Pacific Gas and Electric Company

Yvonne Meeks
Manager

Environmental Remediation
Gas T&D Department

Mailing Address
4325 South Higuera Sreet
San Luis Obispo, Ca 93401
Location
6588 Ontario Road
San Luis Obispo, Ca 93405
TEL: (805) 234-2257
Email: yjm1@pge.com

February 6, 2008

Aaron Yue
Project Manager
5796 Corporate Avenue
Cypress, CA 90630

Ms. Kris Doebbler
U.S. Department of the Interior
BLM WO-360D
Building 50
Denver Federal Center
Denver, Colorado 80225

Subject: Interim Measures No. 3 Closure Planning - Baseline Soil Sampling Work Plan PG&E Topock Compressor Station, Needles, California

Dear: Mr. Yue and Ms. Doebbler:

This letter transmits the technical memorandum *Baseline Soil Sampling at the PE-1 Pipeline, Interim Measure No. 3 at Pacific Gas and Electric Company (PG&E) Topock Compressor Station.* The technical memorandum presents soil data collected from the vicinity of the PE-1 pipeline at the time of startup of operations of this stretch of pipeline in January-February 2006. The PE-1 pipeline baseline soil data are considered to be representative of baseline conditions near the PE-1 pipeline that may be used during a future pipeline closure evaluation or other future floodplain activities. The PE-1 pipeline baseline soil data were collected concurrently with installation of groundwater monitoring wells for the floodplain in situ pilot study authorized by the Department of Toxic Substances Control (DTSC) and the United States Bureau of Land Management (BLM).

In addition, this letter serves as a request to rescind the remaining portions of the *Interim Measures Number 3 (IM-3) Closure Planning - Baseline Soil Sampling Work Plan for the PG&E Topock Compressor Station* dated February 3, 2006. The February 3, 2006 work plan superseded previous versions of the work plan dated July 5, 2005 and January 5, 2006, and incorporated comments on the previous versions of the work plan from DTSC and BLM.

The objective of the Interim Measure No. 3 (IM No. 3) soil baseline sampling was to determine naturally occurring background concentrations of metals and other inorganic compounds in soil in the immediate vicinity of the IM No. 3 treatment system at the time of startup of IM No. 3[1]. These baseline data were intended to be used to determine the appropriate level of site restoration and to guide remediation efforts (if necessary) during future closure activities of the IM No. 3 treatment

1 While the PE-1 pipeline segment started operations in January 2006, the remainder of the IM No. 3 system started operations in July 2005.

and distribution system or in the event of a release of waste water and/or treatment chemicals from the treatment and conveyance system.

PG&E is proposing to rescind the remaining portions of the *Interim Measures Number 3 (IM-3) Closure Planning - Baseline Soil Sampling Work Plan for the PG&E Topock Compressor Station,* dated February 3, 2006, because the proposed data are no longer considered useful for assessing IM No. 3 baseline conditions since the treatment plant has been in operation since July 2005. In addition, a more representative and comprehensive background study is being conducted as part of the RCRA facility investigation/remedial investigation (RFI/RI) soil investigation program. The RFI/RI soil background study includes sample locations within the lithologic units that were proposed for the IM No. 3 baseline sampling outside of the floodplain. The background values calculated in the RFI/RI background study will be used as the baseline data for IM No. 3 to assess the need for and/or level of remediation in the event of a release or during future closure activities at the IM No. 3 treatment plant outside of the floodplain.

The data collection activities proposed in the IM No. 3 baseline soil sampling work plan are not a requirement of DTSC or the United States Department of the Interior (DOI); this sampling is considered a discretionary activity that PG&E previously proposed to implement. While DTSC provided comments on the work plan, DTSC has not yet approved the work plan. The DOI did provide an approval of the work plan in a letter dated February 12, 2007; however, DOI did not approve the portions of the work plan proposing sample collection within Bat Cave Wash.

PG&E appreciates your consideration of the enclosed technical memorandum and PG&E's proposal to rescind the remaining portions of the work plan. Please contact me at 805/234-2257 with any questions or concerns.

Sincerely,

Yvonne Meeks

Yvonne Meeks
Topock Project Manager

cc: Chris Guerre/DTSC

Baseline Soil Sampling at the PE-1 Pipeline, Interim Measure No. 3 at Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

PREPARED FOR: Pacific Gas and Electric Company

DATE: February 6, 2008

Introduction

The following provides a summary of the sample implementation, analytical results, and data quality review for the February 2006 baseline soil sampling at the PE-1 pipeline, Interim Measures (IM) No. 3, Pacific Gas and Electric Company (PG&E) Topock Compressor Station, Needles, California.

The PE-1 pipeline is an approximately 500-foot subsurface pipeline segment (including electrical and control conduits) in the floodplain of the Colorado River that connects extraction well PE-1 to the MW-20 bench. The PE-1 pipeline alignment is shown on Figure 1. The PE-1 pipeline is constructed of double-contained high-density polyethylene pipe with an outer diameter of 6 inches (the inner pipe is 3 inches in diameter). The pipe is buried approximately 3 to 5 feet below ground surface (bgs). The pipeline is equipped with a leak-detection sensor station to detect leaks in the inner conveyance pipe. The PE-1 pipeline conveys untreated groundwater from the extraction well (PE-1) to the MW-20 bench where it is combined with the groundwater extracted from well TW-3D and/or TW-2D. At Valve Vault #1 at the MW-20 bench, the PE-1 pipeline is connected to the IM No. 3 influent pipeline to the IM-3 treatment plant.

Construction of the PE-1 pipeline was initiated in mid-December 2005 and was completed late January 2006. Startup of the PE-1 extraction well and pipeline was authorized by the California Department of Toxics Substances Control (DTSC) on January 26, 2006.

The PE-1 pipeline is one of four primary components of the IM No. 3 system for baseline soil sampling, as discussed in the *Interim Measures No. 3 Closure Planning – Baseline Soil Sampling Work Plan,* dated February 3, 2006 (CH2M HILL, 2006). As described in the work plan, the primary objective of the baseline soil sampling is to determine naturally-occurring concentrations of metals, including hexavalent chromium [Cr(VI)], total chromium, and other inorganic compounds in soil in the immediate vicinity of the IM No. 3 system. As part of future IM No. 3 closure activities, or in the event of a release of wastewater and/or treatment chemicals from the treatment system or pipelines during operations that necessitates some cleanup prior to closure, the baseline data could be used to assess impacts, determine the appropriate level of site restoration, and guide remediation efforts (if necessary). As described in the work plan, the PE-1 pipeline sampling portion of the baseline soil sampling was performed concurrent with installation of groundwater monitoring wells for the floodplain *in-situ* pilot study. Installation of the groundwater monitoring wells for the floodplain *in-situ* pilot study was authorized by the Department of Toxic Substances Control (DTSC, 2005) and the United States Bureau of Land Management (BLM, 2005).

Sample Implementation

The sections below describe the PE-1 baseline soil sample implementation including sample collection, sample analysis, and analytical results summary.

Sample Collection

Between February 7 and February 11, 2006, 15 samples were collected from three sample locations in the vicinity of the PE-1 pipeline. These samples were collected concurrently with installation of groundwater monitoring wells for the floodplain *in-situ* pilot study. Soil sample locations (PT-2, PT-4, and PT-5) are shown on Figure 1. At each location, samples were collected from five depths: the surface (0 to 0.5 bgs), 3, 6, 10, and 20 feet bgs. Table 1 presents sample collection date, time, and depth.

A sonic drilling rig was used to collect soil samples by driving a core sampling tube into soil at each sample location. The core sampling tube was surrounded by an outer casing to obtain a minimally disturbed soil sample. After the retrieval of the inner core sampling tube, the sample cores were logged. Boring logs for these sample locations are presented in Appendix A. Information pertaining to additional data collected during the *in-situ* pilot study is presented in the August 1, 2006 *60-day Status Report for the Floodplain Reductive Zone In Situ Pilot Test, PG&E Topock Compressor Station* prepared by Arcadis G&M, Inc (Arcadis G&M, 2006). Soils within the first 20 feet of these boring locations were described as poorly graded, fine-grained sand. A clay layer was noted at location PT-5 from 18 to 19 feet bgs. Soil samples were collected at the desired depth interval. Soil samples were placed into new, 8-ounce glass jars and were labeled with unique sample identification numbers. Sample identifications, collection date, and time were recorded on a chain of custody. At the end of the day, soil samples were shipped by Federal Express to STL Laboratories (STL) Los Angeles, California for analysis.

Decontamination

The core sampler was decontaminated between sample locations. After the sample was removed, any debris was brushed from the sampler. The sampler was then scrubbed with a synthetic bristle brush and an Alconox and tap water solution. The sampler was rinsed with tap water and then with deionized water.

Sample Analysis

All samples were also shipped to STL to undergo analysis for the following analytes or analyte class: Title 22 metals were analyzed for using United States Environmental Protection Agency (USEPA) Method 6010/7000); mercury was analyzed for using Method SW7471; Cr(VI) was analyzed for using USEPA7199; and specific conductance was analyzed for using USEPA9050.

Analytical Result Summary

Analytical results are presented in Table 2. Barium, total chromium, lead, and zinc were detected in all soil samples. Barium was detected at concentrations ranging from 40 to 110 milligrams per kilogram (mg/kg), total chromium was detected at concentrations ranging from 1.9 to 4.4 mg/kg, lead was detected at concentrations ranging from 3.2 to 5.8 mg/kg, and zinc was detected at concentrations ranging from 8.0 to 19 mg/kg. Arsenic was detected in 14 of 15 samples at concentrations ranging from 1.0 to 1.6 mg/kg. Vanadium was detected in nine of 15 samples at concentrations ranging from 5.1 to 8.4 mg/kg. Copper was detected in only one sample at a concentration of 4.8 mg/kg. The remaining metals were not detected above the laboratory reporting limits. Specific conductance ranged from 230 to 9,600 microSiemens per centimeter.

Analytical Data Quality Review

The laboratory analytical data generated from the February 2006 PE-1 Pipeline baseline soil sampling was independently reviewed by project chemists to assess data quality and to identify deviations from analytical requirements. The quality assurance and quality control requirements are outlined in the *PG&E Program Quality Assurance Project Plan* (CH2M HILL, 2004) or the *Addendum to the Topock Quality Assurance Project Plan (*CH2M HILL, 2005*)*. Fifteen soil samples were submitted to STL for analysis of specific conductance, antimony, arsenic, barium, beryllium, cadmium, total chromium, cobalt, copper, Cr(VI), lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc. A summary discussion of data quality for the PE-1 pipeline baseline soil sampling data is presented below. Additional detail is provided in the data validation reports, which are kept in the project file and are available upon request.

