



ASH POND SYSTEM-CCR LOCATION RESTRICTION EVALUATION

Mountaineer Plant Graham Station Road Mason County New Haven, West Virginia

October 27, 2016

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Mountaineer Plant, Graham Station Road, Mason County, New Haven, West Virginia

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ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power Service Cooperation
amsl	above mean sea level
Arcadis	Arcadis U.S., Inc.
bgs	below ground surface
BAP	bottom ash pond
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
CSM	Conceptual Site Model
EPRI	Electric Power Research Institute
ft	feet
LBR	Little Broad Run

1. OBJECTIVE

This report was prepared by Arcadis U.S., Inc. (Arcadis) for American Electric Power Service Corporation (AEP) to assess location of the bottom ash ponds (BAP) relative to the location restrictions included in the Coal Combustion Residual (CCR) requirements, as specified in Code of Federal Regulations (CFR) 40 CFR 257.60 to 257.64, for the BAPs (CCR Unit) at the AEP Generating Plant (Plant) located on Graham Station Road in New Haven, West Virginia (**Figure 1**). The CCR requirements include an evaluation of the adequacy of the groundwater monitoring well network to characterize groundwater quality up and down gradient of the CCR unit in the uppermost aquifer and an evaluation of whether the CCR unit meets up to 5 location restrictions. The restrictions include: 1) the base of the CCR unit is 5 feet (ft) above and isolated from the uppermost aquifer, and the CCR unit may not be 2) located in a wetland, 3) within 200 ft of the damage zone of a fault that has displacement during the Holocene, 4) within a seismic impact zone, or 5) in an unstable area. This report summarizes the evaluation of the location restriction criteria at the onsite BAPs (Site). The evaluation of the groundwater monitoring well network in the uppermost aquifer is not included in this report and will be completed under separate cover.

Two regulated CCR units associated with the Plant were identified for review, which include the two onsite BAPs (east and west BAPs) and the offsite Little Broad Run (LBR) landfill (**Figure 2**). The evaluation of the LBR landfill is not included in this report and will be completed under separate cover.

Initial evaluation of the monitoring well network was completed in late 2015 into February 2016 and included a review of AEP-provided data associated with previously completed subsurface investigation activities in the vicinity of the BAPs, as well as publicly-available geologic and hydrogeologic data. Gaps in the monitoring well network, as well as in the characterization of subsurface geology, were identified during this initial evaluation. Additional monitoring wells were installed from April through June 2016 to address these data gaps. Drilling activities were performed by a West Virginia-licensed drilling contractor (DLZ) with Arcadis personnel completing borehole logging and well installation oversight. The following report presents the current Conceptual Site Model (CSM), combining the historical Site information with recently collected geologic and hydrogeologic data. This report also includes a description of the uppermost aquifer.

2. BACKGROUND INFORMATION

The following section provides background information for the AEP Mountaineer Generating Plant BAPs.

2.1 Facility Location Description

The AEP Mountaineer Generating Plant is located in Mason County, bounded by Little Broad Run to the west and the Ohio River to the east. The Plant is approximately 2 miles east of New Haven, West Virginia. The BAP CCR units are located on the south side of the Plant, adjacent to and on the west side of West Virginia Route 62 (Graham Station Road). The BAPs are located approximately 0.5 miles southwest of the Ohio River (**Figures 1** and **2**).

2.2 Description of Bottom Ash Pond CCR Units

The following section will discuss the embankment configuration, area, volume, construction and operational history, and surface water control associated with the BAPs.

2.2.1 Embankment Configuration

The BAP CCR Unit includes two separate west and east BAPs. In general, embankments of the BAPs are constructed of earthen material. North, west and east embankment material is comprised from excavation of the ponds and consist of compacted silty sand with some gravel. The embankment crest widths range from 20 to 45 feet (ft), and are approximately 35 ft or less in height. This corresponds to crest elevations that range from 620 ft above mean sea level (amsl) on the north side of the BAPs. The BAP interior and exterior embankments have crest elevations of approximately 620 ft amsl (Woodward-Clyde, 1985). Embankment slopes are typically graded at horizontal to vertical ratios between 3:1 and 2.5:1 (Shaw, Stone and Webster, 2006).

2.2.2 Area/Volume

The BAPs occupy an estimated combined surface area of approximately 28 acres (EPRI, 1999). Specifically related to the ponds that receive CCR products, the west BAP has a normal pool area of 14.1 acres and the east BAP has a normal pool area of 13.9 acres. The normal reservoir volume of the west and east BAPs are 193 and 152 acre ft, respectively. The maximum design volume of the west and east BAPs are 266 and 225 acre ft, respectively (Shaw, Stone, and Webster, 2006).

2.2.3 Construction and Operational History

The AEP Mountaineer Generating Plant is a single-unit coal-fired generating plant and began operations in September 1980. The BAPs were constructed between 1978 and 1980 and were completed when the generating plant became operational. The original configuration is similar to the current configuration (**Figure 3**). All ponds are lined with a 3-ft clay liner with clay derived from offsite borrow areas (Woodward-Clyde, 1985). In 2006, the downstream (i.e. north) embankment of the BAPs was re-

designed to a steeper slope from 3:1 to 2.5:1. This design change was to accommodate the installation of two gypsum conveyors. Modifications to the downstream BAP embankment and installation of the gypsum conveyors were completed by the first half of 2007.

Currently, the BAPs receive all process wastewaters from the Plant via above ground and below ground steel piping. The BAPs are filled in an alternating fashion, with one BAP generally receiving waste streams while the other BAP is being cleaned out. Bottom ash is either used for beneficial reuse or disposed of in the LBR Landfill (EPRI, 1999).

2.2.4 Surface Water Control

The perimeter of the BAPs is graded such that surface runoff is directed away from the ponds. This grading is accomplished by either natural topographic relief or constructed embankments, such as the main dike along the northwest side of the BAPs (**Figure 3**).

Surface water flow within the BAPs is controlled by a series of slide gates, corrugated metal pipes, vertical inlets, and overflow concrete channels. Pond elevations are maintained so that surface water flows via gravity or pumping to ponds in the following order: east and west BAPs and subsequently to east and west wastewater ponds, and the reclaim and/or clearwater pond (Woodward-Clyde, 1985). The stage levels of the BAPs are generally maintained no greater than the normal operating levels ranging from 603 to 612 ft amsl (H.C. Nutting, 2009). From the clearwater pond, water flows to the Ohio River through a National Pollutant Discharge Elimination System permitted outfall via underground piping (EPRI, 1999).

2.3 Previous Investigations

Prior to BAP construction, Casagrande Consultants performed site investigations from 1976 to 1977 related to suitability of onsite soils for pond and embankment construction and stability (Casagrande, 1977).

In 1985, Woodward-Clyde Consultants performed an assessment of dam safety for the BAPs (Woodward-Clyde, 1985). This assessment included review of AEP-provided data and previous site investigations and a complete visual inspection of the dikes and secondary structures. The Woodward-Clyde Consultants report concluded that dike and pond condition was satisfactory.

From 1995 through 1998, AEP worked in coordination with Ish, Inc., META Environmental, Inc., HIS GeoTrans, Inc., and the Electric Power Research Institute (EPRI) to evaluate groundwater quality associated with a number of AEP power generating facilities, including the Mountaineer Plant. The primary objectives of these site investigations were to characterize hydrogeology, identify potential contaminant source areas, establish existing groundwater quality, and identify constituents that exceeded West Virginia Groundwater Standards. These studies are described in detail in the report *Groundwater Quality at the Philip Sporn and Mountaineer Power Plants, Mason County, West Virginia* (EPRI, 1999). Field work for these investigations included 19 direct push technology groundwater sampling points, installation and sampling of 5 permanent monitoring wells (MW-001 through MW-005), surface water sampling, and geotechnical soil characterization.

