1R - 167

REPORTS

DATE:

10/04/2005

100 Glenborough
Suite 100
Houston, TX 77067-3299

Tel: 281.874.6781
Fax: 281.872.2555
www.nobleenergyinc.com

Domestic Division

noble energy

1R0167

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

October 4, 2005

Bill Olson
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
P. O. Box 6429
Sante Fe, NM 87504-6429

RE: Case No. 1R0167
Remediation Closure Documentation
Gary Johnson Property
Hobbs, New Mexico

Dear Mr. Olson

Enclosed please find the Remediation Closure Documentation for the property currently owned by Gary Johnson and formerly known as the Moon A Tank Battery ("Moon Tank Battery"). Noble Energy, Inc. ("Noble") constructed the Remediation Closure Documentation.

As discussed in the Phase II Environmental Site Assessment (ESA) report dated March 26, 2004, confirmation sample results of delineation of the extent of petroleum contamination in the near surface soils in certain areas of the former Moon A Tank Battery location exceeded the New Mexico Oil Conservation Division ("NMOCD") 100 mg/kg remediation guidelines for total petroleum hydrocarbons ("TPH").

As stated in the NMOCD letter dated August 13, 2004, the NMOCD accepted Noble's proposal to conduct further vertical delineation of contamination during remedial activities.

As requested by the NMOCD, Noble respectfully submits the attached Remediation Closure Documentation for the Moon Tank Battery. This Remediation Closure Document was based on the following:

- Noble conducted further vertical and horizontal delineation during remediation activities, confirmation sampling was conducted to insure that complete horizontal and vertical delineation and the removal of the hydrocarbon-impacted soils was accomplished.

October 4, 2005

- A total of six (6) hydrocarbon impacted spill areas on the Moon Tank Battery were targeted to conduct remedial activities.
- All measured BTEX and TPH constituents were found to be below NMOCD remediation guidelines.
- Complete horizontal and vertical delineation with removal of the hydrocarbon-contaminated soils at each impacted spill area were remediated as per NMOCD remediation guidelines.
- Confirmation samples were obtained and analyzed using EPA approved methods and quality assurance/quality control (QA/QC) procedures.
- All wastes and contaminated soils were disposed of at an NMOCD approved facility.

No further soil remediation is required for the impacted spill areas that were outlined in the approved Remediation Work Plan and the impacted spill area is in compliance with NMOCD guidelines for remediation of leaks, spills and releases at this property.

There is no evidence that an ongoing source of contamination exists.

If you have any questions about this remediation closure document, please don't hesitate to give me a call at (281) 874-6781.

Sincerely,

Terry Webster
Environmental Coordinator

cc: with enclosure

Aaron Carlson
Noble Energy, Inc.
100 Glenborough
Houston, TX 77067

Chris Williams
New Mexico Oil Conservation Division
1625 North French Drive
Hobbs, NM 88240

Mr. Gary Johnson
1500 Tasker
Hobbs, NM 88240

noble energy

Remediation Closure Documentation

Gary Johnson Property

Former

Moon A Tank Battery Lease

Lea County, New Mexico

September 2005

TABLE OF CONTENTS

TABLES

FIGURES

ATTACHMENTS

1.0 OVERVIEW

In response to the New Mexico Energy, Minerals and Natural Resources Department Environmental Bureau, Oil Conservation Division (NMOCD), Noble Energy Inc (NEI) is submitting this Remediation Closure Documentation report to address the concerns identified at the property currently owned by Mr. Gary Johnson and formerly known as the Moon A Tank Battery Lease. This property is identified as being located at 1831 Mobile Street, Hobbs, NM, Sec 28, T18S R38E, Lea County, GPS coordinates North 32° 43' 13.6", West 103° 9' 2.0". A topographic map of the location is shown as **Figure 1.**

The issues of concern, as identified by the NMOCD, include the following:

- weathered asphaltic-type oil
- highly viscous oil identified approximately 6" – 1' below grade surface
- an abandoned flowline located under Mr. Johnson's mobile home

