AP - 090

GENERAL CORRESPONDENCE

2008 - 2007

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

April 25, 2008

Mr. Dennis Newman
OXY USA, Inc.
P.O. Box 4294
Houston, TX 77210-4294

RE: REQUIREMENT TO SUBMIT ABATEMENT PLAN
OXY USA, INC. - TODD WATER INJECTION STATION
SECTION 31, TOWNSHIP 7 SOUTH, RANGE 36 EAST
ROOSEVELT COUNTY, NEW MEXICO
OCD CASE NO. AP090

Dear Mr. Newman:

The Oil Conservation Division (OCD) has determined that OXY USA, Inc. (OXY) must submit a Stage 1 Abatement Plan in accordance with OCD's Rule 19 (19.15.1.19 NMAC) to investigate ground water contamination at its Todd Water Injection Station, located in Section 31, Township 7 South, Range 36 East, Roosevelt County, New Mexico. The Stage 1 Abatement Plan proposal must be submitted to the OCD Santa Fe Office with a copy provided to the OCD Hobbs District Office and must meet all of the requirements specified in OCD Rule 19 (19.15.1.19 NMAC), including, but not limited to, the public notice and participation requirements specified in Rule 19G. The Stage 1 Abatement Plan is due sixty (60) days from the receipt by OXY of this written notice.

OXY's Stage 1 Abatement Plan must specifically meet all of the requirements specified in OCD Rule 19E.3, including, but not limited to, a site investigation work plan and monitoring program that will enable it to characterize the release using an appropriate number of isoconcentration maps and cross sections and to provide the data necessary to select and design an effective abatement option. OXY's proposal must include the installation of at least one monitor well beneath the water injection station screened below the water table to determine whether "plume diving" is occurring. OXY may, if it chooses, concurrently submit a Stage 2 Abatement Plan that addresses appropriate proactive abatement options.

OXY should submit one paper copy with and an electronic copy on CD of all future workplans and/or reports. Please refer to ***OCD Case No. AP090*** on all future correspondence. If you have any questions, please contact Glenn von Gonten of my staff at (505) 476-3488.

Sincerely,

Glenn von Gonten

For Wayne Price
Environmental Bureau Chief

WP/gvg

cc: Chris Williams
Larry Johnson

Occidental Permian Ltd.
A subsidiary of Occidental Petroleum Corporation

5 Greenway Plaza, Suite 110, Houston, Texas 77046-0521
P.O. Box 4294, Houston, Texas 77210-4294
Phone 713.215.7000
www.oxy.com

RECEIVED
2008 MAR 17 PM 2 00

VIA REGULAR MAIL AND EMAIL

March 11, 2008

Mr. Glenn von Gonten
New Mexico Energy, Mineral and Natural Resources Department
Oil Conservation Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

RE: Submission of Form C-141 – Release Notification and Corrective Action and OXY USA Inc. Authorized Representative
Todd ATB#1,
State L-2 Tank Battery
E. M. Elliott Tank Battery
Todd Water Injection Station
Todd Hobbs R #10 Tank Battery
E. C. Hill "B" ATB at Well #24
E. C. Hill B-D Tank Battery
E. C. Hill Federal #7 Tank Battery

Dear Mr. von Gonton:

OXY USA Inc. ("Oxy") appreciates the time you and Wayne Price with the Oil Conservation Division ("OCD") spent meeting with Oxy representatives (Rick Passmore with Glenn Springs Holding, Inc., Tim Reed with Highlander Environmental, and myself) on February 27, 2008 to discuss Oxy's role as the new operator for the subject sites effective March 1, 2008.

Per your request, attached are Form C-141s for the eight (8) referenced sites. Note Rule 116 letter notifications for these sites were sent to the OCD on June 25, 2007 by Latigo Petroleum Inc. ("Latigo"). Pogo Producing ("Pogo") acquired Latigo in 2006 followed by Plains Exploration and Production ("PXP") acquiring Pogo in November 2007. Oxy has recently acquired majority interest in these sites from PXP and is the new operator.

OXY's remediation company, Glenn Springs Holding, Inc. ("GSH") will be responsible for managing the referenced sites; GSH is a subsidiary of Occidental Petroleum Corporation. OXY's authorized project manager for the referenced sites will be:

Mr. Rick Passmore
Glenn Springs Holding, Inc.
5005 LBJ Freeway, Suite 1350
Dallas Texas 75244
Office: 972-687-7504
Mobile: 859-221-7616
Rick_passmore@oxy.com

If you or District I have any questions concerning the C-141s for the referenced sites, please contact Mr. Passmore. Again, we thank you for your time meeting with us.

Sincerely,

Dennis L. Newman, P.E.

cc: New Mexico Energy, Mineral and Natural Resources Department
Oil Conservation Division
District I
1625 N. French Dr.
Hobbs, New Mexico 88240

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

☒ Initial Report ☐ Final Report

Name of Company OXY USA, Inc.	Contact Rick Passmore
Address P.O. Box 4294, Houston, Texas 77210-4294	Telephone No. 972-687-7504
Facility Name Todd Water Injection Station	Facility Type Water Injection Facility

Surface Owner	Mineral Owner	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
	31	7 South	36 East					Roosevelt

Latitude 33.67111 **Longitude** 103.29191

NATURE OF RELEASE

Type of Release Oil and /or produced water	Volume of Release Unknown	Volume Recovered None
Source of Release Historic oil and produced water spills	Date and Hour of Occurrence Unknown	Date and Hour of Discovery
Was Immediate Notice Given? ☐ Yes ☐ No ☒ Not Required	If YES, To Whom? N/A	
By Whom?	Date and Hour N/A	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

Historic spills.

Latigo Petroleum, Inc. made initial notification to the NMOCD on June 25, 2007, based on due diligence. Latigo was bought by Pogo Producing in 2006. Plains Exploration and Production (PXP) bought Pogo Producing in 2007, and finally OXY, USA Inc. purchased a majority interest in the PXP New Mexico assets on February 29, 2008 and became the operator on March 1, 2008.

Describe Area Affected and Cleanup Action Taken.*

Site Investigation and Characterization is in progress.

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:	OIL CONSERVATION DIVISION
Printed Name: Dennis Newman	Approved by District Supervisor:
Title: Senior Environmental Consultant	Approval Date: / Expiration Date:
E-mail Address: dennis_newman@oxy.com	Conditions of Approval: / Attached ☐
Date: March 7, 2008 Phone: 713-366-5485	

* Attach Additional Sheets If Necessary

Highlander Environmental Corp.

Midland, Texas

February 18, 2008

Mr. Glenn von Gonten
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

RE: Latigo Petroleum, Inc. – Project Summary
Todd Water Injection Station
Section 31, Township 7 South, Range 36 East
Roosevelt County, New Mexico
33.67111° N, 103.29191° W

Mr. von Gonten:

On behalf of Latigo Petroleum, Inc. (Latigo), Highlander Environmental Corp. (Highlander) performed a limited subsurface investigation at the Latigo Todd Water Injection Station, Section 31, Township 7 South, Range 36 East, Roosevelt County, New Mexico. The site location is shown on Figure 1. The soil investigation consisted of placement of hand auger holes and boreholes to assess the subsurface soils. Based on the soil assessment, a well was installed to assess the groundwater qualities at the Site.

Several impacted areas were investigated around the water injection station. One borehole was installed east of the facility in an area measuring 45' x 50'. The hydrocarbon impact was found from the surface to a depth of 15 feet below surface, elevated chloride concentrations to 70' below surface. The hand auger and borehole locations are shown on Figure 2. The analytical results are shown in Table 1 and Table 2.

Based on the results, borehole (BH-1) was converted to a temporary 2-inch monitor well. Groundwater was encountered at approximately 69 feet below top of casing (TOC). On September 6, 2006 and May 15, 2007, Highlander purged and sampled the well per OCD guidelines for analyses of chlorides and BTEX. Chloride concentrations exceed New Mexico Water Quality Control Commission (NMWQCC) standards, while hydrocarbon constituents (BTEX) were detected at levels below the NMWQCC action levels. The analytical results are shown in Table 3.

A total of eleven (11) monitor wells have been installed at this facility. The well locations are shown on the attached Figures 3 and 4. The wells have been gauged and sampled. The results are summarized in Table 3.

Should you have any questions or concerns regarding this site, please do not hesitate to contact me at (432) 682-4559.

Highlander Environmental Corp.

Ike Tavarez, P.G.
Sr. Geologist/Project Manager

FIGURES

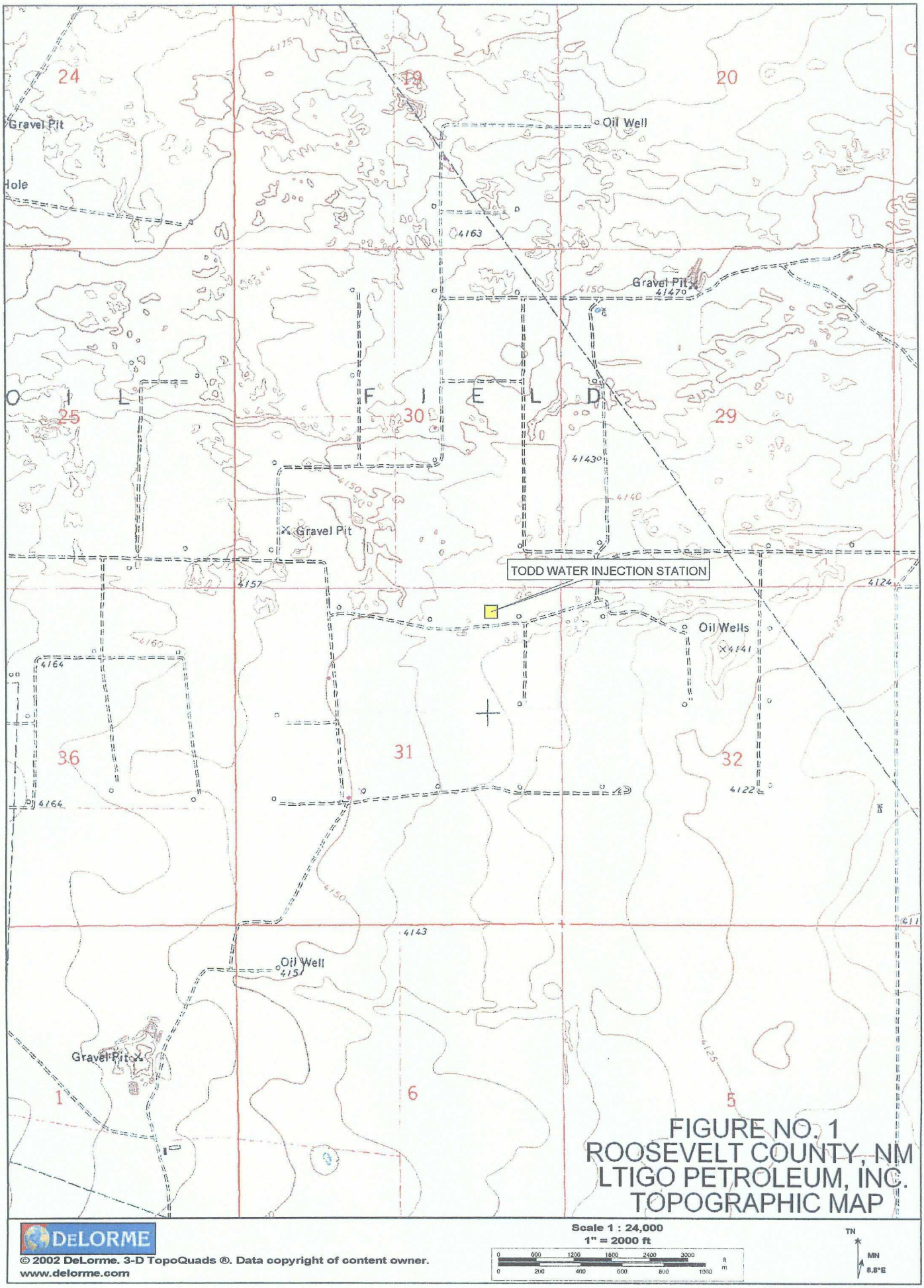
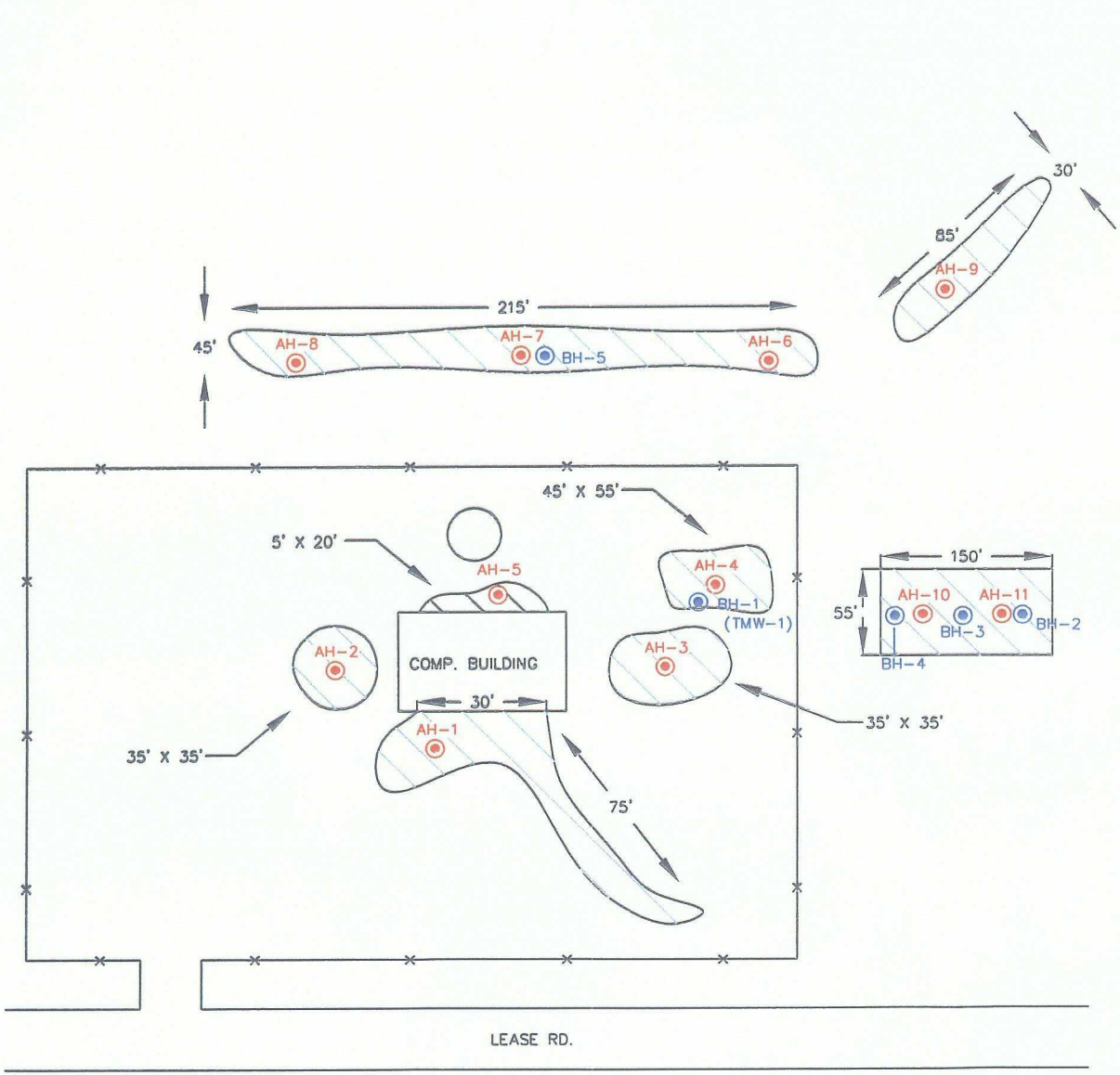