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In 2006, H.C. Nutting Company performed site investigations associated with planned modifications to the main dike in preparation for construction of two gypsum conveyors (H.C. Nutting, 2006a; H.C. Nutting, 2006b). These investigations involved foundation inspections, compaction testing of fill material, geotechnical analysis of soil samples, and concrete testing associated with conveyor construction. Also in 2006, Shaw, Stone, and Webster, Inc. performed stability analysis related to the gypsum conveyor construction (Shaw, Stone, and Webster, 2006). Additional slope stability analyses for the north, west, and east embankments related to the gypsum conveyor construction in 2009 was also performed by Shaw, Stone, and Webster, Inc. The results of this analysis showed that, in general, embankment slopes would be stable under static and seismic loading. However, a blanket drain was recommended at the toe and cut faces of the embankment along gypsum conveyor #2 to prevent saturation and slumping (Shaw, Stone, and Webster, 2009).

H.C. Nutting performed a geotechnical investigation of the BAPs in 2009, specifically related to upstream and downstream embankment slope factors of safety under static and seismic conditions. Field methods involved drilling, logging, and sampling 6 soil borings through select embankments (B-09-01 through B-09-06). Split-spoon samples were collected during installation of the borings for the purpose of slope stability analysis, and 3 of the borings were converted to piezometers (PZ-09-03, PZ-09-04, and PZ-09-05). This site investigation included numerical slope stability modeling, and concluded that the embankment slopes had adequate factors of safety for both long-term and earthquake stability (H.C. Nutting, 2009).

2.4 Hydrogeologic Setting

The Site is immediately underlain by Quaternary-aged alluvial deposits consisting of clay, silt, sand, and gravel. While there is a general coarsening downward pattern, the shallower clay matrix is interbedded with silty or sandy layers and the deeper sand matrix is interbedded with silty or clayey layers. The uppermost groundwater zone occurs in the unconfined deeper sand zones. Maximum alluvium thickness is approximately 80 to 90 ft and thins westward towards the edges of the valley. Groundwater flow direction within the alluvium is generally towards the Ohio River. However, there are active production wells (East 1, West 1) and firewater supply wells (Well 5, Well 6) at the Site (**Figure 3**) that withdraw water from the alluvial aquifer. Groundwater flow is influenced towards those wells during pumping conditions.

In the upland areas surrounding the Site, bedrock consists of the Pennsylvanian age sandstones, shales, limestones, and coal of the Monongahela Group. At higher elevations, the hilltops are capped by the Permian age Dunkard Formation, which is lithologically similar to the Monongahela Group. Sandstone and shale of the Monongahela Group immediately underlie alluvial sediments at the Site.

Cross section A-A', which extends through the BAPs further illustrates the geology. The cross section A-A' trends from southwest to northeast as shown on **Figure 4** and is depicted as **Figure 5**. Boring logs and well construction diagrams are included in **Appendix A**.

2.4.1 Climate and Water Budget

The climate of Mason County, West Virginia is characterized as humid continental with an average rainfall of approximately 42 inches annually. The average maximum temperature is 68 °F and the average minimum temperature is 44 °F based on information from Southeast Regional Climate Center (SERCC, 2015).

2.4.2 Regional and Local Geologic Setting

The Site is located in the Appalachian Plateau physiographic province, and is also situated in the Ohio River alluvial plain along the western bank of the Ohio River. Alluvial sediments consist of clay, silt, sand and gravel deposits that generally coarsen downward. In general, shallow clays and silts range in thickness from 10 to 40 ft. Some fill material is present near the Ohio River, which was likely derived from on-site excavations. This fill material varies from silty clay to gravelly sand. Unconsolidated mine wastes can be found in the base of the BAPs and blanketing the BAP embankments in thicknesses ranging from 3 to 7 ft (Shaw, Stone and Webster, 2006; H.C. Nutting, 2009).

Bedrock is present underlying the alluvial deposits near the BAPs, as well as bounding ridges of the Ohio River alluvial valley. The primary regional bedrock units are sedimentary rocks of the Permian age Dunkard Formation and the Pennsylvanian age Monongahela Formation. The depositional environment for these formations is characterized by a gradually subsiding shallow sea with alternating marine and freshwater strata. Sedimentary rocks associated with the Monongahela Formation, which immediately underlie the alluvial sediments beneath the Site, consist of alternating shale and sandstone units, with occasional thin limestone beds. Several coal horizons are present in the region and often serve as marker beds for unit identification. The base of the younger Dunkard group, which caps surrounding ridges and is lithologically similar to the Monongahela Formation, is marked by a thick, massive conglomeritic sandstone (EPRI, 1999).

2.4.3 Surface Water and Surface Water Groundwater Interactions

The Site is adjacent to the Ohio River, and the BAPs are located approximately 0.5 miles southwest of the Ohio River. Little Broad Run is immediately adjacent to the west of the BAPs. Groundwater flow direction is generally to the northeast and discharges to the Ohio River, although local pumping from Plant operations influences groundwater flow to the north. Groundwater recharge is primarily from precipitation. Despite its proximity, Little Broad Run is generally not connected to groundwater at the Site. The base of Little Broad Run is perched on surficial clay deposits and is at an elevation of 580 to 590 ft amsl (EPRI, 1999), which is approximately 30 to 40 ft above the groundwater table. The Ohio River stage level is dam controlled and is a gaining surface water feature. Groundwater elevations on Site are higher than the normal stage elevation of the Ohio River at 538 ft amsl (EPRI, 1999).

2.4.4 Water Users

There are currently five active pumping wells associated with the Plant that extract groundwater from the deep unconsolidated sand and gravel aquifer. Two of these wells (West 1, East 1) are alternately

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pumped for process water and are located approximately 2,200 feet and 2,600 feet northeast of the BAPs, respectively. At the time of this report, average pumping rates from September 6 through September 26, 2016 for West 1 and East 1 were 566 gallons per minute and 144 gallons per minute, respectively. There are also two pumping wells (Wells 5 and 6) which are used for fire water supply. Well 5 is located approximately 1,200 ft north of the BAPs and Well 6 is located approximately 2,700 feet northwest of the BAPs. A fifth well (Well 4) is used in the plant's wastewater system and is located approximately 2,500 feet northeast of the BAPs. Well location coordinates, production test data, and boring log for the pumping wells are included in **Appendix A**. The screened intervals for each of these wells is from 63 to 78 feet below ground surface, which is near the base of the alluvial aquifer. There are no potable groundwater wells at the Site.

In 2014, a water well inventory for the Mountaineer Plant indicated information on one other groundwater well located within a 0.5-mile buffer of the Site (Banks, 2014) (**Appendix B**). The well is registered with the United States Geological Survey and is assumed to have been used for monitoring. The well is located approximately 3,700 feet east of the BAPs.

3. ISOLATION FROM THE UPPERMOST AQUIFER

Per 40 CFR 257.60(a), new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must be constructed with a base that is located no less than 1.52 meters (5 ft) above the upper limit of the uppermost aquifer, or must demonstrate there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high conditions).

3.1 Uppermost Aquifer and Piezometric Analysis

3.1.1 Piezometric Analysis

3.1.1.1 Horizontal and Vertical Position Relative to CCR Unit

The uppermost unconsolidated aquifer consists of the saturated alluvial sediments beneath and surrounding the Site. The upper limit of the uppermost aquifer is defined by the water table elevation in the unconfined sand and gravel deposits, which ranges from approximately 543 to 556 ft amsl in the immediate vicinity of the BAPs. The base elevation of the BAPs (i.e. bottom of clay liner) is estimated to be approximately 586 to 597 ft amsl (Woodward-Clyde, 1985). Based on this information, there appears to be at least 30 ft of separation between the top of the saturated sand and gravel zone and the base of the CCR Unit, which is illustrated in cross section A-A' (**Figure 5**).

The vertical extent of the aquifer likely extends to the base of the unconsolidated deposits in the valley to the bedrock interface. There are no significant clay or silt layers within the aquifer. The saturated thickness of alluvial deposits is at least 20 to 30 ft, and likely greater where alluvial deposits are thickest. The uppermost unconsolidated aquifer appears laterally extensive in all directions around the BAPs. The uppermost aquifer pinches out towards the bedrock valley wall to the west. The soil liner beneath the ponds limits hydraulic connection of the BAPs to the subsurface.

3.1.1.2 Overall Flow Conditions

Regional groundwater recharge occurs from precipitation infiltration and from leakage from tributary streams crossing the Ohio River floodplain. Bedrock, to a lesser extent, likely contributes recharge of the uppermost unconsolidated aquifer from the west of the Site where the alluvial valley is in contact with the valley wall.

