

**GW - 007**

**C-141s**

## Chavez, Carl J, EMNRD

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Friday, September 28, 2012 11:35 AM  
**To:** 'Robinson, Kelly'  
**Subject:** RE: Jal Brine Soil Disposal

**Approved** with the condition that Western Refining L.P. also meet any OCD Permitted Disposal Facility Waste acceptance requirements.

Thank you.

*Please be advised that OCD approval of this waste analytical report does not relieve Western Refining L.P. of responsibility should their operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve Western Refining L.P. of responsibility for compliance with any other federal, state, or local laws and/or regulations.*

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Department  
Oil Conservation Division, Environmental Bureau  
1220 South St. Francis Drive, Santa Fe, New Mexico 87505  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

“Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?” To see how, please go to: “Pollution Prevention & Waste Minimization” at <http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Robinson, Kelly [mailto:[Kelly.Robinson@wnr.com](mailto:Kelly.Robinson@wnr.com)]  
**Sent:** Friday, September 28, 2012 11:22 AM  
**To:** Chavez, Carl J, EMNRD  
**Subject:** RE: Jal Brine Soil Disposal

Carl,

Western can confirm that based on “process knowledge,” the fluids in the pond are not hazardous and therefore meet the waste acceptance requirements of the OCD permitted disposal facility. Recent samples of the impacted soil collected from the excavated material confirm that the material does not exhibit BTEX and TPH concentrations above the respective laboratory detection limits (see attached).

If there is anything more you needed, please let me know.  
I appreciate your time and consideration on this issue.

Sincerely,

Kelly R. Robinson  
Environmental Supervisor

**Western Refining Southwest, Inc.**

111 County Road 4990  
Bloomfield, NM87413

(o) 505-632-4166  
(c) 505-801-5616

(f) 505-632-4024

(e) [kelly.robinson@wnr.com](mailto:kelly.robinson@wnr.com)

---

**From:** Chavez, Carl J, EMNRD [<mailto:CarlJ.Chavez@state.nm.us>]

**Sent:** Friday, September 28, 2012 10:33 AM

**To:** Robinson, Kelly

**Subject:** RE: Jal Brine Soil Disposal

Kelly:

Re:

**6. Waste Disposal and Storage:** The owner/operator shall dispose of all wastes at an OCD-approved facility. Only oil field RCRA-exempt wastes may be disposed of by injection in a Class II Salt Water Disposal Well. Any disposal regardless of waste type by injection into a UIC Class II LPG Storage Well is prohibited and shall be a violation of the permit. RCRA non-hazardous, non-exempt oil field wastes may be disposed of at an OCD-approved facility upon proper waste determination pursuant to 40 CFR Part 261. Any waste stream that is not listed in the discharge permit application must be approved by the OCD on a case-by-case basis.

A little more waste disposal communication is needed here.

This waste is not listed in the discharge permit application right? If not, then OCD does need to approve it. Western may forego well testing if the facility has "process knowledge" that the fluids in the pond are not hazardous and/or meets the waste acceptance requirements of the OCD permitted disposal facility. The above is true because we have determined that the waste is oilfield exempt waste that may be accepted by an OCD permitted disposal facility.

Please communicate on the above so that the OCD may issue an approval and/or approval with conditions.

Thank you.

Carl J. Chavez, CHMM

New Mexico Energy, Minerals & Natural Resources Department

Oil Conservation Division, Environmental Bureau

1220 South St. Francis Drive, Santa Fe, New Mexico 87505

Office: (505) 476-3490

E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at

<http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Robinson, Kelly [<mailto:Kelly.Robinson@wnr.com>]

**Sent:** Friday, September 28, 2012 10:16 AM

**To:** Chavez, Carl J, EMNRD

**Subject:** RE: Jal Brine Soil Disposal

Carl,

Good Morning to you too! Once again, I appreciate your assistance on this and the resources you provide. I agree in regards to the Google Search Engine. I don't think a day goes by that I don't use it to research something. It has been a great resource for learning for me.

I agree with your explanation for and clarification as to how the material would qualify as an "oilfield exempt waste."

Therefore with this said, Western Refining respectfully requests NMOCD's consideration and approval to dispose of the brine impacted soil at an OCD-permitted disposal facility located in Eunice, NM. This request is pursuant to Condition No. 6 of the Jal LPG Storage Facility's Discharge Permit (GW-007).

If there are any questions or you would like to discuss this further, please feel free to contact me at your convenience. I would like to thank you for all your time and assistance over these past couple days, and I hope you have a great weekend!

Sincerely,

Kelly R. Robinson  
Environmental Supervisor

**Western Refining Southwest, Inc.**

111 County Road 4990  
Bloomfield, NM87413

(o) 505-632-4166  
(c) 505-801-5616  
(f) 505-632-4024  
(e) [kelly.robinson@wnr.com](mailto:kelly.robinson@wnr.com)

---

**From:** Chavez, Carl J, EMNRD [<mailto:CarlJ.Chavez@state.nm.us>]  
**Sent:** Friday, September 28, 2012 8:10 AM  
**To:** Robinson, Kelly  
**Subject:** RE: Jal Brine Soil Disposal

Kelly:

Good morning. I think it qualifies as an "oilfield exempt waste." Please evaluate this category of exempt oilfield waste:

. Pit sludges and contaminated bottoms from treatment, storage or disposal of exempt wastes

Since the produced water utilized for the gas storage process comes from downhole, it is exempt oilfield waste. The above provision "contaminated" bottoms means I think a leak in the pit that is discovered. Pit contents are not referred to as "contaminated" when they are contained in a pit, but the term "contaminated" means that perhaps a media such as soil below the pit that is discovered to be contaminated.

In addition, if exempt wastes contain any hydrocarbons, then it qualifies as exempt (see attached resource documents) and as you know it can go to an OCD Permitted disposal facility.

The fluid in the pit is exempt oilfield waste that comes out of the well, the issue is whether the "contaminated bottoms" may be discovered leaks in pits with contaminated bottoms (soil contamination) that qualify for disposal at OCD permitted disposal facilities.

Study this a little more and let me know what you think. I find google to be quite useful for research into these categories. Thanks.

\*\*\*\*\*

Oil and Gas Exempt Oilfield Wastes generated in association with the following activities:

- drilling, operation, and plugging of wells associated with the exploration, development, or production of oil and gas, including oil and gas wells, fluid injection wells used in enhanced recovery projects, and disposal wells;
- separation and treatment of produced fluids in the field or at natural gas

processing plants;

- storage of crude oil before it enters a refinery;
- underground storage of hydrocarbons and natural gas;
- transportation of crude oil or natural gas by pipeline;
- solution mining of brine; and
- storage, hauling, disposal, or reclamation of wastes generated by these activities.

Unfortunately, the wastes are not being recovered for any use; therefore, it would not constitute reclamation above.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM

New Mexico Energy, Minerals & Natural Resources Department

Oil Conservation Division, Environmental Bureau

1220 South St. Francis Drive, Santa Fe, New Mexico 87505

Office: (505) 476-3490

E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

“Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?” To see how, please go to: “Pollution Prevention & Waste Minimization” at

<http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Robinson, Kelly [<mailto:Kelly.Robinson@wnr.com>]

**Sent:** Thursday, September 27, 2012 3:14 PM

**To:** Chavez, Carl J, EMNRD

**Subject:** Jal Brine Soil Disposal

Carl,

I appreciate you taking the time to talk with Randy and I earlier today. With regards to the disposal of the brine water impacted soil from the recent excavation activities at Jal, I believe I have changed my stance with regards to the classification of the material for disposal. After further review of the Texas Railroad Commission reference for exempt waste, I do not believe the brine impacted soil qualifies as an exempt Oil and Gas Exploration and Production waste. The brine water is part of a process used to store refined liquid petroleum gases (LPGs) prior to sale. Although there exists an exemption listed by New Mexico OCD for “Wastes from subsurface gas storage and retrieval,” I believe that is specific to subsurface gas storage prior to refining/processing. The gases stored at Jal are not from field exploration, but rather are stored at Jal in below-surface caverns of refined product....a by-product from oil refining.

I apologize for taking your time on this issue prematurely. I will be submitting additional samples to the lab for analysis in preparation for requesting approval to dispose of the material as a “Non-Hazardous Waste.” Once I have the additional analytical in-hand, I will re-submit to you a request for disposal approval.

Thanks again for your time, and I hope you have a great evening!

Sincerely,

Kelly R. Robinson

Environmental Supervisor

**Western Refining Southwest, Inc.**

111 County Road 4990

Bloomfield, NM87413

(o) 505-632-4166

(c) 505-801-5616

(f) 505-632-4024

(e) [kelly.robinson@wnr.com](mailto:kelly.robinson@wnr.com)

# Analytical Report 449368

## for Western Refining

**Project Manager: Ken Parker**  
**Midland Odessa Standard List of prices**

**20-SEP-12**

Collected By: Client



**Celebrating 20 Years of commitment to excellence in Environmental Testing Services**



**12600 West I-20 East Odessa, Texas 79765**

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)  
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)  
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)  
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):

Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD ( L10-135)  
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)

Xenco-Lakeland: Florida (E84098)

Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

Xenco Tucson (EPA Lab code: AZ000989): Arizona (AZ0758)



20-SEP-12

Project Manager: **Ken Parker**  
**Western Refining**  
P.O. Box 1345  
Jal, NM 88252

Reference: XENCO Report No: **449368**  
**Midland Odessa Standard List of prices**  
Project Address:

**Ken Parker:**

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 449368. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 449368 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

---

**Nicholas Straccione**

Project Manager

*Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.  
Certified and approved by numerous States and Agencies.  
A Small Business and Minority Status Company that delivers SERVICE and QUALITY*

Houston - Dallas - Odessa - San Antonio - Tampa - Lakeland - Atlanta - Phoenix - Oklahoma - Latin America



**Sample Cross Reference 449368**



**Western Refining, Jal, NM**  
Midland Odessa Standard List of prices

<b>Sample Id</b>	<b>Matrix</b>	<b>Date Collected</b>	<b>Sample Depth</b>	<b>Lab Sample Id</b>
Background	S	09-20-12 08:00		449368-001
Spoil Rile	S	09-20-12 08:00		449368-002
Excepvation	S	09-20-12 08:00		449368-003



## CASE NARRATIVE

*Client Name: Western Refining*

*Project Name: Midland Odessa Standard List of prices*



*Project ID:*

*Work Order Number: 449368*

*Report Date: 20-SEP-12*

*Date Received: 09/20/2012*

---

**Sample receipt non conformances and comments:**

*None*

---

**Sample receipt non conformances and comments per sample:**

*None*



# Certificate of Analysis Summary 449368

## Western Refining, Jal, NM



**Project Id:**

**Contact:** Ken Parker

**Project Location:**

**Project Name:** Midland Odessa Standard List of prices

Draft

**Date Received in Lab:** Thu Sep-20-12 12:04 pm

**Report Date:** 20-SEP-12

**Project Manager:** Nicholas Straccione

<i>Analysis Requested</i>	<i>Lab Id:</i>	449368-001	449368-002	449368-003			
	<i>Field Id:</i>	Background	Spoil Rile	Excepvtion			
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL			
	<i>Sampled:</i>	Sep-20-12 08:00	Sep-20-12 08:00	Sep-20-12 08:00			
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>	Sep-20-12 12:30	Sep-20-12 12:30	Sep-20-12 12:30			
	<i>Analyzed:</i>	Sep-20-12 14:50	Sep-20-12 15:05	Sep-20-12 15:20			
	<i>Units/RL:</i>	mg/kg      RL	mg/kg      RL	mg/kg      RL			
Benzene		ND    0.00100	ND    0.00100	ND    0.000998			
Toluene		ND    0.00200	ND    0.00201	ND    0.00200			
Ethylbenzene		ND    0.00100	ND    0.00100	ND    0.000998			
m_p-Xylenes		ND    0.00200	ND    0.00201	ND    0.00200			
o-Xylene		ND    0.00100	ND    0.00100	ND    0.000998			
Total Xylenes		ND    0.00100	ND    0.00100	ND    0.000998			
Total BTEX		ND    0.00100	ND    0.00100	ND    0.000998			
<b>TPH by Texas1005</b>	<i>Extracted:</i>	Sep-20-12 12:30	Sep-20-12 12:30	Sep-20-12 12:30			
	<i>Analyzed:</i>	Sep-20-12 14:04	Sep-20-12 14:33	Sep-20-12 15:02			
	<i>Units/RL:</i>	mg/kg      RL	mg/kg      RL	mg/kg      RL			
C6-C12 Gasoline Range Hydrocarbons		ND    24.9	ND    25.1	ND    25.0			
C12-C28 Diesel Range Hydrocarbons		ND    24.9	ND    25.1	ND    25.0			
C28-C35 Oil Range Hydrocarbons		ND    24.9	ND    25.1	ND    25.0			
Total TPH 1005		ND    24.9	ND    25.1	ND    25.0			

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Nicholas Straccione  
Project Manager



# Flagging Criteria

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.
- \* Surrogate recovered outside laboratory control limit.

**BRL** Below Reporting Limit.

**RL** Reporting Limit

**MDL** Method Detection Limit      **SDL** Sample Detection Limit      **LOD** Limit of Detection

**PQL** Practical Quantitation Limit      **MQL** Method Quantitation Limit      **LOQ** Limit of Quantitation

**DL** Method Detection Limit

**NC** Non-Calculable

+ NELAC certification not offered for this compound.

\* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

*Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.*

*Certified and approved by numerous States and Agencies.*

*A Small Business and Minority Status Company that delivers SERVICE and QUALITY*

Houston - Dallas - San Antonio - Atlanta - Midland/Odessa - Tampa/Lakeland - Phoenix - Latin America

4143 Greenbriar Dr, Stafford, TX 77477  
 9701 Harry Hines Blvd, Dallas, TX 75220  
 5332 Blackberry Drive, San Antonio TX 78238  
 2505 North Falkenburg Rd, Tampa, FL 33619  
 12600 West I-20 East, Odessa, TX 79765  
 6017 Financial Drive, Norcross, GA 30071  
 3725 E. Atlanta Ave, Phoenix, AZ 85040

Phone	Fax
(281) 240-4200	(281) 240-4280
(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(813) 620-2000	(813) 620-2033
(432) 563-1800	(432) 563-1713
(770) 449-8800	(770) 449-5477
(602) 437-0330	



# Form 2 - Surrogate Recoveries

Project Name: Midland Odessa Standard List of prices

Work Orders : 449368,

Project ID:

Lab Batch #: 896969

Sample: 449368-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/20/12 14:04

### SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.3	99.7	92	70-135	
o-Terphenyl	44.6	49.9	89	70-130	

Lab Batch #: 896969

Sample: 449368-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/20/12 14:33

### SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.7	100	96	70-135	
o-Terphenyl	46.1	50.1	92	70-130	

Lab Batch #: 896980

Sample: 449368-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/20/12 14:50

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0246	0.0300	82	80-120	
4-Bromofluorobenzene	0.0274	0.0300	91	80-120	

Lab Batch #: 896969

Sample: 449368-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/20/12 15:02

### SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.8	100	97	70-135	
o-Terphenyl	47.2	50.0	94	70-130	

Lab Batch #: 896980

Sample: 449368-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/20/12 15:05

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0264	0.0300	88	80-120	
4-Bromofluorobenzene	0.0285	0.0300	95	80-120	

\* Surrogate outside of Laboratory QC limits

\*\* Surrogates outside limits; data and surrogates confirmed by reanalysis

\*\*\* Poor recoveries due to dilution

Surrogate Recovery [D] = 100 \* A / B

All results are based on MDL and validated for QC purposes.



# Form 2 - Surrogate Recoveries

Project Name: Midland Odessa Standard List of prices

Work Orders : 449368,

Project ID:

Lab Batch #: 896980

Sample: 449368-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/20/12 15:20

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0251	0.0300	84	80-120	
4-Bromofluorobenzene	0.0290	0.0300	97	80-120	

Lab Batch #: 896969

Sample: 627449-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/20/12 13:33

### SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.3	100	95	70-135	
o-Terphenyl	46.5	50.0	93	70-130	

Lab Batch #: 896980

Sample: 627446-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/20/12 14:35

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0262	0.0300	87	80-120	

Lab Batch #: 896969

Sample: 627449-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/20/12 12:34

### SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.5	100	98	70-135	
o-Terphenyl	51.6	50.1	103	70-130	

Lab Batch #: 896980

Sample: 627446-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/20/12 13:50

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0332	0.0300	111	80-120	
4-Bromofluorobenzene	0.0350	0.0300	117	80-120	

\* Surrogate outside of Laboratory QC limits  
 \*\* Surrogates outside limits; data and surrogates confirmed by reanalysis  
 \*\*\* Poor recoveries due to dilution  
 Surrogate Recovery [D] = 100 \* A / B  
 All results are based on MDL and validated for QC purposes.



# Form 2 - Surrogate Recoveries

Project Name: Midland Odessa Standard List of prices

Work Orders : 449368,

Project ID:

Lab Batch #: 896969

Sample: 627449-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg		Date Analyzed: 09/20/12 13:03	SURROGATE RECOVERY STUDY			
TPH by Texas1005		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes						
1-Chlorooctane		95.8	99.7	96	70-135	
o-Terphenyl		51.3	49.9	103	70-130	

Lab Batch #: 896980

Sample: 627446-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg		Date Analyzed: 09/20/12 14:12	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes						
1,4-Difluorobenzene		0.0309	0.0300	103	80-120	
4-Bromofluorobenzene		0.0343	0.0300	114	80-120	

Lab Batch #: 896969

Sample: 449368-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg		Date Analyzed: 09/20/12 15:32	SURROGATE RECOVERY STUDY			
TPH by Texas1005		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes						
1-Chlorooctane		103	99.6	103	70-135	
o-Terphenyl		53.3	49.8	107	70-130	

Lab Batch #: 896980

Sample: 449368-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg		Date Analyzed: 09/20/12 16:04	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes						
1,4-Difluorobenzene		0.0294	0.0300	98	80-120	
4-Bromofluorobenzene		0.0315	0.0300	105	80-120	

Lab Batch #: 896969

Sample: 449368-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg		Date Analyzed: 09/20/12 16:01	SURROGATE RECOVERY STUDY			
TPH by Texas1005		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes						
1-Chlorooctane		105	100	105	70-135	
o-Terphenyl		53.6	50.1	107	70-130	

\* Surrogate outside of Laboratory QC limits  
 \*\* Surrogates outside limits; data and surrogates confirmed by reanalysis  
 \*\*\* Poor recoveries due to dilution  
 Surrogate Recovery [D] = 100 \* A / B  
 All results are based on MDL and validated for QC purposes.



# Form 2 - Surrogate Recoveries

Project Name: Midland Odessa Standard List of prices

Work Orders : 449368,

Project ID:

Lab Batch #: 896980

Sample: 449368-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/20/12 16:34

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B  Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0299	0.0300	100	80-120	
4-Bromofluorobenzene	0.0320	0.0300	107	80-120	

\* Surrogate outside of Laboratory QC limits

\*\* Surrogates outside limits; data and surrogates confirmed by reanalysis

\*\*\* Poor recoveries due to dilution

Surrogate Recovery [D] = 100 \* A / B

All results are based on MDL and validated for QC purposes.



# BS / BSD Recoveries



Project Name: Midland Odessa Standard List of prices

Work Order #: 449368

Analyst: KEB

Date Prepared: 09/20/2012

Project ID:

Date Analyzed: 09/20/2012

Lab Batch ID: 896980

Sample: 627446-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

## BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000998	0.0998	0.104	104	0.100	0.102	102	2	70-130	35	
Toluene	<0.00200	0.0998	0.104	104	0.100	0.101	101	3	70-130	35	
Ethylbenzene	<0.000998	0.0998	0.0984	99	0.100	0.0969	97	2	71-129	35	
m_p-Xylenes	<0.00200	0.200	0.215	108	0.200	0.212	106	1	70-135	35	
o-Xylene	<0.000998	0.0998	0.109	109	0.100	0.104	104	5	71-133	35	

Analyst: KEB

Date Prepared: 09/20/2012

Date Analyzed: 09/20/2012

Lab Batch ID: 896969

Sample: 627449-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

## BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	<25.0	1000	947	95	997	918	92	3	70-135	35	
C12-C28 Diesel Range Hydrocarbons	<25.0	1000	926	93	997	912	91	2	70-135	35	

Relative Percent Difference RPD = 200\*(C-F)/(C+F)

Blank Spike Recovery [D] = 100\*(C)/[B]

Blank Spike Duplicate Recovery [G] = 100\*(F)/[E]

All results are based on MDL and Validated for QC Purposes



# Form 3 - MS / MSD Recoveries



Project Name: Midland Odessa Standard List of prices

Work Order #: 449368

Project ID:

Lab Batch ID: 896980

QC- Sample ID: 449368-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/20/2012

Date Prepared: 09/20/2012

Analyst: KEB

Reporting Units: mg/kg

### MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000996	0.0996	0.0843	85	0.100	0.0870	87	3	70-130	35	
Toluene	<0.00199	0.0996	0.0824	83	0.100	0.0842	84	2	70-130	35	
Ethylbenzene	<0.000996	0.0996	0.0740	74	0.100	0.0764	76	3	71-129	35	
m_p-Xylenes	<0.00199	0.199	0.158	79	0.200	0.164	82	4	70-135	35	
o-Xylene	<0.000996	0.0996	0.0803	81	0.100	0.0834	83	4	71-133	35	

Lab Batch ID: 896969

QC- Sample ID: 449368-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/20/2012

Date Prepared: 09/20/2012

Analyst: KEB

Reporting Units: mg/kg

### MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	<24.9	996	971	97	1000	997	100	3	70-135	35	
C12-C28 Diesel Range Hydrocarbons	<24.9	996	958	96	1000	969	97	1	70-135	35	

Matrix Spike Percent Recovery [D] = 100\*(C-A)/B  
Relative Percent Difference RPD = 200\*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100\*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable  
N = See Narrative, EQL = Estimated Quantitation Limit





# XENCO Laboratories



## Prelogin/Nonconformance Report- Sample Log-In

Client: Western Refining

Acceptable Temperature Range: 0 - 6 degC

Date/ Time Received: 09/20/2012 12:04:00 PM

Air and Metal samples Acceptable Range: Ambient

Work Order #: 449368

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	20.5
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	Yes
#5 Custody Seals intact on sample bottles/ container?	Yes
#6 *Custody Seals Signed and dated for Containers/coolers	Yes
#7 *Chain of Custody present?	Yes
#8 Sample instructions complete on Chain of Custody?	Yes
#9 Any missing/extra samples?	No
#10 Chain of Custody signed when relinquished/ received?	Yes
#11 Chain of Custody agrees with sample label(s)?	Yes
#12 Container label(s) legible and intact?	Yes
#13 Sample matrix/ properties agree with Chain of Custody?	Yes
#14 Samples in proper container/ bottle?	Yes
#15 Samples properly preserved?	Yes
#16 Sample container(s) intact?	Yes
#17 Sufficient sample amount for indicated test(s)?	Yes
#18 All samples received within hold time?	Yes
#19 Subcontract of sample(s)?	Yes
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	Yes
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	Yes
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	Yes

\* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

Analyst:	PH Device/Lot#:
----------	-----------------

\_\_\_\_\_  
**Checklist completed by:** Date: 09/20/2012

\_\_\_\_\_  
**Checklist reviewed by:** Date: 09/20/2012

## Chavez, Carl J, EMNRD

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Friday, September 14, 2012 11:29 AM  
**To:** 'Weaver, Ron'  
**Cc:** 'Schmaltz, Randy'; 'Hains, Allen'; 'Parker, Ken'; VonGonten, Glenn, EMNRD; Gonzales, Elidio L, EMNRD  
**Subject:** RE: Jal action plan

Ron:

The New Mexico Oil Conservation Division (OCD) is in receipt of your "South Brine Pond Repair Work Plan" (work plan) dated August 28, 2012.

