Monitor Well Installation
Pickles Butte Sanitary Landfill

Prepared for **Pickles Butte Sanitary Landfill**
Canyon County, Idaho

April 25, 2014

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Monitor Well Installation
Pickles Butte Sanitary Landfill

1. Introduction

On behalf of the Canyon County Solid Waste Department, Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this report summarizing core sampling and monitor well installation at the Pickles Butte Sanitary Landfill (PBSL) in Canyon County, Idaho. The PBSL is an active landfill that has been accepting solid waste since 1983. Figure 1 is a site location map showing the future design boundary, site certification boundary, and Canyon County property boundaries.

Canyon County anticipates a future need to laterally expand the existing permitted waste boundary at the PBSL. Activities described in this report, including sediment core sampling and monitor well installation, were conducted primarily to provide additional data for a hydrogeologic characterization of the vadose zone in support of the engineering design and application for the expansion. A secondary objective of these activities was to expand the voluntary groundwater monitoring network to complement existing monitor wells at the site.

This document presents a brief description of known hydrogeologic conditions at the site based on previous field investigations, followed by a description of the core sampling, borehole drilling, and well construction activities conducted during this investigation. Interpretation of the data obtained during this investigation and a detailed characterization of the site hydrogeology will be presented in a subsequent report.

2. Previous Investigations

A total of 11 wells have previously been installed at the PBSL. These include 1 water supply well (PB-PROD), 1 former domestic well (PB-01), 1 corehole (PB-02), and 8 monitor wells (PB-03 through PB-10) (Figure 1).

Between 1992 and 1994, Holladay Engineering Company (HEC) conducted a comprehensive hydrogeologic study at the PBSL, advancing the PB-02 corehole and installing six 4-inch-diameter monitor wells (PB-03 through PB-08) (HEC, 1994). Monitor wells PB-09 and PB-10 were installed in 1995. PB-01 and PB-02 have been plugged and abandoned. Monitor wells PB-03 through PB-10 are completed in the uppermost water-bearing zones at their respective locations. The wells have been monitored semiannually since installation. In all well locations except for PB-03 and PB-05, groundwater levels have remained largely unchanged since monitoring began, with a slight declining trend at some locations. The water level at well PB-03 fluctuates in response to pumping from the water supply well. PB-05 has been dry since 2003.

The stratigraphy at the site consists of the following geologic units, from oldest to youngest: Glenns Ferry Formation, Tuana gravel, and Bruneau Formation. The Glenns Ferry Formation is unconformably overlain by the Tuana gravel, which is unconformably overlain by the Bruneau Formation.

The Glenns Ferry Formation is the dominant geologic unit within the study area, and contains the first regional groundwater encountered at the site. It is exposed in Deadhorse Canyon, within the lower elevations of the landfill property. It consists of lacustrine silts and clays with interbedded fluvial sands. Bedding is horizontal and laterally continuous; however, lenticular deposits are present. Vertical changes in stratigraphy can be abrupt and occur over short intervals. The degree of consolidation varies significantly both vertically and horizontally, although in general, the deeper sediments are more consolidated than shallower sediments. Consolidation occurs through both compaction and cementation. The Glenns Ferry Formation contains a regionally occurring deposit referred to locally as the “blue clay”, although the color locally varies from bluish to greenish gray. The blue color stems from reducing conditions that exist at depth. When the blue clay is exposed to the atmosphere, it turns greyish brown. The blue clay is a known confining layer in the vicinity of the PBSL, and has a significant effect on hydrogeologic conditions at the site. Previous investigations have found that the blue clay appears to prevent both downward migration of unconfined water above it and upward migration of confined water below it.

The Tuana gravel is exposed near the top of Pickles Butte and on the northeastern rim of Deadhorse Canyon near the active landfill. It ranges in thickness from approximately 5 to

35 feet in most locations, but may be as much as 95 feet thick in PB-13. The Tuana gravel is poorly sorted and poorly to moderately consolidated by cementation with calcium carbonate. It is non-water-bearing in the vicinity of the landfill.

The Bruneau Formation includes a thin section of fluvial and lacustrine sediments capped by basalt. A thin wedge of the lacustrine facies is present along the northeastern rim of Deadhorse Canyon. The basalt is exposed at the top of Pickles Butte, where it is about 20 feet thick and appears to directly overlie the Tuana gravel. The sedimentary deposits of the Bruneau Formation consist of sandy silt and silty sand (HEC, 1994). The formation is non-water-bearing in the vicinity of the landfill.

There are three distinct groundwater zones located in the vicinity of Pickles Butte: an upper aquifer, middle aquifer, and bottom aquifer (HEC, 1994). All three aquifers occur within the Glenns Ferry Formation. The upper aquifer is discontinuous, and varies considerably in thickness and depth below ground surface. Where present, it lies above the blue clay and is considered to be unconfined. The middle aquifer is between 200 and 300 feet thick, occurs within fractures and sandy beds or lenses within the lower portion of the blue clay, and is typically present under confined conditions. The bottom aquifer occurs beneath the blue clay and is also confined. Regional groundwater occurs in the bottom aquifer, and is thought to enter the middle aquifer through fractures (HEC, 1994). The wells installed during this investigation were completed in the first groundwater zone encountered, which was the middle aquifer.

First-encountered groundwater beneath the northeastern corner of the site (wells PB-05, PB-06, PB-07, PB-09, and PB-10) is unconfined and flows to the northeast (Figure 2). This unconfined aquifer is believed to be separated from groundwater to the southwest by a divide that is approximately coincident with several northwest/southeast trending faults (Figure 2). First-encountered groundwater beneath the remainder (majority) of the site is confined by a laterally continuous claystone unit locally known as the blue clay (HEC, 1994), and flows to the southwest (Figure 2). The newly installed monitor wells expand the existing network of wells to the west and south within this area of confined groundwater conditions.

3. Current Investigation

Field investigation activities were conducted from May 4, 2011 to December 16, 2011. The primary goals of the field investigation were to:

- Determine depth to first groundwater beneath the southwestern portion of the landfill
- Collect data and information needed to characterize the ability of the subsurface geology to transmit water from ground surface to the first groundwater-bearing zone
- Add additional groundwater monitoring locations around the perimeter of the landfill

A total of 5 coreholes (Figure 1) were advanced, and continuous cores were collected and stored for later use. From the continuous cores, 56 representative samples of subsurface materials were selected and submitted to an analytical laboratory for determination of physical and hydrologic properties. Following coring, the holes were reamed to a larger diameter and permanent monitor wells were installed at each location. All wells were developed according to the procedures described in Section 3.2.2.

The Idaho Department of Water Resources (IDWR) did not require permits for the exploratory coreholes. Data from the coreholes were used to design drilling and well construction plans. Prior to drilling, permits were obtained from IDWR. Regular communication with IDWR was maintained during the project, and on several occasions approval was granted to modify the original drilling plan when unexpected geologic and drilling conditions were encountered.

The following subsections provide details of the field investigation.

3.1 Corehole Drilling

All coring was conducted by HAZ-Tech Drilling, Inc. of Meridian, Idaho. Coreholes were advanced using an Atlas Copco CS1000 coring rig equipped with an HQ (approximately 2.4-inch-diameter) wireline core drilling system. At PB-14, core was collected using both HQ and NQ (1.87-inch-diameter) wireline core systems. The purpose of coring was to collect

continuous, undisturbed core from the surface to the first occurrence of groundwater to serve as a permanent record of site geology. Drilling conditions prevented collection of continuous cores at some locations; however, every effort was made to collect as much core as possible. Borehole depths and well construction details are presented in Table 1.

Cores were collected in lexan liner tubes and carefully transferred to core boxes for storage and preservation. Core boxes and liner tubes were labeled with the borehole designation (e.g., PB-11), run interval and orientation, box number relative to total number of boxes, and date of collection. If needed, core blocks or other materials were placed in the box to prevent cores from sliding.

A DBS&A field geologist described and recorded the following core sample characteristics, as appropriate based on lithology and consolidation:

- Rock type and/or Unified Soil Classification System (USCS) designation
- Color
- Texture (including particle size, shape, sorting, and wet plasticity)
- Structure
- Presence of natural fractures
- Stratigraphic contacts
- Moisture content (when drilling dry, or at interior of intact rock core)
- Changes in drilling characteristics

Continuous core was collected for the entire length of borehole PB-11 (to 400 feet below ground surface [bgs]).

In borehole PB-12, continuous core was collected from ground surface to a depth of 350 feet bgs, where the core barrel became stuck and the hole was abandoned.

In boreholes PB-13, PB-14 and PB-15, unconsolidated sediments in the top 400 to 500 feet of each hole prevented coring without getting the core barrel and core rod stuck. To enable coring below these intervals (within consolidated materials), a permanent 10-inch welded steel surface casing was installed from ground surface to approximately 20 feet below the top of consolidated materials. Boreholes were drilled to a nominal diameter of 15 inches using the mud-rotary drilling method, and 10-inch surface casings were lowered into the borings. The surface casings were installed to depths of 440, 480, and 400 feet bgs in wells PB-13, PB-14, and PB-15, respectively. Surface casings were perforated so that the annulus would be filled during pressure grouting conducted during well construction activities.

Within the 10-inch surface casing, a 4-inch temporary conductor casing was installed to the top of consolidated materials (same depth as the 10-inch casing). The 4-inch conductor casing was used to provide lateral stability for the HQ core rods, which were lowered through the 4-inch conductor casing to the top of consolidated materials. Coring was then conducted from the top of consolidated materials to the maximum depth attainable.

The initial work plan specified that the presence of first groundwater would be investigated during coring. First groundwater would be determined by a combination of inspection of core material for moist or wet conditions, airlifting to evacuate the hole in 50-foot intervals, and placing a pressure transducer in the hole for a period of no less than 12 hours if the presence of water was suspected by the first two indicators. In this manner, the investigation sought to determine if there existed any thin lenses of perched groundwater above the blue clay, and to determine the depth to first water in the middle aquifer. During completion of PB-12, the airlifting method was determined to be infeasible because the pressurized air dried the mudcake walls of the corehole, increasing friction and causing the core barrel to become stuck. After PB-12, airlifting during coring was not attempted, and first water was determined by inspection of cores, use of the pressure transducer, and by airlifting during drilling of the monitor well boring. Due to complicated drilling conditions, first groundwater was not encountered during coring in any of the holes except for PB-11; rather, it was determined during drilling of the borings using air-rotary drilling methods (Section 3.3).

Pertinent events and findings at each corehole location are as follows:

- *PB-11:* Continuous core was collected at PB-11 from ground surface to a depth of 400 feet bgs. The top of the blue clay was encountered at approximately 200 feet bgs. First water was encountered between 350 and 400 feet bgs. After the water-bearing zone was pierced, static water level rose to approximately 295 feet bgs, indicating a positive head of between 55 and 105 feet.

- *PB-12:* Continuous core was collected at PB-12 from ground surface to a depth of 350 feet bgs. The top of the blue clay was encountered at approximately 140 feet bgs. First water was not encountered during coring, but was subsequently determined to be between 500 and 560 feet bgs during drilling. Coring ceased at 350 feet bgs, at which point it appeared that a water-bearing zone consistent with the one encountered at PB-11 had been encountered. Drillers were unable to retrieve the core barrel, and the core-hole was abandoned. It was later determined during drilling that a water-bearing zone had not been reached; it is assumed that what was thought to be groundwater was actually drilling fluids flowing back into the corehole. After the water-bearing zone was pierced, static water level rose to approximately 315 feet bgs, indicating a positive head of between 185 and 245 feet.

- *PB-13:* Continuous core was collected at PB-13 from 0 to 440 feet bgs, at which point the core barrel became stuck due to flowing sands at approximately 330 feet bgs. To enable additional coring, 10-inch surface casing was installed to a depth of 440 feet bgs to case off the unconsolidated materials. Coring was resumed from 440 to 666 feet bgs, which was the deepest the core rig was capable of penetrating without getting stuck again. The top of the blue clay was encountered at a depth of approximately 545 feet bgs. No groundwater was encountered between ground surface and the total core depth of 666 feet bgs. First groundwater was encountered during air-rotary drilling (Section 3.2) between 850 and 900 feet bgs. Static water level following well construction was approximately 735 feet bgs, indicating a positive head of between 115 and 165 feet.

- *PB-14:* Continuous core was collected at PB-14 from 0 to 385 feet bgs before friction became too high to continue advancing the core barrel. To enable additional coring, 10-inch surface casing was installed to a depth of 480 feet bgs to case off unconsolidated materials. Coring was resumed from 520 to 750 feet bgs, which was the deepest the core rig was capable of penetrating. The top of the blue clay was encountered at a depth of approximately 520 feet bgs. No groundwater was encountered between ground surface and the total core depth of 750 feet bgs. First groundwater was encountered during air-rotary drilling (Section 3.2) between 800 and 840 feet bgs. Static water level following well construction was approximately 720 feet bgs, indicating a positive head of between 80 and 120 feet.

- *PB-15:* Coring in the near-surface unconsolidated materials was not attempted at PB-15. Before any coring was attempted, the 10-inch surface casing and 4-inch conductor casings were installed to a depth of 400 feet bgs. Continuous core was collected from 425 to 625 feet bgs. Coring was stopped when friction became too high and there was risk of getting the core barrel stuck. The blue clay was encountered at approximately 565 feet bgs. No groundwater was encountered between ground surface and 625 feet bgs. First groundwater was encountered during air-rotary drilling (Section 3.2) between 800 and 860 feet bgs. Static water level following well construction was approximately 660 feet bgs, indicating a positive head of between 140 and 200 feet.

3.2 Borehole Drilling

Following coring, boreholes were reamed or redrilled to a diameter of 9⅞ inches using the direct air-rotary drilling method. Drilling was conducted by Adamson Pump and Drilling of Nampa, Idaho using an Ingersoll Rand T3 drill rig that could be used for both air-rotary and mud drilling. Mud-rotary methods were used when drilling boreholes in poorly consolidated material in preparation for permanent surface casing installations. Air-rotary methods were employed at all other times because it enabled more accurate determination of the occurrence of first groundwater. During air-rotary drilling, the boring was evacuated by airlifting and water levels were monitored using a sounder and/or pressure transducer at a maximum interval of 60 feet. To determine if water was entering the boring, drilling was stopped for a period of no less than

2 hours to allow sufficient time for a water level increase to occur. If it appeared that water was entering the boring after a 2-hour period, water level data were collected using the pressure transducer overnight to verify that groundwater was encountered. In this manner, the depth to first groundwater was determined to within an accuracy of 60 feet.

Over depth intervals for which continuous cores were not obtained, rotary cuttings were collected every 10 feet and logged by a DBS&A geologist. For the most part, these intervals represent the bottom of the boring only. The cuttings obtained by the rotary methods represent amalgamated bulk samples, so that much of the small bedding structure and interbedded lithologies apparent in the cores was not determinable.

3.3 Monitor Well Completion

Monitor well construction was conducted in compliance with IDWR monitor well construction standards (IDAPA 37.03.09). Well materials were selected to withstand corrosion from elevated groundwater temperatures and natural methane. It is believed that geothermal groundwater is the cause of elevated water temperatures at site monitor wells. During borehole drilling, downhole thermal logs showed water temperatures between 71.5°F and 84.6°F at the new well locations.

Monitor wells were screened across the first significant water-bearing zone encountered during drilling, within sediments of the Glenns Ferry Formation. Well completion depths and screen intervals were determined in the field, with the approval of the project manager and after consultation with the Canyon County Solid Waste Department and IDWR.

3.3.1 Well Construction

Because groundwater temperatures measured in boreholes PB-11 through PB-15 prior to well installation were below the regulatory limit of 85°F for geothermal conditions, monitor wells were constructed according to IDWR standards for non-geothermal wells. All monitor well materials were new and unused and meet applicable ASTM and industry standards. General well material and construction specifications are as follows:

- Completed boreholes and installed surface casings have a minimum inside diameter of 9⅞ inches to allow for a uniform seal thickness of at least 2⅝ inches on all sides of the well casing. An exception is well PB-13, where an additional 8-inch steel casing was installed to a depth of 600 feet bgs due to caving borehole conditions. The 8-inch casing was suspended at the surface, perforated, and grouted in place during well sealing.

- Where present, 10-inch surface casings are sealed from the ground surface to 50 feet bgs with neat cement grout. Grout was also emplaced between casings and the borehole wall by either pressure grouting and allowing the cement to flow up around the casing to the extent possible (as at PB-14 and PB-15), or perforating the casing prior to grouting (as at PB-13).

- Well casings are nominal 4-inch-diameter, welded, 316 stainless steel (SS)

- Screens are 60 feet in length and constructed of nominal 4-inch-diameter, 316 SS, 20-slot wirewrap.

- A 5-foot, 4-inch-diameter, 316 SS sump is welded to the base of each screen section.

- Centralizers are installed above and below the well screen and at 50- or 100-foot intervals to land surface.

- Filter pack, consisting of 10/20 silica sand, was placed using a tremie pipe and extends from bottom of hole to at least 5 feet above top of screen.

- A minimum of 19.5 feet of ⅜-inch coated bentonite pellets, hydrated with emplacement, were placed above the filter pack using a tremie pipe.

- The remainder of the annular space was sealed with neat cement grout.

- Surface completions consist of an 8-foot by 8-foot by 6-inch-thick concrete pad gently sloped away from the well, 2-foot minimum casing stickup, and protective steel riser with locking cap set approximately 6 inches above the top of the well casing.

Well construction details for each new well are presented in Table 1 and Appendix A.

3.3.2 Well Development

Wells were developed by bailing and pumping until produced water contained essentially no sediment, was visually free of suspended solids, and consistent (minimum three consecutive values within 10 percent) field parameters (electrical conductivity, temperature, and pH) were achieved. Final water quality field parameter measurements for each well at the end of development are presented in Table 2. Well development water was discharged to the land surface at least 20 feet from the wellhead.

3.3.3 Groundwater Quality Sampling

Sampling of new wells was conducted by PBSL staff quarterly for one year from the time of installation. Since that time, sampling has been conducted concurrently with regularly scheduled semiannual sampling at existing site monitor wells, and according to procedures in place for routine sampling at PBSL. Semiannual sampling is currently conducted in April and October. Water quality samples were obtained in April 2012 and submitted to Analytical Laboratories, Inc. of Boise, Idaho, where they were analyzed for the organic and inorganic constituents identified in Appendix I of 40 CFR § 258.53. The analytical results are presented in Appendix C.

Reference

Holladay Engineering Company (HEC). 1994. *Hydrogeologic characterization, ground water monitoring plan, and facility design, Pickles Butte Sanitary Landfill, Canyon County, Idaho*. Prepared for Canyon County, Idaho. July 1994.

Figures

PB-11
PB-12
PB-13
PB-14
PB-15
PB-01
PB-02
PB-03
PB-04
PB-05
PB-06
PB-07
PB-08
PB-09
PB-10
PB-PROD

Deadhorse Canyon Road
Pickles Butte
Gravel Pit
Storage Bins
Trailer Park
ROSS LANE
LANDING STRIP
CARMER ROAD
SURREY AVE
MISSOURI AVE
DEER FLAT
WOOD DRAIN
ABANDONED CANAL
LANE

N

0 1000 2000 Feet

Explanation

- New monitor well
- Corehole
- Former domestic well
- Monitor well
- Supply well
- Approximate extent of future design boundary
- Site certification boundary
- Property boundary

Site Location

Canyon County

Idaho Location Map

Note: PB-01 and PB-02 have been plugged and abandoned.

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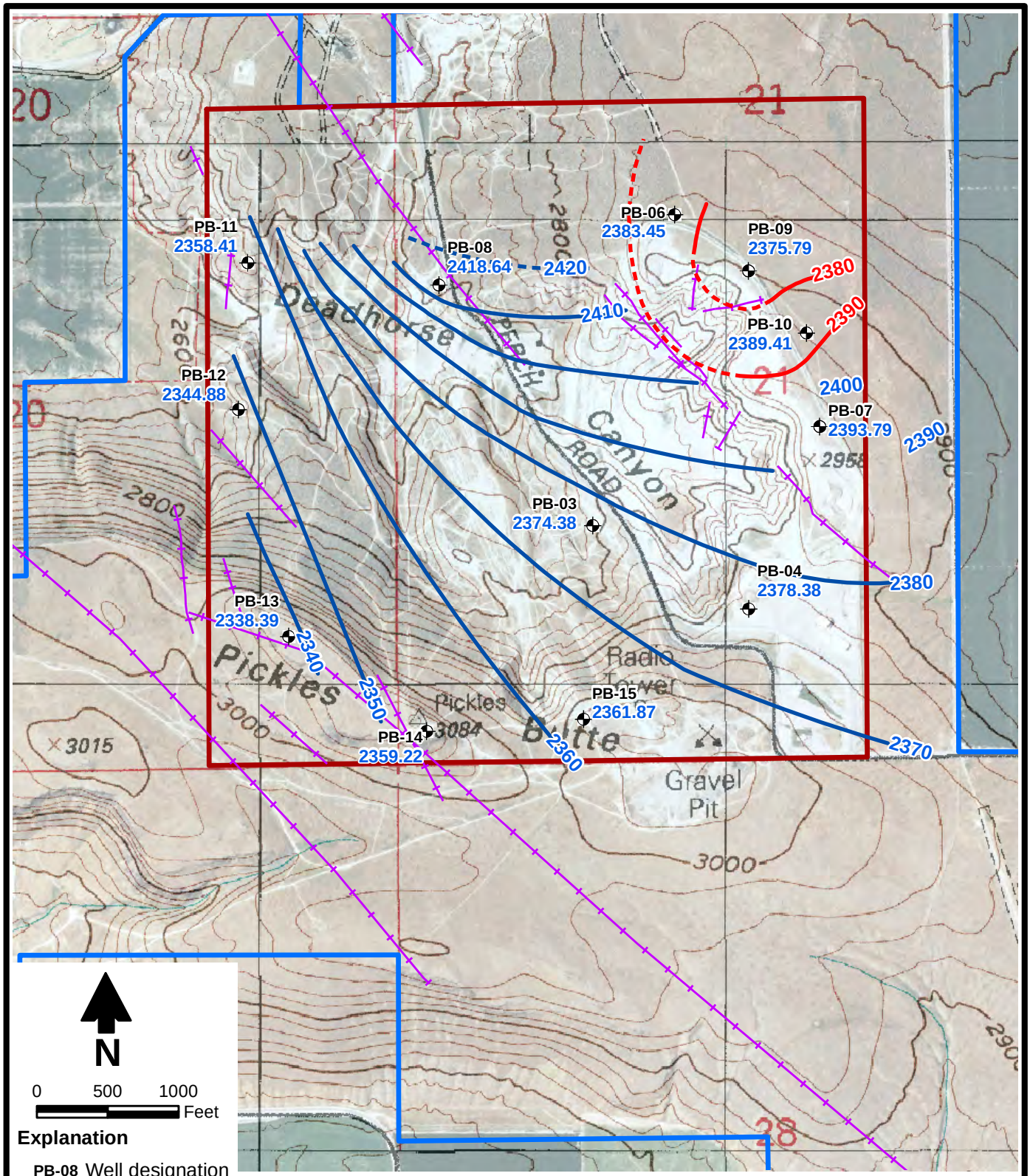
Daniel B. Stephens & Associates, Inc.
4/21/2014
JN ES09.0154

PICKLES BUTTE SANITARY LANDFILL

Site Groundwater Wells

Figure 1



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PICKLES BUTTE SANITARY LANDFILL

Water Level Elevations, April 2012

Daniel B. Stephens & Associates, Inc.

