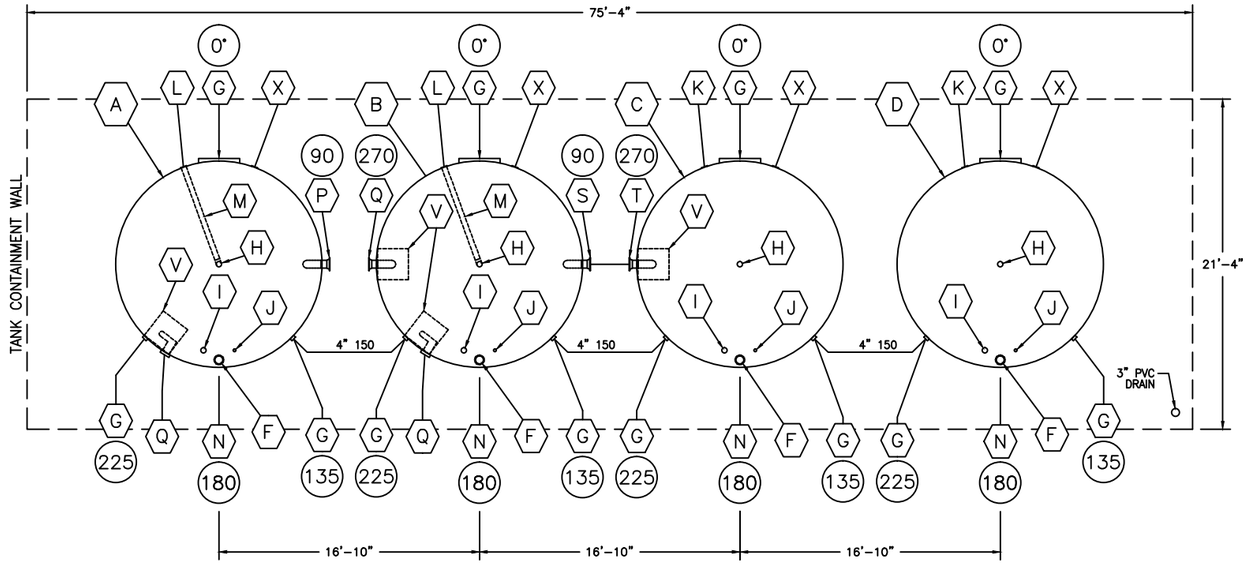
BLOOMFIELD REFINING AREA PLOT PLAN

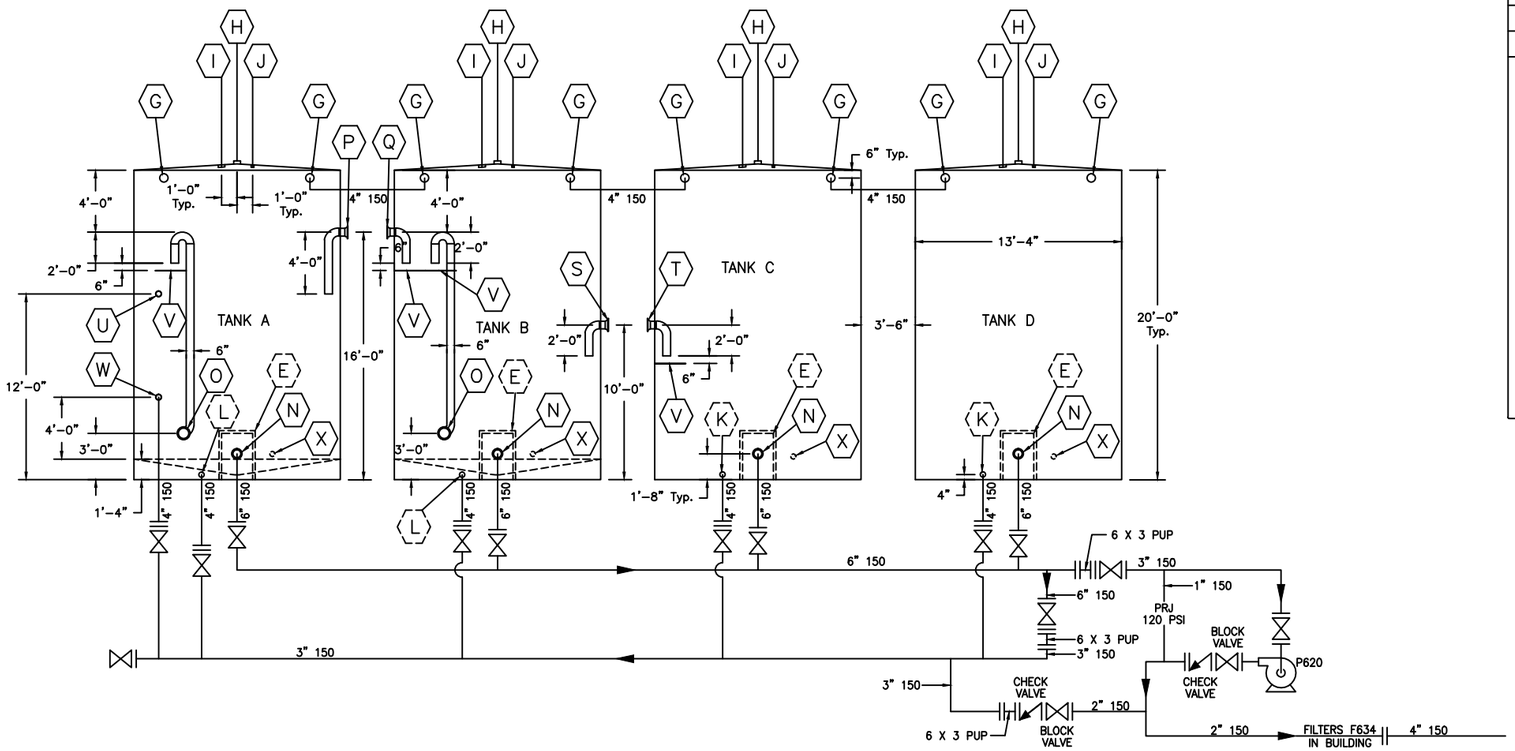
GIANT REFINING CO.
BLOOMFIELD REFINERY
BLOOMFIELD NEW MEXICO

DWG. NO. D-000-900-002
REV. 2


HAMMOND DITCH
ROADWAY
EL. 98.77'
B-1
B-2
SUB. STA.
C.T. #2
TREATER UNIT #300
SPENT CAUSTIC TANK
DHT & SULFEROX UNIT LOCATION
EL. 99.26'
POLY UNIT #900
GASCON UNIT #201
REFORMER UNIT #400
CONT. RV/LBT
EL. 98.56'
CRUDE UNIT #100
FCC UNIT #200
PIPE RACK
PIPE BRIDGE
TEL.
PRECIP.
MAIN AIR BLOWER
NOWP-W 411,500 Gals
NOWP-E 360,000 Gals
SOWP 216,000 Gals
CRUDE OIL TANKS 8 AND 9
A.P.I. SEP. BENZENE STRIPPER
E.P.N.G. 110' R.O.W.
EL. 94.04'
PIPEWAY
EL. 104.54'
EL. 111.63'
EL. 109.82'
CONTRACTOR TRAILER
CONTRACTOR TRAILER
FIRE EQUIPMENT
DIESEL AST
BURNER RACK
EL. 101.52'
T/A STORAGE
WELDING SHOP
SUB. STA.
(SULLIVAN ROAD)
OUTFALL NO. 3
(AT CULVERT OUTLET)
E.P.N.G.
F.H. #2
TANK #33
FIRE-FIGHTING TRAINING AREA
FIRE HYDRANT
ANCHOR
FIRELINE
SOUR H20 LINE FROM 616S
WASTE DISPOSAL WELL 2
PROPOSED 500 BBL TANKS
TOE BERM
BUILDING
TRANSFORMER
CONTAINMENT FIR (15 x 15)
MONITOR WELL B
MONITOR WELL 52
VALVE
PRODUCT FILTERS
VRU UNIT
TANK
PRODUCT LOADING DOCK
TERMINAL OFFICES
SHOP
B-12 THRU B-21
L.P.G. LOADING
B-23
B-22
CRUDE SAMPLING RACK
CRUDE RECEIVING AND HEAVY BURNER LOADING
AUXILIARY WAREHOUSE
90 DAY HAZARDOUS WASTE STORAGE
INSULATION SHOP
GASOLINE PUMPS
DIESEL AST
Heater Treater Skid
42A
42B
41
43
Future
Four Corners Regional Office
Truck Shop
EVAPORATION PONDS


SOUR H20 LINE FROM 6163
ANCHOR
WASTE DISPOSAL WELL 2
CAN
ROADWAY
FIRE HYDRANT
PROPOSED 500 BBL TANKS
TOE BERM
ANCHOR
BUILDING
MONITOR WELL 52
22
32
TRANSFORMER
TOE BERM
CONTAINMENT PIT (12 X 5)
EL. 109.82'
36
PP
PIPEWAY
PP
PP
Future





Mark	Quan	Description
A	1	500 BBL Steel Tank, 1/4" BCB, 3/16" Shell and Deck
B	1	500 BBL Steel Tank, 1/4" BCB, 3/16" Shell and Deck
C	1	500 BBL Steel Tank, 1/4" FB, 3/16" Shell and Deck
D	1	500 BBL Steel Tank, 1/4" FB, 3/16" Shell and Deck
E	4	24" x 36" Cleanout with one piece cover
F	4	8" Std. Thief Hatch
G	8	Overflow Conn. – 4" Coupling
H	4	Vent – 4" Coupling
I	4	Aux. – 4" 150 Flanged Coupling
J	4	Aux. – 2" 150 Flanged Coupling
K	2	Drain – 4" Coupling
L	2	Siphon Drain – 4" Coupling
M	2	Siphon Drain – 4" Pipe to Center, braced to tank bottom
N	4	Suction – 6" Flanged Connection, 6" Ext. Projection
O	2	Inlet – 6" Flanged Connection with 6" Line I.D. as Shown
P	1	Outlet – 6" Flanged Conn. With 6" Line on I.D. as Shown
Q	1	Inlet – 6" Flanged Conn. with 6" Line on I.D. as Shown
S	1	Outlet – 6" Flanged Conn. With 6" Line on I.D. as Shown
T	1	Inlet – 6" Flanged Conn. with 6" Line on I.D. as Shown
U	1	Oil Skim – 4" Coupling
V	4	Splash Plate – 1/4" PL x 24" x 24", 5/8" Holes spaced at 2" Centers – 121 Holes
W	1	4" 150 4" Coupling
X	4	1" Coupling

Notes:
1) All Internal Welds–seal welded and ground for coating.
2) All internal piping braced to tank.
3) All splash plates welded to tank wall.
4) All tanks to have removable Striker Plate for coating.
5) All Flanged Connections – 6" External Projection.
6) All Tanks to have walkway clips – API Type.
7) Exterior painted white.
8) Furnish the following Walkway and Stairway
   1–26' Stairway, 1–21' Walkway, 3 – 18'–4" Extension Walkway, 6–Sets of Brackets

NOTES

NO.	REVISION	BY	DATE
A	Issued for Review	VC	10/16

REFERENCE DWGS.

JOB No.	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
	VC	10/2016				

		DATE
SCALE	NTS	
DRAWN BY	VC	10/2016
INITIAL CHK.		
FINAL CHK.		
ENGR.		
APPR. BY		
AFE/WO No.		

TANKS A, B, C, & D LAYOUT

Western Refining

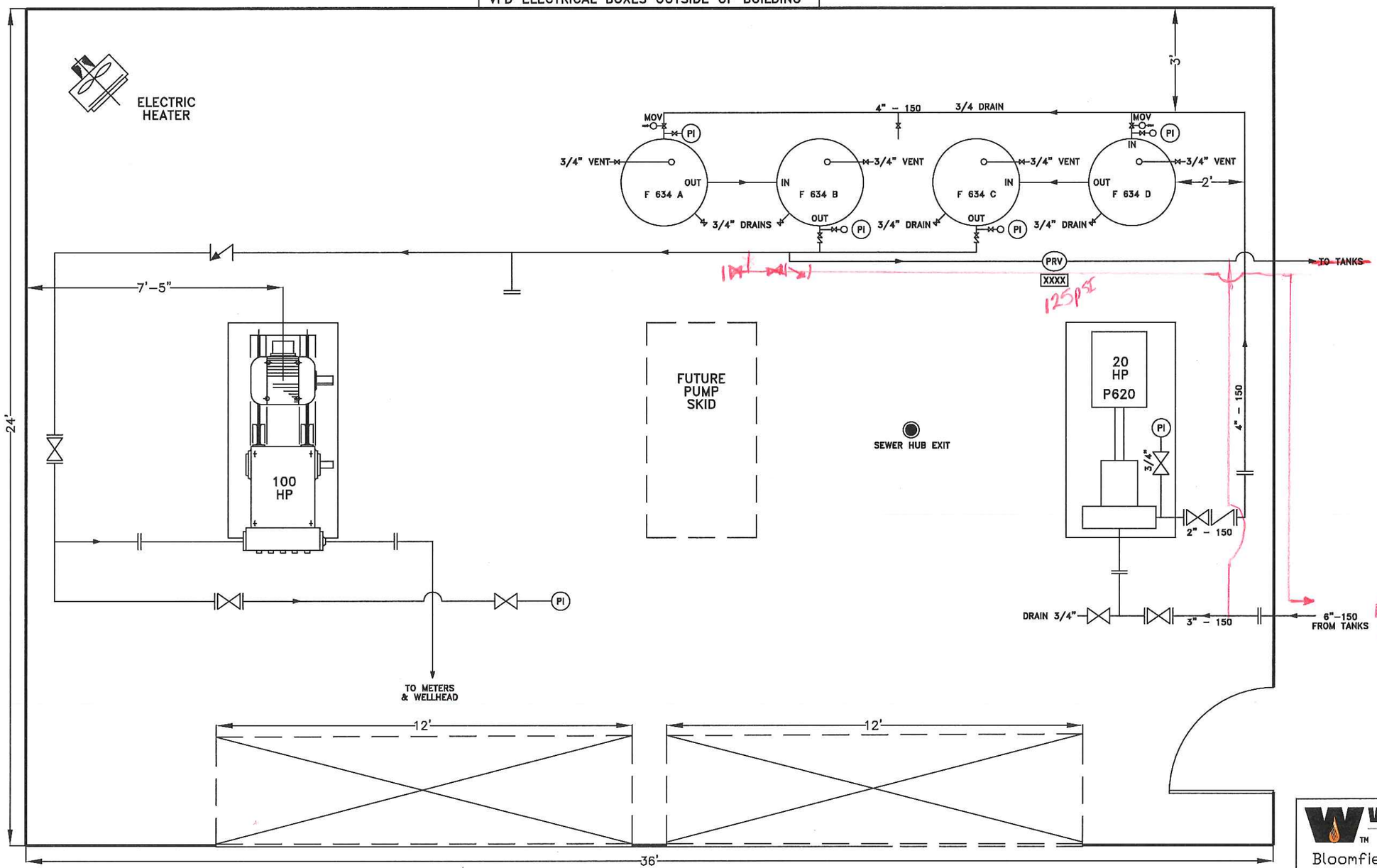
Bloomfield SWD

San Juan County, NM

DWG. NO.

REV. 0

VFD ELECTRICAL BOXES OUTSIDE OF BUILDING



Western Refining

Bloomfield SWD

San Juan County, NM

DRAWN BY: V.C	DATE 11-11-16	SCALE	APPROVED
CHECKED BY:			

DWG. NO. D–700–300–001 REV. 3

DATE	SYM	REVISION RECORD	DR.	CHK.

Please put the right BORDER

-SOUTH LINED-
-POND No. 4-

-NORTH LINED-
-POND No. 3-

FUTURE 4" SPRAYER NOZZLE

SIPHON LINE

CS PVC

2"ø PVC SCH 80

1" INJECTION POINT

VALVE BOX

ATMOS. DRAIN END

FENCE LINE

6x4 RED.

CAP

6" PVC S/40

PIPELINE RIGHT OF WAY

EL PASO PIPELINE

6" PVC TO INJECTION

6" PVC BACKFLUSH

6" PVC TO INJECTION UNIT

10" ROAD CROSSING SLEEVES

6" PVC S/80 BACKFLUSH

PHONE LINES

WOOTEN ROADWAY

POTABLE WATER LINE

(1) FILTER- AMIAD AUTOMATIC ELECT. OPERATED MODEL 3-415 220-3-60 MOTOR

ELECT./TRANS.

TANK 634 HOLDING TANK 300 BBL

ELECT. HTR.

TO 606

C.S.

LSH 603

LSL 603

LSHH 603

FR/PR/PR 608/609/607

NEW 6"ø TRANSFER LINE

8" N.O.

ELEC. TRACE PUMP CASE & ALL VALVES & PIPING

SET @ 80psi

PCV 4415

FI 601

FI 602

2" INSUL.

4x2 RED.

To O/S Sprinkler Pump.

BYPASS LINE

P-671
TRANSFER PUMP
25HP 230V.
(PLASTIC IMPELLER)

ADD MOV each Place

6-150 PVC

3-150

Dirt

EFFLUENT WATER INJECTION WELL

EFFLUENT WATER FROM NORTH OILY WATER POND SEE DWG. 500-800-016

P-616

P-616A
HORIZONTAL PUMP

Removal only thing needed is Ben to dig x Tank

To Dw. D-700 -300 -001

NOTES:
1. ALL INSTRU. TAG No. PREFIX = 500-Δ

REFERENCE DWGS.

NO.	REVISION	JOB No.	DRAWN	CHECKED	APPROVED
7	Revised To Depict Corrected Instrum. Numbers. (M. Spolar)		NHB 5/99		
6	Replaced Giant Title Block With Western Title Block.		NHB 5/99		
5	Added Pump Bypass line to P-571 per MOC 08-07		TAG 10/08		
4	REVISED AS NOTED		TDF 12/07		
3	Revised As Per Mark-Up. (R. Weaver)		NHB 4/03		
8	Revise Drawing To Add Temporary Water Filter Per TMOC 09-17		TAG 11/09		
1	REVISED & REDRAWN ON CAD		NHB 10/99		
			BY DATE	BY DATE	BY DATE

SCALE	NTS
DRAWN BY	NHB
INITIAL CHK.	
FINAL CHK.	
ENGR.	
APPR. BY	
AFE/WO No.	NONE
DATE	10-11-99

EFFLUENT WATER INJECTION WELL & TRANSFER SYSTEM

Western Refining
BLOOMFIELD REFINERY
BLOOMFIELD NEW MEXICO

DWG. NO. D-500-800-031
REV. 8

Nicole R. Bigay

Nicole R. Bigay

GENERAL STRUCTURAL NOTES

BUILDING CODE
2009 EDITION OF THE INTERNATIONAL BUILDING CODE, WITH STATE OF NEW MEXICO AMENDMENTS.

LOADS

GRAVITY:

ROOF:
ROOF LIVE LOAD = 20 PSF (REDUCIBLE).
ROOF DEAD LOAD = 2.5 PSF.
ROOF SNOW LOAD = 30 PSF.
COLLATERAL LOAD = 2 PSF.

LATERAL:

WIND:
3 SECOND WIND GUST = 90MPH.
WIND IMPORTANCE FACTOR = 1.0
EXPOSURE = C.

SEISMIC:
SEISMIC IMPORTANCE FACTOR = 1.0.
SHORT PERIOD SPECTRAL ACCELERATION Ss = 0.178g.
ONE SECOND SPECTRAL ACCELERATION S1 = 0.038g.
SOIL SITE CLASS = D.
Sds = 0.189g.
Sd1 = 0.061g.
SEISMIC DESIGN CATEGORY = B.
BASIC SEISMIC-FORCE RESISTING SYSTEM = ORDINARY STEEL CONCENTRICALLY BRACED FRAMES AND LIGHT FRAMED WALLS SHEATHED WITH STEEL SHEETS.
DESIGN BASE SHEAR = 0.6K
RESPONSE MODIFICATION FACTOR (R) = 3.25 AND 7.
ANALYSIS PROCEDURE USED = EQUIVALENT LATERAL FORCE PROCEDURE.

FOUNDATIONS

DESIGN SOIL BEARING VALUE = 2500 PSF (CODE MAXIMUM).

CONCRETE

ALL EXTERIOR CONCRETE SLABS ARE TO SLOPE AWAY FROM BUILDINGS.

THE SPECIFIED 28 DAY COMPRESSIVE STRENGTH IS AS FOLLOWS: FOOTINGS AND SLABS ON GRADE , F'c = 3000 PSI (DESIGN BASED ON 2500 PSI).

ALL CAST-IN-PLACE CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ACI. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED UNLESS NOTED OTHERWISE. ADMIXTURES CONTAINING CHLORIDES SHALL NOT BE USED. NO OTHER ADMIXTURES PERMITTED WITHOUT APPROVAL. FOR CONCRETE WITHOUT PLASTICIZER, MAXIMUM SLUMP 5 INCHES AT POINT OF PLACEMENT UNLESS NOTED OTHERWISE. IF PLASTICIZER IS USED, A HIGHER FINAL SLUMP MAY BE ALLOWED UPON ENGINEER'S APPROVAL. UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE EMBEDMENT OF CONDUITS, PIPES, SLEEVES, ETC. OF ANY MATERIAL SHALL NOT BE PERMITTED WITHIN ANY CONCRETE STRUCTURAL ELEMENT OR STRUCTURAL CONCRETE TOPPINGS WITHOUT THE APPROVAL OF THE ENGINEER.
TEST DATA FOR EACH CONCRETE MIX SHALL BE SUBMITTED FOR REVIEW PER CHAPTER 5 OF ACI 318. REFERENCE FIGURE R5.3 FOR SUBMITTAL REQUIREMENTS AND OPTIONS. CONCRETE MIX DESIGNS THAT ARE SUBMITTED WITHOUT THE APPROPRIATE TEST DATA CANNOT BE REVIEWED.

REINFORCING

ALL REINFORCING PER CRSI SPECIFICATIONS AND HANDBOOK. NO TACK WELDING OF REINFORCING BARS ALLOWED WITHOUT PRIOR REVIEW OF PROCEDURE WITH THE ENGINEER. LATEST ACI CODE AND DETAILING MANUAL APPLY. CLEAR CONCRETE COVERAGES ARE 3 INCHES FOR CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, 1-1/2 INCHES FOR CONCRETE EXPOSED TO EARTH OR WEATHER.

ALL REINFORCING SHALL BE CHAIRED TO ENSURE PROPER CLEARANCES. SUPPORT OF FOUNDATION REINFORCING MUST PROVIDE ISOLATION FROM MOISTURE/CORROSION BY USE OF A PLASTIC OR CONCRETE CHAIR. DUCT-TAPE COVERED REINFORCING IS NOT AN ACCEPTABLE CHAIR.

ALL DIMENSIONS REFERENCED IN DRAWINGS AS "CLEAR" SHALL BE FROM FACE OF STRUCTURE TO EDGE OF REINFORCING, AND SHALL NOT BE LESS THAN STATED, NOR GREATER THAN "CLEAR" DIMENSION PLUS 3/8 INCHES. ALL OTHERS SHALL BE PLUS OR MINUS ¼ INCHES TYPICAL UNLESS NOTED OTHERWISE.

STEEL REINFORCING:
A. ALL PRINCIPAL LONGITUDINAL - ASTM A615 - GR 60.
B. TIES, STIRRUPS, ETC. ASTM A615 - GR 40.
C. WIRE PER ASTM A82.

LAP SPLICES IN CONCRETE:

PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZONTAL BARS AT ALL CORNERS AND INTERSECTIONS PER TYPICAL DETAILS. REINFORCING BAR SPACING GIVEN ARE MAXIMUM ON CENTERS. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE. LAP SPLICES, UNLESS NOTED OTHERWISE, SHALL BE CLASS "B" TENSION LAP SPLICES PER LATEST EDITION OF ACI 318.

DRYPACK:

DRYPACK SHALL BE 5000 PSI NON-SHRINK GROUT, FIVE STAR OR EQUIVALENTS. INSTALL DRYPACK UNDER COLUMN BASE PLATE AFTER COLUMN HAS BEEN PLUMBED BUT PRIOR TO SUPPORTED FRAMING BEING INSTALLED.

STRUCTURAL STEEL

ALL STEEL MEMBERS ARE TO BE PAINTED FOR RUSTPROOFING AND WEATHERPROOFING.

GENERAL:
ALL CONSTRUCTION PER LATEST AISC HANDBOOK. ALL WIDE FLANGE STEEL SHALL BE ASTM A992 (Fy = 50 KSI). ALL MISCELLANEOUS STEEL UNLESS NOTED OTHERWISE SHALL BE ASTM A36 (Fy = 36 KSI).

ALL STRUCTURAL ROLLED STEEL MEMBERS WITH Fy GREATER THAN 36 KSI ARE TO BE IDENTIFIED WITH AN ASTM SPECIFICATION MARK OR TAG PER IBC SEC. 2203.1.

UNLESS NOTED OTHERWISE, ALL BOLTS SHALL BE ASTM A307. ALL BOLTS SHALL BE INSTALLED WITH STEEL WASHERS AT SHORT SLOTTED HOLES USING SNUG TIGHT INSTALLATION, UNLESS NOTED OTHERWISE.

MATERIAL PROPERTIES OF COLD FORMED LIGHT GAGE STEEL MEMBERS CONFORM TO THE REQUIREMENTS OF ASTM A1011-06b GRADE 55 WITH A MINIMUM YIELD OF 55,000 PSI.

ANCHOR RODS:

ANCHOR RODS INCLUDE HOOKED, HEADED, AND THREADED AND NUTTED ANCHORS. THE TERMS ANCHOR BOLT AND ANCHOR ROD ARE USED SYNONYMOUSLY THROUGHOUT THESE DOCUMENTS. ALL ANCHOR ROD MATERIAL SHALL BE PER ASTM F1554 GRADE 55 - WELDABLE. ALL ANCHOR RODS SHALL BE INSTALLED WITH STEEL WASHERS AT SHORT SLOTTED HOLES USING SNUG TIGHT INSTALLATION UNLESS NOTED OTHERWISE.

STEEL ERECTION NOTE:

PER OSHA, STEEL MEMBERS AND DIAGONAL BRACING CANNOT BE RELEASED FROM HOISTING CABLES UNTIL ALL BOLTS OR WELDS AT MEMBER ENDS ARE COMPLETELY INSTALLED.

Lamb Engineering & Design
2805 BANNOCK DR
LOVINGTON NM, 88260
(575) 396-5377
dplambd3@gmail.com

DANIEL P. LAMB
NEW MEXICO
19111
PROFESSIONAL ENGINEER
11-23-16

BUILD IT WITH STEEL BUILD IT TO LAST
JNL
STEEL COMPONENTS, INC.
430 US HWY 62/180 W
SEMINOLE, TX 79360
P: 432-758-9900
F: 432-758-9903

PROJECT:
JNL 24X36X12
BLOOMFIELD, NM

PROJECT NO:	
DRAWN BY:	DCL
CHECKED BY:	DPL
DATE:	11-23-16

SHEET TITLE
GENERAL STRUCTURAL NOTES

S-101

GENERAL STRUCTURAL NOTES

CERTIFICATES SHALL BE THOSE ISSUED BY AN ACCEPTED TESTING AGENCY. ALL WELDING DONE BY E70 SERIES LOW HYDROGEN RODS UNLESS NOTED OTHERWISE. SHOP WELDS AND FIELD WELDS SHALL BE SHOWN ON THE SHOP DRAWINGS SUBMITTED FOR REVIEW.

ROOF/WALL SHEATHING:

ALL ROOF AND WALL SHEATHING SHAL BE 26 GA. R-PANEL SHEATHING, 36 INCHES WIDE MANUFACTURED IN ACCORDANCE TO ASTM-A792 GRADE 80 WITH MINIMUM YIELD STRESS OF 80,000 PSI AND INSTALLED PER ER-5409P. ATTACH DECK TO FRAMING WITH 1¼" SELF DRILLING TEK SCREWS WITH WASHERS BY PROVIDING 3 SCREWS AT INTERMEDIATE SUPPORTS, 6 SCREWS AT SHEET ENDS AND AT 6" MAX ALONG PARALLEL SUPPORTS. PROVIDE ¾" SELF DRILLING TEK SCREWS WITH WASHERS AT 12" ON CENTER MAXIMUM ALONG SIDECAPS. ROOF SHEETS ARE TO BE INSTALLED AS A 4-SPAN MINIMUM.
PANEL CLOSURES SHALL BE PROVIDED AT ALL ROOF TO WALL TRANSITIONS. SIDE LAP SEALANT IS TO BE PROVIDED AT ROOF PANEL LAPS. SEALANT IS TO BE PROVIDED BETWEEN ROOF PANELS AND RIDGE CAP. RAKE TRIM AND OUTSIDE CORNER WALL TRIM ARE TO BE PROVIDED FOR WEATHERPROOFING. RAKE TRIM IS TO BE INSTALLED WITH SEALANT AND CLOSURES. ALL ROOF AND WALL PENETRATIONS SHALL BE SEALED ACCORDINGLY.

GENERAL NOTES:

THE STRUCTURAL CONSTRUCTION DOCUMENTS REPRESENT THE FINISHED STRUCTURE. EXCEPT WHERE NOTED, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. THE STRUCTURAL ENGINEER OF RECORD SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES FOR PROCEDURE OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND THE PROGRAMS INCIDENT THERETO (NOR SHALL OBSERVATION VISITS TO THE SITE INCLUDE INSPECTIONS FOR THESE ITEMS).

WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA. ANY ENGINEERING DESIGN, PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW, SHALL BEAR THE SEAL OF A REGISTERED ENGINEER RECOGNIZED BY THE BUILDING CODE JURISDICTION OF THIS PROJECT.

NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED OF IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL STRUCTURAL NOTES AND SPECIFICATIONS, THE GREATER REQUIREMENTS SHALL GOVERN.

CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS WITH DRAWINGS PRIOR TO START OF CONSTRUCTION. RESOLVE ANY DISCREPANCY WITH THE ENGINEER. ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR ARCHITECTURAL, CIVIL, MECHANICAL, PLUMBING, AND ELECTRICAL ITEMS WITH THE APPROPRIATE TRADE DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.

TYPICAL DETAILS MAY NOT NECESSARILY BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.

CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED CONSTRUCTION. LOAD SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT.

OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE. IF AN OPTION IS CHOSEN, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY CHANGES, APPROVALS AND THE COORDINATION OF THE WORK WITH ALL RELATED TRADES AND SUPPLIERS.

VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS (IF APPLICABLE) AND FIELD CONDITIONS.

THE ADEQUACY OF ENGINEERING DESIGNS AND LAYOUT PERFORMED BY OTHERS RESTS WITH THE DESIGNING OR SUBMITTING AUTHORITY.

REVIEWING IS INTENDED ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR.

MECHANICAL, ELECTRICAL, PLUMBING, SITE, EXISTING BUILDING PLANS AND WORK BY OTHERS. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR PROVIDING ADDITIONAL INFORMATION INCLUDING, BUT NOT LIMITED TO, PREVIOUSLY MENTIONED ITEMS IF REQUIRED BY RELEVANT AUTHORITY.

CONSTRUCTION NOTES:

A. PER OSHA, STEEL MEMBERS AND DIAGONAL BRACING CANNOT BE RELEASED FROM HOISTING CABLES UNTIL ALL BOLTS OR WELDS AT MEMBER ENDS ARE COMPLETE.
B. FOUNDATION FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED SOIL 18 INCHES MINIMUM BELOW ADJACENT FINISHED GRADE. FINISHED GRADE IS DEFINED AS TOP OF SLAB FOR INTERIOR FOOTINGS.
IF CLAY OR OTHER UNSUITABLE SOIL IS FOUND, THE FOLLOWING GUIDELINES SHALL BE FOLLOWED:

1. OVEREXCAVATE THE EXISTING SITE SOILS TO A MINIMUM DEPTH OF TWO FEET BELOW BOTTOM OF FOOTING ELEVATION SHOWN. THE OVEREXCAVATION SHALL EXTEND LATERALLY OUTSIDE PERIMETER WALL AND OUTSIDE OF FOOTING EDGES A MINIMUM OF 5 FEET.
2. THE EXPOSED OVEREXCAVATESD SURFACE SHALL BE SCARIFIED TO A DEPTH OF 8 INCHES AND RECOMPACTED TO 95% OF MAXIMUM DENSITY AS ESTABLISHED BY ASTM D - 1557.
3. THE FOOTING BASE SHALL BE BROUGHT TO DESIGN ELEVATION UTILIZING ENGINEERED STRUCTURAL FILL PLACED AS NOTED BELOW.

C. ON SITE SOILS MAY BE SUITABLE FOR USE AS BACKFILL SOILS AND STRUCTURAL FILL, IF THEY MEET THE FOLLOWING REQUIREMENTS. ALL FILL MATERIAL SHALL BE FREE OF VEGETATION AND DEBRIS AND CONTAIN NO ROCKS LARGER THAN 4 INCHES. GRADATION OF THE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH ASTM D-442. SAND IS NOT AN ACCEPTABLE BACKFILL.

D. STRUCTURAL FILL AND BACKFILL SHALL BE PLACED IN LAYERS OF NOT MORE THAN 8 INCHES LOOSE WITH EACH LAYER BEING COMPACTED TO A MINIMUM DENSITY OF 95% OF LABORATORY DENSITY AS DETERMINED BY ASTM D-1557.

E. THE METHOD AND STABILITY OF THE FOUNDATION EXCAVATION IS THE RESPONSIBILITY OF THE CONTRACTOR, SEE SPECIFICATIONS AND NOTES HEREIN FOR ADDITIONAL INFORMATION.