Matrix Spike Samples

Two samples had matrix spike and matrix spike duplicate results that were recovered outside the lower control limit for antimony (SW60210B). The non-detected sample result from PT-02-00 and PT-05-02 were qualified as estimated and flagged “UJ.” All other matrix spike acceptance criteria were met.

Quantitation and Sensitivity

All samples were reported from non-diluted samples aliquots, and the method/analyte combinations meet the project reporting limit requirements.

Holding Time Data Qualification

Holding-time exceedances can result in the possible loss of target analytes due to degradation or chemical reactions that usually cause a negative bias to sample results. For the February 2006 PE-1 baseline soil results, all holding-time criteria were met.

Field Duplicates

No field duplicates samples were collected for this event.

Method Blanks

All method blank acceptance criteria were met.

Equipment Blanks

No equipment blanks were collected.

Laboratory Duplicates

All laboratory duplicate acceptance criteria for the methods were met.

Calibration

Initial and continuing calibrations were performed as required by the methods. All calibration criteria were met.

Conclusion

For the February 2006 PE-1 Pipeline baseline soil sampling, the completeness objectives were met for all method and analyte combinations. The analyses and data quality met the Quality Assurance Project Plan and laboratory method quality control criteria except as noted above. Overall, the analytical data are considered acceptable for the purpose of the baseline sampling.

Summary

This technical memorandum presents soil data collected from the vicinity of the PE-1 pipeline approximately 12 to 14 days after startup of the PE-1 pipeline. Soil samples were collected of the floodplain material between the surface and 20 feet bgs in three locations along the PE-1 pipeline segment. The data reported here are considered to be representative of baseline conditions of the floodplain material at the time of startup of the PE-1 pipeline and will be available in the future for future pipeline closure evaluation or other future floodplain activities, as necessary. Statistical evaluation of the data reported here will not be performed until the ultimate use of these data is defined.

References

Arcadis G&M, Inc. 2006. *60-day Status Report for the Floodplain Reductive Zone In Situ Pilot Test, PG&E Topock Compressor Station.* August 1.

California Department of Toxic Substances Control. 2005. Letter to Yvonne Meeks/PG&E. "Approval of Floodplain In Situ Workplan dated August 2005 and Technical Addendum dated December 8 2005, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California." December 12.

CH2M HILL. 2004. *PG&E Program Quality Assurance Project Plan.* November.

__________. 2005. *Quality Assurance Project Plan Addendum, PG&E Topock Program.* July 7.

__________. 2006. *Interim Measures No. 3 Closure Planning – Baseline Soil Sampling Work Plan*. February 3.

United States Bureau of Land Management (BLM). 2005. Letter to Yvonne Meeks/PG&E. “Bureau of Land Management (BLM) Authorization to Proceed with the PE-1 Pipeline and the *In Situ* Floodplain Pilot Study Workplan.” December 9.

Tables

TABLE 1
Soil Sample Collection Information
Baseline Soil Sampling at PE-1 Pipeline - Interim Measures No. 3
PG&E Topock compressor Station, Needles, California

Sample Identification	Sample Date	Sample Time (24-hour clock)	Sample Depth (feet below ground surface)
PT-02-00	02/07/2006	11:25	0.5
PT-02-03	02/07/2006	11:30	3
PT-02-06	02/07/2006	11:35	6
PT-02-10	02/07/2006	11:40	10
PT-02-20	02/07/2006	11:45	20
PT-04-00	02/11/2006	12:12	0.5
PT-04-03	02/11/2006	12:15	3
PT-04-06	02/11/2006	12:16	6
PT-04-10	02/11/2006	12:20	10
PT-04-20	02/11/2006	13:00	20
PT-05-00	02/09/2006	11:55	0.5
PT-05-03	02/09/2006	11:58	3
PT-05-06	02/09/2006	12:03	6
PT-05-10	02/09/2006	12:10	10
PT-05-20	02/09/2006	12:40	20

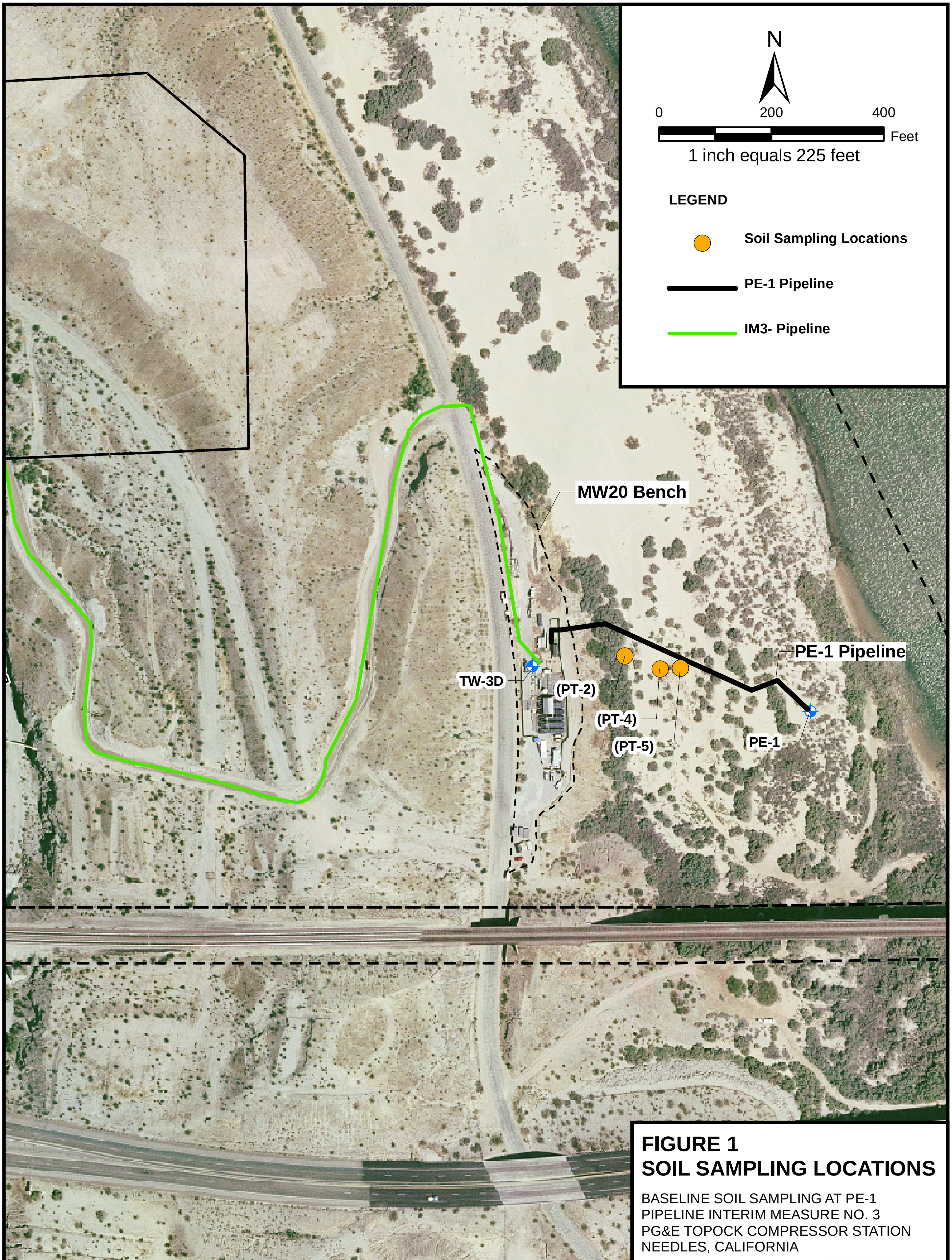
TABLE 2
Soil Sample Results - Metals
Baseline Soil Sampling at PE-1 Pipeline - Interim Measure No. 3
PG&E Topock Compressor Station, Needles, California

				Metals by SW6010B/SW7199/SW7471 in mg/kg																	
Location	**Sample Date**	**Depth (ft bgs)**	**Specific Conductance (µS/cm)**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Hexavalent Chromium**	**Cobalt**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
PT-2	2/7/2006	0.5	540	ND (6.0) J	1.30	51.0	ND (0.5)	ND (0.5)	2.30	ND (0.4)	ND (5.0)	ND (2.5)	3.20	ND (0.1)	ND (4.0)	ND (4.0)	ND (0.5)	ND (1.0)	ND (1.0)	5.10	8.00
	2/7/2006	3	750	ND (6.1)	1.40	110	ND (0.51)	ND (0.51)	2.40	ND (0.41)	ND (5.1)	ND (2.5)	3.50	ND (0.1)	ND (4.1)	ND (4.1)	ND (0.51)	ND (1.0)	ND (1.0)	5.90	8.90
	2/7/2006	6	1400	ND (6.1)	1.60	47.0	ND (0.51)	ND (0.51)	1.90	ND (0.4)	ND (5.1)	ND (2.5)	3.60	ND (0.1)	ND (4.0)	ND (4.0)	ND (0.51)	ND (1.0)	ND (1.0)	ND (5.1)	9.20
	2/7/2006	10	2100	ND (6.1)	1.20	61.0	ND (0.51)	ND (0.51)	2.50	ND (0.41)	ND (5.1)	ND (2.5)	3.50	ND (0.1)	ND (4.1)	ND (4.1)	ND (0.51)	ND (1.0)	ND (1.0)	ND (5.1)	12.0
	2/7/2006	20	790	ND (6.0)	1.50	92.0	ND (0.5)	ND (0.5)	2.20	ND (0.4)	ND (5.0)	ND (2.5)	3.30	ND (0.1)	ND (4.0)	ND (4.0)	ND (0.5)	ND (1.0)	ND (1.0)	5.60	8.60
PT-4	2/11/2006	0.5	550	ND (6.0)	1.20	81.0	ND (0.5)	ND (0.5)	2.10	ND (0.4)	ND (5.0)	ND (2.5)	3.70	ND (0.1)	ND (4.0)	ND (4.0)	ND (0.5)	ND (1.0)	ND (1.0)	5.10	8.40
	2/11/2006	3	230	ND (6.2)	1.20	93.0	ND (0.51)	ND (0.51)	2.20	ND (0.41)	ND (5.1)	ND (2.6)	3.60	ND (0.1)	ND (4.1)	ND (4.1)	ND (0.51)	ND (1.0)	ND (1.0)	5.50	8.20
	2/11/2006	6	270	ND (6.2)	1.30	120	ND (0.51)	ND (0.51)	2.60	ND (0.41)	ND (5.1)	ND (2.6)	4.20	ND (0.1)	ND (4.1)	ND (4.1)	ND (0.51)	ND (1.0)	ND (1.0)	6.30	9.80
	2/11/2006	10	580	ND (6.0)	1.30	79.0	ND (0.5)	ND (0.5)	2.20	ND (0.4)	ND (5.0)	ND (2.5)	3.60	ND (0.1)	ND (4.0)	ND (4.0)	ND (0.5)	ND (1.0)	ND (1.0)	5.80	8.00
	2/11/2006	20	2200	ND (6.4)	1.50	80.0	ND (0.53)	ND (0.53)	3.20	ND (0.43)	ND (5.3)	ND (2.7)	4.70	ND (0.11)	ND (4.3)	ND (4.3)	ND (0.53)	ND (1.1)	ND (1.1)	6.60	11.0
PT-5	2/9/2006	0.5	600	ND (6.0) J	1.10	40.0	ND (0.5)	ND (0.5)	1.90	ND (0.4)	ND (5.0)	ND (2.5)	4.00	ND (0.1)	ND (4.0)	ND (4.0)	ND (0.5)	ND (1.0)	ND (1.0)	ND (5.0)	9.90
	2/9/2006	3	360	ND (6.1)	1.20	70.0	ND (0.51)	ND (0.51)	2.10	ND (0.41)	ND (5.1)	ND (2.5)	4.10	ND (0.1)	ND (4.1)	ND (4.1)	ND (0.51)	ND (1.0)	ND (1.0)	ND (5.1)	9.20
	2/9/2006	6	1800	ND (6.1)	1.00	79.0	ND (0.51)	ND (0.51)	2.00	ND (0.41)	ND (5.1)	ND (2.5)	3.40	ND (0.1)	ND (4.1)	ND (4.1)	ND (0.51)	ND (1.0)	ND (1.0)	ND (5.1)	8.50
	2/9/2006	10	300	ND (6.0)	1.10	76.0	ND (0.5)	ND (0.5)	2.10	ND (0.4)	ND (5.0)	ND (2.5)	3.60	ND (0.1)	ND (4.0)	ND (4.0)	ND (0.5)	ND (1.0)	ND (1.0)	ND (5.0)	8.40
	2/9/2006	20	9600	ND (7.6)	ND (1.3)	110	ND (0.63)	ND (0.63)	4.40	ND (0.51)	ND (6.3)	4.80	5.80	ND (0.13)	ND (5.1)	ND (5.1)	ND (0.63)	ND (1.3)	ND (1.3)	8.40	19.0