4/21/2014

JN ES09.0154

Figure 2

Tables

Table 1. Monitor Well Completion Information

Well Designation	Completion Date	Survey Data [a]			Screen Interval (feet bgs)		Total Well Depth (feet bgs)	Total Borehole Depth (feet bgs)
		Northing (feet)	Easting (feet)	TOC Elevation (feet msl)	Top	Bottom		
PB-11	6/30/2011	668731.199	243735.206	2654.1	340	400	405	420
PB-12	7/15/2011	667697.966	243653.665	2657.2	480	540	545	555
PB-13	12/15/2011	666231.696	243986.781	3073.9	840	900	905	920
PB-14	10/11/2011	665549.182	244947.947	3080.9	845	905	910	923
PB-15	10/26/2011	665617.168	246058.254	3023.3	790	850	855	870

[a] Northing and easting coordinates provided in NAD27, Idaho State Plane West, FIPS 1103. Surveyed points are 2 feet north of the protective well vault. Casing stickup was approximately 2 feet above ground surface at time of well completion.

TOC = Top of casing
msl = Above mean sea level
bgs = Below ground surface

Table 2. Post-Development Field Parameter Measurements

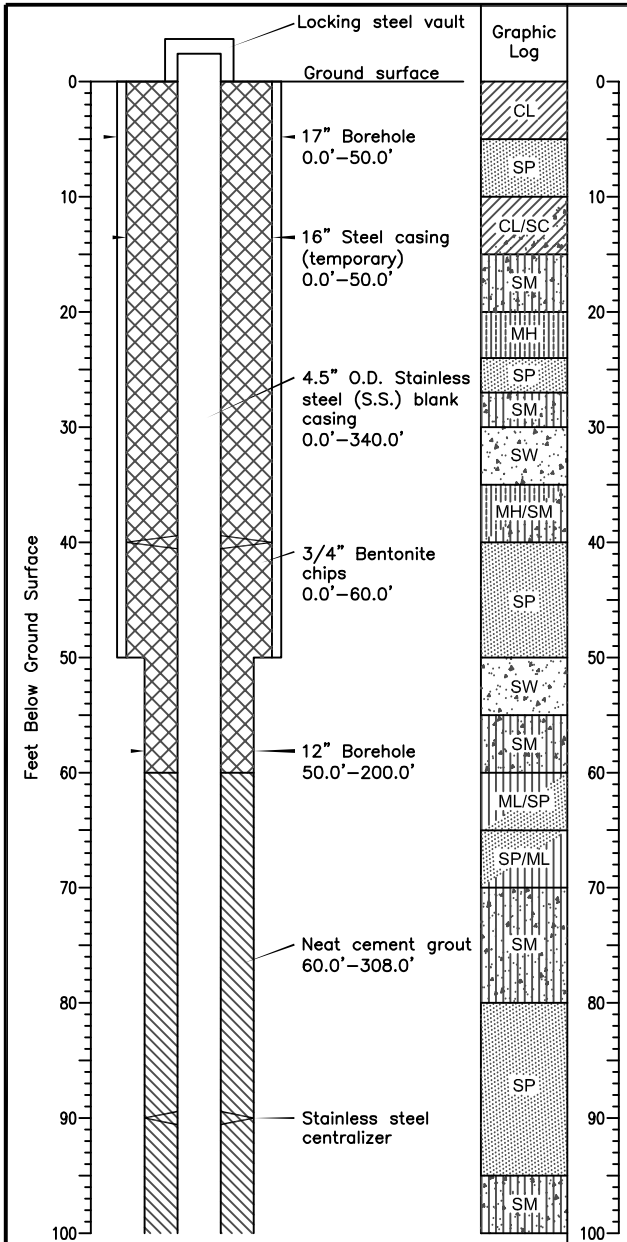
Well	Date	Specific Conductivity (µmhos/cm @ 25°C)	pH	Temperature (°C)	Final Appearance	Total Volume Removed During Development (gallons)	Static Depth to Water (feet btoc)	Water Elevation (feet msl)
PB-11	12/15/2011	1,146	7.87	20.0	Cloudy	414	293.44	2,360.66
PB-12	11/17/2011	966	7.96	23.1	Cloudy	700	313.08	2,344.12
PB-13	12/16/2011	626	8.07	25.7	Cloudy	530	732.54	2,341.36
PB-14	12/16/2011	844	7.59	26.5	Cloudy	563	723.09	2,357.81
PB-15	11/16/2011	828	8.2	25.0	Cloudy	490	663.23	2,360.07

Note: Field parameters were observed at the conclusion of well development, with the exception of static water level, which was measured immediately prior to well development.
µmhos/cm = Micromhos per centimeter
°C = Degrees Celsius
btoc = Below top of casing
msl = Above mean sea level

Appendix A

Lithologic Logs and Well Construction Diagrams

S:\Projects\ES09.0154_Pickles\VR_Drawings\ES09_0154_07B_borelogs.dwg PB-11 (1of5)



Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
CL	40%/40%	0–5	CL	Silty clay, light brownish gray (2.5Y 6/2).
SP	70%/90%	5–10	SP	Sand, light gray (10YR 7/2), medium gravel, well sorted.
CL/SC	25%/25%	10–15	CL–SC	Sandy clay/clayey sand, light brownish gray (2.5Y 6/2).
SM	40%/50%	15–20	SM	Silty sand, light yellowish brown (7.5Y 7/3), fine–grained, well sorted.
MH	90%/90%	20–24	MH	Clayey silt, grayish brown (2.5YR 5/2), low plasticity, hard.
SP	90%/90%	24–25	SP	Sand, dark yellowish brown (10YR 4/4), medium–grained, well sorted, well cemented, hard.
	70%/90%	25–27	SP	Same as above.
SM	70%/90%	27–30	SM	Silty sand, light olive brown (2.5Y 5/4), fine– to medium–grained, moderately sorted, soft.
SW	50%/50%	30–35	SW	Sand, light brownish gray (2.5Y 6/2), thinly laminated, fine– to medium–grained, moderately sorted, moderately cemented.
MH/SM	75%/75%	35–40	MH–SM	Clayey silt and silty fine sand, light gray (5Y 7/1), laminated, some orange banding, moderately indurated.
SP	70%/70%	40–45	SP	Sand, dry color light gray (10YR 7/2), medium–grained, moderately to well sorted, moderately to well indurated.
	75%/75%	45–50	SP	Same as above.
SW	30%/30%	50–55	SW	Sand, light gray (2.5YR 7/1) to light brownish gray (2.5YR 6/2), prominent orange banding, medium–grained, moderately sorted, soft.
SM	20%/20%	55–60	SM	Silty sand, light olive brown (2.5Y 5/4) to grayish brown (2.5YR 5/2), fine–grained, weakly indurated.
ML/SP	40%/40%	60–65	ML–SP	Silty very fine sand, gray (2.5Y 6/1), massive, grading downward to sand, olive yellow (2.5Y 6/6), medium–grained, well sorted, hard.
SP/ML	45%/45%	65–70	SP–ML	Sand, as above, grading downward to silt and silty fine sand, slightly moist.
SM	60%/60%	70–75	SM	Silty sand, light brownish gray (2.5Y 6/2), fine–grained, slightly moist.
	20%/20%	75–80	SM	Similar to above, finer–grained, dry.
SP	65%/65%	80–85	SP	Sand, light brownish gray (2.5Y 6/2), fine–grained, well sorted, moderately indurated, slightly moist.
	55%/55%	85–90	SP	Same as above, dry.
	20%/20%	90–95	SP	Sand, light brownish gray (7.5YR 6/2), fine– to medium–grained, moderately sorted.
SM	85%/85%	95–100	SM	Sand, light gray (2.5Y 6/1), silty fine–grained, softer than above, slightly moist.

Geologist: J. Raucci
Driller: HAZ–Tech
Date completed: 6–30–11

Drilling method: Core, air rotary
Bit diameters: 19" (0'–50'), 12" (50'–200'), 9 7/8" (200'–420')
Sampling device: HQ core, air rotary cuttings (400'–420')
Steel suface casing: 16" steel (0'–50')

Northing: 668731.199
Easting: 243735.206
Elevation: 2654.1 (TOC)

Note: TOC = top of casing

PICKLES BUTTE
Well Log: PB-11

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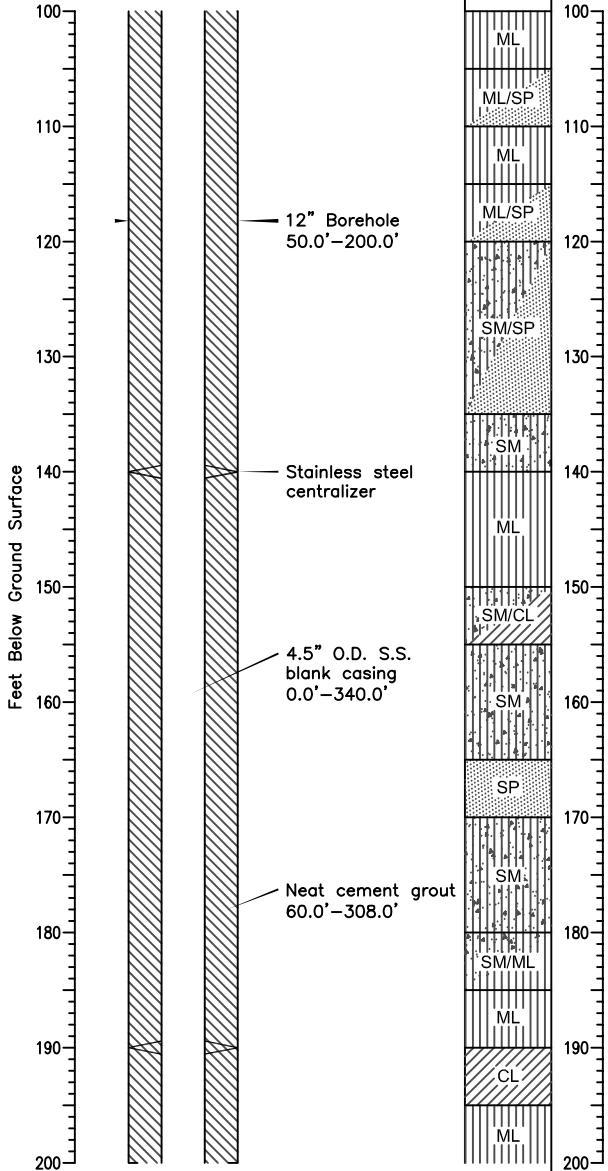
6–05–2012
JN ES09.0154

S:\Projects\ES09.0154_Pickles\VR_Drawings\ES09_0154_07B_borelogs.dwg PB-11 (2of5)



Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
ML	20%/20%	100–105	ML	Sandy silt, pale yellow (2.5Y 8/2), moderately indurated, dry.
ML/SP	20%/20%	105–110	ML–SP	Same as above, interbedded with dark gray (2Y 3/1), medium–grained sandstone, very hard, CaCO3 cement.
ML	20%/20%	110–115	ML	Sandy silt and silt, light olive gray (5Y 6/2), weakly indurated, slightly moist.
ML/SP	20%/20%	115–120	ML–SP	Same as above, interbedded with dark gray medium–grained sandstone.
SM/SP	50%/50%	120–125	SM–SP	Sandy silt, light olive gray, similar to above, slightly moist, with white fine–grained, well sorted sandstone, cross bedded, some yellow with orange banding, dry, hard.
	20%/20%	125–130	SM–SP	Same as above, interbedded with sandstone, dark gray (2Y 3/1), medium–grained.
	60%/60%	130–135	SM–SP	Sandy silt, pale yellow (2.5Y 7/3), with white fine–grained sand with yellow color banding, dry.
SM	30%/30%	135–140	SM	Silty sand, light gray (5Y 7/2), fine–grained, moist, reddish yellow color banding.
ML	0%/30%	140–145	ML	Sandy silt, light gray (2.5Y 7/2), fine–grained, slightly moist with small (less than 1 inch) reddish yellow clay lenses.
	55%/55%	145–150	ML	Siltstone, light gray (2.5Y 7/2), hard, dry.
SM/CL	100%/100%	150–155	SM–CL	Interbedded, silty sand/sandy silt, light brownish gray (7.5Y 6/2) with clay, dark greenish gray (5GY 4/1), thin bands of reddish clay, fine–grained.
SM	20%/20%	155–160	SM	Silty sand, light yellowish brown (2.5Y 6/4), laminated and color banded, cross bedded, fine–grained, weakly cemented, slightly moist.
	50%/50%	160–165	SM	Silty sand, light brownish gray (2.5YR 6/2), otherwise as above, very fine–grained, borderline sandy silt.
	100%/100%	165–168	SP	Similar to above, but dominantly fine sand.
SP	100%/100%	168–170	SP	Sandstone, light olive brown (2.5Y 5/4), color banded, cross bedded, fine, soft, slightly moist.
	50%/50%	170–175	SM	Silty sandstone, grayish brown (7.5Y 5/2), massive to laminated, color banding (yellow), trough cross bedded, fine–grained, organic material (?).
SM	30%/50%	175–180	SM	Silty sandstone, light olive brown (7.5Y 5/3), fine–grained, similar to above, slightly moist.
SM/ML	100%/100%	180–185	SM–ML	Sandy silt and silty sand, gray (5Y 5/1) to grayish brown (2.5Y5/2), moderately indurated, slightly moist.
ML	85%/85%	185–190	ML	Siltstone, gray (5Y 5/1), moderately to strongly cemented, massive, slightly moist to dry.
CL	0%/0%	190–195	CL	Little recovery, clay, appears to be dark gray (5Y 4/1).
ML	65%/75%	195–200	ML	Siltstone, sandy silt and clayey silt intervals, gray (5Y 5/1), reddish brown color banding, moderately indurated, very slightly moist.

Geologist: J. Raucci
Driller: HAZ–Tech
Date completed: 6–30–11

Drilling method: Core, air rotary
Bit diameters: 19" (0'–50'), 12" (50'–200'), 9 7/8" (200'–420')
Sampling device: HQ core, air rotary cuttings (400'–420')
Steel suface casing: 16" steel (0'–50')

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PICKLES BUTTE
Well Log: PB-11

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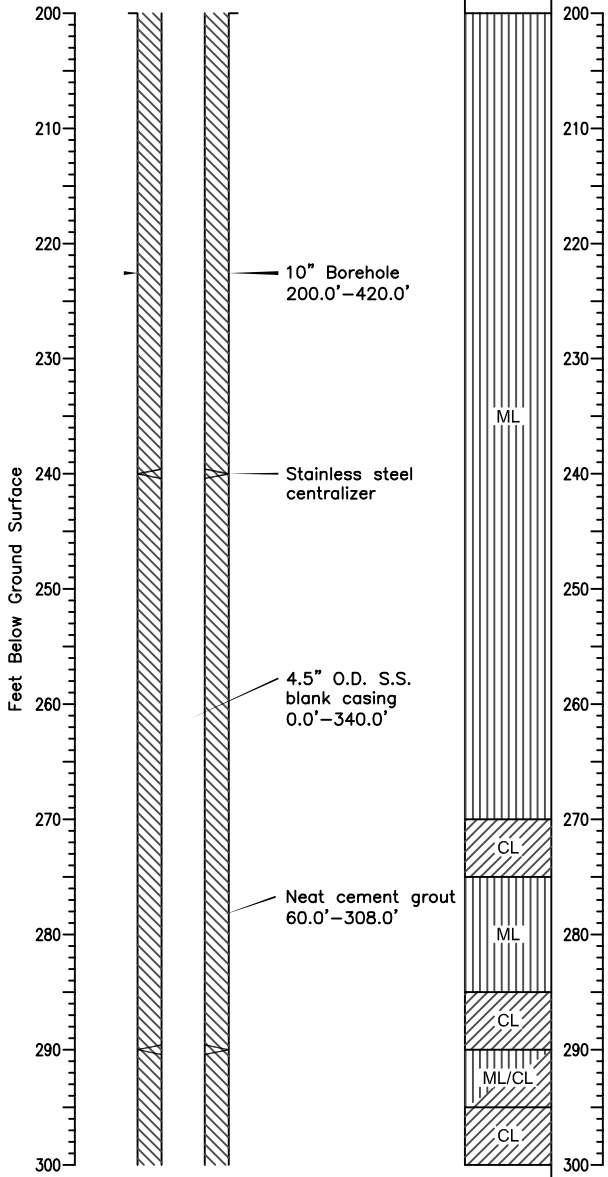

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
ML	60%/85%	200–205	ML	Siltstone, gray (5Y 5/1), same as above.
	90%/100%	205–210	ML	Same as above.
	100%/100%	210–215	ML	Same as above.
	85%/100%	215–220	ML	Same as above.
	100%/100%	220–225	ML	Siltstone, dark gray (5Y 4/1), finely laminated, moderately indurated, slightly moist.
	100%/100%	225–230	ML	Same as above.
	75%/85%	230–235	ML	Same as above.
	90%/90%	235–240	ML	Same as above, lighter color (5Y 5/1).
	25%/75%	240–245	ML	Same as above, highly fractured.
	90%/90%	245–250	ML	Same as above.
	40%/100%	250–255	ML	Same as above, many fractures.
	60%/100%	255–260	ML	Same as above.
	70%/100%	260–265	ML	Same as above.
	80%/100%	265–270	ML	Same as above.
CL	85%/85%	270–275	CL	Similar to above, finer–grained (claystone, some silt).
	100%/100%	275–280	ML	Similar to above, silty, locally cross bedded.
ML	100%/100%	280–285	ML	Siltstone, same as above.
CL	50%/100%	285–290	CL	Silty claystone, similar to above.
ML/CL	50%/100%	290–295	ML/CL	Siltstone and claystone, same as above, fractured.
CL	60%/100%	295–300	CL	Predominantly silty claystone, two prominent, steeply inclined fractures.

Geologist: J. Raucci
Driller: HAZ–Tech
Date completed: 6–30–11

Drilling method: Core, air rotary
Bit diameters: 19" (0'–50'), 12" (50'–200'), 9 7/8" (200'–420')
Sampling device: HQ core, air rotary cuttings (400'–420')
Steel suface casing: 16" steel (0'–50')

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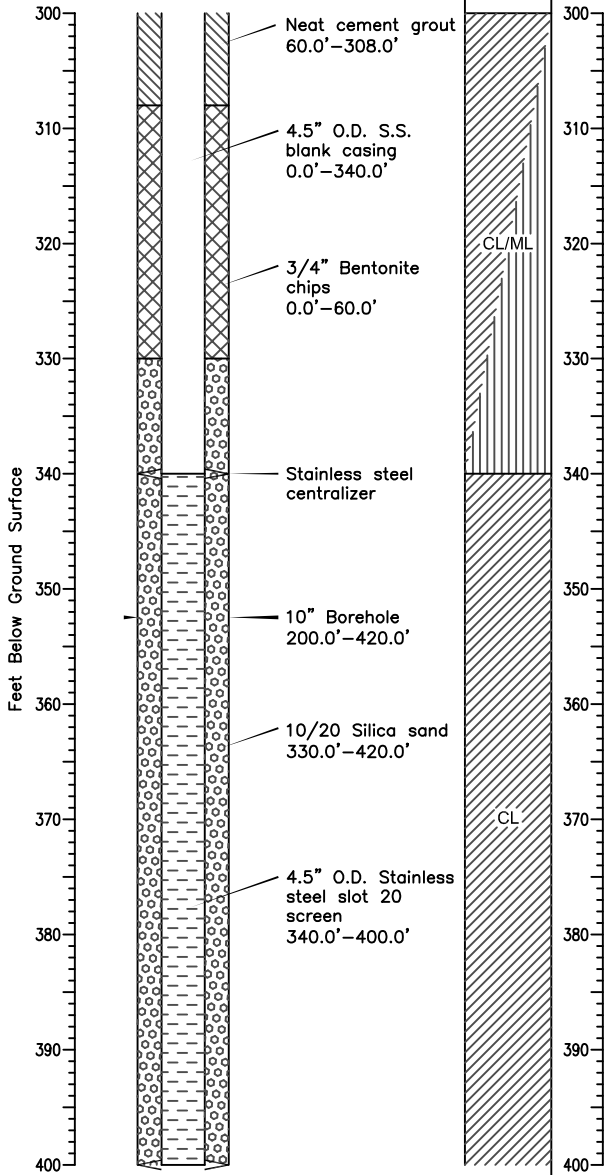

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
100%/100%	300–305	CL/ML	Clay, silty claystone and siltstone, color as above (5YR 4/1–5/1), siltstones are laminated, locally cross bedded, claystone is massive to finely laminated, slightly moist, moderately indurated, brittle to slightly plastic.
100%/100%	305–310	CL–ML	Same as above.
40%/75%	310–315	CL–ML	Same as above.
80%/100%	315–325	CL–ML	Same as above.
100%/100%	325–330	CL–ML	Same as above.
100%/100%	330–335	CL–ML	Same as above.
100%/100%	335–340	CL–ML	Becoming more dominantly claystone and silty claystone.
100%/100%	340–345	CL	Same as above.
90%/90%	345–350	CL	Same as above.
75%/90%	350–355	CL	Claystone, silty claystone and siltstone, gray (5Y 5/1), interbedded, predominantly claystone and silty claystone, slightly moist, slight to moderate plasticity.
100%/100%	355–360	CL	Same as above.
90%/90%	360–365	CL	Same as above.
85%/85%	365–370	CL	Same as above.
95%/95%	370–375	CL	Same as above.
75%/90%	375–380	CL	Same as above.
100%/100%	380–385	CL	Same as above.
80%/80%	385–390	CL	Same as above.
55%/100%	390–395	CL	Same as above.
90%/90%	395–420	CL	Same as above.