On January 25, 2000 Mr. Bill Olson of the NMOCD collected a water well sample from the subject site. Analyses of the well water sample included cations, anions, metals, and BTEX (benzene, toluene, ethyl benzene and xylenes). All parameters tested were measured below the primary and secondary drinking water and irrigation water standards, as specified in 20.6.2.3103 NMAC, Section A, B, and C, and depicted in **Table 1.**

On June 25, 2002, Mr. Olson collected five shallow soil samples from the subject property. Sample 0206251150 (BH-1-6") and 0206251210 (BH-1-1ft) were collected in an area reported to be heavily contaminated with hydrocarbons near the fence, on the west side of the Mr. Johnson's mobile home. Samples 020625 1240 (SS-W-1), 020625 1250 (SS-E-1), and 020625 1305 (SS-N-1) were collected at a depth of 1-2' below grade surface (bgs) to the west, east, and north of the mobile home, respectively depicted in **Table 2.**

On February 17, 2004, Noble Energy, Inc. conducted a Phase II Environmental Site Assessment of the parcel of property owned by Mr. Johnson. This parcel is known as the historical location of the Moon A Tank Battery Lease. The primary purpose of this assessment was to determine, to the degree practical, the horizontal and vertical extent of hydrocarbon impact remaining on said property from historical oil and gas operations at this site.

Using the NMOCD Guidelines for Remediation of Leaks, Spills and Releases, the subject location has been determined to have a sensitivity ranking of 20, as the area of impact is located within 200' of a private domestic water source. Petroleum hydrocarbon levels for all samples were measured above the NMOCD guidelines of 100 mg/Kg, (the threshold for sites with a ranking score of >19). Benzene and Total BTEX concentrations in all samples were measured below NMOCD remediation guidelines for this sensitivity ranking.

All soil samples collected during the Site Investigation were analyzed for BTEX, Diesel Range Petroleum Hydrocarbons (DRO), Gasoline Range Petroleum Hydrocarbons (GRO), and metals. .

Remediation guidelines for soils at sites in this sensitivity ranking are as follows:

- TPH (total petroleum hydrocarbon) concentrations..... 100 mg/kg
- Benzene.....<10 mg/kg
- Total BTEX (benzene, toluene, ethylbenzene and xylenes) <50 mg/kg

Based upon the findings of the Phase II ESA, the NMOCD requested a Remediation Work Plan be developed by NEI. After approval of the Remediation Work Plan, dated September, 2004, by the NMOCD and permission from the land owner, Mr. Gary Johnson, the remediation of the property was initiated on August 15, 2005.

2.0 SAMPLING AND ANALYSIS

Discrete field headspace soil sampling and confirmation soil sample collection for laboratory analysis was conducted during remediation activities to demonstrate to the NMOCD that complete horizontal and vertical delineation and removal of hydrocarbon impacted soil was completed at each impacted area.

A total of six (6) hydrocarbon impacted spill areas on the property were identified during the Phase II ESA and required remediation as outlined in the NEI approved Remediation Work Plan. Complete horizontal and vertical delineation with removal of hydrocarbon contaminated soils at each impacted spill area was completed as per NMOCD remediation guidelines and the approved Remediation Work Plan. A plot plan depicting impacted remedial areas is depicted in **Figure 2**.

All samples were obtained and analyzed using EPA approved methods and quality assurance/quality control (QA/QC) procedures. All confirmation soil samples were placed in pre-cleaned laboratory glass jars with Teflon™ lined lids. Sample jars were placed in an ice cooler and transported with a Chain of Custody to Environmental Labs of Texas in Odessa, TX. Each confirmation soil sample was analyzed for TPH by EPA Method 8015. Per the remediation work plan, 10% of all confirmation soil samples collected were analyzed for BTEX by EPA Method SW8021B/5030.

During remediation activities, samples were collected from the center point of each impacted area. Samples were collected using a hand auger, advancing the auger to a targeted depth of 1' below bottom grade of removed soils impacted area. Soil samples were screened for hydrocarbons using a field PID (photo ionization detector). Field headspace readings were performed on each sample collected, with a threshold value of 100 ppm used to substitute for BTEX analyses.