F. CONTRACTOR TO VERIFY ROUGH OPENING REQUIREMENTS WITH DOOR AND/OR WINDOW MANUFACTURERS PRIOR TO INSTALLATION.

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DANIEL P. LAMB NEW MEXICO 19111 PROFESSIONAL ENGINEER
11-23-16

PROJECT:
JNL 24X36X12
BLOOMFIELD, NM

PROJECT NO:	
DRAWN BY:	DCL
CHECKED BY:	DPL
DATE:	11-23-16

SHEET TITLE

GENERAL STRUCTURAL NOTES

S-102

NOTES:

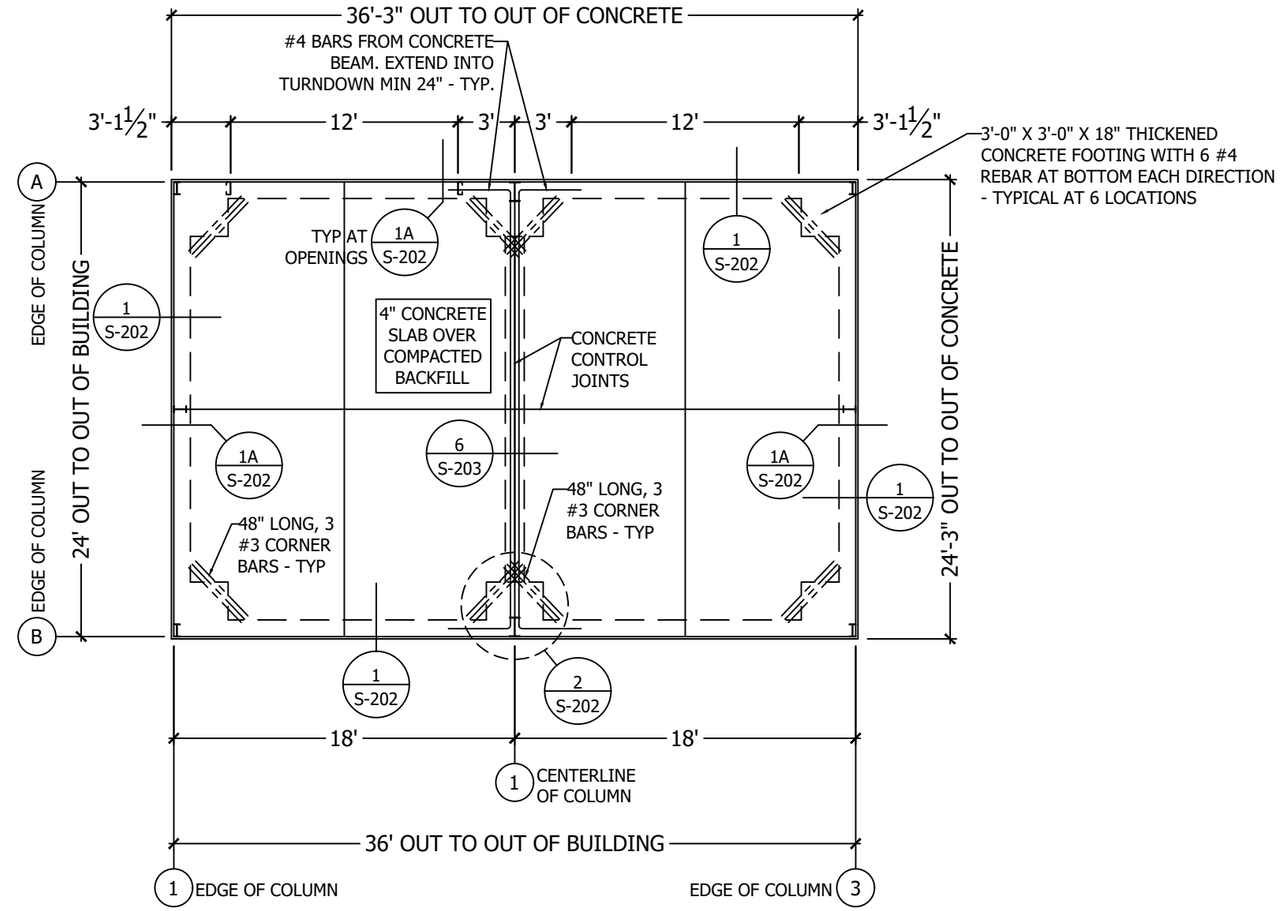
A) CONCRETE CONTROL JOINTS REQUIRED IN SLAB.

B) CONCRETE SLAB REINFORCEMENT (IF USED) SHALL BE PLACED AT MIDPOINT BETWEEN TOP OF CONCRETE SLAB AND BOTTOM OF CONCRETE SLAB. SUPPORT REINFORCEMENT WITH MATERIAL THAT DOES NOT RUST.

C) NO CONCRETE SLAB ON GRADE SLOPE IS SHOWN ON PLAN. IF SLOPE IS REQUIRED, CONTACT ENGINEER.

D) PLANS SHOWN PROVIDE CONCRETE SLAB ON GRADE CRACK CONTROL UTILIZING A MONOLITHIC CONCRETE POUR. IF CONCRETE CRACKING IS OF GREAT CONCERN, CONTACT ENGINEER FOR A 2 OR 3 CONCRETE POUR DESIGN.

E) CONCRETE FOOTINGS AND TURNDOWNS SHALL BEAR EITHER ON UNDISTURBED SOIL OR ENGINEERED BACKFILL, COMPACTED PREPARED AND TESTED PER CONSTRUCTION NOTES WITHIN GENERAL FOUNDATION NOTES. IF FOOTINGS ARE CONSTRUCTED TO DEPTHS GREATER THAN PLANS SHOW, ADDITIONAL REINFORCING SHALL BE REQUIRED AND ENGINEER SHOULD BE NOTIFIED TO RESOLVE.



FOUNDATION PLAN

Scale: 1/8" = 1'

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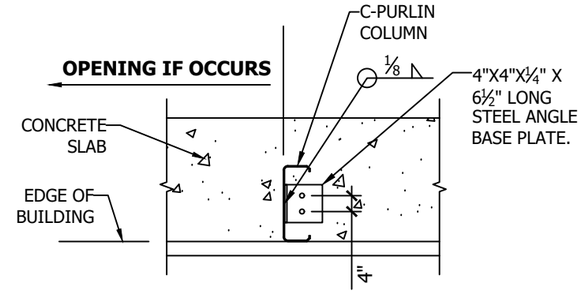
SHEET TITLE

FOUNDATION PLAN

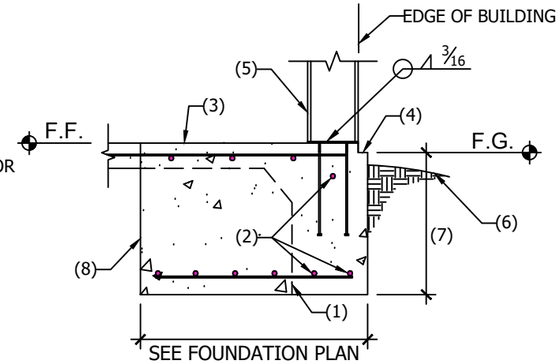
S-201

NOTE:
CONTRACTOR TO MAINTAIN MIN OF 1¼" CLEARANCE OF ANCHORS FROM ALL EDGES OF BASE PLATES.



5 TYPICAL 8" C-PURLIN BASE PLATE
No Scale

NOTES:
1. CONCRETE TURNDOWN BEYOND.
2. #4 CONTINUOUS REBAR.
3. CONCRETE SLAB ON GRADE. SLAB REINFORCING MAY OR MAY NOT OCCUR.
4. NOTCH SLAB EDGE AS REQUIRED TO ACCEPT METAL SIDING.
5. STEEL COLUMN - SEE DETAIL 4/S-202 FOR BASE PLATE OR EMBED INFO.
6. GRADE TO SLOPE AWAY FROM SLAB.
7. 18" MINIMUM BELOW LOWEST ADJACENT FINISH GRADE OR MINIMUM FROST DEPTH AS REQUIRED BY LOCAL JURISDICTION.
8. CONCRETE FOOTING.



3 TYPICAL STEEL COLUMN AT CONCRETE
No Scale

NOTES:
1. ½" STEEL PLATE.
2. (4) ½" DIA HEADED STUDS.
3. STEEL COLUMN.
4. W-SHAPED STEEL EMBED PER SCHEDULE.
5. 3" DIA HOLE CENTERED IN EMBED.

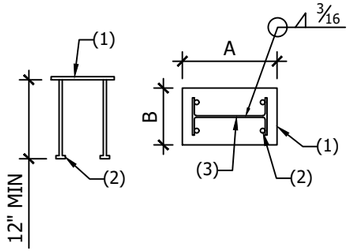
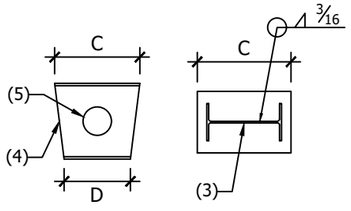


PLATE WITH ANCHORS

BASE PLATE AND ANCHOR SCHEDULE		
COLUMN	**A**	**B**
W8X10 OR 4X4 T.S.	10"	6"
W8X15	10"	6"
W10X12	12"	6"
W12X14	14"	6"
W12X16	14"	6"
W12X19	14"	6"
W14X22	16"	7"
W16X26	18"	7"
W16X31	18"	7"
W18X35	20"	8"
W21X44	23"	8"

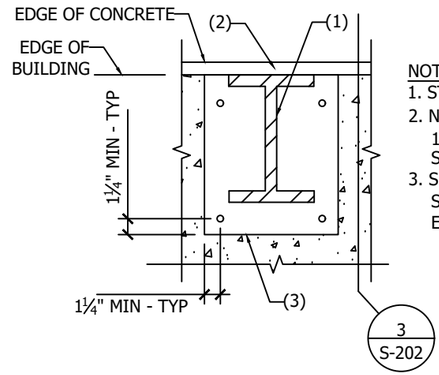
NOTE:
REFER TO CROSS SECTION FOR COLUMN SIZE



W-SHAPED EMBED PLATE

EMBED PLATE SCHEDULE			
COLUMN	**EMBED TYPE**	**C**	**D**
W8X10 OR 4X4 T.S.	W12X26	10"	8"
W8X15	W12X26	10"	8"
W10X12	W12X26	12"	10"
W12X14	W12X26	14"	12"
W12X16	W12X26	14"	12"
W12X19	W12X26	14"	12"
W14X22	W16X36	16"	14"
W16X26	W16X36	18"	16"
W16X31	W16X36	18"	16"
W18X35	W12X40	20"	18"
W21X44	W12X40	23"	21"

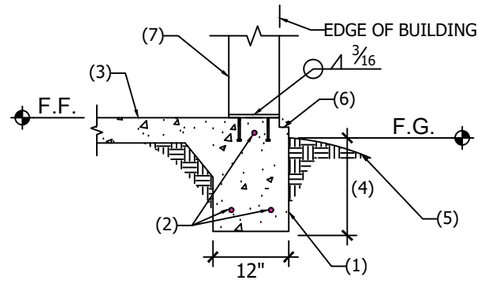
4 TYPICAL BASE PLATE AND ANCHOR
No Scale



NOTES:
1. STEEL COLUMN.
2. NOTCH SLAB EDGE 1½" X 1½" TO ACCEPT METAL SIDING.
3. SEE DETAIL 4/S-202 FOR STEEL BASE PLATE OR EMBED INFO.

2 TYPICAL STEEL COLUMN AT CONCRETE
No Scale

NOTES:
1. CONCRETE TURNDOWN.
2. #4 CONTINUOUS REBAR - 2 AT BOTTOM AND 1 AT TOP.
3. CONCRETE SLAB ON GRADE. SLAB REINFORCING MAY OR MAY NOT OCCUR.
4. 18" MINIMUM BELOW LOWEST ADJACENT FINISH GRADE OR MINIMUM FROST DEPTH AS REQUIRED BY LOCAL JURISDICTION.
5. GRADE TO SLOPE AWAY FROM SLAB.
6. NOTCH CONCRETE EDGE 1½" X 1½" AS REQUIRED TO ACCEPT METAL WALL SHEATHING.
7. AT **1A**, STEEL COLUMN OCCURS. FOR W8X10 COLUMNS, SEE DETAIL 4/S-202 FOR BASE PLATE OR EMBED INFO. AT C-PURLIN COLUMNS, FASTEN TO CONCRETE WITH ½" DIA HEADED STUDS WITH MIN 6" EMBEDMENT. SEE DETAIL 5/S-202 FOR ADD'L C-PURLIN COLUMN INFO.



1 TYPICAL CONCRETE TURNDOWN
No Scale

1A AS NOTED
No Scale

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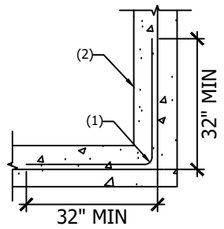
SHEET TITLE
FOUNDATION DETAILS

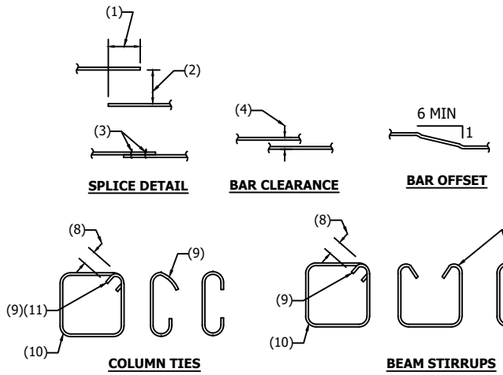
S-202



NOTES:
1. CORNER BAR - CORNER BARS TO BE SAME SIZE AND NUMBER AS LARGEST HORIZONTAL REINFORCEMENT BAR.
2. CONCRETE TURNDOWN.

4 TYPICAL FOOTING CORNER

No Scale



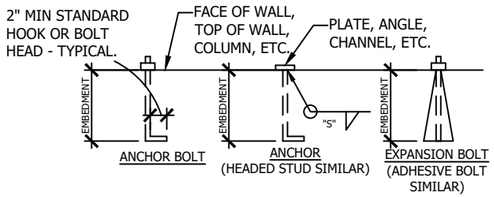
NOTES:
1. LAP - SEE G.S.N.
2. MAXIMUM ⅓ LAP BUT NOT MORE THAN 6".
3. WIRE TIES.
4. 1d (1" MINIMUM)
5. RADIUS = 3d FOR BARS NOT OVER #8; 4d FOR #9, #10, AND #11 BARS; 5d FOR #14 AND #18 BARS. 5d FOR ALL GRADE 40 BARS WITH 180° HOOK.
6. 4d (4" MINIMUM).
7. 12d (90° HOOK).
8. 6d (4" MINIMUM).
9. 135° BEND.
10. BEND AROUND 1½" PIN FOR #3 BARS. BEND AROUND 2" PIN FOR #4 BARS. BEND AROUND 2½" PIN FOR #5 BARS.
11. ROTATE TIE LOCATION 90° EACH COURSE.

3 TYPICAL CONCRETE REINFORCING BAR DETAILS

No Scale

BOLT DIAMETER	VERT BOLT EMBEDMENT LENGTH	HORIZ BOLT EMBEDMENT LENGTH	HEADED STUD FILLET WELD SIZE. "S"
1/2"	6"	4"	1/4"
5/8"	6"	4"	5/16"
3/4"	7"	5"	5/16"
7/8"	8"	6"	5/16"
1"	9"	7"	3/8"
1 1/8"	10"	8"	-
1 1/4"	11"	9"	-

NOTE: PROVIDE ANCHORS, ANCHOR BOLTS, AND EXPANSION BOLTS PER THIS SCHEDULE UNLESS NOTED ON PLANS OR DETAILS. AT "ANCHORS" USE 3/16" FILLET WELD("S").



2 TYPICAL ANCHOR, ANCHOR BOLT, AND EXPANSION BOLT SCHEDULE

No Scale

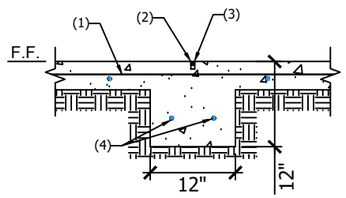
	CLASS B TENSION SPLICE LENGTHS						COMP. BARS	
CONC PSI	f'c=2,500/3,000 PSI		f'c = 4,000 PSI		f'c = 5,000 PSI		f'c= ≧ 3,000 PSI	
BAR LOCATION / SIZE	REGULAR	TOP	REGULAR	TOP	REGULAR	TOP	STD LAP	ENCLOSED W/ SPIRAL TIES
#3	24"	31"	19"	24"	17"	22"	12"	12"
#4	32"	41"	25"	32"	22"	29"	15"	12"
#5	39"	51"	31"	40"	28"	36"	19"	14"
#6	47"	61"	37"	48"	33"	43"	23"	17"
#7	69"	89"	54"	70"	49"	63"	26"	20"
#8	78"	102"	62"	80"	55"	72"	30"	23"
#9	88"	115"	70"	91"	63"	81"	34"	25"
#10	99"	120"	79"	102"	70"	91"	38"	28"
#11	110"	143"	87"	113"	78"	101"	42"	31"

NOTES:
1. TOP BARS ARE ANY HORIZONTAL BARS PLACED SO THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.
2. LAP SPLICES SHALL BE CLASS "B" TENSION LAP SPLICES PER LATEST EDITION OF ACI 318 UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS OR SCHEDULES.
3. CONTACT STRUCTURAL ENGINEER IF CLEAR SPACING OF REINFORCEMENT IS LESS THAN OR EQUAL TO 2 BAR DIAMETERS, OR IF CLEAR COVER IS LESS THAN THE BAR DIAMETER.
4. THIS TABLE IS BASED ON NORMAL WEIGHT CONCRETE.
5. FOR ADDITIONAL INFORMATION, SEE G.S.N., PLANS, SCHEDULES, AND DETAILS.

1 LAP SCHEDULE FOR REINFORCING STEEL IN CONCRETE

No Scale

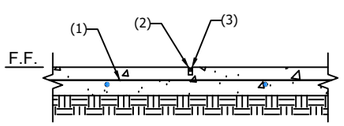
NOTES:
1. SLAB REINFORCING IF REQUIRED.
2. FILL SAWCUT JOINT WITH URETHANE SEALANT ON FOAM ROD IF CLIENT REQUIRES SMOOTH FINISH.
3. SAWED JOINT OR TOOLED GROOVE JOINT ¼ SLAB THICKNESS.
4. 2 #4 CONTINUOUS. EXTEND EACH END INTO TURNDOWN MINIMUM 24".



6 TYPICAL CONCRETE BEAM BETWEEN COLUMNS

No Scale

NOTES:
1. SLAB REINFORCING IF REQUIRED.
2. FILL SAWCUT JOINT WITH URETHANE SEALANT ON FOAM ROD IF CLIENT REQUIRES SMOOTH FINISH.
3. SAWED JOINT OR TOOLED GROOVE JOINT ¼ SLAB THICKNESS.



5 TYPICAL CONCRETE CONTROL JOINT

No Scale

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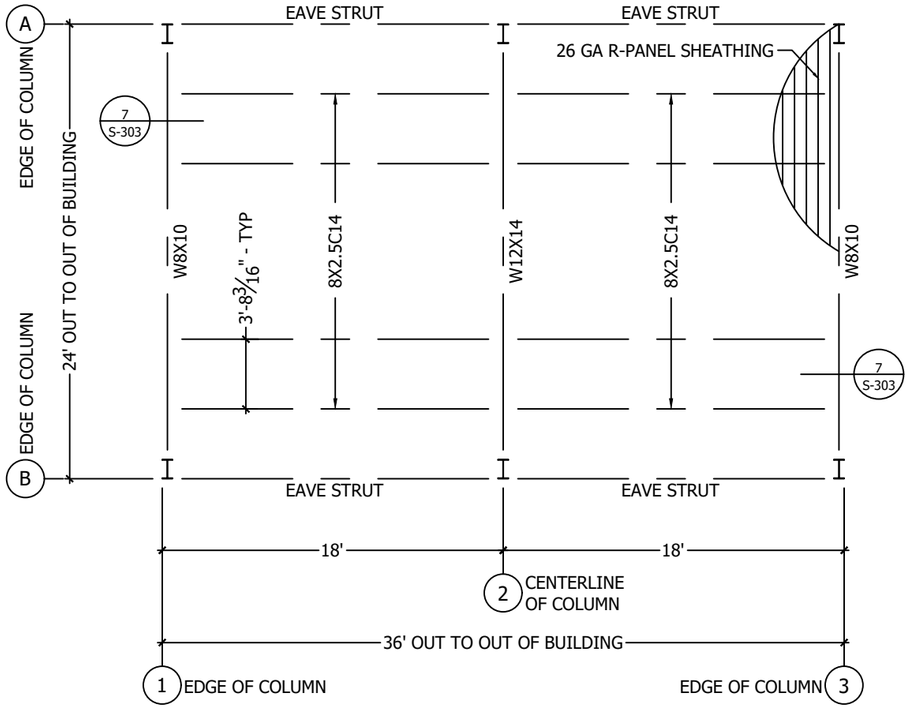
SHEET TITLE
FOUNDATION DETAILS

S-203

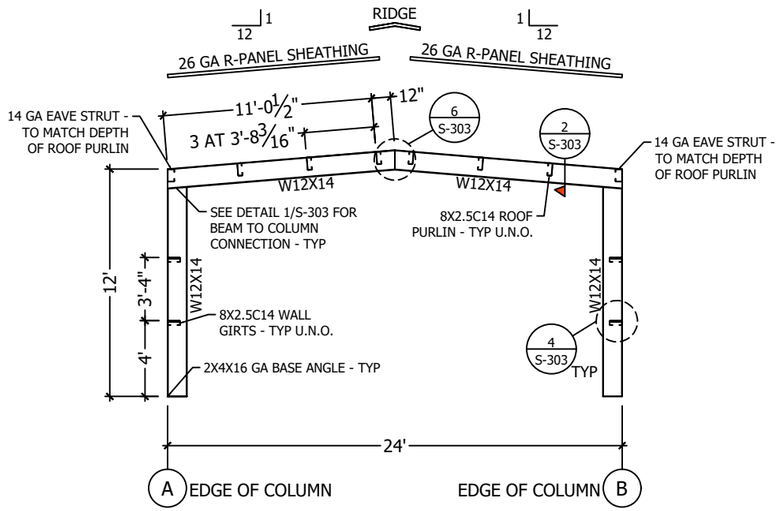


ROOF FRAMING PLAN

Scale: 1/8" = 1'

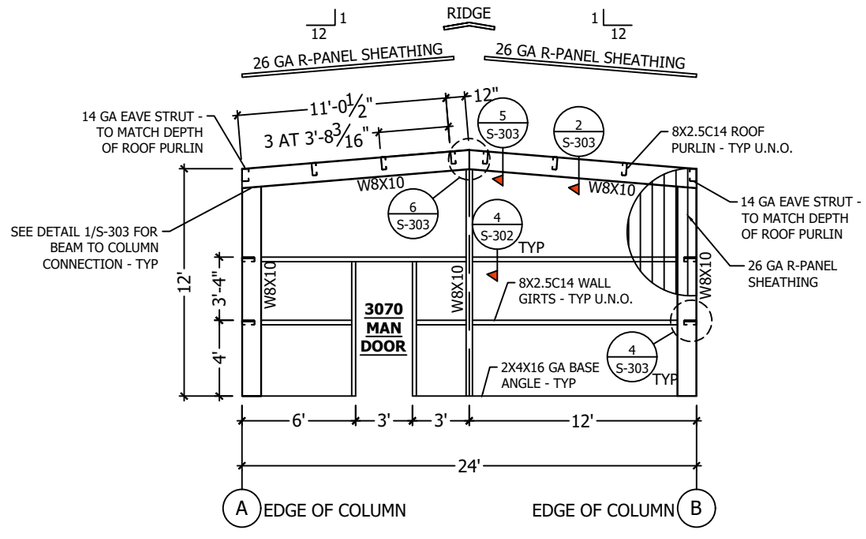
NOTES:

1. FRAME OPENINGS WITH 8X2.5C14 MEMBERS - TYPICAL.
2. INSTALL 8X2.5C14 MEMBERS AS NECESSARY TO ACHIEVE REQUIRED R.O. FOR WINDOW OPENINGS - CONTRACTOR TO VERIFY WITH MANUFACTURER.
3. CONTRACTOR TO COORDINATE DOOR LOCATIONS WITH OWNER.



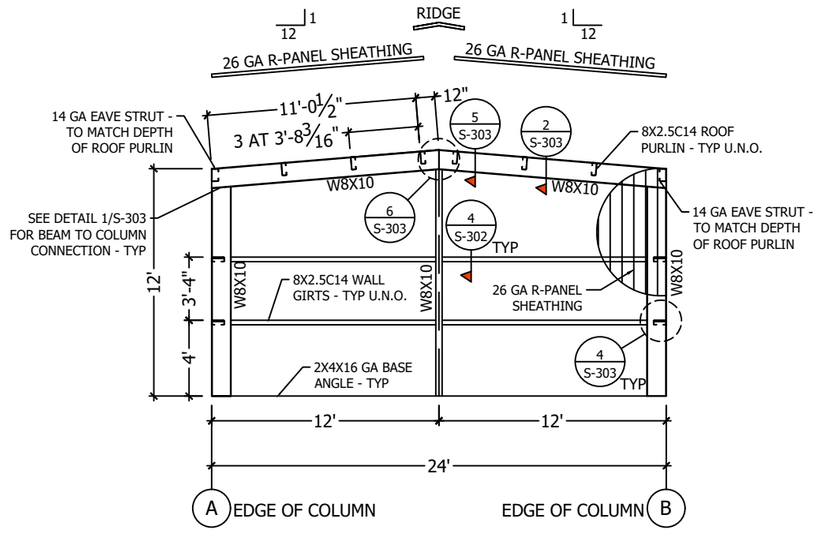
CROSS SECTION ALONG GRIDLINE 2

Scale: 1/8" = 1'



ENDWALL FRAMING ALONG GRIDLINE 1

Scale: 1/8" = 1'



ENDWALL FRAMING ALONG GRIDLINE 3

Scale: 1/8" = 1'

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11-23-16

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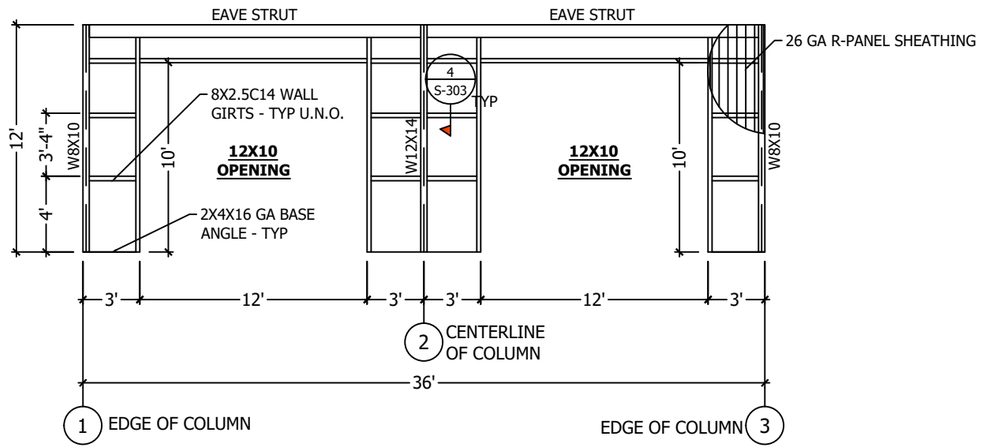
SHEET TITLE

ROOF FRAMING, ENDWALL FRAMING, CROSS SECTION

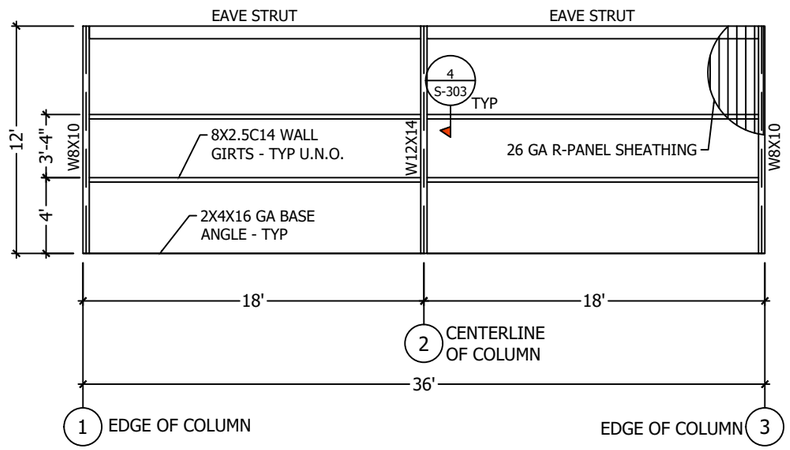
S-301

NOTES:
1. FRAME OPENINGS WITH 8X2.5C14 MEMBERS - TYPICAL.
2. INSTALL 8X2.5C14 MEMBERS AS NECESSARY TO ACHIEVE REQUIRED R.O. FOR WINDOW OPENINGS - CONTRACTOR TO VERIFY WITH MANUFACTURER.
3. CONTRACTOR TO COORDINATE DOOR LOCATIONS WITH OWNER.



SIDEWALL FRAMING ALONG GRIDLINE A

Scale: 1/8" = 1'



SIDEWALL FRAMING ALONG GRIDLINE B

Scale: 1/8" = 1'

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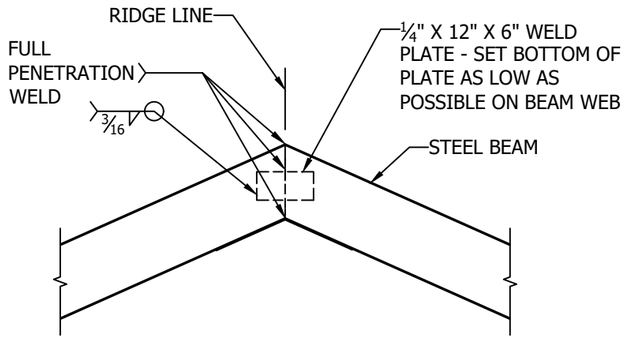
SHEET TITLE

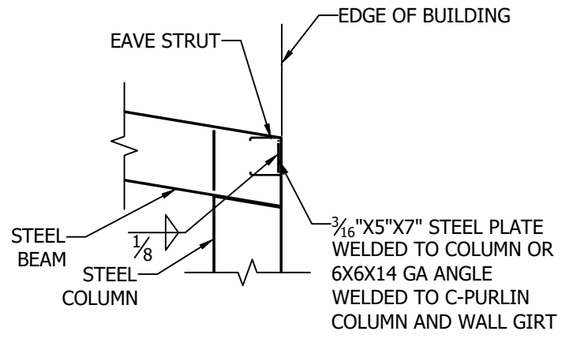
SIDEWALL FRAMING

S-302



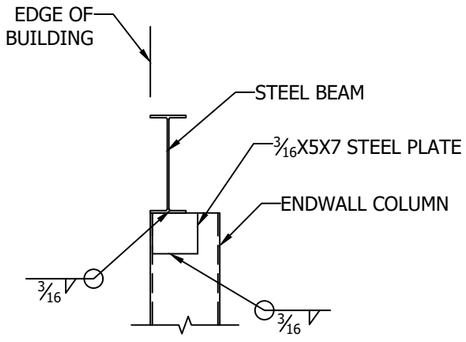
6 STEEL BEAMS AT RIDGE

NO SCALE



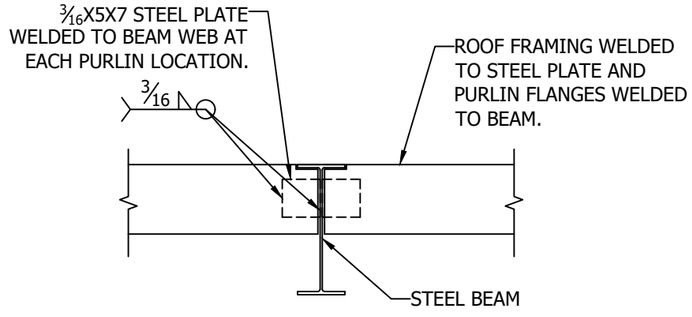
3 EAVE PURLIN DETAIL

NO SCALE



5 ENDWALL BEAM TO C-PURLIN COLUMN

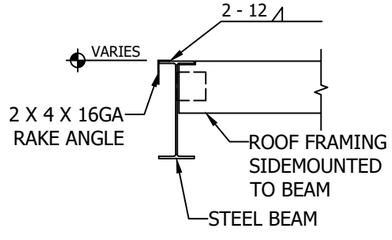
NO SCALE



2 STEEL RAFTERS AT STEEL BEAM - TOP MOUNT

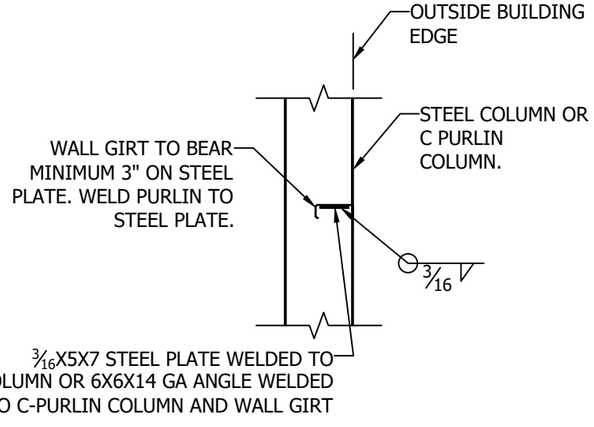
NO SCALE

NOTE:
CONTRACTOR TO CUT WALL PANELS AT ANGLE OF ROOF.