Geologist: J. Raucci
Driller: HAZ–Tech
Date completed: 6–30–11

Drilling method: Core, air rotary
Bit diameters: 19" (0'–50'), 12" (50'–200'), 9 7/8" (200'–420')
Sampling device: HQ core, air rotary cuttings (400'–420')
Steel suface casing: 16" steel (0'–50')

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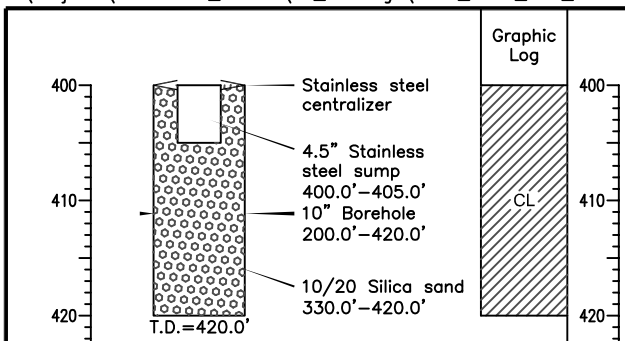

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
CL			CL	Same as above, rotary cuttings.

Geologist: J. Raucci
Driller: HAZ–Tech
Date completed: 6–30–11

Drilling method: Core, air rotary
Bit diameters: 19" (0'–50'), 12" (50'–200'), 9 7/8" (200'–420')
Sampling device: HQ core, air rotary cuttings (400'–420')
Steel suface casing: 16" steel (0'–50')

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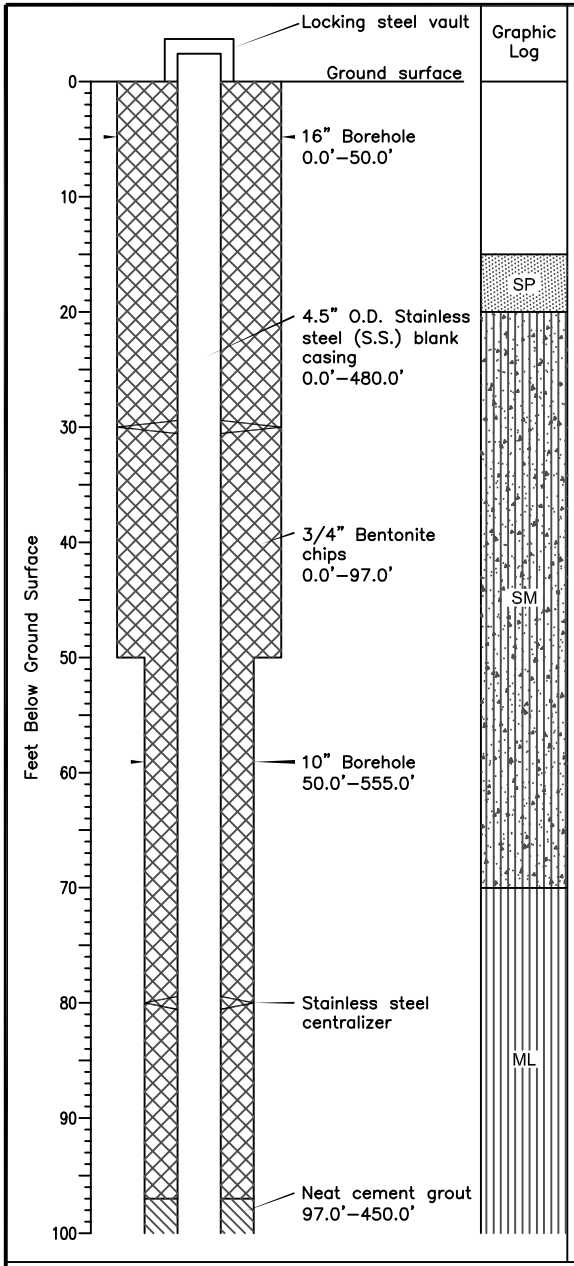

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
0%/0%	0–15		No recovery.
0%/20%	15–20	SP	Sand, olive brown (2.5Y 4/3), coarse–grained, no plasticity.
35%/60%	20–25	SM	Silty sand, olive brown (2.5Y 4/4), fine–grained, no plasticity.
35%/60%	25–30	SM	Same as above.
25%/55%	30–35	SM	Same as above.
25%/55%	35–40	SM	Same as above.
100%/100%	40–45	SM	Silty sand, olive brown (2.5Y 4/3), fine–grained.
100%/100%	45–50	SM	Clayey silty sand, light olive brown (2.5Y 5/4), very low plasticity.
25%/90%	50–60	SM	Silty sand grading into sand, light yellowish brown (2.5Y 6/3), fine– to medium–grained, no plasticity, hard, clayey silty sand, light olive brown (2.5Y 5/3), fine–grained, hard no plasticity.
100%/100%	60–70	SM	Clayey silty sand, light olive brown (2.5Y 5/3), hard no plasticity.
95%/95%	70–80	ML	Sandy silt, light yellowish brown (2.5Y 6/3), no plasticity.
100%/100%	80–90	ML	Clayey sandy silt, grayish brown (2.5YR 5/2).
100%/100%	90–100	ML	Same as above.

Geologist: M. Nauck
Driller: HAZ–Tech
Date completed: 7–15–11

Drilling method: Core, air rotary
Bit diameters: 16" (0'–50'), 9 7/8" (50'–555')
Sampling device: HQ core (0'–350'), air rotary cuttings (350'–555')
Steel suface casing: None

Northing: 667697.966
Easting: 243653.665
Elevation: 2657.2 (TOC)

Note: TOC = top of casing

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Well Log: PB-12

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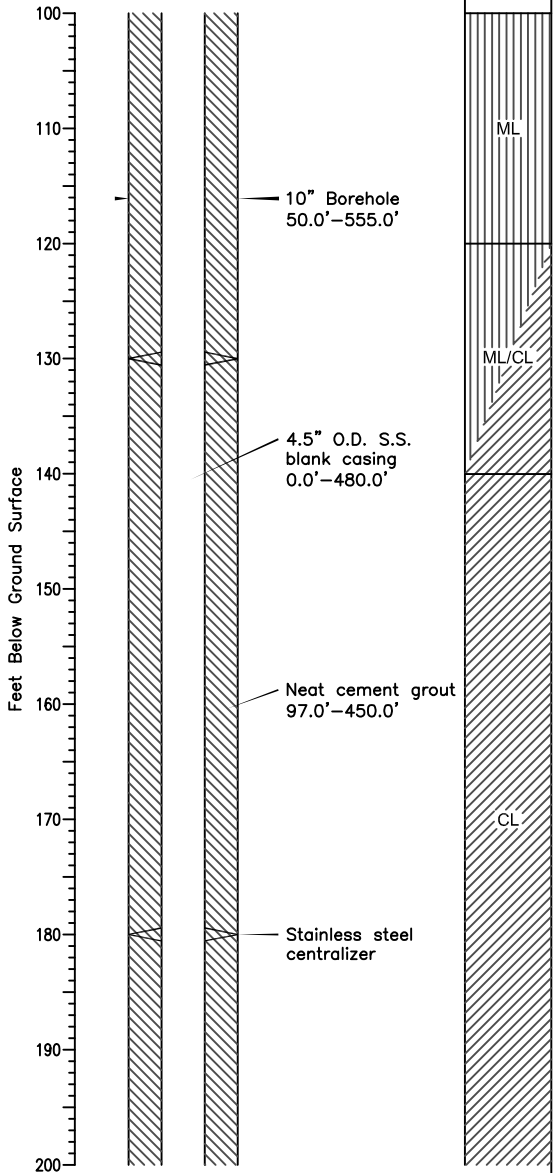

	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
100	35%/48%	100–110	ML	Clayey silt with abrupt transition to clay, light olive brown (2.5Y 5/4), clay has iron and manganese stain.
110	100%/100%	110–120	ML	Same as above with interbedded silty sand.
120	100%/100%	120–130	ML–CL	Silty claystone, gray (5Y 5/4), no plasticity, hard.
130	100%/100%	130–140	ML–CL	Same as above.
140	40%/65%	140–150	CL	Similar to above; claystone, gray (5Y 5/1), no plasticity, hard to brittle.
150	100%/100%	150–160	CL	Same as above.
160	100%/39%	160–170	CL	Same as above.
170	100%/100%	170–180	CL	Same as above.
180	5%/18%	180–190	CL	Same as above with multiple fractures.
190	90%/100%	190–200	CL	Same as above.
200				

Geologist: M. Nauck
Driller: HAZ–Tech
Date completed: 7–15–11

Drilling method: Core, air rotary
Bit diameters: 16" (0'–50'), 9 7/8" (50'–555')
Sampling device: HQ core (0'–350'), air rotary cuttings (350'–555')
Steel suface casing: None

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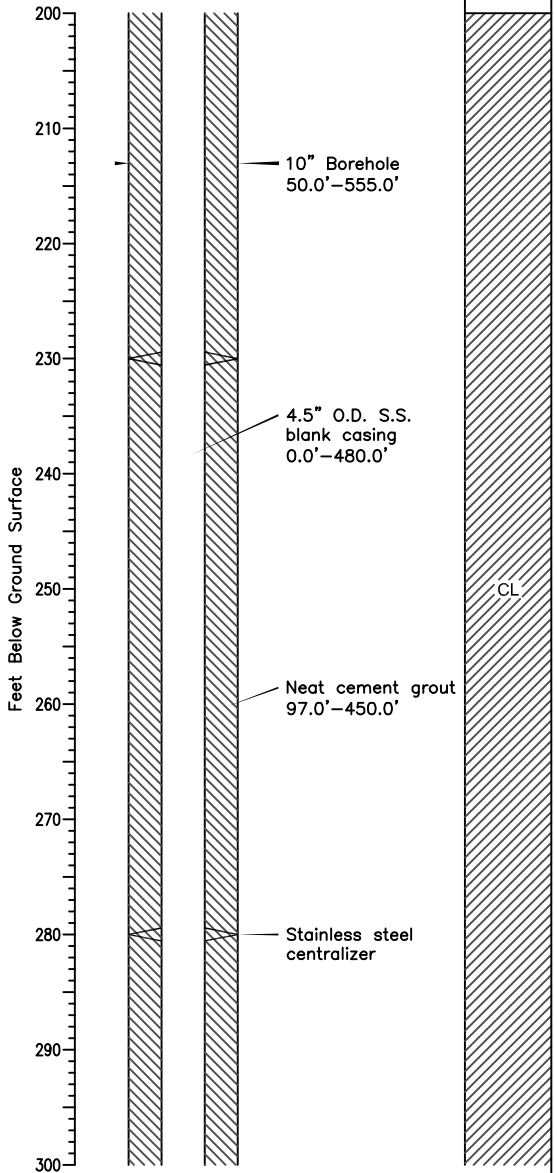

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
	100%/100%	200–210	CL	Same as above.
	85%/89%	210–220	CL	Same as above.
	100%/100%	220–230	CL	Same as above.
	85%/95%	230–240	CL	Same as above, massive, non–fractured.
	75%/75%	240–250	CL	Claystone, gray (5Y 5/1), no plasticity, hard, brittle, slightly moist.
	90%/90%	250–260	CL	Same as above.
	100%/100%	260–270	CL	Same as above.
	100%/100%	270–280	CL	Same as above.
	100%/35%	280–290	CL	Same as above.
	100%/100%	290–300	CL	Same as above.

Geologist: M. Nauck
Driller: HAZ–Tech
Date completed: 7–15–11

Drilling method: Core, air rotary
Bit diameters: 16" (0'–50'), 9 7/8" (50'–555')
Sampling device: HQ core (0'–350'), air rotary cuttings (350'–555')
Steel suface casing: None

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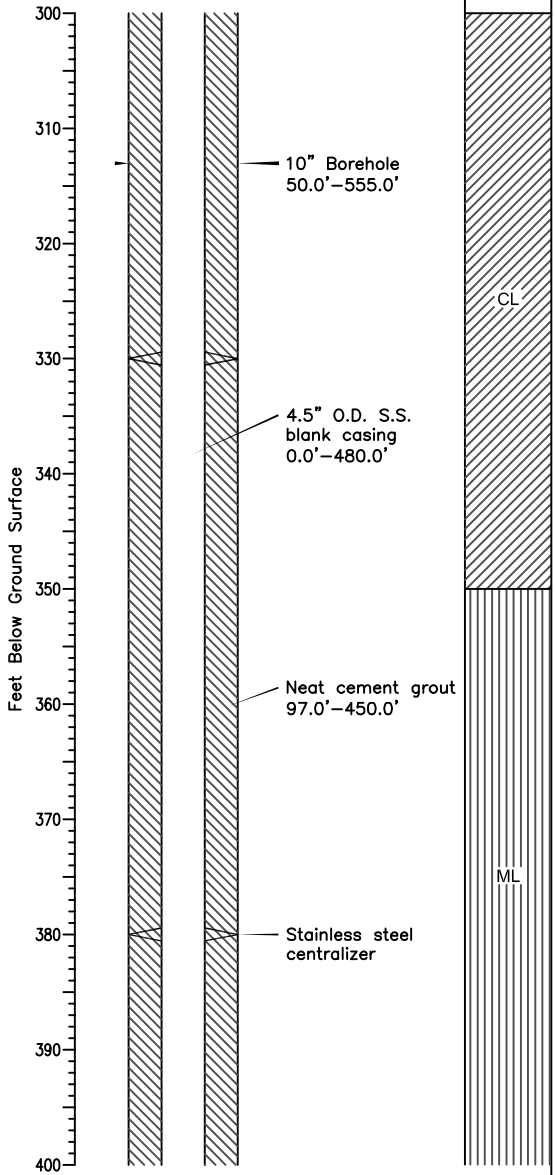

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
CL	100%/100%	300–310	CL	Same as above.
	100%/100%	310–320	CL	Same as above.
	100%/100%	320–330	CL	Same as above.
	100%/100%	330–340	CL	Same as above.
	100%/100%	340–350	CL	Same as above.
ML	NA	350–555	ML	Cuttings not sampled at discrete intervals from 350 feet to 555 feet. Visual inspection indicated predominantly gray silt with varying amounts of clay and sand.

Geologist: M. Nauck
Driller: HAZ–Tech
Date completed: 7–15–11

Drilling method: Core, air rotary
Bit diameters: 16" (0'–50'), 9 7/8" (50'–555')
Sampling device: HQ core (0'–350'), air rotary cuttings (350'–555')
Steel suface casing: None

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Well Log: PB-12

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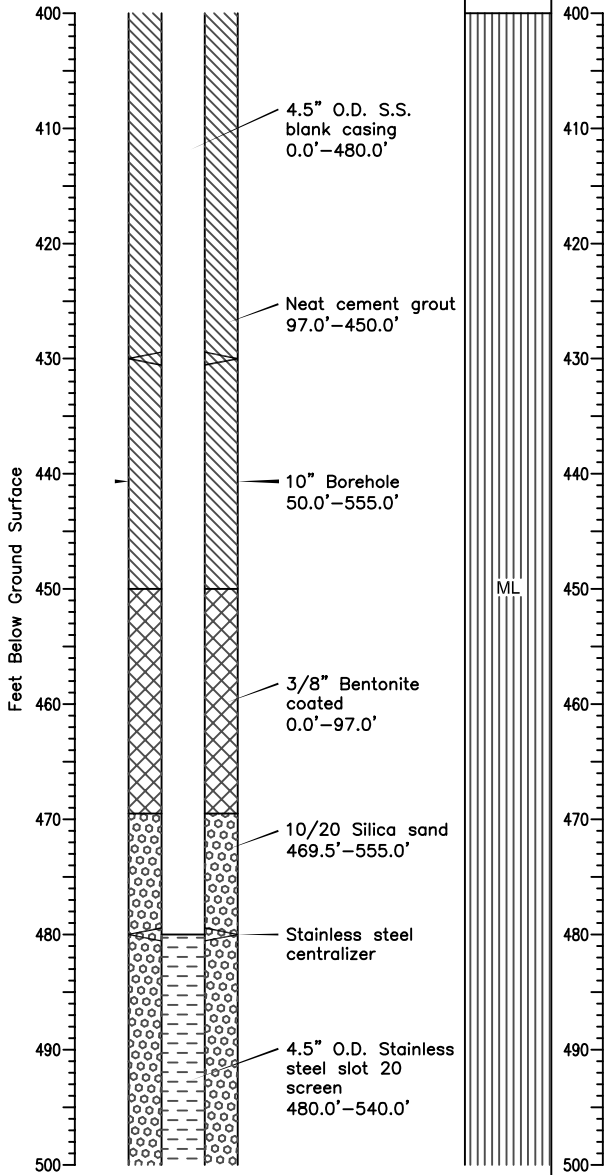

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
NA		ML	Cuttings not sampled at discrete intervals from 350 feet to 555 feet. Visual inspection indicated predominantly gray silt with varying amounts of clay and sand.

Geologist: M. Nauck
Driller: HAZ–Tech
Date completed: 7–15–11

Drilling method: Core, air rotary
Bit diameters: 16" (0'–50'), 9 7/8" (50'–555')
Sampling device: HQ core (0'–350'), air rotary cuttings (350'–555')
Steel suface casing: None

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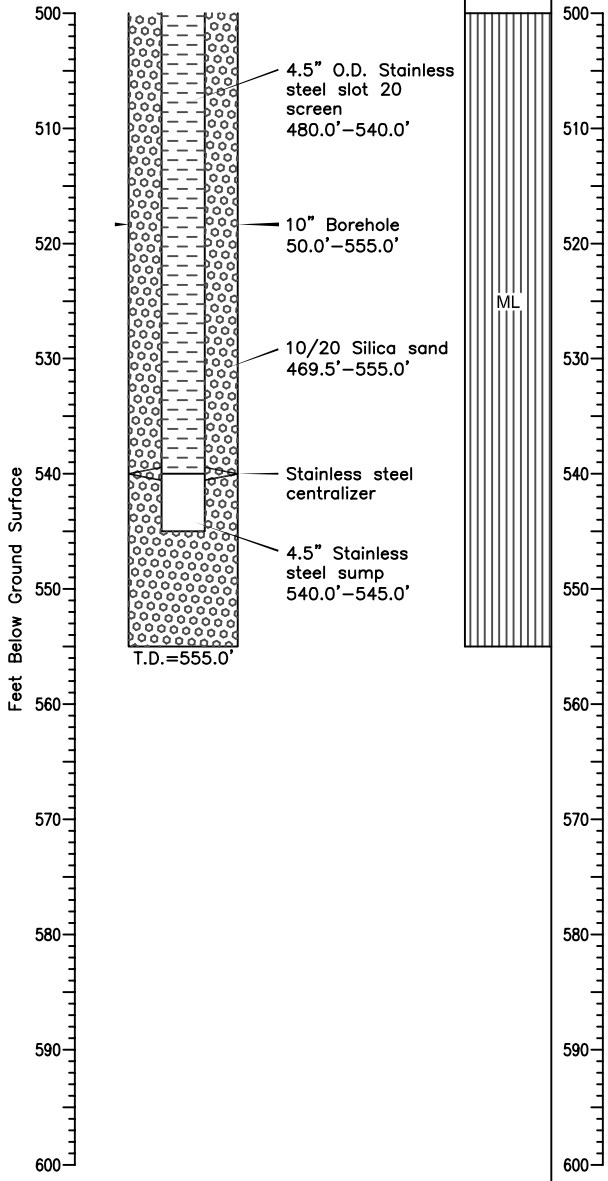

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
ML	NA		ML	Cuttings not sampled at discrete intervals from 350 feet to 555 feet. Visual inspection indicated predominantly gray silt with varying amounts of clay and sand.