When the field headspace measurements for a sample exceeded the 100 ppm threshold, or hydrocarbons were detected by visual or olfactory methods, additional horizontal and vertical excavation was performed and samples were collected at horizontal and vertical 5-10 foot intervals from the center point. These additional field screening samples were collected from each of the four cardinal directions and at depth. The headspace of each sample was screened as described above, with the frequency of horizontal advancement repeated until a headspace reading of <100 ppm was achieved.

Confirmation soil samples from locations where field headspace readings were below 100 ppm were collected for DRO and GRO analyses to demonstrate delineation of the impact by confirming that the measured constituents are within targeted parameters. Select sidewall and floor samples (Example: North and West Sidewall and South and East Sidewall at each impact area) were composited for analyses based on proximity to other samples in a particular area with field headspace readings below 100 ppm.

A total of 20 confirmation soil samples were collected from the floor and side wall slope of each excavation area. The confirmation soil sample locations are presented on **Figure 2** and the analytical results are included on **Table 3**.

3.0 SITE CLOSURE ACTIVITIES

Approximately 4,400 cubic yards of hydrocarbon-contaminated soil was excavated and removed for offsite disposal at a NMOCD approved facility from the 6 impacted spill areas. All measured constituents were found to be below the contaminant specific remediation levels as outlined in the approved Remediation Work Plan for each confirmation soil sample collected as provided in **Table 3** and illustrated on **Figure 1**. No further soil remediation is required for the impacted spill areas outlined in the approved Remediation Work Plan to be found in compliance with NMOCD guidelines for remediation of leaks, spills and releases at this property.

A photo log of the site cleanup activities is presented in **Attachment A.**

Table 1 Analyses Results for Gary Johnson Water Well Sampled January 27, 2000

Parameter	G. Johnson Water Well, Sampled 1/27/00	NMED Drinking/Irrigation Water Standards
Metals	**Mg/L**	**mg/L**
Ag	<0.05	0.05[1]
Al	<0.50	5.0[3]
As	<0.10	0.1[1]
B	<0.05	0.75[3]
Ba	<0.05	1.0[1]
Cd	0.03	0.01[1]
Co	<0.05	0.05[3]
Cr	<0.05	0.05[1]
Cu	<0.10	1.0[2]
Fe	<0.50	1.0[2]
Mn	<0.01	0.2[2]
Mo	<0.01	1.0[3]
Ni	<0.01	0.2[3]
Pb	<0.05	0.05[1]
Se	<0.05	0.05[1]
Si	28	--
Na	47	--
K	4	--
Mg	18	--
Ca	108	--
Zn	<0.10	10.0[2]
Hg	<0.0002	0.002[1]
BTEX, mg/L		
Benzene	<0.005	0.01[1]
Toluene	<0.005	0.75[1]
Ethyl benzene	<0.005	0.75[1]
M,P,O-Xylenes	<0.005	0.62[1]
Total BTEX	<0.005	--
Ion Chromatography, mg/L		
Chloride	70	250[2]
Fluoride	1.5	1.6[1]
Nitrate-N	3.8	10.0[1]
Sulfate	110	600[2]
Alkalinity (mg/L as $CaCO_3$)		
Hydroxide Alkalinity	<1.0	--
Carbonate Alkalinity	<1.0	--
Bicarbonate Alkalinity	182	--
Total Alkalinity	182	--
pH	7.2	6 – 9
Specific conductance, uMHOS/cm	820	--
Total Dissolved Solids, mg/L	510	1000.0[2]

[1]20.6.2.3103 NMAC, Section A. Human Health Standards
[2]20.6.2.3103 NMAC, Section B. Other Standards for Domestic Water Supply
[3]20.6.2.3103 NMAC, Section C. Standards for Irrigation Use (Includes section A and B requirements)

Table 2. Analyses Results for Soil Samples from Gary Johnson Property, Sampled June 25, 2002.