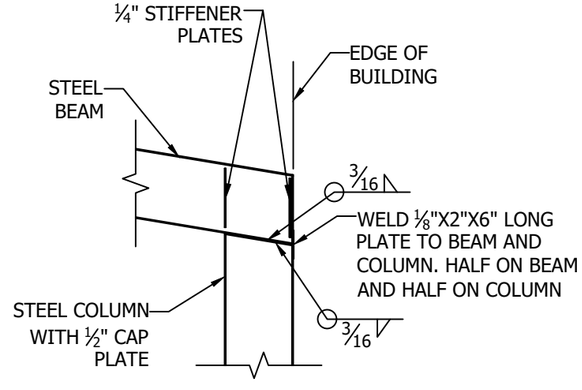
7 RAKE ANGLE AT ENDWALL

NO SCALE



4 WALL GIRT AT STEEL COLUMN OR C PURLIN COLUMN

NO SCALE



1 STEEL BEAM AT STEEL COLUMN

NO SCALE

Lamb Engineering & Design
2805 BANNOCK DR. LOVINGTON NM, 88260
(575) 396-5377
dplambd3@gmail.com

DANIEL P. LAMB NEW MEXICO 19111 PROFESSIONAL ENGINEER
11-23-16

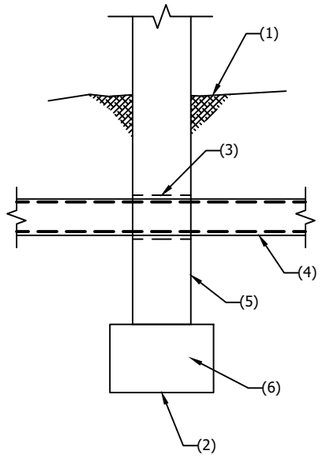
PROJECT:
JNL 24X36X12
BLOOMFIELD, NM

PROJECT NO:	
DRAWN BY:	DCL
CHECKED BY:	DPL
DATE:	11-23-16

SHEET TITLE

FRAMING DETAILS

S-303

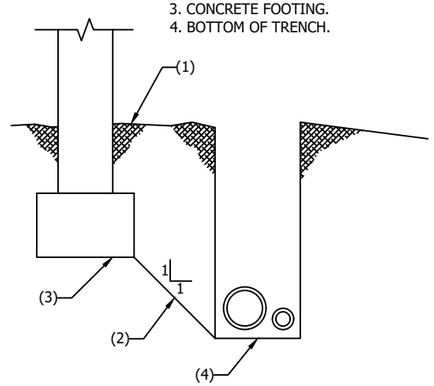


NOTES:
1. FINISHED GRADE WHERE OCCURS.
2. CONCRETE FOOTING.
3. SLEEVE - PROVIDE ½" MINIMUM CLEARANCE AROUND PIPE/CONDUIT.
4. PIPE OR CONDUIT.
5. STEM WALL.
6. NO PIPE SHALL PASS THRU FOOTINGS OR UNDER COLUMN FOOTINGS.

4 PIPE THROUGH FOUNDATION STEM WALL

NO SCALE

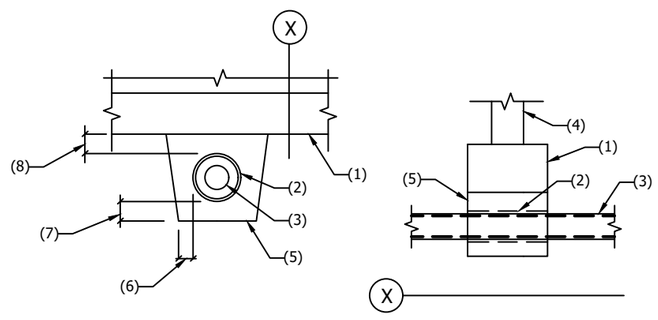
NOTES:
1. FINISHED GRADE WHERE OCCURS.
2. DO NOT EXCAVATE A TRENCH CLOSER THAN A 45 DEGREE ANGLE BELOW BOTTOM OF FOOTING OR FOUNDATION.
3. CONCRETE FOOTING.
4. BOTTOM OF TRENCH.



2 TRENCH PARALLEL TO FOUNDATION

NO SCALE

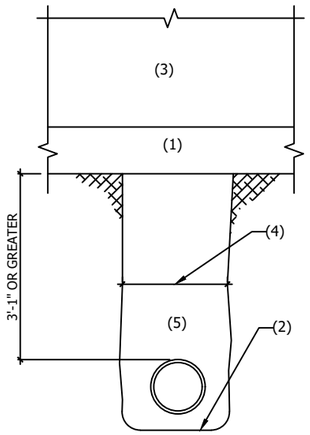
NOTES:
1. CONCRETE FOOTING.
2. SLEEVE - PROVIDE ½" MINIMUM CLEARANCE AROUND PIPE/CONDUIT.
3. PIPE OR CONDUIT.
4. STEM WALL.
5. CONCRETE FILL TO BE PLACED BEFORE FOOTING IS POURED - FORM SAME AS FOOTING AND POUR FULL WIDTH OF PIPE TRENCH.
6. 8" MINIMUM.
7. 6" MINIMUM.
8. 8" MINIMUM/3'-0" MAXIMUM.



3 PIPE PASSING BELOW WALL FOOTING IN TRENCH

NO SCALE

NOTES:
1. CONCRETE FOOTING.
2. BOTTOM OF TRENCH.
3. STEM WALL.
4. 1'-6" MAXIMUM - WHERE TRENCH EXCEEDS 1'-6", NOTIFY STRUCTURAL ENGINEER PRIOR TO PLACEMENT OF FOOTING.
5. BACKFILL AND RECOMPACT TRENCH PER SOILS REPORT AND SPECIFICATIONS.



1 PIPE PASSING BELOW WALL FOOTING IN TRENCH

NO SCALE

Lamb Engineering & Design
2805 BANNOCK DR.
LOVINGTON NM, 88260
(575) 396-5377
dplambd3@gmail.com

DANIEL P. LAMB NEW MEXICO 19111 PROFESSIONAL ENGINEER
11-23-16

PROJECT:
JNL 24X36X12
BLOOMFIELD, NM

PROJECT NO:	
DRAWN BY:	DCL
CHECKED BY:	DPL
DATE:	11-23-16

SHEET TITLE
TYPICAL DETAILS

S-401

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, July 20, 2016 8:17 AM
To: Davis, Bruce (Bruce.Davis@wnr.com)
Cc: Griswold, Jim, EMNRD; Perrin, Charlie, EMNRD; Schmaltz, Randy (Randy.Schmaltz@wnr.com); Allen.Hains@wnr.com
Subject: Western Refining Southwest, Inc. Approval of Discharge Permit (UICI-011) for the Class I (non-hazardous) Waste Injection Well "WDW-2" (API# 30-045-35747) UL: H of Section 27, Township 29 North, Range 11 West, NMPM, San Juan County
Attachments: UICI-11 DP 7-20-2016.pdf

Mr. Davis, et al.:

Please find attached the New Mexico Oil Conservation Division (OCD) above subject letter and discharge permit related to your recent Underground Injection Control Well Application. The hardcopy was placed in the U.S. Mail this morning.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
Environmental Engineer
Oil Conservation Division- Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
Phone: (505) 476-3490
Main Phone: (505) 476-3440
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: www.emnrd.state.nm.us/ocd
Why not prevent pollution, minimize waste, reduce operation costs, and move forward with the rest of the Nation? To see how, go to "Publications" and "Pollution Prevention" on the OCD Website.

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

Tony Delfin
Deputy Cabinet Secretary

David R. Catanach, Division Director
Oil Conservation Division

JULY 20, 2016

CERTIFIED MAIL
RETURN RECEIPT NO: 3771 5961

Mr. Bruce D. Davis
Director
Western Refining Southwest, Inc.
P.O. Box 159
Bloomfield, New Mexico 87413

RE: **Approval of Discharge Permit (UICI-011) for the Class I (non-hazardous) Waste Injection Well "WDW-2" (API# 30-045-35747) Western Refining Southwest, Inc.- Bloomfield Terminal, UL: H of Section 27, Township 29 North, Range 11 West, Lat. 36.69860, Long. 107.97035, NMPM, San Juan County, New Mexico**

Dear Mr. Davis:

The discharge permit (UICI-011) for the Western Class I Non-Hazardous Waste Injection Well "WDW-2," located 2028 FNL and 111 FEL Unit Letter "H", Section 27, Township 29 North, Range 11 West, San Juan County, New Mexico, **is hereby approved** under the terms and conditions specified in the enclosed discharge permit.

OCD approves this discharge permit renewal pursuant to 20.6.2.3109A NMAC. Please note 20.6.2.3109G NMAC, which provides for possible future amendment of the permit. Please be advised that approval of this discharge permit does not relieve Western of liability if operations result in pollution of surface water, ground water, or the environment.

Please note that 20.6.2.3104 NMAC specifies "*When a permit has been issued, discharges must be consistent with the terms and conditions of the permit.*" Pursuant to 20.6.2.3107C NMAC, Western is required to notify the Director of any increase in the injection volume or injection pressure, or process modification that would result in any change in the water quality or volume of the discharge.

This discharge permit will expire on **July 20, 2021**, and Western should submit a discharge permit renewal application in ample time before this date. Note that under 20.6.2.3106F NMAC, if a discharger submits a discharge permit renewal application at least 120 days before the discharge permit expires and is in compliance with the approved discharge permit, then the existing discharge permit will not expire until the application for renewal has been approved or disapproved.

The discharge permit renewal application for the Western Class I Non-Hazardous Waste Injection Well is subject to 20.6.2.3114 NMAC. Every billable facility submitting a discharge permit renewal application is assessed a non-refundable filing fee of $100.00. OCD has already received the required $100.00 filing fee and the $4,500.00 permit fee for a Class I non-hazardous waste injection well is now required by check made payable by Western to the "Water Quality Management Fund."

If you have any questions, please contact Carl Chavez of my staff at (505-476-3490) or email: CarlJ.Chavez@state.nm.us. On behalf of the staff of the OCD, I wish to thank you and your staff for your cooperation during this discharge permit review.

Sincerely,

David R. Catanach

David R. Catanach
Director

DRC/cc

xc: Aztec District Office
Randy R. Schmaltz, Western Refining Southwest, Inc.
Allen Hains, El Paso

DISCHARGE PERMIT UICI-011 (WDW-2)

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY: The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department issues Discharge Permit UICI-011 (Discharge Permit) to WESTERN REFINING SOUTHWEST, INC., L.L.C. (Permittee) to operate its Underground Injection Control (UIC) Class I non-hazardous waste injection well "Waste Disposal Well No. 2 (WDW-2) API No. 30-045-35747, located 2028 FNL and 111 FEL, Unit Letter "H", Section 27, Township 29 North, Range 11 West, (Lat. 36.69860, Long. 107.97035), NMPM, San Juan County, New Mexico. WDW-2 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 Permittee is permitted to dispose of only non-hazardous (RCRA exempt and RCRA non-exempt non-hazardous) oil field waste fluids into WDW-2. Groundwater that may be affected by a spill, leak, or accidental discharge occurs at a depth of approximately 10 - 30 feet below ground surface and has a total dissolved solids (TDS) concentration of approximately 200 mg/L.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class I non-hazardous waste injection wells (see Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (see 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5299 NMAC).

This Discharge Permit for a Class I non-hazardous waste injection well (WDW-2) is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or on-site disposal of, any materials, product, by-product, or oil field waste, other than non-hazardous oil field waste fluids into its Class I non-hazardous waste injection well (WDW-2), including, but not limited to, the on-site disposal of lube oil, glycol, antifreeze, and wash-down water. The Permittee may not dispose of any industrial waste fluid that is not oil field waste that is generated at its terminal. The Ground Water Quality Bureau of the New Mexico Environment Department permits the management of all industrial fluids that are not generated in the oil field.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.
2. The injection of fluids into a large capacity cesspool is prohibited.

3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.

4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.

5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a hazard to public health (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified in 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5299 NMAC) for Class I non-hazardous waste injection wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5299 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified in 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject waste fluids into ground water containing 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (see Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT: This Discharge Permit (UICI-011) is a new UIC Class I (Non-hazardous) Discharge Permit due to the abandonment of the former San Juan Refining Company Disposal Well No. 1 (API# 30-045-29002) under former Discharge Permit UICI-009.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit

fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required $100.00 filing fee. The Permittee shall submit the final $4,500.00 permit fee for a Class I non-hazardous waste injection well to OCD with a check made payable to "Water Quality Management Fund" no later than thirty days after the date that this permit is issued.

1.F. EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT: This Discharge Permit becomes effective on the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit shall **expire on July 20, 2021.** The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. If a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (see Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

1.G. MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD Director and the OCD's Environmental Bureau of any Facility expansion, any injection increase above the approved pressure limit or volume limit specified in Permit Condition 3.B.2, or process modification that would result in any significant modification in the discharge of water contaminants (see 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class I non-hazardous waste injection well (WDW-2) that was approved pursuant to the requirements of this 20.6.2.5000 through 20.6.2.5299 NMAC for the following causes:

a. Noncompliance by Permittee with any condition of this Discharge Permit; or,

b. The Permittee's failure in the discharge permit application or during the discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

c. A determination that the permitted activity may cause a hazard to public health or undue risk to property and can only be regulated to acceptable levels by discharge

permit modification or termination (see Section 75-6-6 NMSA 1978; 20.6.2.5101I NMAC; and 20.6.2.3109E NMAC).

2. This Discharge Permit may also be modified or terminated for any of the following causes:

a. Violation of any provisions of the Water Quality Act or any applicable regulations, standard of performance or water quality standards;

b. Violation of any applicable state or federal effluent regulations or limitations; or

c. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (see Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS I NON-HAZARDOUS WASTE INJECTION WELL DISCHARGE PERMIT:

1. The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class I non-hazardous waste injection well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class I non-hazardous waste injection well discharge permit if:

a. The OCD Director receives written notice 30 days prior to the transfer date; and

b. The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2.a shall:

a. Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgment that the succeeding Permittee shall be responsible for compliance with the Class I non-hazardous waste injection well discharge permit upon taking possession of the facility;

b. Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

c. Include information related to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance

immediately or within a specified time period, or assess a civil penalty, or both (see Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (see Section 74-6-10(A)(2) NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a state or federal law or regulation (see Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS:

2.A. QUARTERLY MONITORING REQUIREMENTS FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELL: The Permittee shall properly conduct waste management injection operations at its facility by injecting only non-hazardous (RCRA exempt and RCRA non-hazardous, non-exempt) oil field waste fluids. Injected waste fluids shall not exhibit the RCRA characteristics, i.e., ignitability, reactivity, corrosivity, or toxicity under 40 CFR 261 Subpart "C" 261.21 – 261.24 (July 1, 1992), at the point of injection into WDW-2, based upon environmental analytical laboratory testing. Pursuant to 20.6.2.5207B, the Permittee shall provide analyses of the injected fluids at least quarterly to yield data representative of their toxicity characteristic.

The Permittee shall also analyze the injected fluids quarterly for the following characteristics:

- pH (Method 9040);
- Eh;
- Specific conductance;
- Specific gravity;
- Temperature;
- Major dissolved cations and anions, including: fluoride, calcium, potassium, magnesium, sodium bicarbonate, carbonate, chloride, sulfate, bromide, total dissolved solids, and cation/anion balance using the methods specified in 40 CFR 136.3); and,
- EPA RCRA Characteristics for Ignitability (ASTM Methods); Corrosivity (SW-846) and Reactivity (determined through Permittee's application of knowledge or generating process).

The Permittee shall analyze the injected fluids quarterly for the constituents identified in the Quarterly Monitoring List (below) to demonstrate that the injected fluids do not exhibit the characteristic of toxicity using the Toxicity Characteristic Leaching Procedure, EPA SW-846 Test Method 1311 (see Table 1, 40 CFR 261.24(b)).

QUARTERLY MONITORING LIST			
EPA HW No.	**Contaminant**	**SW-846 Methods**	**Regulatory Level (mg/L)**
D004	Arsenic	1311	5.0
D005	Barium	1311	100.0
D018	Benzene	8021B	0.5
D006	Cadmium	1311	1.0
D019	Carbon tetrachloride	8021B 8260B	0.5
D020	Chlordane	8081A	0.03
D021	Chlorobenzene	8021B 8260B	100.0
D022	Chloroform	8021B 8260B	6.0
D007	Chromium	1311	5.0
D023	o-Cresol	8270D	200.0
D024	m-Cresol	8270D	200.0
D025	p-Cresol	8270D	200.0
D026	Cresol	8270D	200.0
D027	1,4-Dichlorobenzene	8021B 8121 8260B 8270D	7.5
D028	1,2-Dichloroethane	8021B 8260B	0.5
D029	1,1-Dichloroethylene	8021B 8260B	0.7
D030	2,4-Dinitrotoluene	8091 8270D	0.13
D032	Hexachlorobenzene	8121	0.13
D033	Hexachlorobutadiene	8021B 8121 8260B	0.5
D034	Hexachloroethane	8121	3.0
D008	Lead	1311	5.0
D009	Mercury	7470A 7471B	0.2
D035	Methyl ethyl ketone	8015B 8260B	200.0
D036	Nitrobenzene	8091 8270D	2.0
D037	Pentrachlorophenol	8041	100.0
D038	Pyridine	8260B 8270D	5.0

D010	Selenium	1311	1.0
D011	Silver	1311	5.0
D039	Tetrachloroethylene	8260B	0.7
D040	Trichloroethylene	8021B 8260B	0.5
D041	2,4,5-Trichlorophenol	8270D	400.0
D042	2,4,6-Trichlorophenol	8041A 8270D	2.0
D043	Vinyl chloride	8021B 8260B	0.2

If o-, m-, and p-cresol concentrations cannot be differentiated, then the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/L.
If the quantitation limit is greater than the regulatory level, then the quantitation limit becomes the regulatory level. If metals (dissolved), the EPA 1311 TCLP Laboratory Method is required with the exception of Mercury (total).

1. **Monitor and Piezometer Wells:** Groundwater with a total dissolved solids concentration of less than 10,000 mg/L occurs at an estimated depth of approximately 10 - 30 ft. below ground surface at the WDW-2 well (hereafter, "uppermost water-bearing unit"). Groundwater monitoring well (MW) with GW sampling capability shall be installed proximal to and hydrogeologically downgradient from WDW-2 in order to monitor the uppermost water-bearing unit. The MW shall be screened (15 ft. screen with top of screen positioned 5 ft. above water table) into the uppermost water-bearing unit. The Permittee shall propose a monitoring frequency with chemical monitoring parameters in order to detect potential groundwater contamination either associated with or not associated with WDW-2.

2.B. CONTINGENCY PLANS: The Permittee shall implement its proposed contingency plan(s) included in its application to cope with failure of a system(s) in the Discharge Permit.

2.C. CLOSURE: Prior to closure of the facility, the Permittee shall submit for OCD's approval, a closure plan including a completed form C-103 for plugging and abandonment of the waste injection well. The Permittee shall plug and abandon its well pursuant to 20.6.2.5209 NMAC and as specified in Permit Condition 2.D.

1. **Pre-Closure Notification:** Pursuant to 20.6.2.5005A NMAC, the Permittee shall submit a pre-closure notification to OCD's Environmental Bureau at least 30 days prior to the date that it proposes to close or to discontinue operation of WDW-2. Pursuant to 20.6.2.5005B NMAC, OCD's Environmental Bureau must approve all proposed well closure activities before the Permittee may implement its proposed closure plan.

2. **Required Information:** The Permittee shall provide OCD's Environmental Bureau with the following information in the pre-closure notification specified in Permit Condition 2.C.1:

- Name of facility;
- Address of facility;
- Name of Permittee (and owner or operator, if appropriate);

- Address of Permittee (and owner or operator, if appropriate);
- Contact person;
- Phone number;
- Number and type of well(s);
- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (*e.g.*, sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation, *etc.*);
- Proposed date of well closure;
- Name of Preparer; and
- Date.

2.D. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon WDW-2, it shall submit to OCD a plugging and abandonment plan that meets the requirements of 20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.E. RECORD KEEPING: The Permittee shall maintain records of all inspections required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection by OCD.

2.F. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified in 20.6.2.3103 NMAC, then it shall report a release to OCD's Environmental Bureau.

1. Oral Notification: As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

- The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
- The name and location of the facility;
- The date, time, location, and duration of the discharge;

- The source and cause of discharge;
- A description of the discharge, including its chemical composition;
- The estimated volume of the discharge; and
- Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. **Written Notification:** Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use C-141 Form with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

The Permittee shall provide subsequent written reports as required by OCD's Environmental Bureau.

2.G. OTHER REQUIREMENTS:

1. **Inspection and Entry:** Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director to:

- Upon the presentation of proper credentials, enter the premises at reasonable times;
- Inspect and copy records required by this Discharge Permit;
- Inspect any treatment works, monitoring, and analytical equipment;
- Sample any effluent before or after discharge; and
- Use the Permittee's monitoring systems and wells in order to collect samples.

2. **Advance Notice:** The Permittee shall provide OCD's Environmental Bureau and Aztec District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well subsurface work, i.e., Mechanical Integrity Testing, well plugging, abandonment or decommissioning of any equipment associated with WDW-2.

3. **Environmental Monitoring:** The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC. The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit data summary tables, all raw analytical data, and EPA laboratory Quality Assurance/Quality Control (QA/QC) and Data Quality Objectives (DQOs) documentation to comply with OCD environmental sampling and analytical laboratory methods and data reporting requirements in New Mexico.

2.H. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a single well plugging bond in the amount that it shall determine, in accordance with Permit Condition 5.B, to cover potential costs associated

with plugging and abandonment of WDW-2, surface restoration, and post-operational monitoring, as may be needed. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required corrective action(s).

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances per Permit Condition 5.B. herein, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding or financial assurance requirements of Sections 20.6.2.5000 through 20.6.2.5299 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required herein.

2.I. REPORTING:

1. Quarterly Reports: The Permittee shall submit quarterly reports pursuant to 20.6.2.5208A NMAC to OCD's Environmental Bureau no later than 45 days following the end of each calendar quarter. The quarterly reports shall include the following:

a. Physical, chemical and other relevant characteristics of injection fluids;

b. Monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure with any exceedances identified; and

c. Results of monitoring prescribed under Section 20.6.2.5207B NMAC with any exceedances of Permit Condition 2.A.

d. Piezometer and monitor well information from Permit Condition 2.A.1.

e. Continuous monitoring chart(s) and information from Permit Condition 3.C.

2. Annual Report: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by **June 1st** of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class I Non-Hazardous Waste Injection Well (WDW-2), Name of Permittee, Discharge Permit Number, API number of well, date of report, and person submitting report;

- Summary of Class I non-hazardous waste injection well operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103(s);
- Copy of Monthly injection/disposal volume, including the cumulative total should be carried over to each year;
- Maximum and average injection pressures;
- Copy of the quarterly chemical analyses shall be included with data summary and all QA/QC and DQO associated information;
- Copy of any mechanical integrity test (MIT) chart(s), including the type of test, *i.e.*, duration, gauge pressure, etc. unless OCD has approved Monthly Continuous Monitoring Charts for MITs in lieu of individual MITs;
- Copy of Fall-Off Test charts;
- Summary tables listing environmental analytical laboratory data for quarterly waste fluid samples. Any 20.6.2.3103 NMAC constituent(s) found to exceed a water quality standard shall be highlighted and noted in the annual report. The Permittee shall include copies of the most recent year's environmental analytical laboratory data sheets with QA/QC summary sheet information in conformance with the National Environmental Laboratory Accreditation Conference (NELAC) and EPA Standards;
- Brief explanation describing deviations from the normal injection operations;
- Results of any leaks and spill reports (include any C-141 reports);
- Area of Review (AOR) annual update summary with any new wells penetrating the injection zone within a 1-mile radius from WDW-2;
- Summary with interpretation of MITs, Fall-Off Tests, Bradenhead Tests, *etc.*, with conclusion(s) and recommendation(s);
- Summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;
- Summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken; and,
- Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

3. CLASS I NON-HAZARDOUS WASTE INJECTION WELL OPERATIONS:

3.A. OPERATING REQUIREMENTS: The Permittee shall comply with the operating requirements specified in 20.6.2.5206A NMAC and 20.6.2.5206B NMAC to ensure that:

1. The maximum injection pressure at the wellhead shall not initiate new fractures or propagate existing fractures in the confining zone, or cause the movement of injection or formation fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to 20.6.2.5103 NMAC.

2. Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone. If the Permittee determines that WDW-2 is discharging or suspects that it is discharging fluids into a zone or zones other than the permitted injection zone specified in Permit Condition 3.B.1., then the Permittee shall cease operations until proper

repairs are made, notify the OCD's Environmental Bureau and Aztec District office within 24 hours, and shall not resume injection until the Permittee has received approval from the OCD.

3. Except during well stimulation, the maximum injection pressure shall not initiate new fractures or propagate existing fractures in the injection zone.

4. The annulus between the injection tubing and the long string of injection casing shall be filled with a fluid approved by the OCD Director with an annulus pressure also approved rework by the OCD Director.

3.B. INJECTION OPERATIONS:

1. Injection Formation, Interval (Zone) and Waste Fluids: The Permittee shall determine whether the Total Dissolved Solids (TDS) within the injection zone is greater than 10,000 ppm before OCD will approve any injection into the Entrada Formation. The Permittee shall inject only non-hazardous (RCRA exempt and/or RCRA non-exempt) oil field waste fluids into the Entrada Sandstone Formation estimated to exist from ~ 7,316 feet to 7,482 feet below ground level (bgl) at WDW-2. The conductor casing will be set at 300 feet. The surface casing will be set at 3,600 feet. The intermediate protection or injection casing will be set at 7,500 feet. The injection tubing will be set in the injection packer at approximately 7,265 feet, which isolates WDW-2 into the perforated injection interval estimated to be between 7,316 and 7,482 feet bgl. The Permittee shall ensure that the injected non-hazardous waste fluids enter perforations only within the specified injection interval and are not permitted to escape into other formations or onto the land surface.

2. Well Injection Pressure Limits and Injection Flow Rate: The Permittee shall ensure that the maximum allowable surface injection pressure on WDW-2 shall not exceed 1,465 psig. A Step-Rate Test (SRT) shall be performed and submitted to OCD under Sundry before approval of any increase in the injection pressure. The Permittee shall inspect and monitor the pressure-limiting device daily and shall report any pressure exceedances within 24 hours of detection to OCD's Environmental Bureau and Aztec District Office.

3. Pressure-Limiting Device: The Permittee shall equip and operate its Class I non-hazardous waste injection well or system with a pressure limiting device, or equivalent (*i.e.*, Murphy switch), in working condition which shall at all times limit surface injection pressure to the maximum allowable surface injection pressure limit.

The Permittee shall inspect and monitor the pressure-limiting device daily and shall report any pressure exceedances within 24 hours of detection to OCD's Environmental Bureau and Aztec District Office. The Permittee shall take all steps necessary to ensure that the injected waste fluids enter only the permitted injection interval and not escape to other formations or onto the ground surface. The Permittee shall report to OCD's Environmental Bureau within 24 hours of discovery any indication that new fractures or existing fractures have been propagated under operational conditions, or that damage to the well, the injection zone, or formation has occurred.

OCD may authorize an increase in maximum surface injection pressure if the Permittee demonstrates that higher pressure will not result in migration of the injected fluid from the designated injection zone or interval using a valid Step-Rate Test (SRT) run preferably in coordination with a Fall-Off Test (FOT).

3.C. CONTINUOUS MONITORING DEVICE: The Permittee shall install a continuous monitoring device in advance of injection that records the monthly (hourly basis) real-time injection pressure, injection rate, injection volume, and pressure on the annulus between the injection tubing and the long string of casing. The Permittee shall implement a chart changing procedure that depressurizes and properly re-aligns the pens on the chart scale during changing to prevent anomalous pressure noise, i.e., MIT annulus pressure, etc. The Permittee shall notify OCD within 24 hours after having knowledge of the MIT failure. The Permittee shall not resume injection operations until approved by OCD.

3.D. MECHANICAL INTEGRITY FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELLS:

1. Pursuant to 20.6.2.5204 NMAC, the Permittee shall conduct a mechanical integrity test (MIT) for WDW-2 at least once every five years or more frequently as the OCD Director may require for good cause during the life of the well. In addition, an annual Bradenhead test shall be performed. The Permittee shall also demonstrate mechanical integrity for WDW-2 by completing an MIT after well workovers, including when it pulls the tubing or reseats the packer. The Permittee shall request MIT approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Aztec District Office. The Permittee shall notify OCD's Environmental Bureau 5 days prior to conducting any MIT to allow OCD the opportunity to witness the MIT.

The Permittee shall conduct a casing-tubing annulus MIT from the surface to the approved injection packer depth to assess casing and tubing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 500 psig measured at the surface. The Permittee shall follow OCD's 2004 *New Mexico Oil Conservation Division Underground Injection Control Program Manual* guidance when conducting a MIT. The Permittee shall submit the results of its MIT to OCD's Environmental Bureau and Aztec District Office within 30 days of completion. If any remedial work or any other workover operations are necessary, the Permittee shall comply with Permit Condition 3.F.

2. A Class I non-hazardous waste injection well has mechanical integrity if there is no detectable leak in the casing, tubing or packer which OCD considers to be significant at maximum operating temperature and pressure, and no detectable conduit for fluid movement out of the injection zone through the well bore, or vertical channels adjacent to the well bore, which the OCD considers to be significant. The following criteria will determine if the Class I non-hazardous waste injection well has passed the MIT:

a. The MIT passes if there is zero bleed-off during the test;

b. The MIT passes if there is a less than a ± 10% change in the final test pressure compared to the starting pressure, if approved by OCD;

c. The MIT fails if there is more than a 10% reduction in the final pressure compared to the starting pressure or that the pressure does not stabilize within 10% of the starting pressure before the end of the MIT. The Permittee shall immediately shut-in the well and investigate for leaks in accordance with Permit Conditions 3.B, 3.C, 3.D, and 3.F. The Permittee shall not resume injection operations until approved by OCD.

d. When the MIT is not witnessed by OCD and fails, the Permittee shall immediately shut-in the well and investigate for leaks in accordance with Permit Conditions 3.C, 3.D, and 3.F. The Permittee shall notify OCD within 24 hours after having knowledge of the MIT failure. The Permittee shall not resume injection operations until approved by OCD.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

5. The Permittee shall conduct a Bradenhead test at least annually and each time that it conducts an MIT.

3.E. FALL-OFF TEST: The Permittee shall submit an initial C-103 (Sundry Notice) form for the Fall-Off Test (FOT) to be completed within 90-days of well completion, which shall include a provision to evaluate injection zone (Entrada Formation) environmental laboratory water quality consistent with the water quality parameters in Permit Condition 2.A. The Permittee shall notify OCD within 24-hours of receipt of environmental laboratory quality data confirming total dissolved solids (TDS) are less than the protection limit of 10,000 ppm within the injection zone for further instruction. The minimum FOT frequency shall be at least annually before September 30th and comply with OCD's 2007 *New Mexico Oil Conservation Division UIC Class I Well Fall-Off Test Guidance* for conducting a FOT and for reporting FOT results. Historical FOT results shall be included with the FOT results to monitor injection zone characteristics over time. The Permittee shall submit the FOT results to the OCD Environmental Bureau and Aztec District Office within 60 days of FOT completion.

3.F. WELL WORKOVER OPERATIONS: The Permittee shall pursuant to 20.6.2.5205A(5) NMAC, provide notice to and shall obtain approval from the OCD District Office prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) sent to the OCD District Office with copies sent to

the OCD's Environmental Bureau. After completing remedial work, pressure tests, or any other workover operations, the Permittee shall run an MIT in accordance with Permit Condition 3.D to verify that the remedial work has successfully repaired any problems.

3.G. INJECTION RECORD VOLUMES AND PRESSURES: The Permittee shall submit quarterly reports of its injection operations and well workovers. The Permittee shall record the minimum, maximum, and average flow waste injection volumes (including total volumes) and annular pressures of the injected waste fluids on a monthly basis, and shall submit the data to OCD on a quarterly basis and in the annual report. The Permittee shall fill the casing-tubing annulus with an OCD-approved liquid and install a Murphy pressure switch or equivalent, as described in the Permittee's permit renewal application, in order to detect leakage in the casing, tubing, or packer.

3.H. AREA OF REVIEW (AOR): The Permittee shall report to OCD's Environmental Bureau within 72 hours of discovery of any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class I non-hazardous waste injection well. Any un-cemented wells within the injection interval shall be identified by the Permittee and reported to OCD.

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells. This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (*e.g.*, septic systems, leach fields, dry wells, *etc.*) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. QUARTERLY AND ANNUAL REPORTS: The Permittee shall submit its quarterly and annual reports to OCD as specified in Permit Condition 2.I.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit a cost estimate of the actual cost to properly close, restore land surface, plug and abandon its Class I non-hazardous waste injection well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC). The Permittee's financial assurance shall be based on third person estimates. OCD requires the Permittee to submit Financial Assurance based on the OCD approved cost estimate. Financial assurance shall be approved by OCD and executed prior to discharge permit issuance and shall become effective upon commencement of construction.

AFFIDAVIT OF PUBLICATION

Ad No. 72834

STATE OF NEW MEXICO
County of San Juan:

SAMMY LOPEZ, being duly sworn says: That he IS the PUBLISHER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Sunday, June 19, 2016

And the cost of the publication is $206.50

ON 6/28/16 SAMMY LOPEZ appeared before me, whom I know personally to be the person who signed the above document.

Christine Sellers

OFFICIAL SEAL
CHRISTINE SELLERS
Notary Public
State of New Mexico
My Comm. Expires 11/05/19

RECEIVED OCD
2016 JUN 29 P 1:39

COPY OF PUBLICATION

NOTICE OF PUBLICATION

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

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations (20.6.2.3108 NMAC), the following discharge permit application(s) has been submitted to the Director of the New Mexico Oil Conservation Division ("OCD"), 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

(UICI-11) Western Refining Southwest, Inc. James R. Schmaltz, Refinery Environmental Manager, #50 Road 4990, P.O. Box 159, Bloomfield, New Mexico 87413, has submitted an application for a new Underground Injection Control (UIC) Class I Non-Hazardous Injection Well (API No. 30-045-35747) Discharge Permit for waste disposal 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 will be 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. Oil-field exempt and non-exempt, non-hazardous wastewater will be disposed into the Entrada Formation at an injection interval from 7,315 ft. to 7,483 ft. below ground surface at a daily rate not to exceed 8,500 barrels per day - (248 gpm) and at a maximum surface injection pressure of 1,465 psig. The injection fluid contains approximately 5,250 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. below ground surface with a TDS concentration of approximately 200 ppm TDS. Water quality in the Entrada Formation at this location is currently not known, and OCD will require environmental analytical testing during well completion before authorizing injection into the formation. The discharge permit addresses well construction, operation, monitoring of the well, associated surface facilities, provides a contingency plan in the event of accidental spills, leaks and other accidental discharges in order to protect fresh water, and closure plan for proper plug and abandonment of the well and restoration of the land surface to its pre-existing condition.

The OCD has determined that the application is administratively complete and has prepared a draft permit. The OCD will accept comments and statements of interest regarding this 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 OCD at the address given above. The administrative completeness determination and draft permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, or may also be viewed at the OCD web site http://www.emnrd.state.nm.us/ocd/. Persons interested in obtaining a copy of the application and draft permit may contact the OCD at the address given above. Prior to ruling on any proposed discharge permit or major modification, the Director shall allow a period of at least thirty (30) days after the date of publication of this notice, during which interested persons may submit comments or request that OCD hold a public hearing. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines that there is significant public interest.