Based on the submitted work plan, the OCD recommends that the new leachate detection pipe be positioned between the two liners (secondary and primary) at an angle up the berm slope so as not to breach any liner material and create a pathway for fluid migration.

I think the OCD incorporated language into its Oil and Gas Pit Rule Regulations and/or Surface Waste Management Facility Regulations with the preferred pit/pond design.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Department  
Oil Conservation Division, Environmental Bureau  
1220 South St. Francis Drive, Santa Fe, New Mexico 87505  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)  
Website: <http://www.emnrd.state.nm.us/ocd/>

"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Tuesday, August 14, 2012 10:58 AM  
**To:** 'Weaver, Ron'  
**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken; VonGonten, Glenn, EMNRD  
**Subject:** RE: Jal action plan

Ron:

Please plan on submitting a diagram to scale of the pond relative to MWs and water quality monitoring data from the downgradient wells for OCD review.

Thank you.

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Department  
Oil Conservation Division, Environmental Bureau

1220 South St. Francis Drive, Santa Fe, New Mexico 87505

Office: (505) 476-3490

E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

“Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?” To see how, please go to: “Pollution Prevention & Waste Minimization” at <http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Weaver, Ron [<mailto:Ron.Weaver@wnr.com>]

**Sent:** Tuesday, August 14, 2012 9:43 AM

**To:** Chavez, Carl J, EMNRD

**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken; VonGonten, Glenn, EMNRD

**Subject:** RE: Jal action plan

Carl:

This note is written as a follow up to our telephone conversation this morning concerning the brine pond at Jal. Western has pumped the water out of the pond and contacted two environmental firms and had a site walk-through at the Jal facility. Each firm will provide Western with a work plan proposal by the 24th of August. At that point we will decide which firm to utilize in assessing the pond liner and piping and repairs needed for each. We will then provide NMED a more detailed work plan and schedule. A report of all repairs and findings will be submitted to NMED upon completion of the work.

El Paso Natural Gas has monitoring wells down gradient of the pond if it is determined that there was a release from the pond containment and there is need for monitoring for chlorides.

Thank you for your assistance in this matter.

Ron Weaver  
Regional Terminals Manager  
Western Refining Inc.  
505-632-4185 office  
505-320-7074 cell  
[ron.weaver@wnr.com](mailto:ron.weaver@wnr.com)

---

**From:** Chavez, Carl J, EMNRD [<mailto:CarlJ.Chavez@state.nm.us>]

**Sent:** Friday, August 10, 2012 4:08 PM

**To:** Weaver, Ron

**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken; VonGonten, Glenn, EMNRD

**Subject:** RE: Jal action plan

Ron:

Good afternoon.

The work plan looks pretty basic based on my prior discussion with Mr. Parker.

If Western proceeds with this approach, the OCD requires a MW screened at the water table to be monitored for chlorides. In addition, the fluid level within the LDS piping will require frequent monitoring to determine whether liquid is again detected from a leaky liner system and verify that the limited pipe repair under the primary liner solved the LDS fluid problem.

Thank you.

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

Office: (505) 476-3490

E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

“Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?” To see how, please go to: “Pollution Prevention & Waste Minimization” at

<http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Weaver, Ron [<mailto:Ron.Weaver@wnr.com>]

**Sent:** Wednesday, August 08, 2012 2:09 PM

**To:** Chavez, Carl J, EMNRD

**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken

**Subject:** Jal action plan

Good afternoon, Carl

Attached is the Action Plan for the Jal south brine pond. The hard copy is in the mail to you.

Thanks for all of your assistance in this matter!

Ron Weaver  
Western Refining Company, L.P.  
Regional Terminals Manger  
505-632-4185

RECEIVED OCD

2012 AUG 30 P 12:38

August 28, 2012

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

Certified Mail #: 7011 3500 0000 2169 0700

**RE: South Brine Pond Repair Work Plan  
Jal LPG Storage Facility (GW-007)  
Lea County, New Mexico**

Mr. Chavez:

Pursuant to our previous conversations earlier this month, please find enclosed a detailed Work Plan outlining the activities proposed to investigate the potential leak in the primary liner at the south brine pond located at the Jal LPG Storage Facility in Lea County, New Mexico. If you have any questions or would like to discuss this topic in more detail, please feel free to contact me at (505) 632-4185.

Sincerely,



Ron Weaver  
Western Refining Company, L.P.  
Regional Terminals Manager  
50 County Road 4990  
Bloomfield, NM 87413

Cc: Randy Schmaltz (WNR)  
Allen Hains (WNR)  
Ken Parkér (WNR)

# **South Brine Pond Investigation Work Plan**

Jal LPG Storage Facility  
Lea County, New Mexico

## Purpose and Scope

This Work Plan describes activities proposed to investigate the potential leak in the primary liner of the South Brine Pond located at the Jal LPG Storage Facility in Lea County, New Mexico. In the event that evidence of a leak is identified resulting in potential impacts to groundwater, Western will notify OCD within 72-hours of discovery to determine if additional investigation activities are necessary beyond what is included in this Work Plan.

## Background

The LPG Storage Facility located in Lea County, New Mexico operates two double-lined brine ponds, each equipped with a leak detection pumping system. Brine water from each double-lined pond is pumped into on-site LPG wells via three 6-inch pipelines to facilitate LPG displacement for product loading purposes. The three pipelines are encased in concrete at the base of the pond. The pond lining is secured to the concrete at the pond base. Attachment A provides a detailed as-built construction drawing of the south brine pond.

The leak detection system for each brine pond consists of perforated piping located between the primary and secondary liners at the base of the pond. Liquid collected within the leak detection tubes is removed via a submersible pump. The leak detection system operates on a level control system; therefore the leak detection pump automatically starts pumping when a liquid level is detected between the primary and secondary liners.

## Discovery

On July 20, 2012, Western noticed the cycle operation of the south brine pond dewatering system. Operation of the dewatering system heightened concern of a potential leak between the primary and secondary pond liners. The facility Operator immediately initiated corrective actions which included isolating the south brine pond from service and transferring the brine water from the south brine pond to the north brine pond. The New Mexico Oil Conservation Division (NMOCD) was notified via a phone call on July 23, 2012 of the potential leak findings. A completed C-141 form was submitted to NMOCD on July 26, 2012 formally documenting the discovery of a potential leak of the primary liner at the south brine pond.

### Proposed Inspection Activities

Although it is uncertain as to if there exists a leak in the south pond primary liner, Western has contracted with Envirotech, Inc. to clean and inspect the primary liner of the south brine pond. If a breach in the primary liner is found, the secondary liner will also be inspected within the same vicinity to ensure that liquids that passed through the primary liner did not breach the secondary liner. Any breach in the pond lining will be repaired prior to returning the pond to normal operation. If there is evidence that a breach in the secondary liner exists, Western will evaluate the extent of the release and contact OCD within 72 hours of the discovery to determine if additional corrective action is necessary.

### Preventative Maintenance Activities

Following inspection of the pond liner, additional work is scheduled to be completed that includes replacement of the brine water transfer piping. Due to the potential corrosive nature of the brine water and also to eliminate any potential for future leaks near the south brine pond, Western will replace the three 6-inch pipelines that are used to transfer the brine solution from the pond to the on-site LPG wells. The existing galvanized steel piping will be replaced with PVC Schedule 80 piping.

These proposed activities will include removal of the concrete encasement around the piping at the pond base. The pond liner, both primary and secondary, will be cut to allow for the brine water piping to be removed and new piping to be installed. Any visually impacted soil during the excavation activities will be removed prior to installing the new piping and Western will notify OCD of the finding. Soil surrounding the piping will be properly compacted prior to welding the pond liner to ensure the support of the pond liner is sufficient.

### Waste Management

In the event that visually impacted oil is encountered during the pond liner inspection and piping replacement activities, the impacted soil will be placed within secondary containment until such time as the material can be characterized for disposal. All waste generated as part of this Work Plan will be managed in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste.

### Schedule

Western has tentatively scheduled to commence activities outlined in this Work Plan as early as mid-September 2012. The timeframe for completion of these activities is estimated to be approximately two weeks from the date activities commence.

# **Attachment A**



## Chavez, Carl J, EMNRD

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Tuesday, August 14, 2012 10:58 AM  
**To:** 'Weaver, Ron'  
**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken; VonGonten, Glenn, EMNRD  
**Subject:** RE: Jal action plan

Ron:

Please plan on submitting a diagram to scale of the pond relative to MWs and water quality monitoring data from the downgradient wells for OCD review.

Thank you.

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Department  
Oil Conservation Division, Environmental Bureau  
1220 South St. Francis Drive, Santa Fe, New Mexico 87505  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

“Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?” To see how, please go to: “Pollution Prevention & Waste Minimization” at <http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Weaver, Ron [<mailto:Ron.Weaver@wnr.com>]  
**Sent:** Tuesday, August 14, 2012 9:43 AM  
**To:** Chavez, Carl J, EMNRD  
**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken; VonGonten, Glenn, EMNRD  
**Subject:** RE: Jal action plan

Carl:

This note is written as a follow up to our telephone conversation this morning concerning the brine pond at Jal. Western has pumped the water out of the pond and contacted two environmental firms and had a site walk-through at the Jal facility. Each firm will provide Western with a work plan proposal by the 24th of August. At that point we will decide which firm to utilize in assessing the pond liner and piping and repairs needed for each. We will then provide NMED a more detailed work plan and schedule. A report of all repairs and findings will be submitted to NMED upon completion of the work.

El Paso Natural Gas has monitoring wells down gradient of the pond if it is determined that there was a release from the pond containment and there is need for monitoring for chlorides.

Thank you for your assistance in this matter.

Ron Weaver  
Regional Terminals Manager  
Western Refining Inc.  
505-632-4185 office  
505-320-7074 cell  
[ron.weaver@wnr.com](mailto:ron.weaver@wnr.com)

---

**From:** Chavez, Carl J, EMNRD [<mailto:CarlJ.Chavez@state.nm.us>]  
**Sent:** Friday, August 10, 2012 4:08 PM  
**To:** Weaver, Ron  
**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken; VonGonten, Glenn, EMNRD  
**Subject:** RE: Jal action plan

Ron:

Good afternoon.

The work plan looks pretty basic based on my prior discussion with Mr. Parker.

If Western proceeds with this approach, the OCD requires a MW screened at the water table to be monitored for chlorides. In addition, the fluid level within the LDS piping will require frequent monitoring to determine whether liquid is again detected from a leaky liner system and verify that the limited pipe repair under the primary liner solved the LDS fluid problem.

Thank you.

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Department  
Oil Conservation Division, Environmental Bureau  
1220 South St. Francis Drive, Santa Fe, New Mexico 87505  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)  
Website: <http://www.emnrd.state.nm.us/ocd/>  
“Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?” To see how, please go to: “Pollution Prevention & Waste Minimization” at <http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Weaver, Ron [<mailto:Ron.Weaver@wnr.com>]  
**Sent:** Wednesday, August 08, 2012 2:09 PM  
**To:** Chavez, Carl J, EMNRD  
**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken  
**Subject:** Jal action plan

Good afternoon, Carl

Attached is the Action Plan for the Jal south brine pond. The hard copy is in the mail to you.

Thanks for all of your assistance in this matter!

Ron Weaver  
Western Refining Company, L.P.  
Regional Terminals Manger  
505-632-4185

**Chavez, Carl J, EMNRD**

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Friday, August 10, 2012 4:08 PM  
**To:** 'Weaver, Ron'  
**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken; VonGonten, Glenn, EMNRD  
**Subject:** RE: Jal action plan

Ron:

Good afternoon.

The work plan looks pretty basic based on my prior discussion with Mr. Parker.

If Western proceeds with this approach, the OCD requires a MW screened at the water table to be monitored for chlorides. In addition, the fluid level within the LDS piping will require frequent monitoring to determine whether liquid is again detected from a leaky liner system and verify that the limited pipe repair under the primary liner solved the LDS fluid problem.

Thank you.

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Department  
Oil Conservation Division, Environmental Bureau  
1220 South St. Francis Drive, Santa Fe, New Mexico 87505  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)  
Website: <http://www.emnrd.state.nm.us/ocd/>

“Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?” To see how, please go to: “Pollution Prevention & Waste Minimization” at <http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Weaver, Ron [<mailto:Ron.Weaver@wnr.com>]  
**Sent:** Wednesday, August 08, 2012 2:09 PM  
**To:** Chavez, Carl J, EMNRD  
**Cc:** Schmaltz, Randy; Hains, Allen; Parker, Ken  
**Subject:** Jal action plan

Good afternoon, Carl

Attached is the Action Plan for the Jal south brine pond. The hard copy is in the mail to you.

Thanks for all of your assistance in this matter!

Ron Weaver  
Western Refining Company, L.P.  
Regional Terminals Manger  
505-632-4185



WNR  
LISTED  
NYSE

August 8, 2012

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

Mr. Chavez:

This letter is to apprise NMED of the Plan of Action developed by Western Refining Company, L.P. for the Jal LPG underground storage facility south brine pond. The Plan of Action is as follows:

1. Empty the pond of all brine water
2. Cut open the primary liner around the suction piping
3. Make necessary repairs to suction piping
4. Fill and compact area around suction piping
5. Repair primary liner where cut to access piping

Sincerely,

A handwritten signature in black ink that reads 'Ron Weaver'.

Ron Weaver  
Western Refining Company, L.P.  
Regional Terminals Manager  
50 County Road 4990  
Bloomfield, NM 87413

Cc:  
Randy Schmaltz (WNR)  
Allen Hains (WNR)  
Ken Parker (WNR)

## Chavez, Carl J, EMNRD

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Wednesday, August 01, 2012 8:01 AM  
**To:** 'Parker, Ken'  
**Cc:** Gonzales, Elidio L, EMNRD; Weaver, Ron; VonGonten, Glenn, EMNRD; Leking, Geoffrey R, EMNRD  
**Subject:** RE: C-141

Ken:

Good morning.

OCD has reviewed the C-141 and the "Cleanup Action Taken" section where Western Refining LP indicates it will submit a scope of work for repairs to the pond.

Please submit the scope of work to me on or before Friday 8/10 COB with copy to the Hobbs DO.

Thank you.

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Department  
Oil Conservation Division, Environmental Bureau  
1220 South St. Francis Drive, Santa Fe, New Mexico 87505  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental>

---

**From:** Parker, Ken [<mailto:Ken.Parker@wnr.com>]  
**Sent:** Thursday, July 26, 2012 1:26 PM  
**To:** Chavez, Carl J, EMNRD  
**Cc:** Gonzales, Elidio L, EMNRD; Weaver, Ron  
**Subject:** C-141

Carl,

Jal has a leak that is contained within the leak detection system on the South Brine Pond. Since the leak was discovered we have already dropped the water level 18 inches. We are transferring brine water from the South to North pond 24/7.

Ken

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

Form C-141  
Revised August 8, 2011

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

Submit 1 Copy to appropriate District Office in  
accordance with 19.15.29 NMAC.

**Release Notification and Corrective Action**

**OPERATOR**

X Initial Report  Final Report

Name of Company Western Refining Company	Contact Ken Parker
Address PO Box 1342 Jal, New Mexico 88252	Telephone No. 575-395-2632
Facility Name Jal Terminal	Facility Type LPG Storage Facility

Surface Owner Western Refining Company	Mineral Owner	API No. N/A
--	---------------	-------------

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
M	32	23S	37E	725	South	1005	West	Lea

Latitude N32-15-18.7 Longitude W103-11-22.9

**NATURE OF RELEASE**

Type of Release Brine Water Contained within Primary/Secondary Liner	Volume of Release N/A	Volume Recovered N/A
Source of Release Brine Pond Suction Line	Date and Hour of Occurrence 7-20-12	Date and Hour of Discovery 7-20-12 @ 6 P.M.
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	
By Whom? Ken Parker	Date and Hour 7-25-12 @ 2 P.M.	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.\*

Describe Cause of Problem and Remedial Action Taken.\*

There is a possibility that the leak was caused by line corrosion. The leak is contained within the leak detection system and therefore no remedial action is necessary outside the perimeter of the South Brine Pond.

Describe Area Affected and Cleanup Action Taken.\*

Damaged area is located on the South slope of the ponds inter wall. The damaged suction line was taken out of service and modification were made to convert and existing line into a suction line. This modification was completed on Monday July 26, 2012.

Action Plan:

- Empty South Brine Pond
- Remove water trapped within primary/secondary liner
- Mechanical Integrity Testing and Inspection
- Submit Scope of Work for repairs

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	<b><u>OIL CONSERVATION DIVISION</u></b>	
Printed Name: Ken Parker	Approved by Environmental Specialist:	
Title: Facility Manager	Approval Date:	Expiration Date:

E-mail Address: Ken.Parker@wnr.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 7-26-12                      Phone: 575-395-2632		

\* Attach Additional Sheets If Necessary

## Chavez, Carl J, EMNRD

---

**Subject:** Jal LPG Facility GW-7 Propane Loss Meeting  
**Location:** Telephone Conf. Call

**Start:** Fri 5/29/2009 2:00 PM  
**End:** Fri 5/29/2009 2:30 PM

**Recurrence:** (none)

**Meeting Status:** Meeting organizer

**Organizer:** Chavez, Carl J, EMNRD  
**Required Attendees:** Cauthen, Bruce; Allen.Hains@wnr.com; Robertson, Bill; Chavez, Carl J, EMNRD

Agenda: See report for issues to discuss. My phone number to call me is 505-476-3490. Thanks.

C-141 from 5/20/2008:

There was a leak detected in casing at 282 ft. from surface; however, based on gas monitoring during the Well No. 3 workover, there was no indication that propane had leaked upward through the hole that was repaired (see attached C-141). Propane gas should have been detected. A work plan was submitted and a propane screening was conducted at selected MWs that are part of an El Paso Natural Gas remediation.

Meeting Conclusions on Propane Screening Sampling and Analyses Report dated May 26, 2009:

Based on the meeting, it was surprising that any propane and butane were detected above the water table in well bore air at the MW locations; however, it was determined based on the detected concentrations (<3%) and sporadic spatial detection, that that propane loss in LPG Storage Well No. 3 may have migrated upward into the water table, but it was determined that if there was a major propane source, the percentage of propane would have been much greater and there would have been detection during the monitoring event around the MWs and storage wells. Due to the concentrations detected, there is a possibility that propane detected above the water table may be gas in the unsaturated zone and not diffusing from ground water? Ultimately, since the gases are only slightly soluble in water with relatively high vapor pressures, any release to fresh water would eventually diffuse through preferential pathways in the unsaturated zone to ambient air conditions (high pressure to low pressure).

The operator believes that the gas is still down there somewhere and may even show up in the storage cavern again someday? The OCD concurs with the conclusions of the report with a recommendation that the company conduct monitoring throughout the facility with an oxygen meter to determine if there are any preferential pathways for the gas to be venting into ambient air for public safety.

End.