Parameter	0206251150 BH-1-6	0206251150 BH-1	0206251150 SS-W-1	0206251150 SS-E-1	0206251150 SS-N-1	NMOCD Spill Remediation Guidance[1]
BTEX, mg/Kg						
Benzene	<0.050	<0.1	<0.1	<0.010	0.0234	10
Toluene	<0.050	<0.1	<0.1	<0.010	<0.020	--
Ethyl benzene	0.0806	1.16	<0.1	<0.010	0.0474	--
Xylenes	0.328	4.23	0.352	<0.010	0.183	--
Total BTEX	0.409	5.39	0.352	<0.010	0.254	50
Petroleum Hydrocarbon Analyses, mg/Kg						
Diesel Range Organics	11,600	<250	10,200	4,600	16,500	100 (total)
Gasoline Range Organics	32.5	352	<10	<1	20.5	
Total Metals Analyses, mg/Kg						
Hg	<0.19	<0.19	<0.19	<0.19	<0.19	--
Al	9140	11100	7710	9490	10300	--
As	<5.0	<5.0	<5.0	<5.0	<5.0	--
Ba	100	78.1	86.5	124	121	--
B	36.0	38.4	30.1	35.2	40.6	--
Cd	<0.5	<0.5	<0.5	<0.5	<0.5	--
Cr	6.92	8.31	5.92	6.84	7.37	--
Co	2.78	4.32	<2.50	<2.50	2.54	--
Cu	6.80	8.61	6.33	7.80	6.82	--
Fe	7250	8200	6450	7150	8250	--
Pb	7.27	4.44	6.32	156	14.9	--
Mn	111	117	115	110	142	--
Mo	<5.0	<5.0	<5.0	<5.0	<5.0	--
Ni	8.32	9.00	7.32	7.22	7.82	--
Se	<1.0	<1.0	<1.0	<1.0	<1.0	--
Si	224	214	220	194	208	--
Ag	<0.2	<0.2	<0.2	<0.2	<0.2	--
Zn	35.8	47.5	25.1	55.7	49.0	--

[1]Guidelines for Remediation of Leaks, Spills and Releases, NM OCD, August 13, 1993

Table 3
Detected Volatile Organic Compounds, and TPH in Confirmation Soil Samples Collected in August/September 2005
Gary Johnson Property - Moon A Lease, Lea County, New Mexico