NOTES:

ft bgs feet below ground surface
µS/cm microsiemens per centimeter
mg/kg milligrams per kilogram
ND analyte was not detected at the reporting limit listed
J concentration or reporting limit estimated by laboratory or data validation

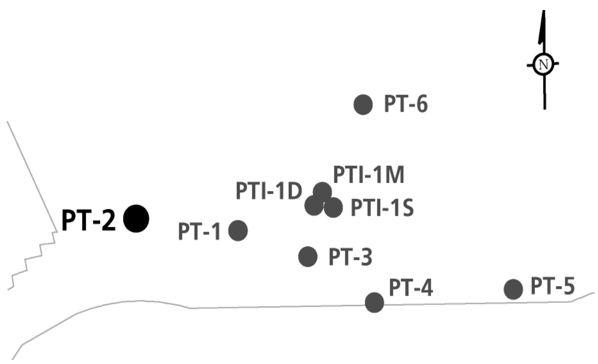
Figure



\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MAPFILES\2008\BASELINESAMPLING_PE1.MXD BASELINESAMPLING_PE1 1/15/2008 10:50:26

Appendix A

Boring Logs



LOG OF BORING **PT-2**

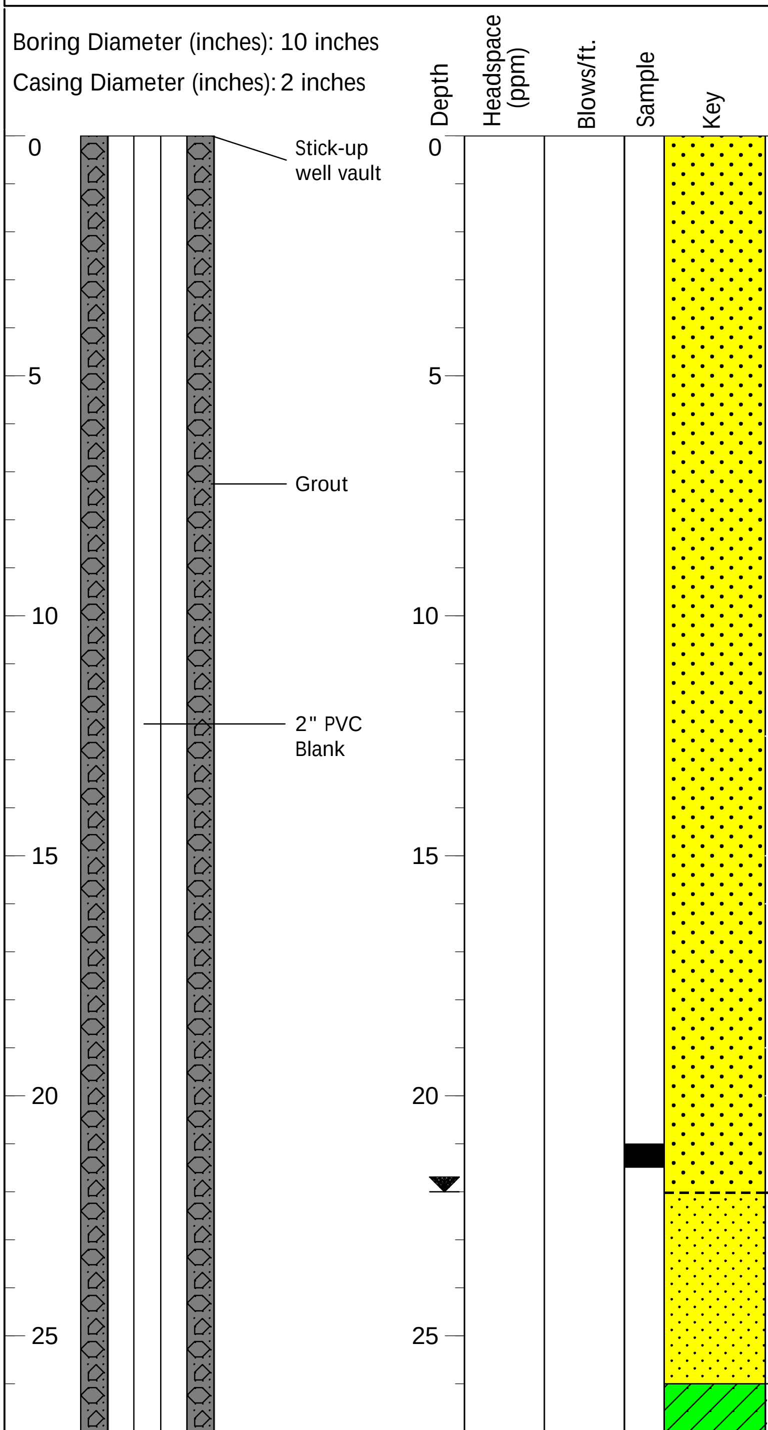
PG&E Topock
Interstate 40 and Park Moabi Road
Needles, California

Project No.:	RC000689.0001	Date Started:	7 February 2006
Logged by:	J. Ely	Date Completed:	8 February 2006
Drilling Co.:	Prosonic Corporation	Drilling Method:	Sonic
Driller:	Don Youngblood	Sample Method:	Core
Well Permit #:	2006010012	Driller's License:	C57-756217

WELL CONSTRUCTION

LITHOLOGIC DESCRIPTION

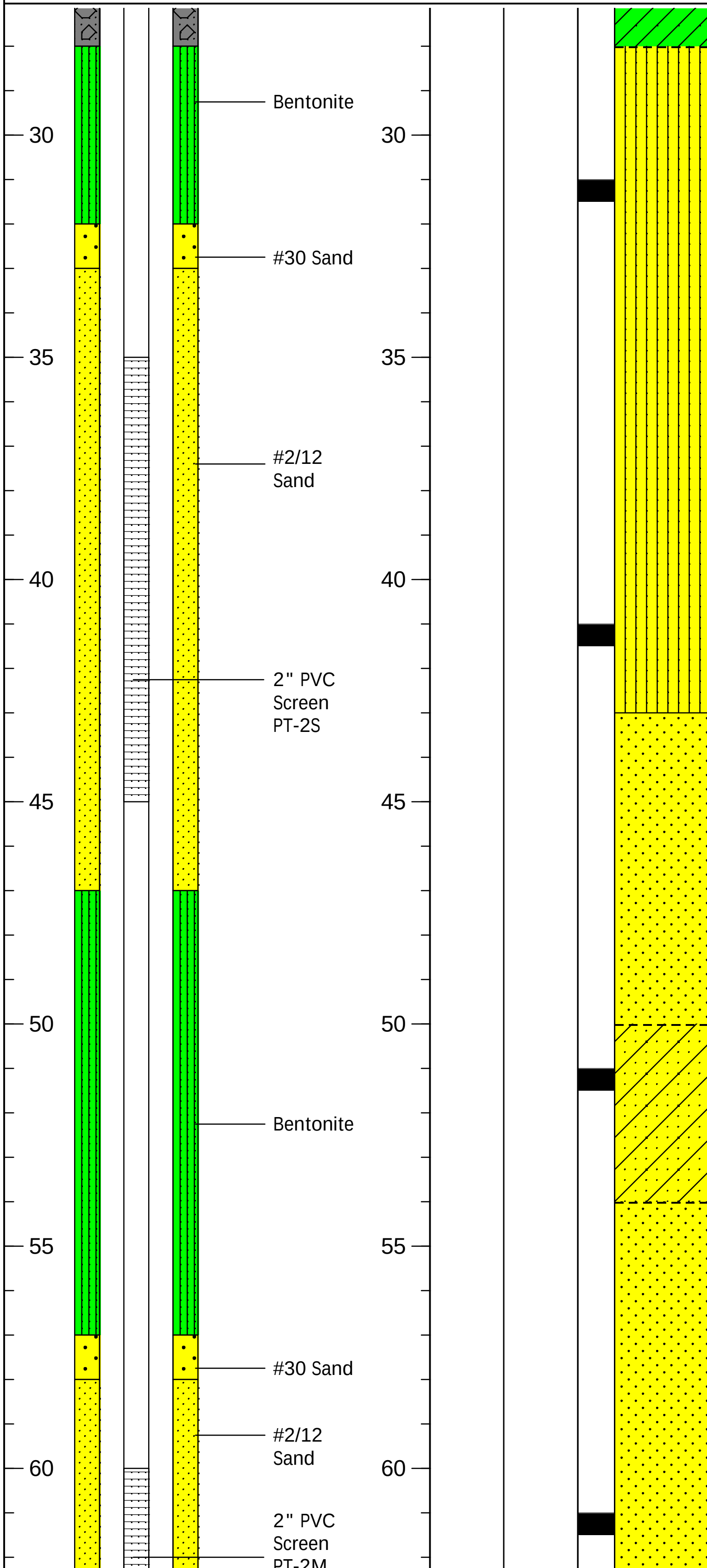
Boring Diameter (inches): 10 inches
Casing Diameter (inches): 2 inches



Depth (ft)	Lithologic Description
0	Poorly Graded Sand (SP), 100% fine grained sand, very loose, dry, trace roots.
12.5	@ 12.5 ft bgs: changes to yellowish brown (10YR 5/4), damp.
15	@ 15 ft bgs: changes to 90% fine grained sand, 10% silt.
16	@ 16 ft bgs: changes to 100% fine grained sand.
19	@ 19 ft bgs: changes to dry.
20	@ 20 ft bgs: changes to dark yellowish brown (10YR 4/4), moist.
22	Well Graded Sand (SW), dark yellowish brown (10YR 4/4), 85% fine grained sand, 10% silt, 5% clay, very loose, damp.
26	Clay (CL), dark gray (10YR 4/1), 80% clay, 10% fine grained sand, 10% silt, very stiff, high plasticity, moist.