FIGURE NO. 1
ROOSEVELT COUNTY, NM
LTIGO PETROLEUM, INC.
TOPOGRAPHIC MAP



BORE HOLES
SPILL AREAS
SAMPLE LOCATIONS

NOT TO SCALE

FIGURE NO. 2

ROOSEVELT COUNTY, NEW MEXICO

LATIGO PETROLEUM, INC.
TODD WATER INJECTION STATION

HIGHLANDER ENVIRONMENTAL CORP.
MIDLAND, TEXAS

DATE: 11/30/06
DWN. BY: JJ
FILE: C:\POGO\2617\TODD WATER STATION

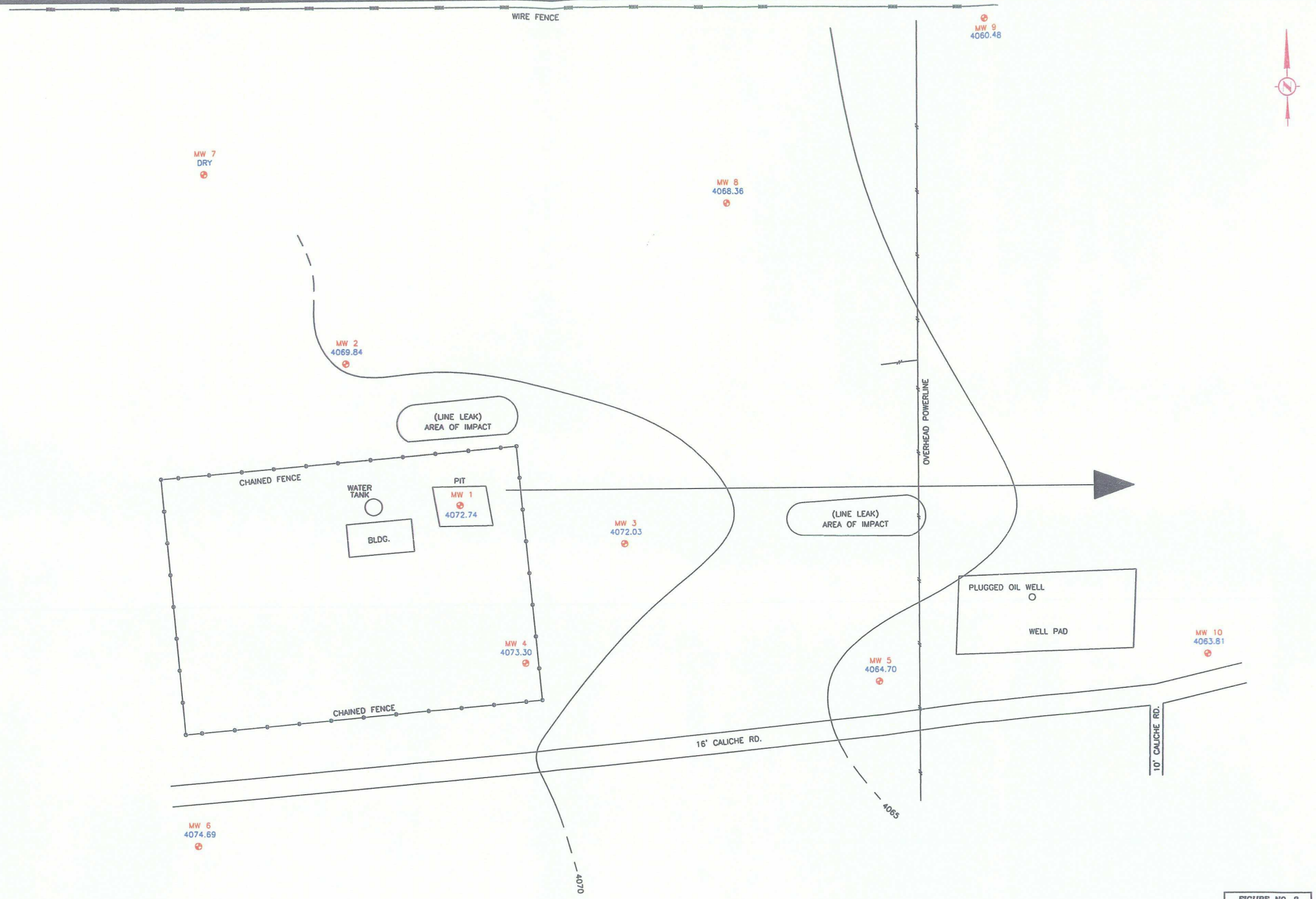


FIGURE NO. 3

ROOSEVELT COUNTY, NEW MEXICO

POGO PRODUCING COMPANY

TODD WATER INJECTION STATION
GROUNDWATER GRADIENT MAP
9/25/07

HIGHLANDER ENVIRONMENTAL CORP.
MIDLAND, TEXAS

DATE: 10/8/07
DWG. BY: RC
FILE: C:\POGO\2617

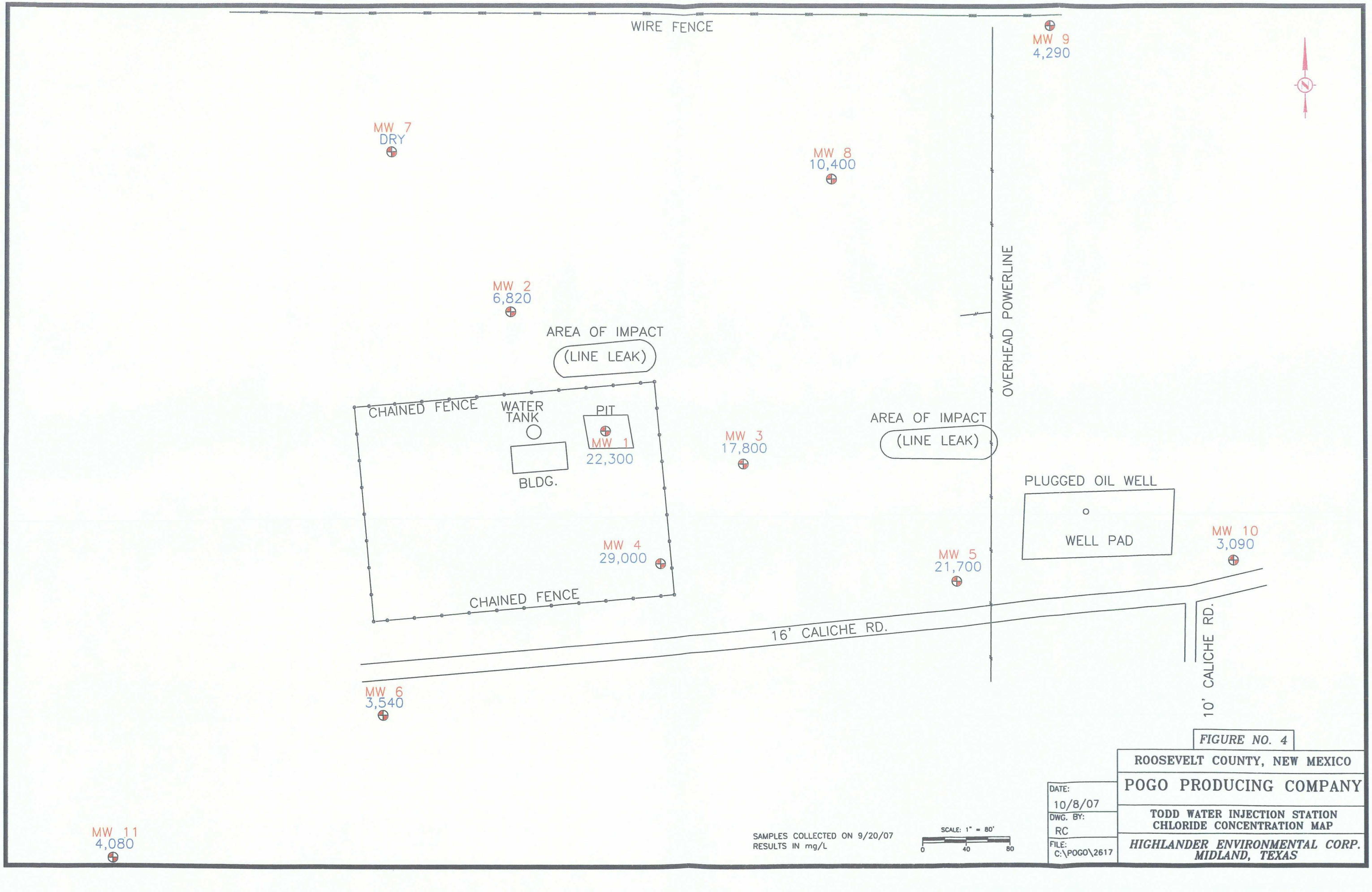


FIGURE NO. 4

ROOSEVELT COUNTY, NEW MEXICO

POGO PRODUCING COMPANY

TODD WATER INJECTION STATION
CHLORIDE CONCENTRATION MAP

HIGHLANDER ENVIRONMENTAL CORP.
MIDLAND, TEXAS

TABLES

Table 1
Pogo Producing Company
TODD WATER INJECTION STATION
Roosevelt County, New Mexico