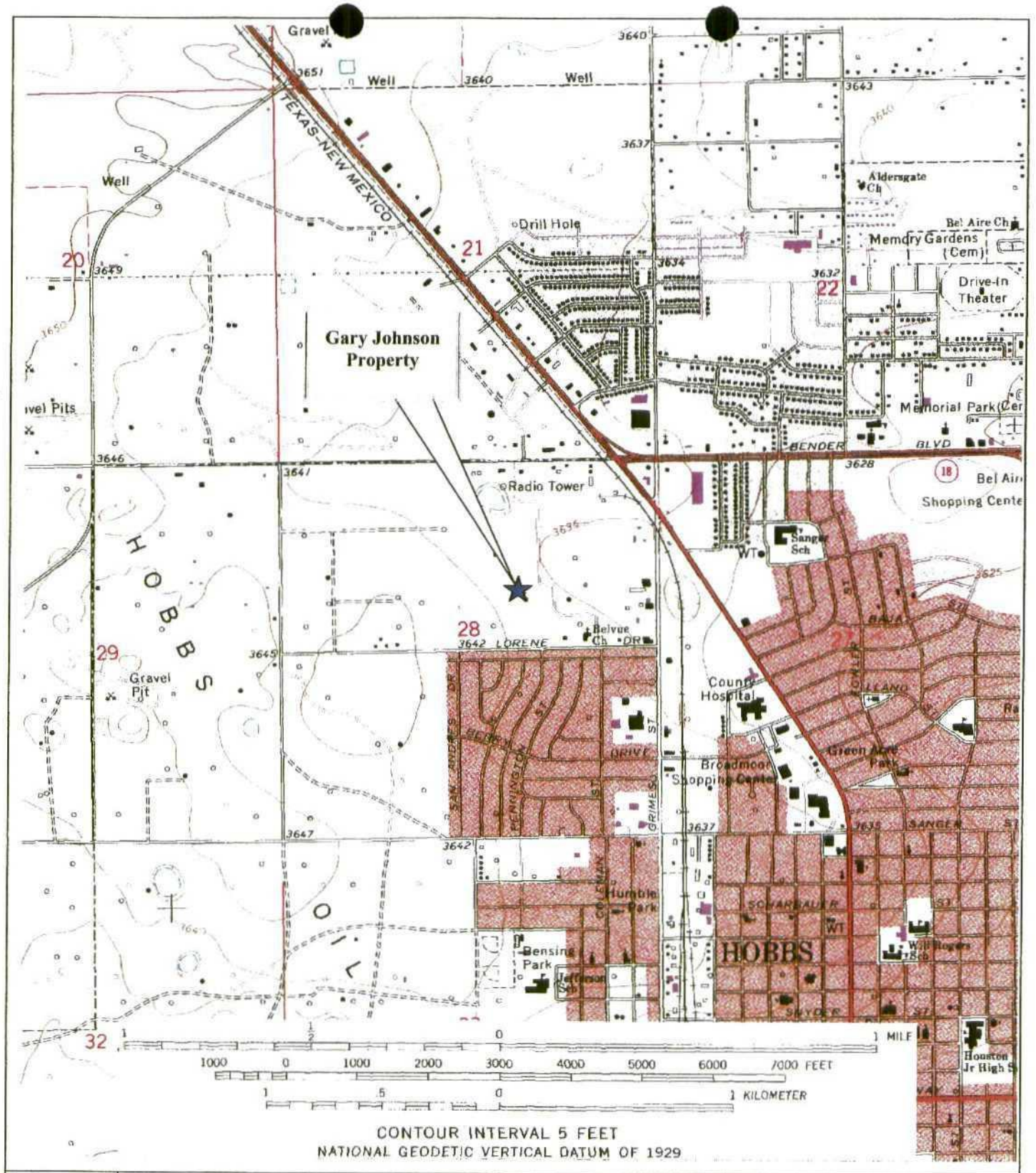
Analyte	NMOCD Regulatory Threshold*	Sample ID:	A1-CS01	A1-CS01	A1-CS02	A1-CS03	A2-CS01	A2-CS01	A2-CS02	A2-CS03	A3-CS01	A3-CS02	A3-CS03
		Sample Depth:	(9.0 - 10.0')	(11.0 - 12.0')	(6.0 - 7.0')	(6.0 - 7.0')	(8.0 - 9.0')	(9.0 - 9.0') REPLICATE	(3.0 - 4.0')	(3.0 - 4.0')	(19.0 - 20.0')	(6.0 - 7.0')	(6.0 - 7.0')
		Date:	19-Aug-2005	24-Aug-2005	24-Aug-2005	24-Aug-2005	01-Sep-2005	01-Sep-2005	01-Sep-2005	01-Sep-2005	29-Aug-2005	29-Aug-2005	29-Aug-2005
Volatile Organic Compounds (VOC)													
Benzene, (mg/kg)	10		0.025 U	---	---	---	---	---	---	---	---	---	---
Toluene, (mg/kg)			0.025 U	---	---	---	---	---	---	---	---	---	---
Ethylbenzene, (mg/kg)			0.025 U	---	---	---	---	---	---	---	---	---	---
Xylene, Total, (mg/kg)			0.025 U	---	---	---	---	---	---	---	---	---	---
Total BTEX, (mg/kg)	50		0.025 U	---	---	---	---	---	---	---	---	---	---
Total Petroleum Hydrocarbon Compounds													
Gasoline Range Organics >C6-C12, (mg/kg)			12	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.5 J	10 U	10 U
Diesel Range Organics >C12-C35, (mg/kg)			126	65.2	10 U	10 U	10 U	10 U	10 U	10 U	28.7	10 U	10 U
Total Hydrocarbons >C6-C35, (mg/kg)	100		138	65.2	10 U	10 U	10 U	10 U	10 U	10 U	28.7	10 U	10 U
Field Screening													
VOC Headspace, (ppm)	100		58.3	ND	ND	ND	ND	---	ND	ND	ND	ND	ND