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

Para obtener más información sobre esta

olicitud en español, sirvase comunicarse por avor: New Mexico Energy, Minerals and Natu- l Resources Department (Depto. Del Energia, linerals y Recursos Naturales de Nuevo éxico), Oil Conservation Division (Depto. onservacio´n Del Petróleo), 1220 South St. rancis Drive, Santa Fe, New México (Contacto: aura Tulk, 575-748-1283).

IVEN under the Seal of New Mexico Oil Con- rvation Commission at Santa Fe, New Mexi- , on this 19th day of June 2016.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

E A L

David R. Catanach, Director

gal No. 72834 published in The Daily Times June 19, 2016.

THE DAILY TIMES
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Farmington, NM 87499

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NMED - Oil Conservation Division
% Carlos Chavez
1220 S St. Francis Dr
Santa Fe, NM 87505

87505-422559

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, June 15, 2016 2:15 PM
To: 'james.lane@state.nm.us'; Wunder, Matthew, DGF; 'arthur.allison@state.nm.us'; 'ddapr@nmda.nmsu.edu'; 'jjuen@blm.gov'; 'psisneros@nmag.gov'; 'r@rthicksconsult.com'; 'sric.chris@earthlink.net'; Parks, NM, EMNRD; 'Verhines, Scott, OSE'; 'peggy@nmbg.nmt.edu'; 'marieg@nmoga.org'; Fetner, William, NMENV; 'lazarus@glorietageo.com'; Wojahn, Beth, EMNRD; 'cnewman02@fs.fed.us'; Kieling, John, NMENV; 'bsg@garbhall.com'; 'Jerry.Schoeppner@state.nm.us'; 'claudette.horn@pnm.com'; 'ekendrick@montand.com'; 'staff@ipanm.org'; 'maxey.brown@state.nm.us'; Bratcher, Mike, EMNRD; Perrin, Charlie, EMNRD; Jones, William V, EMNRD; Kelly, Jonathan, EMNRD; Powell, Brandon, EMNRD; Jones, William V, EMNRD; Griswold, Jim, EMNRD; Sanchez, Daniel J., EMNRD; Goetze, Phillip, EMNRD; Bayliss, Randolph, EMNRD
Cc: Schmaltz, Randy (Randy.Schmaltz@wnr.com); Allen.Hains@wnr.com
Subject: Western Refining Southwest, Inc. UIC Class I (Non-Hazardous) Disposal Well Draft Discharge Permit and Public Notice (UICI-011) Waste Disposal Well No. 2 (API# 30-045-35747) in Eddy County

Ladies and Gentlemen:

Please find below the New Mexico Oil Conservation Division (OCD) Public Notice (30-day public comment period begins Sunday, June 19, 2016) and Draft Discharge Permit for the above subject Underground Injection Control (UIC) Class I (Non-hazardous) Disposal Well.

Discharge Permit (UICI-011) Western Refining Southwest, Inc. Waste Disposal Well No. 2- "WDW-2"
(6/14/16): The Underground Injection Control (UIC) Class I (Non-hazardous) Disposal Well (API#: 30-045-35747) is located approximately 415 ft. N of the intersection of Sullivan Rd. and Wooten Rd. in Bloomfield, NM (San Juan County) or approximately 1 mile E-NE of the intersection of Hwy 550 and Sullivan Rd.

Administrative Completeness
Description
Application(s)
Discharge Permit (6/14/2016)
Public Notice (6/19/2016)

The OCD Website for public notices is at http://www.emnrd.state.nm.us/OCD/env-draftpublicetc.html (see "Draft Permits and Public Notices" section).

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
Environmental Engineer
Oil Conservation Division- Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
Phone: (505) 476-3490
Main Phone: (505) 476-3440
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us

Website: www.emnrd.state.nm.us/ocd

Why not prevent pollution, minimize waste, reduce operation costs, and move forward with the rest of the Nation? To see how, go to “Publications” and “Pollution Prevention” on the OCD Website.

Chavez, Carl J, EMNRD

From: Donnelly, Patti <Patti.Donnelly@wnr.com>
Sent: Monday, May 16, 2016 1:08 PM
To: Chavez, Carl J, EMNRD
Cc: Schmaltz, Randy; Hains, Allen; Robinson, Kelly
Subject: Proof of Public Notice for Western Refining SW, Inc. WDW-2 Class 1 Injection Well Discharge Permit Application (UICI-011)
Attachments: Proof of Public Notice for WDW-2 Class 1 Injection Well Discharge Permit Ap(UICI-011).pdf

Good afternoon! This is our submittal of proof of Public Notice for the WDW-2 Class 1 Injection Well Discharge Permit Application. The originals will be mailed to you Certified via the US Postal Service. If you have any questions or concerns, please do not hesitate to contact myself, Randy Schmaltz or Kelly Robinson.

Thank you,
Patti Donnelly

Patti Donnelly
Logistics, HSER
Western Refining
111 CR 4990
Bloomfield, NM 87413
(505) 632-4005
patti.donnelly@wnr.com

Western Refining

WNR LISTED NYSE

May 12, 2016

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

Certified Mail: 7015 1520 0001 8113 5666

RE: Proof of Public Notice for Western Refining Southwest, Inc. – Bloomfield Terminal's, Waste Disposal Well No. 2 "WDW-2" Class 1 (non-hazardous) Injection Well Discharge Permit Application (UICI-011).

Dear Mr. Chavez,

Western Refining Southwest, Inc. respectfully submits proof of public notice for the above subject's permit application as required by Oil Conservation Division and specified in NMAC 20.6.2.3108. The notice used was approved by the Oil Conservation Division.

Western provided notice by each of the following methods:

- The public notice was published in the Farmington Daily Times on Monday, April 11, 2016. Notice was published in both English and Spanish in a display ad. The Affidavit of Publication is attached.
- On April 7, 2016 the public notice was posted in both English and Spanish on a sign, 2 feet by 3 feet in size. The sign was placed at the entrance to the Bloomfield Terminal. The sign will be maintained in this location for a minimum of 30 days. A picture of the sign is attached.
- On April 7, 2016 Western mailed written notice to owners of properties within 1/3 mile of the proposed WDW-2 location. Copies of the certified letters are attached.
- On April 7, 2016 the notice was also placed at general public locations, being the Bloomfield US post office, and the Bloomfield public library. Posting of Public Notice - Certification is attached.

If you need additional information, please contact me at (505) 632-4171.

Sincerely,

James R. Schmaltz
HSER Director
Western Refining Southwest, Inc.

Cc: Allen Hains

AFFIDAVIT OF PUBLICATION

Ad No. 1107981

STATE OF NEW MEXICO
County of San Juan:

SAMMY LOPEZ, being duly sworn says: That he IS the PUBLISHER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Monday, April 11, 2016

And the cost of the publication is $525.92

ON 5/10/16 SAMMY LOPEZ appeared before me, whom I know personally to be the person who signed the above document.

Christine Sellers

OFFICIAL SEAL
CHRISTINE SELLERS
Notary Public
State of New Mexico
My Comm. Expires 11/05/19

COPY OF PUBLICATION

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(s) 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-11) Western Refining Southwest, Inc. - Bloomfield Crude Oil and Motor Fuel Bulk Storage and Transportation Terminal, # 50 Road 4990 or PO Box 159, Bloomfield, New Mexico 87413 has submitted an application for a new Underground Infection Control (UIC) Class I (non-hazardous) Injection Well Discharge Permit(UICI-11) for Waste Disposal Well No.2 (WDW-2), 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. WDW-2 is proposed to be drilled to a total depth of 7500 ft. below ground level (bgl) into the Entrada Sandstone Formations The well replaces the previous Class I (non-hazardous) disposal well (UICI-9), which was plugged and abandoned in September of 2015. Wastewater to be disposed is derived from recovered ground water, water used for heating and cooling, boiler blowdown water, water entrained in crude supply, process equipment cleaning, waste water treatment system effluent, hydrotest water, and contact storm water. Oil field exempt and non-exempt, non-hazardous industrial wastewater will be injected at an average injection rate of 3,500 bbl/day (~100gpm). The Total Dissolved Solids (TDS) concentration of injected waste fluid is about 5,250 ppm. The TDS of the formation fluids is currently unknown and will be tested before final authorization is given by OCD to inject. Groundwater most likely to be affected by a spill, leak or accidental discharge is at a depth of approximately 10 to 30 ft bgl with a TDS concentration of about 3650 ppm. The discharge permit will address well construction, operation, monitoring of the well, and associated surface facilities, and provides a contingency plan in the event of accidental spills, leaks and other accidental discharges in order 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 and has prepared a draft permit. The NMCOD will accept comments and statements of interest regarding this application and will create a facility-specific mailing list for persons who wish to receive further notices. Persons interested in obtaining further information, submitting comments or requesting to be on a facility-specific mailing list for future notices may contact the Environmental Bureau Chief of the Oil Conservation Division at the address given above. The administrative completeness determination and draft permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, or may be also be viewed at the NMOCD web site http://www.emnrd.state.nm.us/ocd/. Persons interested in obtaining a copy of the application and draft permit may contact the address above. Prior to ruling on any proposed discharge permit or major modification, the Director shall allow a period of at least (30) days after the date of publication of this notice, during which interested persons may submit comments or request that NMOCD hold a public hearing. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines that there id significant public interest.

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

Comments and inquires on regulations should be directed:

Director
New Mexico Oil Conservation Division (NMOCD)
1220 S. Saint Francis Drive
Sante Fe, New Mexico 87505
Telephone: (505) 476-3440

Para obtener más información sobre esta solicitud en español, sirvase comunicarse por favor:

New Mexico Energy, Mineral and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservació n Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New Mexico (Contacto: Laura Tulk, 575-748-1283).

0001107981-01

AFFIDAVIT OF PUBLICATION

Ad No. 1107981

STATE OF NEW MEXICO
County of San Juan:

SAMMY LOPEZ, being duly sworn says: That he IS the PUBLISHER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Monday, April 11, 2016

And the cost of the publication is $525.92

ON 5/10/16 SAMMY LOPEZ appeared before me, whom I know personally to be the person who signed the above document.

Christine Sellers

OFFICIAL SEAL
CHRISTINE SELLERS
Notary Public
State of New Mexico
My Comm. Expires 11/05/19

COPY OF PUBLICATION

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Director
New Mexico Oil Conservation Division (NMOCD)
1220 S. Saint Francis Drive
Sante Fe, New Mexico 87505
Telephone: (505) 476-3440

Para obtener más información sobre esta solicitud en español, sirvase comunicarse por favor:

New Mexico Energy, Mineral and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservació n Del Petróleo) 1220 South St. Francis Drive, Santa Fe, New Mexico (Contacto: Laura Tulk, 575-748-1283).

TX-0001107981-01

AFFIDAVIT OF PUBLICATION

Ad No. 1107975

STATE OF NEW MEXICO
County of San Juan:

SAMMY LOPEZ, being duly sworn says: That he IS the PUBLISHER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Monday, April 11, 2016

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ON 5/10/16 SAMMY LOPEZ appeared before me, whom I know personally to be the person who signed the above document.

Christine Sellers

OFFICIAL SEAL
CHRISTINE SELLERS
Notary Public
State of New Mexico
My Comm. Expires 11/05/19

COPY OF PUBLICATION

Aviso de Publicación

Se hace saber que en conformidad con los reglamentos de la Comisión de Control de la Ca dad del Agua de Nuevo México (20.6.2.31 06 NMAC); la siguiente solicitud para un pmmiso d descarga ha sido presentado al Director de la División de Conservación del Petróleo de Nuev México (NMOCD por sus siglas en ingles), 1220 S. San Francisco Drive, Santa Fe, Nuevo Méxic 87505, teléfono (505) 476-3440:

(UICI -11) Western Refining Southwest, Inc.-Bloomfield Crude Oil and Motor Fuel Bul Storage and Transportation Terminal,# 50 Road 4990 o PO Box 159, Bloomfield, Nuev Mexico 87413 ha presentado una solicitud para un nuevo Pozo de Inyección Subterráne Controlado (UIC por sus siglas en ingles) de Clase I (no peligroso) para un Permiso del Poz de Inyección de lDescarga (UICI-11) para un Pozo de Descarga de Residuos No.2 (WDW 2), que se encuentra en 2028 FNL y 111 FEL (SE/4, NE/4) en la Sección 27, del Municip 29 Norte, Rango 11 Oeste, NMPM, en el Condado de San Juan, Nuevo México. El pozo d inyección se encuentra a unos 415 pies. N de la intersección de Sullivan Rd. y Wooten R o aproximadamente 1 milia E-NE de la intersección de la carretera 550 y Sullivan Rd. S propone WDW-2 para ser perforado anna profundidad total de 7,500 pies. debajo delniv del suelo (BGL por sus siglas en ingles) en una formacion de piedra arenada. El po: sustituye al pozo anterior de Clase I (no peligroso) de descarga (UICI-9), que fuc sellado abandonado en septiembre del 2015. Las aguas residuales que deben eliminarse se deriv de agua subterránea recuperada, agua utilizada para calentamiento y enfriamiento, ag de boiler, agua separada del suministro de petróleo crudo, limpieza de equipos de proces efluente del sistema de tratamiento de aguas de desecho, agua utilizada para prueb hidrostática, y agua de lluvia. Aguas residuales industriales no peligrosas provenientes yacimientos de petróleo exentos y no exentos, se inyectaran a una velocidad promed de 3,500 barriles I día (-100 gpm). La concentración de sólidos disueltos totales (TDS p sus siglas en ingles) de fluido inyectado es de aproximadamente 5,250 ppm. El TDS de l fluidos de la formacion es actualmente desconocido y se obtendran y analizaran muestr antes de la autorizacion final para inyectar sea aprobada por OCD. El agua subterran mas propensa a ser afectada por un derrame, fuga o descarga accidental esta a u profundidad de aproximada de entre 10 y 30 pies BGL con una concentracion de TDS aproximadamente 3650 ppm. La autorizacion de descarga iucluira información sobre construccion, operacion, monitoreo del pozo, y las instalaciones en la snperficie asociac con el pozo, y proporcionara un plan de contingencia en caso de den-ames accidental fugas y otras descargas accidentales con elfin de proteger el agua fresca.

El propietario y operador de la instalación es:
Western Refining Southwest, Inc.
#50 County Road 4990
P.O. Box 159 Bloomfield, New Mexico 87413
Telephone: (505) 632-8013

El NMOCD ha determinado qne la solicitud es administrativamente completa y ha preparad borrador del permiso. El NMOCD aceptará comentarios y declaraciones de interés respect esta solicitud y creará una lista de correo sobre una instalación específica para las personas deseen recibir notificaciones en el futuro. Las personas interesadas en obtener más informac enviar comentarios o solicitar que estar en una lista de correo sobre una instalación espec para futuras notificaciones pueden ponerse en contacto con el Jefe de la Oficina Ambiental d División de Conservación de Petróleo en la dirección indicada anteriormente. La determina administrativamente completa y el borrador del permiso puede ser visto en la dirección a mencionada de 8:00a.m. a 4:00pm, de lunes a viernes, o también se puede consultar en la pá web de NMOCD http://wwww.emnrd.state.nm.us/ocd/. Las personas interesadas en obt una copia del permiso de solicitud y el proyecto pneden ponersc en contacto con la direc antes mencionada. Antes de decidir sobre cualquier autorización del permiso de descar modificación mayor, el Director debera permitir un periodo de por lo monos (30) días despué la fecha de publicación del presente anuncio, durante el cual las personas interesadas pue presentar observaciones o solicitar gue NMOCD efectué una audiencia pública. En las solicit de una audiencia pública se exponen las razones por las que una audiencia debe ser rete Una audiencia se llevará a cabo si el Director determina que existe un interes público significa

Si no se realiza una audiencia pública, el Director aprobara o rechazara la propuesta de per en base a la información disponible, incluyendo todos los comentarios recibidos. Si se lle cabo una audiencia pública, el director aprobara o rechazara la propuesta de permiso seg información de la solicitud de permiso y la información presentada en la audiencia.

Comentarios y preguntas sobre las regulaciones deben ser dirigidas a:
Director 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 New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energia, Mir y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conserva Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Laura 575-748-1283).

AFFIDAVIT OF PUBLICATION

Ad No. 1107975

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County of San Juan:

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P.O. Box 159 Bloomfield, New Mexico 87413
Telephone: (505) 632-8013

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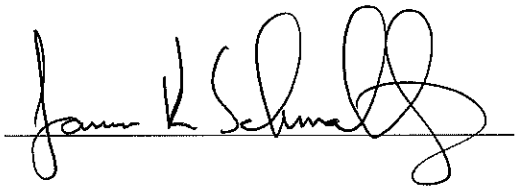
Posting of Public Notice – Certification

I, James Schmaltz, the undersigned, certify that on April 7, 2016, I posted a public notice for Western Refining Southwest, Inc submittal of a discharge permit application for an Underground Injection Control (UIC) Class I (Non-hazardous) Disposal Well in the following locations:

- Bloomfield Post Office
- Bloomfield Public Library

Signed this 13th day of April, 2016

Signature  Date 4/13/16

Printed Name James R. Schmaltz Title HSER Director

Western Refining

LOGISTICS

WNR LISTED NYSE

April 7, 2016

Bureau of Land Management
6251 College Blvd.
Suite A
Farmington, NM 87402

Certified Mail #: 7015 1520 0001 8113 5475

Re: Landowner Notification - Western Refining Southwest, Inc. – Bloomfield Crude Oil and Motor Fuel Bulk Storage and Transportation Terminal.

Pursuant to the requirements of the New Mexico Water Quality Control Commission regulation 20 NMAC 6.2.3108, Western Refining Southwest, Inc. announces that it is making application to the New Mexico Oil Conservation Division (NMOCD) – Environmental Bureau for a discharge permit to install a new Class I (Nonhazardous) Disposal Well (WDW#2) to replace the facilities previous Class I (Nonhazardous) Disposal Well (VICI-9) which was plugged and abandoned in September 2015.

The new Disposal Well (WDW-2) will be located at 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 feet N of the intersection of Sullivan Road and Wooten Road or approximately 1 mile E-NE of the intersection of Hwy 550 and Sullivan Road. WDW-2 is proposed to be drilled to a total depth of 7500 feet below ground level (bgl) into the Entrada Sandstone Formations.

A copy of the public notice is attached. If you have any questions please feel free to contact me at (505) 632-4171.

Sincerely,

James R. Schmaltz
HSER Director

cc: Carl Chavez, NMOCD
Allen Hains, Western Refining
Kelly Robinson, Western Refining

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece

Bureau Of Land Management
Farmington District Office
6251 College Blvd.
Suite A
Farmington, NM 87402

9590 9401 0154 5234 1249 72

2. Article Number *(Transfer from service label)*
7015 1520 0001 8113 5550

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X
☐ Agent
☐ Addressee

B. Received by *(Printed Name)*
Kim Cabrera

C. Date of Delivery
4-11-16

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

FARMINGTON NM 87401
APR 11 2016

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

7015 1520 0001 8113 5550

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

OFFICIAL USE

Certified Mail Fee
$

Extra Services & Fees *(check box, add fee as appropriate)*
☐ Return Receipt (hardcopy) $
☐ Return Receipt (electronic) $
☐ Certified Mail Restricted Delivery $
☐ Adult Signature Required $
☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$

Postmark Here
APR 11 2016
FARMINGTON NM 87401

Sent To BLM
Street and Apt. No., or PO Box No. 6251 College Blvd Ste A
City, State, ZIP+4® Farmington 87402

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Western Refining
LOGISTICS

WNR LISTED NYSE

April 7, 2016

Mr. & Mrs. Carroll G. Wooten
103 Road 4990
P.O. Box 1841
Bloomfield, NM 87413

Certified Mail #: 7015 1520 0001 8113 5574

Re: Landowner Notification - Western Refining Southwest, Inc. – Bloomfield Crude Oil and Motor Fuel Bulk Storage and Transportation Terminal.

Pursuant to the requirements of the New Mexico Water Quality Control Commission regulation 20 NMAC 6.2.3108, Western Refining Southwest, Inc. announces that it is making application to the New Mexico Oil Conservation Division (NMOCD) – Environmental Bureau for a discharge permit to install a new Class I (Nonhazardous) Disposal Well (WDW#2) to replace the facilities previous Class I (Nonhazardous) Disposal Well (VICI-9) which was plugged and abandoned in September 2015.

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James R. Schmaltz
HSER Director

cc: Carl Chavez, NMOCD
Allen Hains, Western Refining
Kelly Robinson, Western Refining

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Mr. & Mrs. Carroll G. Wooten
P.O. Box 1841
103 Road 4990
Bloomfield, NM 87413

9590 9401 0154 5234 1250 30

2. Article Number *(Transfer from service label)*
7015 1520 0001 8113 5574

PS Form 3811, July 2015 PSN 7530-02-000-9053

COMPLETE THIS SECTION ON DELIVERY

A. Signature
x Pamela C. Peterson ☑ Agent ☐ Addressee

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C. Date of Delivery 4/13/16

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PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7015 1520 0001 8113 5574

Western Refining

LOGISTICS

WNR LISTED NYSE

April 7, 2016

Mr. & Mrs. J.D. Wooten
103 Road 4990
P.O. Box 1841
Bloomfield, NM 87413

Certified Mail #: 7015 1520 0001 8113 5475

Re: Landowner Notification - Western Refining Southwest, Inc. – Bloomfield Crude Oil and Motor Fuel Bulk Storage and Transportation Terminal.

Pursuant to the requirements of the New Mexico Water Quality Control Commission regulation 20 NMAC 6.2.3108, Western Refining Southwest, Inc. announces that it is making application to the New Mexico Oil Conservation Division (NMOCD) – Environmental Bureau for a discharge permit to install a new Class I (Nonhazardous) Disposal Well (WDW#2) to replace the facilities previous Class I (Nonhazardous) Disposal Well (VICI-9) which was plugged and abandoned in September 2015.

The new Disposal Well (WDW-2) will be located at 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 feet N of the intersection of Sullivan Road and Wooten Road or approximately 1 mile E-NE of the intersection of Hwy 550 and Sullivan Road. WDW-2 is proposed to be drilled to a total depth of 7500 feet below ground level (bgl) into the Entrada Sandstone Formations.

A copy of the public notice is attached. If you have any questions please feel free to contact me at (505) 632-4171.

Sincerely,

James R. Schmaltz
HSER Director

cc: Carl Chavez, NMOCD
Allen Hains, Western Refining
Kelly Robinson, Western Refining

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. & Mrs. J.D. Wooten
P.O. Box 1841
103 Road 4990
Bloomfield, NM 87413

9590 9401 0154 5234 1249 65

2. Article Number *(Transfer from service label)*

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COMPLETE THIS SECTION ON DELIVERY

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X Pamela C. Peterson ☑ Agent ☐ Addressee

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BLOOMFIELD NM 87413 APR 13 2016 USPS

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Street and Apt. No., or PO Box No.
POBox 1841 103 Rd 4990
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Bloomfield, NM 87413

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions


NOTICE OF PUBLICATION


NOTICE OF PUBLICATION
NOTICE OF PUBLICATION
Aviso de Publicación


NOTICE OF PUBLICATION
Western
Refining
Bloomfield
Terminal

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, March 18, 2016 3:24 PM
To: 'Lane, James, DGF'; Wunder, Matthew, DGF; 'Allison, Arthur, DIA'; 'ddapr@nmda.nmsu.edu'; 'jjuen@blm.gov'; 'psisneros@nmag.gov'; 'r@rthicksconsult.com'; 'sric.chris@earthlink.net'; 'nmparks@state.nm.us'; Verhines, Scott, OSE; 'peggy@nmbg.nmt.edu'; 'marieg@nmoga.org'; Fetner, William, NMENV; 'lazarus@glorietageo.com'; 'cnewman02@fs.fed.us'; Kieling, John, NMENV; 'bsg@garbhall.com'; 'Schoeppner, Jerry, NMENV'; 'claudette.horn@pnm.com'; 'ekendrick@montand.com'; 'staff@ipanm.org'; Dade, Randy, EMNRD; Bratcher, Mike, EMNRD; Perrin, Charlie, EMNRD; Jones, William V, EMNRD; Kelly, Jonathan, EMNRD; Powell, Brandon, EMNRD; Wojahn, Beth, EMNRD; Griswold, Jim, EMNRD; Goetze, Phillip, EMNRD
Cc: Schmaltz, Randy (Randy.Schmaltz@wnr.com); Robinson, Kelly (Kelly.Robinson@wnr.com); Allen.Hains@wnr.com
Subject: Western Refining Southwest, Inc. Bloomfield UIC Class I (Non-hazardous) Disposal Well Discharge Permit Application (UICI-011) San Juan County

Ladies and Gentlemen:

Please find below the New Mexico Oil Conservation Division (OCD) **initial** Public Notice for the above subject Underground Injection Control (UIC) Class I (Non-hazardous) Disposal Well Facility.

Discharge Permit (UICI-011) Western Refining Southwest, Inc. Waste Disposal Well No. 2- "WDW-2"
(3/18/16): The Underground Injection Control (UIC) Class I (Non-hazardous) Disposal Well (API#: *Currently Pending*) is located approximately 415 ft. N of the intersection of Sullivan Rd. and Wooten Rd. in Bloomfield, NM (San Juan County) or approximately 1 mile E-NE of the intersection of Hwy 550 and Sullivan Rd.

Administrative Completeness
Description
Application(s)

The OCD Website for public notices is at http://www.emnrd.state.nm.us/OCD/env-draftpublicetc.html (see "Draft Permits and Public Notices" section).

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
Environmental Engineer
Oil Conservation Division- Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
Phone: (505) 476-3490
Main Phone: (505) 476-3440
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: www.emnrd.state.nm.us/ocd
Why not prevent pollution, minimize waste, reduce operation costs, and move forward with the rest of the Nation? To see how, go to "Publications" and "Pollution Prevention" on the OCD Website.

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

Tony Delfin
Deputy Cabinet Secretary

David R. Catanach, Division Director
Oil Conservation Division

MARCH 18, 2016

CERTIFIED MAIL
RETURN RECEIPT NO: 3771 5916

Mr. James R. Schmaltz
Western Refining Southwest, Inc.
P.O. Box 159
Bloomfield, New Mexico 87413

Re: Discharge Permit (UICI-11)
Class I Non-Hazardous Oil Field Waste Disposal Well No. 2
Unit Letter H of Section 27 in Township 29 North, Range 11 East, NMPM; San Juan County

Mr. Schmaltz:

The Oil Conservation Division (OCD) has received Western Refining Southwest, Inc.'s application for disposal well No. 2 to inject non-hazardous oil field wastes into the Bluff-Cow Springs Sandstone and Entrada Sandstone Formations at the above referenced location. The initial submittal on March 4, 2016 provided the required information in order to deem the application administratively complete.

As such, the Water Quality Control Commission regulations (WQCC) notice requirements of 20.6.2.3108 NMAC must be satisfied and demonstrated to the OCD. OCD will also provide public notice pursuant to WQCC requirements and determine if there is sufficient public interest.

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

Sincerely,

Carl J. Chávez
Environmental Engineer

xc: OCD District III Office, Aztec

Description:

A new Underground Injection Control (UIC) Class I (Non-hazardous) Disposal Well (UICI-11) or "WDW-2" located at latitude N 36.698607646066º and longitude W 107.9703543338º has been proposed to be drilled to a total depth of 7,500 ft. below ground level (bgl) into the Entrada Sandstone Formation within the property boundary of the former Bloomfield Refinery (GW-1). The well replaces the previous Class I (Non-hazardous) Disposal Well (UICI-9), which was plugged and abandoned in September of 2015.

An assemblage of cemented casing strings to surface are proposed to be set as follows: 1) 13-3/8 inch conductor casing will be set to 300 ft. bgl; 2) 9-5/8 inch surface casing will be set to 3,600 ft. bgl; and 3) 7 inch production casing will be set to 7,500 ft. bgl. A 4-1/2 inch plastic lined injection string will be set through the packer at 7,265 ft. bgl within the 7 inch casing slotted from 7,315 - 7,483 ft. bgl.

Oilfield wastewater (~ 5,250 mg/L TDS) will be injected at an average injection rate of 3,500 bbl/day (~ 100 gpm) below a permitted maximum surface injection pressure (MSIP) of ~ 1,460 psig. A step-rate pressure test will be completed on the well shortly after well construction to determine the actual allowable fracture pressure and final MSIP for the well. A Fall-Off Test (FOT) on the well will also be performed shortly after well construction to verify the baseline injection zone hydrogeologic characteristics, i.e., permeability, aerial extent of the injection zone, fracture growth, etc. for future required annual FOTs to monitor the ability of the injection zone to accept wastewater over the operational life of the disposal well.

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.
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 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

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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

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.

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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
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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.
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 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
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 140128036
Project Name: 1401A07

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:CERT0028; 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:

*	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#: **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								
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

WO#: **1401A07**

Hall Environmental Analysis Laboratory, Inc.

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:

- * 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 **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

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

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

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

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

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

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: X Yes ☐ No

Sample Temperature: 1.2

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	Hydrogen 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	Remarks:
1-23-14	1510	Robert Krakow	Christine Walls	1/23/14	1510	
1/23/14	1710	Christine Walls		01/24/14	1015	

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.
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 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.
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**	
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:

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J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
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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

Anatek Labs, Inc.

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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

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:

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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#: **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:

- * 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 **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:

*	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 **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:

- * 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 **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
- 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-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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- 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#: **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								
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	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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- 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 **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:

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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#: **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:

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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-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:

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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#: **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:

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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#: **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) 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

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

Project #:

Project Manager:

Sampler: Bob
On Ice: ☒ Yes ☐ No
Sample Temperature: /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. 1407D13
7-28-14	9:30	H_2O	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	TDS 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
7-28-14	1452	Robert Krakow	Christine Walker	7/28/14	1452
7/28/14	1724	Christine Walker		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
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Albuquerque, NM 87109
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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.	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**	
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.
- 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**	
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.
- 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.
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:

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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
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 141003043
Project Name: 1410102

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		10/6/2014	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.