Available groundwater elevations are summarized on **Table 1** for 1997 through 2016. Current groundwater flow conditions that includes influence from groundwater pumping at the Mountaineer Plant was evaluated using the U.S. EPA's Wellhead Analytical Element Model (WhAEM2000; Kraemer et al., 2007). Results of the current understanding of groundwater flow from the model under current pumping conditions and BAP use is shown on **Figure 6**. Groundwater flow direction as depicted is predominantly north to northeast towards the Plant pumping wells and the Ohio River. As presented in **Table 2**, wells included in the monitoring network have been designated as up or down gradient.

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Vertical hydraulic gradients in the immediate vicinity of the BAPs are generally upwards. Groundwater elevations measured on September 26, 2016 indicated upward vertical hydraulic gradients ranging from 6.0×10^{-4} ft/ft (MW-1605S/MW-1605D) to 9.9×10^{-3} ft/ft (MW-1604S/MW-1604D). A downward vertical gradient of 1.8×10^{-3} ft/ft was measured at the MW-1606S/MW-1606D well pair.

3.1.2 Uppermost Aquifer

3.1.2.1 CCR Rule Definition

Per 40 CFR 257.60(a), new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must be constructed with a base that is located no less than 1.52 meters (5 ft) above the upper limit of the uppermost aquifer, or must demonstrate there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high conditions).

The CCR rule definitions for an aquifer and the uppermost aquifer as specified in 40 CFR 257.53 indicates an aquifer is a geologic formation capable of yielding usable quantities of groundwater to wells or springs while an uppermost aquifer is defined as the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers, that are hydraulically interconnected with this aquifer within the facility's property boundary. Upper limit is measured at a point nearest to the natural groundwater surface to which the aquifer rises during the wet season.

3.1.2.2 Common Definitions

An aquifer is commonly defined as a geologic unit that stores and transmits water (readily or at sufficient flow rates) to supply wells and springs (USGS, 2015; Fetter, 2001). The uppermost aquifer is considered the first encountered aquifer nearest to the CCR unit.

3.1.3 Identified Onsite Hydrostratigraphic Unit

The identified Site hydrostratigraphic unit is the unconsolidated alluvial aquifer consisting of unconfined sands and gravels. This aquifer is used locally for groundwater supply related to plant operations, but is not known to provide other private or industrial water use in the area.

3.2 Compliance with Isolation Distance

The estimated base of the CCR unit is estimated to be approximately 586 to 597 ft amsl, based on the depth of the bottom of the 3-feet of clay liner beneath the BAPs (Woodward-Clyde, 1985). The highest observed water level in the immediate vicinity of the BAPs is 556.42 ft amsl, measured in October 1997 at MW-5. Based on this review of historical data, there is nearly 30 ft of separation between the upper limit of the uppermost aquifer and the estimated base of the CCR unit. This is illustrated in cross section A-A' (**Figure 5**). This CCR unit meets the location restriction for separation of 5 ft from the uppermost aquifer.

4. WETLANDS

CCR Rule 40 CFR Part 257.61 requires that existing and new CCR surface impoundments must not be located in wetlands.

4.1 Local Wetlands

Based on the August 12, 2015 site visit and review of available published information, the BAPs are not located within any areas that exhibited wetland characteristics that would be classified as a regulated wetland. There was one potential wetland area, Little Broad Run, observed to the west of this CCR unit. Little Broad Run is located adjacent to the southwest embankment on the west side of the gypsum conveyor and discharges into the Ohio River (**Figure 3** and **Figure 7**). Photos of these areas are included in **Appendix C**.

4.2 Compliance with Wetland Restrictions

Based on the August 12, 2015 site visit and review of available information, the BAPs are not located within wetlands. Therefore, this CCR unit meets the location restriction regarding wetlands.

5. FAULT AREAS

CCR Rule 40 CFR Part 257.62 requires that existing and new CCR surface impoundments must not be located within 200 ft of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates that the alternate setback will prevent damage to the structural integrity of the CCR unit.

5.1 Description of Regional Geologic Structural Features

The Parkersburg Syncline is the predominant regional structural feature in the vicinity of the Site. The axis of the syncline is located approximately 11 miles east-southeast of the Site and it trends northeastward. Regionally, bedrock dips gently to the east-southeast towards the axis of the syncline. Locally, however, bedrock dip is essentially flat lying and is affected by isolated anticlines and mild upwarping of the bedrock strata (EPRI, 1999).

5.2 Compliance with Fault Area Restrictions

A review of available geologic reports and maps has indicated that the Site is not located near any faults with displacement in the Holocene. **Figure 8** presents a map depicting known faults in the region, all of Paleozoic age (USGS, 2005; WVGES, 2013). As shown on the figure, the nearest faults that do exist are at least tens of miles from the site. Therefore, the CCR units at this Site meet the location restriction for faults.

6. SEISMIC IMPACT ZONE

CCR Rule 40 CFR Part 257.63 requires that existing and new CCR surface impoundments must not be located within a seismic impact zone unless the owner or operator demonstrates that all structural components of the CCR unit are designed to withstand the maximum horizontal acceleration in lithified earth material for the Site.

6.1 Definition of Seismic Impact Zone

CCR Rule 40 CFR Part 257.53 defines a seismic impact zone as an area having a 2% or greater probability that the maximum horizontal acceleration expressed as a percentage of the earth's gravitational pull (g) will exceed 0.10 g in 50 years.

6.2 Compliance with Seismic Impact Zone Restriction

Figure 9 presents the map of the peak ground acceleration with a 2% probability of exceedance in 50 years for West Virginia, as published by the United States Geological Survey (USGS) Earthquake Hazards Program (USGS, 2014). As shown on **Figure 9**, the Site falls within the zone having a maximum horizontal acceleration of 0.06 to 0.1 g. Therefore, the CCR unit meets the location restriction for seismic impact zone.

7. UNSTABLE AREAS

CCR Rule 40 CFR Part 257.64 requires that existing and new CCR surface impoundments must not be located within an unstable area unless the owner or operator demonstrates that the design of the unit will ensure the integrity of the structural components of the unit.

7.1 Definition of Unstable Area and local Conditions

7.1.1 CCR Rule Definition

CCR Rule 40 CFR Part 257.53 defines an unstable area as a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of the CCR unit. These may include poor foundation conditions, areas susceptible to mass movements (landslides), and karst terrains.

7.1.2 Poor Foundation Soils

Several investigation and stability reports have been prepared for the BAPs. Woodward-Clyde Consultants performed an assessment of dam safety for the BAPs and concluded that the pond conditions and stability were satisfactory (Woodward-Clyde, 1985). There were additional embankment stability analyses performed in 2006 and 2009 by H.C. Nutting and Shaw, Stone, and Webster. The 2006 and 2009 H.C. Nutting reports consisted, in part, of compaction testing of embankment soil, laboratory soil analysis, and numerical stability modeling (H.C. Nutting, 2006a; H.C. Nutting 2006b; H.C. Nutting 2009). The Shaw, Stone, and Webster analyses performed in 2006 and 2009 consisted of 2-dimensional modeling of seismic and static loading (Shaw, Stone, and Webster, 2006; Shaw, Stone, and Webster, 2009). These reports conclude that the embankments exhibit acceptable factors of safety and that the underlying foundation soils are not susceptible to liquefaction.

7.1.3 Mass Movements

The BAPs are located within the valley floor area, and is therefore not an area subject to mass movements. **Figure 10** presents a map of known landslide activity in the area. This figure supports the conclusion the BAPs are not located within an area susceptible to mass movements (USGS, 1978).

7.1.4 Karst

Figure 11 presents a map of known karst features in West Virginia. As shown on this figure, the BAPs are not located in a karst area.

7.1.5 Subsurface Mining

The Redstone Coal unit is the only coal member in the immediate vicinity of the Site with previous mining activity. There are inactive underground mine workings located beneath the southern corner of the BAPs, and the depth to the coal seam is approximately 150 ft below ground surface (Figure 3).