LOG OF BORING PT-2
(Continued)

WELL CONSTRUCTION | Depth | Headspace (ppm) | Blows/ft. | Sample | Key | LITHOLOGIC DESCRIPTION



Silt and Clay (ML/CL), dark gray (10YR 4/1), 45% clay, 45% silt, 10% fine grained sand, stiff, medium plasticity, wet.

@ 31 ft bgs: changes to Silt (ML), very dark grayish brown (10YR 3/2), 70% silt, 25% clay, 5 % fine grained sand, soft to medium stiff, low plasticity, wet.

@ 35 ft bgs: changes to 1% mica particles.

@ 40 ft bgs: changes to grayish brown (10YR 5/2), to yellow brown (10YR 5/4), 15% fine grained sand, 1% rounded gravel.

Well Graded Sand with Silt and Gravel (SW), dark reddish brown (2.5 YR 3/3), 75% fine to coarse grained sand, rounded to very angular, 15% gravel (up to 20mm) angular to very angular, 10% silt and clay, very loose, wet.

@ 48 ft bgs: changes to Well Graded Sand and Gravel (SW), medium dense, wet.

Well Graded Sand with Clay (SC), 20% clay.

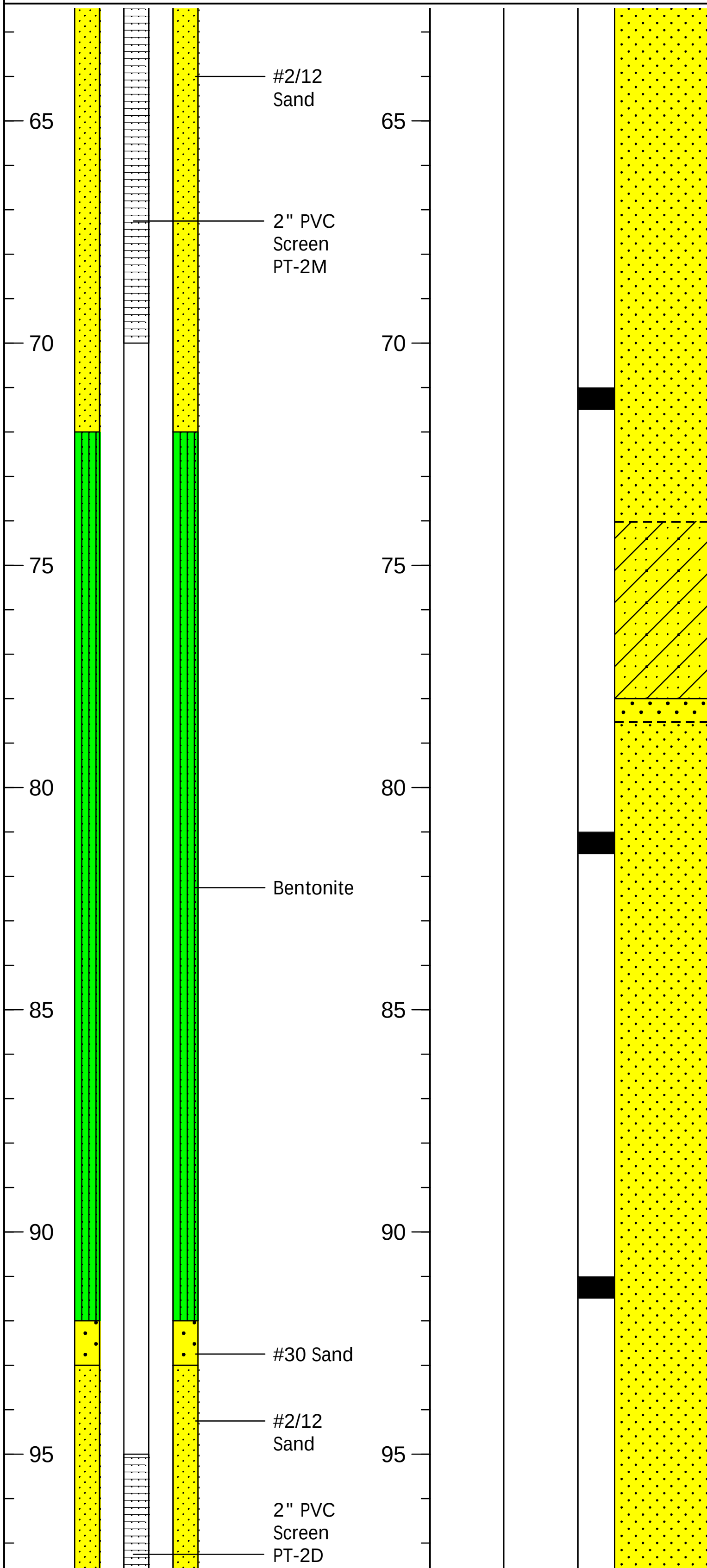
@ 52 ft bgs: changes to very dense, moist.

Well Graded Sand with Clay (SW), reddish brown, 10% clay, coarse sand, angular gravel, very dense, moist.

@ 59 ft bgs: changes to very angular gravel (up to 10mm), cobbles up ot 4 inches, medium dense to loose, wet.

LOG OF BORING PT-2
(Continued)

WELL CONSTRUCTION	Depth	Headspace (ppm)	Blows/ft.	Sample	Key	LITHOLOGIC DESCRIPTION



@ 63 ft bgs: changes to dark reddish brown (2.5YR 3/3), 5% silt and clay, loose.

@ 68 ft bgs: changes to 70% coarse sand, 20% subrounded to very angular gravel, 5% very angular to subrounded cobbles.

@ 70 ft bgs: changes to 10% clay, medium dense.

Clayey Sand with Gravel (SC), dark reddish brown, 65% coarse grained sand, 15% clay, 15% silt, 5% cobbles, subrounded to very angular, dense, nonplastic, wet.

Poorly Graded Sand (SP), dark brown (7.5YR 3/3), 100% coarse grained sand, very loose.

Well Graded Sand with Clay and Gravel (SW), dark reddish brown (5YR 3/3), 75% coarse grained sand, 15% gravel, 10% clay, medium dense, wet.

@ 82 ft bgs: 1% gravel, very angular, loose.

@ 84 ft bgs: 10 to 15% gravel, medium dense.

@ 87 ft bgs: changes to medium dense to dense.

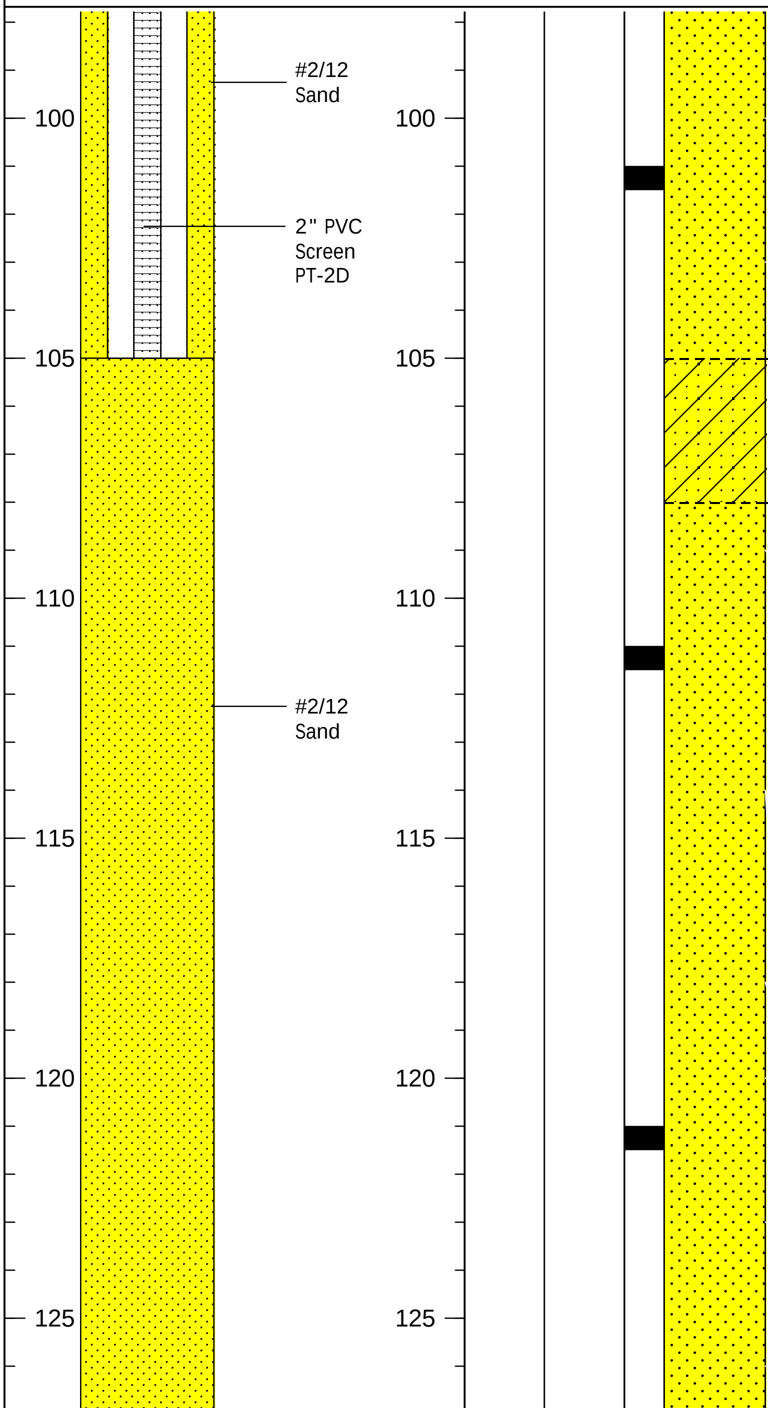
@ 90 ft bgs: changes to dark reddish gray (2.5 YR 3/1) and dark reddish brown (2.5YR 3/3), 80% sand, 15% gravel, 5% clay, subrounded to very angular, very loose, wet.