Geologist: M. Nauck
Driller: HAZ–Tech
Date completed: 7–15–11

Drilling method: Core, air rotary
Bit diameters: 16" (0'–50'), 9 7/8" (50'–555')
Sampling device: HQ core (0'–350'), air rotary cuttings (350'–555')
Steel suface casing: None

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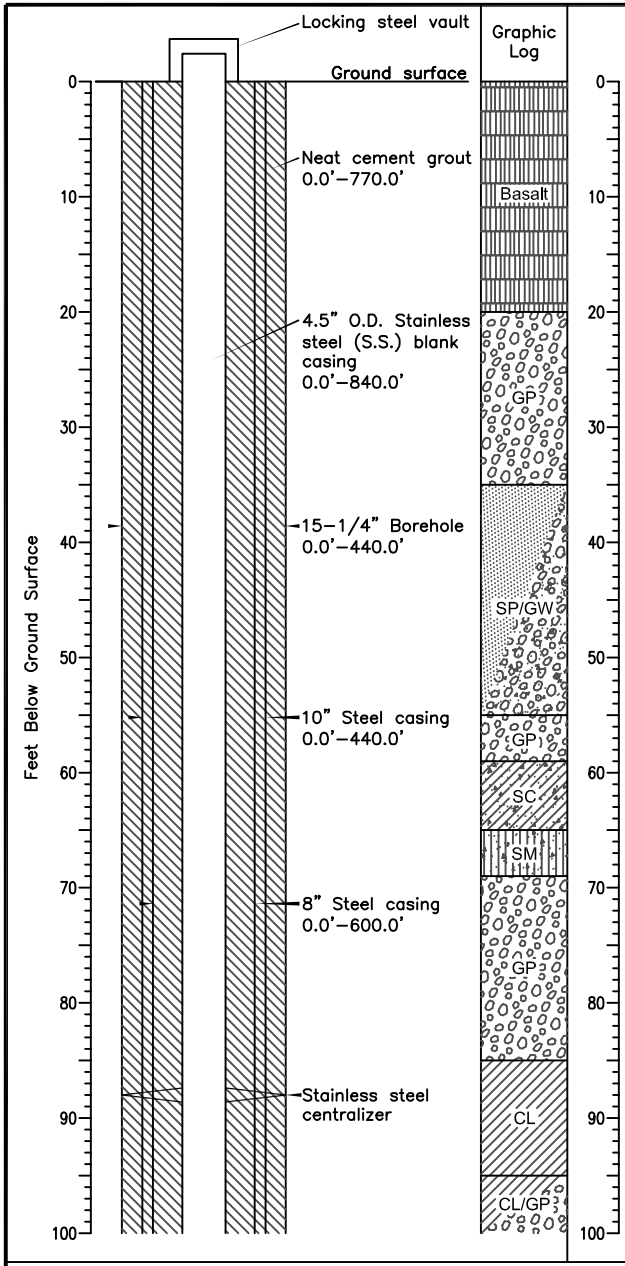

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
90%/95%	0–5		Vesicular basalt, gray (2.5Y 5/1), several fractures near top of core, slightly glassy texture.
100%/100%	5–10		Same as above.
80%/95%	10–15		Same as above with vertical and horizontal fractures.
25%/70%	15–20		Vesicular basalt, gray (2.5Y 5/1), highly fractured.
0%/2%	20–25	GP	Gravel, unconsolidated, well rounded, loose, 1 to 2.5 inches diameter.
0%/10%	25–35	GP	Same as above, 0.25 to 3.0 inches diameter.
0%/0%	35–45	SP/GW	No core recovery. Rotary cuttings indicate predominantly medium– to coarse–grained sand and interbedded gravel.
0%/0%	45–55	SP/GW	No core recovery, same as above.
8%/15%	55–65	GP SC	Gravel, 0.5 to 3.0 inches diameter with abrupt change to clayey silty fine sand, light olive brown (2.5Y 5/3), very fine–grained, well graded, well rounded, moderate plasticity, soft.
0%/23%	65–75	SM	65 to 69 feet silty fine sand, light olive brown (2.5Y 5/3). 69 to 75 feet coarse sandy gravel, polychromic, well rounded, 0.25 to 2.0 inches diameter, loose.
0%/10%	75–85	GP	Greater than 2 inches diameter, loose.
85%/95%	85–95	CL	Claystone to silty claystone, pale olive (5Y 6/3), none to medium plasticity, hard to stiff, dry, transition to very well consolidated to well consolidated.
55%/55%	95–105	CL/GP	Silty claystone, light yellowish brown (2.5Y), medium plasticity, medium density, slightly moist, some ferric like staining. Gravel lenses noted at 95 to 100 feet in rotary cuttings.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech
Date completed: 12–15–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Northing: 666231.696
Easting: 243986.781
Elevation: 3073.9 (TOC)
Notes: HAZ–Tech core drilling 0'–666'; Adamson Pump and Drill air rotary drilling 666'–920'
TOC = top of casing

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Well Log: PB-13

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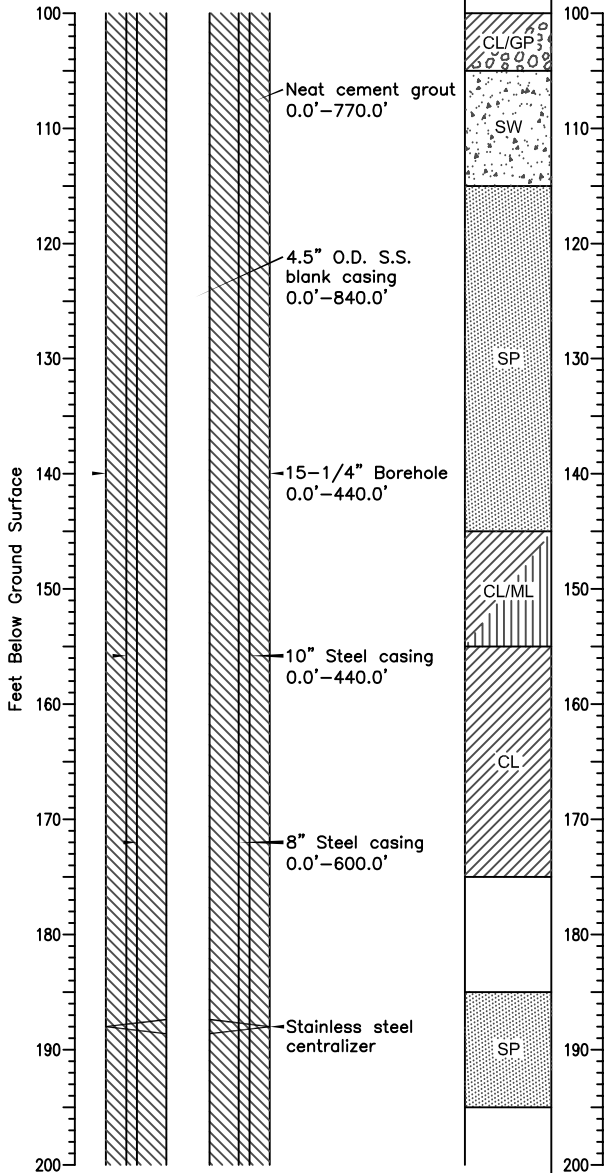

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
0%/12%	105–115	SW	Sand, grayish brown (2.5Y 5/2), medium– to fine–grained, subrounded, poorly sorted, no plasticity, soft, wet (drilling fluid).
0%/0%	115–125	SP	No core recovery. Rotary cuttings predominantly loose, medium–grained sand with few fines.
0%/0%	125–135	SP	No core recovery, same as above.
0%/0%	135–145	SP	No core recovery, same as above.
12%/25%	145–155	CL–ML	Silty claystone to claystone, light brownish gray (2.5Y 6/2), stiff/brittle, dry.
15%/22%	155–165	CL	Claystone, light brownish gray (2.5Y 6/2), stiff, dry.
15%/20%	165–175	CL	Same as above.
0%/0%	175–180		No recovery.
0%/18%	185–195	SP	Fine to medium sand, olive gray (5Y 5/2), poorly graded, loose, wet.
0%/0%	195–205		No recovery.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech
Date completed: 12–15–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Note: HAZ–Tech core drilling 0'–666';
Adamson Pump and Drill air rotary drilling
666'–920'

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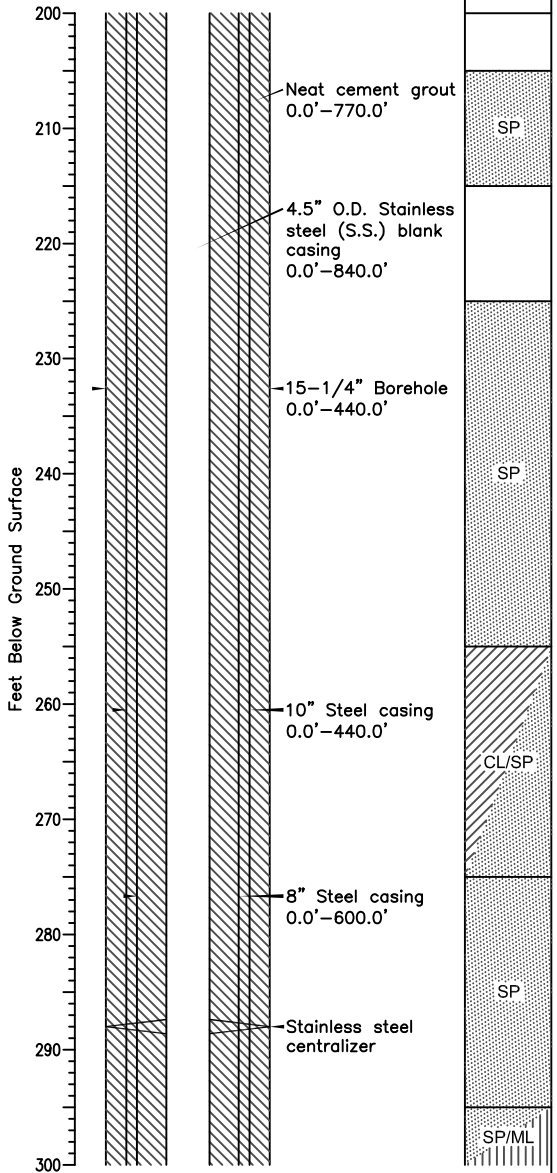

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
SP	0%/20%	205–215	SP	Sand, olive brown (2YR 4/3), medium–grained, well sorted, loose, wet.
	0%/0%	215–225		No recovery.
	0%/15%	225–235	SP	Same as above.
	0%/15%	235–245	SP	Same as above.
	0%/35%	245–255	SP	Sand, same as above, color (2.5Y 4/2), then 3 inches of claystone, light yellowish brown (2.5Y 6/2), slight plasticity, slightly moist.
CL/SP	35%/90%	255–265	CL–SP	Interbedded brown sand, same as above, with light yellowish brown claystone, some oxidation color banding.
	30%/80%	265–275	CL–SP	Same as above, predominantly sand with sandy claystone interbeds.
SP	50%/100%	275–285	SP	Sand, light yellowish brown (2.5Y 6/3), fine–grained, well sorted, micaceous, claystone interbeds, moderately compact, slightly moist.
	45%/95%	285–295	SP	Sand, grayish brown (7.5Y 5/3) medium–grained, well sorted with uncommon silty and clayey interbeds, 1 to 2 centimeters thick, loose to weakly cemented, moist, prominent oxidation color banding.
SP/ML	40%/90%	295–305	SP–ML	Similar to above, grayish brown sand interbedded with lighter colored silty fine sand and sandy clay, loose to weakly cemented.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech
Date completed: 12–15–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Note: HAZ–Tech core drilling 0'–666';
Adamson Pump and Drill air rotary drilling
666'–920'

PICKLES BUTTE
Well Log: PB-13

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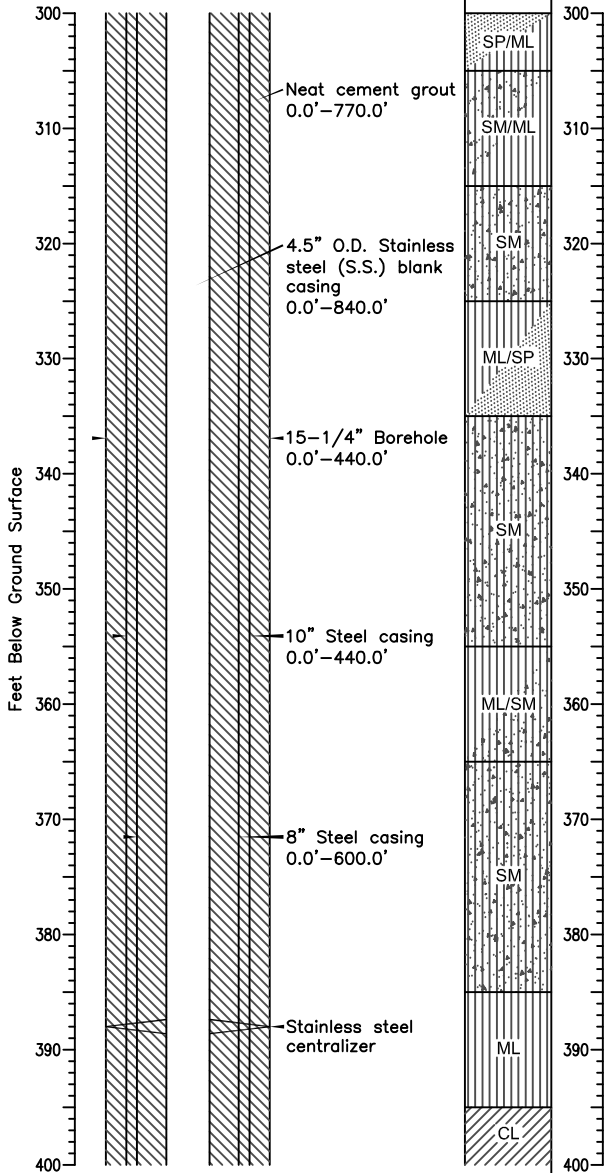

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
50%/85%	305–315	SM–ML	Sandy silt and silty sand, light yellowish brown (2.5Y 6/3–6/4), fine–grained, weakly cemented, brittle, moist, interbedded with olive brown sand, similar to above.
70%/100%	315–325	SM	Similar to above, but also several thin layers (5 to 10 centimeters) very hard fine sandstone, pale yellow (5Y 8/2), prominent oxidation color sanding, hard rock is dry.
50%/100%	325–335	ML–SP	Sandy siltstone, pale yellow (2.5Y 7/4), hard, dry, interbedded with light olive brown loose sand, similar to above.
0%/90%	335–345	SM	Silty sandstone and sandy siltstone, light yellow brown (2.5Y 6/4), generally weakly cemented with loose and very hard layers, oxidation staining especially in very hard layers.
60%/90%	345–355	SM	Same as above, color mottled with olive yellow (2.5Y 6/6), massive to finely laminated, dry to slightly moist.
40%/90%	355–365	ML–SM	Siltstone, sandy siltstone and very fine sandstone, pale yellow (2.5Y 7/4) to light olive brown (2.5Y 6/3), weakly to moderately cemented, laminated, local oxidation staining, dry to slightly moist.
50%/90%	365–375	SM	Interbedded silty fine sandstone, and siltstone, same as above, with olive brown, fine– to medium–grained sandstone, weakly cemented, slightly moist.
40%/75%	375–380	SM	Sandstone, light olive brown, fine–grained, similar to above, finely laminated, cross–bedded, claystone 384 to 385 feet, slightly moist.
25%/75%	385–395	ML	Similar to above, sandy siltstone and very fine–grained silty sandstone, local oxidation staining, highly fractured, slightly moist.
0%/15%	395–405	CL	Sandy claystone and siltstone, color same as above.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech
Date completed: 12–15–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Note: HAZ–Tech core drilling 0'–666';
Adamson Pump and Drill air rotary drilling
666'–920'

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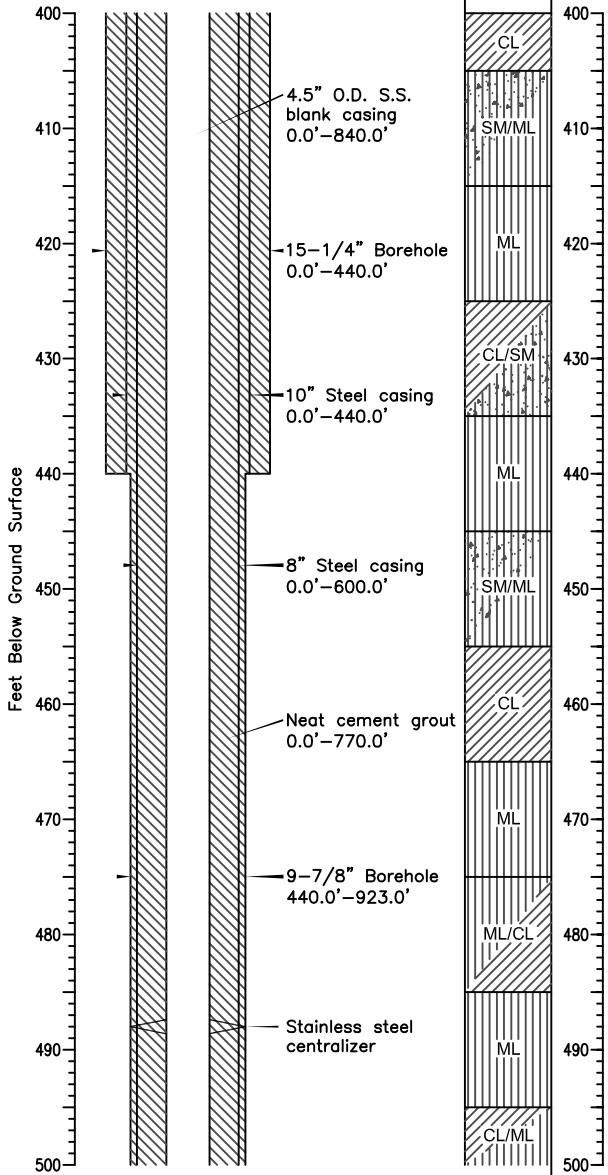

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
CL	20%/70%	405–415	SM–ML	Sandy siltstone and sandstone, light olive brown, finely laminated, cross–bedded, very fine–grained local oxidation staining, slightly moist.
SM/ML	0%/15%	415–425	ML	Silty claystone and siltstone, light yellowish brown to pale olive.
ML	60%/80%	425–435	CL–SM	Similar to above, light olive brown fine–grained sediments, some organic material, slightly moist, laminated, weakly to moderately cemented.
CL/SM	75%/85%	435–445	ML	Same as above, dominantly sandy silt, clayey fine sand, color same as above.
ML	15%/50%	445–455	SM–ML	Same as above, a bit more sand.
SM/ML	20%/50%	455–465	CL	Silty claystone, olive gray (5Y 5/2), massive, micaceous, brittle, very slightly moist.
CL	30%/90%	465–475	ML	Similar to above, siltier (clayey siltstone), sub–vertical fractures 460 to 465 feet.
ML	40%/100%	475–485	ML–CL	Same as above, color pale olive (5Y 6/3).
ML/CL	100%/100%	485–495	ML	Same as above, clayey siltstone, pale olive, some oxidation staining, few fractures.
ML	100%/100%	495–505	CL–ML	Siltstone and claystone with minor very fine sandstone, light olive gray (5Y 6/2), micaceous, dry to slightly moist, indurated, oxidation staining along bedding.
CL/ML				

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech
Date completed: 12–15–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Note: HAZ–Tech core drilling 0'–666';
Adamson Pump and Drill air rotary drilling
666'–920'

PICKLES BUTTE
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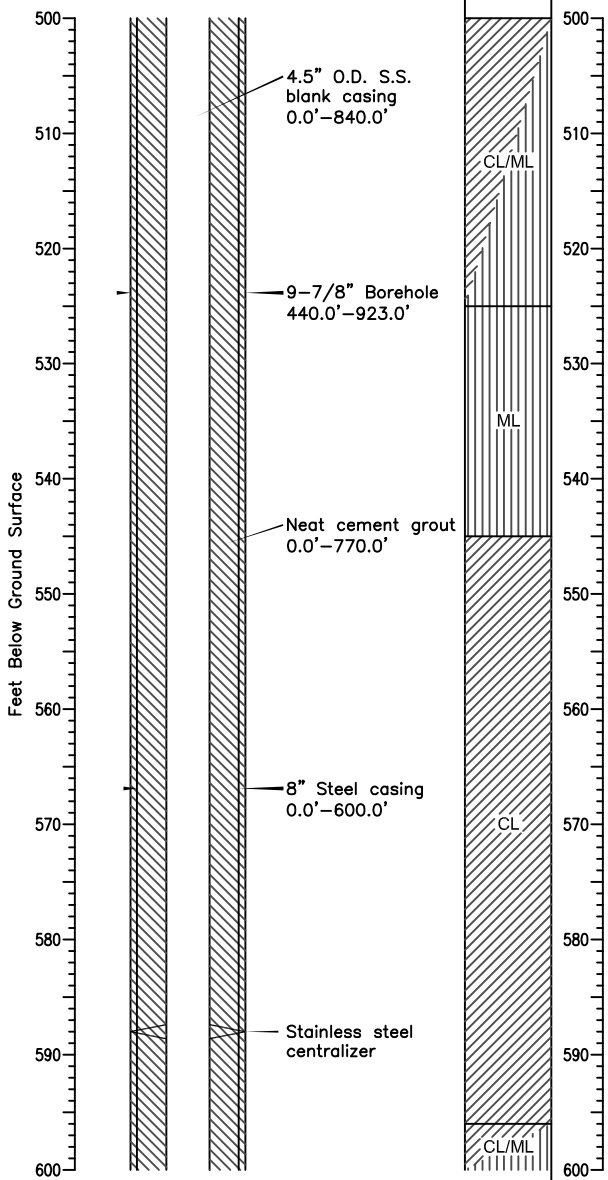

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
80%/100%	505–515	CL–ML	Same as above, silty clay and clayey silt, abundant organic material and oxidation staining.
0%/100%	515–525	CL–ML	Same as above.
80%/100%	525–535	ML	Similar to above, less muddy, siltstone and silty very fine sandstone with claystone, olive (5Y 5/3), sandy layers are laminated, cross–bedded.
0%/100%	535–545	ML	Predominantly fine–grained silt, sandstone and clayey siltstone.
100%/100%	545–555	CL	Silty claystone, pale olive to olive gray, weakly cemented to 553 feet, then clayey siltstone, gray (5Y 5/1), dense, finely laminated, slightly moist. Contact with "blue clay" unit at 552.5 feet.
not recorded	555–565	CL	Silty claystone with minor sand, gray (5Y 5/1), massive to laminated, fine–grained, weakly to moderately cemented, dense, very slightly moist.
40%/100%	565–576	CL	Silty claystone, dark greenish gray (Gley1 4/1), hard, brittle, numerous fractures.
70%/100%	576–586	CL	Same as above.
85%/100%	586–596	CL	Silty claystone, dark greenish gray (Gley1 4/1), slight plasticity, brittle, slightly moist, micaceous.
80%/100%	596–606	CL–ML	Same as above, a bit siltier, greenish gray (Gley1 5/1), interbedded with hard micaceous siltstone.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech
Date completed: 12–15–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Note: HAZ–Tech core drilling 0'–666';
Adamson Pump and Drill air rotary drilling
666'–920'