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In 2005, GAI Consultants, Inc. performed stability analysis associated with previous mining activities associated with the Redstone Coal (GAI, 2005). As part of this investigation, GAI reviewed existing boring logs and rock cores, performed point load strength testing of core samples, and performed stability calculations of mine pillars and ground movement from proposed future mining operations. GAI concluded that the Site is not expected to experience adverse impacts from past or future mining of the Redstone Coal.

7.2 Compliance with Unstable Areas Restriction

Based on the Site visit and review of available information, the BAPs are not located within unstable areas. Therefore, this CCR unit meets the location restriction requirements for unstable areas.

8. SUMMARY, CONCLUSIONS, AND PE CERTIFICATION

I, John W. Holm, certify that this report was prepared under my direction and supervision, and that the information contained herein is true and accurate to the best of my knowledge. Based on my experience and knowledge of the Site, as well as the evaluations discussed within this report, the Mountaineer BAPs meet the CCR surface impoundment location restrictions of 40 CFR Part 257 for separation from the uppermost aquifer, wetlands, fault areas, seismic impact zones, and unstable areas.

John w Holm Printed Name of Registered Brotessional Engineer NW. HO Signature 27/16 1241 alswallow State Registration No. Re Date

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arcadis.com

ASH POND SYSTEM-CCR LOCATION RESTRICTION EVALUATION

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TABLE



FIGURES



APPENDIX A

Boring/Well Construction Logs



APPENDIX B

Banks Well Inventory Report



APPENDIX C

Photographic Log





Arcadis U.S., Inc.

100 E Campus View Boulevard Suite 200 Columbus, Ohio 43235-1447 Tel 614 985 9100 Fax 614 985 9170

www.arcadis.com

TABLE



Table 1 Water Level Data AEP Mountaineer Generating Plant - Bottom Ash Ponds New Haven, West Virginia

	5/1/1997	8/1/1997	12/1/1997	7/1/2008	10/1/2008	1/1/2009	4/1/2009	12/1/2009	3/10/2010	6/10/2010	9/10/2010	12/1/2010	4/1/2011	11/1/2011	6/12/2012	12/17/2012	6/11/2013	12/3/2013	6/10/2014	12/16/2014	6/9/2015	9/26/2016
Well ID	GW Elev. ^a	GW Elev. ^a	GW Elev. ^a	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.	GW Elev.
	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl	ft. amsl
Gravel Zone Wells																						
Downgradient																						
MW-001	NA	542.19	542.41	542.20	541.13	541.79	542.69	541.18	545.06	541.51	539.81	542.78	544.6	540.8	540.70	541.75	540.91	540.52	541.66	540.80	541.35	539.25
Sand Zone Wells																						
Upgradient																						
MW-1601A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	544.58
MW-1602	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	544.76
MW-1603	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	543.67
MW-1608	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	541.35
Downgradient																						
MW-002	NA	541.76	542.30	541.87	540.91	541.56	542.73	541.39	545.59	541.43	539.74	542.96	544.79	540.67	540.58	541.84	540.87	540.57	541.5	540.80	541.2	539.95
MW-003	NA	554.86	553.42	NA	NA	NA	NA	NA	NA	NA	545.18	545.06	dry	dry	dry	dry	dry	dry	dry	dry	dry	NA
MW-004	NA	541.65	542.19	541.74	540.79	541.46	542.63	541.26	545.54	541.34	539.71	542.81	544.65	540.59	540.48	541.77	540.76	540.44	541.42	540.67	541.14	540.15
MW-005	NA	556.42	555.05	NA	550.17	548.62	547.57	545.85	547.79	545.84	544.57	544.68	544.3	544.61	544.54	dry	545.14	544.66	545.84	544.17	545.71	NA
MW-016	NA	NA	NA	548.13	546.38	545.37	543.89	541.09	541.09	541.3	540.25	541.45	542.15	542.01	542.03	540.08	543.26	541.62	543.08	541.32	543.30	541.30
JTMN-1	NA	541.80	542.66	541.13	540.10	540.03	541.56	540.48	544.39	540.19	539.06	542.15	542.88	539.63	539.43	540.84	540.42	539.97	540.38	539.93	540.20	539.40
JTMN-2	NA	542.61	543.40	541.35	540.35	540.20	541.50	540.30	544.18	540.04	538.99	541.95	542.77	539.53	539.32	540.65	540.38	539.90	540.30	539.84	540.15	539.24
MW-1604S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	542.54
MW-1604D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	542.74
MW-1605S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	542.51
MW-1605D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	542.52
MW-1606S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	543.19
MW-1606D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	543.15
MW-1607S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	543.52
MW-1607D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	543.56
<u>Piezometers</u>																						
Downgradient																						
PZ-09-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	592.65
PZ-09-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	572.23
PZ-09-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	561.61
Sporn Wells ^b																						
MW-006	NA	551.48	551.13	NA	NA	NA	NA	NA	601.00	542.64	541.23	543.08	543.28	541.67	541.17	541.02	542.61	541.83	542.50	541.58	542.18	541.20
MW-008	NA	543.58	544.46	NA	NA	543.94	545.45	543.82	550.26	527.28	542.01	545.23	546.45	542.46	542.03	543.71	542.25	542.52	543.41	542.75	542.62	NA
MW-009	NA	543.48	544.33	535.64	534.40	535.63	537.16	535.78	540.94	536.16	533.90	537.27	538.38	534.39	533.93	535.86	533.97	534.45	536.35	534.75	534.45	540.97
MW-011	NA	557.51	554.95	NA	NA	552.21	551.04	551.46	556.52	570.44	552.17	551.79	552.4	547.43	548.34	547.86	547.05	549.22	550.05	547.99	547.67	NA
MW-013	NA	541.24	541.69	NA	NA	NA	NA	NA	581.21	542.99	540.47	544.18	545.81	540.36	540.82	542.90	540.92	541.22	542.40	541.61	541.41	540.33
MW-014	NA	540.14	541.70	NA	NA	NA	NA	NA	588.44	542.49	540.11	543.97	545.75	540.59	540.12	542.36	540.56	539.84	541.48	541.11	540.83	540.08

Notes:

a. Source: EPRI. June 1999. Groundwater Quality at the Philip Sporn and Mountaineer Power Plants, Mason County, West Virginia

b. Sporn wells used for the simulated groundwater flow model only. Sporn wells are not used for the CCR well network.
 Elevation in feet above mean sea level

Unless otherwise noted, water level data collected during AEP well gauging events

amsl - above mean sea level

Elev - elevation

ft - feet

GW - groundwater NA - not available



FIGURES















AEP MOUNTAINEER GENERATING PLANT - BOTTOM ASH PONDS GRAHAM STATION ROAD NEW HAVEN, WEST VIRGINIA

REFERENCE: CROSS SECTION MODIFIED FROM EPRI, 1999.

NOTE: 1. BASE OF BOTTOM ASH PONDS BASED ON AEP DWG. No. 1-3018A-7.

VERTICAL SCALE: 1 - INCH = 20 - FEETHORIZONTAL SCALE: AS SHOWN


Last Created By: K.Iv ineer Ash Pond) CITRIX Div/Group: IM/DV 15976.0009.00001 (Mountaii SPROJECTS_ENV\AEP\M

NOTES: 1. 2015 AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE 2. TOPOGRAPHY FROM AEP DRAWING MTLF_3-20-12_2729SF.DGN 3. MW-001 THROUGH MW-005 WELL COORDINATE SOURCE: GROUNDWATER QUALITY AT THE PHILIP SPORN AND MOUNTAINEER POWER PLANTS, MASON COUNTY, WEST VIRGINIA, EPRI, JUNE 1999 (WEST
 VIRGINIÁ 1983 STATE PLANAR COORDINATES) 4. MONITORING WELL COORDINATES FOR MW-1601A THROUGH MW-1608 WERE SURVEYED BY AEP IN SEPTEMBER 2016 (WEST VIRGINIA 1927 STATE PLANAR COORDINATES) 5. ALL OTHER WELL LOCATIONS ARE BASED ON AEP-PROVIDED BORING LOGS (WEST VIRGINIA 1983 STATE PLANAR COORDINATES)
0 1,000 2,000
GRAHAM STATION ROAD NEW HAVEN, WEST VIRGINIA
ARCADIS FIGURE 6