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, 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

Form C-141  
Revised October 10, 2003

Submit 2 Copies to appropriate  
District Office in accordance  
with Rule 116 on back  
side of form

**Release Notification and Corrective Action**

**OPERATOR**

X Initial Report  Final Report

Name of Company: Western Refining Company	Contact Ken Parker
Address PO Box 1345 Jal, NM 88252	Telephone No. 575-395-2632
Facility Name: Jal Storage Facility	Facility Type LPG Salt Dome Storage
Surface Owner: Western Refining Company	Mineral Owner
Lease No. 30-025-35956	

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	South Line	Feet from the	West Line	County
M	32	23S	37E	1000 FT		530 FT		Lea

Latitude N 32-15-23.1 Longitude W 105-11-30.3

**NATURE OF RELEASE**

Type of Release Propane released underground	Volume of Release 13,755 Barrels	Volume Recovered None
Source of Release Casing leak at 282 Ft.	Date and Hour of Occurrence Unknown	Date and Hour of Discovery March 29, 2008 @ 6AM
Was Immediate Notice Given? <input type="checkbox"/> Yes X No <input type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes X No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.\*

Describe Cause of Problem and Remedial Action Taken.\*

In April of 2007, State LPG Well 3 was utilized to store 1,047,186 gallons of unoderized propane. Product was in storage in the months of April and May.

In early June we transferred the product from well 3 into well 2. I was concerned when the transfer of product fell short of the allotted time. I ran an internal audit for propane received to make certain that I had used the correct number of barrels for my transfer calculation. The audit indicated that well 3 was short 13,756 barrels of propane. At this time based on the well pressure reading I was convinced that we may have had communication through the discharge manifold that could allow propane to commingle with the butane in well 1.

Without physical knowledge as to what happened, we checked the monitor wells up and down stream for gas leakage. Without any indication of gas leaking in any of the monitor wells, I assumed the product was in well 1. This was the only well that was in service at the same time propane was injecting into well 3. At this stage of the investigation, we knew that we didn't have gas/liquid leaking to the surface and into the atmosphere.

Well 3 was made ready for the MIT test in July 2007. The tubing was pulled to isolate the casing from the salt storage formation. The casing test failed and a leak was isolated at 282 feet from the surface. Lonquist recommended that we do a cement squeeze on the leak in the 9-5/8 casing and then run a new 7 inch liner and cement from top to bottom. During this phase of the test and repair, at no time did we recover any propane during the work over. Even with the leak in the casing I wasn't convinced this was the reason for the loss. I continued checking the monitor wells until well 1 was made ready for testing. We never detected any gas leaking from the monitor wells.

In early March 2008, butane was transferred from well 1 into well 2. At this time we could physically identify the well that had the product loss. The facts as we know it today is that well 3 has the loss. At no time did we have gas/liquid at ground surface or in the monitor wells.

Describe Area Affected and Cleanup Action Taken.\*

This well is in a remote area and the closest public receptors are 2 miles away. The area affected by the propane loss is unknown and therefore monitoring the area is the only action taken. Cleanup is not an issue at this time.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

OIL CONSERVATION DIVISION

Signature: <i>Ken Parker</i>	Approved by District Supervisor:	
Printed Name: <i>Ken Parker</i>	Approval Date:	Expiration Date:
Title: <i>Facility Manager</i>	Conditions of Approval:	
E-mail Address: <i>Ken.Parker@WWR.com</i>	Attached <input type="checkbox"/>	
Date: <i>5-20-08</i> Phone: <i>505-895-2632</i>		

\* Attach Additional Sheets If Necessary

**LONQUIST**



**MECHANICAL INTEGRITY TEST REPORT**

**Western Refining Company, LP**

**Well No. 3**

**API No. 30-025-35956**

**Jal, New Mexico, USA**

**Prepared for:**

**Western Refining Company, LP**

**Jal, New Mexico, USA**

**by:**

**Lonquist Field Service, LLC**

**Austin, Texas**

**October 17, 2007**

## *Western Refining Company, Well No 3 - MIT Report*

---

### **Executive Summary**

Lonquist Field Service, LLC. (LFS) was contracted to conduct a Mechanical Integrity Test on Well No. 3 for Western Refining Company, LP (Western Refining) from August 13-19, 2007. A nitrogen-interface test method was used for this test. Nitrogen was injected into Well No. 3 on August 16, 2006 and there was a stabilization period until August 17, 2007. The well was then shut in for a period of 48 hours to conduct the actual test. After observing the change in the nitrogen interface depth the total volume change was calculated. Using an average temperature and pressure across the effected well depth and by extrapolating the time an annual net loss could be calculated. This calculation yielded a loss of 443.36 bbls of nitrogen per year and a Minimum Detectable Leak Rate (MDLR) 827.46 bbls/year. The well was tested to a test gradient of 0.75 psi/ft at the 9 5/8" casing shoe. Considering these results and the guidelines set forth by the Oil Conservation Division, Well No. 3, at the time of this test, demonstrated the mechanical integrity required for LPG storage.

*Western Refining Company, Well No 3 - MIT Report*

---

**Table of Contents**

---

<u>Section Title</u>	<u>Section</u>
INTRODUCTION.....	1
SUMMARY.....	2
CONCLUSIONS.....	3
DAILY ACTIVITIES.....	4
TEST PARTICIPANTS .....	5
CALCULATIONS.....	6
WELL DATA SHEET .....	7
MIT/WELL SCHEMATIC .....	8
PRESSURE AND TEMPERATURE GRAPHS.....	9
APPENDIX A – MIT TEST PROCEDURE.....	A
APPENDIX B – INJECTION PRESSURE DATA.....	B
APPENDIX C – TEST PRESSURE DATA .....	C
APPENDIX D – WELL LOGS.....	D

## *Western Refining Company, Well No 3 - MIT Report*

---

### **Introduction**

Lonquist Field Service, LLC (LFS) was contracted to conduct a mechanical integrity test (MIT) for Well No. 3 located at the Jal Station, Jal New Mexico. LFS prepared a MIT procedure according to guidelines set forth by the OCD.

Well No. 3 was tested using the Nitrogen-Brine Interface Test Method (See Appendix A). This procedure begins with an initial injection of nitrogen into the well to check for wellhead and casing leaks. The initial injection is followed by continued injection of nitrogen into the storage well until the interface is located below the casing shoe and a sufficient test pressure has been reached. The interface depth and both the nitrogen (annulus) and brine (tubing) pressure are monitored during the test period. The test is evaluated by calculating the nitrogen mass (volume) at the commencement and completion of the test period. This difference yields an apparent mass (volume) change. As the test occurs over a finite time period, the apparent mass (volume) rate can be calculated and linearly forecasted to an annual rate. The annual mass (volume) rate is usually expressed in barrels of nitrogen per year (at average well pressure and temperature conditions). The mass (volume) rate of change is subject to the accuracy of the test or Minimum Detectable Leak Rate (MDLR), also expressed in barrels per year.

The following report will outline the Nitrogen-Brine Interface Test for Well No. 3. The report includes the cavern and wellbore configuration, pressure trends, temperature logs, and density logs completed during the test.

## *Western Refining Company, Well No 3 - MIT Report*

---

### **Summary**

On August 16, 2007 nitrogen was injected into Well No. 3 at a rate of 1000 SCFM with a target temperature of 65° F. Nitrogen was pumped into the annulus until the interface was located at a depth of 1630'. A well casing test was completed after the well was shut in for a period of time. The density logs and pressure test did not indicate any appreciable leaks in the well casing and wellhead components.

Nitrogen injection resumed until the nitrogen – brine interface was determined (through density logging) to be below the casing shoe depth of 1666'. The nitrogen – brine interface was established at a depth of 1669' with a nitrogen (annulus) pressure of 1193.57 psig at surface. The brine (tubing) pressure at surface was observed to be 460.33 psig.

After a stabilization period of approximately 16 hours the well was re-logged to determine the interface depth that would be used for the test calculations. At the beginning of the observation period on August 17, 2006 at 10:00 hrs, the nitrogen - brine interface was logged at 1669' (3' below casing shoe). The nitrogen (annulus) pressure was 1177.57 psig and the brine (tubing) pressure was 442.96 psig.

The well was shut in for the duration of the test (approximately 48 hours) which concluded on August 19, 2007 at 10:00 hrs. A density log was again completed to determine the depth of the nitrogen – product interface. The interface was measured at a depth of 1669'. The nitrogen (annulus) pressure was 1166.45 psig and the brine (tubing) pressure was 431.41 psig. The net change in the nitrogen (annulus) pressure was 11.12 psig and the net change in the brine (tubing) pressure was 11.55 psig. The interface depth didn't move.

*Western Refining Company, Well No 3 - MIT Report*

---

**Conclusions**

The mechanical integrity of Well No. 3 was established with a Nitrogen-Brine Interface Test Method. Well No. 3 was initialized with an annulus pressure of 1177.57 psig and tubing pressure of 442.96 psig with the nitrogen-product interface at 1669'. Well No. 3 was finalized with an annulus pressure of 1166.45 psig and a tubing pressure of 431.41 psig with the nitrogen-brine interface at 1669'.

Well No. 3 had a test length of 48 hours and a test gradient of 0.75 psi/ft at the 9 5/8" casing shoe.

The calculated nitrogen leak rate was 443.36 bbls per year which is less than the Minimum Detectable Leak Rate (MDLR) of 827.46 bbls per year.

At the completion of this test, Well No. 3 exhibited the characteristics of a well that has mechanical integrity as required for the storage of liquid petroleum products in accordance with the Oil Conservation Division guidelines.

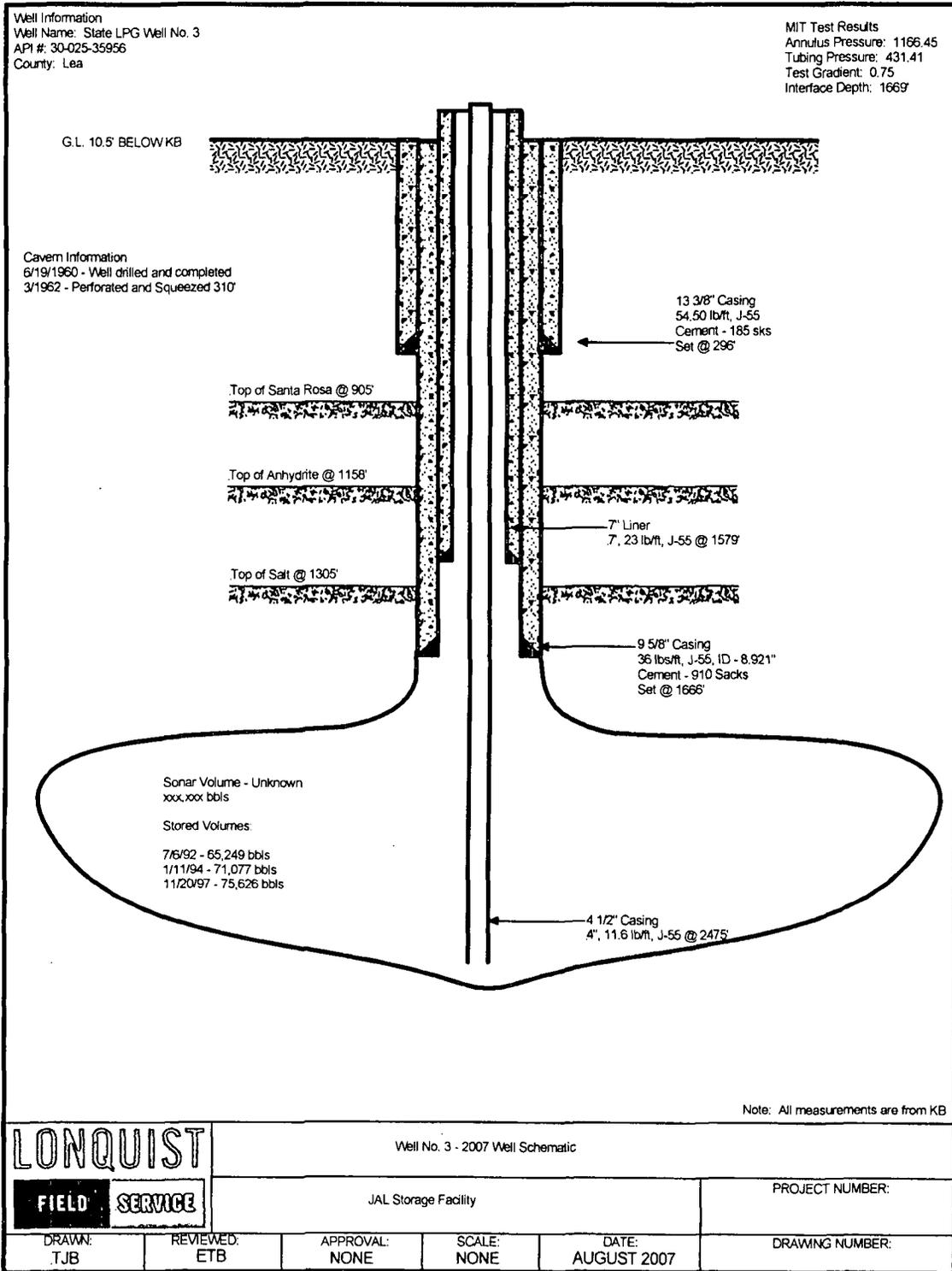
Western Refining Company, Well No 3 - MIT Report

Well Data Sheet

TEST INFORMATION AND RESULTS			
Well Name:	Well No. 3		
Operator:	Western Refinery		
State:	New Mexico		
Parish:	Lea		
Field:	Jal Station		
Serial #:	30-025-35956		
UIC #	0		
WELL INFORMATION			
Cemented Casing		Casing Liner	
Casing Size	9.63 inches	Casing Size	7.00 inches
Casing ID	8.92 inches	Casing ID	6.37 inches
Casing Weight	36.00 lbs/ft	Casing Weight	23.00 lbs/ft
Grade		Grade	
Depth	1666 feet	Depth	1579 feet
Hanging String No. 1		Hanging String No. 2	
Casing Size	4 1/2 inches	Casing Size	0 inches
Casing ID	4 inches	Casing ID	0 inches
Casing Weight	11 3/5 lbs/ft	Casing Weight	0 lbs/ft
Grade		Grade	0
Depth	2568 feet	Depth	0 feet
Cavern			
Cavern Size			71,725 bbls
Compressibility			0.22 bbls/psi
Cavern TD			640 feet
FINAL TEST INFORMATION			
Effective Casing Shoe	1666 feet	Casing Shoe Pressure	1252.00 psi
Test Gradient	0.75 psi/ft	Interface Pressure	1252.14 psi
Brine Specific Gravity	1.2	Surface Tubing Pressure	384.92 psi
Nitrogen Temperature	65 deg F	Surface Annulus Pressure	1183.08 psi
Interface Depth	1669 feet	Pressure Increase	534.24 psi
Gas Compressibility	0.9997	Conversion	14.70 psi
Volume		Nitrogen	
Annular Volume No. 1	0.020 bbls/ft	Surface to Casing Shoe	16946.22 SCF
Annular Volume No. 2	0.058 bbls/ft	Casing Shoe to Interface	38602.4 SCF
Surface to Liner Shoe	31.101 bbls	Total	55548.62 SCF
Liner Shoe to Casing Shoe	5.015 bbls	Brine	
Casing Shoe to Interface	80 bbls	Cavern Pre-Pressure	-149.31 psi
Total	116.115 bbls	Brine Injection	-32.45 bbls
TEST RESULTS			
Test Initialization Information		Test Finalization Information	
Date	8/17/2007	Date	8/19/2007
Tubing Pressure	442.96 psig	Tubing Pressure	431.41 psig
Annulus Pressure	1177.57 psig	Annulus Pressure	1166.45 psig
Wellbore Temperature	65 deg F	Wellbore Temperature	65 deg F
Nitrogen/Brine Interface	1669 feet	Nitrogen/Brine Interface	1669 feet
Test Results			
MDLR	827.46 bbls/yr	Test Length	48 hours
Calculated Volume Change	443.36 bbls/yr	Test Length	2 days
Test Gradient	0.75 psi/ft	Logging Resolution	0.2 feet
Tubing Pressure Change	11.55 psi		
Annulus Pressure Change	11.12 psi		

Western Refining Company, Well No 3 - MIT Report

MIT/Well Schematic



RECEIVED

2009 MAY 28 AM 10 01

May 26, 2009

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

Certified Mail #: 7006 0100 0002 9205 1348

RE: Propane Screening - Sampling and Analyses Report, OCD Discharge Permit GW-007  
Western Refining Company, L.P. Jal LPG Storage Facility; Jal, New Mexico

Dear Mr. Chavez:

On March 29, 2008, a discrepancy was discovered in the LPG propane inventory for Well #3. Approximately 13,755 Barrels of propane could not be reconciled. There was no evidence of propane venting or accumulating at the surface. The discrepancy was confirmed and was reported to NMOCD on May 20, 2008.

Western verbally agreed with NMOCD to perform field screening for propane at potential receptors (monitoring wells) at the facility. Field work was conducted in December 2, 2008. The Propane Screening - Sampling and Analyses Report is attached.

We appreciate your continued cooperation concerning this facility. If you have any questions please call Bruce Cauthen at 505/632-4035.

Regards,



Ron Weaver  
Terminal Manager  
Western Refining Southwest Inc.  
111 CR 4990  
Bloomfield, NM 87413  
505-632-8006

cc: Ken Parker  
Bill Robertson  
Allen Hains

# **Propane Screening Sampling and Analyses Report**

Jal LPG Storage Facility  
NMOCD Discharge Permit GW-007  
Lea County, New Mexico  
May 26, 2009

## **BACKGROUND**

This facility is an LPG Storage Facility, and is manned when loading/unloading operations are in progress. The site has been permitted to allow storage of LPG in underground LPG storage caverns. The operation includes four (4) underground LPG storage caverns, truck and railcar loading/unloading racks, two (2) double-lined brine storage ponds, LPG aboveground storage tanks and associated pumps, valves and piping. LPG is transported to and from the facility via tanker trucks, LPG tanker rail cars, and pipeline. The facility operations also include an offsite NMOCD permitted disposal well. The facility location and layout are illustrated in Figures 1 and 2, respectively.

On March 29, 2008, a discrepancy was discovered in the LPG inventory for State LPG Storage Well #3. Approximately 13,755 Barrels of propane could not be reconciled. There was no evidence of propane venting or accumulating at the surface. The discrepancy was confirmed and reported to NMOCD on May 20, 2008.

## **PURPOSE**

The purpose of this report is to present the results of a field screening for propane at potential conduits.

## **SCOPE OF WORK**

The scope of work consisted of two phases: field screening/sampling and laboratory analyses. The field screening and sampling was performed on December 2, 2008.

## **FIELD SCREENING**

The field screening of groundwater remediation and monitoring wells for propane was attempted using a Lower Explosive Level (LEL)/ Photoionization Detector (PID) multi gas meter (MSA Model Sirius).

## **Materials and Equipment**

The following materials and equipment were utilized:

- A peristaltic sampling pump
- Tygon tubing
- Tedlar bags
- Sirius PID Four Gas Monitor

## **Procedure**

There are approximately fifteen (15) monitoring wells at the Jal LPG Storage Facility and adjacent properties. Seven (7) wells were selected for field screening across the facility. Field personnel collected a representative sample of the gases from the wells at a level just above the water surface, (~1' to 2'), and field screened for the presence of Volatile Organic Compounds (VOCs), including propane, using a combination of LEL and PID readings. The LEL meter detects propane and total VOCs. The PID does not detect Propane (and Butane) but will detect heavier VOCs. Using a combination of LEL and PID results, the field personnel selected the samples for laboratory analyses.

Upon review of the field readings, field personnel was to select four (4) samples and one duplicate sample for confirmation analysis by Hall Environmental Laboratory.

The following field screening protocol was used for this sampling event:

1. The sampling sequence started from the farthest receptor from Well #3 and end with the nearest well.
2. Tygon tubing was attached to the peristaltic pump and Tedlar bag.
3. The open end of the Tygon tubing was lowered down the casing of the monitoring/remediation well to above the water table at approximately 100 feet below surface.
4. The peristaltic pump was activated, the tubing was purged (approx. 5 min.), and a gaseous sample for field screening purposes was collected in the Tedlar bag. A second sample was collected for purpose of validating field results with outside laboratory analysis...
5. The gaseous samples were screened using the MSA Sirius Multigas Monitor.
6. Field personnel recorded the screening results.

Field personnel packaged and transported the selected samples to Hall Environmental Laboratory for analysis.

### **FIELD SCREENING RESULTS**

The field screening results were inconclusive because the gas sample compositions were outside the operational range of the MSA Monitor. For proper operation of the MSA detector, oxygen must to be in the 19.5% and 21.5% range. The gas samples were below 19.5%. The use of Flame Ionization Detector (FID) Monitors would have also resulted into erroneous readings or flame out. There was no evidence of propane venting from the monitoring wells or accumulating at the surface.

## **GAS SAMPLING**

Gas samples were selected for laboratory analyses from five (5) wells, ACW-1, ENSR-1, ENSR-3, ACW-2A and PTP-1. The samples were collected above the water table at approximately 100 feet below surface. An additional sample was collected from well ACW-2A at 75 feet for laboratory analyses because an apparent anomalous field screening reading was observed. As discussed above, it was later determined that the MSA Monitor was operating outside range of the MSA Monitor.

## **LABORATORY ANALYSES RESULTS**

Propane was detected in samples from four monitoring wells ranging from non-detect to 2.680%. The samples with detectable propane are not in the explosive range because they are oxygen deficient. The carbon dioxide concentration may be indicative of biological action or nearby enhanced oil recovery operations. The laboratory analyses are summarized in Table 1. The Laboratory Analytical Report including Chain-of- Custody is attached to this report.

## **CONCLUSIONS AND RECOMMENDATIONS**

- There was no evidence of propane venting from the monitoring wells or accumulating at the surface.
- Propane is present in the wells only in residual concentrations.
- Due to the low oxygen concentrations, the gas samples from monitoring wells were not in the explosive range. Any gas escaping from the wells would be diluted below Lower Explosive Level by the atmosphere.
- Western recommends no further action.