@ 91 ft bgs: changes to 5% gravel, medium dense.

@ 96 ft bgs: changes to dark reddish brown (2.5YR 3/3), 15% gravel (up to 3 inches), very angular, loose.

LOG OF BORING PT-2
(Continued)

WELL CONSTRUCTION | Depth | Headspace (ppm) | Blows/ft. | Sample | Key | LITHOLOGIC DESCRIPTION



@ 100 ft bgs: 1 cobble, 6 inches in diameter

@ 103 ft bgs: changes to 5% gravel, medium dense.

Clayey Sand with Gravel (SC), strong brown (2.5YR 4/6), 70% sand, 15% gravel (20mm), 15% clay, medium dense, no to low plasticity, wet.

Well Graded Sand and Gravel (SW), 80% coarse grained sand, 15% gravel (2mm to 6mm), 5% clay, trace cobbles (up to 2 inches).

@ 109 ft bgs: changes to dark reddish brown (5YR 3/3) and dark brown (7.5YR 3/3), no cobbles, very dense, moist, possible cementation.

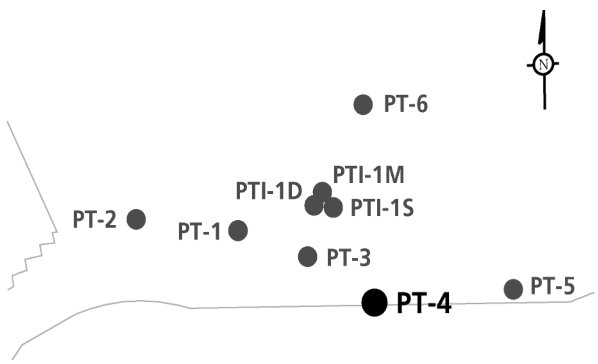
@ 114 ft bgs: changes to loose.

@ 118 ft bgs: changes to cemented

@ 120 ft bgs: changes to dark brown (7.5YR 3/3), loose, possible bedrock.

@ 132 ft bgs: changes to moist.

End of Boring at 127 ft bgs.



LOG OF BORING **PT-4**

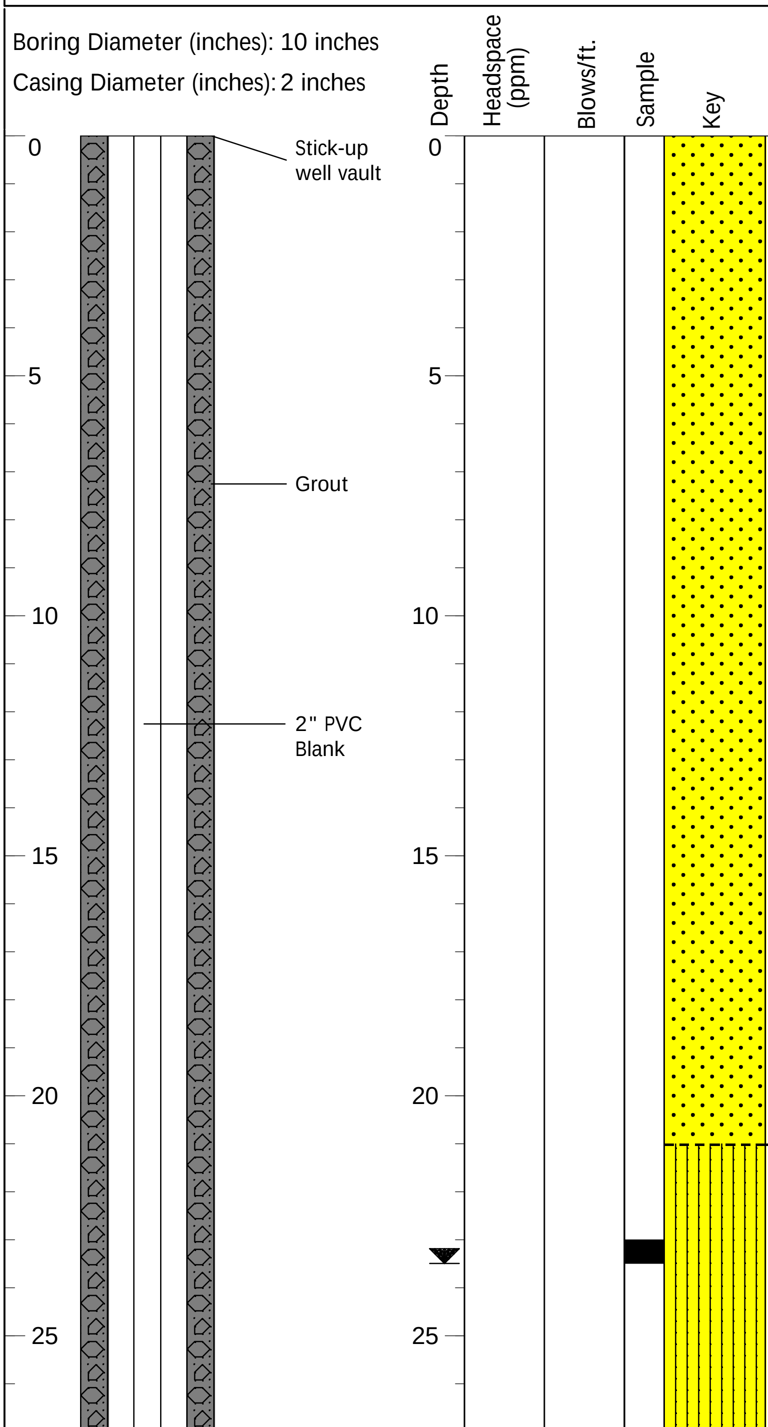
PG&E Topock
Interstate 40 and Park Moabi Road
Needles, California

Project No.:	RC000689.0001	Date Started:	11 Feb 2006
Logged by:	J. Ely	Date Completed:	12 Feb 2006
Drilling Co.:	Prosonic Corporation	Drilling Method:	Sonic
Driller:	Don Youngblood	Sample Method:	Core
Well Permit #:	2006010010	Driller's License:	C57-756217

WELL CONSTRUCTION

LITHOLOGIC DESCRIPTION

Boring Diameter (inches): 10 inches
Casing Diameter (inches): 2 inches



Poorly Graded Sand (SP), pale brown (10YR 6/3) to brownish yellow (10YR 6/6), 100% fine grained sand, very loose, dry.

@ 11 ft bgs: changes to very slightly damp trace roots.

@ 14 ft bgs: changes to brownish yellow (10YR 6/6).

@ 16 ft bgs: changes to light yellowish brown (10YR 6/4).

@ 18 ft bgs: dark yellowish brown (10YR 3/4), 5% silt.

@ 20 ft bgs: very dark gray (10YR 3/1), 10% silt. Gradational change to ML.

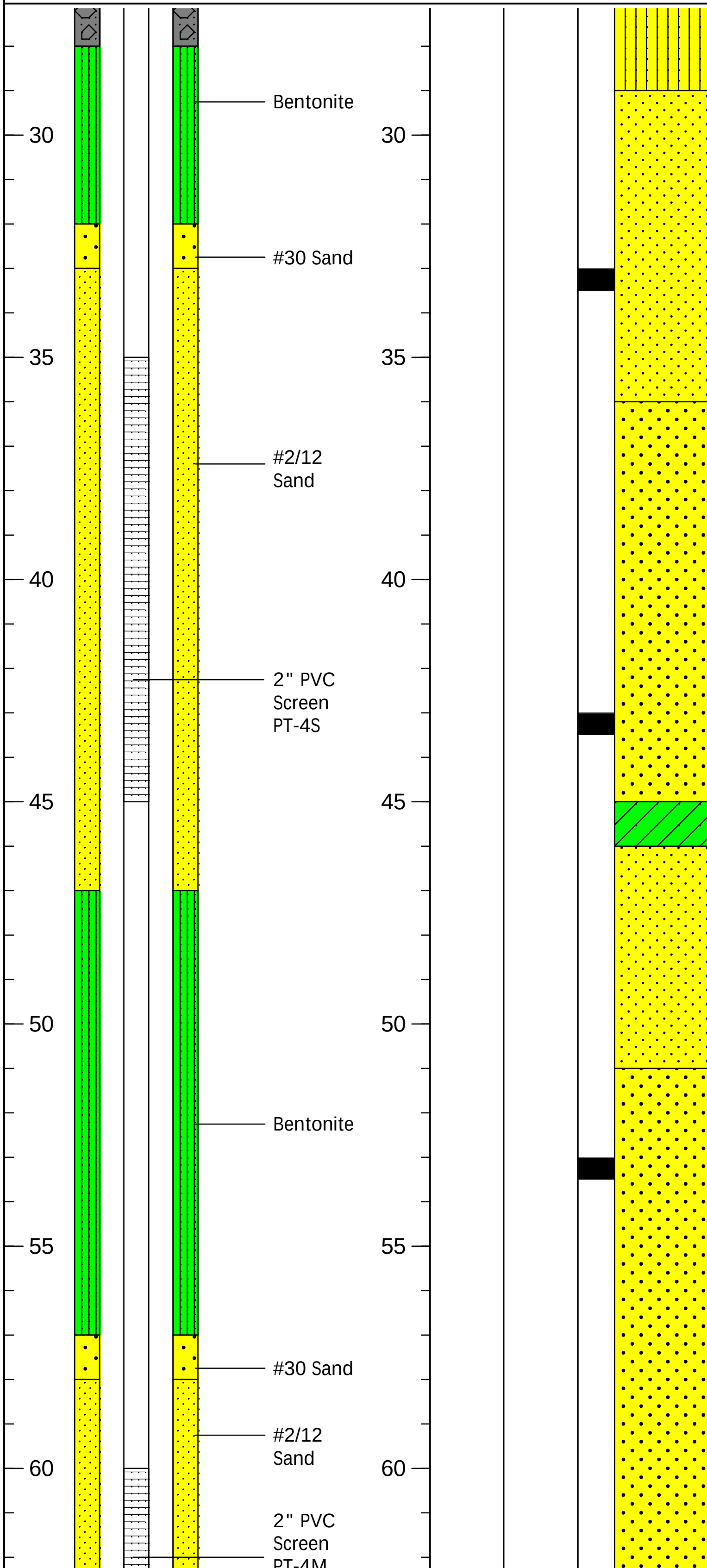
Silt with Sand (ML), very dark gray (10 YR 3/1), 70% silt, 30% very fine sand, very soft, moist, non-plastic.