APPENDIX A

Boring/Well Construction Logs





Casagrande Consultants 1977

Soil Boring Logs

401 to 415, 505, 506, 513, 514, 701 to 703, 801 to 803

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AMERICAN ELECTRIC POLER SERVICE CORFORMION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

ompany roject Locati	y <u>App</u> Pro on of Bo	alachian ject 1301 pring:	Power C L - Ash	ompan Ponds	<u>y</u>		Boring No. <u>401</u> Date <u>1-21-77</u> Sheet <u>1</u> of <u>3</u> Type of Boring <u>Auger</u> Rig <u>B-50</u> Casing used <u>Size</u> Drilling mud used Boring begun <u>1-21-77</u> Boring completed <u>1-24-77</u>
Nater I	_evel	47'				Ground Elevation 596.14 referred to Date	
<u>Time</u> Date		1-24-7	77			Field Party: King and Smithson	
Depth af Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	1	3.5-5	5/ 640	14"			Medium brown clayey silty sand.
	2	8.5-10	5/ ₅	6"	- 7 - - 8 - - 9 - - /0 - - /1 - - /2 -		Same as sample number 1.
	3	13.5-15	5/ 6/ ₆	6''	/3 - /4 - /5 - /6 -		Same as sample number 1 but more sandy.
	4	18.5-20	16/ 17/ ₁₈	4"	/7 - /8 - /9 - .20 -		Sand and gravel. Large gravel in end of spoon.
							Engineer

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.							
Compan	У						Boring No. <u>401</u> Date <u>1-24-77</u> Sheet <u>2</u> of <u>3</u>
Project					-		Type of BoringRig
Locat	ion of Bo	pring:					Casing used Size Drilling mud used
							Boring begun Boring completed
Water	Level						Ground Elevation Telefield to Datum
Time		<u> </u>					Field Party: King and Smithson
Date		<u>l</u>		·			
Depth af Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
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					E-21-		
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			101		E 24 -	1//	//
			25/			11/	Medium brown coarse snd and gravel.
	5	23.5-25	24	10''	- 25 -	11/2	
		a de la					
					- 26 -		
					F	1	
					$F^{2'}$ -	1	
					E 28 -		
					F -	H_{7}	77
				<u> </u>	- 29 -	11/	
	6	28 5-29	45/	6 ⁿ	E_ =	12	Dense sand and gravel.
	0	20.3 23.	1		+ ³⁰ -		
				· ·	Fn		
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			L	ļ	- 32 -		
						41	
 					-33-	-	
	a the second				==	11/	
			14/	†	E	3V/	//
	7	33.5-35	17/21	10"	- 35 -	±1/4	More sand.
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	0	29 5 10	16/		[][/	Sama as sample number 7
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		·	<u> </u>	<u> </u>	1-	-11	
a a ba	[김 명이		1.1				Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job N	0.					LUG	OF BORING
Compa	any						Boring No. 401 Date 1-24-77 Sheet 3 of 3
Projec	ct		-				Type of BoringRig
Loca	ation of I	Boring:				Casing used Size Drilling mud used	
Water	r Level						Ground Elevation referred to
Time							Dat
Date							Field Party: King and Smithson
	Ŷ	ta ta	o u o o	n of ople	DEPTH	ЧЧ	DESCRIPTION
th o		e de m-to feet)	trati stan stan	eng ti san	IN	G R /	Soil type, color, texture, consistency, sampler driving notes,
C Def	Samp	fro fro	Sta Sta ene Resi	ot. je cov.	FEET	5	blows per toot on casing, depths wash water lost, observed
		Ň		<u>⊢ 2</u>		- N	indeductions in water level, notes on anning ease, etc.
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					$E_{41} =$		
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[$E_{43} =$		
					=	 	
			15/	+	44		
<u> </u>	9	43.5-45	197	14"	E 45 -	V/A	Wet medium brown sand and gravel.
					F		
			+	1	- 46 -		
-	-				E 47 =		Water
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					E / 8 -		
			15/	ļ	E 49 I	V_{λ}	
	10	48.5-50	20/	16"	E]		More sandy.
			-		E°∃		
				ļ	E-51-]		
					E' 3		Washed out 3' plug in augers.
	-				- 53 -		
					E_{54}	1/1	
	11	53 5-55	23%	Q11		VA-	Como en 2001 10
	<u> </u>	55.5-55	2.9	0	- 55 -	14	Same as sample number 10.
					ESGE		
						-	
	<u>en de la constan</u> Se puede a constante				57		Washed out 2' plug in augers.
					E (8 -		
		F.O. F. 40	32/	· · · · ·	59-		
	12	58,5-60	10/23	10"	E 60 =	4	Medium brown sand and gravel w/sandstone fragments
							scopped noge at 60.0' 1-24-77
					- 1-		
			•				Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No.				~ ·			
Compan	у	ppalachia	n Power	Compa	iny		Boring No. <u>402</u> Date <u>102876</u> Sheet <u>1</u> of <u>3</u>
Project	P:	roject 13	01 - Pr	oposed	ASN P		Casing used Size Drilling mud used
Locat	ion of B	oring:					Boring begun 10-28-76 Boring completed 10-28-76
Water	Level	45.5	i jî	11			Ground Elevation 597.40' referred to
Time			7				Datu
Date		1					Field Party: <u>Roush and Reltmire</u>
		Ę	5.5	p e	DEPTH	Hd	DESCRIPTION
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	3	13-14.5	4/4	13"	E 14 -	H	Medium brown clayey fine sand.
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	4	18-19.5	10	14"	E /0	EV.	Same as sample number 3
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		1			<u> </u>		Engineer