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

Batch #: 141003043
Project Name: 1410102

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:C585
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Wednesday, October 22, 2014

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:

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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#: **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:

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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#: **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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- 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 **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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- 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
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- 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 **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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- 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 **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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- 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.
- 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 **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:

- * 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 **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:

- * 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 **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:

- * 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 **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:

- * 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 **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: 15

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. 1410 2	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	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)
10-1-14	10:00	H_2O	Inj. well	3-VOA	HCl	-001										X						
				1-Liter	amber	-002											X					
				1-500ml		-003												X				
				1-500ml		-004				X										X		
				1-125 ml	H_2SO_4	-005					X											
				1-500 ml	HNO_3	-006							X									
				1-500ml	NaOH	-007													X			
				1-500ml	ZN-Acetate	-008															X	

Date:	Time:	Relinquished by:	Received by:	Date	Time
10-1-14	1421	Robert Krakow	Mistie Walker	10/1/14	1421
10/1/14	1815	Mistie Walker		10/02/14	0750

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

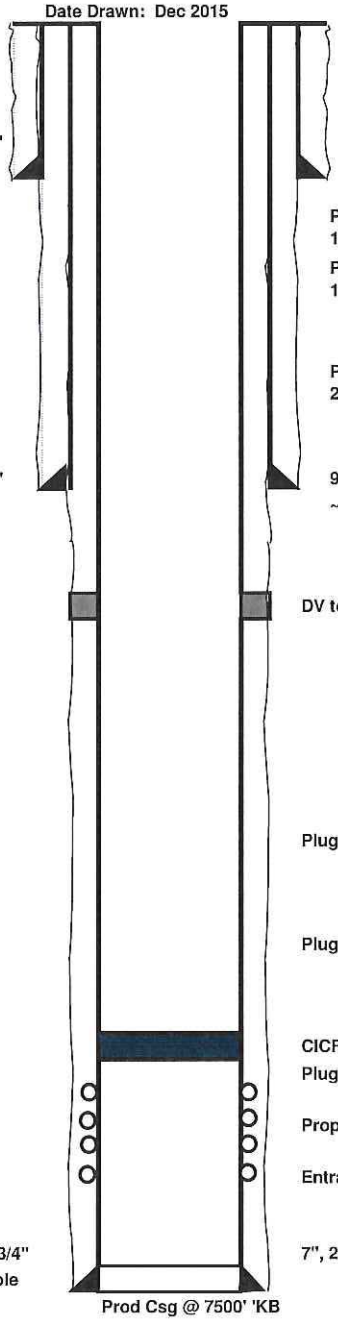
1 Move-in, rig up pulling unit. Pump & pit. Half tank for cement returns.
2 Hold safety meeting with rig crew and related personnel explaining the procedure and outlining potential hazards.
3 ND WH & NU BOP
4 TIH w/ CICR & set at ~ 7265'.
5 Load hole and circulate clean with fresh water.
6 Load tubing 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

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

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. Davis 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. Current 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

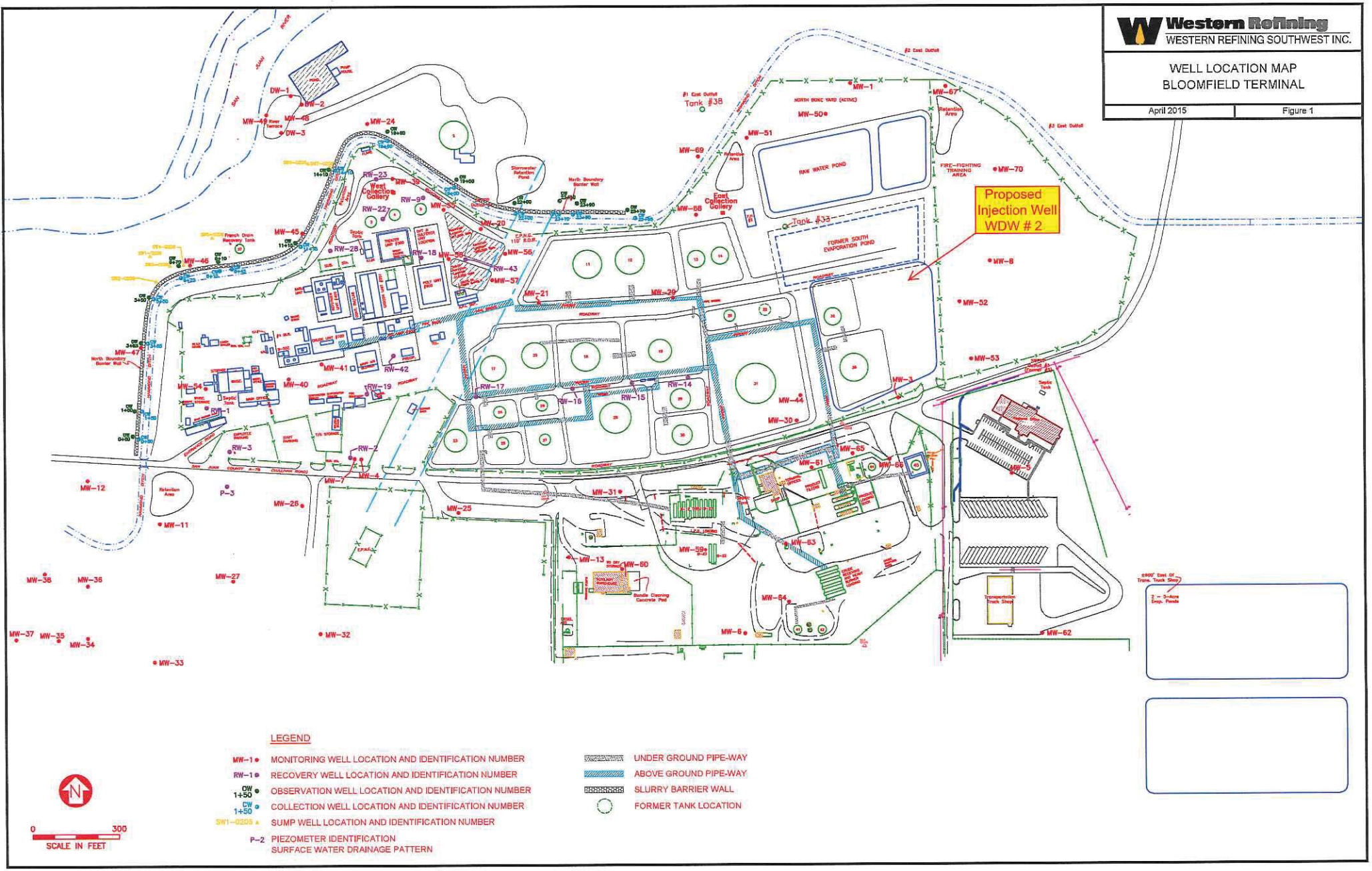
Casing/Cement Program: Additional Comments

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 D. 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
RAW WATER POND
FORMER SOUTH EVAPORATION POND
NORTH BOMC YARD (ACTIVE)
FIRE-FIGHTING TRAINING AREA
West Collection Gallery
East Collection Gallery
Stormwater Retention Pond
Retention Area
Transportation Truck Shed
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
SW1-0205 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
0 300
SCALE IN FEET

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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

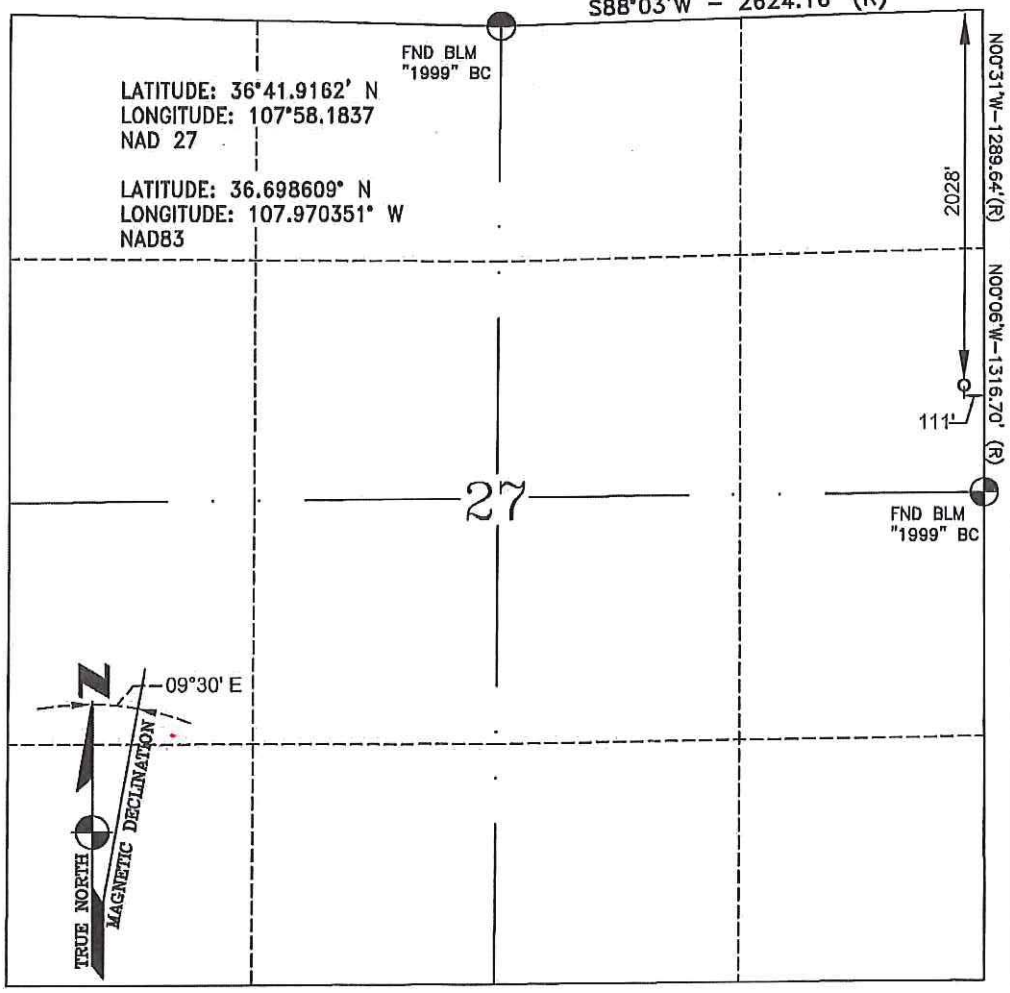
[11] Bottom Hole Location If Different From Surface

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 12/23/13 Date

John C. Thompson
Printed Name

johnc@wrisberg.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
Date of Survey

Signature and Seal of Professional Surveyor:

NEW MEXICO GLEN W. RUSSELL 15703 LICENSED PROFESSIONAL SURVEYOR

GLEN W. RUSSELL
Certificate Number 15703

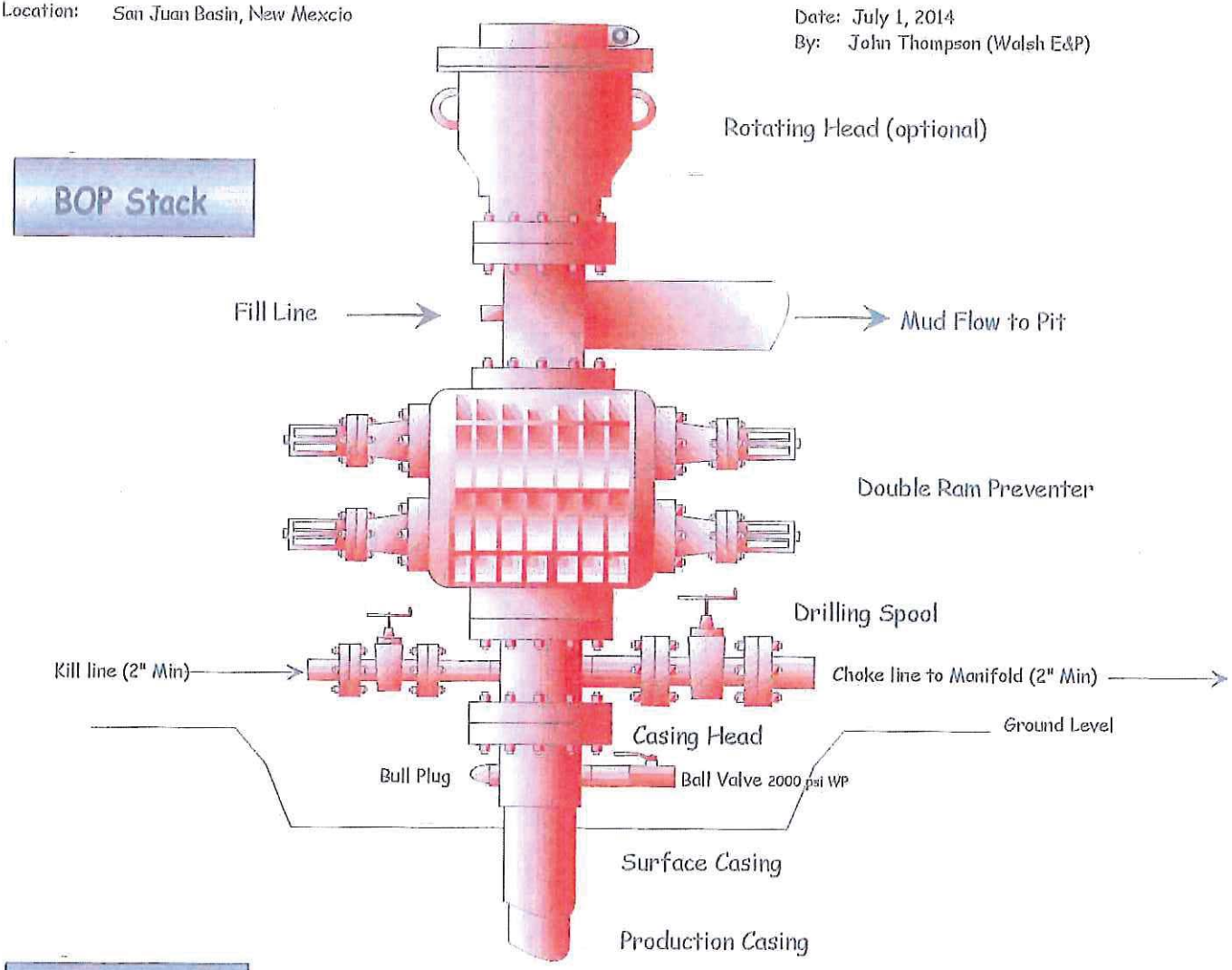
Well Control Equipment Schematic for 2M Service

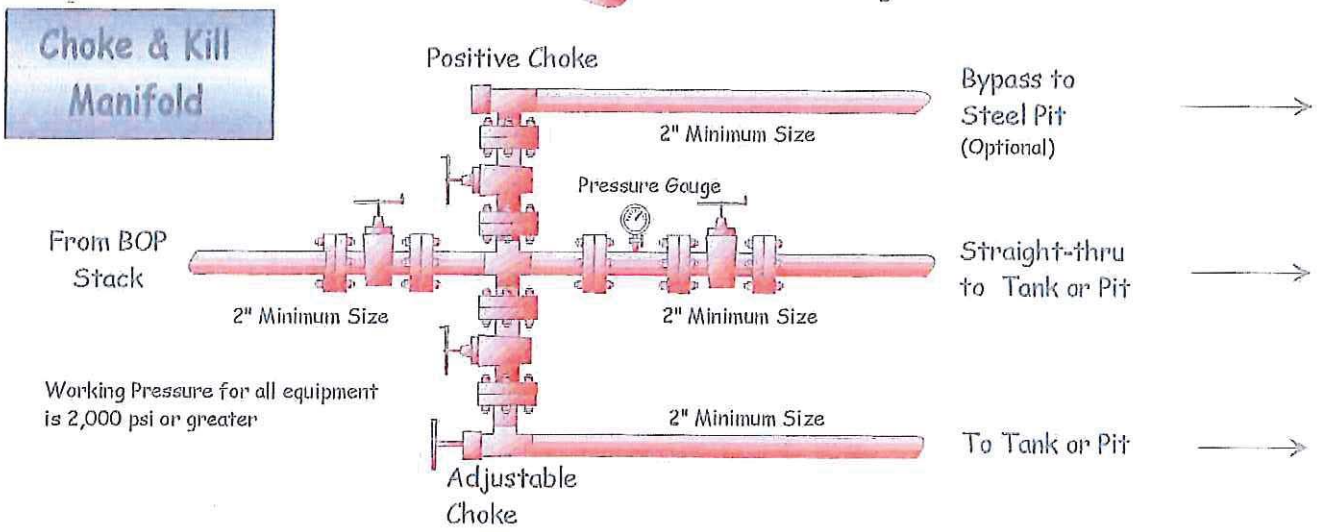
Attachment to Drilling Technical Program

Exhibit #1
Typical BOP setup

Location: San Juan Basin, New Mexcio

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





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 information submitted with this application is true and 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 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

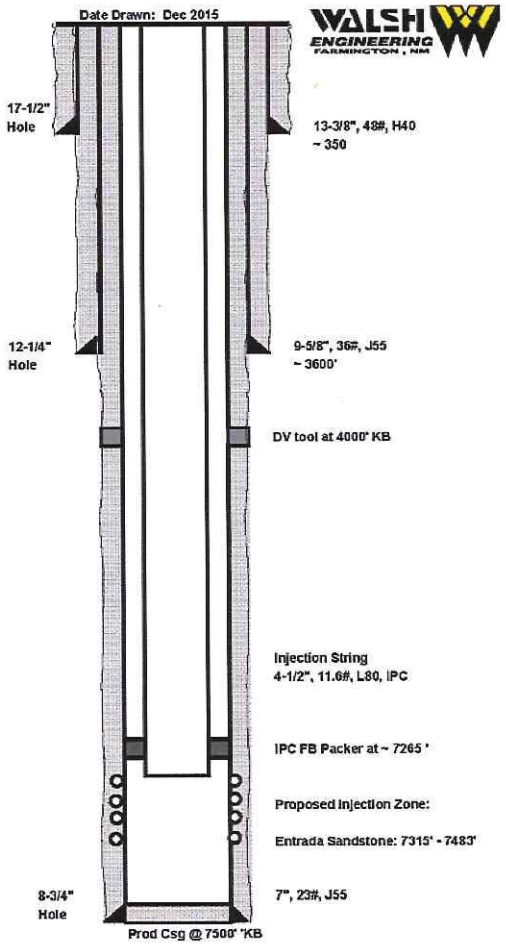
OPERATOR: Western Refining Southwest, Inc.

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: 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.

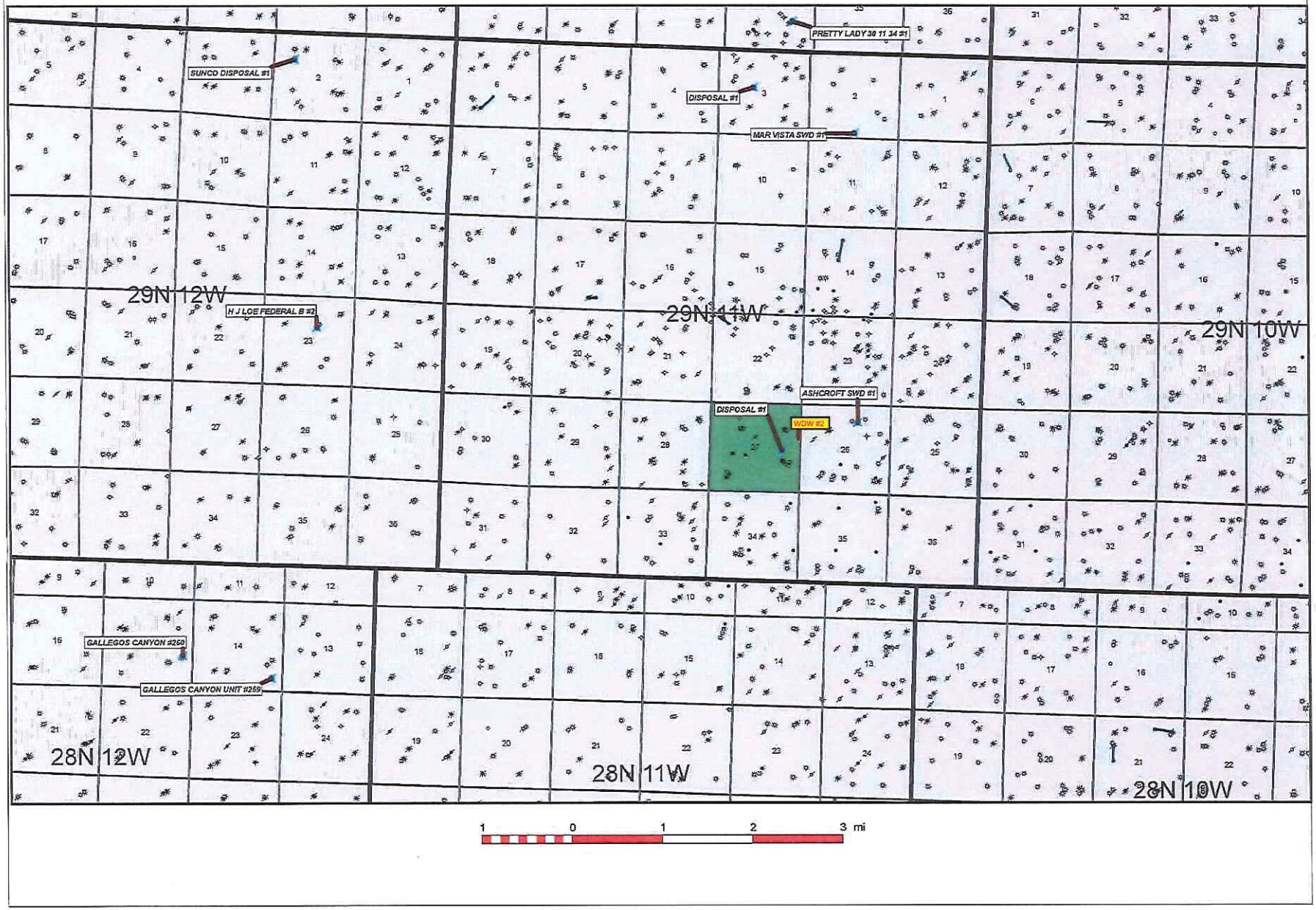
Waste Disposal Well (WDW) #2

C-108 Data Sheet

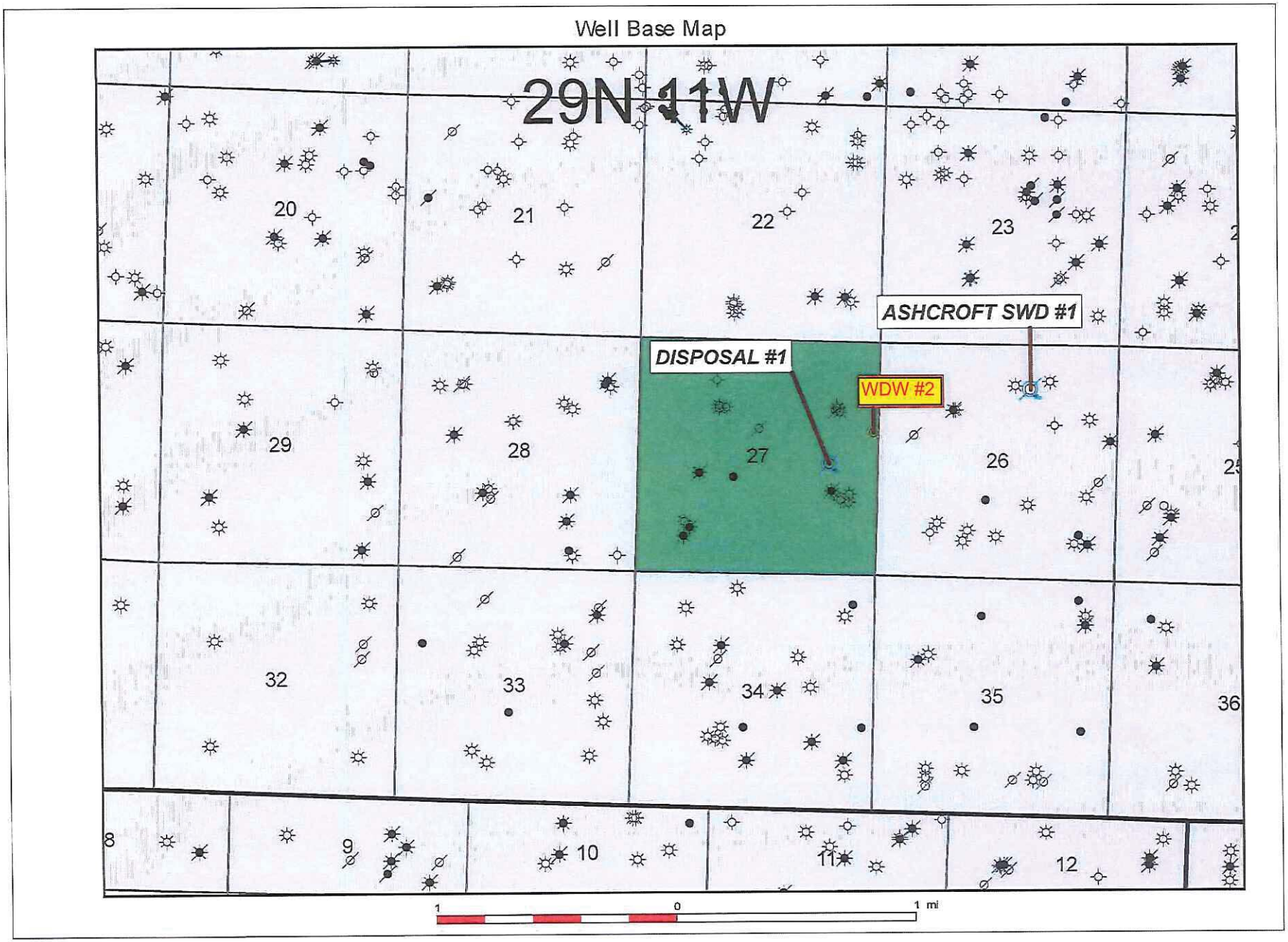
V. Maps identifying all wells within 2 ½ miles of proposed injection well and Area of Review (AOR) of 1-mile radius.

The maps are below.

Well Base Map

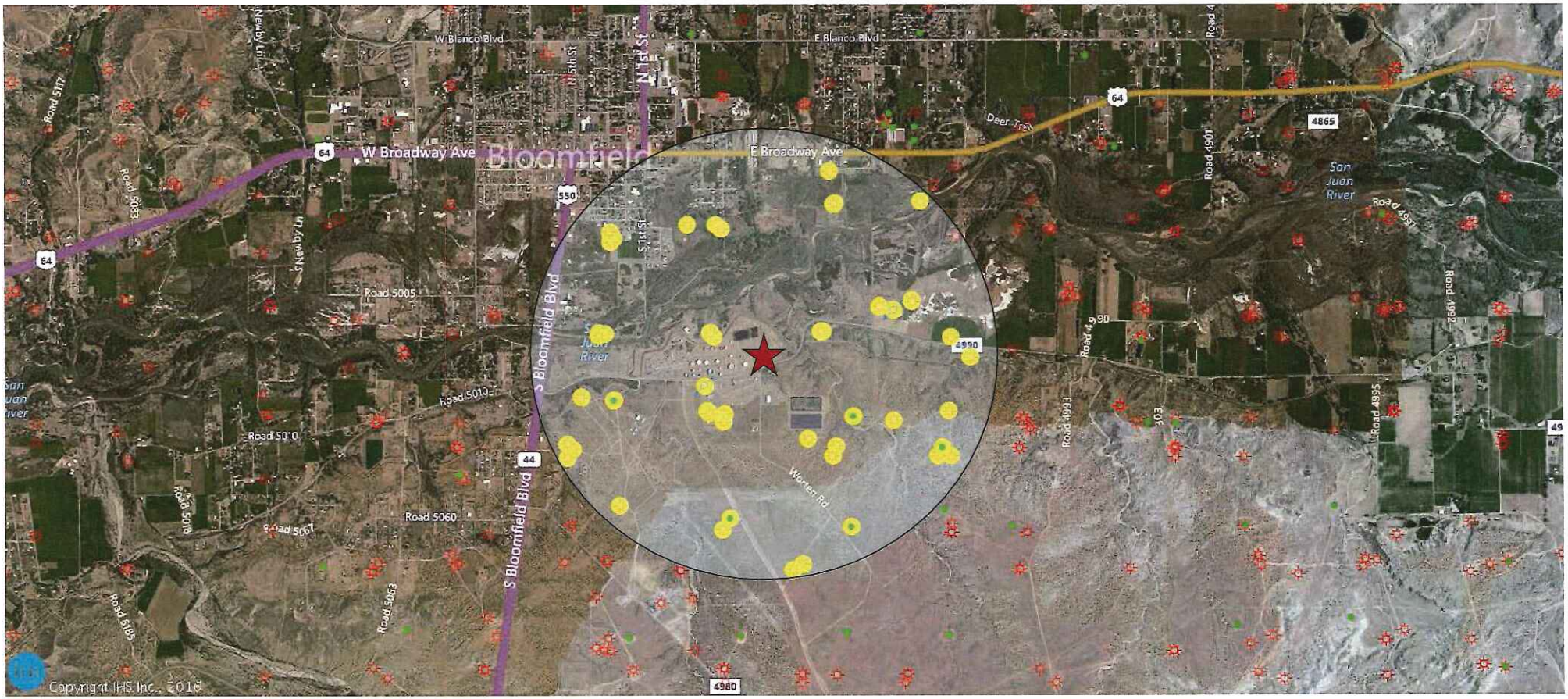


Well Base Map



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 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.

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	36.69953096	-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	007039	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	4,630	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

	(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**	**Tws**	**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 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

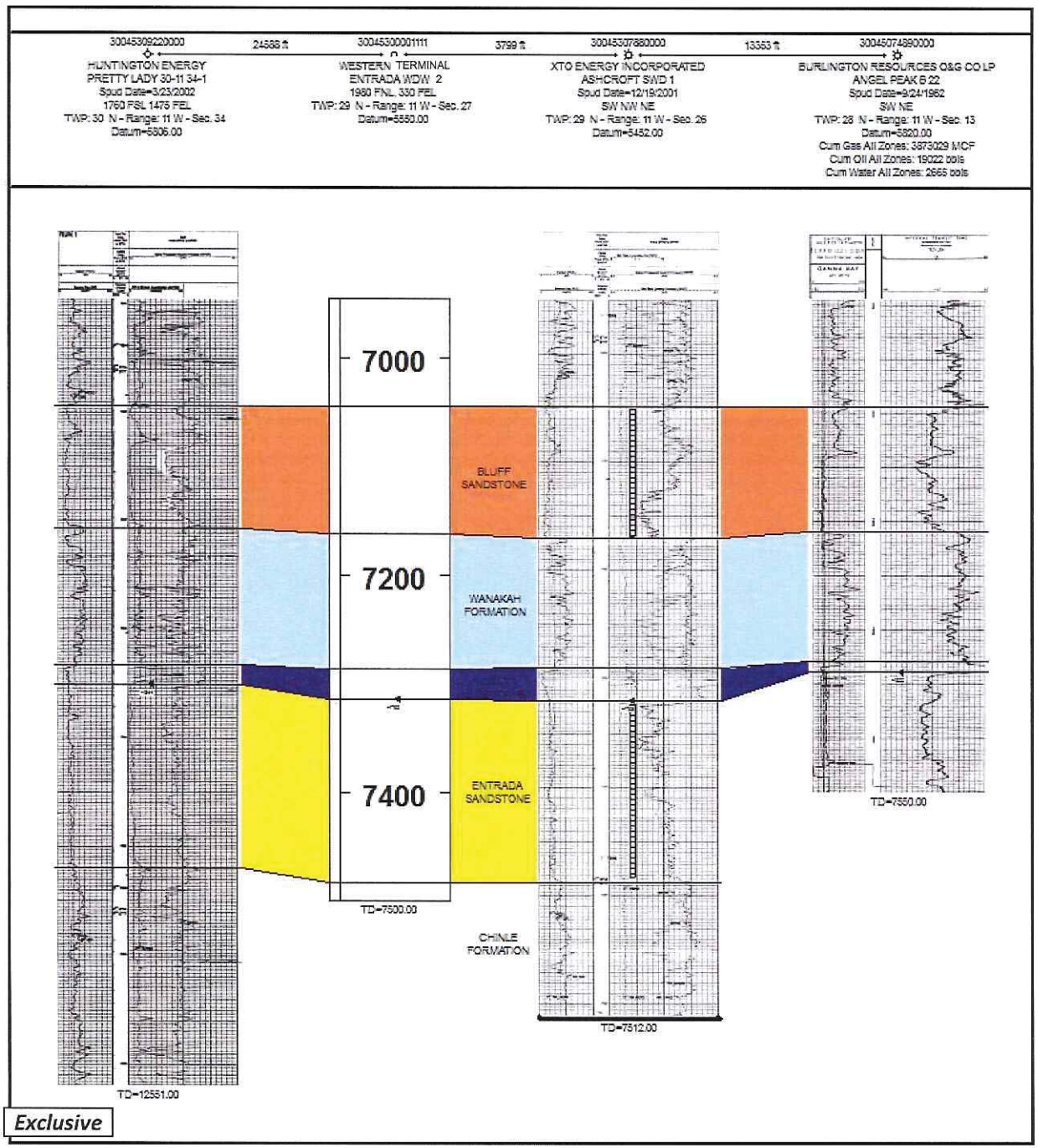
Well Name & Number: **Waste Disposal Well (WDW) #2**
API: Pending Latitude (NAD 83): 36.698499 Objective: **Entrada & Bluff FM Water Disposal** Longitude (NAD 83): -107.971156 Location: TWP: 29 N - Range: 11 W - Sec. 27 Field: Basin
Surface Location Footage: 1980 FNL, 330 FEL County: San Juan
Bottom 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:

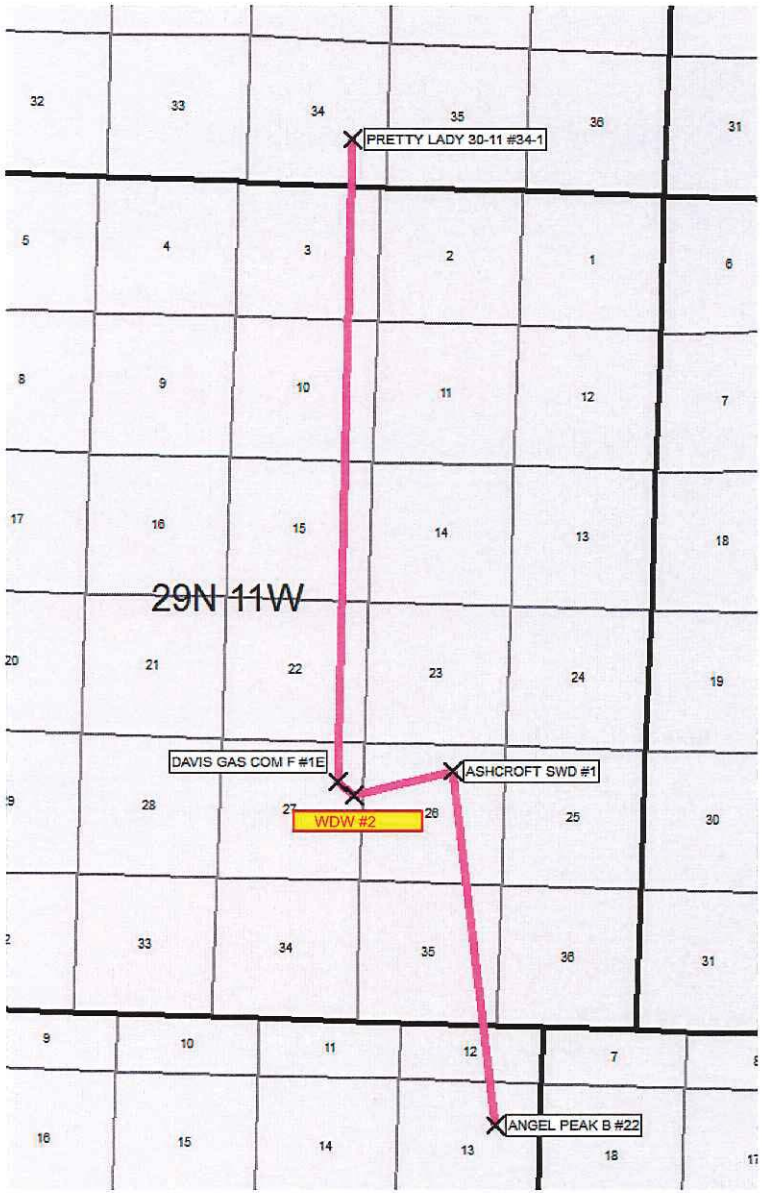
Formation Tops	Top MD (KB)	Top Subsea (KB)	Thickness (FT)	Rock Type	Drilling Notes	Depositional Environment
Quaternary Alluvium	0	5550	10	Unconsolidated Gravels	Boulders, water, lost circulation	Continental Rivers
Naciemento FM	10	5540	505	Shale & Sandstone	Water, gas	Continental Rivers
Ojo Alamo Sandstone	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

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. D 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. Current 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