Sample ID	Date Sampled	Sample Depth (ft)	TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			C6-C12	C12-C35	Total					
AH-1	7/24/2006	0-1	**88.3**	**831**	**831.0**	<0.0500	<0.0500	<0.0500	<0.0500	**621**
	7/24/2006	1-1.5	<1.00	<50.0	<50.0	-	-	-	-	**243**
	7/24/2006	2-2.5	<1.00	<50.0	<50.0	-	-	-	-	**299**
AH-2	7/24/2006	0-1	**172**	**4300**	**4472**	**0.0816**	**0.372**	**0.772**	**0.731**	**5010**
	7/24/2006	1-1.5	<1.00	**82.1**	**82.1**	-	-	-	-	**670**
	7/24/2006	2-2.5	<1.00	<50.0	<50.0	-	-	-	-	**812**
AH-3	7/24/2006	0-1	<1.00	**288**	**288**	<0.0100	<0.0100	<0.0100	**0.0336**	**244**
	7/24/2006	1-1.5	<1.00	<50.0	<50.0	-	-	-	-	**208**
	7/24/2006	2-2.5	<1.00	<50.0	<50.0	-	-	-	-	**284**
	7/24/2006	4-4.5	<1.00	<50.0	<50.0	-	-	-	-	**1030**
AH-4	7/24/2006	0-1	<1.00	<50.0	<50.0	**0.0109**	<0.0100	<0.0100	<0.0100	**1310**
	7/24/2006	1-1.5	**9.02**	**1030**	**1039**	-	-	-	-	**1360**
	7/24/2006	2-2.5	**2150**	**6800**	**8950**	**24.8**	**54.9**	**72.4**	**57.4**	**2080**
	7/24/2006	4-4.5	**1830**	**4900**	**6730**	-	-	-	-	**1650**
	7/24/2006	6-6.5	**2940**	**8900**	**11840**	-	-	-	-	**2120**
	7/24/2006	7-7.5								**2780**
	7/24/2006	8.5-9	**8120**	**7030**	**15150**	**43.8**	**204**	**208**	**179**	**1880**

Table 1
Pogo Producing Company
TODD WATER INJECTION STATION
Roosevelt County, New Mexico

Sample ID	Date Sampled	Sample Depth (ft)	TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			C6-C12	C12-C35	Total					
AH-5	7/24/2006	0-1	**1080**	**6630**	**7710**	**2.64**	**4.86**	**8.01**	**6.26**	**4630**
	7/24/2006	1-1.5	<1.00	**62.9**	**62.9**	-	-	-	-	**2380**
	7/24/2006	2-2.5	<1.00	<50.0	<50.0	-	-	-	-	**752**
	7/24/2006	4-4.5								**2520**
	7/24/2006	5-5.5	<1.00	<50.00	<50.0	-	-	-	-	**1040**
AH-6	7/24/2006	0-1	<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	**780**
	7/24/2006	1-1.5	<1.00	<50.0	<50.0	-	-	-	-	**3780**
	7/24/2006	2-2.5								**1860**
	7/24/2006	3-3.5	<1.00	<50.0	<50.0	-	-	-	-	**66.4**
AH-7	7/24/2006	0-1	**87.5**	**3890**	**3977.5**	<0.200	<0.200	**0.584**	<0.200	**4610**
	7/24/2006	1-1.5	<1.00	<50.0	<50.0	-	-	-	-	**4560**
	7/24/2006	2-2.5								**20100**
	7/24/2006	3-3.5	<1.00	**79.2**	**79.2**	-	-	-	-	**13900**
AH-8	7/24/2006	0-1	<1.00	**68.2**	**68.2**	<0.0100	<0.0100	<0.0100	<0.0100	**66.8**
	7/24/2006	1-1.5	<1.00	<50.0	<50.0	-	-	-	-	**315**
AH-9	7/24/2006	0-1	**93.3**	**5640**	**5733.3**	<0.200	<0.200	<0.200	<0.200	**22.6**
	7/24/2006	1-1.5	<1.00	**137**	**137**	-	-	-	-	**15.9**

Table 1
Pogo Producing Company
TODD WATER INJECTION STATION
Roosevelt County, New Mexico

Sample ID	Date Sampled	Sample Depth (ft)	TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			C6-C12	C12-C35	Total					
AH-10	7/24/2006	0-1	<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	**2140**
	7/24/2006	1-1.5	-	-	-	-	-	-	-	**4040**
	7/24/2006	2-2.5	-	-	-	-	-	-	-	**5250**
	7/24/2006	5-5.5	-	-	-	-	-	-	-	**7480**
	7/24/2006	6-6.5	-	-	-	-	-	-	-	**6320**
AH-11	7/24/2006	0-1	<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	**1660**
	7/24/2006	1-1.5	-	-	-	-	-	-	-	**8010**
	7/24/2006	2-2.5	-	-	-	-	-	-	-	**10800**
	7/24/2006	4-4.5	-	-	-	-	-	-	-	**11600**
	7/24/2006	6-6.5	-	-	-	-	-	-	-	**5940**
	7/24/2006	7-7.5	-	-	-	-	-	-	-	**14000**
	7/24/2006	8-8.5	-	-	-	-	-	-	-	**11400**
	7/24/2006	9-9.5	-	-	-	-	-	-	-	**8070**

Table 2
Pogo Producing Company
TODD WATER INJECTION STATION
Roosevelt County, New Mexico

Sample ID	Date Sampled	Sample Depth (ft)	TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			C6-C12	C12-C35	Total					
BH-1	8/31/2006	10-12'	**1290**	**6800**	**8090**	**30.7**	**65.3**	**71.6**	**55.4**	**1730**
	8/31/2006	15-17'	**770**	**2470**	**3240**	**3.38**	**7.53**	**10.1**	**30.1**	**2850**
	8/31/2006	20-22'	**21.7**	**65.9**	**87.60**	**0.0740**	**0.376**	**0.760**	**0.646**	**660**
	8/31/2006	30-32'	-	-	-	-	-	-	-	**583**
	8/31/2006	40-42'	-	-	-	-	-	-	-	**1610**
	8/31/2006	50-52'	-	-	-	-	-	-	-	**1220**
	8/31/2006	60-62'	-	-	-	-	-	-	-	**486**
	8/31/2006	70-72'	**1.16**	<50.0	**1.16**	<0.0100	<0.0100	<0.0100	<0.0100	**609**

(-) not analyzed

Table 3
Pogo Producing Company
TODD WATER INJECTION STATION
Roosevelt County, New Mexico

Sample ID	Date Sampled	Date Gauged	Total Depth (feet)	Top of Casing Elevation (feet)	Measured Groundwater Elevations (feet)	Corrected Groundwater Elevations (feet)	Sample Number	Benzene (mg/L)	Toluene (mg/L)	Ethly-benzene (mg/L)	Xylene (mg/L)	Chloride (mg/L)	TDS (mg/L)
TMW-1 (MW-1)	09/06/06	N.G.	80.10	4,142.16	N.G.	N.G.	102407	**0.00220**	**0.00350**	**0.00390**	**0.00280**	**8,250**	-
	05/15/07	N.G.		4,142.16	N.G.	N.G.	124635	<0.001	<0.001	<0.001	<0.001	**26,200**	-
	09/20/07	09/25/07		4,142.16	69.42	4,072.74	137376	<0.001	<0.001	<0.001	<0.001	**22,300**	-
	12/07/07	12/04/07		4,142.16	69.37	4,072.79	-	-	-	-	-	**20,700**	**38,200**
MW-2	09/24/07	09/25/07	84.80	4,143.19	73.35	4,069.84	137487	<0.001	<0.001	<0.001	<0.001	**6,820**	-
	12/07/07	12/04/07		4,143.19	70.94	4,072.25	-	-	-	-	-	**9,080**	**16,400**
MW-3	09/20/07	09/25/07	88.10	4,141.38	69.35	4,072.03	137377	<0.001	<0.001	<0.001	<0.001	**17,800**	-
	12/07/07	12/04/07		4,141.38	69.32	4,072.06	-	-	-	-	-	**4,100**	**9,000**
MW-4	09/20/07	09/25/07	87.80	4,142.03	68.73	4,073.30	137378	<0.001	<0.001	<0.001	<0.001	**29,000**	-
	12/07/07	12/04/07		4,142.03	68.70	4,073.33	-	-	-	-	-	**6,760**	**14,150**
MW-5	09/20/07	09/25/07	88.70	4,142.21	77.51	4,064.70	137379	<0.001	<0.001	<0.001	<0.001	**21,700**	-
	12/07/07	12/04/07		4,142.21	72.72	4,069.49	-	-	-	-	-	**14,100**	**21,100**

Pogo Producing Company

TODD WATER INJECTION STATION

Roosevelt County, New Mexico

Sample ID	Date Sampled	Date Gauged	Total Depth (feet)	Top of Casing Elevation (feet)	Measured Groundwater Elevations (feet)	Corrected Groundwater Elevations (feet)	Sample Number	Benzene (mg/L)	Toluene (mg/L)	Ethly-benzene (mg/L)	Xylene (mg/L)	Chloride (mg/L)	TDS (mg/L)
MW-6	09/20/07	09/25/07	89.50	4,143.94	69.25	4,074.69	137380	<0.001	<0.001	<.0.001	<0.001	**3,540**	-
	12/07/07	12/04/07		4,143.94	69.32	4,074.62	-	-	-	-	-	**3,520**	**7,660**
MW-7	09/20/07	09/25/07	88.10	4,143.27	Dry	Dry	-	-	-	-	-	-	-
	12/07/07	12/04/07		4,143.27	Dry	Dry	-	-	-	-	-	-	-
MW-8	09/20/07	09/25/07	88.82	4,142.61	74.25	4,068.36	137381	<0.001	<0.001	<0.001	<0.001	**10,400**	-
	12/07/07	12/04/07		4,142.61	74.26	4,068.35	-	-	-	-	-	**10,800**	**20,300**
MW-9	09/26/07	09/25/07	92.25	4,141.66	81.18	4,060.48	137488	<0.001	<0.001	<0.001	<0.001	**4,290**	-
	12/07/07	12/04/07		4,141.66	80.95	4,060.71	-	-	-	-	-	**4,690**	**8,862**
MW-10	09/26/07	09/25/07	90.24	4,142.92	79.11	4,063.81	137489	<0.001	<0.001	<0.001	<0.001	**3,090**	-
	12/07/07	12/04/07		4,142.92	78.98	4,063.94	-	-	-	-	-	**3,310**	**6,410**
MW-11	09/26/07	09/25/07	81.49	4,145.09	75.65	4,069.44	137490	<0.001	<0.001	<0.001	<0.001	**4,080**	-
	12/07/07	12/04/07		4,145.09	63.12	4,081.97	-	-	-	-	-	**5,010**	**10,151**

(-) not analyzed N.G. - Not gauged TMW-1 converted to MW-1 on September 17, 2007

SAMPLE LOG

SAMPLE LOG

Boring/Well: **BH-2**
Project Number: **2617**
Client: **Pogo Production Inc.**
Site Location: **Todd Water Station**
Location: **Roosevelt County, New Mexico**
Total Depth **30**
Date Drilled: **09/11/07**

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Gray sandy clay (hydrocarbon stained with odor)
5-10	--	Gray sandy clay (hydrocarbon stained with odor)
10-15	--	Gray clayey sand (hydrocarbon stained)
15-20	--	Tan medium grain sand with limestone intermixed
20-25	--	Tan sand intermixed with limestone
25-30	--	Tan fine grain sand

Total Depth is 30 feet

SAMPLE LOG

Boring/Well: **BH-3**
Project Number: **2617**
Client: **Pogo Production Inc.**
Site Location: **Todd Water Station**
Location: **Roosevelt County, New Mexico**
Total Depth **30**
Date Drilled: **09/11/07**