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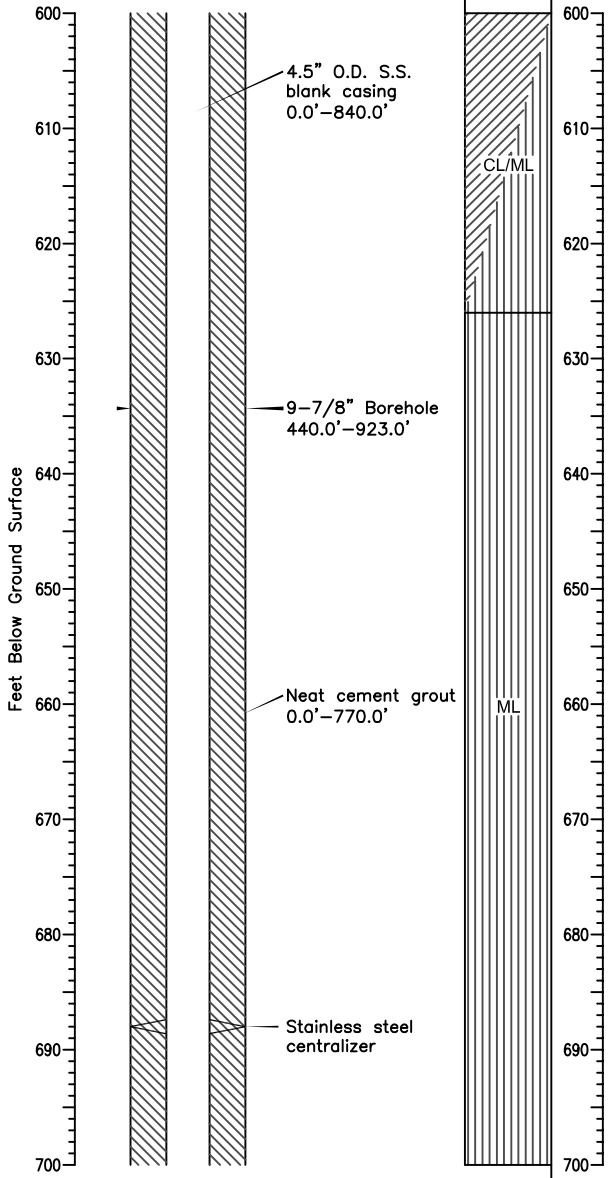

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
100%/100%	606–616	CL–ML	Same as above. Large steeply dipping fracture at 5 feet.
100%/100%	616–626	CL–ML	Siltstone and interbedded claystone, greenish gray (Gley1 5/10Y–5/N), micaceous, harder than above, (claystone is soft).
100%/100%	626–636	ML	Same as above, predominantly siltstone.
100%/100%	636–646	ML	Siltstone with minor sand and mud, dark greenish gray (Gley1 4/1–10/Y), laminated, fine–grained, hard, slightly moist.
80%/90%	646–656	ML	Same as above.
40%/40%	656–666	ML	Same as above.
	666–923	ML	Cuttings not sampled at discrete intervals from 666 feet to 923 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech
Date completed: 12–15–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Note: HAZ–Tech core drilling 0'–666';
Adamson Pump and Drill air rotary drilling 666'–920'

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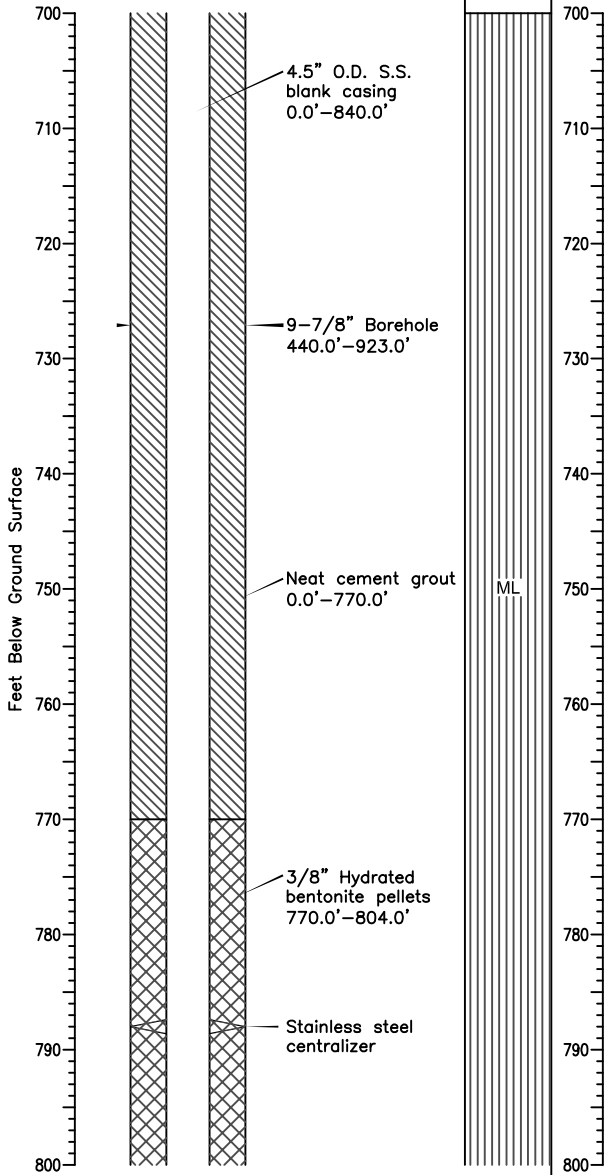

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
ML			ML	Cuttings not sampled at discrete intervals from 666 feet to 923 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: M. Nauck/J. Raucci
Driller: HAZ-Tech
Date completed: 12-15-11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Note: HAZ-Tech core drilling 0'–666';
Adamson Pump and Drill air rotary drilling 666'–920'

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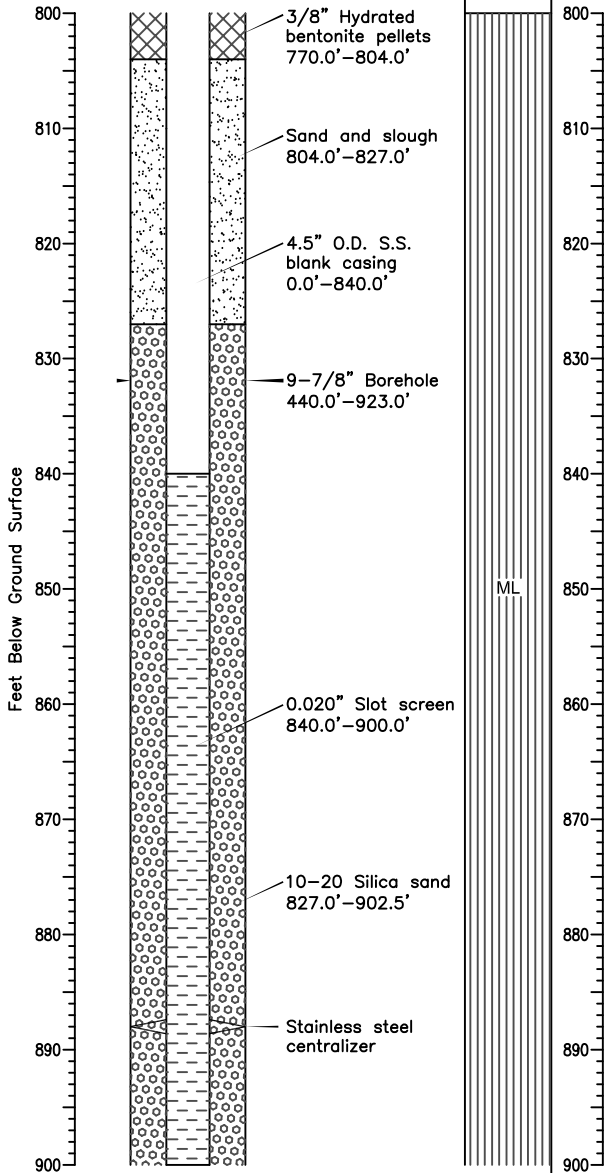

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
		ML	Cuttings not sampled at discrete intervals from 666 feet to 923 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech
Date completed: 12–15–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'–440'), 9 7/8" (440'–923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'–600'), 10" (0'–440')

Note: HAZ–Tech core drilling 0'–666';
Adamson Pump and Drill air rotary drilling 666'–920'

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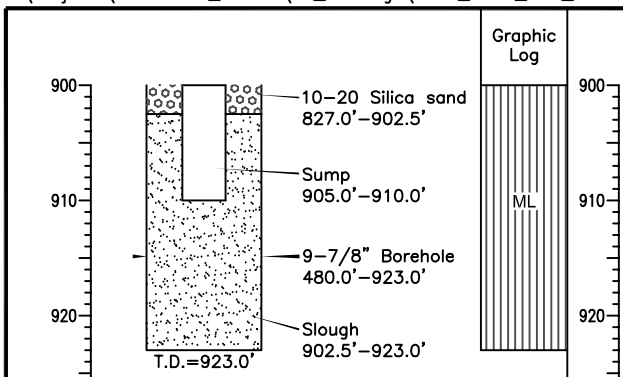

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
		ML	Cuttings not sampled at discrete intervals from 666 feet to 923 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: M. Nauck/J. Raucci
Driller: HAZ-Tech
Date completed: 12-15-11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15 1/4" (0'-440'), 9 7/8" (440'-923')
Sampling device: HQ core, air rotary cuttings
Steel suface casing: 8" (0'-600'), 10" (0'-440')

Note: HAZ-Tech core drilling 0'-666';
Adamson Pump and Drill air rotary drilling
666'-920'

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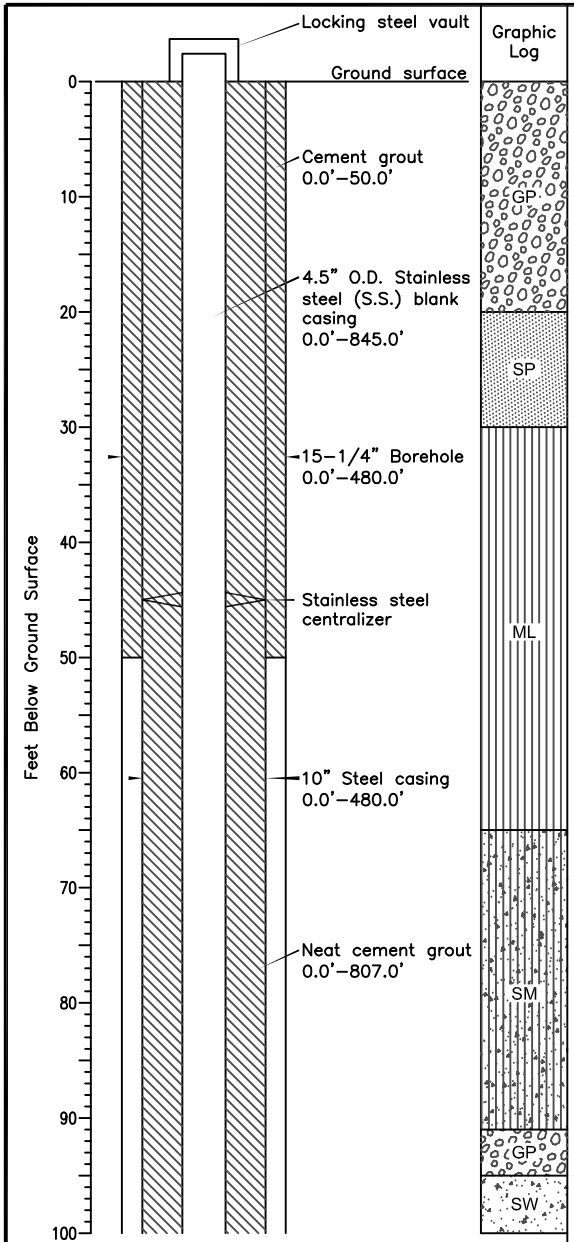

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
0%/0%	0–10	GP	No core recovery. 0 to 30 feet description based on rotary cuttings unconsolidated gravel, meterolithic clasts up to 3 inches, rounded, coarse–grained, poorly sorted, sand matrix.
	10–20	GP	Same as above.
	20–30	SP	Sand, medium– to coarse–grained, moderately well sorted, loose.
80%/80%	30–35	ML	Silstone, light brownish gray (2.5Y 6/2), weakly cemented.
85%/85%	35–40	ML	Siltstone–sandy siltstone, light brownish gray (2.5Y 6/2), weakly cemented.
85%/85%	40–45	ML	Siltstone–clayey siltstone, pale yellow (2.5Y 7/3), weakly cemented.
45%/75%	45–50	ML	Sandy silstone, light yellowish brown (2.5Y 6/3), very weakly cemented, highly fractured, oxidation staining.
60%/75%	50–55	ML	Same as above.
25%/40%	55–60	ML	Same as above, fine–grained.
50%/95%	60–65	ML	Same as above, fine–grained, highly fractured.
35%/35%	65–75	SM	Silty sandstone, light yellowish brown (2.5Y 5/4), laminated, fine– to medium–grained, weakly cemented.
25%/30%	75–85	SM	Same as above, light olive brown (2.5Y 5/4).
19%/19%	85–91	SM	Same as above with coarse–grained sand in drilling fluid matrix.
	91–95	GP	Rotary cuttings indicate gravel layer at 91 to 95 feet.
60%/99%	95–100	SW	Sand, pale yellow (2.5Y 8/3), coarse–grained, subrounded, loose, wet.
60%/99%	100–105	SM	Silty sandstone, pale yellow (2.5Y 8/3), fine–grained, weakly cemented.

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"
Note: TOC = top of casing

Northing: 665549.182
Easting: 244947.947
Elevation: 3080.9 (TOC)
Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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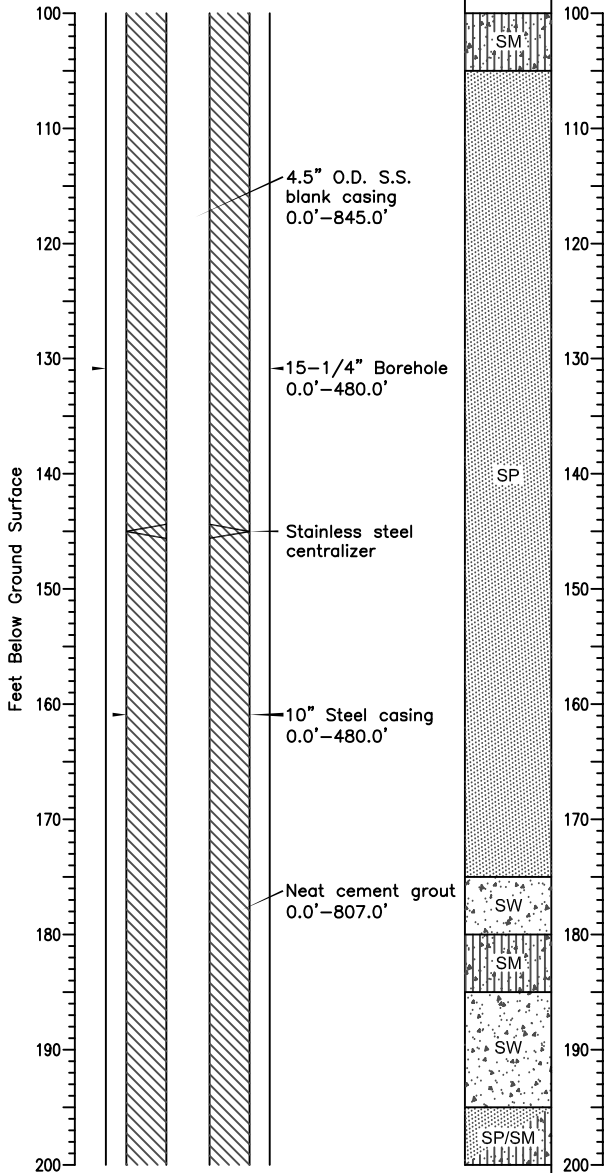

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
0%/0%	105–115	SP	No core recovery 105 feet to 175 feet, rotary cuttings indicate dominantly medium sand, moderately well sorted, unconsolidated.
0%/0%	115–125	SP	Same as above.
0%/0%	125–175	SP	Same as above to 175 feet (rotary cuttings).
0%/50%	175–180	SW	Sand, dark yellowish brown (10YR 4/4), coarse–grained, non–plastic, loose, wet.
0%/50%	180–185	SM	Silty sand, light yellowish brown (2.5Y 6/4), fine–grained, low plasticity, loose, wet.
30%/40%	185–195	SW	Sandstone, dark grayish brown (2.5Y 5/2), coarse–grained, subrounded, weakly cemented, vertical fractures.
35%/35%	195–205	SP–SM	Sandstone grading to silty sandstone, olive brown (2.5Y 4/3), coarse– to fine–grained, weakly cemented.

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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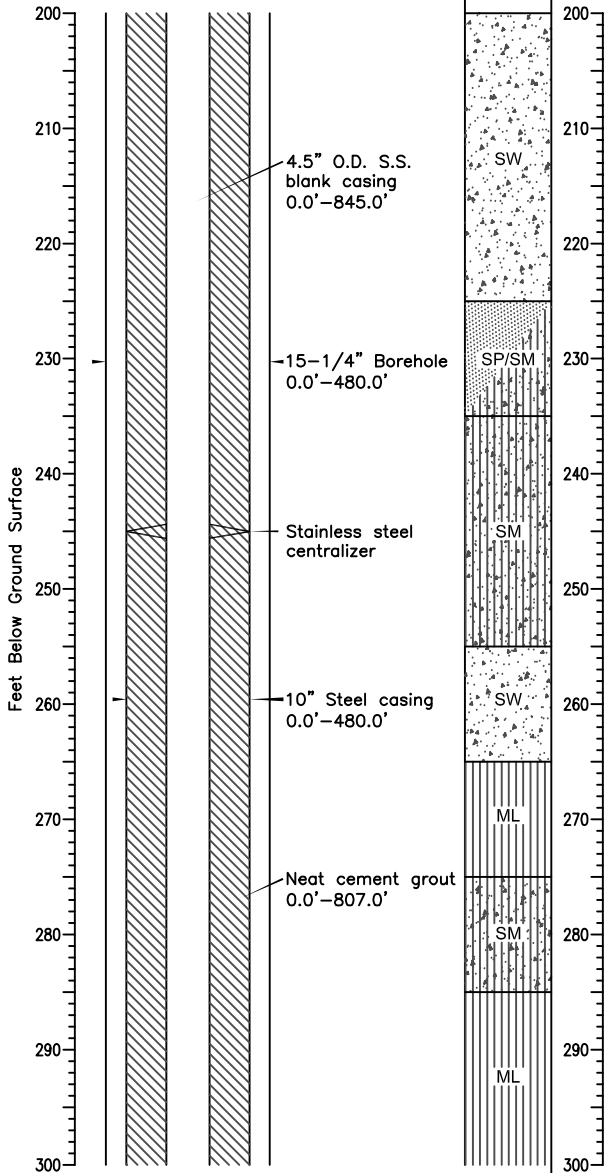

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
SW	0%/48%	205–215	SW	Sand, dark yellowish brown (10YR 4/4), coarse–grained, non–plastic, loose, wet.
	0%/48%	215–225	SW	Same as above.
SP/SM	0%/48%	225–235	SP–SM	Loose sand graiding to silty sandstone, light yellowish brown (2.5Y 6/3), fine–grained, weakly cemented.
	0%/48%	235–245	SM	Silty sandstone, light yellowish brown (2.5Y 6/3), fine– to medium–grained, weakly cemented, fractured.
SM	0%/48%	245–255	SM	Same as above with iron staining.
	0%/48%	255–265	SW	Sandstone, light olive brown (2.5Y 5/3), laminated, coarse–grained, very weakly cemented, iron staining.
SW				
	0%/48%	265–275	ML	Sandy clayey silt, light yellowish brown (2.5Y 6/3), low plasticity, soft, damp.
ML				
	0%/48%	275–285	SM	Silty sandstone, light yellowish brown (2.5Y 6/3), iron stained banding, fine–grained, weakly cemented.
SM				
	0%/48%	285–295	ML	Sandy siltstone, light yellowish brown (2.5Y 6/3), fine–grained, weakly cemented, fractured.
ML				
	0%/48%	295–305	ML	Same as above, light olive brown (2.5Y 5/3).

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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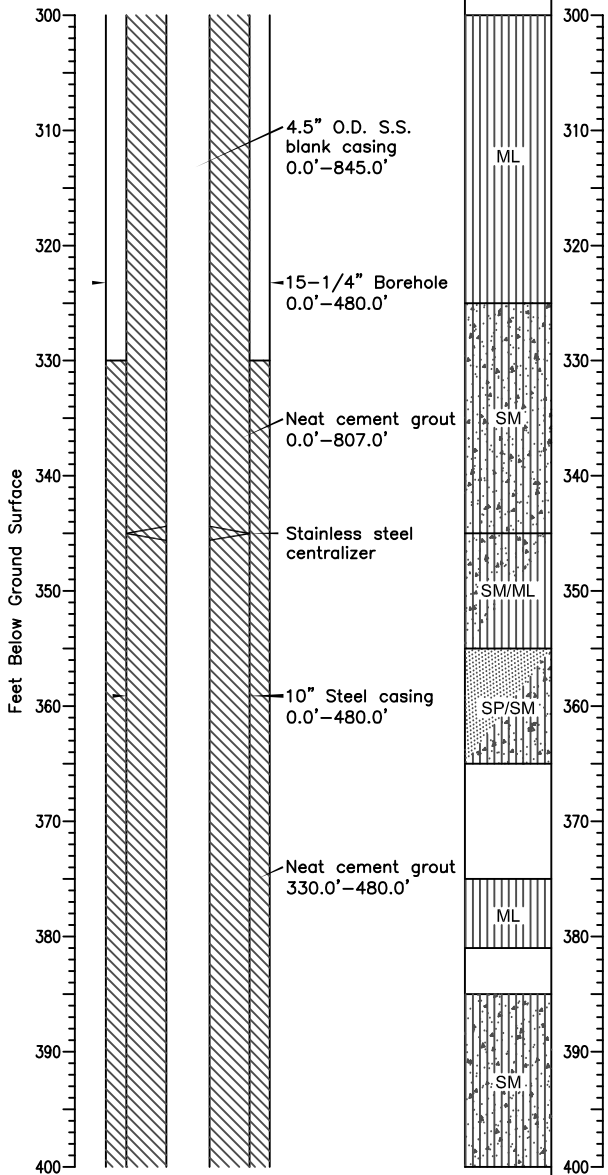

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
100%/100%	305–315	ML	Same as above.
100%/100%	315–325	ML	Same as above, light olive brown (2.5Y 6/2).
100%/100%	325–335	SM	Silty sandstone, light olive brown (2.5Y 5/3), fine–grained, moderatedly cemented.
100%/100%	335–345	SM	Silty sandstone, pale yellow (2.5Y 7/3), fine–grained, weakly cemented dry.
85%/95%	345–355	SM–ML	Same as above grading into siltstone, light yellowish brown (2.5Y 6/3), weakly cemented.
45%/88%	355–365	SP–SM	Same as above, with loose medium–grained sand.
0%/0%	365–375		No recovery.
95%/95%	375–381	ML	Siltstone, plae yellow (2.5Y 7/3), weakly cemented, dry.
0%/0%	381–385		No recovery.
NA	385–395	SM	Clayey silty sand, light yellowish brown (2.5Y 6/3), fine– to medium–grained, moderately sorted, moderate plasticity, soft (cuttings from mud rotary).
NA	395–405	SM	As above, more sand than fines (cuttings from mud rotary).