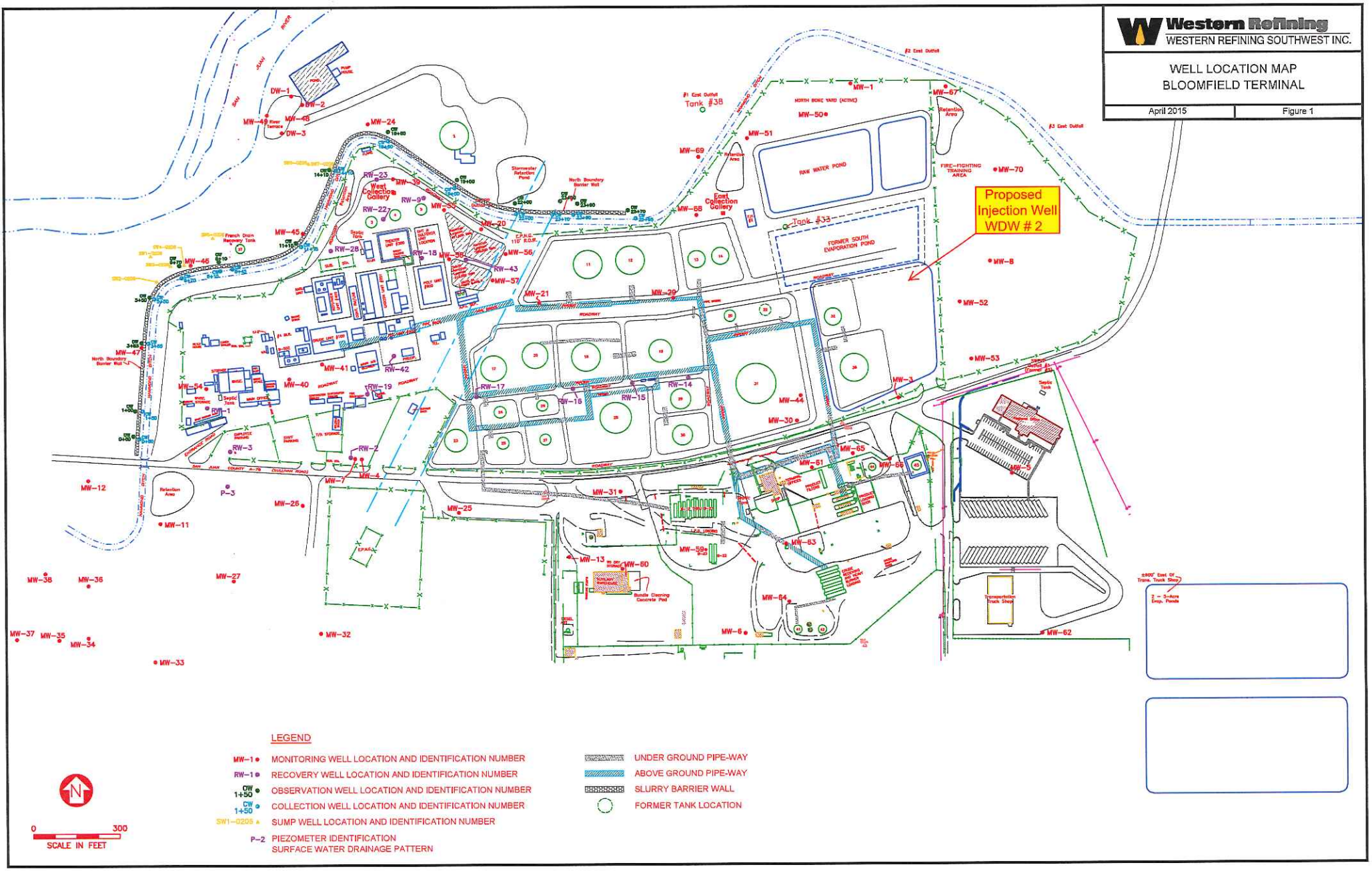
Casing/Cement Program: Additional Comments

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
RAW WATER POND
FORMER SOUTH EVAPORATION POND
NORTH BORG YARD (ACTIVE)
FIRE-FIGHTING TRAINING AREA
West Collection Gallery
East Collection Gallery
Stormwater Retention Pond
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
SW1-0205 ▲ 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
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
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

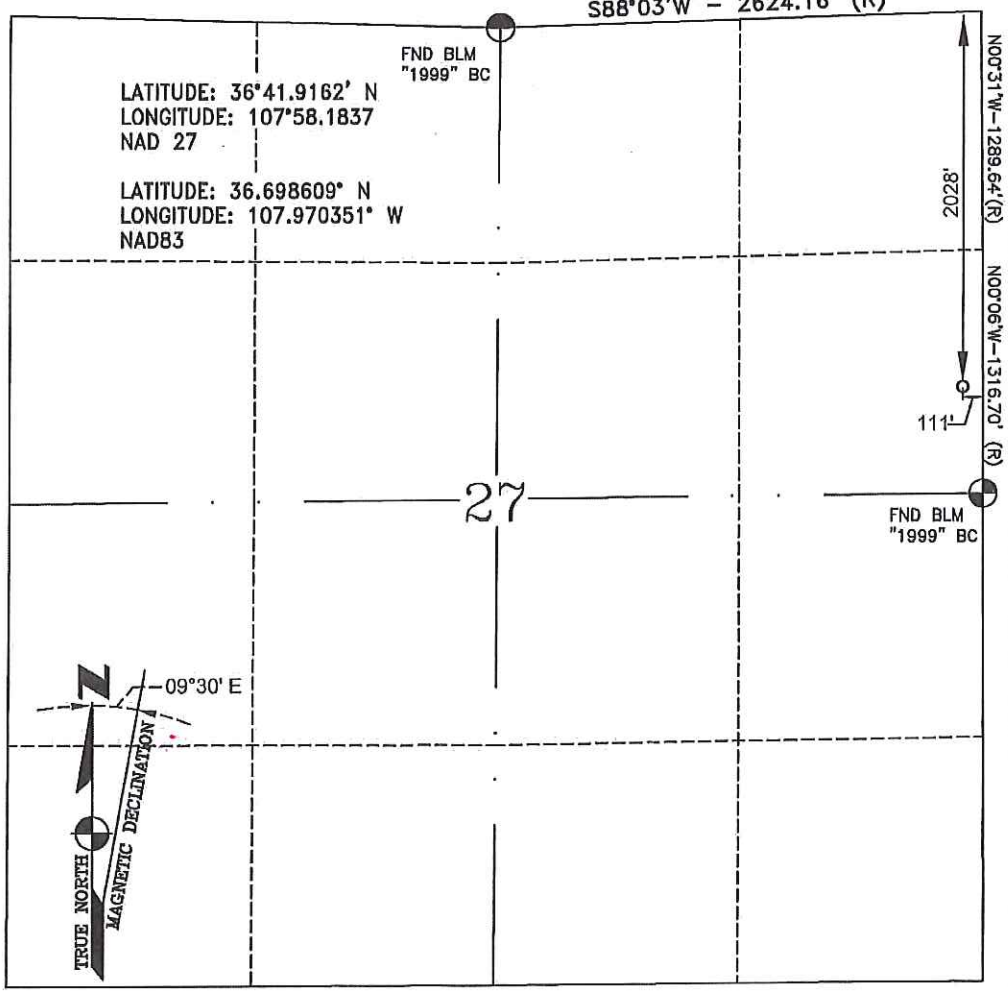
[11] Bottom Hole Location If Different From Surface

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 12/23/13 Date

John C. Thompson
Printed Name

johnc@wrlsheng.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

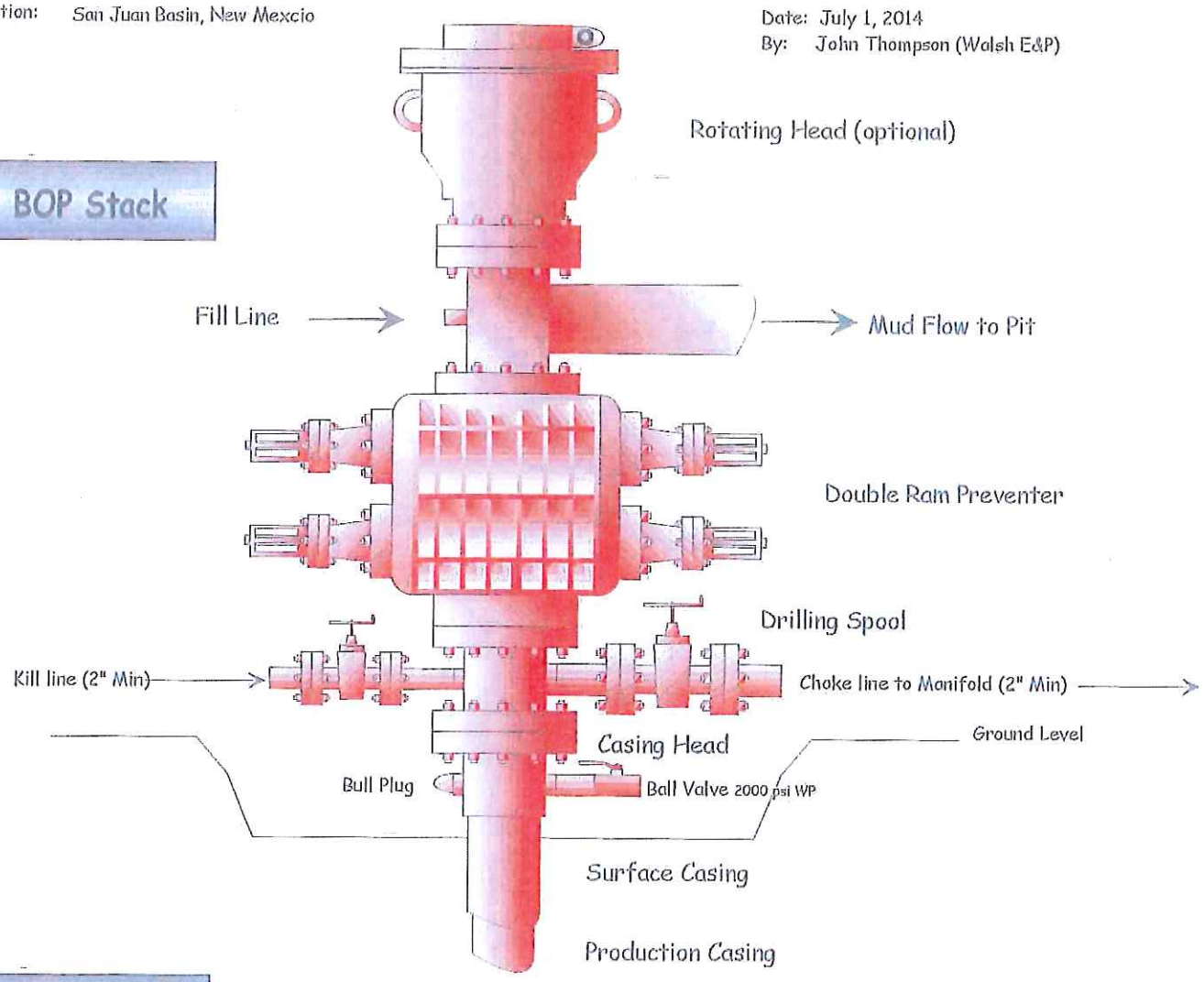
Attachment to Drilling Technical Program

Exhibit #1
Typical BOP setup

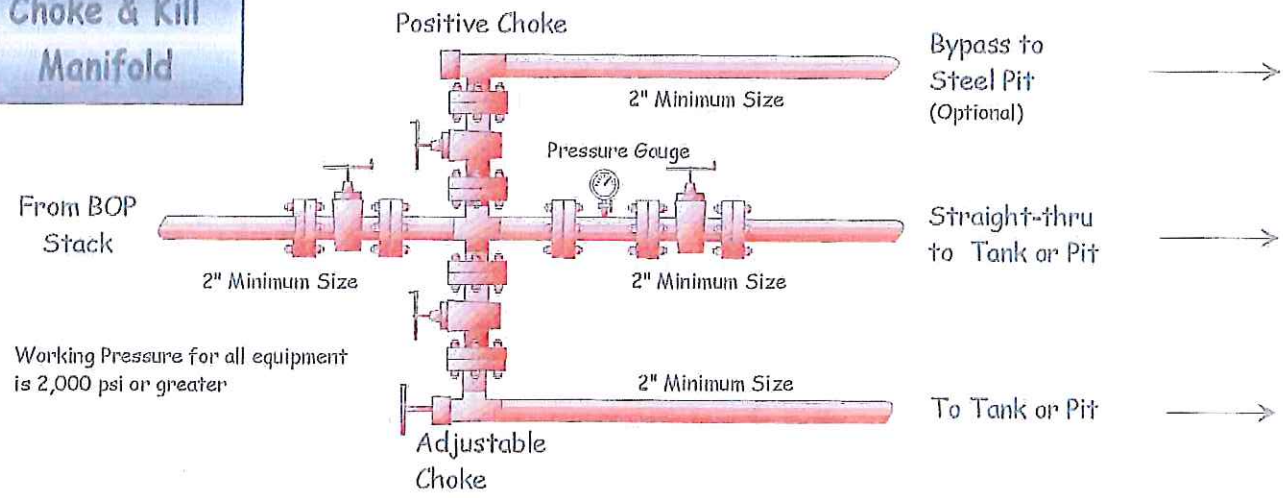
Location: San Juan Basin, New Mexcio

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 information submitted with this application is true and 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 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

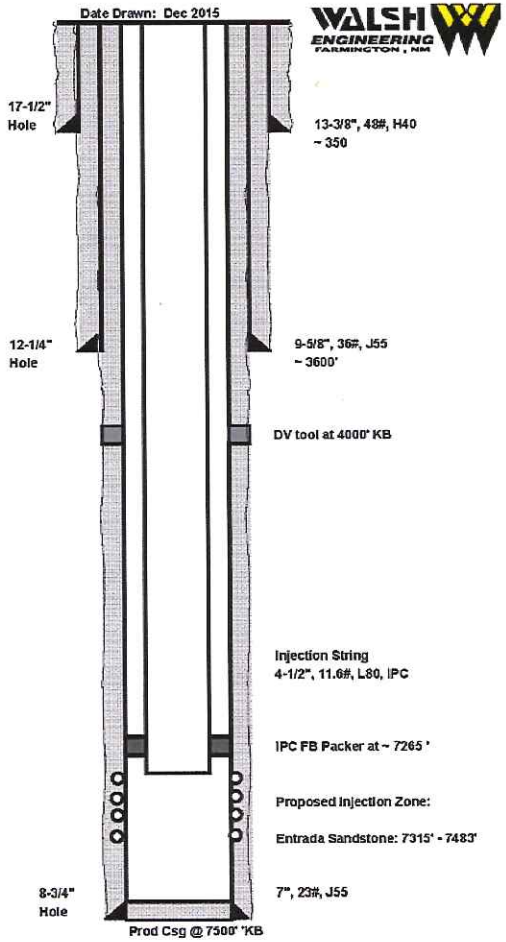
INJECTION WELL DATA SHEET

OPERATOR: Western Refining 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.

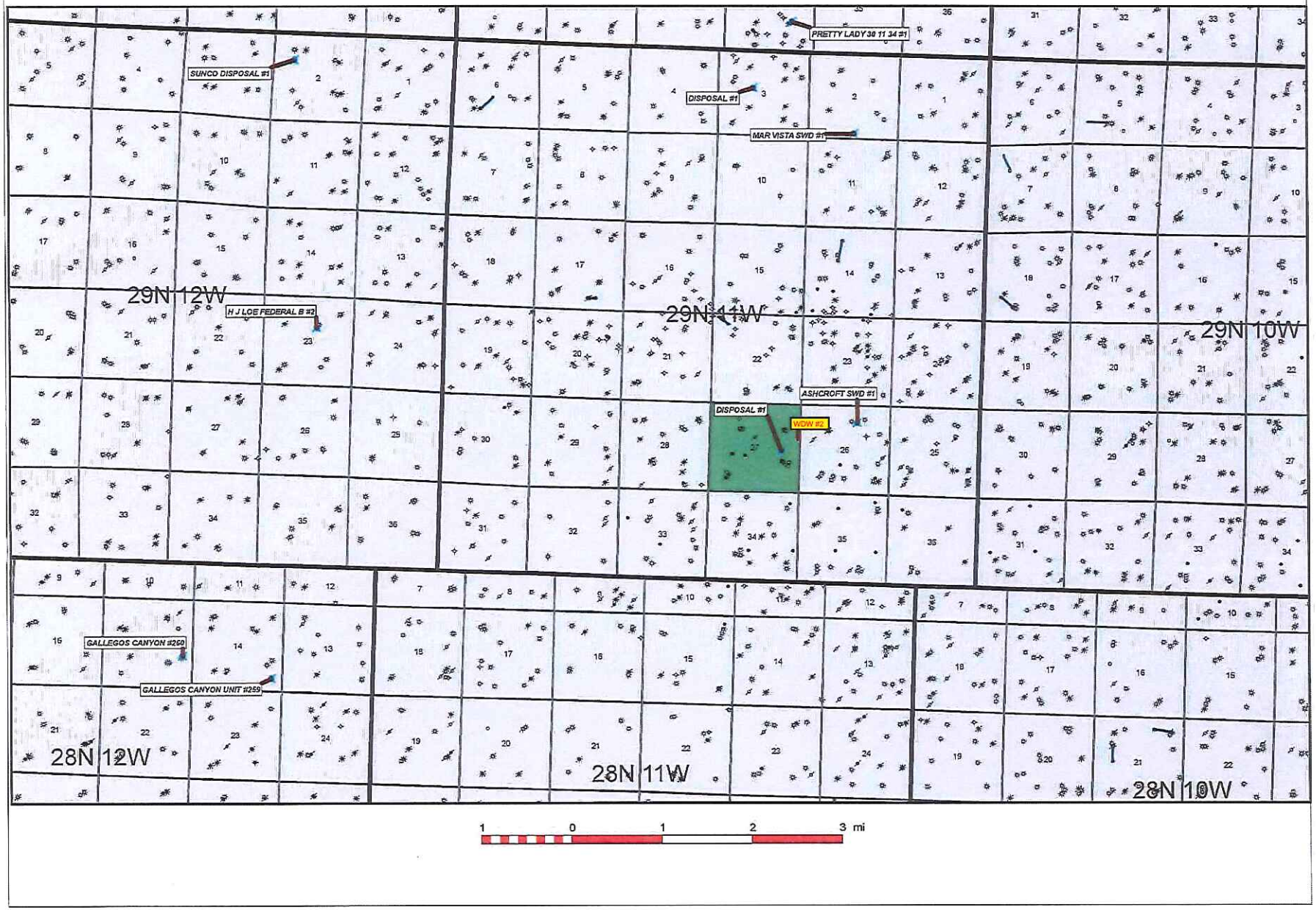
Waste Disposal Well (WDW) #2

C-108 Data Sheet

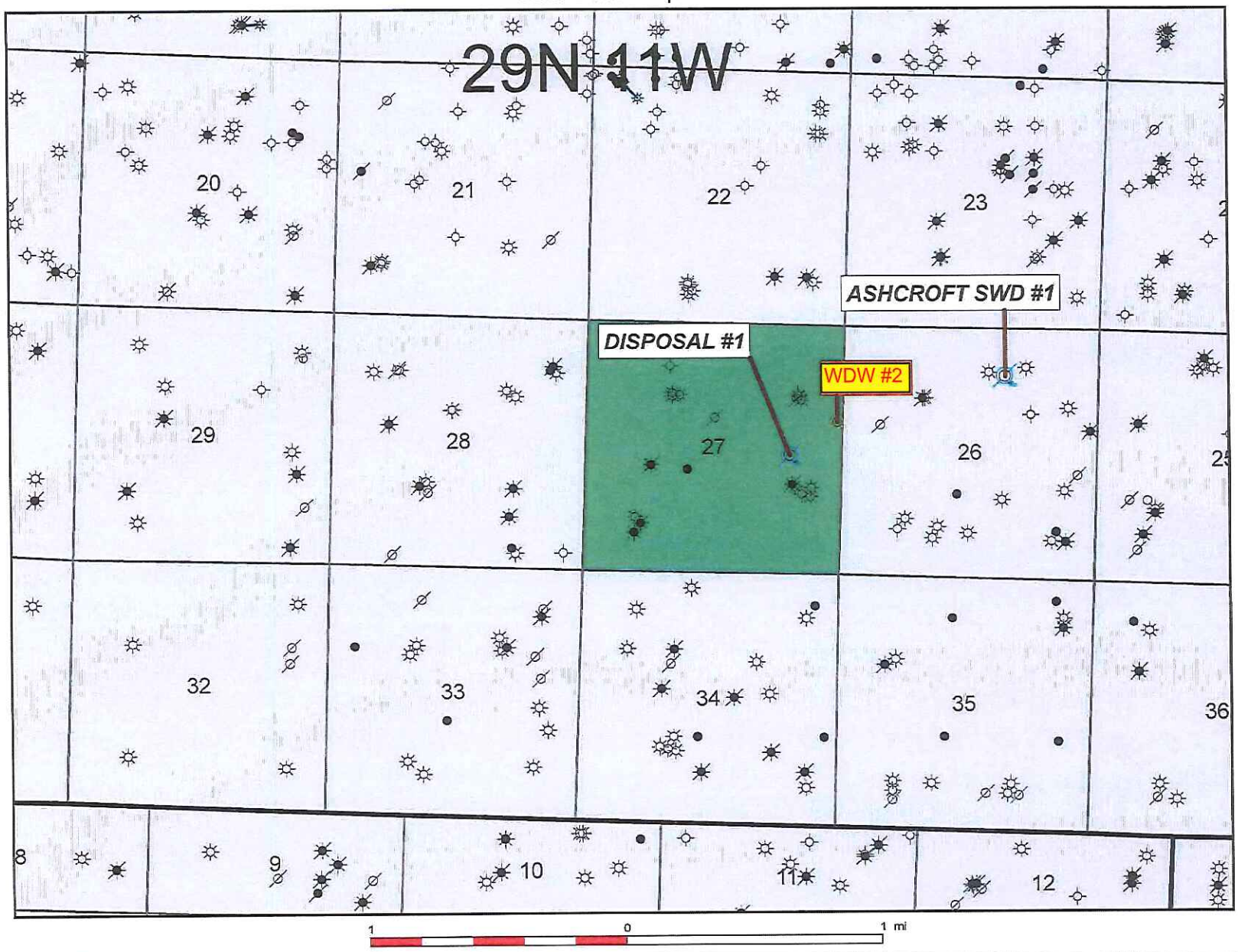
V. Maps identifying all wells within 2 ½ miles of proposed injection well and Area of Review (AOR) of 1-mile radius.

The maps are below.

Well Base Map

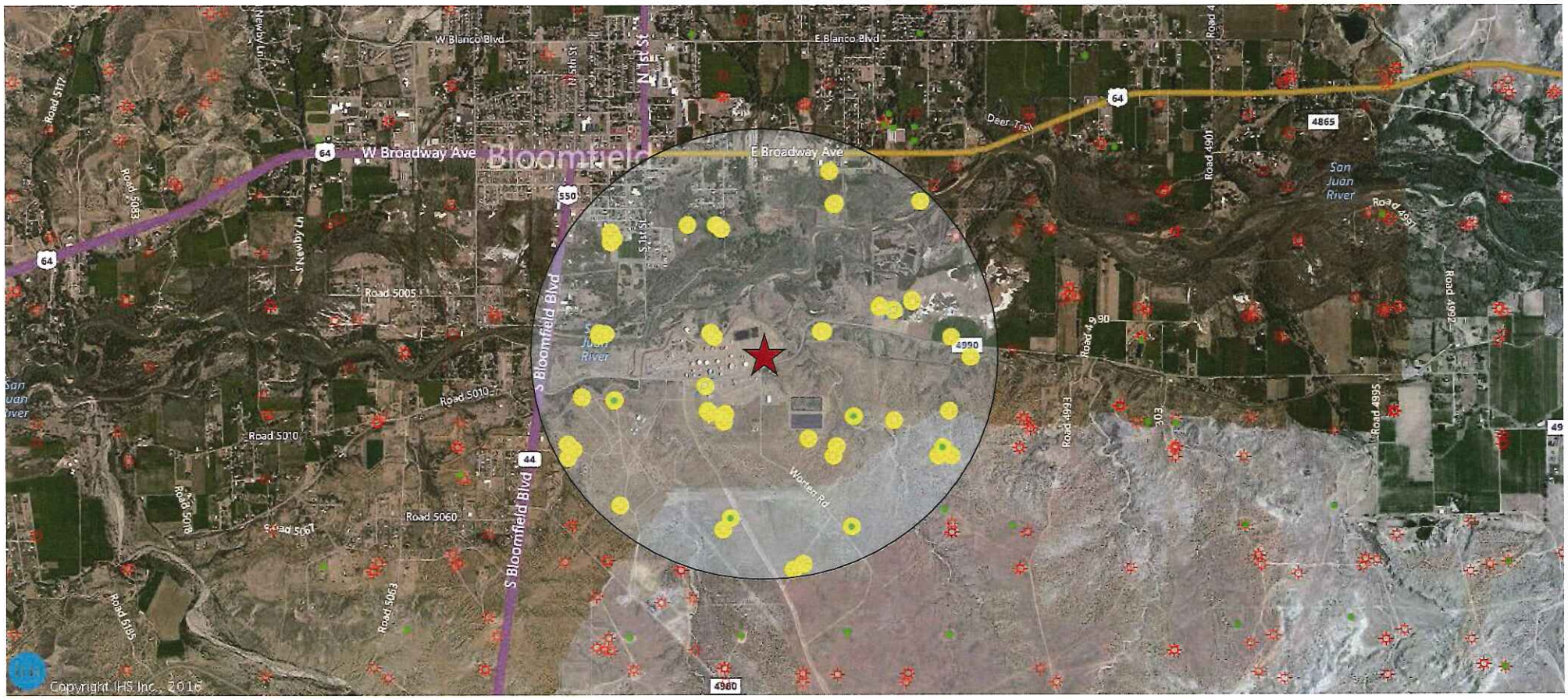


Well Base Map



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 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.

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	36.69953096	-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	007039	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	4,630	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	36.69985569	-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

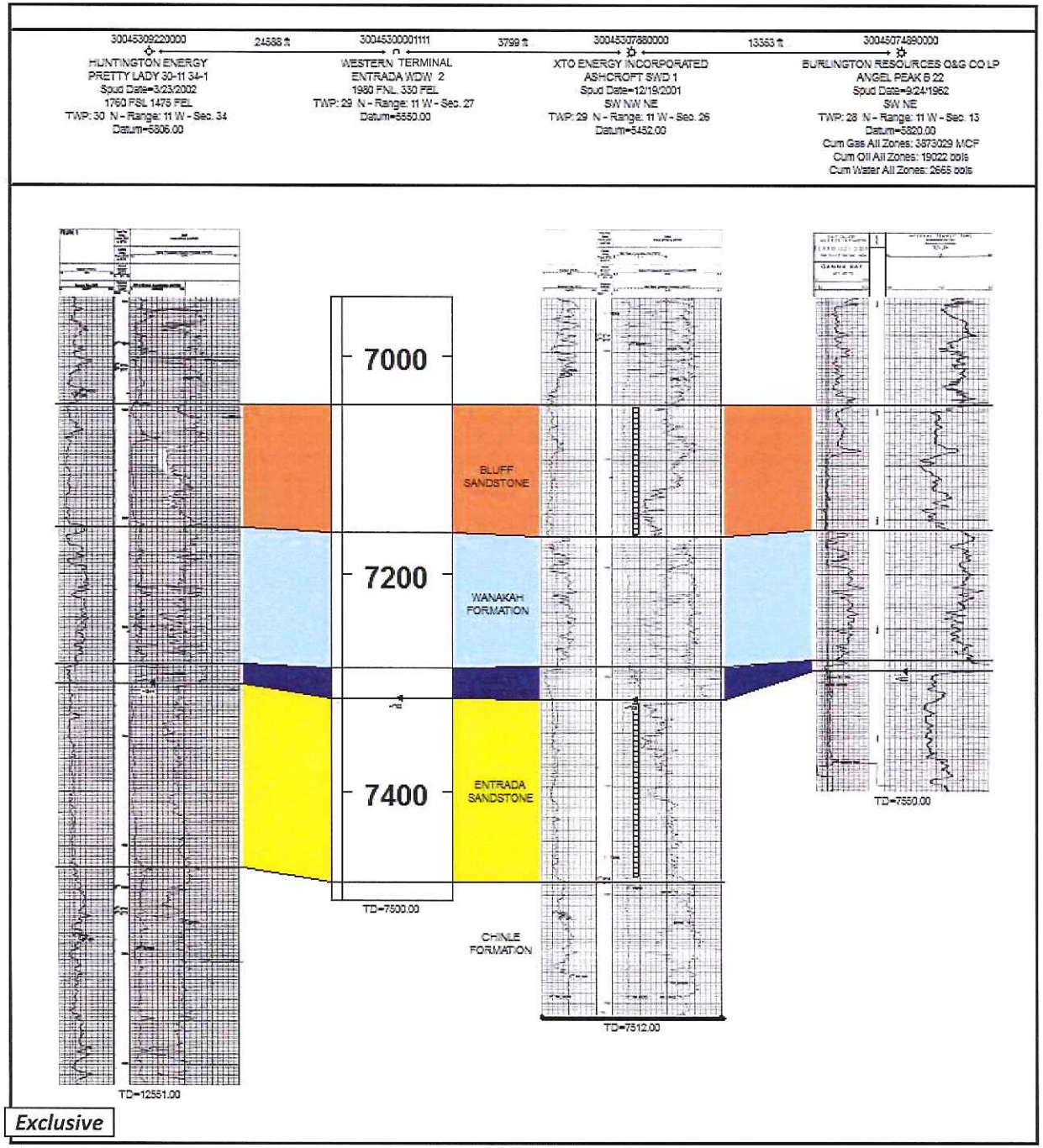
Well Name & Number: **Waste Disposal Well (WDW) #2**
API: Pending Latitude (NAD 83): 36.698499 Objective: **Entrada & Bluff FM Water Disposal** Longitude (NAD 83): -107.971156 Location: TWP: 29 N - Range: 11 W - Sec. 27 Field: Basin
Surface Location Footage: 1980 FNL, 330 FEL County: San Juan
Bottom 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:

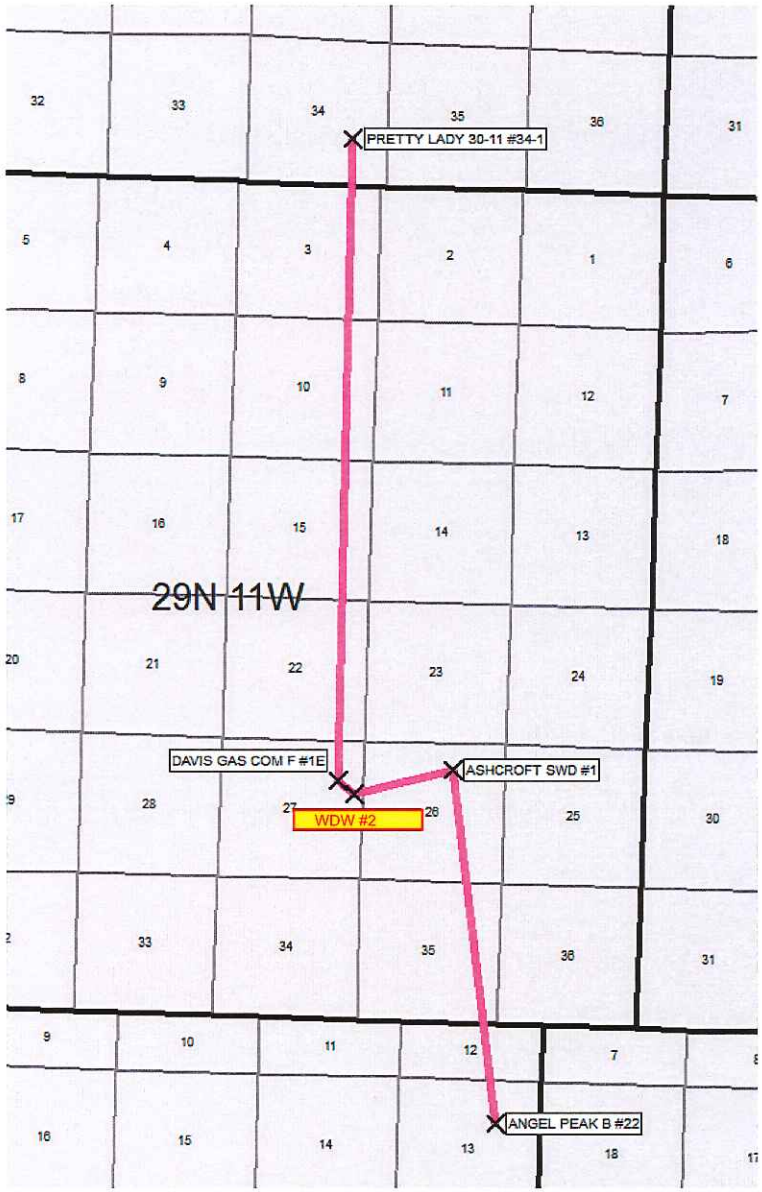
Formation Tops	Top MD (KB)	Top Subsea (KB)	Thickness (FT)	Rock Type	Drilling Notes	Depositional Environment
Quaternary Alluvium	0	5550	10	Unconsolidated Gravels	Boulders, water, lost circulation	Continental Rivers
Naciemento FM	10	5540	505	Shale & Sandstone	Water, gas	Continental Rivers
Ojo Alamo Sandstone	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.
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 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

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Qualifiers:

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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.
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 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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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
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 140128036
Project Name: 1401A07

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:CERT0028; NM: ID00013; OR:ID200001-002; WA:C585
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E87109

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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- 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
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

WO#: **1401A07**

Hall Environmental Analysis Laboratory, Inc.

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:

- * 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 **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

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

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

Hall Environmental Analysis Laboratory, Inc.

WO#: **1401A07**

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.	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

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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?