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Gray sandy clay (hydrocarbon stained with odor)
5-10	--	Gray sandy clay (hydrocarbon stained with odor)
10-15	--	Tan medium grain sand
15-20	--	Tan medium grain sand with limestone intermixed
20-25	--	Tan medium grain sand with limestone
25-30	--	Tan fine grain sand

Total Depth is 30 feet

SAMPLE LOG

Boring/Well: **BH-4**
Project Number: **2617**
Client: **Pogo Production Inc.**
Site Location: **Todd Water Station**
Location: **Roosevelt County, New Mexico**
Total Depth **30**
Date Drilled: **09/11/07**

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Gray sandy clay (hydrocarbon stained with odor)
5-10	--	Tan medium grain sand with limestone intermixed
10-15	--	Tan medium grain sand with limestone intermixed
15-20	--	Tan medium grain sand with limestone intermixed
20-25	--	Tan medium grain sand with limestone intermixed
25-30	--	Tan fine grain sand

Total Depth is 30 feet

SAMPLE LOG

Boring/Well: **BH-5**
Project Number: **2617**
Client: **Pogo Production Inc.**
Site Location: **Todd Water Station**
Location: **Roosevelt County, New Mexico**
Total Depth **30**
Date Drilled: **09/11/07**

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Tan medium grain calcareous sand
5-10	--	Tan medium grain calcareous sand
10-15	--	Tan medium grain calcareous sand
15-20	--	Tan medium grain calcareous sand

Total Depth is 20 feet

SAMPLE LOG

Boring/Well: MW-1
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 80
Date Installed: 08/29/06

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Dark hydrocarbon stained soil
5-10	--	Dark hydrocarbon stained soil
15-20	--	Brown/tan calcareous sand (strong hydrocarbon odor)
20-25	--	Tan/buff sandy limestone (hydrocarbo odor)
25-30	--	Tan calcareous sand (salty)
30-35	--	Tan calcareous sand (slightly salty)
35-40	--	Tan calcareous sand with strong hydrocarbon odor
40-45	--	Tan calacareous sand (salty)
50-55	--	Tan calcareous sand (salty)
45-50	--	Buff/tan calcareous fine grain sand
50-55	--	Tan/buff slightly calcareous fine grain sand
60-65	--	Tan calacareous sand (salty)
70-75	--	Tan sandy limestone (no salt)
75-80	--	Tan sandy limestone (no salt)

Total Depth is 80 feet Groundwater encountered at 71 feet below ground surface

SAMPLE LOG

Boring/Well: MW-2
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 82
Date Installed: 08/29/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Buff sandy limestone
5-10	--	Buff/tan calcareous sand
10-15	--	Tan/buff calcareous sand
15-20	--	Buff sandy limestone
20-25	--	Buff sandy limestone
25-30	--	Buff/tan calcareous sand
30-35	--	Tan well sorted fine grain sand
35-40	--	Tan/buff slightly calcareous fine grain sand
40-45	--	Buff fine grain sandy limestone
45-50	--	Buff/tan calcareous fine grain sand
50-55	--	Tan/buff slightly calcareous fine grain sand
55-60	--	Tan/buff slightly calcareous fine grain sand
60-65	--	Tan/buff slightly calcareous fine grain sand
65-70	--	Tan/buff slightly calcareous fine grain sand
70-75	--	Tan fine grain sandy clay with pebbles intermixed (moist)
75-80	--	Tan fine grain sandy clay with pebbles intermixed (moist)
80-82	--	Tan fine grain sandy clay

Total Depth is 82 feet Groundwater encountered at 71 feet below ground surface

SAMPLE LOG

Boring/Well: MW-3
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 85
Date Installed: 08/29/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Buff sandy limestone with clay intermixed
5-10	--	Buff/tan sandy limestone
10-15	--	Tan calcareous sand with clay intermixed
15-20	--	Buff slightly sandy limestone with some clay intermixed
20-25	--	Buff limestone
25-30	--	Tan calcareous fine grain well sorted sand (blow sand)
30-35	--	Tan calcareous fine grain well sorted sand (blow sand)
35-40	--	Tan/red well sorted fine grain sand (blow sand)
40-45	--	Tan/buff calcareous fine grain sand with lenses of limestone intermixed
45-50	--	Tan (slightly calcareous) fine grain sand
50-55	--	Tan/buff calcareous very fine grain well sorted sand
55-60	--	Tan/buff calcareous very fine grain well sorted sand
60-65	--	Tan/buff calcareous very fine grain well sorted sand
65-70	--	Tan sand with some sandstone intermixed
70-75	--	Tan well sorted very fine grain sand with sandstone intermixed
75-80	--	Two feet of sandstone to 77 feet, then fine grain sand with chert/quartz intermixed
80-85	--	Tan clay of high plasticity starting at 84 feet

Total Depth is 85 feet Groundwater encountered at 70 feet below ground surface

SAMPLE LOG

Boring/Well: MW-4
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 85
Date Installed: 08/30/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Gray clayey sand
5-10	--	Gray clayey sand
10-15	--	Tan/gray clayey medium grain sand
15-20	--	Buff sandy limestone
20-25	--	Buff sandy limestone with chert layers intermixed
25-30	--	Tan well sorted fine grain calcareous sand (blow sand)
30-35	--	Tan well sorted fine grain sand (blow sand)
35-40	--	Tan well sorted fine grain sand (blow sand)
40-45	--	Tan well sorted fine grain sand with layers of limestone intermixed
45-50	--	Tan well sorted fine grain sand with sandstone intermixed
50-55	--	Tan well sorted fine grain sand
55-60	--	Tan well sorted fine grain sand
60-65	--	Tan well sorted fine grain sand
65-70	--	Tan well sorted fine grain sand with sandstone intermixed
70-75	--	Tan well sorted fine grain sand with sandstone intermixed
75-80	--	Tan sandy clay of high plasticity
80-85	--	Tan sandy clay of high plasticity

Total Depth is 85 feet Groundwater encountered at 69 feet below ground surface

SAMPLE LOG

Boring/Well: MW-5
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 87
Date Installed: 09/11/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Gray/red medium grain sand with limestone
5-10	--	Tan fine grain well sorted sand
10-15	--	Buff/red calcareous sand
15-20	--	Buff/red calcareous sand
20-25	--	Buff sandy limestone
25-30	--	Light tan calcareous fine grain sand
30-35	--	Light tan calcareous fine grain sand
35-40	--	Tan fine grain well sorted sand
40-45	--	Buff fine grain calcareous sand
45-50	--	Buff fine grain calcareous sand
50-55	--	Tan fine grain well sorted sand
55-60	--	Tan well sorted fine grain sand
60-65	--	Yellow/tan fine grain sand
65-70	--	Tan/brown medium grain sand
70-75	--	Tan/brown medium grain sand
75-80	--	Tan fine grain well sorted sand
80-85	--	Yellow/tan clay of high plasticity
85-87	--	Yellow clay of high plasticity

Total Depth is 87 feet Groundwater encountered at 72 feet below ground surface

SAMPLE LOG

Boring/Well: MW-6
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 87
Date Installed: 09/11/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Brown medium grain sand
5-10	--	Buff fine grain calcareous sand
10-15	--	Buff fine grain calcareous sand
15-20	--	Buff sandy limestone
20-25	--	Buff sandy limestone
25-30	--	Tan/buff calcareous sand
30-35	--	Tan calcareous fine grain sand
35-40	--	Tan calcareous fine grain sand
40-45	--	Tan/buff calcareous sand (increasing limestone)
45-50	--	Tan fine grain calcareous sand
50-55	--	Tan fine grain calcareous sand
55-60	--	Tan fine grain sand
60-65	--	Tan fine grain sand with sandstone intermixed
65-70	--	Tan medium grain sand with some sandstone intermixed
70-75	--	Fine grain tan sand with some gravel intermixed
75-80	--	Tan sandy clay with gravel intermixed (moist)
80-85	--	Yellow to tan clay of high plasticity
85-87	--	Yellow to tan clay of high plasticity

Total Depth is 87 feet Groundwater encountered at 74 feet below ground surface

SAMPLE LOG

Boring/Well: MW-7
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 86
Date Installed: 09/13/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Brown medium grain sand
5-10	--	Grayish tan calcareous sand
10-15	--	Tan/buff calcareous sand
15-20	--	Tan/buff calcareous sand
20-25	--	Tan/buff calcareous sand (increasing limestone)
25-30	--	Tan/buff calcareous fine grain sand
30-35	--	Tan calcareous fine grain sand
35-40	--	Tan calcareous fine grain sand
40-45	--	Tan calcareous fine grain sand
45-50	--	Tan fine grain sand (blow sand)
50-55	--	Tan fine grain sand with sandstone intermixed
55-60	--	Tan fine grain sand with sandstone intermixed
60-65	--	Tan sandy clay (moist)
65-70	--	Tan sandy clay
70-75	--	Tan/yellow clay of high plasticity
75-80	--	Tan/yellow clay of high plasticity
80-85	--	Tan/yellow clay of high plasticity

Total Depth is 86 feet Moist layer encountered at 65 feet but well is dry.

SAMPLE LOG

Boring/Well: MW-8
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 85
Date Installed: 09/13/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Tan medium grain sand
5-10	--	Tan/buff fine grain calcareous sand
10-15	--	Tan/buff fine grain calcareous sand
15-20	--	Tan/buff fine grain sand with limestone intermixed
20-25	--	Tan calcareous fine grain sand
25-30	--	Buff/tan sandy limestone
30-35	--	Tan/buff fine grain sand
35-40	--	Tan fine grain sand (blow sand)
40-45	--	Tan fine grain sand (blow sand) intermixed with some sandstone
45-50	--	Tan fine grain calcareous sand
50-55	--	Tan fine grain sand (blow sand)
55-60	--	Tan fine grain sand (blow sand)
60-65	--	Tan fine grain sand (blow sand)
65-70	--	Tan fine grain sand (blow sand) with sandstone intermixed
70-75	--	Tan fine grain sand (blow sand) with sandstone intermixed
75-80	--	Tan fine grain sand (blow sand) with sandstone intermixed
80-85	--	Tan/yellow clay of high plasticity.

Total Depth is 87 feet Groundwater encountered at 75 feet below ground surface.

SAMPLE LOG

Boring/Well: MW-9
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 90
Date Installed: 09/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Tan/brown medium grain sand
5-10	--	Buff fine grain sand
10-15	--	Tan fine grain sand
15-20	--	Buff sandy limestone
20-25	--	Buff sandy limestone
25-30	--	Buff/tan sandy limestone
30-35	--	Tan/buff calcareous sand
35-40	--	Tan fine grain sand
40-45	--	Tan/buff fine grain calcareous sand
45-50	--	Tan/buff fine grain calcareous sand
50-55	--	Tan fine grain sand (blow sand)
55-60	--	Tan fine grain sand (blow sand)
60-65	--	Tan fine grain sand (blow sand)
65-70	--	Tan fine grain sand (blow sand)
70-75	--	Tan fine to medium grain sand (moist)
75-80	--	Brown/tan medium grain sand
80-85	--	Brown/tan medium grain sand
85-90	--	Tan/yellow clay of high plasticity

Total Depth is 90 feet Groundwater encountered at 75 feet below ground surface.

SAMPLE LOG

Boring/Well: MW-10
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 88
Date Installed: 09/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Tan/brown medium grain sand
5-10	--	Buff/tan fine grain calcareous sand
10-15	--	Buff/tan fine grain calcareous sand
15-20	--	Buff/tan fine grain calcareous sand
20-25	--	Buff/tan fine grain calcareous sand
25-30	--	Buff/tan fine grain calcareous sand
30-35	--	Tan fine grain sand
35-40	--	Tan fine grain sand
40-45	--	Tan fine grain sand
45-50	--	Tan/buff fine grain calcareous sand
50-55	--	Tan/buff fine grain calcareous sand
55-60	--	Tan fine grain sand
60-65	--	Tan fine grain sand
65-70	--	Tan fine grain sand
70-75	--	Tan fine grain sand
75-80	--	Medium grain well sorted sand
80-85	--	Medium grain well sorted sand with some clay intermixed
85-90	--	Tan clay of high plasticity

Total Depth is 88 feet Groundwater encountered at 79 feet below ground surface.