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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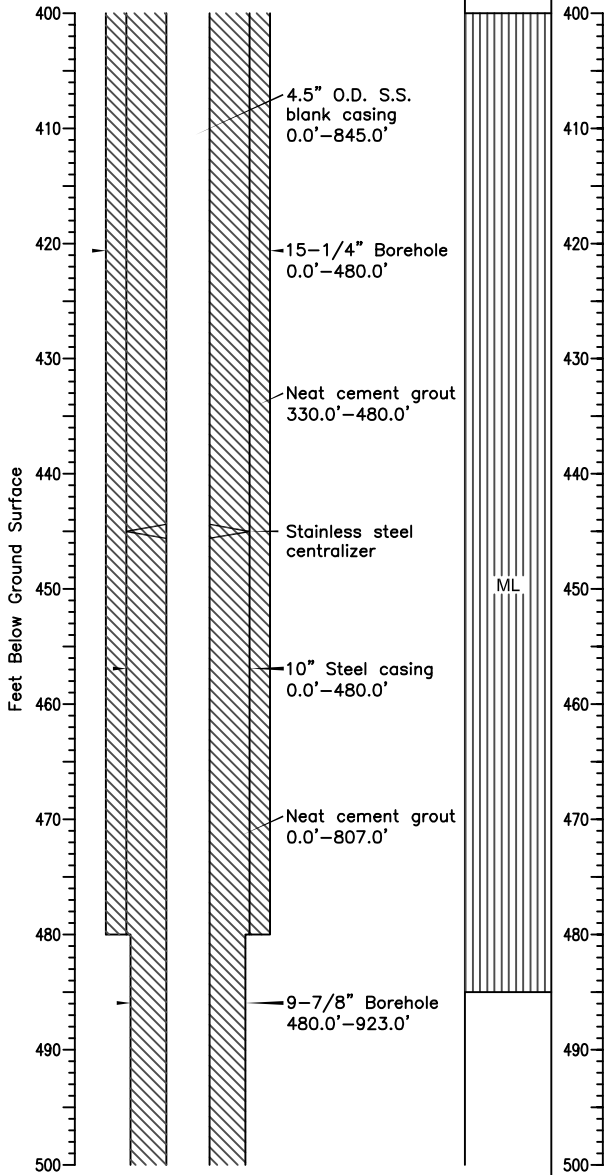

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
NA	405–415	ML	Same as above, clayey silt with sand, more fines than sand (cuttings from mud rotary).
NA	415–425	ML	Same as above (cuttings from mud rotary).
NA	425–435	ML	Same as above (cuttings from mud rotary).
NA	435–445	ML	Same as above, few cutting returns (cuttings from mud rotary).
NA	445–455	ML	Same as above (cuttings from mud rotary).
NA	455–465	ML	Same as above (cuttings from mud rotary).
NA	465–475	ML	Same as above (cuttings from mud rotary).
NA	475–485	ML	Same as above (cuttings from mud rotary).
NA	485–520		No cuttings return.

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

PICKLES BUTTE
Well Log: PB-14

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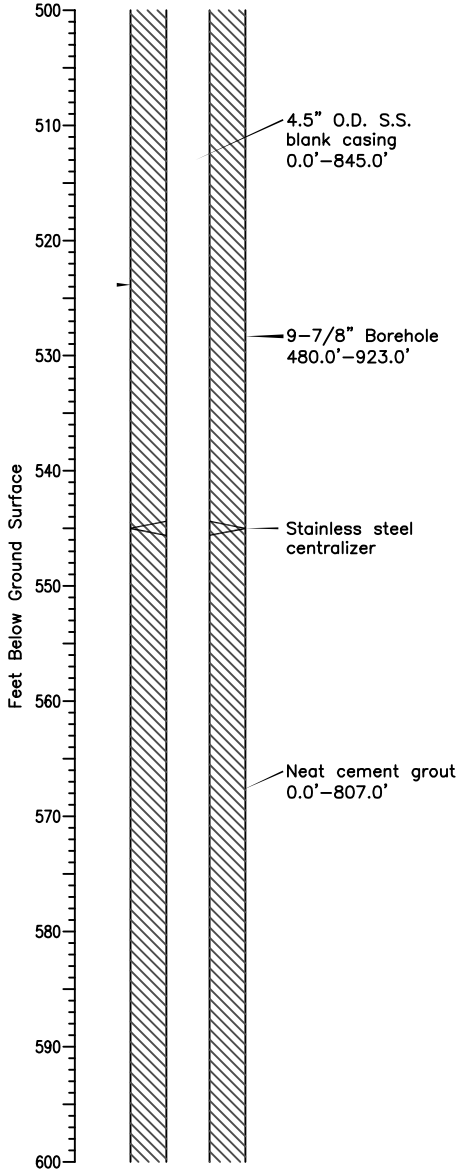

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
	NA			No cuttings return.
	70%/77%	520–525	CL	Silty claystone, olive gray (5Y 3/2), weakly cemented.
	96%/96%	525–530	CL	Same as above.
	90%/90%	530–540	CL	Silty sandy claystone, dark olive gray (5Y 3/2), fine–grained, weakly cemented, moist.
	90%/95%	540–550	CL	Same as above, with dark gray mottling, moderately cemented, few fractures.
	95%/95%	550–560	CL	Same as above.
CL	95%/95%	560–570	CL	Same as above.
	70%/95%	570–580	CL	Sandy silty claystone, light yellowish brown (7.5Y 6/3), very fine–grained, weakly cemented, slight to moderate plastice when wet.
	82%/82%	580–590	CL	Same as above, some fractures.
	70%/90%	590–595	CL	Sandy silty claystone, dark greenish brown (2.5Y 4/2), very fine–grained, weakly cemented, dry to damp.
	0%/37%	595–605	CL	Sandy silty claystone, greenish gray (Gley1 5/1), very fine–grained, slight plasticity, moderately cemented, brittle, dry.

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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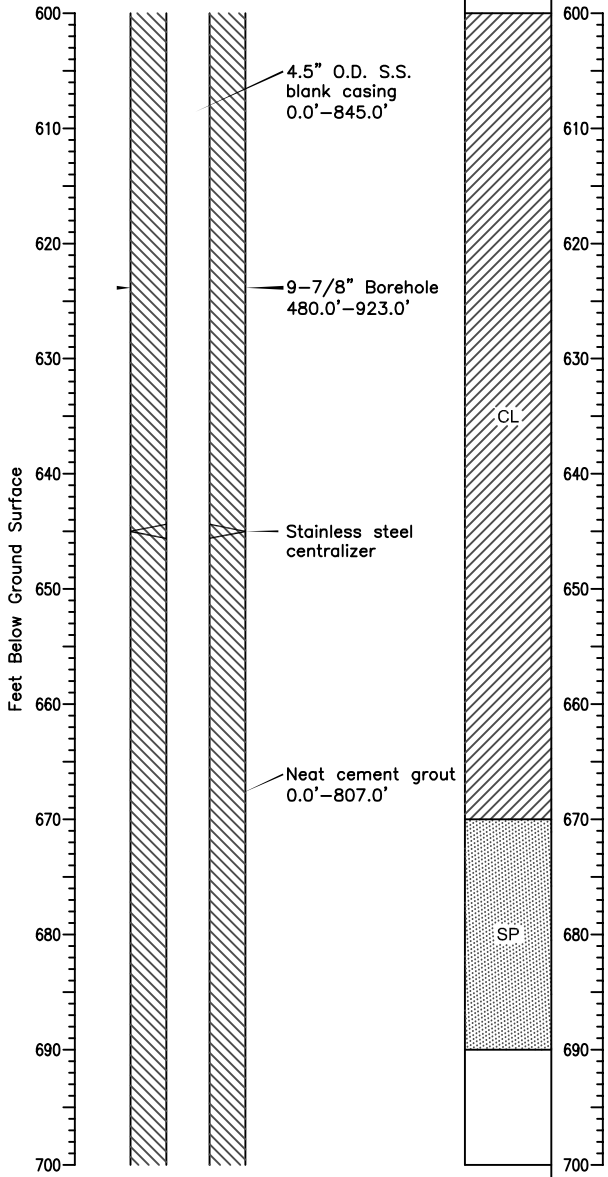

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
10%/81%	605–615	CL	Sandy silty claystone, dark greenish gray (Gley1 4/1), fine-grained, slight to moderate plasticity when wet, dry (608–615 feet no recovery).
65%/84%	615–625	CL	Same as above.
40%/64%	625–635	CL	Claystone, dark greenish gray (Gley1 4/1), plastic when wet, hard, brittle, dry–damp, massive.
0%/84%	635–640	CL	Same as above.
0%/20%	640–650	CL	Same as above.
30%/44%	650–660	CL	Same as above.
10%/34%	660–670	CL	Same as above.
0%/38%	670–690	SP	Sandstone, dark greenish gray (Gley1 4/1), fine-grained, well sorted, round to subround, non-plastic, hard, dry–damp.
0%/0%	690–700		No recovery.

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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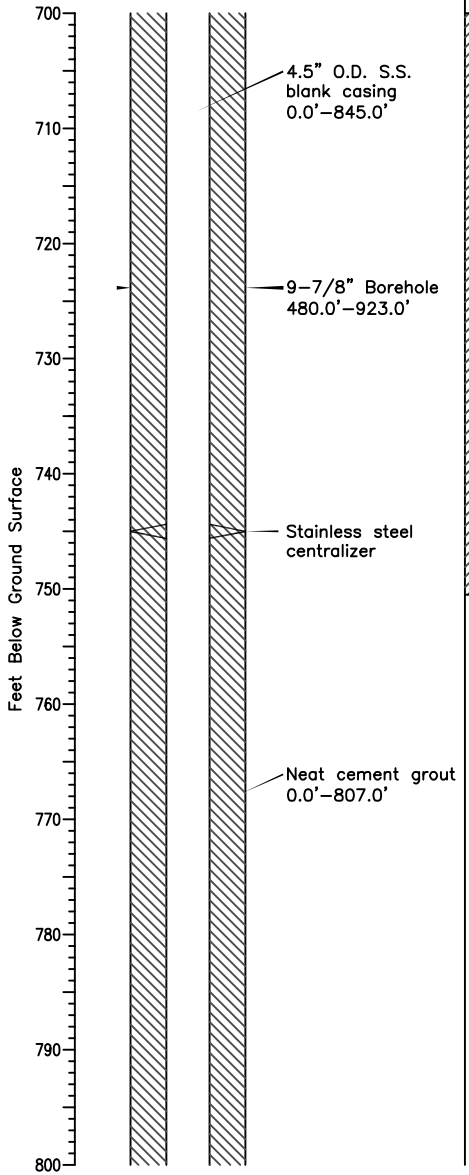

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
CL	15%/58%	700–710	CL	Claystone, dark greenish gray (Gley1 4/1), plastic when wet, hard, brittle, damp.
	0%/63%	710–720	CL	Same as above, most likely borehole slough.
	20%/55%	720–730	CL	Claystone, dark greenish gray (Gley1 4/1), plastic when wet, hard, brittle, dry–damp, massive, with few fractures.
	90%/96%	730–740	CL	Same as above, without fractures.
	70%/100%	740–750.5	CL	Same as above.
ML	NA	750.5–923	ML	Cuttings not sampled at discrete intervals from 750.5 feet to 923 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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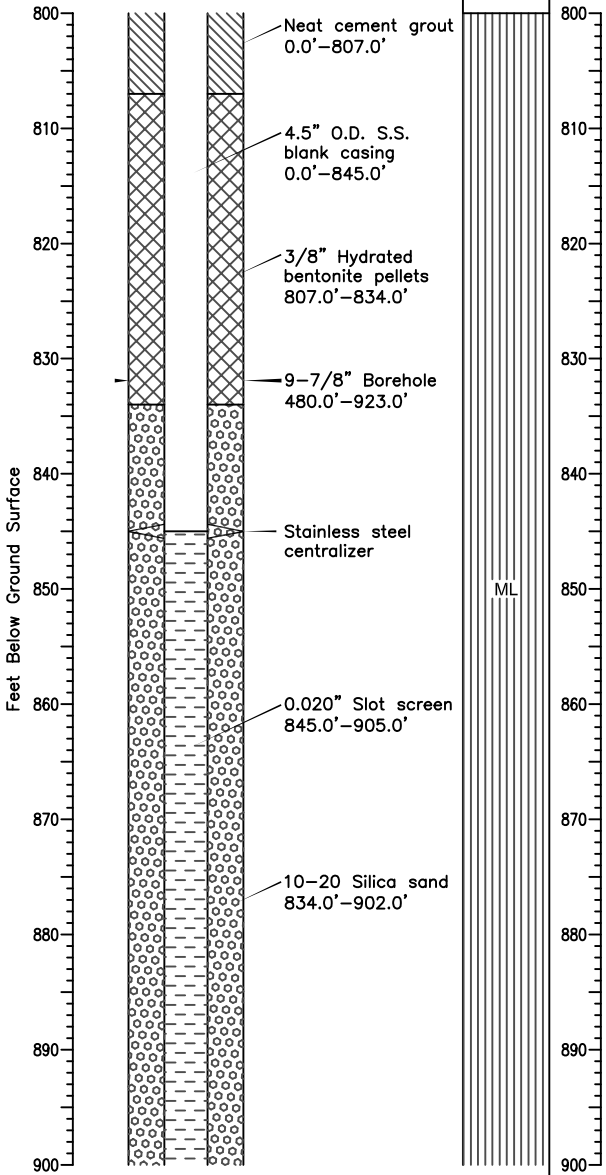

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
NA		ML	Cuttings not sampled at discrete intervals from 750.5 feet to 923 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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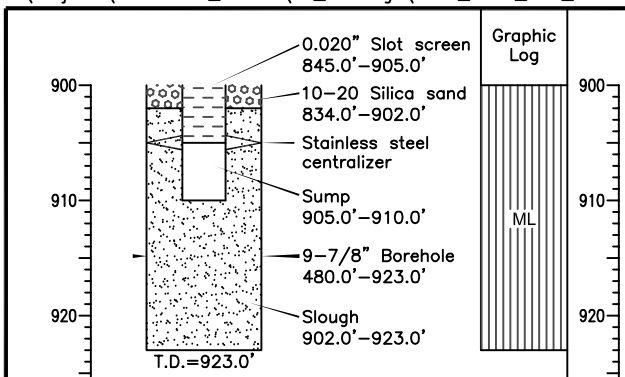

Feet Below Ground Surface	Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
900					
910	ML	NA		ML	Cuttings not sampled at discrete intervals from 750.5 feet to 923 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.
920					
930					
940					
950					
960					
970					
980					
990					
1000					

Geologist: J. Fisher/M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–11–11

Drilling method: Core, mud rotary, air rotary
Bit diameters: 15–1/4" and 9–7/8"
Sampling device: HQ core, NQ core, rotary cuttings
Steel suface casing: 10"

Note: HAZ–Tech core drilling 0'–385', 520'–750' (NQ core 600'–750'); Adamson Pump and Drill mud rotary drilling 385'–520', air rotary drilling 750'–923'

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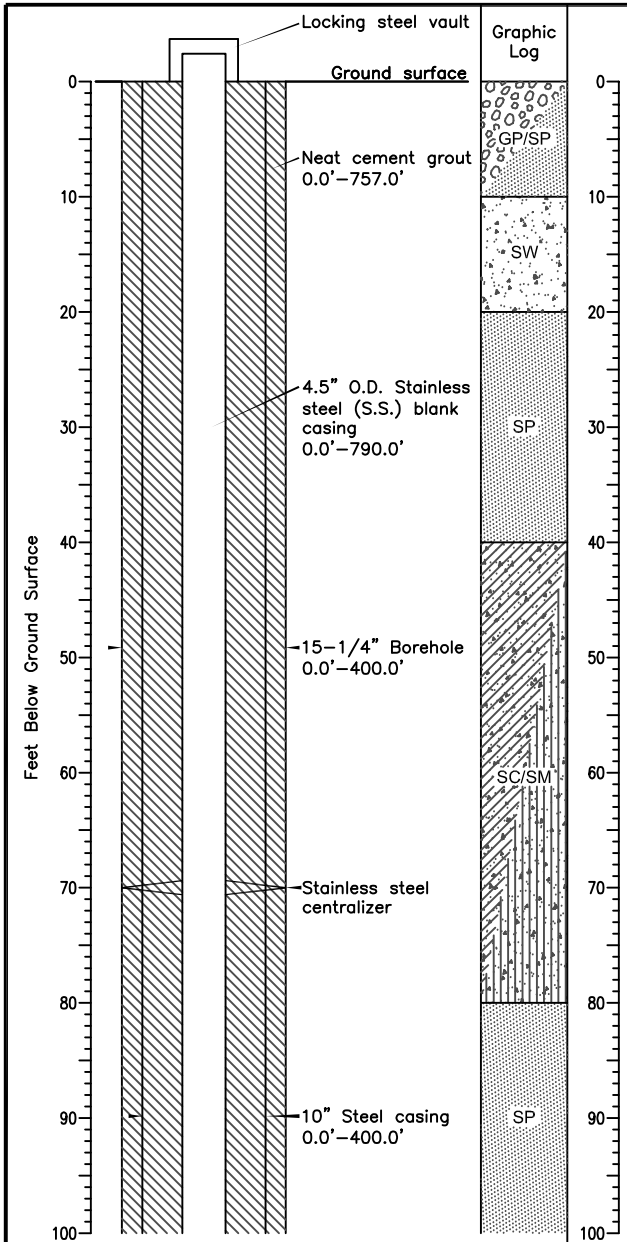

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
NA	0–10	GP–SP	Gravelly sand, olive gray (5Y 5/2), fine– to medium–grained, subrounded, well sorted, non–plastic, loose, moist.
NA	10–20	SW	Sand, light gray (5Y 7/2), fine– to coarse–grained, well sorted, subrounded, non–plastic, loose, dry.
NA	20–30	SP	Same as above.
NA	30–40	SP	Same as above.
NA	40–50	SC–SM	Clayey silty sand, pale yellow (5Y 7/3), fine–grained, subrounded, low plastic, soft, slightly moist.
NA	50–60	SC–SM	Same as above.
NA	60–70	SC–SM	Same as above.
NA	70–80	SC–SM	Clayey silty sand, light olive brown (2.5Y 5/3), fine– to coarse–grained, rounded to subrounded, low plastic, soft, moist.
NA	80–90	SP	Sand, pale yellow (2.5Y 7/4), fine–grained, non–plastic, loose, moist.
NA	90–100	SP	Same as above.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–26–11

Drilling method: Core, mud rotary
Bit diameters: 15–1/4", 12" and 9–7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"
Note: TOC = top of casing

Northing: 665617.168
Easting: 246058.254
Elevation: 3023.3 (TOC)
Note: Adamson Pump and Drill mud rotary drilling 0'–425'; HAZ–Tech core drilling 425'–625'; air rotary drilling 625'–870'

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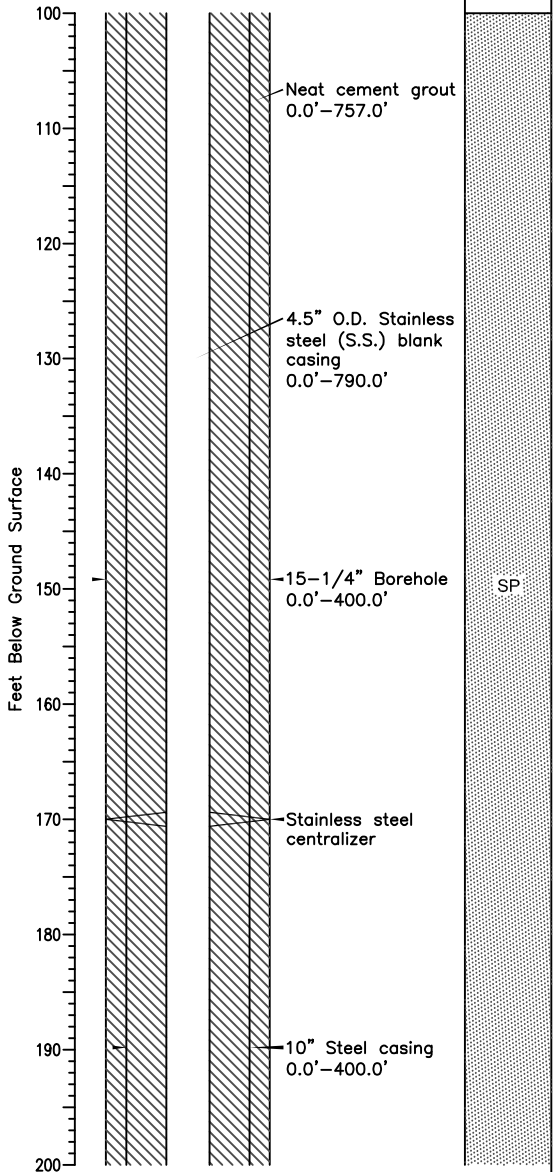