@ 23 ft bgs: changes to very dark brown (10 YR 2/2).
@ 23.5 ft bgs: changes to Silt and Clay (ML/CL), very dark brown (10 YR 2/2), 45% silt, 45% clay, 5% very fine sand, medium stiff, wet, high plasticity.

@ 26 ft bgs: changes to 90% silt, 10% clay.

LOG OF BORING PT-4
(Continued)

WELL CONSTRUCTION | Depth | Headspace (ppm) | Blows/ft. | Sample | Key | LITHOLOGIC DESCRIPTION



@ 27 ft bgs: changes to 60% silt, 40% fine sand, very dark brown, medium to stiff, wet, low plasticity.

Well Graded Sand with Silt (SW/SM), very dark grayish brown (10 YR 3/2), 90% fine grained sand, 10% silt, trace clay, yellowish brown (5/4 10YR), loose, wet.

@ 32 ft bgs: changes to medium to coarse sand (gradational).

@ 34 ft bgs: changes to 5% silt, 5% clay (chunks).

Poorly Graded Sand (SP), dark grayish brown (10YR 4/2), 95% fine to medium grained sand, 5% silt, medium dense, wet.

@ 40 ft bgs: changes to 0% silt, loose to medium dense.

@ 44 ft bgs: changes to very wet.

Clay with Sand (CL), very dark gray (10YR 3/1), 70% clay, 30% fine sand, medium stiff to stiff, medium to high plasticity.

Well Graded Sand (SW), dark grayish brown (10YR 4/2), 70% fine grained sand, 25% coarse grained sand (subrounded to subangular), 5% silt, medium dense, wet.

@ 49.5 ft bgs: changes to 70% coarse sand, 25% fine sand, 5% silt, trace gravel.

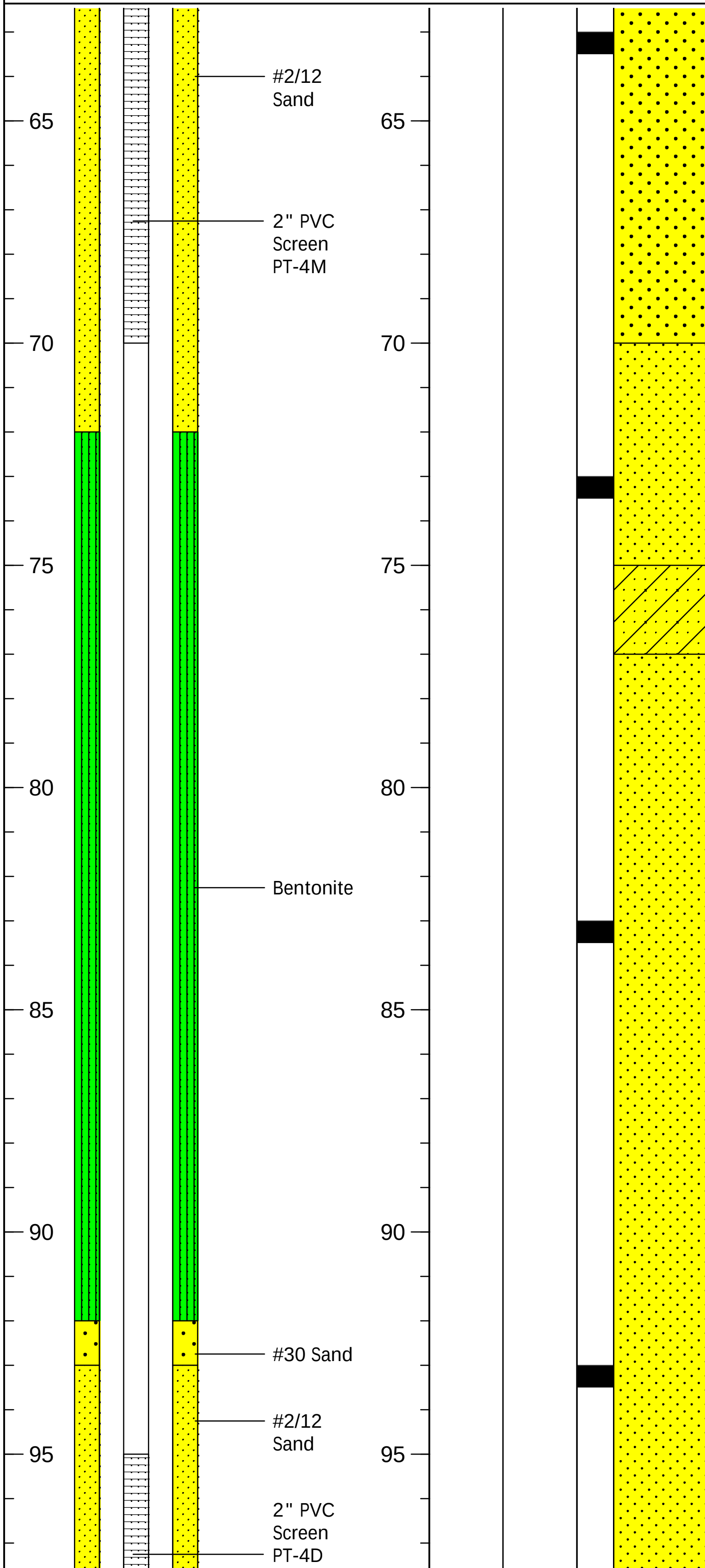
Poorly Graded Sand (SP), dark grayish brown, 95% medium coarse grained sand, subrounded-subangular, 5% gravel, very wet, loose.

@ 57 ft bgs: changes to 95% fine sand, 5% coarse gravel, medium dense, very wet.

@ 61 ft bgs: changes to very loose.

LOG OF BORING PT-4
(Continued)

WELL CONSTRUCTION | Depth | Headspace (ppm) | Blows/ft. | Sample | Key | LITHOLOGIC DESCRIPTION



@ 63 ft bgs: changes to dark grayish brown to very dark grayish brown, 50% fine sand, 50% coarse sand, trace gravel.

@ 67 ft bgs: changes to 70 to 80% fine grained sand, 20 to 30% coarse grained sand, very wet.

Well Graded Sand with Gravel (SW), dark grayish brown (10YR 4/2), 60% sand (subrounded), 35% gravel (2mm to 10mm, subrounded to subangular), 5% clay/silt, loose, damp.

@ 74 ft bgs: increased clay amount.

Clayey Sand with Gravel (SC), dark reddish brown (5YR 3/2), 45% coase sand, 35% gravel and cobbles (subrounded to very angular), 30% clay, loose to medium dense, moist, non-plasctic.

Well Graded Sand with Clay and Gravel (SW), dark reddish brown (5YR 3/2), 50% coarse sand, 35% gravel (subrounded to angular), 10% clay, 5% cobbles, medium dense, wet.

@ 79 ft bgs: changes to well graded sand with gravel, 5% clay to sand and gravel.

@ 84 ft bgs: changes to 10% clay, loose to medium dense.

@ 87 ft bgs: changes to 5% clay.

@ 89 ft bgs:changes to 10 to 15% clay, medium dense to dense.

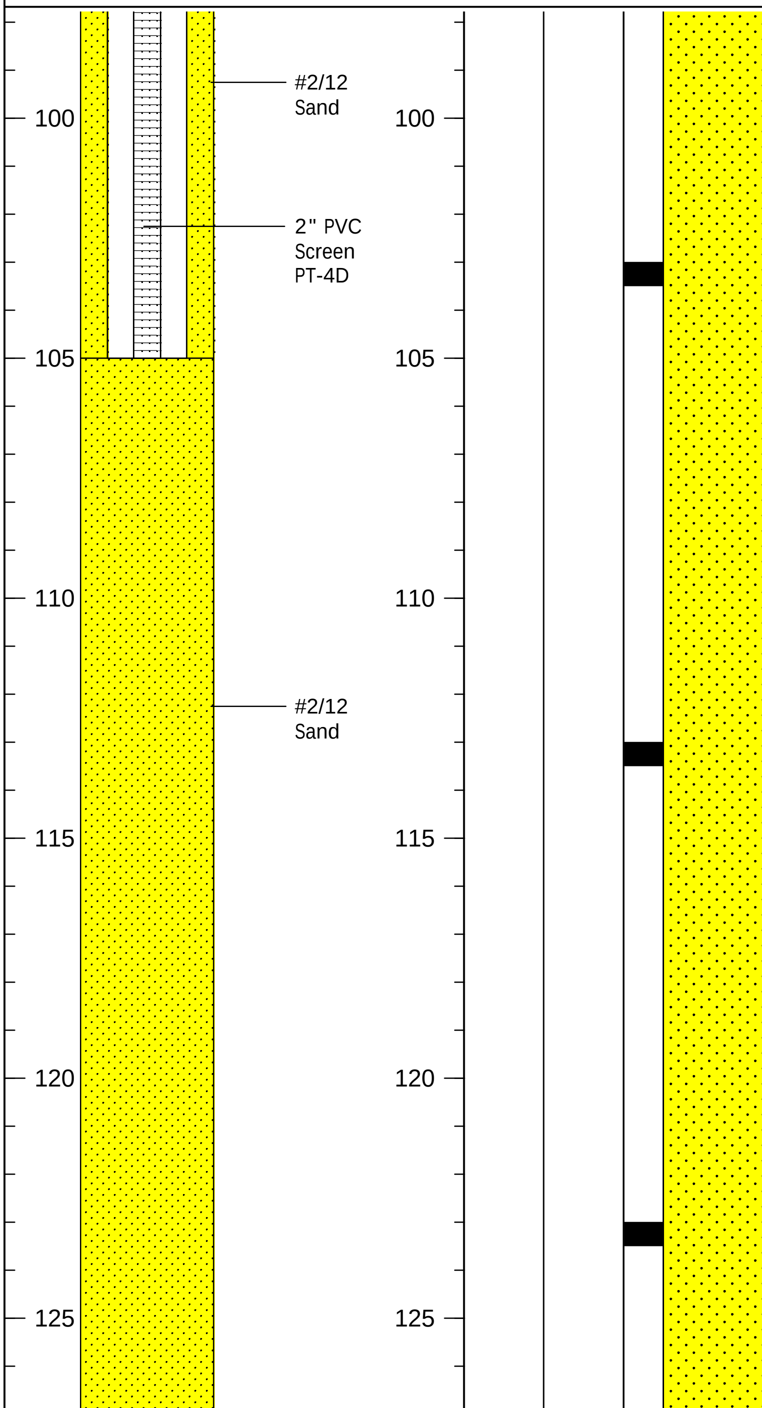
@ 92 ft bgs: changes to dark reddish brown, 5% clay, gravel/cobble size increases (~2 inches).