Analyte	NMOCD Regulatory Threshold*	Sample ID:	A1/A3-CS01	A4-CS01	A4-CS01	A4-CS01	A4-CS01	A4-CS02	A4-CS03	A5-CS01	A5-CS02	A5-CS03	A6-CS01
		Sample Depth:	(2.0 - 3.0')	(19.0 - 20.0')	(19.0 - 20.0') REPLICATE	(21.0 - 22.0')	(23.0 - 24.0')	(11.0 - 12.0')	(11.0 - 12.0')	(2.0 - 3.0')	(2.0 - 3.0')	(2.0 - 3.0')	(2.0 - 3.0')
		Date:	29-Aug-2005	24-Aug-2005	24-Aug-2005	24-Aug-2005	24-Aug-2005	29-Aug-2005	01-Sep-2005	18-Aug-2005	18-Aug-2005	18-Aug-2005	18-Aug-2005
Volatile Organic Compounds (VOC)													
Benzene, (mg/kg)	10		---	---	---	---	---	0.025 U	---	---	---	---	0.025 U
Toluene, (mg/kg)			---	---	---	---	---	0.025 U	---	---	---	---	0.025 U
Ethylbenzene, (mg/kg)			---	---	---	---	---	0.025 U	---	---	---	---	0.025 U
Xylene, Total, (mg/kg)			---	---	---	---	---	0.025 U	---	---	---	---	0.025 U
Total BTEX, (mg/kg)	50		---	---	---	---	---	0.025 U	---	---	---	---	0.025 U
Total Petroleum Hydrocarbon Compounds													
Gasoline Range Organics >C6-C12, (mg/kg)			10 U	1640	2040	16.6	10.5 U	10 U	10 U	10 U	10 U	10 U	10 U
Diesel Range Organics >C12-C35, (mg/kg)			10 U	4050	5080	173	17.1 U	10 U	10 U	53.4	49.1	10 U	39.1
Total Hydrocarbons >C6-C35, (mg/kg)	100		10 U	5690	7120	190	27.6 U	10 U	10 U	53.4	49.1	10 U	39.1
Field Screening													
VOC Headspace, (ppm)	100		ND	99.1	---	33.5	ND	ND	ND	ND	ND	ND	ND