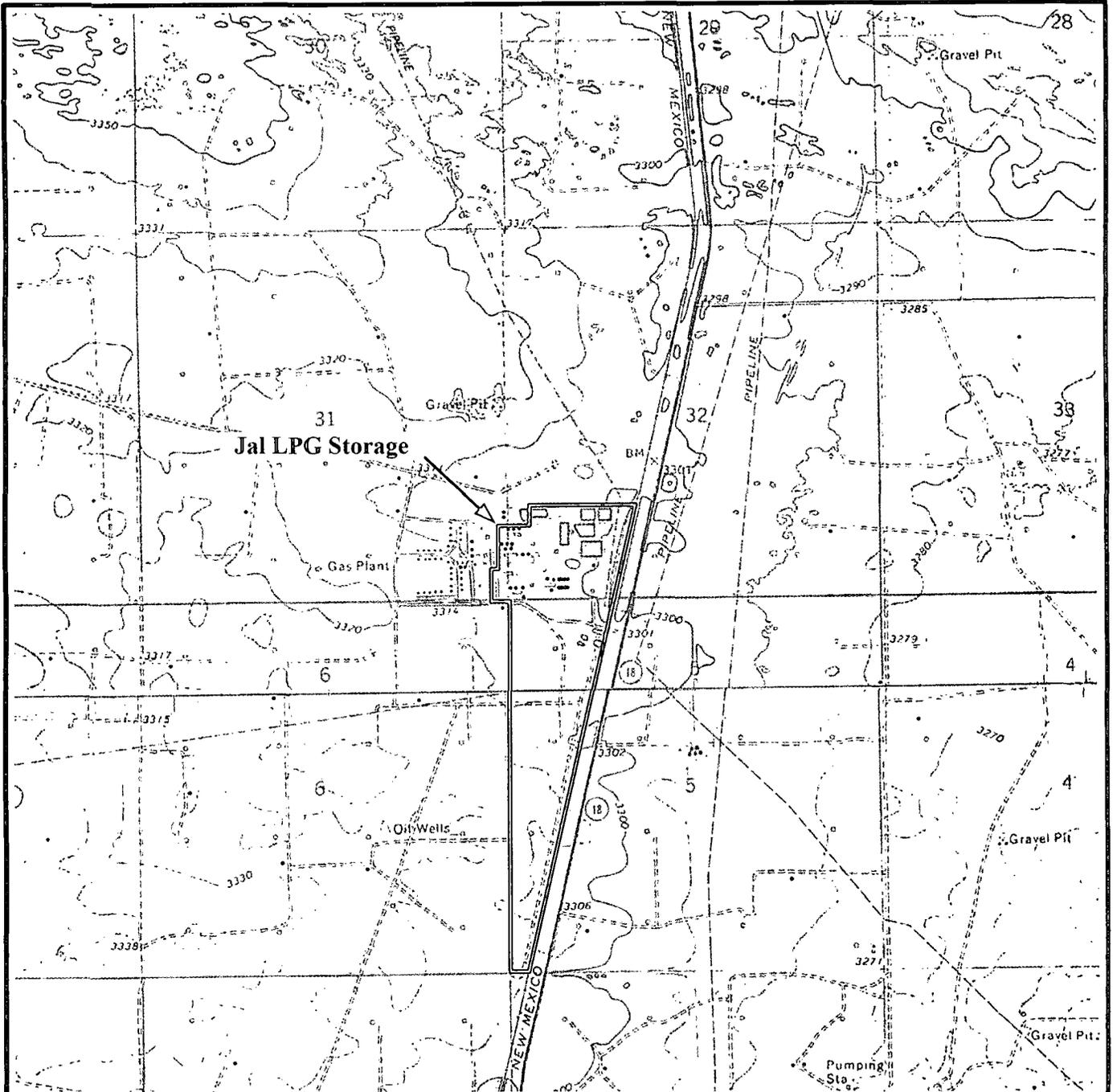
# Table

TABLE 1

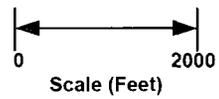
Propane Screening  
**LABORATORY ANALYSES**  
 Jal LPG Storage Facility  
 NMOCD Discharge Permit GW-007

Monitoring Well	Laboratory Samples							
	ACW-1	ACW-2A	ACW-2(A) Duplicate	ACW-2A1	ENSR-1	ENSR-3	PTP-1	
Sample Depth (feet)	ACW-1 ~100	ACW-2A ~100	ACW-2A ~100	ACW-2A ~75	ENSR-1 ~100	ENSR-3 ~100	PTP-1 ~100	
Constituent (%)								
Methane	<0.001	0.197	0.198	0.158	<0.001	<0.001	0.193	
Ethane	<0.001	0.168	0.167	0.197	<0.001	<0.001	0.127	
Propane	<b>0.014</b>	<b>2.680</b>	<b>2.580</b>	<b>2.374</b>	<b>0.030</b>	<b>0.014</b>	<b>2.238</b>	
Isobutane	<0.001	1.171	1.171	1.096	<0.001	0.009	0.191	
n-Butane	<0.001	3.511	3.534	3.168	<0.001	<0.001	0.214	
Oxygen	16.052	1.369	1.419	1.879	17.397	14.685	16.807	
Nitrogen	80.336	79.820	79.785	80.324	79.993	79.713	76.027	
Carbon Dioxide	3.698	11.030	10.979	10.718	2.590	5.579	4.107	

# Figures



Source: USGS Rattlesnake Canyon, New Mexico  
and Jal NW, New Mexico Quadrangles



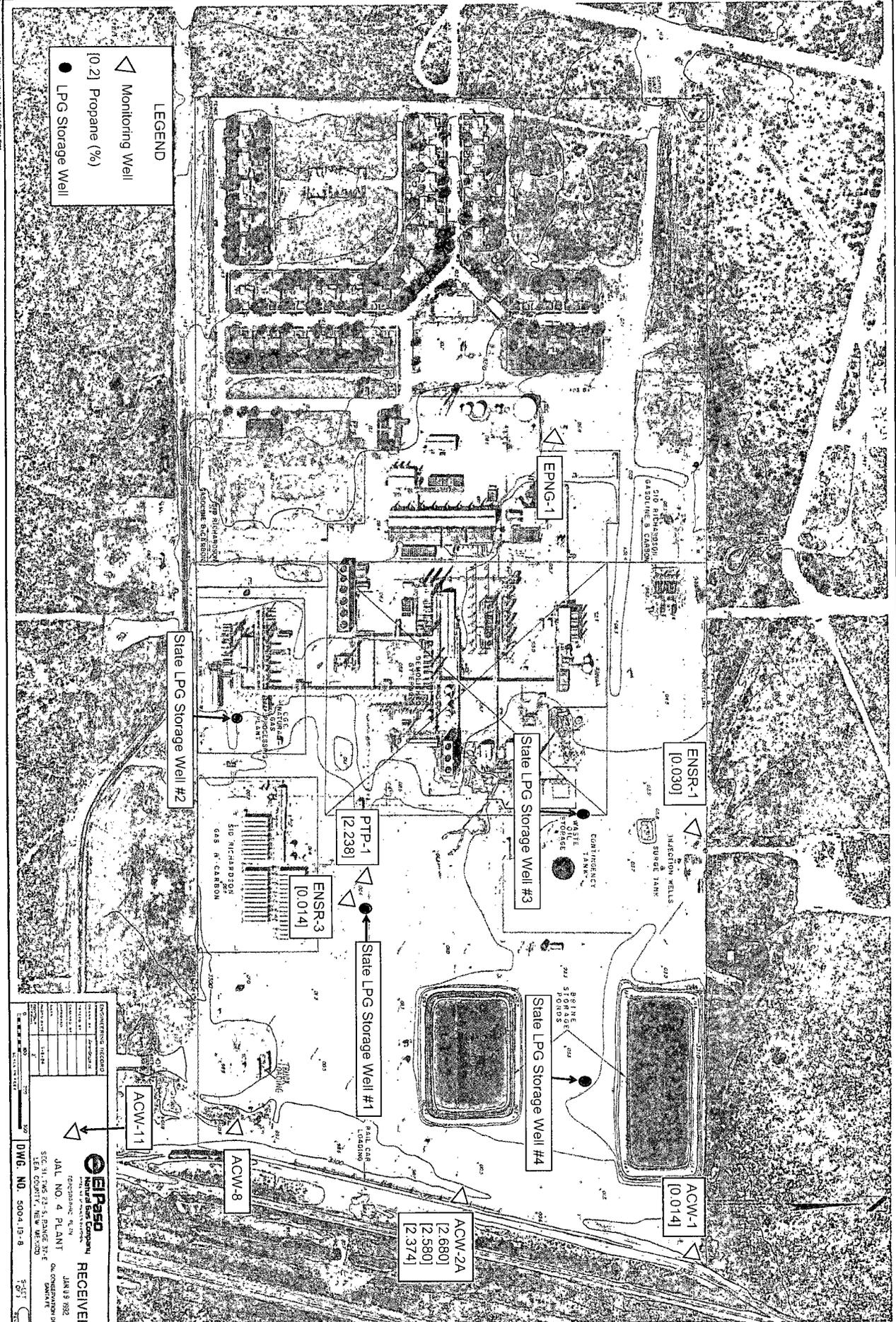
**Figure 1 Site Vicinity / Topographic Map**  
**Jal LPG Storage Facility**  
 Sections 31 & 32, Township 23S Range 37E  
 Section 5, Township 24S Range 37E  
 Lea County, New Mexico

**LEGEND**

▽ Monitoring Well

● LPG Storage Well

[0.2] Propane (%)



**CONFORMING RECORD**

DATE	BY	REVISION

**EIPASO**  
 Environmental Inspection & Planning  
 10000 Old Bridge Road  
 Suite 11, 196 23-5, PAUGE 37-F  
 LEA COUNTY, NEW MEXICO

**RECEIVED**  
 JAN 19 2002  
 JAL NO. 4 PLANT

DWG. NO. 5004-15-B

**Laboratory  
Analytical  
Report**

COVER LETTER

Saturday, December 13, 2008

Bruce Cauthen  
Western Refining Southwest, Inc.  
#50 CR 4990  
Bloomfield, NM 87413  
TEL: (505) 632-4161  
FAX (505) 632-3911

RE: Jal LP Propane Screen

Order No.: 0812126

Dear Bruce Cauthen:

Hall Environmental Analysis Laboratory, Inc. received 7 sample(s) on 12/5/2008 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

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

Sincerely,

\_\_\_\_\_  
Andy Freeman, Business Manager  
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425  
AZ license # AZ0682  
ORELAP Lab # NM100001  
Texas Lab# T104704424-08-TX





ENERGY LABORATORIES, INC. \* 400 W Boxelder Rd \* Gillette, WY 82718-5315  
Toll Free 866.686.7175 \* 307.686.7175 \* FAX 307.682.4625 \* gillette@energylab.com

### LABORATORY ANALYTICAL REPORT

Client: Hall Environmental-Albuquerque  
Project: 0812126  
Client Sample ID: 0812126-01A; ACW 1  
Location:  
Samp FRQ/Type:  
Lab ID: G08120236-001

Report Date: 12/13/08  
Collection Date: 12/02/08 13:30  
Date Received: 12/09/08  
Matrix: Air  
Sampled By:

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
<b>NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT</b>					
Oxygen	16.052	Mol %		GPA 2261	12/10/08 09:56 / djk
Nitrogen	80.336	Mol %		GPA 2261	12/10/08 09:56 / djk
Carbon Dioxide	3.698	Mol %		GPA 2261	12/10/08 09:56 / djk
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	12/10/08 09:56 / djk
Methane	< 0.001	Mol %		GPA 2261	12/10/08 09:56 / djk
Ethane	< 0.001	Mol %		GPA 2261	12/10/08 09:56 / djk
Propane	0.014	Mol %		GPA 2261	12/10/08 09:56 / djk
Isobutane	< 0.001	Mol %		GPA 2261	12/10/08 09:56 / djk
n-Butane	< 0.001	Mol %		GPA 2261	12/10/08 09:56 / djk
Isopentane	< 0.001	Mol %		GPA 2261	12/10/08 09:56 / djk
n-Pentane	< 0.001	Mol %		GPA 2261	12/10/08 09:56 / djk
Hexanes plus	< 0.001	Mol %		GPA 2261	12/10/08 09:56 / djk
<b>GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS</b>					
GPM Propane	0.0040	gal/MCF		GPA 2261	12/10/08 09:56 / djk
GPM Isobutane	< 0.0003	gal/MCF		GPA 2261	12/10/08 09:56 / djk
GPM n-Butane	< 0.0003	gal/MCF		GPA 2261	12/10/08 09:56 / djk
GPM Isopentane	< 0.0004	gal/MCF		GPA 2261	12/10/08 09:56 / djk
GPM n-Pentane	< 0.0004	gal/MCF		GPA 2261	12/10/08 09:56 / djk
GPM Hexanes plus	< 0.0004	gal/MCF		GPA 2261	12/10/08 09:56 / djk
GPM Pentanes plus	< 0.0004	gal/MCF		GPA 2261	12/10/08 09:56 / djk
GPM Total	0.0040	gal/MCF		GPA 2261	12/10/08 09:56 / djk
<b>CALCULATED PROPERTIES</b>					
Compressibility Factor, Z	0.9998	unitless		GPA 2261	12/10/08 09:56 / djk
Gross BTU per cu ft @ std cond, dry	< 1	BTU/cu. ft.		GPA 2261	12/10/08 09:56 / djk
Gross BTU per cu ft @ std cond, wet	< 1	BTU/cu. ft.		GPA 2261	12/10/08 09:56 / djk
Molecular Weight	29.23	unitless		GPA 2261	12/10/08 09:56 / djk
Pseudo-critical Pressure, psia	553	psia		GPA 2261	12/10/08 09:56 / djk
Pseudo-critical Temperature, deg R	248	deg R		GPA 2261	12/10/08 09:56 / djk
Specific Gravity (air=1.000)	1.012	unitless		GPA 2261	12/10/08 09:56 / djk
<b>CONDITIONS</b>					
Calculation Pressure Base	14.730	psia		GPA 2261	12/10/08 09:56 / djk
Calculation Temperature Base	60	°F		GPA 2261	12/10/08 09:56 / djk

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



ENERGY LABORATORIES, INC. \* 400 W Boxelder Rd \* Gillette, WY 82718-5316  
Toll Free 866.686.7176 \* 307.686.7176 \* FAX 307.682.4625 \* gillette@energylab.com

### LABORATORY ANALYTICAL REPORT

Client: Hall Environmental-Albuquerque  
Project: 0812126  
Client Sample ID: 0812126-02A; ACW 2A  
Location:  
Samp FRQ/Type:  
Lab ID: G08120236-002

Report Date: 12/13/08  
Collection Date: 12/02/08 13:50  
Date Received: 12/09/08  
Matrix: Air  
Sampled By:

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
<b>NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT</b>					
Oxygen	1.359	Mol %		GPA 2261	12/10/08 10:25 / djk
Nitrogen	79.820	Mol %		GPA 2261	12/10/08 10:26 / djk
Carbon Dioxide	11.030	Mol %		GPA 2261	12/10/08 10:25 / djk
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	12/10/08 10:25 / djk
Methane	0.197	Mol %		GPA 2261	12/10/08 10:25 / djk
Ethane	0.188	Mol %		GPA 2261	12/10/08 10:25 / djk
Propane	2.680	Mol %		GPA 2261	12/10/08 10:25 / djk
Isobutane	1.171	Mol %		GPA 2261	12/10/08 10:25 / djk
n-Butane	3.511	Mol %		GPA 2261	12/10/08 10:25 / djk
Isopentane	0.150	Mol %		GPA 2261	12/10/08 10:25 / djk
n-Pentane	0.014	Mol %		GPA 2261	12/10/08 10:25 / djk
Hexanes plus	< 0.001	Mol %		GPA 2261	12/10/08 10:25 / djk
<b>GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS</b>					
GPM Propane	0.7090	gal/MCF		GPA 2261	12/10/08 10:25 / djk
GPM Isobutane	0.3620	gal/MCF		GPA 2261	12/10/08 10:25 / djk
GPM n-Butane	1.1040	gal/MCF		GPA 2261	12/10/08 10:25 / djk
GPM Isopentane	0.0550	gal/MCF		GPA 2261	12/10/08 10:25 / djk
GPM n-Pentane	0.0050	gal/MCF		GPA 2261	12/10/08 10:25 / djk
GPM Hexanes plus	< 0.0004	gal/MCF		GPA 2261	12/10/08 10:25 / djk
GPM Pentanes plus	0.0600	gal/MCF		GPA 2261	12/10/08 10:25 / djk
GPM Total	2.2550	gal/MCF		GPA 2261	12/10/08 10:25 / djk
<b>CALCULATED PROPERTIES</b>					
Compressibility Factor, Z	0.9988	unitless		GPA 2261	12/10/08 10:25 / djk
Gross BTU per cu ft @ std cond, dry	230	BTU/cu. ft.		GPA 2261	12/10/08 10:25 / djk
Gross BTU per cu ft @ std cond, wet	226	BTU/cu. ft.		GPA 2261	12/10/08 10:25 / djk
Molecular Weight	31.71	unitless		GPA 2261	12/10/08 10:25 / djk
Pseudo-critical Pressure, psia	687	psia		GPA 2261	12/10/08 10:25 / djk
Pseudo-critical Temperature, deg R	302	deg R		GPA 2261	12/10/08 10:25 / djk
Specific Gravity (air=1.000)	1.098	unitless		GPA 2261	12/10/08 10:25 / djk
<b>CONDITIONS</b>					
Calculation Pressure Base	14.730	psia		GPA 2261	12/10/08 10:25 / djk
Calculation Temperature Base	60	°F		GPA 2261	12/10/08 10:25 / djk

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.


**LABORATORY ANALYTICAL REPORT**

Client: Hall Environmental-Albuquerque  
 Project: 0812126  
 Client Sample ID: 0812126-03A; ENSR 3  
 Location:  
 Samp FRQ/Type:  
 Lab ID: G08120236-003

Report Date: 12/13/08  
 Collection Date: 12/02/08 14:10  
 Date Received: 12/09/08  
 Matrix: Air  
 Sampled By:

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
----------	--------	-------	-----------	--------	--------------------

**NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT**

Oxygen	14.695	Mol %		GPA 2261	12/10/08 10:43 / djk
Nitrogen	79.713	Mol %		GPA 2261	12/10/08 10:43 / djk
Carbon Dioxide	5.579	Mol %		GPA 2261	12/10/08 10:43 / djk
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	12/10/08 10:43 / djk
Methane	< 0.001	Mol %		GPA 2261	12/10/08 10:43 / djk
Ethane	< 0.001	Mol %		GPA 2261	12/10/08 10:43 / djk
Propane	0.014	Mol %		GPA 2261	12/10/08 10:43 / djk
Isobutane	0.009	Mol %		GPA 2261	12/10/08 10:43 / djk
n-Butane	< 0.001	Mol %		GPA 2261	12/10/08 10:43 / djk
Isopentane	< 0.001	Mol %		GPA 2261	12/10/08 10:43 / djk
n-Pentane	< 0.001	Mol %		GPA 2261	12/10/08 10:43 / djk
Hexanes plus	< 0.001	Mol %		GPA 2261	12/10/08 10:43 / djk

**GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS**

GPM Propane	0.0040	gal/MCF		GPA 2261	12/10/08 10:43 / djk
GPM Isobutane	0.0030	gal/MCF		GPA 2261	12/10/08 10:43 / djk
GPM n-Butane	< 0.0003	gal/MCF		GPA 2261	12/10/08 10:43 / djk
GPM Isopentane	< 0.0004	gal/MCF		GPA 2261	12/10/08 10:43 / djk
GPM n-Pentane	< 0.0004	gal/MCF		GPA 2261	12/10/08 10:43 / djk
GPM Hexanes plus	< 0.0004	gal/MCF		GPA 2261	12/10/08 10:43 / djk
GPM Pentanes plus	< 0.0004	gal/MCF		GPA 2261	12/10/08 10:43 / djk
GPM Total	0.0070	gal/MCF		GPA 2261	12/10/08 10:43 / djk

**CALCULATED PROPERTIES**

Compressibility Factor, Z	0.9995	unitless		GPA 2261	12/10/08 10:43 / djk
Gross BTU per cu ft @ std cond, dry	< 1	BTU/cu. ft.		GPA 2261	12/10/08 10:43 / djk
Gross BTU per cu ft @ std cond, wet	< 1	BTU/cu. ft.		GPA 2261	12/10/08 10:43 / djk
Molecular Weight	29.50	unitless		GPA 2261	12/10/08 10:43 / djk
Pseudo-critical Pressure, psia	581	psia		GPA 2261	12/10/08 10:43 / djk
Pseudo-critical Temperature, deg R	259	deg R		GPA 2261	12/10/08 10:43 / djk
Specific Gravity (air=1.000)	1.022	unitless		GPA 2261	12/10/08 10:43 / djk

**CONDITIONS**

Calculation Pressure Base	14.730	psia		GPA 2261	12/10/08 10:43 / djk
Calculation Temperature Base	60	°F		GPA 2261	12/10/08 10:43 / djk

Report RL - Analyte reporting limit.  
 Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



ENERGY LABORATORIES, INC. \* 400 W Boxelder Rd \* Gillette, WY 82718-5315  
Toll Free 866.686.7175 \* 307.686.7175 \* FAX 307.682.4625 \* gillette@energylab.com