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AMERICAR ELECTION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Company Bring No. 402 Date $10-28$, Sheel 2, of 3 Project Excision of Boring: Type of Boring Used Stree Drilling and used Boring Legan Boring completed $\frac{1}{2}$ The Boring Legan Boring completed $\frac{1}{2}$ The Boring Legan Boring Legan Boring Complete $\frac{1}{2}$ $\frac{2}{3}$ $\frac{2}{3}$	IOD NO.							
Priject de Baring: Water Levei 43.5' Time 2 Date 45.5' Time 2 Date 45.5' Time 2 Date 55 23-24.5 $r_{17/5}^{17}$ 12" r_{17}^{17} 13" r_{17}^{17} 14" r_{17}^{17} 14" r	Compan	У		<u></u>			<u>.</u>	Boring No. <u>402</u> Date <u>10-28-76</u> Sheet <u>2</u> of <u>3</u>
Lacation of ISOMB: Water Level 45.5" Time 5 Date 1 Time 5 Date 1 Date 1	Project		<u></u>					Casing used
Water Level 45.5* Ground Flevation	Locat	ion of Bo	oring:					Boring begun Boring completed
Time Date $ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Water	Level	45.5					Ground Elevation referred to
Date $\frac{2}{3}$ $\frac{2}{9}$	Time							Datum
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$]	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						モリヨ		
5 $23-24.5$ 77_{71}^{5} 12^{n} 74^{-1} Medium brown sand and gravel. 7 37^{-1} 76^{-1} 77^{-1} 78^{-1} 78^{-1} 6 $28-29.5$ $77_{8/10}$ 13^{n} 79^{-1} 78^{-1} 6 $28-29.5$ $77_{8/10}$ 13^{n} 79^{-1} 78^{-1} 7 $33-34.5$ $10^{1}_{14}^{17}$ 14^{17}_{17} $78^{-1}_{14}^{-1}$ 83^{2} 8 $38-39.5$ 15^{1}_{13} $1^{n}_{14}^{-1}$ $59^{-1}_{14}^{-1}$ $58^{-1}_{14}^{-1}$ 8 $38-39.5$ 15^{1}_{13} $1^{n}_{14}^{-1}$ $59^{-1}_{14}^{-1}$ $58^{-1}_{14}^{-1}$ 8 $38-39.5$ 15^{1}_{13} $1^{n}_{14}^{-1}^{-1}^{-1}_{-14}^{-1}^{-1}_{-14}^{-1}_{$						- 12 -		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$]]	
5 $23-24.5$ n''_5 $12''_5$ $j4$ 6 $28-29.5$ n''_6 $j6$ $j6$ $j7$ $j8$ $j7$ $j6$ $j7$ $j8$ $j7$ $j7$ $j8$ $j7$ $j7$ $j8$ $j7$ $j7$ $j8$ $j7$ $j8$ $j7$ $j8$ $j7$ $j8$ $j7$ $j7$ $j8$ $j7$ $j7$ $j8$ $j7$ $j7$ $j7$ $j7$ $j7$ $j7$ $j7$ $j7$ $j7$ $j3$ $j7$ $j3$ $j37$ $j7$ $j3-34.5$ 10^{14} $j7$ $j37$ $j37$ $j7$ $j37$ $j37$ $j7$ $j37$ $j37$ $j7$ $j7$ $j37$ $j7$ $j38$ $j38$ $j8$ $j8-39.5$ $j15'_{13}$ $j8$ $j8-39.5$ $j15'_{13}$ $j70$ $j1$ <t< td=""><td></td><td>A</td><td></td><td>7/7/</td><td></td><td>+ 23 -</td><td>10</td><td>/</td></t<>		A		7/7/		+ 23 -	10	/
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		5	23-24.5	<u> </u>	12"	E 14 -		Medium brown sand and gravel.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						E -	11/	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						- 25 -		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						E 16 -		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-			· ·		E -		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						- 17 -		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						E 28 -		
6 $28-29.5$ 0710 13^{11} 29 30 30 30 30 31 32 31 $33-34.5$ $10/4/7$ 14^{11} 34 Same as sample number 6 w/more gravel. 7 $33-34.5$ $10/4/7$ 14^{11} 34 Same as sample number 6 w/more gravel. 35 36 36 38 $38-39.5$ $9/15/3$ 1^{11} 8 $38-39.5$ $9/15/3$ 1^{11} 59 538 538 1 38 $38-39.5$ $9/15/3$ 1^{11} 59 538 1 1 59 538 $38-39.5$ 116 10			00 00 F	7/			11/	Medium brown sand w/trace of gravel.
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		6	28-29.5	<u> </u>	13"	- 19 -	3V	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			1			E 30 -	1	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						Ę :	41	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ļ				+	- 31 -]	
7 $33-34.5$ $10/7$ $33-34.5$ $10/7$ $33-34.5$ $14/7$ $14''$ 34 Same as sample number 6 w/more gravel. 7 $33-34.5$ $14/7$ $14''$ 34 Same as sample number 6 w/more gravel. 35 36 36 36 38 $38-39.5$ $515/3$ $1''$ 8 $38-39.5$ $15/73$ $1''$ 39 $5ame$ as sample number 6 - Large gravel in end of spoon.								
7 $33-34.5$ $10/4/17$ $14''$ 34 Same as sample number 6 w/more gravel. 35						F- 1-		
7 $33-34.5$ $14\frac{4}{17}$ $14^{\prime\prime}$ $= 34$ Same as sample number 6 w/more gravel. 35 $= 36$ $= 36$ $= 36$ $= 36$ $= 36$ 38 $38-39.5$ $9\frac{15}{13}$ $1^{\prime\prime}$ $= 38$ $= 38$ $= 38$ 8 $38-39.5$ $15\frac{1}{13}$ $1^{\prime\prime}$ $= 39$ $= 38$ $= 38$ $= 40$ $= 1$ $= 1$ $= 1$ $= 1$ $= 1$				10/		- 33 -	317	
$ \begin{array}{c} 35 \\ -36 \\ -36 \\ -37 \\ -38 \\$		7	33-34.5	14/17	14"		3V	Same as sample number 6 w/more gravel.
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				1		F .	412	4
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$								
8 38-39.5 13 1'' 59 1 59						E = 6 -]	
$8 38-39.5 15/13 1'' 59 53me \text{ as sample number } 6 - \text{Large gravel in end} \\ 6 50 50 50 50 50 50 50 $							-11	
8 $38-39.5$ $15/_{13}$ 1" $38{13}$ $38{13}$ $38{13}$ 1 " $39{13}$ Same as sample number 6 - Large gravel in end of spoon.						-1-37-	ᅴ	
8 38-39.5 15/13 1" 59 Same as sample number 6 - Large gravel in end of spoon.						E-se	-11	
8 38-39.5 13 1" - 39 - Same as sample number 0 - Large gravel in end of spoon.				P15/		E -	3V	A Same as sample number 6 - Large groupl in and
		8	38-39.5	13	1"		31/	of spoon.
						E	= ~	
			-	1		Ē.	-	
	.					+ 1-	=]	
Engineer								Engineer

AEPMTP-000452

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AMERICAN ELECTRIC FORER SERVICE SORTORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

lob No.							
Company	У					÷	Boring No. 402 Date 10-28-76 Sheet 3 of 3
Project							Casing used Size Drilling mud used
Locati	on of Bo	ring:					Boring begun Boring completed
Water	_evel	45.5					Ground Elevation referred to Datum
Time							Field Party: Roush and REitmire
Date			1		T	TI	
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPI	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
			·				· · · · · · · · · · · · · · · · · · ·
					-4^{-4}		
			9/61		- <i>4</i> 3 -		
	9	43-44.5	8			ľ	No recovery.
	******				- 45 - 		Water
					- <i>f</i> 7 -		
	10	48-49.5	^{6/} 9/ ₁₁	13"	48-		Medium brown sand w/trace of gravel.
	11	53-54.5	7/ _{8/10}	12"	53-		Same as sample number 10.
					<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>		
-			•				
	12	58-59.5	^{8/} 11/ 12	11"	59-		Same as sample number 10 Stopped hole at 59.5' 10-28-76
					1 -		Engineer

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AMERICAN ELECTRIC POWER SERVICE CORTORATION

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

ob No.				~ • • • •			100 p. (
Company	y <u>App</u>	alachian	Power (Company	y		Boring No. 403 Date 10-29-76 Sheet 1 of 3
Project	PE0	ject 1301	- Proj	posed 1	ASII POI		Casing used Size Drilling mud used
Locati	on of Bo	ring:					Boring begun 10-29-76 Boring completed 10-29-76
Water I	_evel	50.5					Ground Elevation 591.09 referred to
Time							Field Party: Roush and Reitmire
Date							
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	1	34.5	4/ 5/ ₇	17"			Medium brown clayey silt.
	2	8-9.5	4/ _{3/4}	13"	8		Same as sample number 1.
	3	13-14.5	⁶⁷ 7/ ₆	13"	/1 /2 //2 //2 //2 //2 //2 //2 //2 //2 //		Same as sample number 1. Medium brown, medium grain sand and gravel.
	4	18-19.5	4/ _{5/5}	12"			Same as sample number 3 w/less gravel.
			<u> </u>	<u></u>	1	11	Engineer
8							

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

Jab No. Boring No. 403 Date 10-29-76 Sheet 2 of 3 Company Type of Boring ______ Rig_____ Casing used _____ Size ___ Drilling mud used _____ Project Casing used _____ Size ____ Drifting into a _____ Boring begun _____ Boring completed _____ Ground Elevation _____ referred to _____ Datum Location of Boring: 50.5 Water Level Time Field Party: Roush and Reitmire Date Tot. length of recov. sample GRAPH DESCRIPTION Sample depth from-to (in feet) Standard Penetration Resistance Blows/Foot DEPTH Sample No. بة بر Soil type, color, texture, consistency, sampler driving notes, Depth of Casing, f IN blows per foot on casing, depths wash water lost, observed FEET SOIL fluctuations in water level, notes on drilling ease, etc. 20 --21 -- 22 -23. 5/ 5/4 Medium brown, medium grain sand w/trace of gravel. 23-24.5 12" 5 24 - 25 -26 27 28 -5/7 12" 28-29.5 Same as sample humber 5 w/medium and fine grain 6 29 gravel. 30 -31-32 33 67 6/8 Same as sample number 5 w/more gravel. 33-34.5 7 12" .34 35 -36 · 37 5/-8/12 - 38 -Same as sample number 7. 38--39.5 8 13" 39-40 Engineer ___