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: 1.2

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	Mistie Walker	1/23/14	1510
1/23/14	1710	Mistie 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.
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 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.
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 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.	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 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.
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

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

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:

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- 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**	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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- 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 **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:

*	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 **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
- 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 **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:

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- 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-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:

- * 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#: **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								
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	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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- 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 **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

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-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:

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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 **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.
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- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
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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 **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: /C

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. 1407D13	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,NO3,NO2,PO4,SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Ignitability, Corrosivity	Reactivity	Ec, pH, SO4, Alk, Cl	Sulfides	Air Bubbles (Y or N)
7-28-14	9:30	H2O	Injection Well	3-VOA	HCl	001										X						
				1-liter	amber	002											X					
				1-500ml	—	001												X				
				1-500ml	—	001				X										X		
				1-250ml	H2SO4	001					X											
				1-500ml	HNO3	001							X									
				1-500ml	NaOH	001													X			
				1-500ml	ZN Acetate	001															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

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4901 Hawkins NE
Albuquerque, NM 87109
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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.	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**	
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:

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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 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
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 141003043
Project Name: 1410102

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		10/6/2014	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

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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

Batch #: 141003043
Project Name: 1410102

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):E87693; ID:ID00013; MT:CERT0028; 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

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:

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- 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

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 **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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- 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 **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
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- P Sample pH greater than 2.
- RL Reporting Detection Limit

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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- 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 **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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- 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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- 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 **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:

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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#: **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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- 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 **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:

- * 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 **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:

- * 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 **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:

- * 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 **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

HEAL No. 1410282

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	
10-1-14	10:00	H_2O	Inj. well	3-VOA	HCl	-001
				1-Liter	amber	-001
				1-500ml		-001
				1-500ml		-001
				1-125 ml	H_2SO_4	-001
				1-500 ml	HNO_3	-001
				1-500ml	NaOH	-001
				1-500 ml	ZN-Acetate	-001

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TDS	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	Mistie Walker	10/1/14	1421
10/1/14	1815	Mistie Walker		10/02/14	0750

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

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

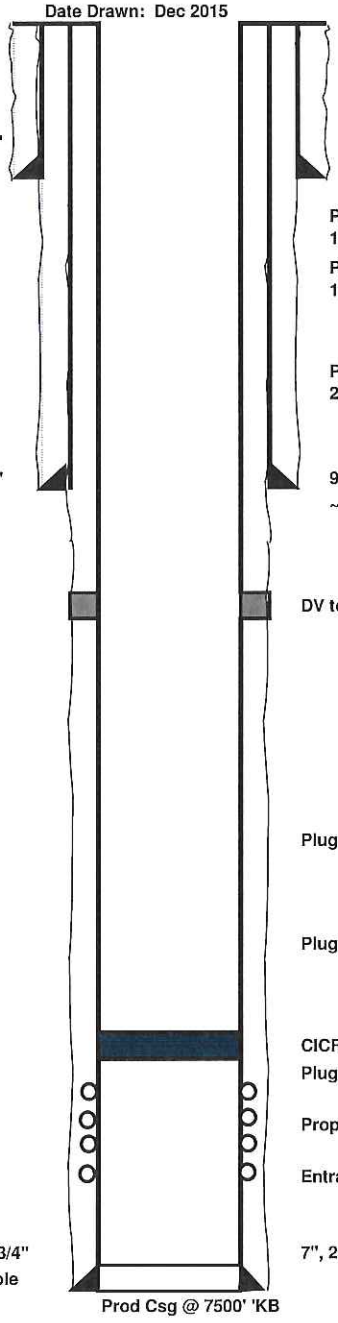
1 Move-in, rig up pulling unit. Pump & pit. Half tank for cement returns.
2 Hold safety meeting with rig crew and related personnel explaining the procedure and outlining potential hazards.
3 ND WH & NU BOP
4 TIH w/ CICR & set at ~ 7265'.
5 Load hole and circulate clean with fresh water.
6 Load tubing 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

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

DATE IN	SUSPENSE	ENGINEER	LOGGED IN	TYPE	APP NO.
12/30/15		PRG	1-4-2016	SWD	PMAM1600432778

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]

- SWD
- SAN JUAN REFINING CO
37218
- well
- SWD #2 - pending
30-045-

[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 _____

RECEIVED OCD
2015 DEC 30 P 1:48

[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

Pool
- SWD; Entrada
96436

[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.

Print or Type Name	Signature	Title	Date
John C. Thompson	John C. Thompson	Agent / Engineer	12/15/2015

johnew@aloheng.net
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: San Juan Refining Co./Western Refining Southwest, Inc.

ADDRESS: #50 County Road 4990, Bloomfield, NM 87413

CONTACT PARTY: John Thompson PHONE: 505-327-4892

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).

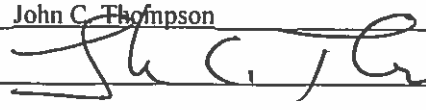
*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

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: John C. Thompson TITLE: Agent/Engineer

SIGNATURE:  DATE: 12/15/2015

E-MAIL ADDRESS: john@walsheng.net

* 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

Side 2

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.

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

Side 1

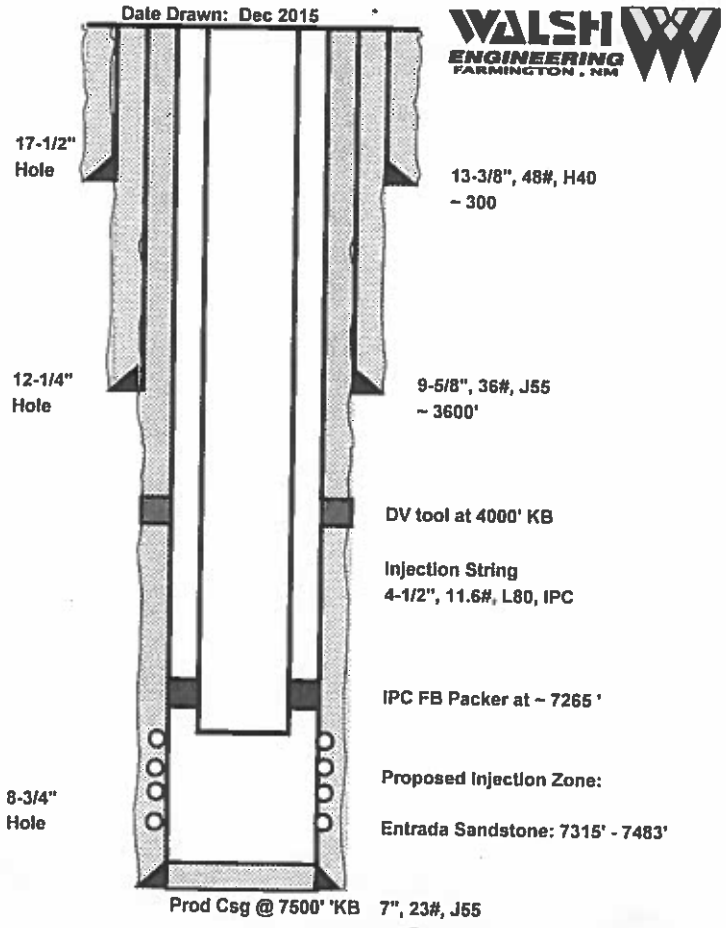
INJECTION WELL DATA SHEET

OPERATOR: Western Refining Southwest, Inc.

WELL NAME & NUMBER: SWD #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)

7316' feet to 7482' (perforated 4 spf)

(Perforated or Open Hole; indicate which)

San Juan Refining Co./Western Refining Southwest, Inc.

SWD #2

C-108 Data Sheet

V. See Attached Map

VI. See Attached Tabulation Sheet

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 refinery 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 of will be non-hazardous treated water generated from the Bloomfield Terminal (former Refinery). Representative water analysis for each formation are attached.

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 of the proposed Western SWD #1. 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. However, water analysis of the recently drilled TnT SWD #1, located in the southern portion of the San Juan Basin are included. Additional geologic properties of the Entrada formation are attached.

VIII. Geology

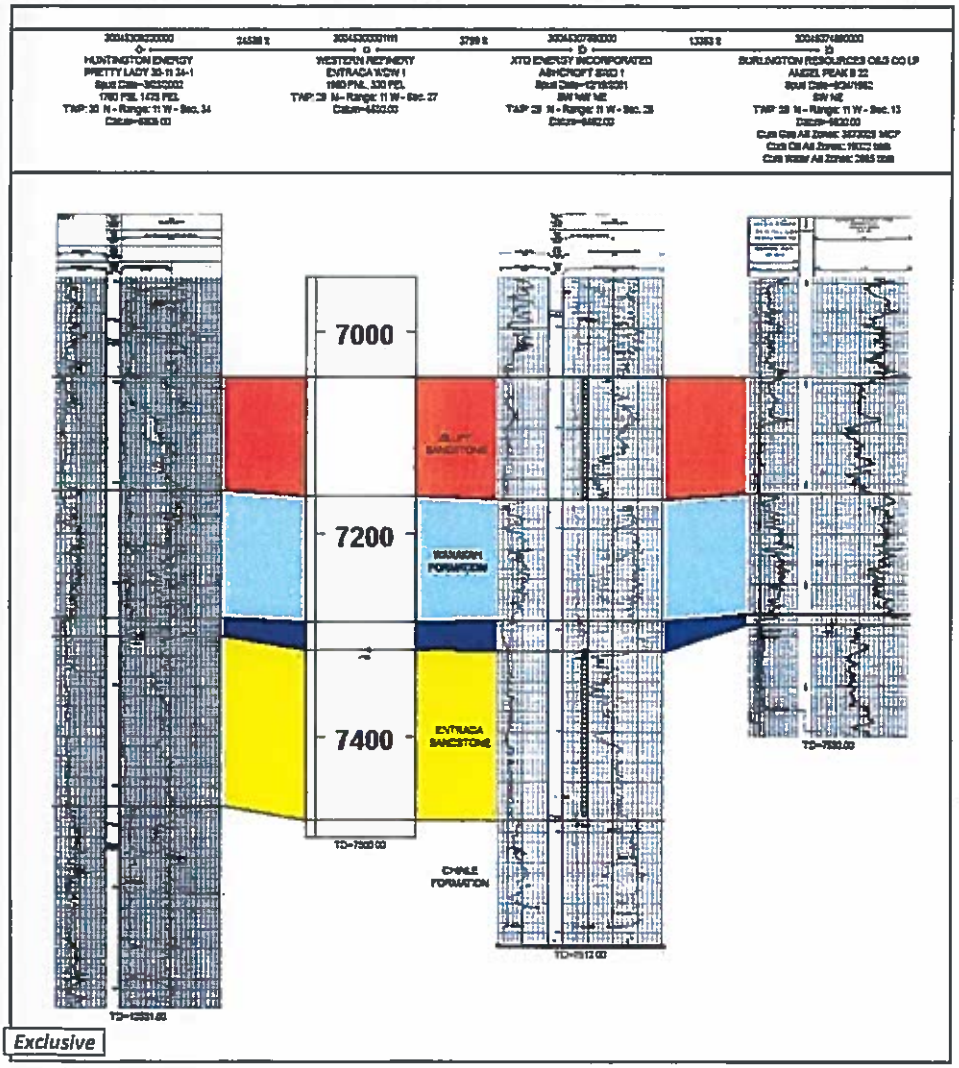
The Entrada Sandstone formation is Jurassic in age and is described as a wind blown deposit with fine to coarse-grained sandstone particles, clean and well sorted. Generally, the Entrada Sandstone formation is 200 to 280 ft thick throughout the San Juan Basin. Natural fractures are few to nonexistent.

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. A cross section showing the regional thickness and log characteristics is included (below).

San Juan Refining Co./Western Refining Southwest, Inc. has approximately 70 ground water monitoring wells located within the refinery terminal (map of well locations is attached for reference). A sampling of the seven closest monitoring wells indicates an average depth to ground water to be approximately 24 ft.

Based on the attached comprehensive water analysis for the treated refinery water to be disposed the approximate TDS is 1220 mg/L.

Regional Bluff & Entrada Sandstones Cross-Section



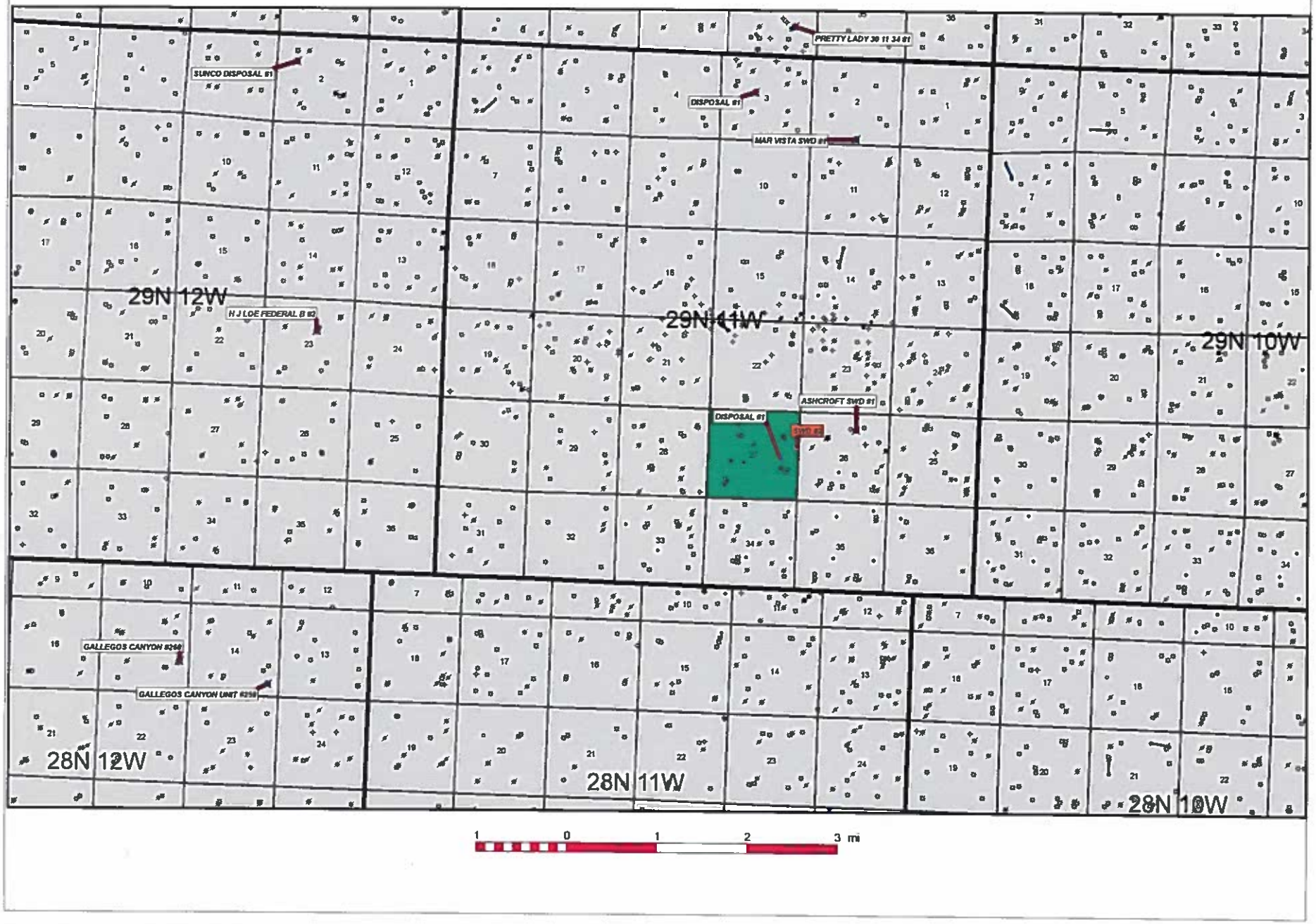
IX. After the well is drilled, cased and perforated a injectivity test will be performed. If the injection rate is less than 6 BPM prior to parting pressure, the well will be stimulated w/ approximately 222,000 lbs of 20/40 white sand in 110,000 gals of 30# cross linked gel at 50 bpm. Note: actual job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

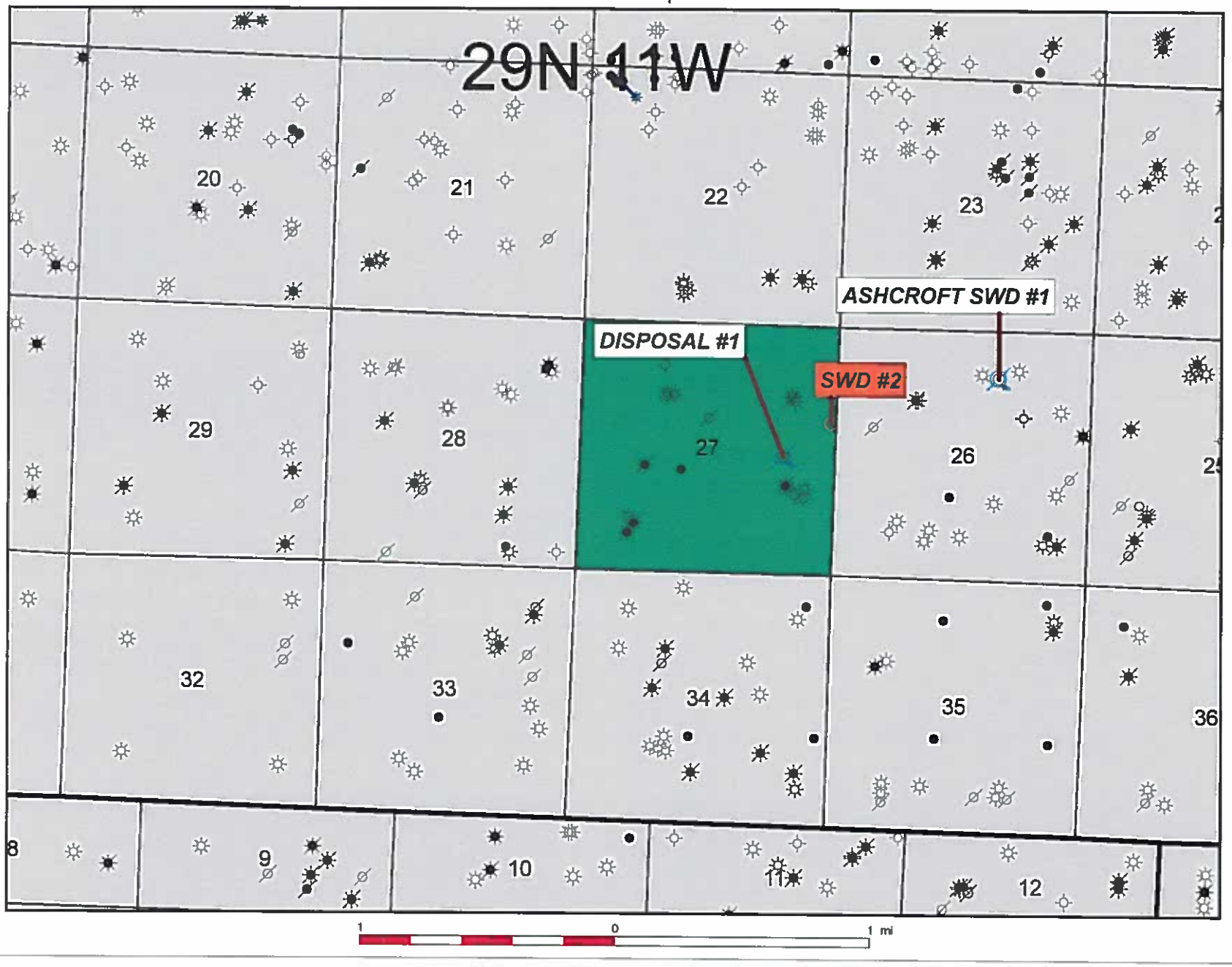
XII. Based on the information available online as well as information from the "Four Corners Geological Society" there are no known faults located in the area of the proposed well. Natural fractures are few to nonexistent in the Entrada formation. The overlaying formation is the relatively impermeable 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 SWD #1. 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. See attached certified mail receipts.

Well Base Map



Well Base Map



Entrada/Bluff WDW #1

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

Western Refining

Header

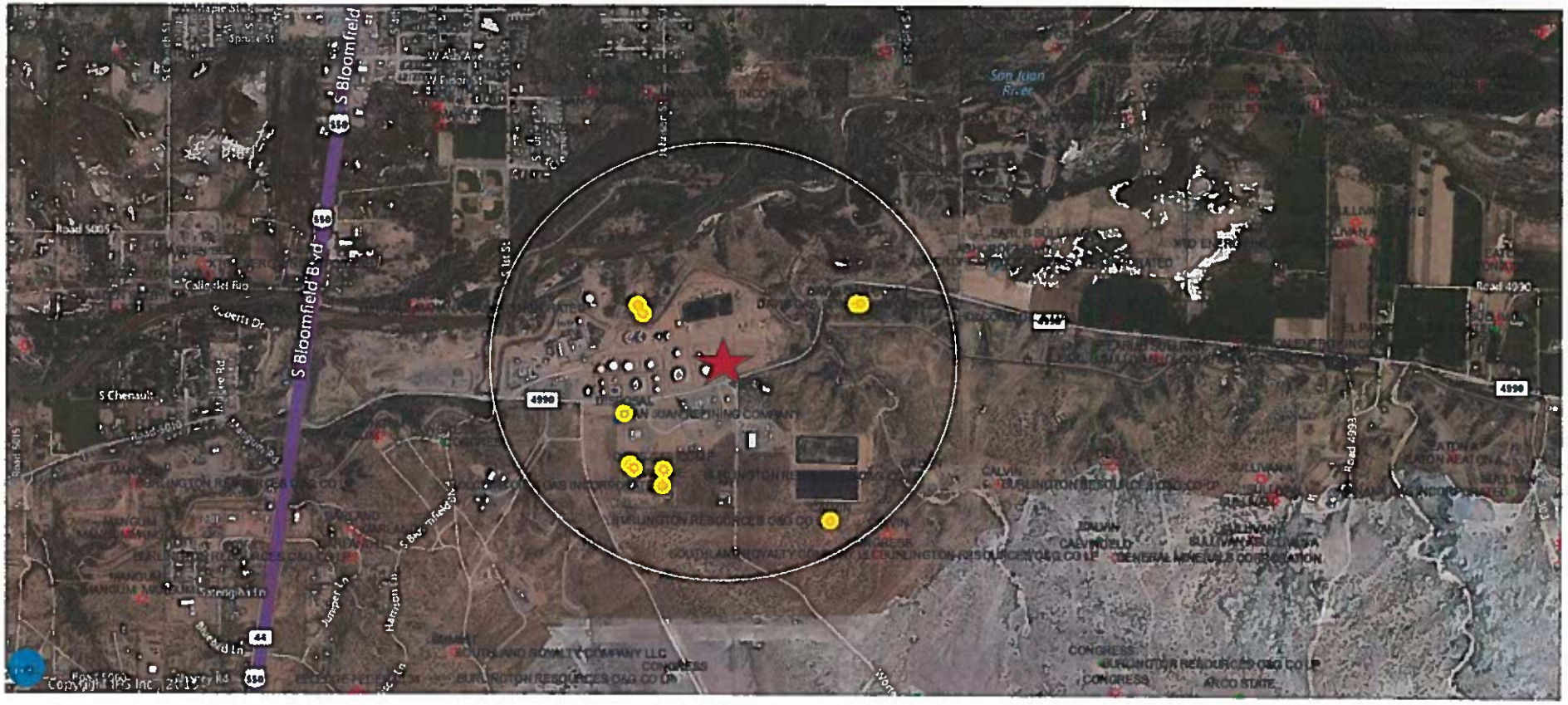
Well Name & Number:	Entrada/Bluff WDW #1		
API:	Pending	Latitude (NAD 83):	36.698499
Objective:	Entrada & Bluff FM Water Disposal	Longitude (NAD 83):	-107.971156
Location:	TWP: 29 N - Range: 11 W - Sec. 27	Field:	Basin
Surface Location Footage:	1980 FNL, 330 FEL	County:	San Juan
Bottom Hole Location Footage:	Same as Surface	State:	New Mexico
Lease:		GL Elevation:	5538
Surface Owner:		KB Elevation:	5550
Type:		Proposed TD:	7500
Expiration Date:		Proposed Plugback:	
Depth:			

November 25, 2015
Geologist: Peter Kondrat

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.

1/2 Mile Radius



Enerdeq Browser Date: Nov 23, 2015 Author: JOHN THOMPSON

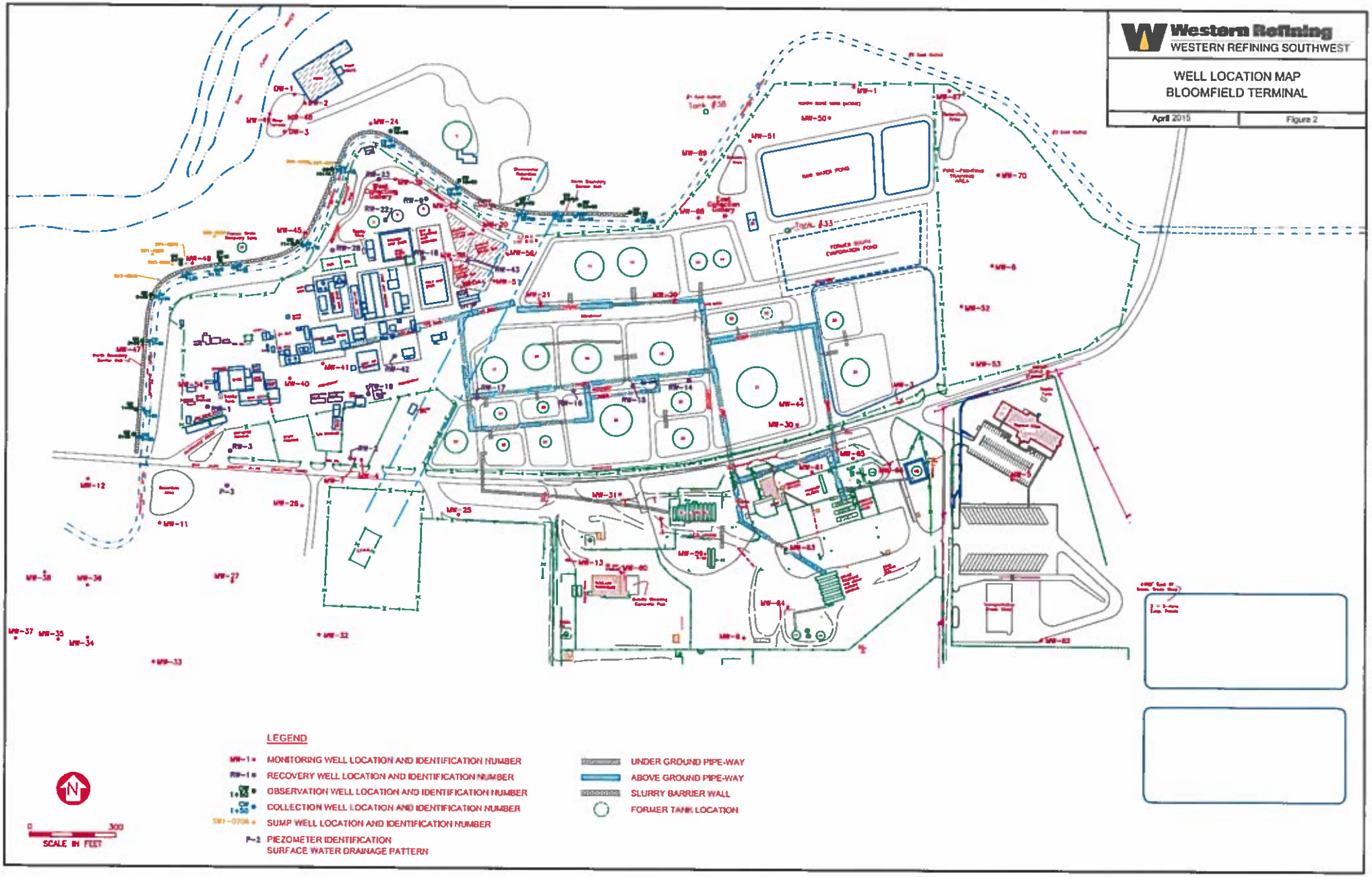
Western Refining
SWD #2
Well Tabulation Sheet

Operator Name	Lease Name	Well Num	Primary API	Location	First Prod Date	TD	Status Na	Upper Perf	Lower Perf
SAN JUAN REFINING COMPA	DISPOSAL	1	30045290020000	29N 11W 27I NW NE SE			P&A	3276	3514
BP AMERICA PRODUCTION C	DAVIS GAS COM F	1	30045078250000	29N 11W 27I SW NE SE	1960-12-01	6365	P&A	6215	6240
BURLINGTON RESOURCES OI	CALVIN	1	30045120030000	29N 11W 26M SW SW	1963-03-01	6450	ACTIVE	6176	6348
XTO ENERGY INCORPORATEI	DAVIS GAS COM G	1	30045235540000	29N 11W 27I SW NE SE	1981-01-01	2951	P&A	2827	2839
XTO ENERGY INCORPORATEI	SULLIVAN GAS COM D	1E	30045240830000	29N 11W 26F NW SE NW	1980-09-01	6329	ACTIVE	6086	6242
XTO ENERGY INCORPORATEI	DAVIS GAS COM F	1E	30045240840000	29N 11W 27H NW SE NE	1981-05-01	6386	ACTIVE	6163	6262
XTO ENERGY INCORPORATEI	DAVIS GAS COM F	1E	30045240840000	29N 11W 27H NW SE NE	1981-06-01	6386	ACTIVE	2701	2810
HOLCOMB OIL & GAS INCOR	DAVIS GAS COM J	1	30045253290000	29N 11W 26F NW SE NW	2008-04-01		ACTIVE	1462	1645
HOLCOMB OIL & GAS INCOR	DAVIS GAS COM J	1	30045253290000	29N 11W 26F NW SE NW	1985-02-01	4331	INACTIVE	3970	4030
XTO ENERGY INCORPORATEI	DAVIS GAS COM J	1	30045253290000	29N 11W 26F NW SE NW	1983-05-01	4331	INACTIVE	2631	2772
XTO ENERGY INCORPORATEI	DAVIS GAS COM F	1R	30045308330001	29N 11W 27I SW NE SE	2002-05-01		ACTIVE	5314	5646
XTO ENERGY INCORPORATEI	DAVIS GAS COM F	1R	30045308330000	29N 11W 27I SW NE SE	2002-03-01		ACTIVE	6177	6308
HOLCOMB OIL & GAS INCOR	JACQUE	2	30045344090000	29N 11W 27H NW SE NE	2008-01-01	1897	ACTIVE	1483	1689
HOLCOMB OIL & GAS INCOR	JACQUE	1	30045344630000	29N 11W 27L	2008-02-01	1890	ACTIVE	1543	1714

San Juan Refining Co./Western Refining Southwest

Monitor Well Information

	Depth to Groundwater (ft)	Approximate GW Elevation (ft amsl)
MW-1	15	5502.2
MW-8	31	5502.9
MW-50	16	5502.1
MW-52	33	5502.6
MW-53	35	5502.5
MW-67	18	5502.1
MW-70	22	5502.4


Western Refining
WESTERN REFINING SOUTHWEST
WELL LOCATION MAP
BLOOMFIELD TERMINAL
April 2015
Figure 2
LEGEND
MW-1 • MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
RW-1 • RECOVERY WELL LOCATION AND IDENTIFICATION NUMBER
OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
COLLECTION WELL LOCATION AND IDENTIFICATION NUMBER
SUMP WELL LOCATION AND IDENTIFICATION NUMBER
P-1 PIEZOMETER IDENTIFICATION
SURFACE WATER DRAINAGE PATTERN
UNDER GROUND PIPE-WAY
ABOVE GROUND PIPE-WAY
SLURRY BARRIER WALL
FORMER TANK LOCATION
0
300
SCALE IN FEET

Comprehensive Water Analysis

non-hazardous, treated water from Western Refinery facility – Bloomfield, NM

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1507094**
Date Reported: **8/6/2015**

CLIENT: Western Refining Southwest, Inc.
Project: Injection Well 7-1-15
Lab ID: 1507094-001 **Matrix:** AQUEOUS

Client Sample ID: Injection Well
Collection Date: 7/1/2015 9:00:00 AM
Received Date: 7/2/2015 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	480	50		mg/L	100	7/2/2015 5:18:55 PM	R27295
Sulfate	65	5.0		mg/L	10	7/2/2015 5:06:31 PM	R27295
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	2000	0.010		µmhos/cm	1	7/6/2015 11:31:17 AM	R27329
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	274.6	20.00		mg/L CaCO3	1	7/6/2015 11:31:17 AM	R27329
Carbonate (As CaCO3)	ND	2.000		mg/L CaCO3	1	7/6/2015 11:31:17 AM	R27329
Total Alkalinity (as CaCO3)	274.6	20.00		mg/L CaCO3	1	7/6/2015 11:31:17 AM	R27329
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1220	40.0	*	mg/L	1	7/8/2015 5:09:00 PM	20129
SM4500-H+B: PH						Analyst: **JRR**	
pH	7.45	1.68	H	pH units	1	7/6/2015 11:31:17 AM	R27329
EPA METHOD 7470: MERCURY						Analyst: **JLF**	
Mercury	ND	0.0010		mg/L	5	7/8/2015 4:47:51 PM	20158
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**	
Arsenic	ND	0.020		mg/L	1	7/9/2015 10:51:23 AM	20102
Barium	0.27	0.020		mg/L	1	7/9/2015 10:51:23 AM	20102
Cadmium	ND	0.0020		mg/L	1	7/16/2015 12:13:28 PM	20102
Calcium	120	5.0		mg/L	5	7/9/2015 1:02:36 PM	20102
Chromium	ND	0.0060		mg/L	1	7/14/2015 3:52:06 PM	20102
Lead	ND	0.0050		mg/L	1	7/9/2015 10:51:23 AM	20102
Magnesium	28	1.0		mg/L	1	7/9/2015 10:51:23 AM	20102
Potassium	7.7	1.0		mg/L	1	7/9/2015 10:51:23 AM	20102
Selenium	ND	0.050		mg/L	1	7/16/2015 12:13:28 PM	20102
Silver	ND	0.0050		mg/L	1	7/16/2015 12:13:28 PM	20102
Sodium	280	5.0		mg/L	5	7/9/2015 1:02:36 PM	20102
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Acenaphthene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Acenaphthylene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Aniline	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Anthracene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Azobenzene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Benz(a)anthracene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Benzo(a)pyrene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Benzo(b)fluoranthene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Benzo(g,h,i)perylene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095

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		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** Injection Well
Project: Injection Well 7-1-15 **Collection Date:** 7/1/2015 9:00:00 AM
Lab ID: 1507094-001 **Matrix:** AQUEOUS **Received Date:** 7/2/2015 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Benzo(k)fluoranthene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Benzoic acid	ND	20		µg/L	1	7/10/2015 1:30:30 PM	20095
Benzyl alcohol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Bis(2-chloroethyl)ether	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Bis(2-ethylhexyl)phthalate	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
4-Bromophenyl phenyl ether	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Butyl benzyl phthalate	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Carbazole	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
4-Chloro-3-methylphenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
4-Chloroaniline	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2-Chloronaphthalene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2-Chlorophenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Chrysene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Di-n-butyl phthalate	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Di-n-octyl phthalate	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Dibenz(a,h)anthracene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Dibenzofuran	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
1,2-Dichlorobenzene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
1,3-Dichlorobenzene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
1,4-Dichlorobenzene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
3,3'-Dichlorobenzidine	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Diethyl phthalate	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Dimethyl phthalate	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2,4-Dichlorophenol	ND	20		µg/L	1	7/10/2015 1:30:30 PM	20095
2,4-Dimethylphenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
4,6-Dinitro-2-methylphenol	ND	20		µg/L	1	7/10/2015 1:30:30 PM	20095
2,4-Dinitrophenol	ND	20		µg/L	1	7/10/2015 1:30:30 PM	20095
2,4-Dinitrotoluene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2,6-Dinitrotoluene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Fluoranthene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Fluorene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Hexachlorobenzene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Hexachlorobutadiene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Hexachlorocyclopentadiene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Hexachloroethane	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095

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Qualifiers:

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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		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** Injection Well
Project: Injection Well 7-1-15 **Collection Date:** 7/1/2015 9:00:00 AM
Lab ID: 1507094-001 **Matrix:** AQUEOUS **Received Date:** 7/2/2015 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Isophorone	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
1-Methylnaphthalene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2-Methylnaphthalene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2-Methylphenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
3+4-Methylphenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
N-Nitrosodimethylamine	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
N-Nitrosodiphenylamine	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Naphthalene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2-Nitroaniline	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
3-Nitroaniline	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
4-Nitroaniline	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Nitrobenzene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2-Nitrophenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
4-Nitrophenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Pentachlorophenol	ND	20		µg/L	1	7/10/2015 1:30:30 PM	20095
Phenanthrene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Phenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Pyrene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Pyridine	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
1,2,4-Trichlorobenzene	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2,4,5-Trichlorophenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
2,4,6-Trichlorophenol	ND	10		µg/L	1	7/10/2015 1:30:30 PM	20095
Surr: 2-Fluorophenol	66.2	14.9-111		%REC	1	7/10/2015 1:30:30 PM	20095
Surr: Phenol-d5	64.1	11.3-108		%REC	1	7/10/2015 1:30:30 PM	20095
Surr: 2,4,6-Tribromophenol	75.7	15.7-154		%REC	1	7/10/2015 1:30:30 PM	20095
Surr: Nitrobenzene-d5	84.6	47.8-106		%REC	1	7/10/2015 1:30:30 PM	20095
Surr: 2-Fluorobiphenyl	63.7	21.3-123		%REC	1	7/10/2015 1:30:30 PM	20095
Surr: 4-Terphenyl-d14	51.4	14.3-135		%REC	1	7/10/2015 1:30:30 PM	20095
EPA METHOD 8260B: VOLATILES						Analyst: **BCN**	
Benzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Toluene	1.5	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Ethylbenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Naphthalene	ND	2.0		µg/L	1	7/9/2015 8:19:52 PM	R27397

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Qualifiers:

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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		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** Injection Well
Project: Injection Well 7-1-15 **Collection Date:** 7/1/2015 9:00:00 AM
Lab ID: 1507094-001 **Matrix:** AQUEOUS **Received Date:** 7/2/2015 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **BCN**	
1-Methylnaphthalene	ND	4.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
2-Methylnaphthalene	ND	4.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Acetone	72	10		µg/L	1	7/9/2015 8:19:52 PM	R27397
Bromobenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Bromodichloromethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Bromoform	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Bromomethane	ND	3.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
2-Butanone	11	10		µg/L	1	7/9/2015 8:19:52 PM	R27397
Carbon disulfide	ND	10		µg/L	1	7/9/2015 8:19:52 PM	R27397
Carbon Tetrachloride	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Chlorobenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Chloroethane	ND	2.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Chloroform	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Chloromethane	ND	3.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
2-Chlorotoluene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
4-Chlorotoluene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
cis-1,2-DCE	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Dibromochloromethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Dibromomethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2-Dichlorobenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,3-Dichlorobenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,4-Dichlorobenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Dichlorodifluoromethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,1-Dichloroethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,1-Dichloroethene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2-Dichloropropane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,3-Dichloropropane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
2,2-Dichloropropane	ND	2.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,1-Dichloropropene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Hexachlorobutadiene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
2-Hexanone	ND	10		µg/L	1	7/9/2015 8:19:52 PM	R27397
Isopropylbenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
4-Isopropyltoluene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
4-Methyl-2-pentanone	ND	10		µg/L	1	7/9/2015 8:19:52 PM	R27397
Methylene Chloride	ND	3.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
n-Butylbenzene	ND	3.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
n-Propylbenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397

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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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** Injection Well
Project: Injection Well 7-1-15 **Collection Date:** 7/1/2015 9:00:00 AM
Lab ID: 1507094-001 **Matrix:** AQUEOUS **Received Date:** 7/2/2015 7:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **BCN**	
sec-Butylbenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Styrene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
tert-Butylbenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
trans-1,2-DCE	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,1,1-Trichloroethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,1,2-Trichloroethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Trichloroethene (TCE)	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Trichlorofluoromethane	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
1,2,3-Trichloropropane	ND	2.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Vinyl chloride	ND	1.0		µg/L	1	7/9/2015 8:19:52 PM	R27397
Xylenes, Total	ND	1.5		µg/L	1	7/9/2015 8:19:52 PM	R27397
Surr: 1,2-Dichloroethane-d4	96.9	70-130		%REC	1	7/9/2015 8:19:52 PM	R27397
Surr: 4-Bromofluorobenzene	90.8	70-130		%REC	1	7/9/2015 8:19:52 PM	R27397
Surr: Dibromofluoromethane	103	70-130		%REC	1	7/9/2015 8:19:52 PM	R27397
Surr: Toluene-d8	95.5	70-130		%REC	1	7/9/2015 8:19:52 PM	R27397

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
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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 #:**	150707035
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1507094
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	150707035-001	**Sampling Date**	7/1/2015	**Date/Time Received**	7/7/2015 11:00 AM
Client Sample ID	1507094-001E / INJECTION WELL			**Sampling Time**	9:00 AM
Matrix	Water	**Sample Location**			
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide (reactive)	ND	mg/L	1	7/15/2015	CRW	SW846 CH7	
Flashpoint	>200	°F		7/15/2015	KFG	EPA 1010	
pH	7.36	ph Units		7/8/2015	KMC	SM 4500pH-B	
Reactive sulfide	ND	mg/L	1	7/15/2015	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 #:**	150707035
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1507094
	ALBUQUERQUE, NM 87109		
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	0.816	mg/L	0.907	90.0	70-130	7/15/2015	7/15/2015
Cyanide (reactive)	0.486	mg/L	0.5	97.2	80-120	7/15/2015	7/15/2015

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
150707035-001A	Reactive sulfide	ND	0.816	mg/L	0.907	90.0	70-130	7/15/2015	7/15/2015
150707035-001	Cyanide (reactive)	ND	0.462	mg/L	0.5	92.4	80-120	7/15/2015	7/15/2015

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide (reactive)	0.454	mg/L	0.5	90.8	1.7	0-25	7/15/2015	7/15/2015

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide (reactive)	ND	mg/L	1	7/15/2015	7/15/2015
Reactive sulfide	ND	mg/L	1	7/15/2015	7/15/2015

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#: **1507094**

06-Aug-15

Client: Western Refining Southwest, Inc.
Project: Injection Well 7-1-15

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R27295**	RunNo: **27295**
Prep Date:	Analysis Date: **7/2/2015**	SeqNo: **817819** 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: **R27295**	RunNo: **27295**
Prep Date:	Analysis Date: **7/2/2015**	SeqNo: **817820** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	5.0	0.50	5.000	0	99.0	90	110			
Sulfate	10	0.50	10.00	0	103	90	110			

Qualifiers:

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- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1507094

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID 100ng LCS	SampType: LCS	TestCode: EPA Method 8260B: VOLATILES
Client ID: LCSW	Batch ID: R27397	RunNo: 27397
Prep Date:	Analysis Date: 7/9/2015	SeqNo: 822125 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	90.9	70	130			
Toluene	17	1.0	20.00	0	87.2	70	130			
Chlorobenzene	17	1.0	20.00	0	85.5	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	95.4	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	84.0	70	130			
Surr: 1,2-Dichloroethane-d4	9.3		10.00		93.4	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.3	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		100	70	130			

Sample ID rb1	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: R27397	RunNo: 27397
Prep Date:	Analysis Date: 7/9/2015	SeqNo: 822418 Units: µg/L

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

Qualifiers:

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- E Value above quantitation range
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- 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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1507094**

06-Aug-15

Client: Western Refining Southwest, Inc.
Project: Injection Well 7-1-15

Sample ID **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R27397**	RunNo: **27397**
Prep Date:	Analysis Date: **7/9/2015**	SeqNo: **822418** Units: **µg/L**

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

Qualifiers:

- * 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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1507094**

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID	rb1	SampType:	MBLK	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID:	R27397	RunNo:	27397					
Prep Date:		Analysis Date:	7/9/2015	SeqNo:	822418	Units:	µg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride		ND	1.0								
Xylenes, Total		ND	1.5								
Surr: 1,2-Dichloroethane-d4		10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene		10		10.00		104	70	130			
Surr: Dibromofluoromethane		11		10.00		107	70	130			
Surr: Toluene-d8		9.9		10.00		98.7	70	130			

Qualifiers:

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- 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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1507094

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID	mb-20095	SampType:	MBLK	TestCode:	EPA Method 8270C: Semivolatiles		
Client ID:	PBW	Batch ID:	20095	RunNo:	27414		
Prep Date:	7/6/2015	Analysis Date:	7/10/2015	SeqNo:	822558	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
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- 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
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1507094

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID	mb-20095	SampType:	MBLK	TestCode:	EPA Method 8270C: Semivolatiles		
Client ID:	PBW	Batch ID:	20095	RunNo:	27414		
Prep Date:	7/6/2015	Analysis Date:	7/10/2015	SeqNo:	822558	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	140		200.0		69.6	14.9	111			
Surr: Phenol-d5	150		200.0		74.2	11.3	108			
Surr: 2,4,6-Tribromophenol	150		200.0		75.2	15.7	154			
Surr: Nitrobenzene-d5	75		100.0		75.0	47.8	106			
Surr: 2-Fluorobiphenyl	76		100.0		75.9	21.3	123			
Surr: 4-Terphenyl-d14	52		100.0		52.2	14.3	135			

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		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1507094

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID lcs-20095	SampType: LCS	TestCode: EPA Method 8270C: Semivolatiles
Client ID: LCSW	Batch ID: 20095	RunNo: 27414
Prep Date: 7/6/2015	Analysis Date: 7/10/2015	SeqNo: 822559 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	51	10	100.0	0	51.2	47.8	99.7			
4-Chloro-3-methylphenol	110	10	200.0	0	56.2	58.1	103			S
2-Chlorophenol	73	10	200.0	0	36.7	49.5	96.8			S
1,4-Dichlorobenzene	34	10	100.0	0	33.8	40.4	89.4			S
2,4-Dinitrotoluene	42	10	100.0	0	41.8	38.6	91.3			
N-Nitrosodi-n-propylamine	51	10	100.0	0	51.1	53.9	95.6			S
4-Nitrophenol	93	10	200.0	0	46.3	26.4	108			
Pentachlorophenol	98	20	200.0	0	49.1	36.5	86.6			
Phenol	85	10	200.0	0	42.7	29.3	108			
Pyrene	56	10	100.0	0	56.2	45.7	100			
1,2,4-Trichlorobenzene	43	10	100.0	0	42.9	39.3	94.5			
Surr: 2-Fluorophenol	67		200.0		33.4	14.9	111			
Surr: Phenol-d5	86		200.0		43.0	11.3	108			
Surr: 2,4,6-Tribromophenol	120		200.0		62.3	15.7	154			
Surr: Nitrobenzene-d5	47		100.0		46.6	47.8	106			S
Surr: 2-Fluorobiphenyl	53		100.0		53.0	21.3	123			
Surr: 4-Terphenyl-d14	44		100.0		44.1	14.3	135			

Sample ID lcsd-20095	SampType: LCSD	TestCode: EPA Method 8270C: Semivolatiles
Client ID: LCSS02	Batch ID: 20095	RunNo: 27414
Prep Date: 7/6/2015	Analysis Date: 7/10/2015	SeqNo: 822560 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	76	10	100.0	0	76.1	47.8	99.7	39.1	28.2	R
4-Chloro-3-methylphenol	160	10	200.0	0	81.3	58.1	103	36.4	24.4	R
2-Chlorophenol	150	10	200.0	0	76.8	49.5	96.8	70.6	28.1	R
1,4-Dichlorobenzene	72	10	100.0	0	72.5	40.4	89.4	72.9	31.2	R
2,4-Dinitrotoluene	55	10	100.0	0	54.6	38.6	91.3	26.4	44.4	
N-Nitrosodi-n-propylamine	76	10	100.0	0	76.4	53.9	95.6	39.6	24.2	R
4-Nitrophenol	130	10	200.0	0	63.8	26.4	108	31.8	36.6	
Pentachlorophenol	130	20	200.0	0	65.8	36.5	86.6	29.1	29.5	
Phenol	160	10	200.0	0	77.8	29.3	108	58.2	30	R
Pyrene	69	10	100.0	0	69.3	45.7	100	20.8	31	
1,2,4-Trichlorobenzene	86	10	100.0	0	85.7	39.3	94.5	66.6	24	R
Surr: 2-Fluorophenol	140		200.0		70.6	14.9	111	0	0	
Surr: Phenol-d5	160		200.0		79.2	11.3	108	0	0	
Surr: 2,4,6-Tribromophenol	160		200.0		82.0	15.7	154	0	0	
Surr: Nitrobenzene-d5	80		100.0		79.5	47.8	106	0	0	
Surr: 2-Fluorobiphenyl	77		100.0		77.3	21.3	123	0	0	

Qualifiers:

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- 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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1507094

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID	lcsd-20095	SampType:	LCSD	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	LCSS02	Batch ID:	20095	RunNo:	27414					
Prep Date:	7/6/2015	Analysis Date:	7/10/2015	SeqNo:	822560	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	51		100.0		51.2	14.3	135	0	0	

Sample ID	mb-20218	SampType:	MBLK	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	PBW	Batch ID:	20218	RunNo:	27531					
Prep Date:	7/13/2015	Analysis Date:	7/15/2015	SeqNo:	826536	Units:	%REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 2-Fluorophenol	90		200.0		45.0	14.9	111			
Surr: Phenol-d5	75		200.0		37.3	11.3	108			
Surr: 2,4,6-Tribromophenol	140		200.0		69.6	15.7	154			
Surr: Nitrobenzene-d5	64		100.0		64.4	47.8	106			
Surr: 2-Fluorobiphenyl	61		100.0		61.2	21.3	123			
Surr: 4-Terphenyl-d14	45		100.0		45.2	14.3	135			

Sample ID	lcs-20218	SampType:	LCS	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	LCSW	Batch ID:	20218	RunNo:	27531					
Prep Date:	7/13/2015	Analysis Date:	7/15/2015	SeqNo:	826537	Units:	%REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 2-Fluorophenol	110		200.0		53.4	14.9	111			
Surr: Phenol-d5	82		200.0		41.0	11.3	108			
Surr: 2,4,6-Tribromophenol	150		200.0		74.7	15.7	154			
Surr: Nitrobenzene-d5	74		100.0		74.2	47.8	106			
Surr: 2-Fluorobiphenyl	74		100.0		73.5	21.3	123			
Surr: 4-Terphenyl-d14	44		100.0		44.2	14.3	135			

Sample ID	lcsd-20218	SampType:	LCSD	TestCode:	EPA Method 8270C: Semivolatiles					
Client ID:	LCSS02	Batch ID:	20218	RunNo:	27531					
Prep Date:	7/13/2015	Analysis Date:	7/15/2015	SeqNo:	826538	Units:	%REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 2-Fluorophenol	100		200.0		52.2	14.9	111	0	0	
Surr: Phenol-d5	84		200.0		41.8	11.3	108	0	0	
Surr: 2,4,6-Tribromophenol	150		200.0		75.7	15.7	154	0	0	
Surr: Nitrobenzene-d5	76		100.0		76.0	47.8	106	0	0	
Surr: 2-Fluorobiphenyl	69		100.0		68.5	21.3	123	0	0	
Surr: 4-Terphenyl-d14	46		100.0		45.5	14.3	135	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- B Analyte detected in the associated Method Blank
- D Sample Diluted Due to Matrix
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- P Sample pH Not In Range
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S % Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1507094**

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID	**1507094-001b dup**	SampType:	**DUP**	TestCode:	**SM2510B: Specific Conductance**					
Client ID:	**Injection Well**	Batch ID:	**R27329**	RunNo:	**27329**					
Prep Date:		Analysis Date:	**7/6/2015**	SeqNo:	**819171**	Units:	**µmhos/cm**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	2000	0.010						0.0491	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1507094**

06-Aug-15

Client: Western Refining Southwest, Inc.
Project: Injection Well 7-1-15

Sample ID	MB-20158	SampType:	MBLK	TestCode:	EPA Method 7470: Mercury				
Client ID:	PBW	Batch ID:	20158	RunNo:	27365				
Prep Date:	7/8/2015	Analysis Date:	7/8/2015	SeqNo:	820590	Units:	mg/L		

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

Sample ID	LCS-20158	SampType:	LCS	TestCode:	EPA Method 7470: Mercury				
Client ID:	LCSW	Batch ID:	20158	RunNo:	27365				
Prep Date:	7/8/2015	Analysis Date:	7/8/2015	SeqNo:	820591	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	102	80	120			

Sample ID	1507094-001DMS	SampType:	MS	TestCode:	EPA Method 7470: Mercury				
Client ID:	Injection Well	Batch ID:	20158	RunNo:	27365				
Prep Date:	7/8/2015	Analysis Date:	7/8/2015	SeqNo:	820635	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0059	0.0010	0.005000	0	118	75	125			

Sample ID	1507094-001DMSD	SampType:	MSD	TestCode:	EPA Method 7470: Mercury				
Client ID:	Injection Well	Batch ID:	20158	RunNo:	27365				
Prep Date:	7/8/2015	Analysis Date:	7/8/2015	SeqNo:	820638	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0058	0.0010	0.005000	0	116	75	125	1.62	20	

Qualifiers:

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- 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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1507094

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID MB-20102	SampType: MBLK	TestCode: EPA 6010B: Total Recoverable Metals
Client ID: PBW	Batch ID: 20102	RunNo: 27378
Prep Date: 7/6/2015	Analysis Date: 7/9/2015	SeqNo: 821352 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								
Calcium	ND	1.0								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID LCS-20102	SampType: LCS	TestCode: EPA 6010B: Total Recoverable Metals
Client ID: LCSW	Batch ID: 20102	RunNo: 27378
Prep Date: 7/6/2015	Analysis Date: 7/9/2015	SeqNo: 821353 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	103	80	120			
Barium	0.49	0.020	0.5000	0	98.5	80	120			
Calcium	51	1.0	50.00	0	102	80	120			
Lead	0.50	0.0050	0.5000	0	100	80	120			
Magnesium	50	1.0	50.00	0	101	80	120			
Potassium	48	1.0	50.00	0	96.8	80	120			
Sodium	49	1.0	50.00	0	98.9	80	120			

Sample ID MB-20102	SampType: MBLK	TestCode: EPA 6010B: Total Recoverable Metals
Client ID: PBW	Batch ID: 20102	RunNo: 27491
Prep Date: 7/6/2015	Analysis Date: 7/14/2015	SeqNo: 824974 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chromium	ND	0.0060								

Sample ID LCS-20102	SampType: LCS	TestCode: EPA 6010B: Total Recoverable Metals
Client ID: LCSW	Batch ID: 20102	RunNo: 27491
Prep Date: 7/6/2015	Analysis Date: 7/14/2015	SeqNo: 824975 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chromium	0.49	0.0060	0.5000	0	98.5	80	120			

Sample ID MB-20102	SampType: MBLK	TestCode: EPA 6010B: Total Recoverable Metals
Client ID: PBW	Batch ID: 20102	RunNo: 27540
Prep Date: 7/6/2015	Analysis Date: 7/16/2015	SeqNo: 826932 Units: mg/L

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

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1507094**

06-Aug-15

Client: Western Refining Southwest, Inc.
Project: Injection Well 7-1-15

Sample ID	MB-20102	SampType:	MBLK	TestCode:	EPA 6010B: Total Recoverable Metals					
Client ID:	PBW	Batch ID:	20102	RunNo:	27540					
Prep Date:	7/6/2015	Analysis Date:	7/16/2015	SeqNo:	826932	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	ND	0.0020								
Selenium	ND	0.050								
Silver	ND	0.0050								

Sample ID	LCS-20102	SampType:	LCS	TestCode:	EPA 6010B: Total Recoverable Metals					
Client ID:	LCSW	Batch ID:	20102	RunNo:	27540					
Prep Date:	7/6/2015	Analysis Date:	7/16/2015	SeqNo:	826933	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	0.50	0.0020	0.5000	0	101	80	120			
Selenium	0.50	0.050	0.5000	0	99.7	80	120			
Silver	0.10	0.0050	0.1000	0	105	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- B Analyte detected in the associated Method Blank
- D Sample Diluted Due to Matrix
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- P Sample pH Not In Range
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S % Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1507094**

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID	1507094-001b dup	SampType:	DUP	TestCode:	SM4500-H+B: pH					
Client ID:	Injection Well	Batch ID:	R27329	RunNo:	27329					
Prep Date:		Analysis Date:	7/6/2015	SeqNo:	819204	Units:	pH units			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.46	1.68								H

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1507094**

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID	mb-1	SampType:	MBLK		TestCode:	SM2320B: Alkalinity				
Client ID:	PBW	Batch ID:	R27329		RunNo:	27329				
Prep Date:		Analysis Date:	7/6/2015		SeqNo:	819128	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:	R27329		RunNo:	27329				
Prep Date:		Analysis Date:	7/6/2015		SeqNo:	819129	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	78.36	20.00	80.00	0	98.0	90	110			

Sample ID	mb-2	SampType:	MBLK		TestCode:	SM2320B: Alkalinity				
Client ID:	PBW	Batch ID:	R27329		RunNo:	27329				
Prep Date:		Analysis Date:	7/6/2015		SeqNo:	819152	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID	lcs-2	SampType:	LCS		TestCode:	SM2320B: Alkalinity				
Client ID:	LCSW	Batch ID:	R27329		RunNo:	27329				
Prep Date:		Analysis Date:	7/6/2015		SeqNo:	819153	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	79.44	20.00	80.00	0	99.3	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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1507094

06-Aug-15

Client: Western Refining Southwest, Inc.

Project: Injection Well 7-1-15

Sample ID	MB-20129	SampType:	MBLK		TestCode:	SM2540C MOD: Total Dissolved Solids				
Client ID:	PBW	Batch ID:	20129		RunNo:	27360				
Prep Date:	7/7/2015	Analysis Date:	7/8/2015		SeqNo:	820297	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-20129	SampType:	LCS		TestCode:	SM2540C MOD: Total Dissolved Solids				
Client ID:	LCSW	Batch ID:	20129		RunNo:	27360				
Prep Date:	7/7/2015	Analysis Date:	7/8/2015		SeqNo:	820298	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
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- 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: 1507094 RcptNo: 1

Received by/date: AT 07/02/15

Logged By: Anne Thorne 7/2/2015 7:00:00 AM

Completed By: Anne Thorne 7/2/2015

Reviewed By: CS 07/02/15

Chain of Custody

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

Log In

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

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

Adjusted? —

Checked by: JA

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

Project Name:
Injection Well 7-1-15

Project #:
P.O.# 126109 39

Project Manager:

Sampler: Bob
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 500794	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'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	Reactivity, Corrosivity	Ea, Al SO_4, Alk, Cl	Sulfides	Air Bubbles (Y or N)
7-1-15	9:00	H_2O	injection well	5-VOA	HCl	-001										X						
				1-liter	Amber	-002											X					
				1-500ml		-003												X				
				1-500ml		-004				X										X		
				1-125ml	H_2SO_4	-005					X											
				1-500ml	HNO_3	-006							X									
				1-500ml	NaOH	-007													X			
				1-500ml	ZN Acetate	-008															X	

Date:	Time:	Relinquished by:	Received by:	Date	Time
7-1-15	1215	Robert Bracken	Christy Walker	7/1/15	1215
7/1/15	1810	Christy Walker		07/02/15	0700

Remarks:

Water Analysis of Entrada Formation Water

(from TnT Disposal well located in section 8/T25N/R3W)

Multi-Chem Analytical Laboratory
1122 S. FM1788
Midland, TX 76706

multi-chem
A HALLIBURTON SERVICE

Units of Measurement: **Standard**

Water Analysis Report

Production Company: **TNT Environmental**
Well Name: **SWD ENTRADA**
Sample Point: **SWD**
Sample Date: **11/20/2014**
Sample ID: **WA-294316**

Sales Rep: **Greg Ramalho**
Lab Tech: **Andrew Callaghan**

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	11/25/2014
System Temperature 1 (°F):	31
System Pressure 1 (psig):	15
System Temperature 2 (°F):	300
System Pressure 2 (psig):	300
Calculated Density (g/ml):	1.0059
pH:	7.60
Calculated TDS (mg/L):	12320.63
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	80.00
H_2S in Gas (%):	
H2S in Water (mg/L):	2.50

Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	4455.35	Chloride (Cl):	6000.00
Potassium (K):	44.79	Sulfate (SO_4):	1094.00
Magnesium (Mg):	23.10	Bicarbonate (HCO_3):	427.00
Calcium (Ca):	115.67	Carbonate (CO_3):	120.00
Strontium (Sr):	7.60	Acetic Acid (CH_3COO)	
Barium (Ba):	9.30	Propionic Acid (C_2H_5COO)	
Iron (Fe):	1.82	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	0.10	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.00	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.55	Silica (SiO_2):	21.35

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
300.00	300.00	1.90	85.63	1.92	5.47	2.21	0.99	1.95	1.31	0.00	0.00	0.09	1.02	0.00	0.00	6.95	0.05
270.00	268.00	1.68	77.73	1.90	5.47	2.04	0.99	1.80	1.30	0.00	0.00	0.00	0.00	0.00	0.00	7.04	0.05
240.00	236.00	1.47	68.31	1.90	5.47	1.89	0.98	1.63	1.29	0.00	0.00	0.00	0.00	0.00	0.00	7.17	0.05
210.00	205.00	1.26	57.99	1.92	5.47	1.76	0.97	1.45	1.27	0.00	0.00	0.00	0.00	0.00	0.00	7.32	0.05
180.00	173.00	1.06	47.51	1.98	5.48	1.67	0.96	1.25	1.24	0.00	0.00	0.00	0.00	0.00	0.00	7.53	0.05
150.00	141.00	0.88	37.61	2.08	5.49	1.62	0.96	1.03	1.19	0.00	0.00	0.00	0.00	0.00	0.00	7.79	0.05
120.00	110.00	0.71	29.02	2.23	5.51	1.64	0.96	0.81	1.11	0.00	0.00	0.00	0.00	0.00	0.00	8.13	0.05
90.00	78.00	0.57	22.00	2.44	5.52	1.73	0.97	0.59	0.96	0.00	0.00	0.00	0.00	0.00	0.00	8.56	0.05
60.00	46.00	0.46	16.76	2.73	5.53	1.92	0.98	0.36	0.73	0.00	0.00	0.00	0.00	0.00	0.00	9.11	0.05
31.00	15.00	0.39	13.73	3.10	5.53	2.26	0.99	0.16	0.39	0.00	0.00	0.00	0.00	0.00	0.00	9.83	0.05

		Hemihydrate CaSO4·0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
300.00	300.00	0.00	0.00	0.14	31.79	0.00	0.00	0.91	0.06	0.00	0.00	7.71	25.75	4.14	13.11	9.66	1.42
270.00	268.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.06	0.00	0.00	6.34	25.03	3.32	12.39	8.62	1.41
240.00	236.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.05	0.00	0.00	4.87	22.02	2.45	10.55	7.49	1.41
210.00	205.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.03	0.00	0.00	3.30	15.59	1.51	7.07	6.31	1.40
180.00	173.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	7.51	0.54	2.57	5.08	1.38
150.00	141.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.84	1.32
120.00	110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.66	1.18
90.00	78.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55	0.90
60.00	46.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.45
31.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01

AFFIDAVIT OF PUBLICATION

Ad No. 72205

STATE OF NEW MEXICO
County of San Juan:

SAMMY LOPEZ, being duly sworn says: That he IS the PUBLISHER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Monday, December 14, 2015

And the cost of the publication is $60.13

ON 12/15/15 SAMMY LOPEZ appeared before me, whom I know personally to be the person who signed the above document.

Christine Sellers

OFFICIAL SEAL
CHRISTINE SELLERS
Notary Public
State of New Mexico
My Comm. Expires 1/05/19

COPY OF PUBLICATION

Western Refining Southwest, Inc., represented by John Thompson (505) 327-4892, has applied to the New Mexico Oil Conservation Division for administrative approval to be authorized to inject non-hazardous treated water generated from the Bloomfield Terminal (former Refinery) into the proposed Class I (non-hazardous) disposal well. The proposed SWD #2, will be located 2019' FNL & 110' FEL, Section 27, T29N, R11W, San Juan County, New Mexico.

The proposed injection zone is the Entrada formation. The estimated injection depths are 7315' to 7,483' and the maximum anticipated injection rate is 8000 BPD. The maximum injection pressure will be determined from a step rate test. Interested parties can make comments to this application to the NM Oil Conservation Division, 1220 St. Francis Dr., Santa Fe, NM 87505. Comments must be received within 15 days of the date of this publication.

Legal No. 72205 published in The Daily Times on Dec 14, 2015

December 10, 2015

VIA CERTIFIED MAIL

Attn: Crystal Walker (Regulatory
Coordinator)
Burlington Resources Oil & Gas Company LP
3401 E. 30th Street
Farmington, NM 87402

Re: Application of Western Refining Southwest, Inc. for Authorization to Inject in the proposed SWD #2, San Juan, New Mexico.

Dear Ms. Walker,

Western Refining Southwest, Inc. has applied to the New Mexico Oil Conservation Division to dispose of non-hazardous treated water generated from the Bloomfield Terminal (former Refinery) into the Entrada formation in the proposed SWD #2. The SWD #2 will be located 2019' feet from the North line and 110' feet from the East in Section 27, Township 29 North, Range 11 West, San Juan County, New Mexico. As an offset operator (the Calvin #1 is within a half mile of the proposed SWD #2) you are being notified of this application pursuant to NMOCD rules

If you have no objection to this Application then no further action is required on your part. If you would like to file an objection or to request a hearing please notify the NMOCD at 1220 South St. Francis, St., Santa Fe, NM 87505 within 20 days of receipt of this notice.

If you have any questions or need additional information please feel free to call me at (505) 327-4892.

Sincerely,

John Thompson
Walsh Engineering & Production
Agent/Engineer for Western Refining Southwest

December 10, 2015

VIA CERTIFIED MAIL

Attn: Diane Montano (Regulatory
Compliance Mgr.)
XTO Energy, Inc.
382 Road 3100
Aztec, NM 87410

Re: Application of Western Refining Southwest, Inc. for Authorization to Inject in the proposed SWD #2, San Juan, New Mexico.

Dear Ms. Montano,

Western Refining Southwest, Inc. has applied to the New Mexico Oil Conservation Division to dispose of non-hazardous treated water generated from the Bloomfield Terminal (former Refinery) into the Entrada formation in the proposed SWD #2. The SWD #2 will be located 2019' feet from the North line and 110' feet from the East in Section 27, Township 29 North, Range 11 West, San Juan County, New Mexico. As an offset operator of the Sullivan Gas Com D #1E, Davis Gas Com F #1E, Davis Gas Com F #1R, all of which are within a half mile of the proposed SWD #2, you are being notified of this application pursuant to NMOCD rules

If you have no objection to this Application then no further action is required on your part. If you would like to file an objection or to request a hearing please notify the NMOCD at 1220 South St. Francis, St., Santa Fe, NM 87505 within 20 days of receipt of this notice.

If you have any questions or need additional information please feel free to call me at (505) 327-4892.

Sincerely,

John Thompson
Walsh Engineering & Production
Agent/Engineer for Western Refining Southwest

December 10, 2015

VIA CERTIFIED MAIL

Attn: Regulatory Coordinator
Holcomb Oil & Gas Inc.
512 W. Arrington
Farmington, NM 87402

Re: Application of Western Refining Southwest, Inc. for Authorization to Inject in the proposed SWD #2, San Juan, New Mexico.

Dear Mr. Holcomb,

Western Refining Southwest, Inc. has applied to the New Mexico Oil Conservation Division to dispose of non-hazardous treated water generated from the Bloomfield Terminal (former Refinery) into the Entrada formation in the proposed SWD #2. The SWD #2 will be located 2019' feet from the North line and 110' feet from the East in Section 27, Township 29 North, Range 11 West, San Juan County, New Mexico. As an offset operator of the Davis Com J#1, Jacque #1, Jacque #2, all of which are within a half mile of the proposed SWD #2, you are being notified of this application pursuant to NMOCD rules

If you have no objection to this Application then no further action is required on your part. If you would like to file an objection or to request a hearing please notify the NMOCD at 1220 South St. Francis, St., Santa Fe, NM 87505 within 20 days of receipt of this notice.

If you have any questions or need additional information please feel free to call me at (505) 327-4892.

Sincerely,

John Thompson
Walsh Engineering & Production
Agent/Engineer for Western Refining Southwest

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Burlington Resources Oil & Gas
Attn: Crystal Walker
3401 E. 30th St.
Farmington, NM 87401

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Judith Dee ☒ Agent ☐ Addressee

B. Received by (Printed Name) Judith Dee
C. Date of Delivery 12-17-15

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☒ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7011 1570 0001 0594 4465

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

XTO Energy, Inc
Attn: Diane Montano
382 Rd. 3100
Aztec, NM 87410

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Renee S. Mendoza ☐ Agent ☐ Addressee

B. Received by (Printed Name) Renee S. Mendoza
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

DEC 17 2015

3. Service Type
☐ Certified Mail ☐ Express Mail
☒ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7011 1570 0001 0594 4441

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Holcomb Oil & Gas Inc
Attn: Regulatory Coordinator
512 W. Arrington
Farmington NM 87401

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X

☐ Agent
☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

DEC 17

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7011 1570 0001 0594 4458

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

McMillan, Michael, EMNRD

From: John Thompson <john@walsheng.net>
Sent: Monday, January 04, 2016 10:23 AM
To: McMillan, Michael, EMNRD
Subject: RE: Western Refining Southwest Refining Co. SWD Well No.2 San Juan Co.

Western owns the surface.

From: McMillan, Michael, EMNRD [mailto:Michael.McMillan@state.nm.us]
Sent: Monday, January 04, 2016 9:31 AM
To: john@walsheng.net
Subject: Western Refining Southwest Refining Co. SWD Well No.2 San Juan Co.

John:
I could not figure out who owns the surface-have they been notified for the Western Refining Southwest Refining Co. SWD Well No.2?

Thank You

Michael A. McMillan
Engineering and Geological Services Bureau, Oil Conservation Division
1220 South St. Francis Dr., Santa Fe NM 87505
O: 505.476.3448 F. 505.476.3462
Michael.mcmillan@state.nm.us