### LABORATORY ANALYTICAL REPORT

Client: Hall Environmental-Albuquerque  
Project: 0812126  
Client Sample ID: 0812126-04A; ACW 2 (A)  
Location:  
Samp FRQ/Type:  
Lab ID: G08120236-004

Report Date: 12/13/08  
Collection Date: 12/02/08 14:20  
Date Received: 12/09/08  
Matrix: Air  
Sampled By:

Analyses	Result	Units	Qualifier Method	Analysis Date / By
<b>NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT</b>				
Oxygen	1.418	Mol %	GPA 2261	12/10/08 10:57 / djk
Nitrogen	79.795	Mol %	GPA 2261	12/10/08 10:57 / djk
Carbon Dioxide	10.979	Mol %	GPA 2261	12/10/08 10:57 / djk
Hydrogen Sulfide	< 0.001	Mol %	GPA 2261	12/10/08 10:57 / djk
Methane	0.198	Mol %	GPA 2261	12/10/08 10:57 / djk
Ethane	0.167	Mol %	GPA 2261	12/10/08 10:57 / djk
Propane	2.580	Mol %	GPA 2261	12/10/08 10:57 / djk
Isobutane	1.171	Mol %	GPA 2261	12/10/08 10:57 / djk
n-Butane	3.534	Mol %	GPA 2261	12/10/08 10:57 / djk
Isopentane	0.152	Mol %	GPA 2261	12/10/08 10:57 / djk
n-Pentane	0.015	Mol %	GPA 2261	12/10/08 10:57 / djk
Hexanes plus	< 0.001	Mol %	GPA 2261	12/10/08 10:57 / djk
<b>GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS</b>				
GPM Propane	0.7090	gal/MCF	GPA 2261	12/10/08 10:57 / djk
GPM Isobutane	0.3820	gal/MCF	GPA 2261	12/10/08 10:57 / djk
GPM n-Butane	1.1120	gal/MCF	GPA 2261	12/10/08 10:57 / djk
GPM Isopentane	0.0550	gal/MCF	GPA 2261	12/10/08 10:57 / djk
GPM n-Pentane	0.0050	gal/MCF	GPA 2261	12/10/08 10:57 / djk
GPM Hexanes plus	< 0.0004	gal/MCF	GPA 2261	12/10/08 10:57 / djk
GPM Pentanes plus	0.0800	gal/MCF	GPA 2261	12/10/08 10:57 / djk
GPM Total	2.2630	gal/MCF	GPA 2261	12/10/08 10:57 / djk
<b>CALCULATED PROPERTIES</b>				
Compressibility Factor, Z	0.9988	unitless	GPA 2261	12/10/08 10:57 / djk
Gross BTU per cu ft @ std cond, dry	231	BTU/cu. ft.	GPA 2261	12/10/08 10:57 / djk
Gross BTU per cu ft @ std cond, wet	227	BTU/cu. ft.	GPA 2261	12/10/08 10:57 / djk
Molecular Weight	31.71	unitless	GPA 2261	12/10/08 10:57 / djk
Pseudo-critical Pressure, psia	567	psia	GPA 2261	12/10/08 10:57 / djk
Pseudo-critical Temperature, deg R	302	deg R	GPA 2261	12/10/08 10:57 / djk
Specific Gravity (air=1.000)	1.088	unitless	GPA 2261	12/10/08 10:57 / djk
<b>CONDITIONS</b>				
Calculation Pressure Base	14.730	psia	GPA 2261	12/10/08 10:57 / djk
Calculation Temperature Base	60	°F	GPA 2261	12/10/08 10:57 / djk

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



ENERGY LABORATORIES, INC. \* 400 W Boxelder Rd \* Gillette, WY 82718-8318  
Toll Free 866.686.7175 \* 307.686.7175 \* FAX 307.682.4625 \* gillette@energylab.com

### LABORATORY ANALYTICAL REPORT

Client: Hall Environmental-Albuquerque  
Project: 0812126  
Client Sample ID: 0812126-05A; PTP 1  
Location:  
Samp FRO/Type:  
Lab ID: G08120236-005

Report Date: 12/13/08  
Collection Date: 12/02/08 14:15  
Date Received: 12/09/08  
Matrix: Air  
Sampled By:

Analyses	Result	Units	Qualifier Method	Analysis Date / By
<b>NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT</b>				
Oxygen	16.807	Mol %	GPA 2261	12/10/08 13:21 / djk
Nitrogen	76.027	Mol %	GPA 2261	12/10/08 13:21 / djk
Carbon Dioxide	4.107	Mol %	GPA 2261	12/10/08 13:21 / djk
Hydrogen Sulfide	< 0.001	Mol %	GPA 2261	12/10/08 13:21 / djk
Methane	0.193	Mol %	GPA 2261	12/10/08 13:21 / djk
Ethane	0.127	Mol %	GPA 2261	12/10/08 13:21 / djk
Propane	2.238	Mol %	GPA 2261	12/10/08 13:21 / djk
Isobutane	0.191	Mol %	GPA 2261	12/10/08 13:21 / djk
n-Butane	0.214	Mol %	GPA 2261	12/10/08 13:21 / djk
Isopentane	0.061	Mol %	GPA 2261	12/10/08 13:21 / djk
n-Pentane	0.007	Mol %	GPA 2261	12/10/08 13:21 / djk
Hexanes plus	0.028	Mol %	GPA 2261	12/10/08 13:21 / djk
<b>GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS</b>				
GPM Propane	0.6150	gal/MCF	GPA 2261	12/10/08 13:21 / djk
GPM Isobutane	0.0620	gal/MCF	GPA 2261	12/10/08 13:21 / djk
GPM n-Butane	0.0670	gal/MCF	GPA 2261	12/10/08 13:21 / djk
GPM Isopentane	0.0220	gal/MCF	GPA 2261	12/10/08 13:21 / djk
GPM n-Pentane	0.0030	gal/MCF	GPA 2261	12/10/08 13:21 / djk
GPM Hexanes plus	0.0120	gal/MCF	GPA 2261	12/10/08 13:21 / djk
GPM Pentanes plus	0.0370	gal/MCF	GPA 2261	12/10/08 13:21 / djk
GPM Total	0.7820	gal/MCF	GPA 2261	12/10/08 13:21 / djk
<b>CALCULATED PROPERTIES</b>				
Compressibility Factor, Z	0.9994	unitless	GPA 2261	12/10/08 13:21 / djk
Gross BTU per cu ft @ std cond, dry	78	BTU/cu. ft.	GPA 2261	12/10/08 13:21 / djk
Gross BTU per cu ft @ std cond, wet	77	BTU/cu. ft.	GPA 2261	12/10/08 13:21 / djk
Molecular Weight	28.85	unitless	GPA 2261	12/10/08 13:21 / djk
Pseudo-critical Pressure, psia	561	psia	GPA 2261	12/10/08 13:21 / djk
Pseudo-critical Temperature, deg R	263	deg R	GPA 2261	12/10/08 13:21 / djk
Specific Gravity (air=1.000)	1.034	unitless	GPA 2261	12/10/08 13:21 / djk
<b>CONDITIONS</b>				
Calculation Pressure Base	14.730	psia	GPA 2261	12/10/08 13:21 / djk
Calculation Temperature Base	60	°F	GPA 2261	12/10/08 13:21 / djk

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## LABORATORY ANALYTICAL REPORT

Client: Hall Environmental-Albuquerque  
 Project: 0812126  
 Client Sample ID: 0812126-08A; ACW 2A1  
 Location:  
 Samp FRQ/Type:  
 Lab ID: G08120236-006

Report Date: 12/13/08  
 Collection Date: 12/02/08 15:05  
 Date Received: 12/09/08  
 Matrix: Air  
 Sampled By:

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
<b>NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT</b>					
Oxygen	1.879	Mol %		GPA 2261	12/10/08 11:37 / djk
Nitrogen	80.324	Mol %		GPA 2261	12/10/08 11:37 / djk
Carbon Dioxide	10.718	Mol %		GPA 2261	12/10/08 11:37 / djk
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	12/10/08 11:37 / djk
Methane	0.158	Mol %		GPA 2261	12/10/08 11:37 / djk
Ethane	0.197	Mol %		GPA 2261	12/10/08 11:37 / djk
Propane	2.374	Mol %		GPA 2261	12/10/08 11:37 / djk
Isobutane	1.096	Mol %		GPA 2261	12/10/08 11:37 / djk
n-Butane	3.168	Mol %		GPA 2261	12/10/08 11:37 / djk
Isopentane	0.134	Mol %		GPA 2261	12/10/08 11:37 / djk
n-Pentane	0.012	Mol %		GPA 2261	12/10/08 11:37 / djk
Hexanes plus	< 0.001	Mol %		GPA 2261	12/10/08 11:37 / djk
<b>GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS</b>					
GPM Propane	0.8620	gal/MCF		GPA 2261	12/10/08 11:37 / djk
GPM Isobutane	0.3580	gal/MCF		GPA 2261	12/10/08 11:37 / djk
GPM n-Butane	0.9960	gal/MCF		GPA 2261	12/10/08 11:37 / djk
GPM Isopentane	0.0490	gal/MCF		GPA 2261	12/10/08 11:37 / djk
GPM n-Pentane	0.0040	gal/MCF		GPA 2261	12/10/08 11:37 / djk
GPM Hexanes plus	< 0.0004	gal/MCF		GPA 2261	12/10/08 11:37 / djk
GPM Pentanes plus	0.0530	gal/MCF		GPA 2261	12/10/08 11:37 / djk
GPM Total	2.0580	gal/MCF		GPA 2261	12/10/08 11:37 / djk
<b>CALCULATED PROPERTIES</b>					
Compressibility Factor, Z	0.8689	unitless		GPA 2261	12/10/08 11:37 / djk
Gross BTU per cu ft @ std cond, dry	209	BTU/cu. ft.		GPA 2261	12/10/08 11:37 / djk
Gross BTU per cu ft @ std cond, wet	208	BTU/cu. ft.		GPA 2261	12/10/08 11:37 / djk
Molecular Weight	31.52	unitless		GPA 2261	12/10/08 11:37 / djk
Pseudo-critical Pressure, psia	566	psia		GPA 2261	12/10/08 11:37 / djk
Pseudo-critical Temperature, deg F	288	deg F		GPA 2261	12/10/08 11:37 / djk
Specific Gravity (air=1.000)	1.092	unitless		GPA 2261	12/10/08 11:37 / djk
<b>CONDITIONS</b>					
Calculation Pressure Base	14.730	psia		GPA 2261	12/10/08 11:37 / djk
Calculation Temperature Base	60	°F		GPA 2261	12/10/08 11:37 / djk

Report RL - Analyte reporting limit.  
 Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.

**LABORATORY ANALYTICAL REPORT**

Client: Hall Environmental-Albuquerque  
 Project: 0812126  
 Client Sample ID: 0812126-07A; ENSR 1  
 Location:  
 Samp FRQ/Type:  
 Lab ID: G08120236-007

Report Date: 12/13/08  
 Collection Date: 12/02/08 14:30  
 Date Received: 12/08/08  
 Matrix: Air  
 Sampled By:

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
<b>NATURAL GAS CHROMATOGRAPHIC ANALYSIS REPORT</b>					
Oxygen	17.397	Mol %		GPA 2261	12/10/08 11:55 / djk
Nitrogen	79.993	Mol %		GPA 2261	12/10/08 11:55 / djk
Carbon Dioxide	2.590	Mol %		GPA 2261	12/10/08 11:55 / djk
Hydrogen Sulfide	< 0.001	Mol %		GPA 2261	12/10/08 11:55 / djk
Methane	< 0.001	Mol %		GPA 2261	12/10/08 11:55 / djk
Ethane	< 0.001	Mol %		GPA 2261	12/10/08 11:55 / djk
Propane	0.030	Mol %		GPA 2261	12/10/08 11:55 / djk
Isobutane	< 0.001	Mol %		GPA 2261	12/10/08 11:55 / djk
n-Butane	< 0.001	Mol %		GPA 2261	12/10/08 11:55 / djk
Isopentane	< 0.001	Mol %		GPA 2261	12/10/08 11:55 / djk
n-Pentane	< 0.001	Mol %		GPA 2261	12/10/08 11:55 / djk
Hexanes plus	< 0.001	Mol %		GPA 2261	12/10/08 11:55 / djk
<b>GPM @ STD COND/1000 CU.FT., MOISTURE FREE GAS</b>					
GPM Propane	0.0080	gal/MCF		GPA 2261	12/10/08 11:55 / djk
GPM Isobutane	< 0.0003	gal/MCF		GPA 2261	12/10/08 11:55 / djk
GPM n-Butane	< 0.0003	gal/MCF		GPA 2261	12/10/08 11:55 / djk
GPM Isopentane	< 0.0004	gal/MCF		GPA 2261	12/10/08 11:55 / djk
GPM n-Pentane	< 0.0004	gal/MCF		GPA 2261	12/10/08 11:55 / djk
GPM Hexanes plus	< 0.0004	gal/MCF		GPA 2261	12/10/08 11:55 / djk
GPM Pentanes plus	< 0.0004	gal/MCF		GPA 2261	12/10/08 11:55 / djk
GPM Total	0.0080	gal/MCF		GPA 2261	12/10/08 11:55 / djk
<b>CALCULATED PROPERTIES</b>					
Compressibility Factor, Z	0.9996	unitless		GPA 2261	12/10/08 11:55 / djk
Gross BTU per cu ft @ std cond, dry	< 1	BTU/cu. ft.		GPA 2261	12/10/08 11:55 / djk
Gross BTU per cu ft @ std cond, wet	< 1	BTU/cu. ft.		GPA 2261	12/10/08 11:55 / djk
Molecular Weight	29.13	unitless		GPA 2261	12/10/08 11:55 / djk
Pseudo-critical Pressure, psia	661	psia		GPA 2261	12/10/08 11:55 / djk
Pseudo-critical Temperature, deg R	248	deg R		GPA 2261	12/10/08 11:55 / djk
Specific Gravity (air=1.000)	1.009	unitless		GPA 2261	12/10/08 11:55 / djk
<b>CONDITIONS</b>					
Calculation Pressure Base	14.730	psia		GPA 2261	12/10/08 11:55 / djk
Calculation Temperature Base	60	°F		GPA 2261	12/10/08 11:55 / djk

Report Definitions: RL - Analyte reporting limit.  
 QCL - Quality control limit.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.

### QA/QC Summary Report

Client: Hall Environmental-Albuquerque

Report Date: 12/13/08

Project: 0812126

Work Order: G08120236

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261 <span style="float: right;">Batch: R165498</span>									
Sample ID: LCS-A103-081210-3	Laboratory Control Sample			Run: VARIAN GC_081210A			12/10/08 08:21		
Oxygen	0.37800	Mol %	0.0010	125	70	130			
Nitrogen	6.5750	Mol %	0.0010	108	90	110			
Carbon Dioxide	1.0130	Mol %	0.0010	100	90	110			
Hydrogen Sulfide	0.20700	Mol %	0.0010	103	70	130			
Methane	74.095	Mol %	0.0010	99	90	110			
Ethane	5.9330	Mol %	0.0010	99	90	110			
Propane	4.9520	Mol %	0.0010	100	90	110			
Isobutane	2.0010	Mol %	0.0010	101	90	110			
n-Butane	2.0130	Mol %	0.0010	101	90	110			
Isopentane	1.0200	Mol %	0.0010	101	90	110			
n-Pentane	1.0080	Mol %	0.0010	101	90	110			
Hexanes plus	0.80500	Mol %	0.0010	100	80	120			
Sample ID: G08120236-001ADUP	Sample Duplicate			Run: VARIAN GC_081210A			12/10/08 10:14		
Oxygen	16.085	Mol %	0.0010				0.1	10	
Nitrogen	80.323	Mol %	0.0010				0	10	
Carbon Dioxide	3.5980	Mol %	0.0010				0	10	
Hydrogen Sulfide	:0.0010000	Mol %	0.0010				0	10	
Methane	:0.0010000	Mol %	0.0010				0	10	
Ethane	:0.0010000	Mol %	0.0010				0	10	
Propane	0.014000	Mol %	0.0010				0	10	
Isobutane	:0.0010000	Mol %	0.0010				0	10	
n-Butane	:0.0010000	Mol %	0.0010				0	10	
Isopentane	:0.0010000	Mol %	0.0010				0	10	
n-Pentane	:0.0010000	Mol %	0.0010				0	10	
Hexanes plus	:0.0010000	Mol %	0.0010				0	20	
Sample ID: G08120236-002ADUP	Sample Duplicate			Run: VARIAN GC_081210A			12/10/08 10:29		
Oxygen	1.3810	Mol %	0.0010				1.8	10	
Nitrogen	79.792	Mol %	0.0010				0	10	
Carbon Dioxide	11.038	Mol %	0.0010				0.1	10	
Hydrogen Sulfide	:0.0010000	Mol %	0.0010				0	10	
Methane	0.19300	Mol %	0.0010				2.1	10	
Ethane	0.16800	Mol %	0.0010				0	10	
Propane	2.5810	Mol %	0.0010				0	10	
Isobutane	1.1710	Mol %	0.0010				0	10	
n-Butane	3.5120	Mol %	0.0010				0	10	
Isopentane	0.15000	Mol %	0.0010				0	10	
n-Pentane	0.014000	Mol %	0.0010				0	10	
Hexanes plus	:0.0010000	Mol %	0.0010				0	20	
Sample ID: G08120236-003ADUP	Sample Duplicate			Run: VARIAN GC_081210A			12/10/08 10:47		
Oxygen	14.803	Mol %	0.0010				0.8	10	
Nitrogen	78.665	Mol %	0.0010				0.1	10	

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

### QA/QC Summary Report

Client: Hall Environmental-Albuquerque  
 Project: 0812126

Report Date: 12/13/08  
 Work Order: G08120236

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: GPA 2261							Batch: R165408		
Sample ID: G08120236-003ADUP	Sample Duplicate		Run: VARIAN GC_081210A				12/10/08 10:47		
Carbon Dioxide	5.5080	Mol %	0.0010				1.3	10	
Hydrogen Sulfide	: 0.0010000	Mol %	0.0010				0	10	
Methane	: 0.0010000	Mol %	0.0010				0	10	
Ethane	: 0.0010000	Mol %	0.0010				0	10	
Propane	0.014000	Mol %	0.0010				0	10	
Isobutane	0.0090000	Mol %	0.0010				0	10	
n-Butane	: 0.0010000	Mol %	0.0010				0	10	
Isopentane	: 0.0010000	Mol %	0.0010				0	10	
n-Pentane	: 0.0010000	Mol %	0.0010				0	10	
Hexanes plus	: 0.0010000	Mol %	0.0010				0	20	
Sample ID: G08120236-004ADUP	Sample Duplicate		Run: VARIAN GC_081210A				12/10/08 11:01		
Oxygen	1.4480	Mol %	0.0010				2	10	
Nitrogen	79.778	Mol %	0.0010				0	10	
Carbon Dioxide	10.874	Mol %	0.0010				0	10	
Hydrogen Sulfide	: 0.0010000	Mol %	0.0010				0	10	
Methane	0.18600	Mol %	0.0010				6.3	10	
Ethane	0.18700	Mol %	0.0010				0	10	
Propane	2.5780	Mol %	0.0010				0.1	10	
Isobutane	1.1710	Mol %	0.0010				0	10	
n-Butane	3.5310	Mol %	0.0010				0.1	10	
Isopentane	0.15200	Mol %	0.0010				0	10	
n-Pentane	0.015000	Mol %	0.0010				0	10	
Hexanes plus	: 0.0010000	Mol %	0.0010				0	20	
Sample ID: G08120236-006ADUP	Sample Duplicate		Run: VARIAN GC_081210A				12/10/08 11:41		
Oxygen	1.8370	Mol %	0.0010				3	10	
Nitrogen	80.275	Mol %	0.0010				0.1	10	
Carbon Dioxide	10.693	Mol %	0.0010				0.2	10	
Hydrogen Sulfide	: 0.0010000	Mol %	0.0010				0	10	
Methane	0.18500	Mol %	0.0010				4.3	10	
Ethane	0.13700	Mol %	0.0010				0	10	
Propane	2.3710	Mol %	0.0010				0.1	10	
Isobutane	1.1000	Mol %	0.0010				0.4	10	
n-Butane	3.1780	Mol %	0.0010				0.3	10	
Isopentane	0.13400	Mol %	0.0010				0	10	
n-Pentane	0.012000	Mol %	0.0010				0	10	
Hexanes plus	: 0.0010000	Mol %	0.0010				0	20	
Sample ID: G08120236-009ADUP	Sample Duplicate		Run: VARIAN GC_081210A				12/10/08 13:25		
Oxygen	16.910	Mol %	0.0010				0.6	10	
Nitrogen	76.025	Mol %	0.0010				0	10	
Carbon Dioxide	4.0400	Mol %	0.0010				1.8	10	
Hydrogen Sulfide	: 0.0010000	Mol %	0.0010				0	10	

Qualifiers:  
 RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

### QA/QC Summary Report

Client: Hall Environmental-Albuquerque

Report Date: 12/13/08

Project: 0812126

Work Order: G08120236

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
---------	--------	-------	----	------	-----------	------------	-----	----------	------

Method: GPA 2261

Batch: R165498

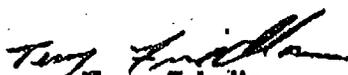
Sample ID: G08120236-005ADUP

Sample Duplicate

Run: VARIAN GC\_081210A

12/10/08 13:26

Methane	0.16700	Mol %	0.0010				3.2	10	
Ethane	0.12500	Mol %	0.0010				1.8	10	
Propane	2.2150	Mol %	0.0010				1	10	
Isobutane	0.19000	Mol %	0.0010				0.5	10	
n-Butane	0.21200	Mol %	0.0010				0.9	10	
Isopentane	0.061000	Mol %	0.0010				0	10	
n-Pentane	0.0070000	Mol %	0.0010				0	10	
Hexanes plus	0.028000	Mol %	0.0010				0	20	

  
**Terry Friedlan**  
 Laboratory Manager

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name WESTERN REFINING SOUT

Date Received:

12/5/2008

Work Order Number 0812126

Received by: ARS

Checklist completed by:

Signature [Handwritten Signature]

Date 12/5/08

Sample ID labels checked by:

Initials AS

Matrix:

Carrier name Client drop-off

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present  Not Shipped
- Custody seals intact on sample bottles? Yes  No  N/A
- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers intact? Yes  No
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Water - VOA vials have zero headspace? No VOA vials submitted  Yes  No
- Water - Preservation labels on bottle and cap match? Yes  No  N/A
- Water - pH acceptable upon receipt? Yes  No  N/A

Container/Temp Blank temperature?