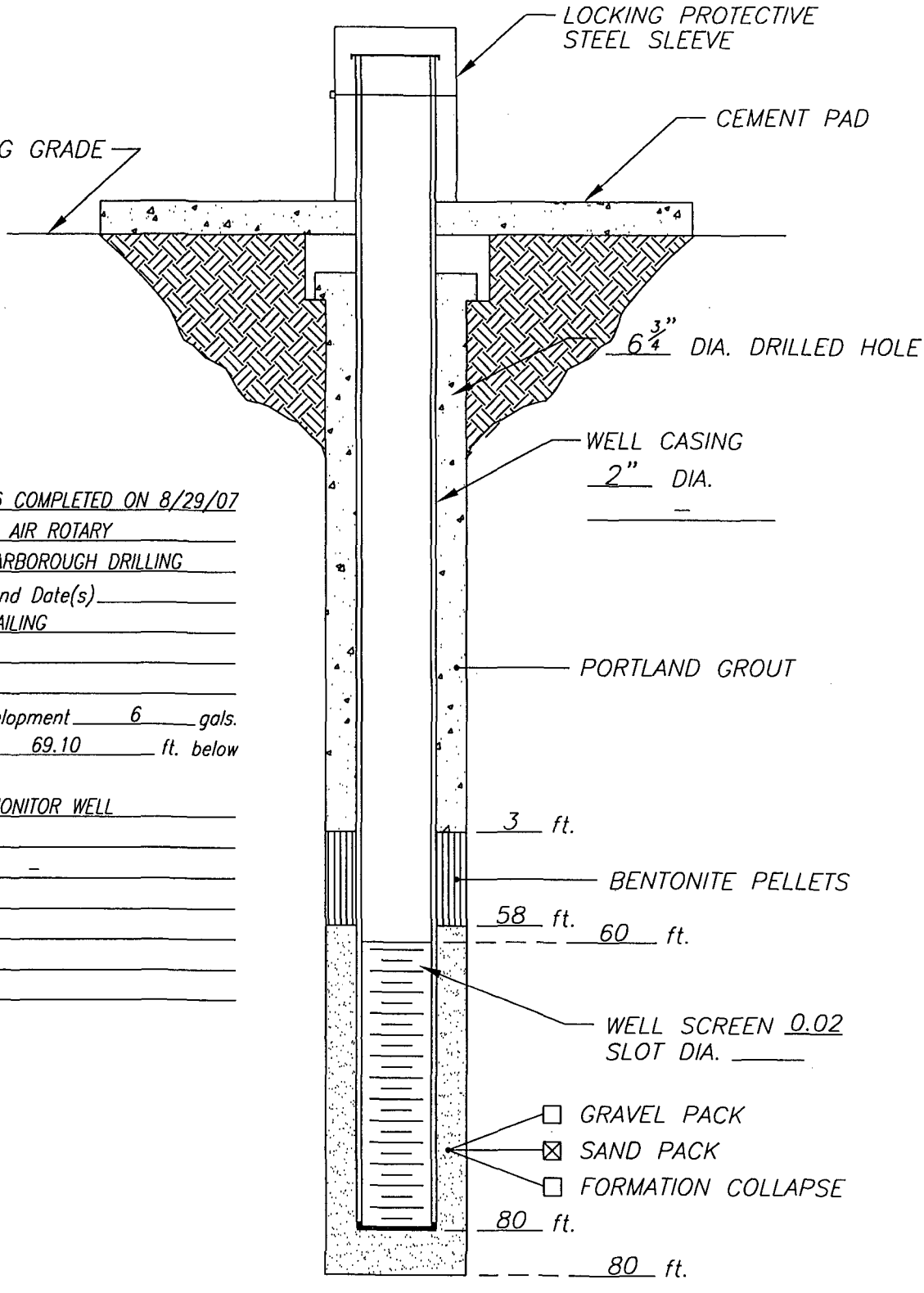
SAMPLE LOG

Boring/Well: MW-11
Project Number: 2617
Client: Pogo Production Inc.
Site Location: Todd Water Station
Location: Roosevelt County, New Mexico
Total Depth 80
Date Installed: 09/24/07

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
0-5	--	Tan medium grain sand
5-10	--	Buff fine grain sandy limestone
10-15	--	Buff/tan fine grain calcareous sand
15-20	--	Buff/tan fine grain sandy limestone
20-25	--	Buff/tan fine grain calcareous sand
25-30	--	Tan very fine grain calcareous sand
30-35	--	Tan very fine grain calcareous sand
35-40	--	Tan/buff fine grain calcareous sand
40-45	--	Tan/buff fine grain calcareous sand
45-50	--	Tan fine grain calcareous sand
50-55	--	Tan fine grain calcareous sand
55-60	--	Tan fine grain calcareous sand
60-65	--	Tan fine grain calcareous sand
65-70	--	Tan clay of high plasticity
70-75	--	Tan clay of high plasticity
75-80	--	Tan clay of high plasticity

Total Depth is 80 feet Groundwater encountered at 73 feet below ground surface.

WELL CONSTRUCTION LOG



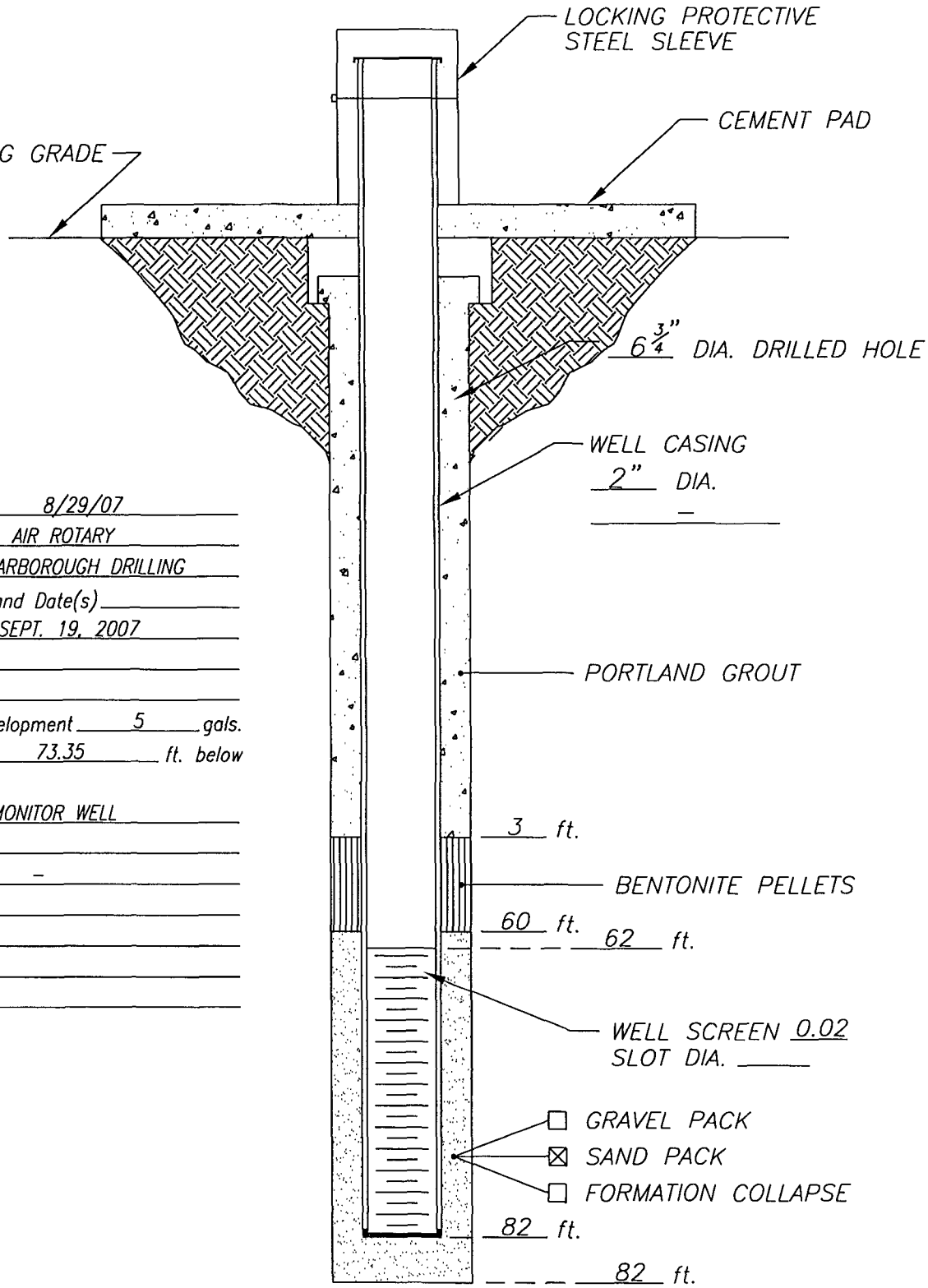
Installation Date(s) 8/29/06 COMPLETED ON 8/29/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING

Water Removed During Development 6 gals.
Static Depth to Water 69.10 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks –

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-1
	LOCATION: ROOSEVELT CO, NM	

WELL CONSTRUCTION LOG



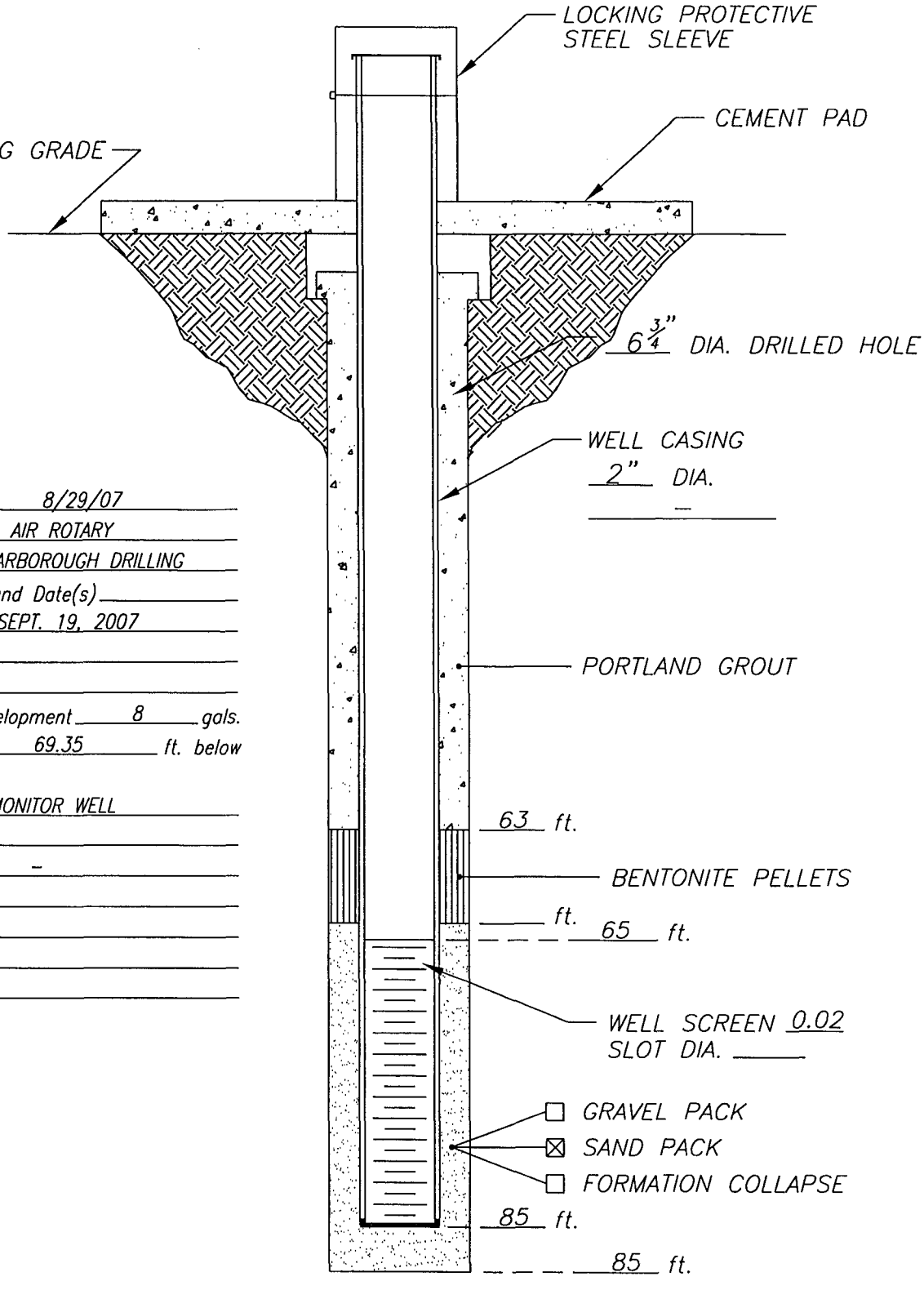
Installation Date(s) 8/29/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING – SEPT. 19, 2007