@ 94 ft bgs: changes to loose, medium dense.

@ 97 ft bgs: changes to 0 ot 15% clay.

LOG OF BORING PT-4
(Continued)

WELL CONSTRUCTION | Depth | Headspace (ppm) | Blows/ft. | Sample | Key | LITHOLOGIC DESCRIPTION



@ 100 ft bgs: changes to 5% clay, loose.

@ 101 ft bgs: changes to 80% coarse sand, 15% gravel (2mm to 10mm angular), 5% clay, loose, wet.

@ 103 ft bgs: gravel size increases (~15 to 20mm).

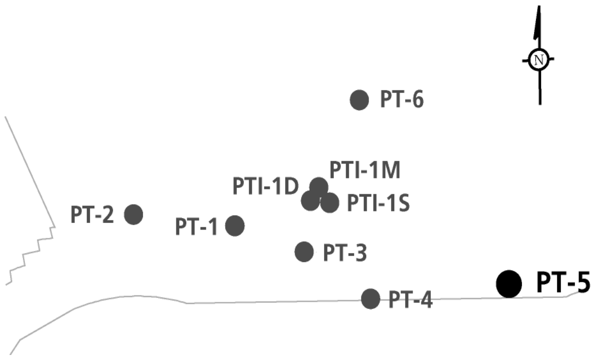
@ 107 ft bgs: Well Graded Sand, very dark gray (7.5YR 3/1) and black (7.5YR 2.5/1), 85% coarse sand, angular 15%, angular gravel (2mm to 10mm), loose to medium dense.

@ 112 ft bgs: changes to 80% sand, 20% gravel, trace silt, loose.

@ 115 ft bgs: changes to medium stiff to stiff (for ~6 inches).

@ 118 ft bgs: changes to dusky red (10YR 3/3), 90% coarse sand, 10% gravel, trace clay, angular sand, gravel (up to 15mm), very dense, slightly damp.

End of Boring at 127 ft bgs.



LOG OF BORING **PT-5**

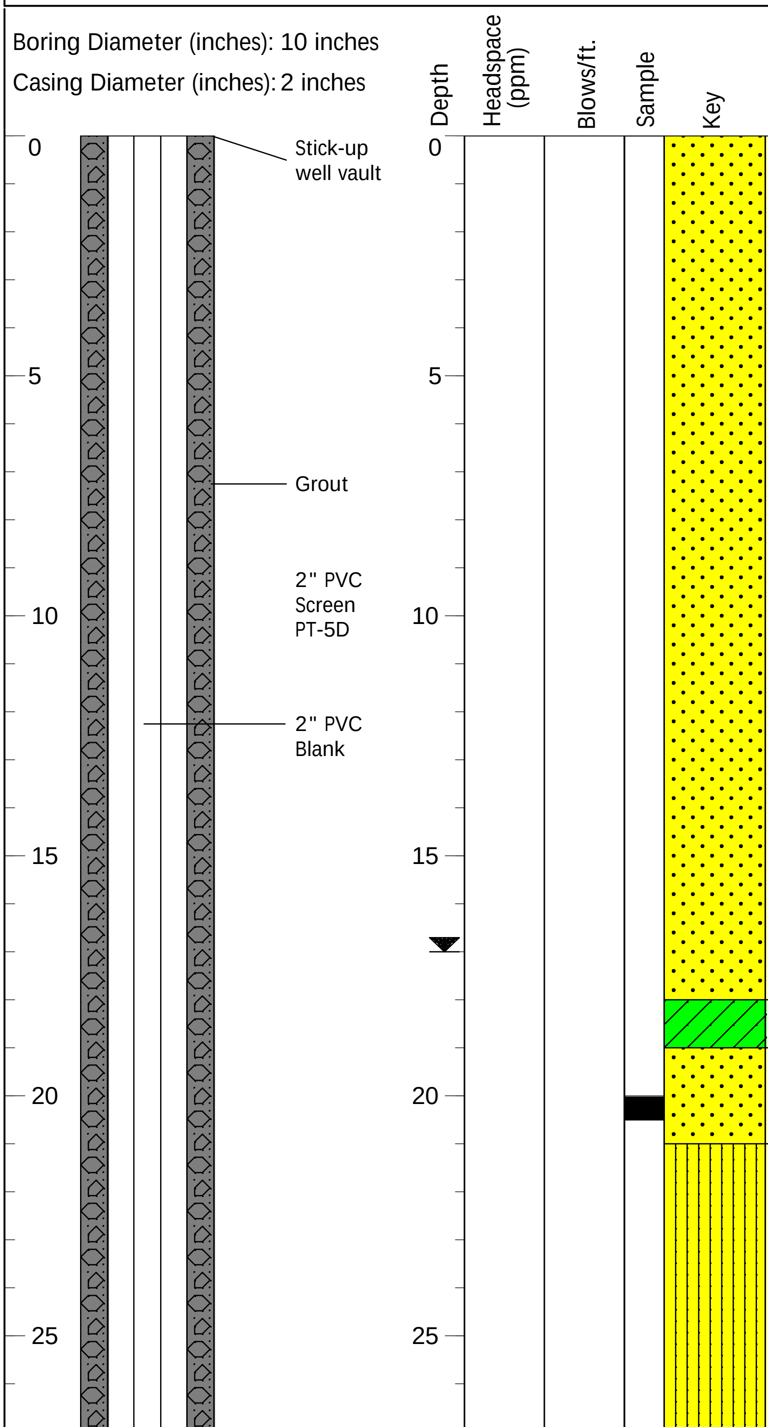
PG&E Topock
Interstate 40 and Park Moabi Road
Needles, California

Project No.:	RC000689.0001	Date Started:	9 Feb 2006
Logged by:	J. Ely	Date Completed:	10 Feb 2006
Drilling Co.:	Prosonic Corporation	Drilling Method:	Sonic
Driller:	Don Youngblood	Sample Method:	Core
Well Permit #:	2006010009	Driller's License:	C57-756217

WELL CONSTRUCTION

LITHOLOGIC DESCRIPTION

Boring Diameter (inches): 10 inches
Casing Diameter (inches): 2 inches



Poorly Graded Sand (SP), pale brown (10YR 6/3), 100% fine sand, very loose, dry.

@ 12 ft bgs: changes to pale brown and grayish brown (10YR 5/2).

@ 15.5 ft bgs: changes to slightly damp.

@ 17 ft bgs: changes to dark grayish brown (10YR 3/2), moist.

Clay (CL), very dark grayish brown, 90% clay, 10% silt, very plastic, wet.

Poorly Graded Sand (SP), very dark grayish brown, 100% fine sand, loose, wet.

Silt (ML), dark grayish brown (10YR 3/2), 80% silt, 15% clay, 5% fine sand, plastic, soft, wet.

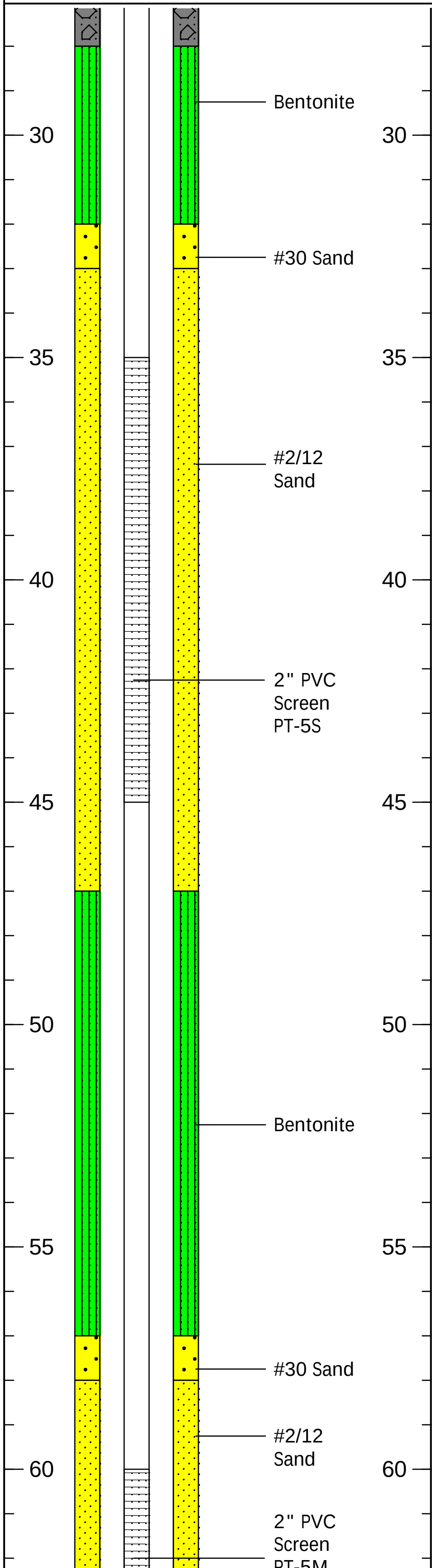
@ 23 ft bgs: changes to very high plasticity.

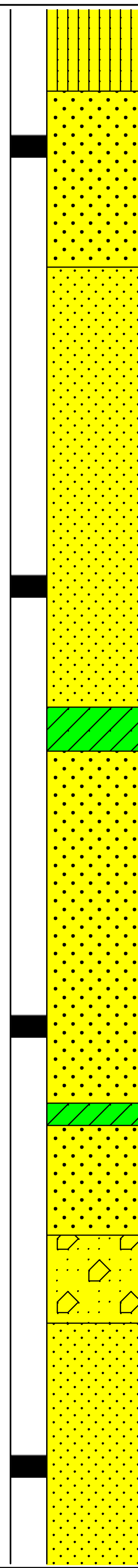
@ 25 ft bgs: changes to 70% silt, 30% clay, non-plastic.

@ 27 ft bgs: changes to very dark gray and black (10YR 4/2), trace organics

LOG OF BORING PT-5
(Continued)

WELL CONSTRUCTION | Depth | Headspace (ppm) | Blows/ft. | Sample | Key | LITHOLOGIC DESCRIPTION





(roots), medium soft.

Poorly Graded Sand (SP), dark grayish brown (10YR 4/2), 95% fine grained sand, 5% silt, loose, wet.

Well Graded Sand with Silt (SW), dark grayish brown (10YR 4/2), 90% fine sand, 5% silt, 5% clay, loose, wet.

@ 37 ft bgs: changes to the 5% clay (chunks), very loose.

Sandy Clay (CL), very dark grayish brown (10YR 3/2), 80% clay, 20% fine sand, plastic, wet.