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AMERICAN ELECTRIC POWER SERVICE CORFORATION

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

0 140.							Deving No. 403 Date 10-29-76 Sheet 3 of 3
mpany	y			<u></u>			Type of BoringRig
ocati	on of Bo	pring:					Casing used Size Drilling mud used
		50.5				Boring begun Boring completed Boring Crowned Elevation	
Vater Level 50.5							
ate							Field Party: <u></u>
			5 0 +	e e	DERTH	H	DESCRIPTION
Casing, ft.	Sample No.	Sample dept from-to (in feet)	Standord Penetration Resistance Blows/Foo	Tot. length recov. samp	IN FEET	SOIL GRAI	Soil type, color, texture, consistency, sampler driving notes blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	<u></u>		-		<i>⊑ 4</i> 0 <u>−</u>		
					- 41 -		
		ļ				1	
					E^{q_2} =		
			8/		- 43 -	1///	
	9	43-44.5	13/	14"	E 14]///	Light brown.medium grain sand w/trace of gravel.
					⊨"-	11″	
					- 45 -		
					46 -		
					<u> </u>	1	
					- 47 -		
					<u>ـ</u>	11-,-	
	10	10 10 5	9/	1 -17		1 <i>\//</i>	Medium brown sand and gravel.
	10	48-49.5	19	15.][//	
					E_{0}		Via to se
					E		
				<u> </u> -	+- 51-	1	
				<u> </u>	E (2 -		
			7/		E^{j_3}		
	11	53-54.5	1013	0	- 54 -	1//	No recovery.
][/	
		1					
		·	-		- 56 -		
					EAT		
			1		E)' -		
			B/		<u>-</u> 58 -	17	
	12	58-59.5	11/12	13"	EG	31//	Medium and dark brown sand and gravel.
					<u>-</u>] //	<u>Stopped hole at 59.5</u>
				<u> </u>	F6-		10-27-70
				<u> </u>	E,		
							Engineer
		<u> </u>	<u> </u>	J			

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AMERICAN ELECTRIC POWER SERVICE CORTORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.					•		
Compan	y	ppalachia	an Power	c Compa	any		Boring No. <u>404</u> Date <u>10-28-76</u> Sheet <u>1</u> of <u>3</u>
Project	P	roject 13	301 - Pr	oposed	Ash P	ond	Area Type of Boring Auger Rig B-61
Locat	ion of Bo	oring:					Casing used Size Drilling mud used Boring begun 10-28-76 Boring completed 10-28-76
Water	Level	47.0)'				Ground Elevation 600.27 referred to
Time							Datum
Date	<u></u>	<u> </u>					Field Party: Roush and Reitmire
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc. Boring off set about 15' east because of
							corn field.
	1	3-4.5	³⁷ 4/ ₆	17"			Medium brown silty clay.
	2	8-9.5	³⁷ 6/ ₈	13"	7 8 9 70 70 70 70		Same as sample number 1.
	3	13-14.5	^{3/} 4/6	7"	/2 - /2 - /2 - /2 - /2 - /2 - /2 - /2 -		Medium brown clayey sand.
	4	18-19.5	6/ 5/ ₈	12"	/6 /7 /8 /9 20		Medium brown sand and gravel.
					•		Engineer
£			L	L	4		······

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No	•				-		
Compar	ıy						Boring No. 404 Date 10-28-76 Sheet 2 of 3
Project	<u>t</u>						Type of Boring Rig
Locat	tion of B	oring:					Boring beaun Boring completed
Water	Level	47.0'				Ground Elevation referred to	
Time						Datum	
Date		1					Field Party: Koush and Relumire
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					-20-		
			ļ		- 22 -		·
			5/01		E^{23}	\overline{V}	
	5	23-24.5	³⁷ 9	12"	E_24 -		Medium brown fine sand and gravel,
						#2	
					E-26 -		
					- 57 -		
					- 78 -		
	c	20 20 5	6/5	1111			Same as sample number 5.
	0	20-29.5			- 29 -		
					E 30 -		
		<u> </u>		<u> </u>	- 31 -		
					= 32 =		
			4/ - /		33	17	
	7	33-34.5	5/5	7"	E 34 -		Medium brown fine sand w/trace of gravel.
						11//	
					-35-		
				 	E-36 -		
					E -		· · · · · · · · · · · · · · · · · · ·
					- 37 -	1	
			1.0/		E 38 -	1	
	0	29. 20 5	12/	1/11		1//	Same as sample number 7 w/light brown sand
	0	50-39.5	1	14"			
					E40=	1	
						1	· ·
	<u> </u>	-	1		+- 1-		<u> </u>
				<u> </u>	<u> </u>		Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

Job No. Boring No. <u>404</u> Date <u>10-28-76</u> Sheet <u>3</u> of <u>3</u> Company _____ Type of Boring ______Rig_____ Casing used______ Size_____ Drilling mud used ______ Project ____ Location of Boring: Boring begun _____ Boring completed _____ Ground Elevation _____ referred to _____ Datum 47.0' Water Level Field Party: Roush and Reitmire Time Date Tot. length of recov. sample GRAPH DESCRIPTION Sample depth from-to (in feet) Standard Penetration Resistance Blows/Foot DEPTH Depth of Casing, ft. Sample No. Soil type, color, texture, consistency, sampler driving notes, IN blows per foot on casing, depths wash water lost, observed SOIL FEET fluctuations in water level, notes on drilling ease, etc. 40 -41 -. 42 43 57_{8/3} Medium brown fine sand w/trace of gravel. 13" 43-44.5 9 44 45 46 Water 17 48 4/ 6/9 Same as sample number 9. 10 48-49.5 14" 50 51 52 3/_4/ 6 53 -Same as sample number 9 w/medium grain sand. 53-54.5 18" 11 54. 55 56 57 . 58 47 7/<u>8</u> 58-59.5 12 No recovery. 59 Stopped hole at 59.5' 60-10-28-76 Engineer __

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AMERICAN ELECTRIC FUNER SERVICE CURPURATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.	ويوري والمحافظة المحافظة والمحافظة والمحافظة والمحافظة والمحافظة والمحافظة والمحافظة والمحافظة والمحافظة والمح				I	LOG	OF BORING
Company	y	ppalachi	an Powe	r Comp	any		Boring No. 405 Date 1-24-77 Shoot 1 of 3
Project	E	roject 1	301 – A	sh Pon	d		Type of Boring Auger Rig B-50
Locati	on of E	Boring:					Casing used Size Drilling mud used
Water L	_evel	51.0	1			Ground Elevation 603.14 referred to	
Time		1-24		· • • • • • • • • • • • • • • • • • • •		Datum	
		<u> </u>		·····		1	Field Party: King and Smithson
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	1	3.5-5	2/ 4/3	5"			Fragments of clay with silt.
	2	8.5-10	5/ 6/7	8"	/0 - - /1 - - /2 -		Brown sand.
	3	13.5-15	7/ _{8/9}	7"	/3/4/4/5		Same as sample number 2 w/some larger grains.
	4	18.5-20	4/ 4/ ₇	6"	/7/8/8/9		Same as sample number 3.
							Engineer