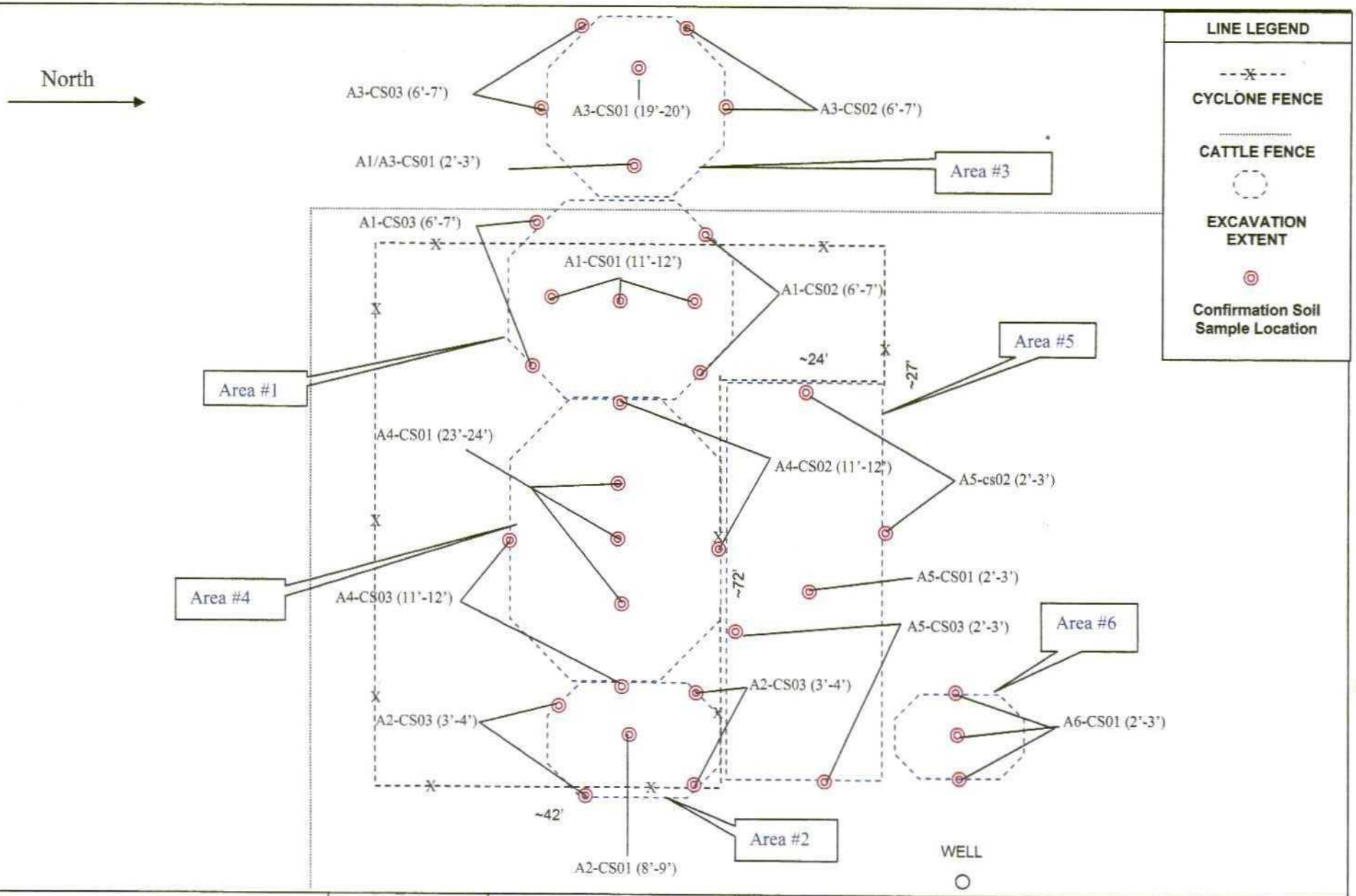
Boxed concentrations indicate result that exceeds regulatory screening criteria listed below.

Notes :

U- Analyte analyzed for but undetected at the corresponding quantitation limit
ND- Not Detected - PID Reading equal to background concentration
mg/kg- Milligrams per kilogram
ppm- Parts per million
(---)- Analysis not collected
* Guidelines for Remediation of Leaks, Spills and Releases, NM OCD, August 13, 1993



Area Location Map	**Noble Energy, Inc.** **MOON "A" Lease** **Gary Johnson Property** **Lea County, New Mexico**	USGS Hobbs West Quadrangle



noble energy	NOT TO SCALE	LEA COUNTY	SW/4 NE/4 SEC 28 T18S R38E	**Moon A Tank Battery Lease**
		N 32° 43.227' W 100° 09.033'	HOBBS WEST QUADRANGLE	**Lea County, New Mexico**
		NAD 27	09/20/05	

Attachment A

Site Photo Log

Impact Area 1 Facing Mobile Street (East) – Excavation Progress

Impacted Area 1 Facing West-Southwest – Excavation in Progress

Impact Area 1 – Impacted soil around 2" flow line to be removed

Impacted Area 1 Facing West-Southwest – Impacted soil and old flow line removal

Impact Area 2 Facing Mobile Street (East) – Hydrocarbon contaminated soil

Impacted Area 4 – Excavation in Progress

Impact Area 3 Facing West – Excavation Progress

Impacted Area 4, 1 & 3 Facing West – Excavation on Area 4

Impact Area 4 – Hydrocarbon contaminated soil excavated from 19 feet below land surface

Excavated Redwood timbers and flow line from Impact Area 1

Clean Backfill staging area East of Impacted Area

Impacted Area 1 hydrocarbon contaminated soil sidewall – Excavation in Progress

Impact Area 2 Facing Mobile Street (East) – Excavation Progress

Impacted Area 4 - Excavation in Progress

Backfill complete for all Impacted Areas

Top soil placement over backfill

Top soil seeding with native grass

Site restoration complete