Poorly Graded Sand (SP), dark grayish brown (10YR 4/2), 90% fine grained sand, 9% silt, 1% gravel (10mm rounded).

@ 48 ft bgs: increases to coarse grained sand, subrounded, yellowish brown (10YR 5/4).

@ 52 ft bgs: 6-inch layer of Sandy Clay (CL).

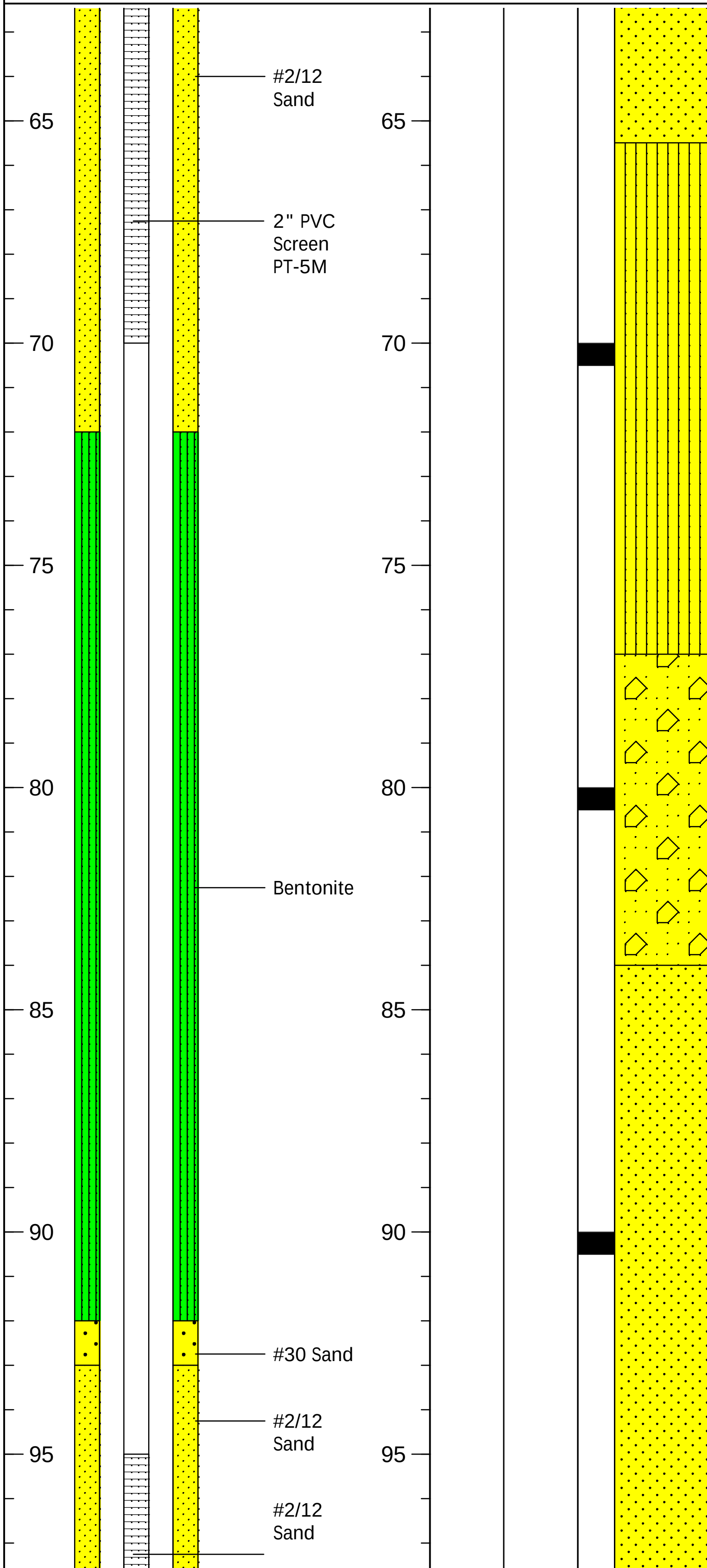
Well Graded Gravel with Sand (GW), brown (10YR 4/3), 50% sand (subrounded to subangular), 30% gravel, 15% cobbles (subrounded to subangular, up to 5 inches), 5% silt, loose, wet.

Well Graded Sand with Gravel (SW), yellowish brown (10YR 4/4), 80% coarse grained sand, 15% gravel (subrounded to subangular, 20mm), 5% cobbles (subrounded to subangular, up to 4 inches), very loose, wet.

@ 63 ft bgs: changes to 5% clay (chunks).

LOG OF BORING PT-5
(Continued)

WELL CONSTRUCTION | Depth | Headspace (ppm) | Blows/ft. | Sample | Key | LITHOLOGIC DESCRIPTION



Silty Sand with Gravel (ML), dark yellow brown (10YR 4/4), 50% silt, 30% fine sand, 15% gravel, 5% clay, 1% cobbles, very rounded to subangular, high plasticity, soft, wet.
@ 66 ft bgs: volcanic clasts.

@ 70 ft bgs: changes to Silt with Gravel, brown (10 YR 4/3), 60% silt, 30% gravel, 5% sand, 5% clay, low to medium plasticity, medium stiff, wet, trace volcanic clasts.

@ 73 ft bgs: 9-inch long, 14-inch circumference volcanic rock.

@ 75 ft bgs: changes to very saturated.

Poorly Graded Gravel with Sand (GW), brown (7.5 YR 4/3) to dark brown (7.5 YR 4/3), 50% gravel and cobbles (from 5mm up to over a foot), 45% sand (coarse grained, subrounded and subangular), 5% silt, loose, wet.

Well Graded Sand with Gravel (SW), dusky red (2.5 YR 3/2), 80% coarse sand, 15% gravel (2mm to 10mm, subrounded and very angular), 5% silt/clay (trace cobbles), loose to dense, wet.

@ 85.5 to 86 ft bgs: very dense.

@ 89 ft bgs: changes to very saturated, gravel up to 20mm, loose.

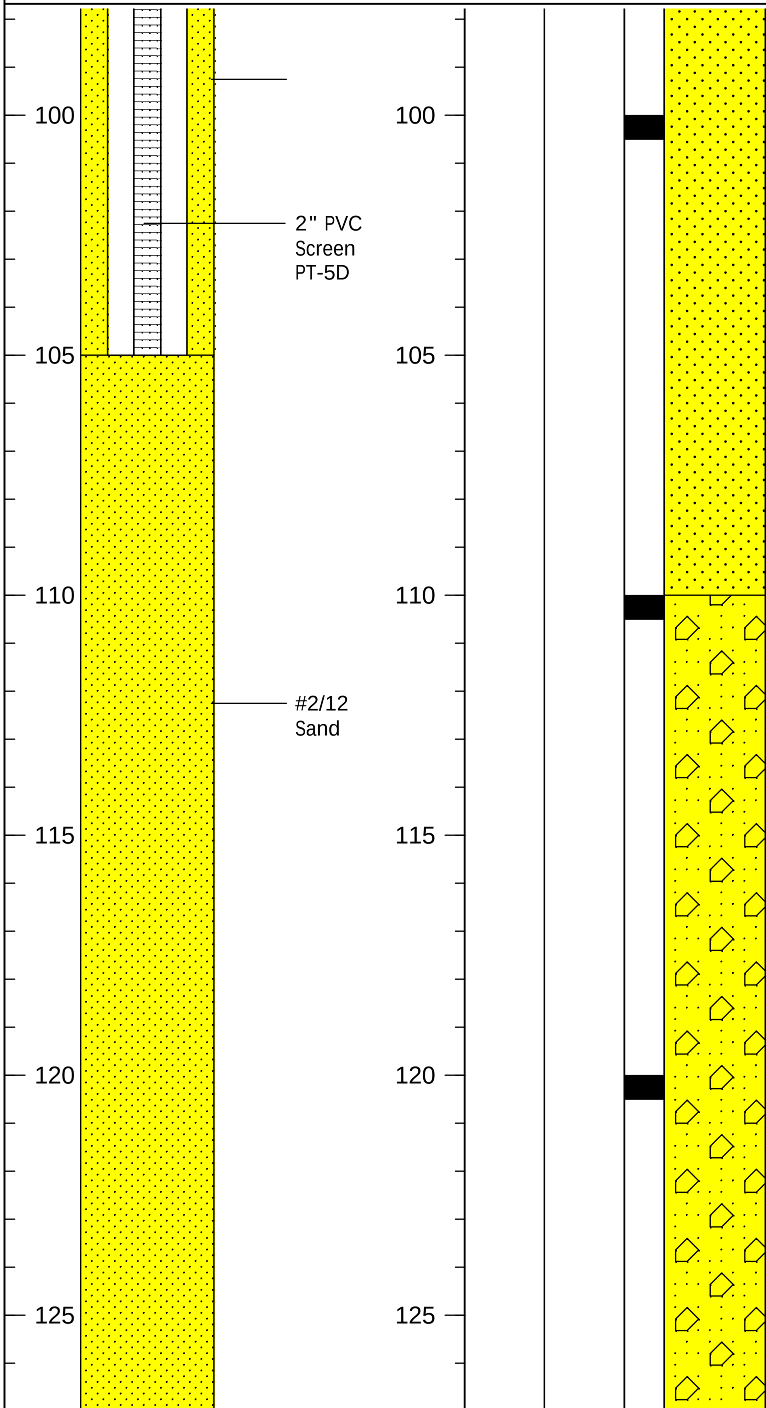
@ 92 ft bgs: changes to 10% clay.

@ 94 ft bgs: changes to 5% clay.

@ 95.5 ft bgs: changes to Well Graded Sand, dark gray (10YR 3/1), 90% coarse sand (very angular to subrounded), 5% gravel (10mm), 5% clay, very loose, wet.

LOG OF BORING PT-5
(Continued)

WELL CONSTRUCTION | Depth | Headspace (ppm) | Blows/ft. | Sample | Key | LITHOLOGIC DESCRIPTION



@ 102 ft bgs: changes to 10% clay.

@ 103 ft bgs: changes to dark reddish brown (5YR 3/2), coarse grained angular sand, 10% gravel (2mm-10mm), angular.

@ 107 ft bgs: changes to 5% clay, gravel very angular to subangular, up to 2 inches.

Well Graded Gravel with Sand (GW), black (7.5YR 2.5/1), 70% angular to very angular gravel (2mm-40mm), 25% coarse sand (subangular to very angular), 5% silt, loose, wet, possible top of bedrock.

@ 117 ft bgs: changes to 80% gravel, 20% coarse sand, gravel up to 2 inches.

@ 121 ft bgs: gravel (2mm-20mm).

@ 123 ft bgs: changes to some cementation.

End of Boring 127 ft bgs.