<6° C Acceptable  
If given sufficient time to cool.

COMMENTS:

Client contacted \_\_\_\_\_ Date contacted: \_\_\_\_\_ Person contacted \_\_\_\_\_

Contacted by: \_\_\_\_\_ Regarding: \_\_\_\_\_

Comments: \_\_\_\_\_

Corrective Action \_\_\_\_\_



## Chavez, Carl J, EMNRD

---

**From:** Cauthen, Bruce [Bruce.Cauthen@wnr.com]  
**Sent:** Friday, December 12, 2008 9:57 AM  
**To:** Chavez, Carl J, EMNRD  
**Cc:** Hains, Allen  
**Subject:** RE: Western Refining Company, L.P. Jal LPG Storage Facility (GW-007)  
**Attachments:** MSA Sirius.pdf

Mr. Chavez,

Please find our summary comments (in red) to your numbered concerns attached to this email. Also I am enclosing a .pdf version of the operations manual for the Sirius PID monitor utilized in our sampling event. Please let me know if you have any further questions or concerns.

Thank you!

***Bruce Cauthen***  
***Environmental Engineer***  
***Logistics / HSER***  
***Western Refining Southwest Inc.***

*San Juan Regional Office*  
*111 County Road 4990*  
*Bloomfield, NM 87413*  
*Main: 505-632-4035*  
*Cell: 505-793-3304*  
[www.wnr.com](http://www.wnr.com)  
[bruce.cauthen@wnr.com](mailto:bruce.cauthen@wnr.com)

---

**From:** Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]  
**Sent:** Thursday, December 04, 2008 8:42 AM  
**To:** Cauthen, Bruce  
**Cc:** Price, Wayne, EMNRD; Parker, Ken  
**Subject:** Western Refining Company, L.P. Jal LPG Storage Facility (GW-007)

Mr. Cauthen:

Good morning. I am in receipt of the Propane Screening- Sampling and Analyses Work Plan that was requested during a meeting in Santa Fe, New Mexico on May 14, 2008. The propane testing was recommended after some propane was apparently unaccounted for or possibly escaped to the formation.

OCD comments on procedure:

1) The operator should if possible procure a sample in the tedlar bag from immediately beneath the cap without opening the cap. If not possible, slightly open the monitor well cap to prevent venting and quickly stick the probe in to see if any propane is detected initially and record results. Any venting of the cap with fresh air will dilute the readings in the proposed procedure, so a cap that will allow the tubing to be lowered w/ minimal venting is recommended. Western considered the comment above during development of the work plan. Our goal is to collect a representative sample of gas entering the well and analyze for propane. These wells are owned and operated by El Paso Energy as part of their ongoing ground water remediation program. Generally, the wells heads do not have a tight seal due to remediation equipment or pressure equalization holes drilled in the cap. The purpose of sampling at the bottom of the well is to collect a representative sample of the gas entering the well by avoiding dilution from the surface.

2) The Sirius PID Four Gas Monitor specifications should have been attached to your submittal to assess the accuracy and limitations of the instrument. For example, will the PID eV bulb detect propane compounds? If so, at what accuracy? PPM. Please attach the specifications with your submittal of analytical data.

During the work plan preparation, Western verified that the Sirius PID Four Gas Monitor would detect propane in LEL mode. See page 7-3 of the attachment. The LEL response factor is approximately 0.80. The Sirius Monitor is used as a field screening tool to detect the presence of VOCs and aid in the selection of confirmation samples. The Sirius Monitor is not capable of differentiating propane from other VOCs. Laboratory analyses is required to determine the presence of Propane.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Dept.  
Oil Conservation Division, Environmental Bureau  
1220 South St. Francis Dr., Santa Fe, New Mexico 87505  
Office: (505) 476-3491  
Fax: (505) 476-3462  
E-mail: [CarlJ.Chavez@state.nm.us](mailto:CarlJ.Chavez@state.nm.us)  
Website: <http://www.emnrd.state.nm.us/ocd/index.htm>  
(Pollution Prevention Guidance is under "Publications")

---

**From:** Cauthen, Bruce [mailto:[Bruce.Cauthen@wnr.com](mailto:Bruce.Cauthen@wnr.com)]  
**Sent:** Monday, November 24, 2008 2:27 PM  
**To:** Chavez, Carl J, EMNRD  
**Subject:**

Mr. Chavez,

Please find attached, a copy of our test protocol for sampling and analyzing the gaseous headspace of the groundwater monitoring wells, located within our property. This document was mailed to the NMOCD office and addressed to Wayne Price. We would appreciate it if you would watch for it and if appropriate, hurry it through the approval process. I plan to be on site on Dec. 2nd to perform these analyses. We have obtained permission from the well owner to enter their wells.

Thank you for your help in this matter.

***Bruce Cauthen***  
***Environmental Engineer***  
***Logistics / HSER***  
***Western Refining Southwest Inc.***

*San Juan Regional Office*  
*111 County Road 4990*  
*Bloomfield, NM 87413*  
*Main: 505-632-4035*  
*Cell: 505-793-3304*  
[www.wnr.com](http://www.wnr.com)  
[bruce.cauthen@wnr.com](mailto:bruce.cauthen@wnr.com)

---

This inbound email has been scanned by the MessageLabs Email Security System.

---

Confidentiality Notice: This e-mail, including all attachments is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited unless specifically provided under the New Mexico Inspection of Public Records Act. If you are not the intended recipient, please contact the sender and destroy all copies of this message. -- This email has been scanned by the Sybari - Antigen Email System.

---

This inbound email has been scanned by the MessageLabs Email Security System.

---

**Chavez, Carl J, EMNRD**

---

**From:** Cauthen, Bruce [Bruce.Cauthen@wnr.com]  
**Sent:** Monday, November 24, 2008 2:27 PM  
**To:** Chavez, Carl J, EMNRD  
**Attachments:** 1119170926.pdf

Mr. Chavez,  
Please find attached, a copy of our test protocol for sampling and analyzing the gaseous headspace of the groundwater monitoring wells, located within our property. This document was mailed to the NMOCD office and addressed to Wayne Price. We would appreciate it if you would watch for it and if appropriate, hurry it through the approval process. I plan to be on site on Dec. 2nd to perform these analyses. We have obtained permission from the well owner to enter their wells.

Thank you for your help in this matter.

***Bruce Cauthen***  
***Environmental Engineer***  
***Logistics / HSER***  
***Western Refining Southwest Inc.***

*San Juan Regional Office*  
*111 County Road 4990*  
*Bloomfield, NM 87413*  
*Main: 505-632-4035*  
*Cell: 505-793-3304*  
[www.wnr.com](http://www.wnr.com)  
[bruce.cauthen@wnr.com](mailto:bruce.cauthen@wnr.com)

---

This inbound email has been scanned by the MessageLabs Email Security System.

---

RECEIVED

2008 NOV 21 PM 1 37

Via Certified Mail  
7006 0100 0002 9205 1829

November 19, 2008

Mr. Wayne Price  
Environmental Bureau Chief  
New Mexico Oil Conservation Division  
1220 South St. Francis  
Santa Fe, New Mexico 87505

**RE: Propane Screening - Sampling and Analyses Work Plan  
OCD Discharge Permit GW-007  
Western Refining Company, L.P. Jal LPG Storage Facility  
Jal, New Mexico**

Dear Mr. Price:

On March 29, 2008, a discrepancy was discovered in the LPG propane inventory for Well #3. Approximately 13,755 Barrels of propane could not be accounted for. There was no evidence of propane venting or accumulating at the surface. The discrepancy was confirmed and was reported to NMOCD on May 20, 2008.

Western verbally agreed with NMOCD to perform field screening for propane at potential receptors (monitoring wells) at the facility. The Propane Screening – Sampling and Analyses Work Plan is attached for your review and approval. With your approval, Western refining would like to schedule the field work for early December 2008.

We appreciate your continued cooperation concerning this facility. If you have any questions please call Bruce Cauthen at 505/632-4035 or Bill Robertson at 505/632-4077.

Regards,



Ron Weaver

cc: Ken Parker  
Bill Robertson  
Bruce Cauthen  
Allen Hains

**Propane Screening - Sampling and Analyses Work Plan**  
**Western Refining Company**  
**L.P. Jal Storage Facility**  
**OCD Discharge Permit GW-007**  
**Jal, New Mexico**

**Date, 11/18/2008**

**Background**

This facility is a LPG Storage Facility and is manned when loading/unloading operations are in progress. The site has been permitted to allow storage of LPG in underground LPG Storage caverns. The operation includes four (4) underground LPG storage Caverns, Truck and railcar loading/unloading racks, two (2) double-lined brine storage ponds, LPG aboveground storage tanks, and associated pumps, valves and piping. LPG is transported to and from the facility via tanker trucks, LPG tanker rail cars, and pipeline. The facility operations also include an offsite NMOCD permitted disposal well. The facility layout is illustrated in Figure #1

On March 29, 2008, a discrepancy was discovered in the LPG propane inventory for Well #3. Approximately 13,755 Barrels of propane could not be accounted for. There was no evidence of propane venting or accumulating at the surface. The discrepancy was confirmed and was reported to NMOCD on May 20, 2008.

**Purpose**

The purpose of this work plan is to screen the potential conduits for the presence of propane.

**Scope of Work**

The scope of work consists of two phases: field screening and laboratory analyses.

**Field Screening – Materials and Procedure**

The field screening of groundwater remediation and monitoring wells and any other potential receptor for propane will be accomplished using a PID (Sirius). The following equipment will be utilized:

- A peristaltic sampling pump
- Tygon® tubing
- Tedlar® bags
- Sirius PID Four Gas Monitor

## **Procedure**

There are approximately fifteen (15) monitoring wells at the Jal LP Storage Facility. Field personnel will collect a representative sample of the gases from the wells and analyze for VOC presence. The samples will be collected and analyzed in accordance with the protocol listed below. Upon review of the field analyses, field personnel will select four (4) samples and one (1) duplicate to be sent to Hall Environmental Laboratory for confirmation analysis. If no wells test positive for VOC's, field personnel will choose four (4) well locations that cover the entire facility and one (1) duplicate to be sent for conformation analysis.

The following test protocol will be used for this field sampling event:

1. The sampling sequence will start from the farthest receptor from Well # 3 and end with the nearest well.
2. The Tygon® tubing attached to the peristaltic pump and to the Tedlar® bag.
3. The tubing will then be lowered down the casing of the monitor well.
4. The peristaltic pump will be activated and a gaseous sample will be collected in the Tedlar® bag.
5. A duplicate laboratory sample will be obtained for outside laboratory analysis.
6. Gas sample will be introduced into the PID.
7. Field personnel will record the results shown on the PID.

Field personnel will package the samples for transport and mail to Hall Environmental Laboratory for analysis

## **Laboratory Analyses**

The four (4) samples and one (1) duplicate will be analyzed by the laboratory for propane using method ASTM-D1945.

## **Schedule**

It is anticipated that the field work will last one day. Western will schedule this work with El Paso Energy, the owner of the wells. Western will provide notice prior to the sampling event.

## **Letter Report**

A letter report describing the methodology, field observations and readings, analytical results and conclusions will be submitted to NMOCD within 45 days of receipt of laboratory analyses.

## Chavez, Carl J, EMNRD

---

**From:** Cauthen, Bruce [Bruce.Cauthen@wnr.com]  
**Sent:** Friday, December 12, 2008 9:57 AM  
**To:** Chavez, Carl J, EMNRD  
**Cc:** Hains, Allen  
**Subject:** RE: Western Refining Company, L.P. Jal LPG Storage Facility (GW-007)  
**Attachments:** MSA Sirius.pdf

Mr. Chavez,

Please find our summary comments (in red) to your numbered concerns attached to this email. Also I am enclosing a .pdf version of the operations manual for the Sirius PID monitor utilized in our sampling event. Please let me know if you have any further questions or concerns.

Thank you!

***Bruce Cauthen***  
***Environmental Engineer***  
***Logistics / HSER***  
***Western Refining Southwest Inc.***

*San Juan Regional Office*  
*111 County Road 4990*  
*Bloomfield, NM 87413*  
*Main: 505-632-4035*  
*Cell: 505-793-3304*  
[www.wnr.com](http://www.wnr.com)  
[bruce.cauthen@wnr.com](mailto:bruce.cauthen@wnr.com)

---

**From:** Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]  
**Sent:** Thursday, December 04, 2008 8:42 AM  
**To:** Cauthen, Bruce  
**Cc:** Price, Wayne, EMNRD; Parker, Ken  
**Subject:** Western Refining Company, L.P. Jal LPG Storage Facility (GW-007)

Mr. Cauthen:

Good morning. I am in receipt of the Propane Screening- Sampling and Analyses Work Plan that was requested during a meeting in Santa Fe, New Mexico on May 14, 2008. The propane testing was recommended after some propane was apparently unaccounted for or possibly escaped to the formation.

OCD comments on procedure:

1) The operator should if possible procure a sample in the tedlar bag from immediately beneath the cap without opening the cap. If not possible, slightly open the monitor well cap to prevent venting and quickly stick the probe in to see if any propane is detected initially and record results. Any venting of the cap with fresh air will dilute the readings in the proposed procedure, so a cap that will allow the tubing to be lowered w/ minimal venting is recommended. Western considered the comment above during development of the work plan. Our goal is to collect a representative sample of gas entering the well and analyze for propane. These wells are owned and operated by El Paso Energy as part of their ongoing ground water remediation program. Generally, the wells heads do not have a tight seal due to remediation equipment or pressure equalization holes drilled in the cap. The purpose of sampling at the bottom of the well is to collect a representative sample of the gas entering the well by avoiding dilution from the surface.

2) The Sirius PID Four Gas Monitor specifications should have been attached to your submittal to assess the accuracy and limitations of the instrument. For example, will the PID eV bulb detect propane compounds? If so, at what accuracy? PPM. Please attach the specifications with your submittal of analytical data. During the work plan preparation, Western verified that the Sirius PID Four Gas Monitor would detect propane in LEL mode. See page 7-3 of the attachment. The LEL response factor is approximately 0.80. The Sirius Monitor is used as a field screening tool to detect the presence of VOCs and aid in the selection of confirmation samples. The Sirius Monitor is not capable of differentiating propane from other VOCs. Laboratory analyses is required to determine the presence of Propane.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM  
New Mexico Energy, Minerals & Natural Resources Dept.  
Oil Conservation Division, Environmental Bureau  
1220 South St. Francis Dr., Santa Fe, New Mexico 87505  
Office: (505) 476-3491  
Fax: (505) 476-3462  
E-mail: [CarlJ.Chavez@state.nm.us](mailto:CarlJ.Chavez@state.nm.us)  
Website: <http://www.emnrd.state.nm.us/ocd/index.htm>  
(Pollution Prevention Guidance is under "Publications")

---

**From:** Cauthen, Bruce [<mailto:Bruce.Cauthen@wnr.com>]  
**Sent:** Monday, November 24, 2008 2:27 PM  
**To:** Chavez, Carl J, EMNRD  
**Subject:**

Mr. Chavez,  
Please find attached, a copy of our test protocol for sampling and analyzing the gaseous headspace of the groundwater monitoring wells, located within our property. This document was mailed to the NMOCD office and addressed to Wayne Price. We would appreciate it if you would watch for it and if appropriate, hurry it through the approval process. I plan to be on site on Dec. 2nd to perform these analyses. We have obtained permission from the well owner to enter their wells.

Thank you for your help in this matter.

***Bruce Cauthen***  
***Environmental Engineer***  
***Logistics / HSER***  
***Western Refining Southwest Inc.***

*San Juan Regional Office*  
*111 County Road 4990*  
*Bloomfield, NM 87413*  
*Main: 505-632-4035*  
*Cell: 505-793-3304*  
[www.wnr.com](http://www.wnr.com)  
[bruce.cauthen@wnr.com](mailto:bruce.cauthen@wnr.com)

---

This inbound email has been scanned by the MessageLabs Email Security System.

---

Confidentiality Notice: This e-mail, including all attachments is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited unless specifically provided under the New Mexico Inspection of Public Records Act. If you are not the intended recipient, please contact the sender and destroy all copies of this message. -- This email has been scanned by the Sybari - Antigen Email System.

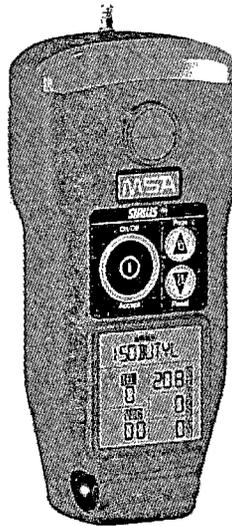
---

This inbound email has been scanned by the MessageLabs Email Security System.

---

# **MSA** Sirius® MultiGas Detector

## Operating Manual



In North America, to contact your nearest stocking location, dial toll-free 1-800-MSA-2222  
To contact MSA International, dial 1-412-967-3354 or 1-800-MSA-7777

© MINE SAFETY APPLIANCES COMPANY 2005 - All Rights Reserved

This manual is available on the internet at [www.msanet.com](http://www.msanet.com)

Manufactured by

**MSA INSTRUMENT DIVISION**

P.O. Box 427, Pittsburgh, Pennsylvania 15230

(L) Rev 2

10048887

## Chapter 1, Instrument Safety and Certifications

The Sirius Multigas Detector is for use by trained and qualified personnel. It is designed to be used when performing a hazard assessment to:

- Assess potential worker exposure to combustible and toxic gases and vapors
- Determine the appropriate gas and vapor monitoring needed for a workplace.

The Sirius Multigas Detector can be equipped to detect:

- Combustible gases and certain combustible vapors
- Volatile organic compounds (VOCs)
- Oxygen-deficient or oxygen-rich atmospheres
- Specific toxic gases for which a sensor is installed.

### **WARNING**

- Read and follow all instructions carefully.
- Check calibration before each day's use and adjust if necessary.
- Check calibration more frequently if exposed to silicone, silicates, lead-containing compounds, hydrogen sulfide, or high contaminant levels.
- Recheck calibration if unit is subjected to physical shock.
- Use only to detect gases/vapors for which a sensor is installed.
- Do not use to detect combustible dusts or mists.
- Make sure adequate oxygen is present.
- Do not block pump sample inlet.
- Use only Teflon sampling lines for reactive gases such as  $\text{Cl}_2$ ,  $\text{PH}_3$ ,  $\text{NH}_3$ ,  $\text{HCN}$ , and for semivolatile organic compounds such as gasoline and jet fuels.
- Use only MSA-approved sampling lines.
- Do not use silicone tubing or sampling lines.
- Wait sufficient time for the reading; response times vary, based on gas/vapor and length of sampling line.

- Have a trained and qualified person interpret instrument readings.
- Account for sensor reproducibility.
- Properly identify the VOC gas being measured before using VOC response factors or setting alarm values (exposures, STEL, TWA).
- Recognize that the VOC Auto-range displays readings in increments of 100 ppb.
- Ensure installed PID bulb corresponds to the PID bulb setting on the instrument display.
- Do not remove battery pack from instrument while in a hazardous atmosphere.
- Do not take spare battery packs into a hazardous atmosphere. Battery packs must be properly attached to the instrument at all times.
- When they are to be discarded, properly dispose of alkaline cells and the Li-Ion battery pack.
- Do not recharge Lithium Ion battery or change Alkaline batteries in a hazardous location.
- Do not alter or modify instrument.

**INCORRECT USE CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.**

## Safety Limitations and Precautions

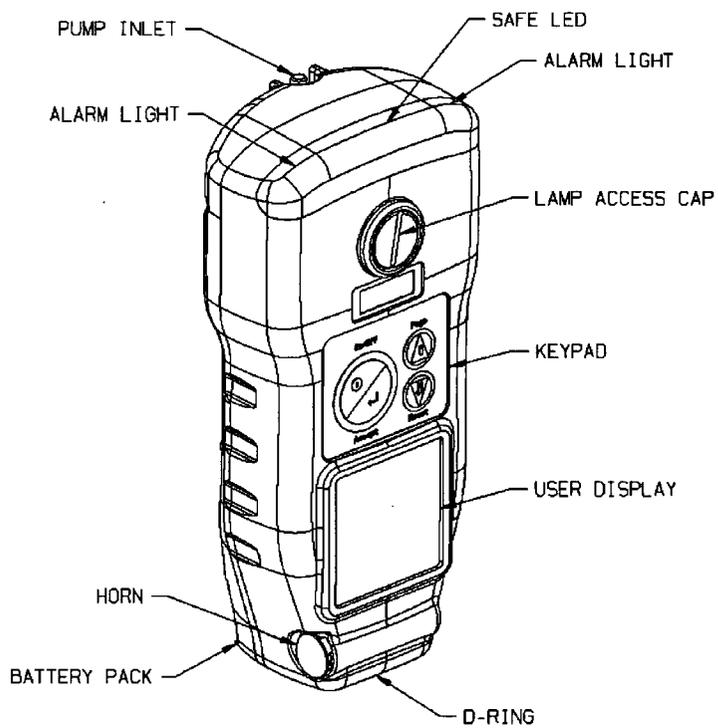
### **▲ WARNING**

It is very important to have an understanding of PID basics when changing your PID settings. Failure to properly identify the VOC gas being measured and/or failure to select the correct Response Factor alarm values (exposure, STEL, TWA) that match your desired Response Factor and/or the correct bulb, will result in erroneous readings that could lead to serious injury or death.