Water Removed During Development 5 gals.
Static Depth to Water 73.35 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks –

DATE: 10/3/07	CLIENT: POGO PRODUCING INC PROJECT: TODD WATER STATION LOCATION: ROOSEVELT CO, NM	WELL NO.
Highlander Environmental		MW-2

WELL CONSTRUCTION LOG



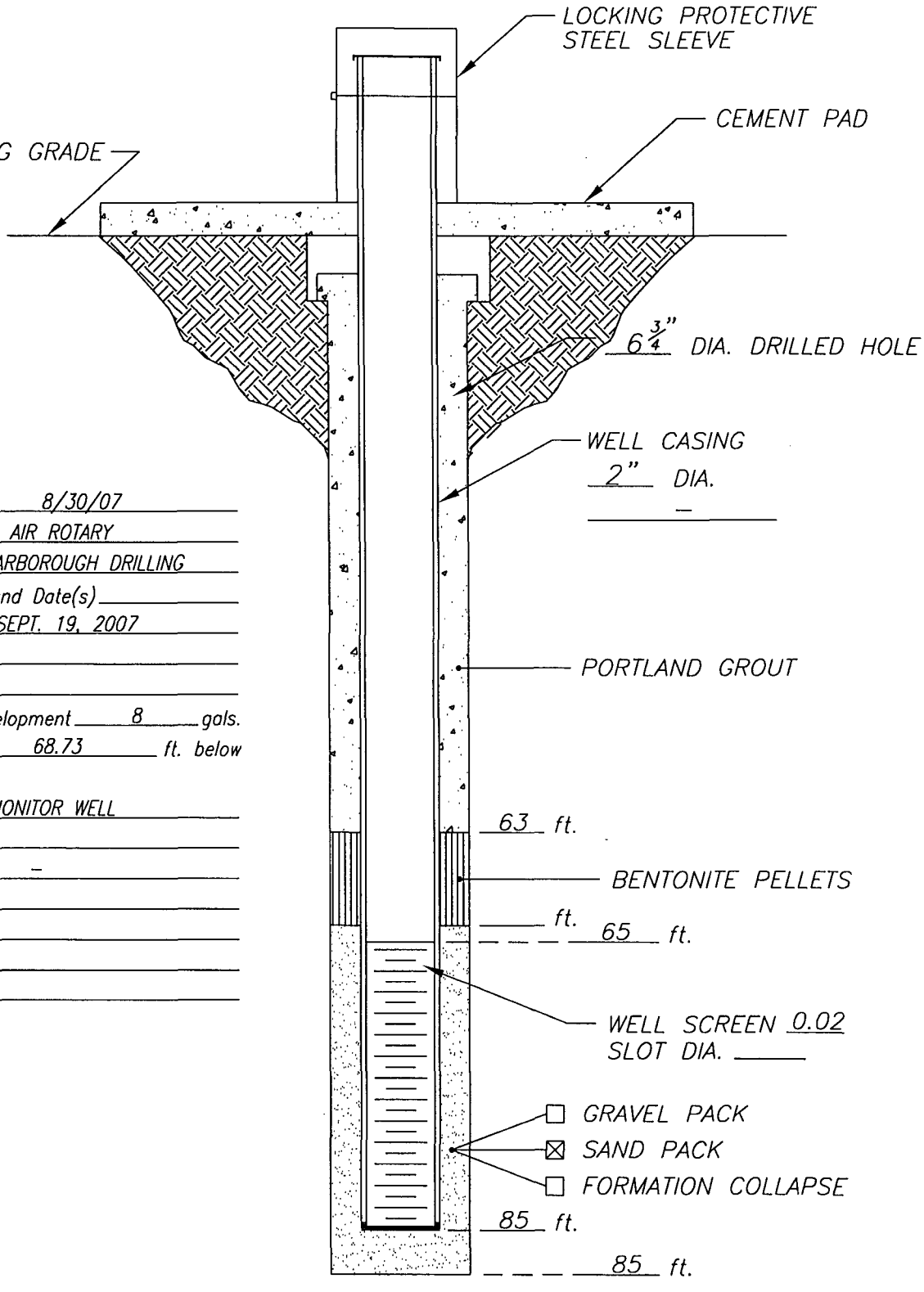
Installation Date(s) 8/29/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING - SEPT. 19, 2007

Water Removed During Development 8 gals.
Static Depth to Water 69.35 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks -

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-3
	LOCATION: ROOSEVELT CO, NM	

WELL CONSTRUCTION LOG



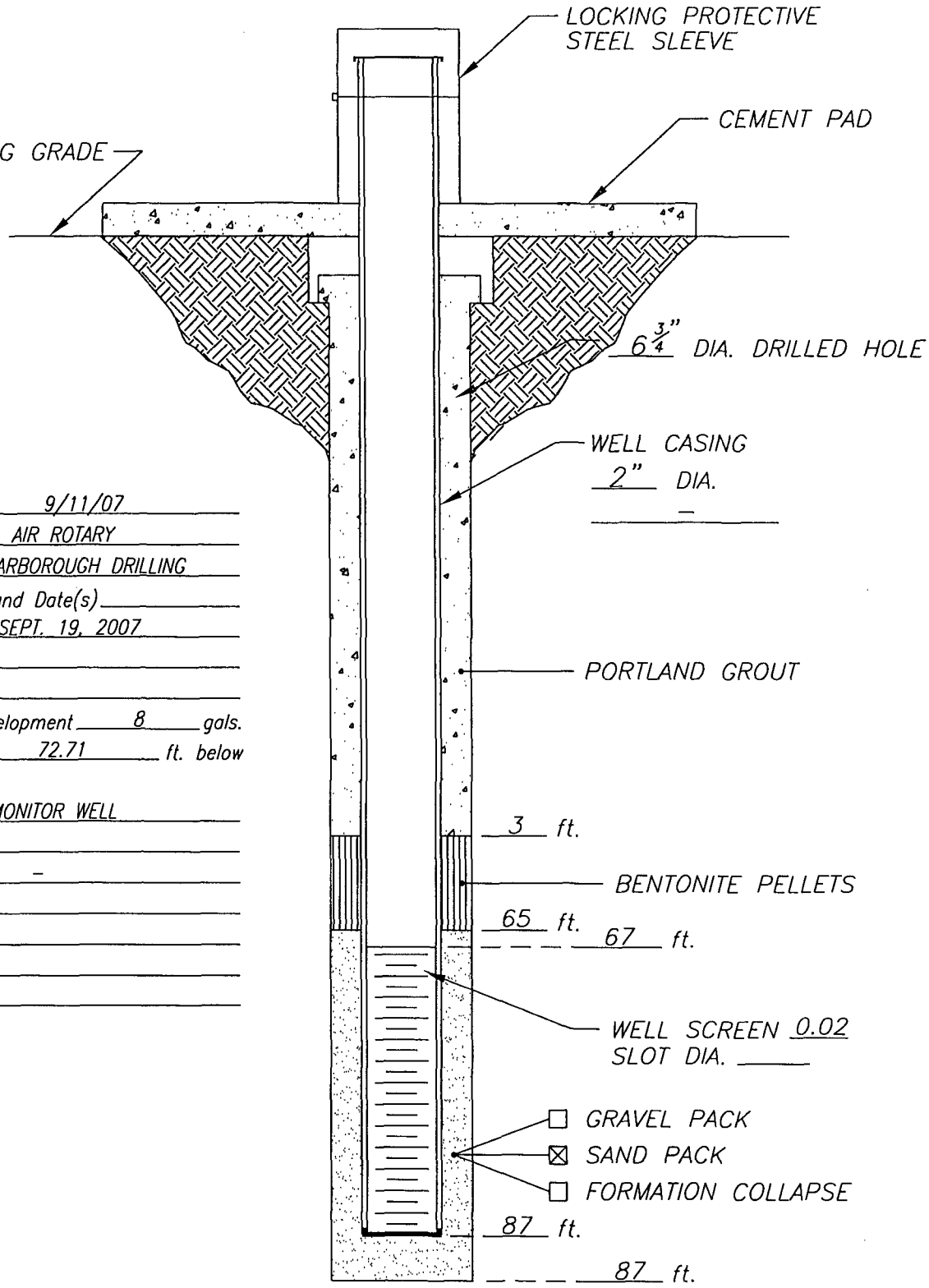
Installation Date(s) 8/30/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING - SEPT. 19, 2007

Water Removed During Development 8 gals.
Static Depth to Water 68.73 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks -

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-4
	LOCATION: ROOSEVELT CO, NM	

WELL CONSTRUCTION LOG



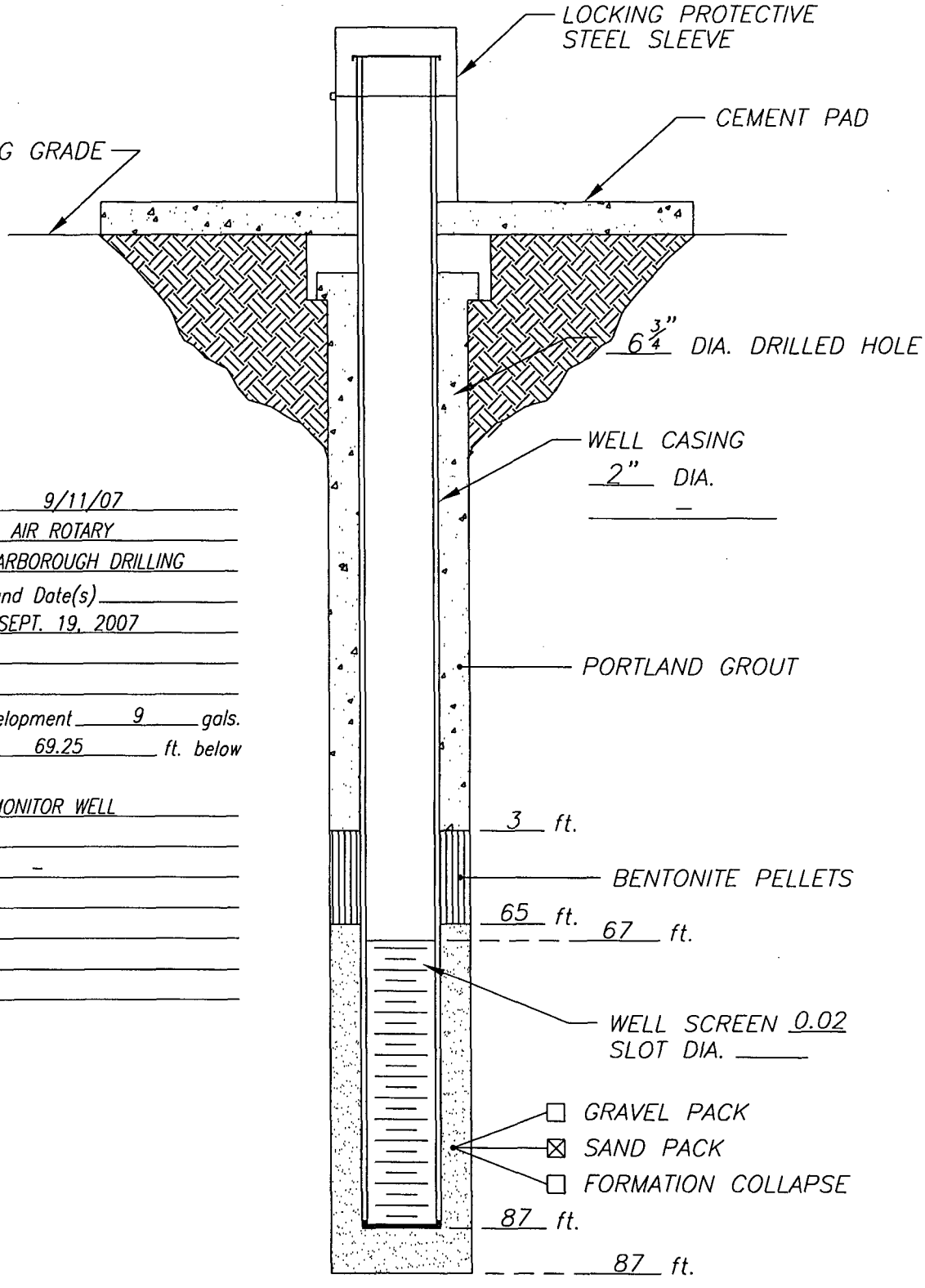
Installation Date(s) 9/11/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING – SEPT. 19, 2007