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
SP	NA	100–110	SP	Sand, light yellowish brown (2.5Y 6/3), fine–grained, poorly sorted, subrounded, non–plastic, loose, moist.
	NA	110–120	SP	Sand, light olive brown (2.5Y 5/3), fine– to medium–grained, subrounded, poorly sorted, non–plastic, loose, moist.
	NA	120–130	SP	Same as above.
	NA	130–140	SP	Same as above.
	NA	140–150	SP	Same as above.
	NA	150–160	SP	Same as above.
	NA	160–170	SP	Same as above.
	NA	170–180	SP	Same as above.
	NA	180–190	SP	Same as above with iron staining.
	NA	190–200	SP	Sand, pale yellow (2.5Y 8/4), fine– to coarse–grained, poorly sorted, subangular to subrounded, non–plastic, loose, dry.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–26–11

Drilling method: Core, mud rotary
Bit diameters: 15–1/4", 12" and 9–7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"

Note: Adamson Pump and Drill mud rotary drilling 0'–425'; HAZ–Tech core drilling 425'–625'; air rotary drilling 625'–870'

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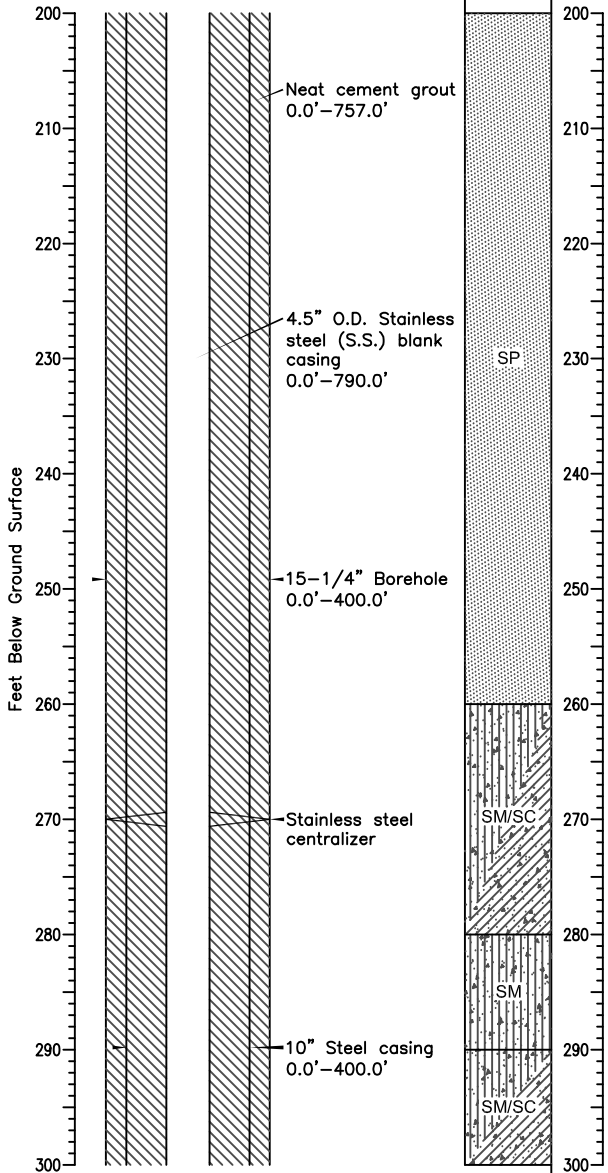

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
NA	200–210	SP	Same as above, medium–coarse grained.
NA	210–220	SP	Same as above.
NA	220–230	SP	Same as above.
NA	230–240	SP	Same as above with iron staining.
NA	240–250	SP	Same as above.
NA	250–260	SP	Sand, pale yellow (2.5Y 8/3), fine–grained, well sorted, subrounded, non–plastic, loose, dry.
NA	260–270	SM–SC	Silty clayey sand, pale yellow (5Y 7/3), fine–grained, subrounded, low plastic, soft, moist.
NA	270–280	SM–SC	Same as above.
NA	280–290	SM	Silty sand, pale olive (5Y 6/3), fine–grained, subrounded, non–plastic, loose, slightly moist.
NA	290–300	SM–SC	Clayey silty sand, olive (5Y 5/3), fine–grained, subrounded, very low plastic, soft, slightly moist.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–26–11

Drilling method: Core, mud rotary
Bit diameters: 15–1/4", 12" and 9–7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"

Note: Adamson Pump and Drill mud rotary drilling 0'–425'; HAZ–Tech core drilling 425'–625'; air rotary drilling 625'–870'

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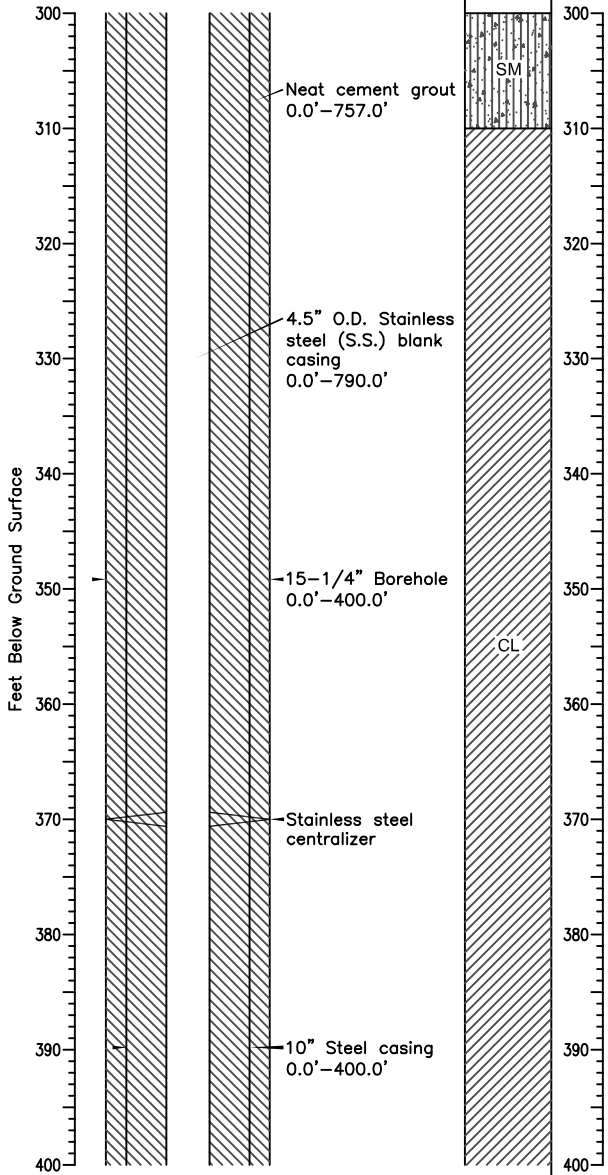

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
NA	300–310	SM	Silty sand, pale yellow (5Y 8/2), fine–grained, subrounded, non–plastic, loose, dry.
NA	310–320	CL	Sandy silty clay, light yellowish brown (2.5Y 6/4), fine–grained, subrounded, medium plastic, soft, moist.
NA	320–330	CL	Same as above.
NA	330–340	CL	Same as above.
NA	340–350	CL	Same as above.
NA	350–360	CL	Silty clay, pale olive (5Y 6/3), very fine–grained, highly plastic, soft, wet.
	360–370		
NA	370–380	CL	Same as above.
NA	380–390	CL	Same as above.
NA	390–400	CL	Same as above.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–26–11

Drilling method: Core, mud rotary
Bit diameters: 15–1/4", 12" and 9–7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"

Note: Adamson Pump and Drill mud rotary drilling 0'–425'; HAZ–Tech core drilling 425'–625'; air rotary drilling 625'–870'

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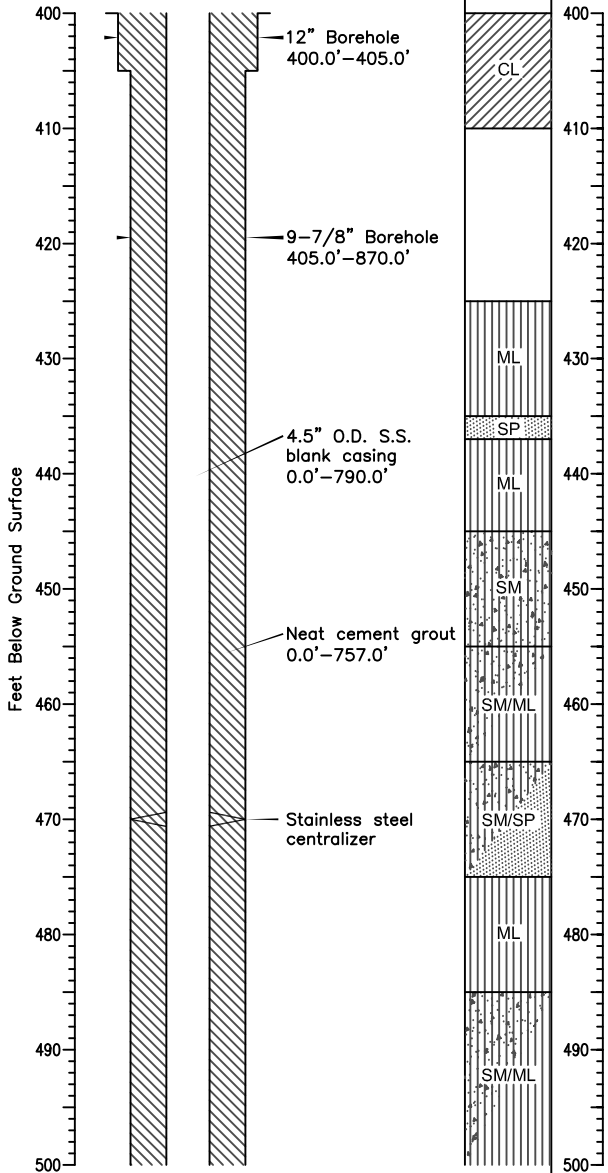

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
NA	400–410	CL	Same as above.
NA	410–425		No recovery.
30%/65%	425–435	ML	Siltstone, pale yellow (5Y 7/3) to light yellowish brown (2.5Y 6/3), moderately soft, significant clay fraction.
75%/100%	435–445	SP ML	Sand, light yellowish brown (2.5Y 6/4), medium–grained, well sorted, loose (from 435 to 437 feet) then siltstone as above to 445 feet.
50%/75%	445–455	SM	Silty clayey sand, pale olive (5Y 6/3), fine–grained, appreciable clay with alternately clayey soft and hard layers, with organic material and orange oxidation. No recovery from 452.5 to 455 feet.
100%/100%	455–465	SM–ML	Silty sand and sandy silt, pale olive (5Y 6/3), laminated, fine–grained, alternating soft and hard layers, brittle to plastic, slightly moist, with abundant organic material.
100%/100%	465–475	SM–SP	Same as above interbedded with sand, olive gray (5Y 5/2), fine– to medium–grained, moderately well sorted, loose, soft.
85%/100%	475–485	ML	Sandy siltstone, pale olive (5Y 6/3), laminated, weakly to moderately cemented, micaceous with some clay.
60%/80%	485–495	SM–ML	Similar to above silty sand and sandy silt, color mottled pale olive (5Y 6/3) to light olive gray (5Y 6/2), massive to laminated, weakly cemented, interbedded clay and clayey layers.
60%/75%	495–505	SM–ML	Same as above, less sand.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–26–11

Drilling method: Core, mud rotary
Bit diameters: 15–1/4", 12" and 9–7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"

Note: Adamson Pump and Drill mud rotary drilling 0'–425'; HAZ–Tech core drilling 425'–625'; air rotary drilling 625'–870'

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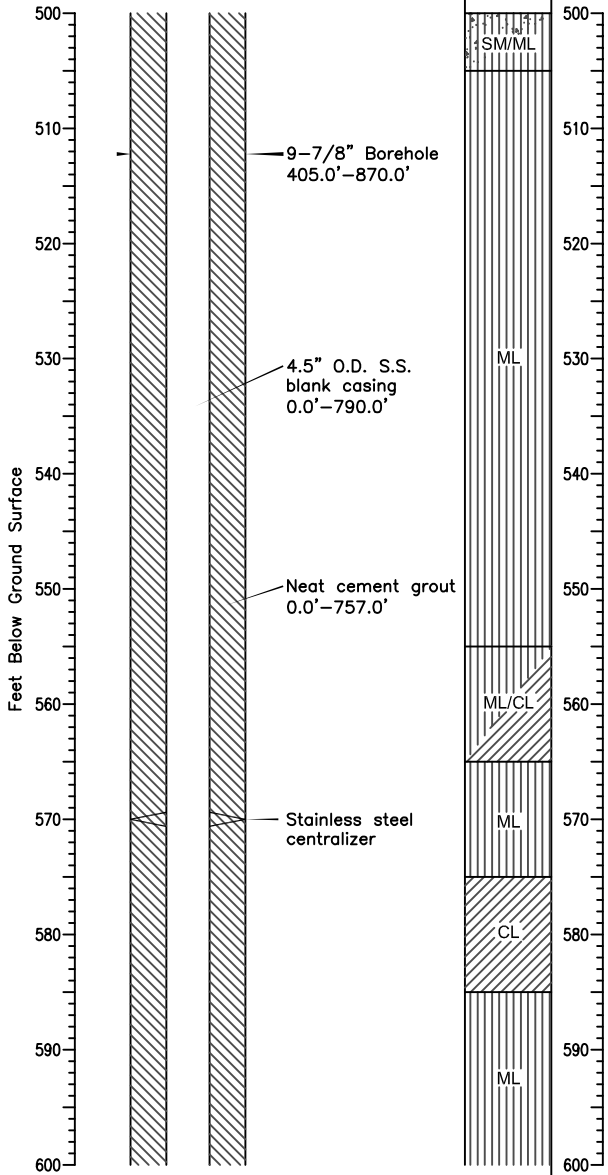

Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
SM/ML	90%/100%	505–515	ML	Same as above, predominantly silt.
	80%/90%	515–525	ML	Same as above.
ML	85%/100%	525–535	ML	Same as above, predominantly silt with minor sand and clay, massive to laminated, locally crossbedded, slightly moist.
	50%/65%	535–545	ML	Same as above.
	100%/100%	545–555	ML	Similar to above, clayey siltstone, light yellowish brown (2.5Y 6/2–6/3).
ML/CL	100%/100%	555–565	ML–CL	Same as above at 555 feet silty clay, brownish gray (2.5Y 5/2), at 565 feet weakly to moderately cemented.
ML	100%/100%	565–575	ML	Clayey silt, olive (5Y 4/3), soft, slightly plastic to 568.5 feet, silstone, dark greenish gray (Gley1 10Y 4/1), siltstone with sand and clay, sandy at top, well cemented, contact w/ "blue clay" unit at 568.5 feet.
CL	20%/30%	575–585	CL	Sandy clay, dark gray (Gley1 4/N), well cemented, slightly plastic when wet, micaceous, dry.
	100%/100%	585–595	ML	Silstone with clay and minor sand, mottled dark gray (Gley1 4/N), well cemented, micaceous.
ML	90%/95%	595–605	ML	Sandy silstone with clay, dark gray (Gley1 4/N), massive to laminated, micaceous.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–26–11

Drilling method: Core, mud rotary
Bit diameters: 15–1/4", 12" and 9–7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"

Note: Adamson Pump and Drill mud rotary drilling 0'–425'; HAZ–Tech core drilling 425'–625'; air rotary drilling 625'–870'

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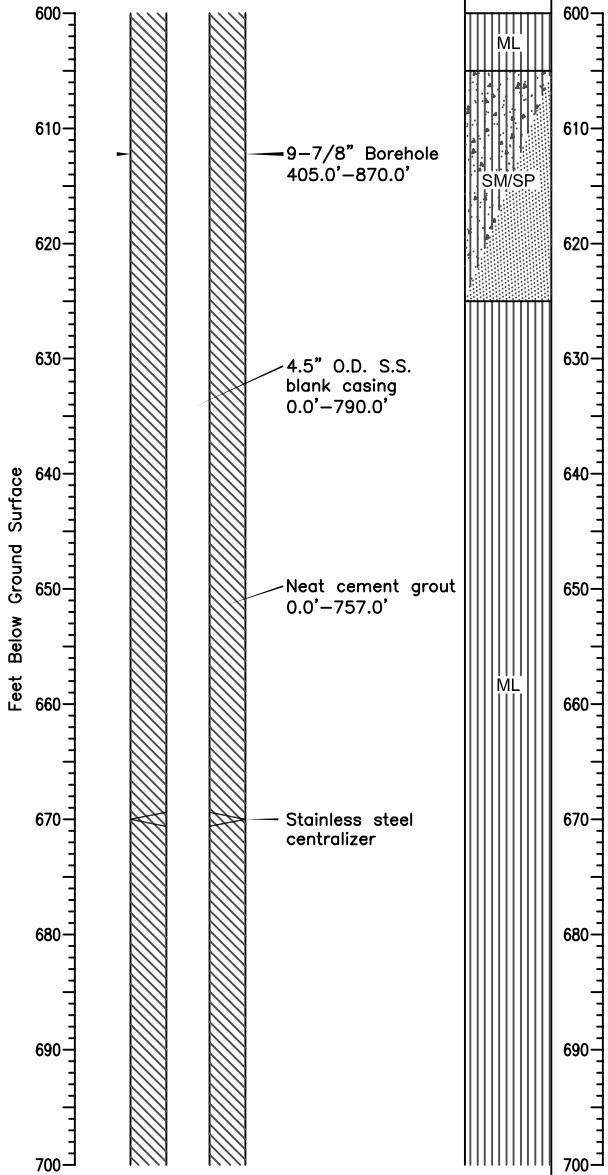

Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
80%/90%	605–625	SM–SP	Sand and silty sand, mottled gray and light gray, laminated, fine– to medium–grained, moderately sorted, loose to well cemented, slightly moist to moist; interbedded w/ thin (1 to 2 cm) clay lenses.
	625–870	ML	Cuttings not sampled at discrete intervals from 625 feet to 870 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: M. Nauck/J. Raucci
Driller: HAZ–Tech; Adamson Pump and Drill
Date completed: 10–26–11

Drilling method: Core, mud rotary
Bit diameters: 15–1/4", 12" and 9–7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"

Note: Adamson Pump and Drill mud rotary drilling 0'–425'; HAZ–Tech core drilling 425'–625'; air rotary drilling 625'–870'

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Well Log: PB-15

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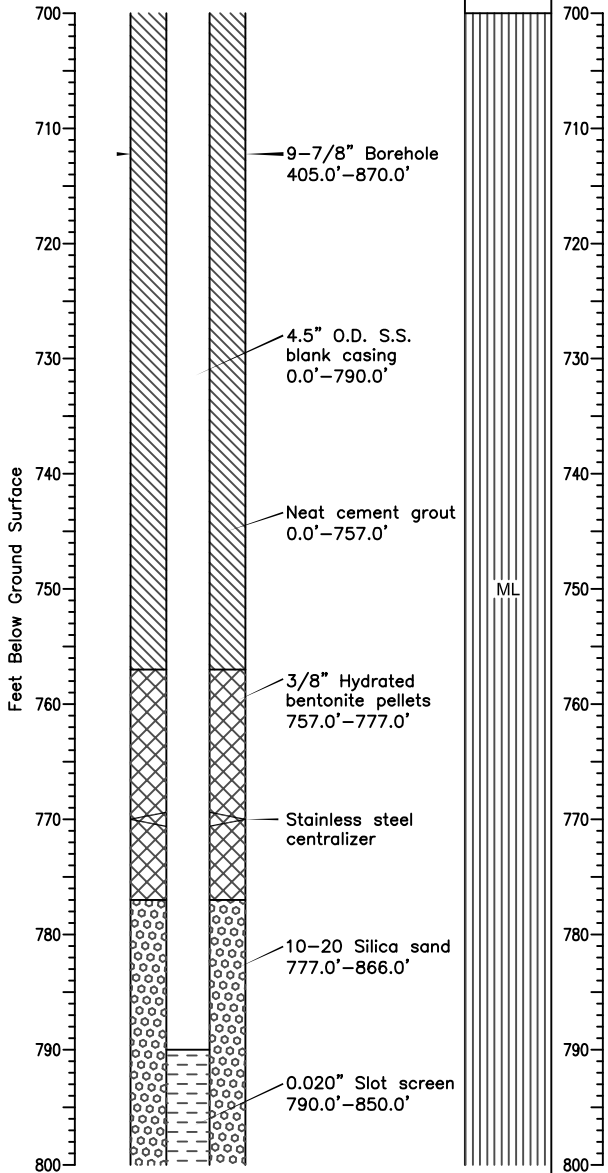


Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
		ML	Cuttings not sampled at discrete intervals from 625 feet to 870 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: M. Nauck/J. Raucci
Driller: HAZ-Tech; Adamson Pump and Drill
Date completed: 10-26-11

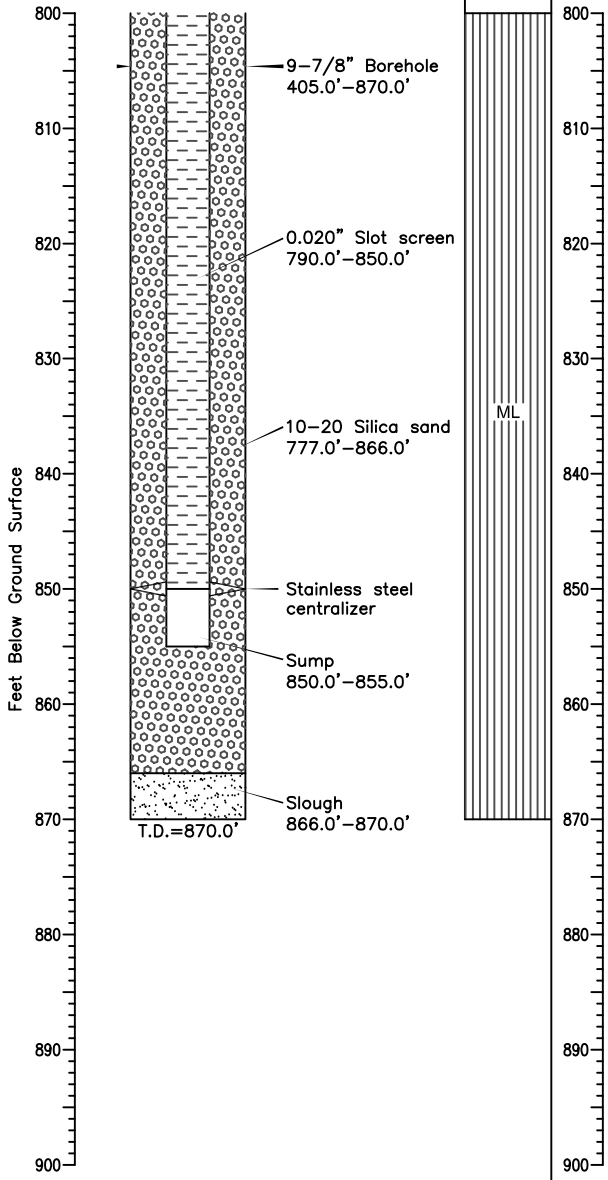
Drilling method: Core, mud rotary
Bit diameters: 15-1/4", 12" and 9-7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"

Note: Adamson Pump and Drill mud rotary drilling 0'-425'; HAZ-Tech core drilling 425'-625'; air rotary drilling 625'-870'

PICKLES BUTTE
Well Log: PB-15

Daniel B. Stephens & Associates, Inc.
2-05-2012
JN ES09.0154

S:\Projects\ES09.0154_Pickles\VR_Drawings\ES09_0154_07B_borelogs.dwg PB-15 (9of9)



Graphic Log	Rock Quality Designation Recovery	Sample Interval (feet bgs)	USCS Symbol	Comments and Lithology
ML			ML	Cuttings not sampled at discrete intervals from 625 feet to 870 feet. Air rotary drilling method only enabled amalgamated bulk sample collection. Visual inspection indicated predominantly gray silt with lesser amounts of clay and sand.