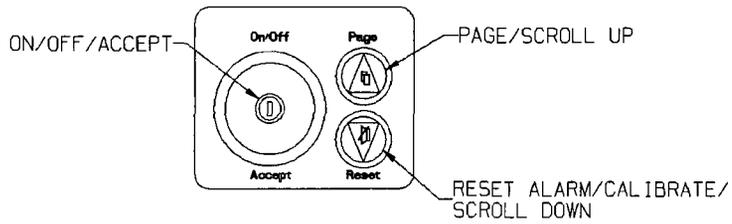
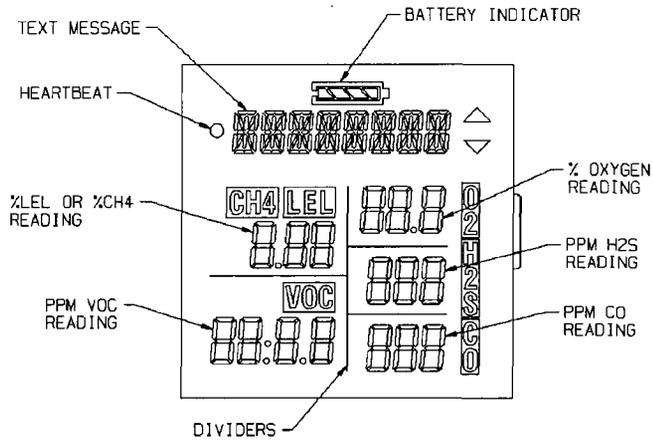
Carefully review the following safety limitations and precautions before placing this instrument in service:

- The Sirius Multigas Detector is designed to:
  - Detect gases and vapors in air only
  - Detect only specified toxic gases for which a sensor is installed.
- Perform the following check before each day's use to verify proper instrument operation:
  - Calibration check (see Calibration Check section). Adjust calibration if the readings are not within the specified limits.

## Chapter 3, Using the Sirius Multigas Detector



*Figure 3-1. Instrument Features*



**Figure 3-2. Understanding the Display**

## Chapter 7, Performance Specifications

**Table 7-1. Certifications  
(see instrument label to determine applicable approval)**

<b>HAZARDOUS LOCATIONS</b>	<b>US (NON-MINING)</b>	UL913 for Class I, Div. 1, Groups A, B, C and D, T3/T4*, Tamb=-20°C to +50°C
	<b>*CANADA</b>	CSA C22.2, No. 157 for Class I, Div. 1, Groups A, B, C and D, T3/T4*, Tamb=-20°C to +50°C
	<b>EUROPE</b>	EEx ia dIIC, T3/T4*, Tamb=-20°C to +50°C
<b>PERFORMANCE</b>	<b>CANADA</b>	CSA C22.2, No. 152 for Methane
	<b>EUROPE</b>	IEC60529
	<b>EUROPE</b>	EN61779-1, EN61779-4 (Methane & Pentane) Tamb = -10°C to +40°C
	<b>EUROPE</b>	EN50271 (Software & Digital Technologies)
<b>APPLICABLE EUROPEAN DIRECTIVES</b>	<b>EUROPE</b>	EN50104 (Oxygen) Tamb = 0°C to +40°C
	<b>ATEX 94/9/EC</b>	II 2G EEx & d IIC, T3/T4*, Tamb=-20°C to +50°C
	<b>EMC 89/336/EEC</b>	EN50270 (EN50081-1, EN50082-2)

\* Li ION & Duracell: T4; Varta & Energizer: T3

**Table 7-2. Instrument Specifications**

<b>TEMPERATURE RANGE</b>	<b>NORMAL</b>	0 to 40°C
	<b>EXTENDED</b>	-20 to 0°C, 40 to 50°C
<b>INGRESS PROTECTION RATING (IP)</b>		IP54
<b>MEASUREMENT METHOD</b>	<b>COMBUSTIBLE GAS</b>	Catalytic Sensor
	<b>OXYGEN</b>	Electrochemical Sensor
	<b>TOXIC GASES</b>	Electrochemical Sensors
	<b>VOC</b>	Photoionization Detector

FACTORY-SET ALARM SETPOINTS	LOW ALARM	HIGH ALARM	STEL	TWA
CO	35 PPM	100 PPM	400	35
H <sub>2</sub> S	10 PPM	15 PPM	15	10
LEL	10%	20%	--	--
O <sub>2</sub>	19.5%	23.0%	--	--
VOC	50	100	25	10

**\*NOTE:** Extended temperature range indicates gas readings may vary slightly if calibrated at room temperature. For optimal performance, calibrate instrument at temperature of use.

**Table 7-3.  
COMBUSTIBLE GAS - Typical Performance Specifications**

REPRODUCIBILITY**		
TEMPERATURE RANGE	GAS CONCENTRATION RANGE	REPRODUCIBILITY
-20°C up to 0°C (Extended)	0% up to and including 50% LEL	±5% LEL <sup>2</sup>
	0.00% up to and including 2.50% CH <sub>4</sub>	±0.25% CH <sub>4</sub> <sup>2</sup>
	Above 50% and up to and including 100% LEL	±8% LEL <sup>2</sup>
	Above 2.50% and up to and including 5.00% CH <sub>4</sub>	±0.40% CH <sub>4</sub> <sup>2</sup>
0°C to 40°C (Normal)	0% up to and including 50% LEL	±3% LEL <sup>1</sup>
	0.00% up to and including 2.50% CH <sub>4</sub>	±0.15% CH <sub>4</sub> <sup>1</sup>
	Above 50% and up to and including 100% LEL	±5% LEL <sup>1</sup>
	Above 2.50% and up to and including 5.00% CH <sub>4</sub>	±0.25% CH <sub>4</sub> <sup>1</sup>
Above 40°C and up to and including 50°C Extended	0% up to and including 50% LEL	±5% LEL <sup>2</sup>
	0.00% up to and including 2.50% CH <sub>4</sub>	±0.25% CH <sub>4</sub> <sup>2</sup>
	Above 50% and up to and including 100% LEL	±8% LEL <sup>2</sup>
	Above 2.50% and up to and including 5.00% CH <sub>4</sub>	±0.40% CH <sub>4</sub> <sup>2</sup>

**Footnotes:**

1. The Canadian Standards Association (CSA) has verified methane reproducibility in the normal temperature range per CSA Standard C22.2 No. 152.
2. CSA has verified methane reproducibility in the extended temperature ranges per the manufacturer's specifications. CSA has not verified methane reproducibility in the extended temperature ranges per CSA Standard C22.2 No. 152, because the extended temperature ranges are outside the scope of CSA Standard C22.2 No. 152.

**Table 7-4.**  
**COMBUSTIBLE GAS - Cross Reference Factors**  
**for Sirius General-Purpose Calibration Using Calibration Cylinder**  
**(P/N 10045035) Set to 58% LEL Pentane Simulant**

COMBUSTIBLE GAS	MULTIPLY %LEL READING BY
Acetone	1.1
Acetylene	0.7
Acrylonitrile <sup>1</sup>	0.8
Benzene	1.1
Butane	1.0
1,3 Butadiene	0.9
n-Butanol	1.8
Carbon Disulfide <sup>1</sup>	2.2
Cyclohexane	1.1
2,2 Dimethylbutane	1.2
2,3 Dimethylpentane	1.2
Ethane	0.7
Ethyl Acetate	1.2
Ethyl Alcohol	0.8
Ethylene	0.7
Formaldehyde <sup>2</sup>	0.5
Gasoline	1.3
Heptane	1.4
Hydrogen	0.6
n-Hexane	1.3
Isobutane	0.9
Isobutyl Acetate	1.5
Isopropyl Alcohol	1.1
Methane	0.6
Methanol	0.6
Methyl Isobutyl ketone	1.1
Methylcyclohexane	1.1
Methyl Ethyl Ketone	1.1
Methyl Tertiary Butyl Ether	1.0
Mineral Spirits	1.1
iso-Octane	1.1
n-Pentane	1.0
Propane	0.8
Propylene	0.8
Styrene <sup>2</sup>	1.9

Tetrahydrofuran	0.9
Toluene	1.2
<b>COMBUSTIBLE GAS</b>	<b>MULTIPLY % LEL READING BY</b>
Vinyl Acetate	0.9
VM&P Naptha	1.6
O-Xylene	1.2

**RESPONSE NOTES:**

1. The compounds may reduce the sensitivity of the combustible gas sensor by poisoning or inhibiting the catalytic action.
2. These compounds may reduce the sensitivity of the combustible gas sensor by polymerizing on the catalytic surface.
3. For an instrument calibrated on Pentane, multiply the displayed %LEL value by the conversion factor above to get the true %LEL.
4. These conversion factors should be used only if the combustible gas is known.
5. These conversion factors are typical for a Sirius Multigas Detector. Individual units may vary by  $\pm 25\%$  from these values

**Table 7-5. OXYGEN - Typical Performance Specifications**

<b>RANGE</b>	0 to 25% O <sub>2</sub>	
<b>RESOLUTION</b>	0.1% O <sub>2</sub>	
<b>REPRODUCIBILITY**</b>	0.7% O <sub>2</sub> , for 0 to 25% O <sub>2</sub>	
<b>RESPONSE TIME</b>	90% of final reading	30 seconds with sample line and probe (normal temperature range*)
		3 minutes with sample line and probe (extended temperature range*)
	*See TABLE 7-2 NOTE	
	**See TABLE 7-10 NOTE	

**Environment and Oxygen Sensor Readings**

A number of environmental factors may affect the oxygen sensor readings, including changes in pressure, humidity and temperature. Pressure and humidity changes affect the amount of oxygen actually present in the atmosphere.

**Pressure Changes**

If pressure changes rapidly (e.g., stepping through airlock) the oxygen

sensor reading may temporarily shift, and possibly cause the detector to go into alarm. While the percentage of oxygen may remain at or near 20.8%, the total amount of oxygen present in the atmosphere available for respiration may become a hazard if the overall pressure is reduced to a significant degree.

### Humidity Changes

If humidity changes to any significant degree (e.g., going from a dry, air conditioned environment to outdoor, moisture laden air), oxygen levels can change up to 0.5%. This is due to water vapor in the air displacing oxygen, thus reducing oxygen readings as humidity increases. The oxygen sensor has a special filter to reduce the affects of humidity changes on oxygen readings. This effect will not be noticed immediately, but slowly impacts oxygen readings over several hours.

### Temperature Changes

The oxygen sensor has built-in temperature compensation. However, if temperature shifts dramatically, the oxygen sensor reading may shift. Zero the instrument at a temperature within 30°C of the temperature-of-use for the least effect.

**Table 7-6.**  
**CARBON MONOXIDE (appropriate models only) -**  
**Typical Performance Specifications**

<b>RANGE</b>	500 ppm CO
<b>RESOLUTION</b>	1 ppm CO, for 5 to 500 ppm CO
<b>REPRODUCIBILITY**</b>	+5 ppm CO or 10% of reading, whichever is greater 0 to 150 ppm CO, ±15% >150 ppm CO (normal temperature range*)
	±10 ppm CO or 20% of reading, whichever is greater (extended temperature range*)
<b>RESPONSE TIME</b>	90% of final reading in 50 seconds with sample line and probe (normal temperature range*)
	*See TABLE 7-2 NOTE
	**See TABLE 7-10 NOTE

**Table 7-7. CARBON MONOXIDE - Cross Reference Factors for Sirius Calibration Using Calibration Cylinder (P/N 10045035)**

**NOTE:** Data is presented as the indicated output in ppm, which would result from the application of 100 ppm of the test gas.

TEST GAS (100 PPM)	EQUIVALENT PPM
Carbon Monoxide (CO)	100 ±9
Hydrogen Sulfide (H <sub>2</sub> S)	4 ±4
TEST GAS (100 PPM)	EQUIVALENT PPM
Sulfur Dioxide (SO <sub>2</sub> )	0 ±1
Nitrogen Dioxide (NO <sub>2</sub> )	2 ±6
Nitric Oxide (NO)	70 ±10
Chlorine (Cl <sub>2</sub> )	1 ±8
Ammonia (NH <sub>3</sub> )	2 ±4
Hydrogen Chloride (HCl)	3 ±2
Ethylene (C <sub>2</sub> H <sub>4</sub> )	76 ±9
Hydrogen Cyanide (HCN)	0 ±1
Methane (CH <sub>4</sub> )	0 ±0
Ethanol (EtOH)	0
Hydrogen (H <sub>2</sub> )	70 +26

The carbon monoxide channel in the Sirius instrument is equipped with internal and external filters. The purpose of these filters is to protect the CO sensor from acid gases (H<sub>2</sub>S, SO<sub>2</sub>, etc.) and from the hydrocarbons that the instrument is intended to measure, including the calibration gas, isobutylene. In normal use, an interferent signal for calibration or bump checking the instrument should not be observed on the CO channel. However, exposure to large amounts of certain hydrocarbons (either long exposure times or high concentrations) can overwhelm the filter and appear as signals on the CO channel. In normal operation, after the hydrocarbon exposure is ended, the filter is designed to outgas absorbed hydrocarbons at a rate that will not cause a signal on the CO channel. However, if the unit is exposed to high temperature (>40°C), this desorption rate increases and spurious signals may be observed on the CO channel due to gassing of previously absorbed hydrocarbons. If this occurs, it may be necessary to replace the CO sensor.

**Table 7-8. HYDROGEN SULFIDE (appropriate models only)  
- Typical Performance Specifications**

<b>RANGE</b>	200 ppm H <sub>2</sub> S
<b>RESOLUTION</b>	1 ppm H <sub>2</sub> S, for 3 to 200 ppm H <sub>2</sub> S
<b>REPRODUCIBILITY**</b>	±2 ppm H <sub>2</sub> S or 10% of reading, whichever is greater 0 to 100 ppm H <sub>2</sub> S, ±15% > 100 ppm H <sub>2</sub> S (normal temperature range*)
	±5 ppm H <sub>2</sub> S or 20% of reading, whichever is greater (extended temperature range*)
<b>RESPONSE TIME</b>	90% of final reading in 50 seconds* with sample line and probe (normal temperature range)
	*See TABLE 7-2 NOTE
	**See TABLE 7-10 NOTE

**Table 7-9. HYDROGEN SULFIDE - Cross Reference Factors  
for Sirius Calibration Using Calibration Cylinder (P/N10045035)**

**NOTE:** Data is presented as the indicated output in ppm, which would result from the application of 100 ppm of the test gas

<b>TEST GAS (100 PPM)</b>	<b>EQUIVALENT PPM</b>
Hydrogen Sulfide (H <sub>2</sub> S)	100 ±10
Ethylene (C <sub>2</sub> H <sub>4</sub> )	0 ±0
Methane (CH <sub>4</sub> )	0 ±0
Hydrogen (H <sub>2</sub> )	0 ±0
<b>TEST GAS (100 PPM)</b>	<b>EQUIVALENT PPM</b>
Ammonia (NH <sub>3</sub> )	0 ±0
Chlorine (Cl <sub>2</sub> )	0 ±0
Nitrogen Dioxide (NO <sub>2</sub> )	-20 ±2
Nitric Oxide (NO)	1 ±1
Carbon Monoxide (CO)	4 ±4
Hydrogen Chloride (HCl)	0 ±0
Hydrogen Cyanide (HCN)	1 ±1
Sulfur Dioxide (SO <sub>2</sub> )	10 ±3
Ethanol (EtOH)	0 ±0
Toluene	0 ±0

**Table 7-10. PID (appropriate models only) -  
Typical Performance Specifications**

<b>RANGE</b>	0 to 2000 ppm
<b>DISPLAY</b>	
<b>RESOLUTION</b>	0.1 ppm (100 ppb) from 0 to 2000 ppm; 1 ppm from 200 to 2000 ppm
<b>REPRODUCIBILITY**</b>	$\pm 2$ ppm ( $\pm 2000$ ppb) or $\pm 10\%$ , whichever is greater (normal temperature range*)
<b>RESPONSE TIME</b>	90% of final reading in 20 seconds (normal mode) 90% of final reading in 30 seconds (VOC ppb autorange)
* See TABLE 7-2	
** Assumes proper calibration and constant ambient conditions. Represents the range of possible variation between the displayed value and the actual concentration in a properly-calibrated instrument.	

Table 7-11. PID Response Factor Table

Analyte Name	CAS no. 1	Chemical Formula	Strius Displayed Name	IP, eV	Response Factors			Chemical Name
					9.8 eV lamp	10.6 eV lamp	11.7 eV lamp	
1,2,3-trimethylbenzene	526-73-8	C <sub>9</sub> H <sub>12</sub>	123MEBNZ	8.42	0.53	0.58	Benzene, 1,2,3-trimethyl-	
1,2,4-trimethylbenzene	95-63-6	C <sub>9</sub> H <sub>12</sub>	124MEBNZ	8.27	0.51	0.48	Benzene, 1,2,4-trimethyl-	
1,2-dibromoethane	106-93-4	C <sub>2</sub> H <sub>4</sub> Br <sub>2</sub>	12BRETHN	10.35	N/A	12.20	Ethane, 1,2-dibromo-	
1,2-dichlorobenzene	95-50-1	C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	12CLBNZ	9.06	0.57	0.43	Benzene, 1,2-dichloro-	
1,3,5-trimethylbenzene	108-67-8	C <sub>9</sub> H <sub>12</sub>	135MEBNZ	8.40	0.43	0.37	Benzene, 1,3,5-trimethyl-	
1,4-butanediol	110-63-4	C <sub>4</sub> H <sub>10</sub> O <sub>2</sub>	BUTNDIOL	10.70	N/A	N/A	1,4-Butanediol	
1,4-dioxane	123-91-1	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	DIOXANE	9.19	1.35	1.06	1,4-Dioxane	
1-butanol	71-36-3	C <sub>4</sub> H <sub>10</sub> O	BUTANOL	9.99	N/A	2.30	1-Butanol	
1-methoxy-2-propanol	107-98-2	C <sub>4</sub> H <sub>10</sub> O <sub>2</sub>	MEOXPROP	9.54	1.89	0.89	Propan-2-ol, 1-methoxy-	
1-propanol	71-23-8	C <sub>3</sub> H <sub>8</sub> O	PROPANOL	10.22	N/A	4.74	1-Propanol	
2-butanone	78-93-3	C <sub>4</sub> H <sub>8</sub> O	BUTANONE	9.52	0.76	0.70	2-Butanone	
2-methoxyethanol	109-86-4	C <sub>4</sub> H <sub>10</sub> O <sub>2</sub>	MEOXETHO	10.13	N/A	1.45	Ethanol, 2-methoxy-	
2-pentanone	107-87-9	C <sub>5</sub> H <sub>10</sub> O	2PENTANO	9.38	0.80	0.68	2-Pentanone	
2-picoline	109-106-8	C <sub>7</sub> H <sub>7</sub> N	2PICOLIN	9.40	0.59	0.41	Pyridine, 2-methyl-	
2-propanol	67-63-0	C <sub>3</sub> H <sub>8</sub> O	IPROPANOL	10.17	N/A	2.72	Isopropyl alcohol	
3-picoline	108-99-6	C <sub>7</sub> H <sub>7</sub> N	3PICOLIN	9.00	0.42	0.45	Pyridine, 3-methyl-	
4-hydroxy-4-methyl-2-pentanone	123-42-2	C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>	PYRATON	9.50	0.42	0.36	4-Hydroxy-4-methylpentan-2-one	
acetaldehyde	75-07-0	C <sub>2</sub> H <sub>4</sub> O	ETHANAL	10.23	N/A	4.57	Acetaldehyde	
acetone	67-64-1	C <sub>3</sub> H <sub>6</sub> O	ACETONE	9.70	0.96	1.12	Acetone	
acetophenone	98-86-2	C <sub>8</sub> H <sub>8</sub> O	ETANONE	9.28	1.36	0.78	Acetophenone	
acrolein	107-02-8	C <sub>3</sub> H <sub>4</sub> O	ACROLEIN	10.11	N/A	3.82	2-Propenal	
acrylic acid	79-10-7	C <sub>3</sub> H <sub>4</sub> O <sub>2</sub>	ACRLACAD	10.60	N/A	7.63	2-Propenoic acid	
allyl alcohol	107-18-6	C <sub>3</sub> H <sub>6</sub> O	PROPENOL	9.67	6.04	1.81	2-Propen-1-ol	
amyl acetate	628-63-7	C <sub>7</sub> H <sub>14</sub> O <sub>2</sub>	AMYLACET	?	5.32	1.65	Acetic acid, pentyl ester	
arsine	7784-42-1	AsH <sub>3</sub>	ARSINE	10.18	N/A	2.71	Arsenic trihydride	
benzene	71-43-2	C <sub>6</sub> H <sub>6</sub>	BENZENE	9.24	0.56	0.53	Benzene	
bromomethane	74-83-9	CH <sub>3</sub> Br	BRMETHAN	10.54	N/A	1.40	Methyl bromide	
butadiene	106-99-0	C <sub>4</sub> H <sub>6</sub>	BUTADIEN	9.07	0.65	0.63	1,3-Butadiene	
butoxyethanol	111-76-2	C <sub>6</sub> H <sub>14</sub> O <sub>2</sub>	BTOXETHO	8.68	1.46	0.80	2-n-Butoxy-1-ethanol	
butyl acetate	123-86-4	C <sub>8</sub> H <sub>16</sub> O <sub>2</sub>	BTYLACET	10.00	N/A	2.22	Acetic acid, butyl ester	