Water Removed During Development 8 gals.
Static Depth to Water 72.71 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks –

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-5
	LOCATION: ROOSEVELT CO, NM	

WELL CONSTRUCTION LOG



Installation Date(s) 9/11/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING - SEPT. 19, 2007

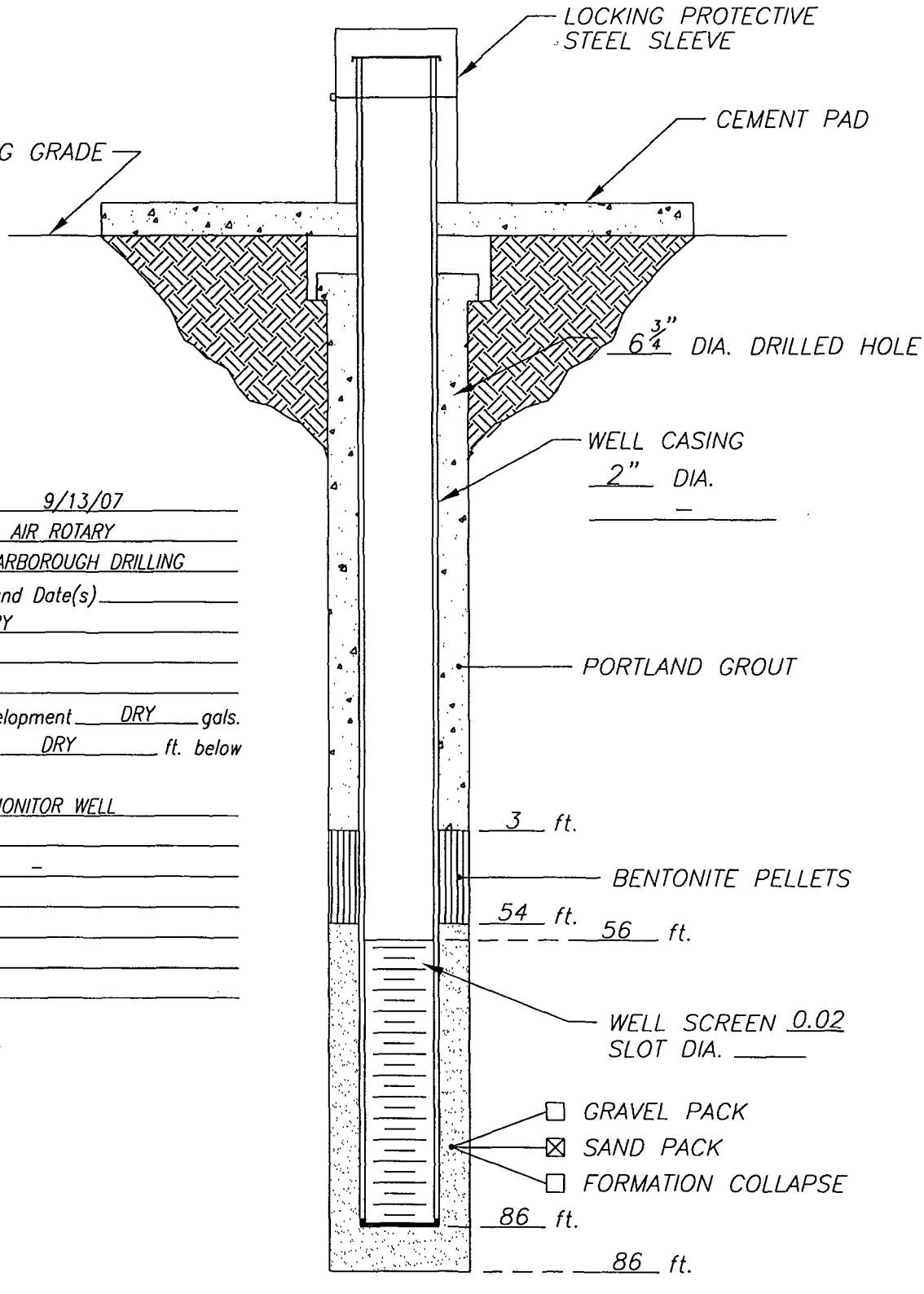
Water Removed During Development 9 gals.
Static Depth to Water 69.25 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks -

DATE: 10/3/07	CLIENT: POGO PRODUCING INC PROJECT: TODD WATER STATION LOCATION: ROOSEVELT CO, NM	WELL NO. MW-6

Highlander Environmental

WELL CONSTRUCTION LOG



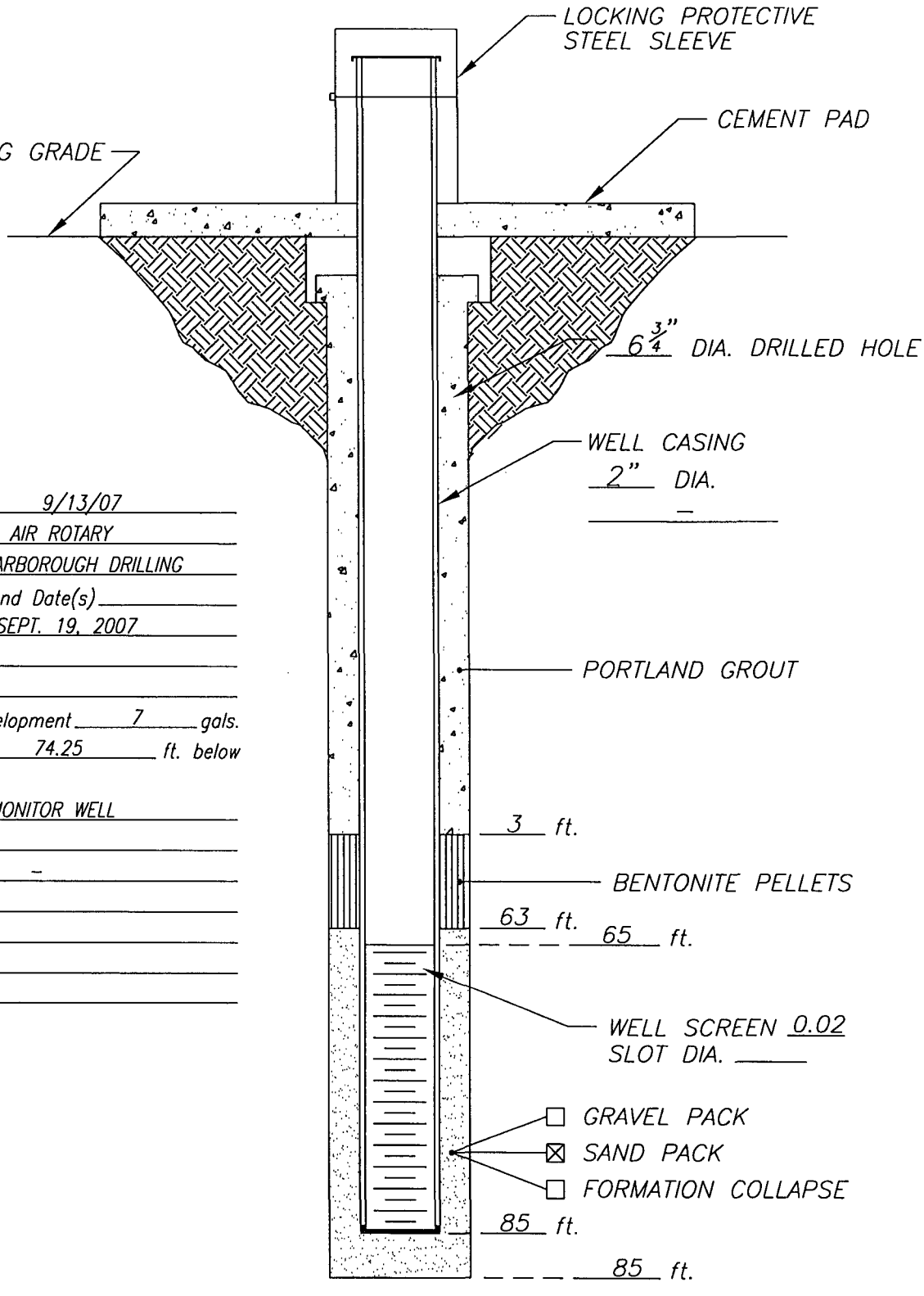
Installation Date(s) 9/13/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s) DRY

Water Removed During Development DRY gals.
Static Depth to Water DRY ft. below Ground Level
Well Purpose MONITOR WELL

Remarks –

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-7
	LOCATION: ROOSEVELT CO, NM	

WELL CONSTRUCTION LOG



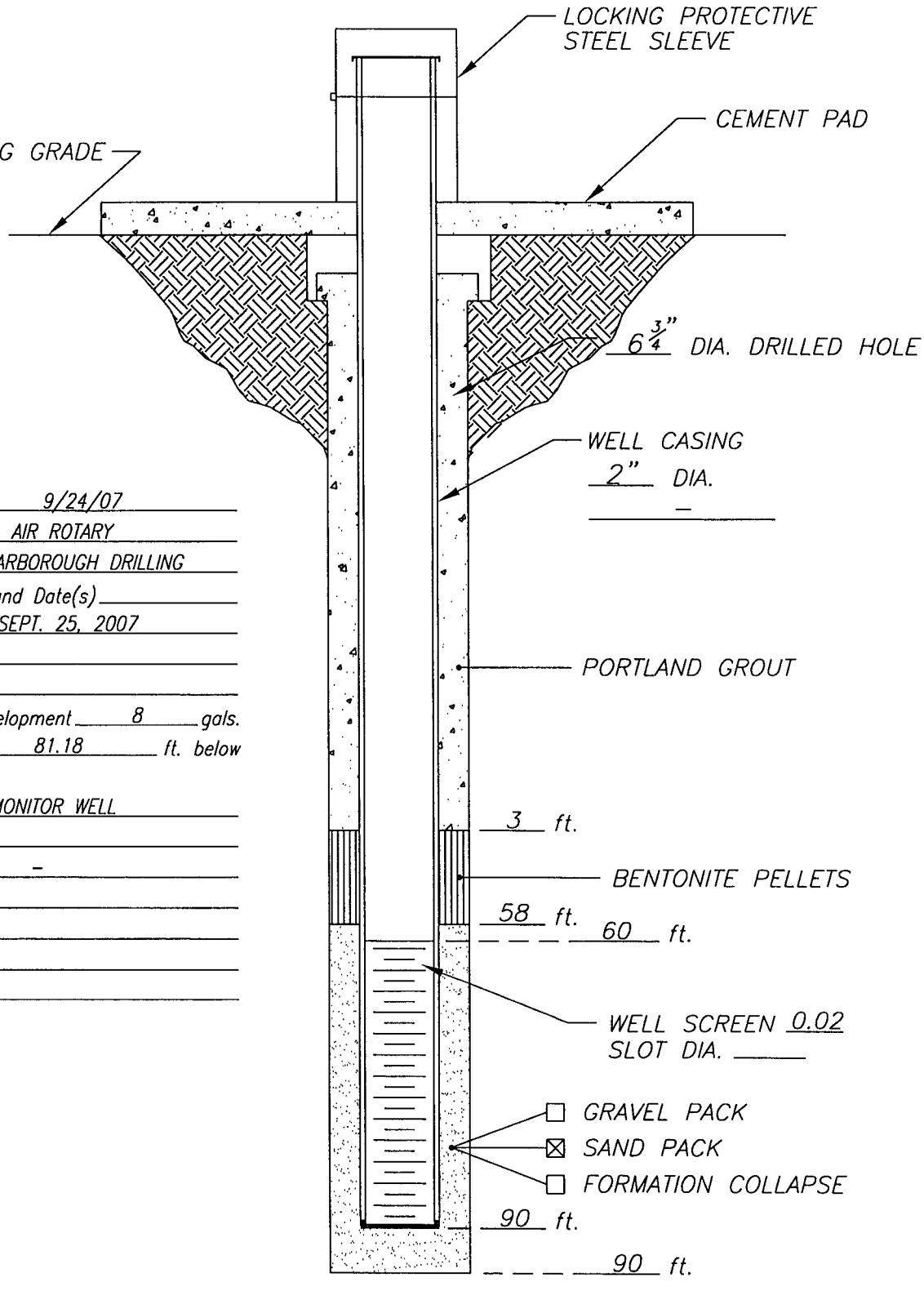
Installation Date(s) 9/13/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING – SEPT. 19, 2007