Geologist: M. Nauck/J. Raucci
Driller: HAZ-Tech; Adamson Pump and Drill
Date completed: 10-26-11

Drilling method: Core, mud rotary
Bit diameters: 15-1/4", 12" and 9-7/8"
Sampling device: HQ core, rotary cuttings
Steel suface casing: 10"

Note: Adamson Pump and Drill mud rotary drilling 0'-425'; HAZ-Tech core drilling 425'-625'; air rotary drilling 625'-870'

Daniel B. Stephens & Associates, Inc.
6-05-2012
JN ES09.0154

PICKLES BUTTE
Well Log: PB-15

Appendix B

Water Quality Analytical Results

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

Attn: JACK BIDDLE
CANYON COUNTY SOLID WASTE
15500 MISSOURI AVE
NAMPA, ID 83686

Collected By: J BIDDLE
Submitted By: J BIDDLE

Source of Sample:
PICKLES BUTTE: PB-11

Time of Collection: 14:15
Date of Collection: 4/4/2012
Date Received: 4/6/2012
Report Date: 4/23/2012

Field Temp:
Temp Rcvd in Lab:
PWS: 3140237
PWS Name CANYON COUNTY SOLID W

Laboratory Analysis Report

Sample Number: 1209837

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Silver, Ag	UR	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Nickel, Ni	UR	< 0.02	mg/L	0.02	EPA 200.7	4/10/2012	KC
Lead Low	0.015	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Zinc, Zn	UR	0.04	mg/L	0.01	EPA 200.7	4/10/2012	KC
Vanadium, V		< 0.05	mg/L	0.05	EPA 200.7	4/16/2012	KC
Thallium Low	0.002	< 0.001	mg/L	0.001	EPA 200.8	4/11/2012	JH
Copper, Cu	1.30	< 0.01	mg/L	0.01	EPA 200.7	4/10/2012	KC
Antimony Low	0.006	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Arsenic Low	0.01	0.013	mg/L	0.003	EPA 200.8	4/11/2012	JH
Metals Digestion		*			EPA 200.9-11	4/9/2012	JMS
Chromium Low	0.1	< 0.002	mg/L	0.002	EPA 200.8	4/11/2012	JH
Cobalt, Co		< 0.02	mg/L	0.02	EPA 200.7	4/16/2012	KC
Cadmium Low	0.005	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Beryllium Low	0.004	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Barium, Ba	2	0.18	mg/L	0.05	EPA 200.7	4/10/2012	KC
Selenium Low	0.05	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH

MCL = Maximum Contamination Level
MDL = Method Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:09:33 A

Laboratory Analysis Report

Sample Number: 1209837

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Acetone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Acrylonitrile		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Benzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromodichloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromoform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Carbon disulfide		<5.0	ug/L	5	EPA 8260B	4/13/2012	ATL
Carbon tetrachloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromo-3-chloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromoethane (EDB)		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,4-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trans-1,4-Dichloro-2-Butene		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Ethylbenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
2-Hexanone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Bromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methylene chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methyl ethyl ketone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:09:33 A

Laboratory Analysis Report

Sample Number: 1209837

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Methyl Iodide		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
4-Methyl-2-pentanone (MIBK)		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Styrene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Tetrachloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Toluene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichlorofluoromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2,3-Trichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Vinyl acetate		<20.0	ug/L	20	EPA 8260B	4/13/2012	ATL
Vinyl chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Xylene, Total		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

CC: SWDH

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions concerning this report,
please contact your client manager: **David Bennett**

Date Report Printed: 4/23/2012 9:09:33 A

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

Attn: JACK BIDDLE
CANYON COUNTY SOLID WASTE
15500 MISSOURI AVE
NAMPA, ID 83686

Collected By: J BIDDLE
Submitted By: J BIDDLE

Source of Sample:
PICKLES BUTTE: PB-12

Time of Collection: 11:15
Date of Collection: 4/4/2012
Date Received: 4/6/2012
Report Date: 4/23/2012

Field Temp:
Temp Rcvd in Lab:
PWS: 3140237
PWS Name CANYON COUNTY SOLID W

Laboratory Analysis Report

Sample Number: 1209838

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Silver, Ag	UR	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Nickel, Ni	UR	< 0.02	mg/L	0.02	EPA 200.7	4/10/2012	KC
Lead Low	0.015	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Zinc, Zn	UR	0.05	mg/L	0.01	EPA 200.7	4/10/2012	KC
Vanadium, V		< 0.05	mg/L	0.05	EPA 200.7	4/16/2012	KC
Thallium Low	0.002	< 0.001	mg/L	0.001	EPA 200.8	4/11/2012	JH
Copper, Cu	1.30	< 0.01	mg/L	0.01	EPA 200.7	4/10/2012	KC
Antimony Low	0.006	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Arsenic Low	0.01	0.006	mg/L	0.003	EPA 200.8	4/11/2012	JH
Metals Digestion		*			EPA 200.9-11	4/9/2012	JMS
Chromium Low	0.1	< 0.002	mg/L	0.002	EPA 200.8	4/11/2012	JH
Cobalt, Co		< 0.02	mg/L	0.02	EPA 200.7	4/16/2012	KC
Cadmium Low	0.005	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Beryllium Low	0.004	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Barium, Ba	2	0.13	mg/L	0.05	EPA 200.7	4/10/2012	KC
Selenium Low	0.05	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:10:14 A

Laboratory Analysis Report

Sample Number: 1209838

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Acetone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Acrylonitrile		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Benzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromodichloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromoform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Carbon disulfide		<5.0	ug/L	5	EPA 8260B	4/13/2012	ATL
Carbon tetrachloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromo-3-chloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromoethane (EDB)		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,4-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trans-1,4-Dichloro-2-Butene		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Ethylbenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
2-Hexanone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Bromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methylene chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methyl ethyl ketone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:10:14 A

Laboratory Analysis Report

Sample Number: 1209838

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Methyl Iodide		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
4-Methyl-2-pentanone (MIBK)		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Styrene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Tetrachloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Toluene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichlorofluoromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2,3-Trichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Vinyl acetate		<20.0	ug/L	20	EPA 8260B	4/13/2012	ATL
Vinyl chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Xylene, Total		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

CC: SWDH

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions concerning this report,
please contact your client manager: **David Bennett**

Date Report Printed: 4/23/2012 9:10:14 A

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

Attn: JACK BIDDLE
CANYON COUNTY SOLID WASTE
15500 MISSOURI AVE
NAMPA, ID 83686

Collected By: J BIDDLE
Submitted By: J BIDDLE

Source of Sample:
PICKLES BUTTE: PB-13

Time of Collection: 10:00
Date of Collection: 4/5/2012
Date Received: 4/6/2012
Report Date: 4/23/2012

Field Temp:
PWS: 3140237

Temp Rcvd in Lab:
PWS Name CANYON COUNTY SOLID W

Laboratory Analysis Report

Sample Number: 1209839

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Silver, Ag	UR	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Nickel, Ni	UR	< 0.02	mg/L	0.02	EPA 200.7	4/10/2012	KC
Lead Low	0.015	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Zinc, Zn	UR	1.47	mg/L	0.01	EPA 200.7	4/10/2012	KC
Vanadium, V		< 0.05	mg/L	0.05	EPA 200.7	4/16/2012	KC
Thallium Low	0.002	< 0.001	mg/L	0.001	EPA 200.8	4/11/2012	JH
Copper, Cu	1.30	< 0.01	mg/L	0.01	EPA 200.7	4/10/2012	KC
Antimony Low	0.006	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Arsenic Low	0.01	0.013	mg/L	0.003	EPA 200.8	4/11/2012	JH
Metals Digestion		*			EPA 200.9-11	4/9/2012	JMS
Chromium Low	0.1	0.006	mg/L	0.002	EPA 200.8	4/11/2012	JH
Cobalt, Co		< 0.02	mg/L	0.02	EPA 200.7	4/16/2012	KC
Cadmium Low	0.005	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Beryllium Low	0.004	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Barium, Ba	2	0.12	mg/L	0.05	EPA 200.7	4/10/2012	KC
Selenium Low	0.05	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:10:50 A

Laboratory Analysis Report

Sample Number: 1209839

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Acetone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Acrylonitrile		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Benzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromodichloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromoform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Carbon disulfide		<5.0	ug/L	5	EPA 8260B	4/13/2012	ATL
Carbon tetrachloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromo-3-chloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromoethane (EDB)		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,4-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trans-1,4-Dichloro-2-Butene		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Ethylbenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
2-Hexanone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Bromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methylene chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methyl ethyl ketone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:10:50 A

Laboratory Analysis Report

Sample Number: 1209839

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Methyl Iodide		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
4-Methyl-2-pentanone (MIBK)		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Styrene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Tetrachloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Toluene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichlorofluoromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2,3-Trichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Vinyl acetate		<20.0	ug/L	20	EPA 8260B	4/13/2012	ATL
Vinyl chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Xylene, Total		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method Minimum Detection Limit
UR = Unregulated

CC: SWDH

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions concerning this report,
please contact your client manager: **David Bennett**

Date Report Printed: 4/23/2012 9:10:51 A

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

Attn: JACK BIDDLE
CANYON COUNTY SOLID WASTE
15500 MISSOURI AVE
NAMPA, ID 83686

Collected By: J BIDDLE
Submitted By: J BIDDLE

Source of Sample:
PICKLES BUTTE: PB-14

Time of Collection: 11:15
Date of Collection: 4/5/2012
Date Received: 4/6/2012
Report Date: 4/23/2012

Field Temp:
Temp Rcvd in Lab:
PWS: 3140237
PWS Name CANYON COUNTY SOLID W

Laboratory Analysis Report

Sample Number: 1209840

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Silver, Ag	UR	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Nickel, Ni	UR	< 0.02	mg/L	0.02	EPA 200.7	4/10/2012	KC
Lead Low	0.015	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Zinc, Zn	UR	3.29	mg/L	0.01	EPA 200.7	4/10/2012	KC
Vanadium, V		< 0.05	mg/L	0.05	EPA 200.7	4/16/2012	KC
Thallium Low	0.002	< 0.001	mg/L	0.001	EPA 200.8	4/11/2012	JH
Copper, Cu	1.30	< 0.01	mg/L	0.01	EPA 200.7	4/10/2012	KC
Antimony Low	0.006	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Arsenic Low	0.01	0.013	mg/L	0.003	EPA 200.8	4/11/2012	JH
Metals Digestion		*			EPA 200.9-11	4/9/2012	JMS
Chromium Low	0.1	< 0.002	mg/L	0.002	EPA 200.8	4/11/2012	JH
Cobalt, Co		< 0.02	mg/L	0.02	EPA 200.7	4/16/2012	KC
Cadmium Low	0.005	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Beryllium Low	0.004	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Barium, Ba	2	0.11	mg/L	0.05	EPA 200.7	4/10/2012	KC
Selenium Low	0.05	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:11:51 A

Laboratory Analysis Report

Sample Number: 1209840

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Acetone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Acrylonitrile		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Benzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromodichloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromoform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Carbon disulfide		<5.0	ug/L	5	EPA 8260B	4/13/2012	ATL
Carbon tetrachloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromo-3-chloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromoethane (EDB)		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,4-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trans-1,4-Dichloro-2-Butene		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Ethylbenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
2-Hexanone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Bromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methylene chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methyl ethyl ketone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:11:51 A

Laboratory Analysis Report

Sample Number: 1209840

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Methyl Iodide		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
4-Methyl-2-pentanone (MIBK)		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Styrene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Tetrachloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Toluene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichlorofluoromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2,3-Trichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Vinyl acetate		<20.0	ug/L	20	EPA 8260B	4/13/2012	ATL
Vinyl chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Xylene, Total		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

CC: SWDH

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions concerning this report,
please contact your client manager: **David Bennett**

Date Report Printed: 4/23/2012 9:11:52 A

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

Attn: JACK BIDDLE
CANYON COUNTY SOLID WASTE
15500 MISSOURI AVE
NAMPA, ID 83686

Collected By: J BIDDLE
Submitted By: J BIDDLE

Source of Sample:
PICKLES BUTTE: PB-15

Time of Collection: 12:45
Date of Collection: 4/5/2012
Date Received: 4/6/2012
Report Date: 4/23/2012

Field Temp:
Temp Rcvd in Lab:
PWS: 3140237
PWS Name CANYON COUNTY SOLID W

Laboratory Analysis Report

Sample Number: 1209841

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Silver, Ag	UR	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Nickel, Ni	UR	< 0.02	mg/L	0.02	EPA 200.7	4/10/2012	KC
Lead Low	0.015	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Zinc, Zn	UR	0.03	mg/L	0.01	EPA 200.7	4/10/2012	KC
Vanadium, V		< 0.05	mg/L	0.05	EPA 200.7	4/16/2012	KC
Thallium Low	0.002	< 0.001	mg/L	0.001	EPA 200.8	4/11/2012	JH
Copper, Cu	1.30	< 0.01	mg/L	0.01	EPA 200.7	4/10/2012	KC
Antimony Low	0.006	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH
Arsenic Low	0.01	0.007	mg/L	0.003	EPA 200.8	4/11/2012	JH
Metals Digestion		*			EPA 200.9-11	4/9/2012	JMS
Chromium Low	0.1	0.006	mg/L	0.002	EPA 200.8	4/11/2012	JH
Cobalt, Co		< 0.02	mg/L	0.02	EPA 200.7	4/16/2012	KC
Cadmium Low	0.005	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Beryllium Low	0.004	< 0.0005	mg/L	0.0005	EPA 200.8	4/11/2012	JH
Barium, Ba	2	0.13	mg/L	0.05	EPA 200.7	4/10/2012	KC
Selenium Low	0.05	< 0.005	mg/L	0.005	EPA 200.8	4/11/2012	JH

MCL = Maximum Contamination Level
MDL = Method Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:12:29 A

Laboratory Analysis Report

Sample Number: 1209841

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Acetone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Acrylonitrile		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Benzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromodichloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Bromoform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Carbon disulfide		<5.0	ug/L	5	EPA 8260B	4/13/2012	ATL
Carbon tetrachloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloroform		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromochloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromo-3-chloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dibromoethane (EDB)		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,4-Dichlorobenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trans-1,4-Dichloro-2-Butene		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,2-Dichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2-Dichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
cis-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
trans-1,3-Dichloropropene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Ethylbenzene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
2-Hexanone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Bromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Chloromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Dibromomethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methylene chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Methyl ethyl ketone		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Date Report Printed: 4/23/2012 9:12:29 A

Laboratory Analysis Report

Sample Number: 1209841

EPA Method 8260 was performed by Anatek Labs (ATL).

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Methyl Iodide		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
4-Methyl-2-pentanone (MIBK)		<10.0	ug/L	10	EPA 8260B	4/13/2012	ATL
Styrene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2,2-Tetrachloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Tetrachloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Toluene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,1-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,1,2-Trichloroethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichloroethene		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Trichlorofluoromethane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
1,2,3-Trichloropropane		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Vinyl acetate		<20.0	ug/L	20	EPA 8260B	4/13/2012	ATL
Vinyl chloride		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL
Xylene, Total		<1.0	ug/L	1	EPA 8260B	4/13/2012	ATL

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

CC: SWDH

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions concerning this report,
please contact your client manager: **David Bennett**

Date Report Printed: 4/23/2012 9:12:29 A

CLIENT CODE= CCSW

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION:

Project Manager: JACK BIDDLE
Company: CANYON CO. SOLID WASTE
Address: 15500 MISSOURI AVE
NAMPA, ID 83686
Phone: 466-7296 Fax: 466-7296
Sampled by: (Please print) JACK BIDDLE

PROJECT INFORMATION:

Project Name: PICKLES BUTTE
PWS Number: ——
Purchase Order Number:
Required Due Date:
E-mail Address: ccsw@speedyquick.net
Transported by: (Please print) JACK BIDDLE

ANALYTICAL LABS, INC.
1804 N. 33rd Street • Boise, ID 83703
(208) 342-5515 • Fax: (208) 342-5591 • 1-800-574-5773
Website: www.analyticallaboratories.com
E-mail: ali@analyticallaboratories.com

TESTS REQUESTED

Lab ID	Date Sampled	Time Sampled	Sample Description (Source)	Sample Matrix	Appendix I Metals	Appendix I 8260								Remarks:
9830	4/4/12	5:00	PB-3	H_2O	✓	✓								
9831	4/5/12	5:30	PB-4		✓	✓								
9832	4/5/12	2:45	PB-6		✓	✓								
9833	4/5/12	5:00	PB-7		✓	✓								
9834	4/4/12	4:00	PB-8		✓	✓								
9835	4/5/12	3:30	PB-9		✓	✓								
9836	4/5/12	4:30	PB-10		✓	✓								
9837	4/4/12	2:15	PB-11		✓	✓								
9838	4/4/12	11:15	PB-12		✓	✓								
9839	4/5/12	10:00	PB-13		✓	✓								

Invoice to: *(If different than above address)*

Special Instructions:

ALLOCATIONS OF RISK: Analytical Laboratories, Inc. will perform preparation and testing services, obtain findings and prepare reports in accordance with Good Laboratory Practices (GLP). If, for any reason, Analytical Laboratories, Inc. errors in the conduct of a test or procedure, their liability shall be limited to the cost of the test or procedure completed in error. Under no circumstances will Analytical Laboratories, Inc. be liable for any other cost associated with obtaining a sample or use of data.

Note: Samples are discarded 21 days after results are reported. Hazardous samples will be returned to client or disposed of at client expense.

	Print Name:	Company:	Date:	Time:
Relinquished By: *(Signature)* Jack Biddle	Jack Biddle	CCSW	4/6/12	3:45 pm
Received By: *(Signature)*	Print Name:	Company:	Date:	Time:
Relinquished By: *(Signature)*	Print Name:	Company:	Date:	Time:
Received By: *(Signature)* Brenda Wright	Print Name: Brenda Wright	Company: ALI	Date: 4-6-12	Time: 15:45

SAMPLE RECEIPT Total # of Containers: Chains of Custody Seals Y / N / NA Intact: Y / N / NA Temperature Received: Condition: good

REV. 2/19/12 WHITE: STAYS WITH SAMPLE(S) YELLOW: LAB PINK: SAMPLER

CLIENT CODE= CCSW

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION:	PROJECT INFORMATION:
Project Manager: JACK BIDDLE	Project Name:
Company: CANYON CO. SOLID WASTE	PWS Number:
Address: 15520 MISSOURI AVE	Purchase Order Number:
NAMPA, ID	Required Due Date:
Phone: 466-7288 Fax: 466-7296	E-mail Address: CCSW@speedyquick.net
Sampled by: (Please print) JACK BIDDLE	Transported by: (Please print) Jack Biddle

ANALYTICAL LABS, INC.
1804 N. 33rd Street • Boise, ID 83703
(208) 342-5515 • Fax: (208) 342-5591 • 1-800-574-5773
Website: www.analyticallaboratories.com
E-mail: ali@analyticallaboratories.com

TESTS REQUESTED

Lab ID	Date Sampled	Time Sampled	Sample Description (Source)	Sample Matrix	Appendix I Metals	Appendix I 8260	Remarks:
9840	4/5/12	11:15	PB-14	H_2O	✓	✓	
9841	4/5/12	12:45	PB-15	"	✓	✓	

Invoice to: *(If different than above address)*

Special Instructions:

ALLOCATIONS OF RISK: Analytical Laboratories, Inc. will perform preparation and testing services, obtain findings and prepare reports in accordance with Good Laboratory Practices (GLP). If, for any reason, Analytical Laboratories, Inc. errors in the conduct of a test or procedure, their liability shall be limited to the cost of the test or procedure completed in error. Under no circumstances will Analytical Laboratories, Inc. be liable for any other cost associated with obtaining a sample or use of data.

Note: Samples are discarded 21 days after results are reported. Hazardous samples will be returned to client or disposed of at client expense.

	Print Name:	Company:	Date:	Time:
Relinquished By: *(Signature)* Jack Biddle	JACK BIDDLE	CCSW	4/6/12	3:45 PM
Received By: *(Signature)*				
Relinquished By: *(Signature)*				
Received By: *(Signature)* Brenda Wright	Brenda Wright		4-6-12	1545
SAMPLE RECEIPT **Total # of Containers:**	**Chains of Custody Seals** Y / N / NA	**Intact:** Y / N / NA	**Temperature Received:**	**Condition:** good

REV. 2/19/12 WHITE: STAYS WITH SAMPLE(S) YELLOW: LAB PINK: SAMPLER

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