Table 7-11. PID Response Factor Table (continued)

Analyte Name	CAS no. <sup>1</sup>	Chemical Formula	Sirius Displayed Name	IP, eV	Response Factors			Chemical Name
					9.8 eV lamp	10.6 eV lamp	11.7 eV lamp	
carbon tetrachloride	56-23-5	CCl <sub>4</sub>	CARBONT	11.47	N/A	N/A	Carbon tetrachloride	
chlorobenzene	108-90-7	C <sub>6</sub> H <sub>5</sub> Cl	CLBNZE	9.07	0.34	0.36	Benzene, chloro-	
cumene	98-82-8	C <sub>9</sub> H <sub>12</sub>	CUMENE	8.73	0.54	0.54	Benzene, (1-methylethyl)-	
cyclohexane	110-82-7	C <sub>6</sub> H <sub>12</sub>	CYCHEXAN	9.88	2.88	1.17	Cyclohexane	
cyclohexanone	108-94-1	C <sub>8</sub> H <sub>16</sub> O	CYCHEXON	9.16	0.26	0.27	Cyclohexanone	
decane	124-18-5	C <sub>10</sub> H <sub>22</sub>	DECANE	9.65	2.67	0.87	Decane	
dichloroethane	107-06-2	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	DICLETAN	11.07	N/A	N/A	Ethane, 1,2-dichloro-	
Diesel #2	68476-34-6	mixture	DIESEL2		1.46	0.80		
Diesel #4, Marine Diesel	77650-28-3	mixture	DIESEL4		1.46	0.80		
Diesel Oil, Diesel Fuel	68334-30-5	mixture	DIESEL		1.46	0.80		
diethylamine	109-89-7	C <sub>4</sub> H <sub>11</sub> N	DIETAMNE	8.01	0.30	0.31	Ethanamine, N-ethyl-	
dimethoxymethane	109-87-5	C <sub>3</sub> H <sub>8</sub> O <sub>2</sub>	DIMEOXME	10.00	N/A	1.63	Methane, dimethoxy-	
dimethylacetamide	127-19-5	C <sub>4</sub> H <sub>9</sub> NO	DMA	8.81	0.63	0.47	Acetamide, N,N-dimethyl-	
dimethylformamide	68-12-2	C <sub>3</sub> H <sub>7</sub> NO	DMF	9.13	0.60	0.46	Formamide, N,N-dimethyl-	
epichlorohydrin	106-89-8	C <sub>3</sub> H <sub>5</sub> ClO	ECLZHYDN	10.64	N/A	N/A	Oxirane, (chloromethyl)-	
ethanol	64-17-5	C <sub>2</sub> H <sub>5</sub> O	ETHANOL	10.48	N/A	9.25	Ethanol	
ethyl acetate	141-78-6	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	ETACET	10.01	N/A	2.85	Ethyl acetate	
ethyl acetoacetate	141-97-9	C <sub>8</sub> H <sub>16</sub> O <sub>3</sub>	EAA	?	1.02	0.66	Butanoic acid, 3-oxo-, ethyl ester	
ethylbenzene	100-41-4	C <sub>8</sub> H <sub>10</sub>	ETBNZE	8.77	0.46	0.43	Ethylbenzene	
ethylene	74-85-1	C <sub>2</sub> H <sub>4</sub>	ETHYLENE	10.51	N/A	6.30	Ethylene	
ethylene glycol	107-21-1	C <sub>2</sub> H <sub>6</sub> O <sub>2</sub>	ETGLYCOL	10.50	N/A	N/A	1,2-Ethanediol	
ethylene oxide	75-21-8	C <sub>2</sub> H <sub>4</sub> O	ETOXIDE	10.56	N/A	34.3	Ethylene oxide	
Fuel Oil #2	68476-30-2	mixture	FUELOIL2		1.46	0.80		
γ-butyrolactone	96-48-0	C <sub>4</sub> H <sub>6</sub> O <sub>2</sub>	GBUTRLCN	10.26	N/A	3.78	γ-Butyrolactone	
gasoline (unleaded)	8006-61-9	mixture	GASOLINE		2.27	1.21		
heptane	142-82-5	C <sub>7</sub> H <sub>16</sub>	HEPTANE	9.93	N/A	2.01	Heptane	
hexane	110-54-3	C <sub>6</sub> H <sub>14</sub>	HEXANE	10.13	N/A	2.88	Hexane	
hydrazine	302-01-2	H <sub>4</sub> N <sub>2</sub>	HYDRAZINE	8.10	7.78	3.23	Hydrazine	
isomyl acetate	123-92-2	C <sub>7</sub> H <sub>14</sub> O <sub>2</sub>	IAMYACET	9.90	N/A	1.65	1-Butanol, 3-methyl-, acetate	
isobutanol	78-83-1	C <sub>4</sub> H <sub>10</sub> O	IBUTANOL	10.02	N/A	5.24	1-Propanol, 2-methyl-	

Table 7-11. PID Response Factor Table (continued)

Analyte Name	CAS no. <sup>1</sup>	Chemical Formula	Sitius Displayed Name	IP, eV	Response Factors			Chemical Name
					9.8 eV lamp	10.6 eV lamp	11.7 eV lamp	
isobutylene	115-11-7	C <sub>4</sub> H <sub>8</sub>	ISOBTYL	9.22	1.00	1.00	1.00	1-Propene, 2-methyl-
isooctane	540-84-1	C <sub>8</sub> H <sub>18</sub>	IOCTANE	9.89	2.75	0.91		Pentane, 2,2,4-trimethyl-
isophorone	78-59-1	C <sub>9</sub> H <sub>18</sub> O	IPHORNE	9.07	0.21	0.20		2-Cyclohexen-1-one, 3,5,5-trimethyl-
isopropylamine	75-31-0	C <sub>3</sub> H <sub>9</sub> N	2PROPAME	8.80	0.61	0.51		2-Propanamine
isopropyl ether	108-20-3	C <sub>6</sub> H <sub>14</sub> O	IPROETHR	9.20	0.72	0.62		Diisopropyl ether
Jef A(A1)	8008-20-6	mixture	JETA(A1)		1.04	0.36		
JP 4, jet B	8008-20-6	mixture	JP4		1.57	1.03		
JP 5	8008-20-6	mixture	JP5		1.04	0.36		
JP 8	8008-20-6	mixture	JP8		1.04	0.36		
kerosene	8008-20-6	mixture	KEROSENE		1.04	0.36		
mesityl oxide	141-79-7	C <sub>9</sub> H <sub>10</sub> O	MSTYLOXD	9.10	0.48	0.40		3-Penten-2-one, 4-methyl-
m-xylene	108-38-3	C <sub>8</sub> H <sub>10</sub>	MXYLENE	8.55	0.80	0.80		Benzene, 1,3-dimethyl-
methanol	67-56-1	CH <sub>3</sub> O	MEOH	10.84	N/A	N/A		Methyl alcohol
methyl acetate	79-20-9	C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	MEACET	10.25	N/A	5.47		Acetic acid, methyl ester
methyl acetoacetate	105-45-3	C <sub>6</sub> H <sub>10</sub> O <sub>2</sub>	MEACACET	9.82	1.23	0.87		Butanoic acid, 3-oxo-, methyl ester
methyl acrylate	96-33-3	C <sub>4</sub> H <sub>6</sub> O <sub>2</sub>	MEACRYLT	10.70	N/A	3.09		2-Propenoic acid, methyl ester
methyl benzoate	93-58-3	C <sub>8</sub> H <sub>8</sub> O <sub>2</sub>	MEBNZOTE	9.32	6.50	1.88		Benzoic acid, methyl ester
methyl benzyl alcohol	589-18-4	C <sub>8</sub> H <sub>10</sub> O	MEBNZOL	?	1.49	0.81		Benzenemethanol, 4-methyl-
methyl ethyl ketone	78-93-3	C <sub>4</sub> H <sub>8</sub> O	MEK	9.52	0.76	0.65		2-Butanone
methyl isobutyl ketone	108-10-1	C <sub>6</sub> H <sub>12</sub> O	MIBK	9.30	0.76	0.65		Methyl isobutyl ketone
methyl methacrylate	80-62-6	C <sub>5</sub> H <sub>8</sub> O <sub>2</sub>	MEMEACRY	10.06	N/A	0.94		2-Propenoic acid, 2-methyl-, methyl ester
methyl tert-butylether	1634-04-4	C <sub>5</sub> H <sub>12</sub> O	MTBE	9.41	0.84	0.74		Propane, 2-methoxy-2-methyl-
methylene chloride	75-09-2	CH <sub>2</sub> Cl <sub>2</sub>	METYLCL2	11.33	N/A	N/A		Methylene chloride
monomethylamine	74-89-5	CH <sub>3</sub> N	MEAMINE	8.90	0.85	0.76		Methylamine
n-methylpyrrolidone	872-50-4	C <sub>5</sub> H <sub>9</sub> NO	MEPRYLDN	9.17	1.22	0.58		2-Pyrrolidone, 1-methyl-
octane	111-65-9	C <sub>8</sub> H <sub>18</sub>	OCTANE	9.80	11.7	1.61		Octane
o-xylene	95-47-6	C <sub>8</sub> H <sub>10</sub>	OXYLENE	8.56	0.51	0.46		Benzene, 1,2-dimethyl-
p-xylene	106-42-3	C <sub>8</sub> H <sub>10</sub>	PXYLENE	8.44	0.41	0.50		Benzene, 1,4-dimethyl-
phenol	108-95-2	C <sub>6</sub> H <sub>6</sub> O	PHENOL	8.49	N/A	N/A		Phenol
phenylethyl alcohol	60-12-8	C <sub>8</sub> H <sub>10</sub> O	BNZETOH	10.00	N/A	N/A		Benzeneethanol

Table 7-11. PID Response Factor Table (continued)

Analyte Name	CAS no. <sup>1</sup>	Chemical Formula	Sirius Displayed Name	IP, eV	Response Factors			Chemical Name
					9.8 eV lamp	10.6 eV lamp	11.7 eV lamp	
phosphine	7803-51-2	PH <sub>3</sub>	PHOSPHIN	9.87	N/A	2.64		Phosphine
propylene	115-07-1	C <sub>3</sub> H <sub>6</sub>	PROPENE	9.73	1.25	1.06		Propene
propylene oxide	75-56-9	C <sub>3</sub> H <sub>6</sub> O	PROPLYOX	10.22	N/A	4.84		Propylene oxide
pyridine	110-86-1	C <sub>5</sub> H <sub>5</sub> N	PYRIDINE	9.26	0.60	0.53		Pyridine
quinoline	91-22-5	C <sub>9</sub> H <sub>7</sub> N	QUINOLINE	8.63	14.2	0.47		Quinoline
styrene	100-42-5	C <sub>8</sub> H <sub>8</sub>	STYRENE	8.46	0.40	0.32		Styrene
tert-butyl alcohol	75-65-0	C <sub>4</sub> H <sub>10</sub> O	TBUOH	9.90	23.7	2.27		Ethanol, 1,1-dimethyl-
tert-butylamine	75-64-9	C <sub>4</sub> H <sub>11</sub> N	TBUAMINE	8.50	0.42	0.41		2-Propanamine, 2-methyl-
tert-butylmercaptan	75-66-1	C <sub>4</sub> H <sub>9</sub> S	TBUMRCAP	9.03	0.45	0.36		2-Propanethiol, 2-methyl-
tetrachloroethylene	127-18-4	C <sub>2</sub> Cl <sub>4</sub>	(CL)4ET	9.33	0.64	0.49		Tetrachloroethylene
tetrahydrofuran	109-99-9	C <sub>4</sub> H <sub>8</sub> O	THF	9.40	1.66	1.47		Furan, tetrahydro-
thiophene	110-02-1	C <sub>4</sub> H <sub>4</sub> S	THIOLE	8.86	0.41	0.52		Thiophene
toluene	108-88-3	C <sub>7</sub> H <sub>8</sub>	TOLUENE	8.83	0.62	0.56		Toluene
trans-dichloroethene	156-60-5	C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>	CL2ETHN	9.64	0.42	0.37		Ethene, 1,2-dichloro-, (E)-
trichloroethylene	79-01-6	C <sub>2</sub> HCl <sub>3</sub>	(CL)3ETL	9.46	0.44	0.36		Trichloroethylene
turpentine - pure gum spirits	8006-64-2	mixture	TURPS		0.12	0.17		
vinyl acetate	108-05-4	C <sub>4</sub> H <sub>6</sub> O <sub>2</sub>	VNYLACET	9.20	1.36	0.94		Acetic acid ethenyl ester
vinyl chloride	75-01-4	C <sub>2</sub> H <sub>3</sub> Cl	VNLYCLDE	9.99	N/A	1.47		Ethene, chloro-
vinylcyclohexane	695-12-5	C <sub>8</sub> H <sub>14</sub>	VYLCYHEX	9.51	0.73	1.38		Cyclohexane, ethenyl-

7-12

<sup>1</sup> CAS no. or Chemical Abstracts Service No. - An internationally recognized unique identifier of chemical compounds. The CAS no. is listed on Material Safety Data Sheets (MSDS).

<sup>2</sup> N/A - Not applicable: This lamp cannot be used to detect this analyte because the ionization energy of the compound is greater than the energy of the lamp or the kinetics of the ionization process or follow-on reactions of the ions prevent detection.

Via Certified Mail  
7006 0100 0002 9205 1829

November 19, 2008

Mr. Wayne Price  
Environmental Bureau Chief  
New Mexico Oil Conservation Division  
1220 South St. Francis  
Santa Fe, New Mexico 87505

**RE: Propane Screening - Sampling and Analyses Work Plan  
OCD Discharge Permit GW-007  
Western Refining Company, L.P. Jal LPG Storage Facility  
Jal, New Mexico**

Dear Mr. Price:

On March 29, 2008, a discrepancy was discovered in the LPG propane inventory for Well #3. Approximately 13,755 Barrels of propane could not be accounted for. There was no evidence of propane venting or accumulating at the surface. The discrepancy was confirmed and was reported to NMOCD on May 20, 2008.

Western verbally agreed with NMOCD to perform field screening for propane at potential receptors (monitoring wells) at the facility. The Propane Screening - Sampling and Analyses Work Plan is attached for your review and approval. With your approval, Western refining would like to schedule the field work for early December 2008.

We appreciate your continued cooperation concerning this facility. If you have any questions please call Bruce Cauthen at 505/632-4035 or Bill Robertson at 505/632-4077.

Regards,



Ron Weaver

cc: Ken Parker  
Bill Robertson  
Bruce Cauthen  
Allen Hains

**Propane Screening - Sampling and Analyses Work Plan**  
**Western Refining Company**  
**L.P. Jal Storage Facility**  
**OCD Discharge Permit GW-007**  
**Jal, New Mexico**

**Date, 11/18/2008**

**Background**

This facility is a LPG Storage Facility and is manned when loading/unloading operations are in progress. The site has been permitted to allow storage of LPG in underground LPG Storage caverns. The operation includes four (4) underground LPG storage Caverns, Truck and railcar loading/unloading racks, two (2) double-lined brine storage ponds, LPG aboveground storage tanks, and associated pumps, valves and piping. LPG is transported to and from the facility via tanker trucks, LPG tanker rail cars, and pipeline. The facility operations also include an offsite NMOCD permitted disposal well. The facility layout is illustrated in Figure #1

On March 29, 2008, a discrepancy was discovered in the LPG propane inventory for Well #3. Approximately 13,755 Barrels of propane could not be accounted for. There was no evidence of propane venting or accumulating at the surface. The discrepancy was confirmed and was reported to NMOCD on May 20, 2008.

**Purpose**

The purpose of this work plan is to screen the potential conduits for the presence of propane.

**Scope of Work**

The scope of work consists of two phases: field screening and laboratory analyses.

**Field Screening – Materials and Procedure**

The field screening of groundwater remediation and monitoring wells and any other potential receptor for propane will be accomplished using a PID (Sirius). The following equipment will be utilized:

- A peristaltic sampling pump
- Tygon® tubing
- Tedlar® bags
- Sirius PID Four Gas Monitor

## **Procedure**

There are approximately fifteen (15) monitoring wells at the Jal LP Storage Facility. Field personnel will collect a representative sample of the gases from the wells and analyze for VOC presence. The samples will be collected and analyzed in accordance with the protocol listed below. Upon review of the field analyses, field personnel will select four (4) samples and one (1) duplicate to be sent to Hall Environmental Laboratory for confirmation analysis. If no wells test positive for VOC's, field personnel will choose four (4) well locations that cover the entire facility and one (1) duplicate to be sent for conformation analysis.

The following test protocol will be used for this field sampling event:

1. The sampling sequence will start from the farthest receptor from Well # 3 and end with the nearest well.
2. The Tygon® tubing attached to the peristaltic pump and to the Tedlar® bag.
3. The tubing will then be lowered down the casing of the monitor well.
4. The peristaltic pump will be activated and a gaseous sample will be collected in the Tedlar® bag.
5. A duplicate laboratory sample will be obtained for outside laboratory analysis.
6. Gas sample will be introduced into the PID.
7. Field personnel will record the results shown on the PID.

Field personnel will package the samples for transport and mail to Hall Environmental Laboratory for analysis

## **Laboratory Analyses**

The four (4) samples and one (1) duplicate will be analyzed by the laboratory for propane using method ASTM-D1945.

## **Schedule**

It is anticipated that the field work will last one day. Western will schedule this work with El Paso Energy, the owner of the wells. Western will provide notice prior to the sampling event.

## **Letter Report**

A letter report describing the methodology, field observations and readings, analytical results and conclusions will be submitted to NMOCD within 45 days of receipt of laboratory analyses.

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, 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

Form C-141  
Revised October 10, 2003

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

Submit 2 Copies to appropriate  
District Office in accordance  
with Rule 116 on back  
side of form

**Release Notification and Corrective Action**

**OPERATOR**

Initial Report  Final Report

Name of Company: Western Refining Company	Contact Ken Parker
Address PO Box 1345 Jal, NM 88252	Telephone No. 575-395-2632
Facility Name: Jal Storage Facility	Facility Type LPG Salt Dome Storage
Surface Owner: Western Refining Company	Mineral Owner
Lease No. 30-025-35956	

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	South Line	Feet from the	West Line	County
M	32	23S	37E	1000 FT		530 FT		Lea

Latitude N 32-15-23.1 Longitude W 103-11-30.3

**NATURE OF RELEASE**

Type of Release Propane released underground	Volume of Release 13,755 Barrels	Volume Recovered None
Source of Release Casing leak at 282 Ft.	Date and Hour of Occurrence Unknown	Date and Hour of Discovery March 29, 2008 @ 6AM
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.\*

Describe Cause of Problem and Remedial Action Taken.\*

In April of 2007, State LPG Well 3 was utilized to store 1,047,186 gallons of unodorized propane. Product was in storage in the months of April and May. In early June we transferred the product from well 3 into well 2. I was concerned when the transfer of product fell short of the allotted time. I ran an internal audit for propane received to make certain that I had used the correct number of barrels for my transfer calculation. The audit indicated that well 3 was short 13,756 barrels of propane. At this time based on the well pressure reading I was convinced that we may have had communication through the discharge manifold that could allow propane to commingle with the butane in well 1. Without physical knowledge as to what happened, we checked the monitor wells up and down stream for gas leakage. Without any indication of gas leaking in any of the monitor wells, I assumed the product was in well 1. This was the only well that was in service at the same time propane was injecting into well 3. At this stage of the investigation, we knew that we didn't have gas/liquid leaking to the surface and into the atmosphere. Well 3 was made ready for the MIT test in July 2007. The tubing was pulled to isolate the casing from the salt storage formation. The casing test failed and a leak was isolated at 282 feet from the surface. Lonquist recommended that we do a cement squeeze on the leak in the 9-5/8 casing and then run a new 7 inch liner and cement from top to bottom. During this phase of the test and repair, at no time did we recover any propane during the work over. Even with the leak in the casing I wasn't convinced this was the reason for the loss. I continued checking the monitor wells until well 1 was made ready for testing. We never detected any gas leaking from the monitor wells. In early March 2008, butane was transferred from well 1 into well 2. At this time we could physically identify the well that had the product loss. The facts as we know it today is that well 3 has the loss. At no time did we have gas/liquid at ground surface or in the monitor wells.

Describe Area Affected and Cleanup Action Taken.\*

This well is in a remote area and the closest public receptors are 2 miles away. The area affected by the propane loss is unknown and therefore monitoring the area is the only action taken. Cleanup is not an issue at this time.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: <i>Ken Parker</i>		<u>OIL CONSERVATION DIVISION</u>	
Printed Name: <i>Ken Parker</i>		Approved by District Supervisor:	
Title: <i>Facility Manager</i>		Approval Date:	Expiration Date:
E-mail Address: <i>Ken.Parker@WNR.com</i>		Conditions of Approval:	Attached <input type="checkbox"/>
Date: <i>5-20-08</i>	Phone: <i>505-395-2632</i>		

\* Attach Additional Sheets If Necessary