Water Removed During Development 7 gals.
Static Depth to Water 74.25 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks –

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-8
	LOCATION: ROOSEVELT CO, NM	

WELL CONSTRUCTION LOG



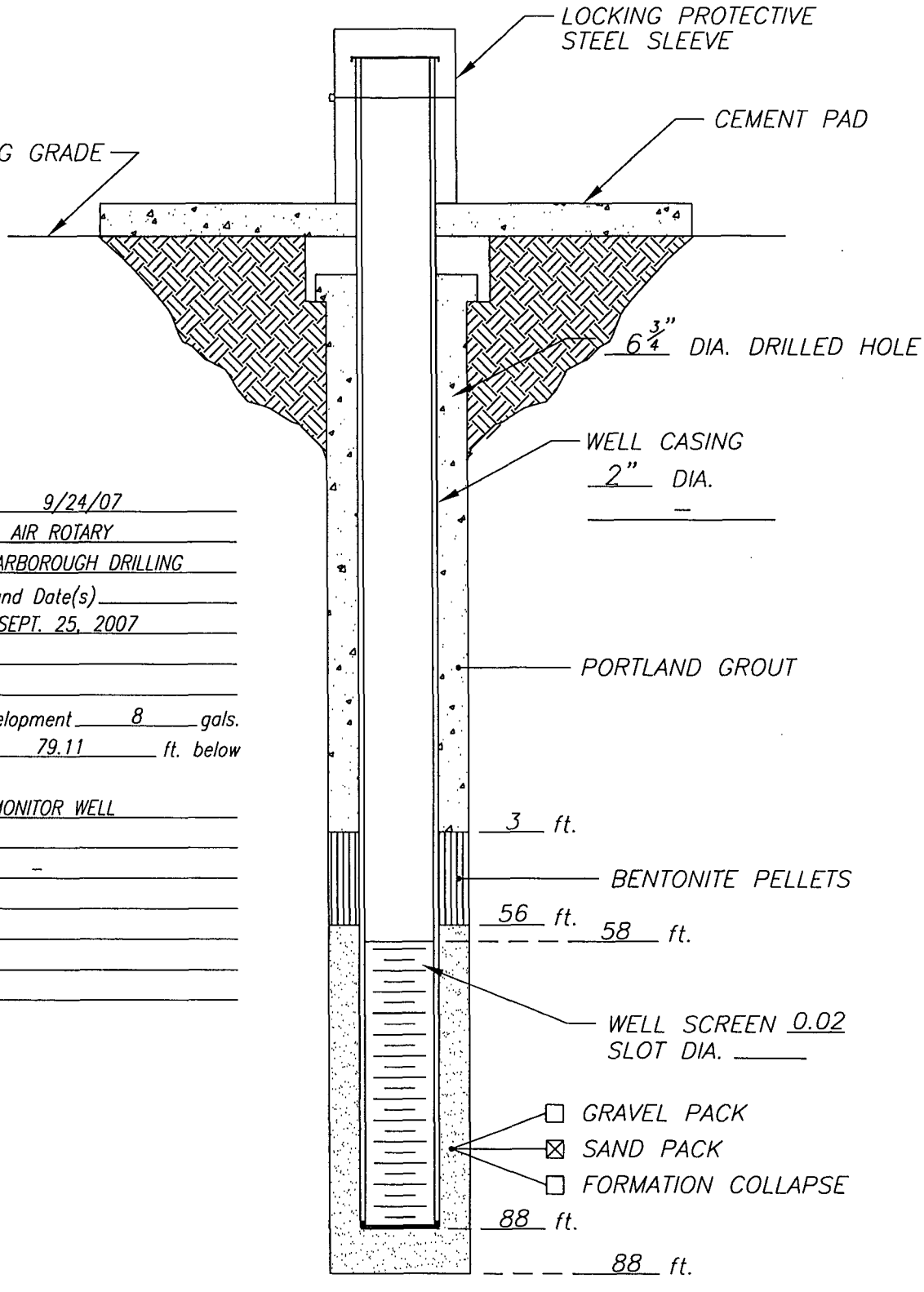
Installation Date(s) 9/24/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING – SEPT. 25, 2007

Water Removed During Development 8 gals.
Static Depth to Water 81.18 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks –

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-9
	LOCATION: ROOSEVELT CO, NM	

WELL CONSTRUCTION LOG



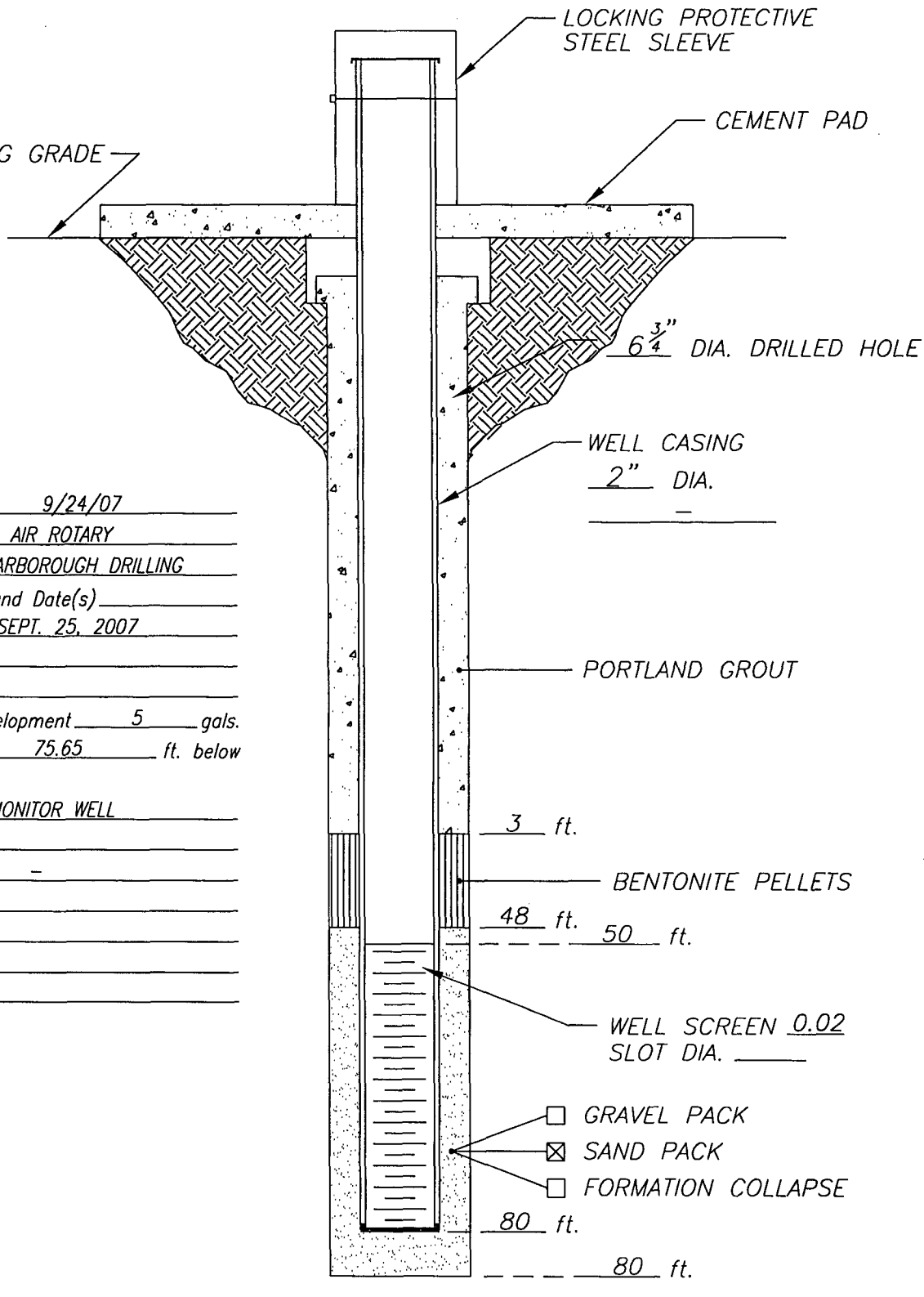
Installation Date(s) 9/24/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING - SEPT. 25, 2007

Water Removed During Development 8 gals.
Static Depth to Water 79.11 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks -

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-10
	LOCATION: ROOSEVELT CO, NM	

WELL CONSTRUCTION LOG



Installation Date(s) 9/24/07
Drilling Method AIR ROTARY
Drilling Contractor SCARBOROUGH DRILLING
Development Technique(s) and Date(s)
HANDBAILING – SEPT. 25, 2007

Water Removed During Development 5 gals.
Static Depth to Water 75.65 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks –

DATE: 10/3/07	CLIENT: POGO PRODUCING INC	WELL NO.
Highlander Environmental	PROJECT: TODD WATER STATION	MW-11
	LOCATION: ROOSEVELT CO, NM	

Highlander Environmental Corp.

Midland, Texas

CERTIFIED MAIL
RETURN RECIEPT NO. 7005 1160 0005 3780 6047

June 25, 2007

Mr. Wayne Price
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

RE: NOTIFICATION OF GROUNDWATER IMPACT
TODD WATER INJECTION STATION
SEC. 31, T7S, R36E
ROOSEVELT COUNTY, TEXAS

Mr. Price:

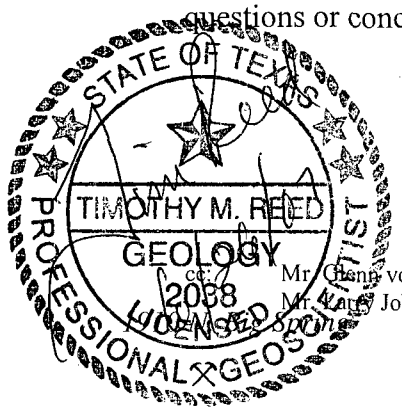
On behalf of Latigo Petroleum, Inc. (Latigo), Highlander Environmental Corp. (Highlander) notifies the Director of the New Mexico Oil Conservation Division (OCD), Environmental Bureau of groundwater impact at the above-referenced site in accordance with NM Rule 116.

Highlander of Midland, Texas was engaged to investigate this site. Highlander installed one soil boring at the site. Highlander installed one soil boring at the site. The soils were found to be impacted from the surface to the vadose zone with chlorides and from the surface to a maximum depth of 20 feet below ground surface for TPH and BTEX. The chlorides, TPH, and BTEX exceed the state regulated levels in the soils. Based on the results of the field sampling, the boring was converted to a temporary 2-inch monitor well. Groundwater was encountered at approximately 72 feet below ground surface (bgs). After appropriate development, the well was sampled pursuant to OCD guidelines by Highlander and submitted to Environmental Lab of Texas for analysis of chlorides and BTEX. Chloride concentrations exceed New Mexico Water Quality Control Commission (NMWQCC) standards. Traces of hydrocarbons (BTEX) were noted in the groundwater sample. However, the concentrations were below NMWQCC standards. Highlander will present a remedy for this site in the submission of a Corrective Action Plan.

Please accept this notification for the above-referenced site. Should you have any questions or concerns regarding this site, please do not hesitate to contact me at (432) 682-4559.

Highlander Environmental Corp.

Timothy M. Reed, P.G.
Vice President



cc: Mr. Glenn vonGonten – NMOCD, Santa Fe
Mr. Larry Johnson-NMOCD, Hobbs