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AMERICAN LELCTRIC TOWER SERVICE CORTORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No	D				3	200	
Compa	iny						Boring No. 405 Date 1-24-77 Sheet 2 of 3
Projec	:t				-		Type of BoringRig
Loca	tion of E	Boring:					Casing used Size Drilling mud used
Water	level	1					Boring begun Boring completed Crowned Elevation
Time		-	· · · · · · · · · · · · · · · · · · ·				Ground Elevation referred to
Date							Field Party: King and Smithson
			E 0 +	4 <u></u>	lornru	E	DESCRIPTION
176 H	Ŷ	dept to	ario ario Foo	g th a m p	IN	RAF	Soil type color texture consistency 'sampler driving notes
epth sing	a ple	n fe	tand netr sist ws/	len v. s	FEET	C L	blows per foot on casing, depths wash water lost, observed
ن م	Sar	Sam (i. f	Blo B	Tot. reco		501	fluctuations in water level, notes on drilling ease, etc.
	1		1				
	~				E 20 -		
	ļ			ļ	$E_{21} =$		
.					– –		
			+	· · · · · · · · · · · · · · · · · · ·	- 22 -		
					F ,, -		
					E^{j}		
ļ			41		÷ 24 -	V/λ	
	5	23.5-25	4/8	6"	E -	///	Light brown sand.
	<u> </u>	23.5 25			+-25-	Y7-	
					E 26 -		
		42					
					-27 -		
					\mathbf{F}		
		+			E ²⁸ =		
ļ	ļ		6		E 29 -	V/A	
	6	28.5-30	8/7	511	F _		Larger grain sand with small gravel light brown
<u> </u>					<u></u>	74	harger grand band with bharr graver right brown.
					$E_{31} =$		
					= =		
					- 32 -		
	· · ·						
					E 3		
			8/		-34-	V/A	
	7	33.5-35	114,	6"	E -	VA	Modium arain cond - light hrorm
			11	. 0	- 35 -	₩	Medium grain Sand - Hgnt brown.
					E 26 -		
					E		
					-37-		
	1						
			· · · · · ·				
					E-39 =	V/A	
	В	38,5-40	11/5	611	F	X/}	Cravely cond - light have
	<u> </u>	50.5 40	13		-40-	14	Gravery Sand - right prown.
	-				E, 3		
	·	L	<u> </u>		L		Engineer

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Company Boring No. 405. Date 1-25-77. Sheet 3. of 3 Project Rig Rig Castion of Boring: Diffing ind used Doring No. 405. Date 1-25-77. Sheet 3. of 3 Water Level Time Diffing Boring No. 405. Date Diffing ind used Doring Ind used Time Date Boring No. 405. Date Diffing ind used Doring No. 405. Date Diffing ind used Time Date Boring No. 405. Date Diffing ind used Date Date Diffing ind used Date Time Soil type, color, texture, consistency, sampler driving notes Soil type, color, texture, consistency, sampler driving notes Soil type, color, texture, consistency, sampler driving notes Soil type, color, texture, consistency, sampler driving notes Soil type, color, texture, consistency, sampler driving notes Soil type, color, texture, consistency, sampler driving notes Soil type, color, texture, consistency, sampler driving notes Soil type Soil type, color, texture, consistency, sampler driving notes Soil type, color, texture, consistency, sampler driving notes Soil type Soil type, color, texture, consistency, sampler driving notes Soil type, color, texture, consistency, sampler driving notes Soil type Soil type<	Job No.						.00	
Project Type of Boring Rig	Compan	ıy	• •					Boring No. <u>405</u> Date <u>1-25-77</u> Sheet <u>3</u> of <u>3</u>
Location of Boring: Water Level Time Date Use for a stand of the s	Project							Rig
Water Level Borng Competed Construction <	Locat	ion of B	oring:					Casing used Size Drilling mud used
ConstraintsConstrai	Wator	Loval				<u> </u>		Boring begun Boring completed
Date Field Party: King and Saithson $\frac{1}{2}$	Time	Levei		<u></u>				Globing Lievation Telefred to Datum
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Date				- در مربع			Field Party: King and Smithson
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			T		4.9	T	II	DESCRIPTION
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	5 2	ů Z	t te bt	ard Tool	gth e amp		RAF	Soil type color texture consistency sampler driving notes
3 5	t d Bui	ple	fee	and etre vs/	leng v. s	FEFT	U L	blows per foot on casing, depths wash water lost, observed
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ن م	Sam .	(in the second	Per St Blor	eco.		So	fluctuations in water level, notes on drilling ease, etc.
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							<u> </u>	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						<u>-</u>		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			-			F / -		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				-		E"=		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			L	·····		- 42 -		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			-			E' =		
9 43.5-45 $7/_{6}$ 5" 4 9 43.5-45 $7/_{6}$ 5" 4 4 4 4 4 4 4 4						<u></u>		
9 43.5-45 $\frac{4}{7}$ 9 43.5-45 $\frac{4}{7}$ 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7						= , =	17/	
9 43.5-45 7_{6} 5" 4/5 4 -46 4/7 4 10 48.5-50 $9_{9/11}$ 8" 50 5 -47 7 -47 5 -47 7 -47 5 -47 7 -47 7 -56 5 -57 5 -58 5 -58 5 -58 5 -58 5 -58 5 -58 5 -58 5 -59 7 -58 5 -59 7 -59 7 -				47		E #* =	1 <i>V//</i>	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		9	43.5-45	1/6	5"	L 15		Same as sample number 8 with more gravel.
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						⊨′, =		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						- 46 -		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$					1990 - E			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				[F 41 -		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		-				E 48 =		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$							1	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				9		E-49 -	1//	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		10	48.5-50	⁻⁹ / ₁₁	8"	÷ _ =	ŧ <i>V//</i>	Small gravel with some sand.
$51 =$ Water $52 =$ $53 =$ $53 =$ $53 =$ $53 =$ $54 =$ $11 = 53.5-55 =$ $71/8 = 10^{11}$ $56 =$ $56 =$ $56 =$ $56 =$ $58 =$ $58 =$ $12 = 58.5-60 =$ $41/7 = 8^{11}$ $12 = 58.5-60 =$ $1 =$ $12 = 58.5-60 =$ $1 =$ $12 = 58.5-60 =$ $1 =$ $12 = 58.5-60 =$ $1 =$ $1 =$ $1 =$ $1 =$ $1 =$			100000	<u>-</u>				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						EZIZ		Water
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$								
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						- 52 -		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$								
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			1			E 33 -		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			<u> </u>	·		E 54 -	17/	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$.	50 E EE	⁴ 7/	1.011	F -	1 <i> //</i>	Prove redium orașin cond
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		11	100.0-00	<u>×</u>	10	E-55 -	<u> ″-</u>	DIOWII MEGIUM grain Sand,
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$						F_{c} =	11 :	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			1			E°Ξ		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		-	L			- 57 -		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						E		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						<u>- 58</u> -		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							177	
12 58.5-60 4'7 8" - // Fine medium brown sand. - - - Stopped hole at 60.0' - - 1-25-77			1	4/		E 39 -	IV/.	
Stopped hole at 60.0'	<u> </u>	12	58.5-60	. 4/7	8"	E 100 =	H <u>//</u>	Fine medium brown sand.
						ب آ =		Stopped hole at 60.0'
The state of the first of the first of the state of the state of the first of the state of the						- 1 -		
Engineer								Engineer

AEPMTP-000462

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

471

Job Nr	o			-		LOG	OF BORING
Compa	iny A	uppalachi;	an Power	: Comps	any		Device No. 406 Data 1-25-77 cl 1 1
Projec	<u>:t P</u>	roject 13	<u>301 – A</u>	sh Por	ıd		Type of Boring Auger Rig B-50
Loca	tion or	Boring:				•	Casing used Size Drilling mud used
Water	Level	51.0'				Ground Elevation 603.14 referred to	
Date					-	•	Dat
F	T						Field Party: <u>King and Smithson</u>
1 = =	No.	depti to et)	ard ation ance Foot	jth of ampl	DEPTH	RAPI	DESCRIPTION
)epth as ing	mple	trom from	tand netrc Ssist	leng vv. s	FEET	10	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing depths wash water lost observed
ΰ	Sa	San (ы Б Б С С С С С	Tot. recc		soi	fluctuations in water level, notes on drilling ease, etc.
I	ļ				En	打	
	ĺ	-			Ē -	┨┠	
	1	-	-		E '-	4	
\vdash				<u> </u>	F 2 -	1	
	I		'		F, -	<u> </u>	
	1	2 5 5	3/ 5/ _	••	E 33		
├ ──┤		<u></u>	7	18"	<u> </u>		Silty clay.
			<u> '</u>		E 5		
E 1])		F =	1-	
		1	++	ļ'	F 6]		
 		<u> </u>		 '	王 7 3	1 -	
				1'	E]	ιF	
				1	E°3		
			3/	T	E 9]	1/1/-	
	2	8.5-10	4/5	8''	E,J	14	Same as sample number 1.
				, j	F' = 1'	Π-	
1		1	f	+	F11		
		!		ţ	Ē 2-]'		
					F,]	1 E	
					三"刊	177-	
			5/		÷ 4-]/	(/ <u>}</u> -	
	3	13.5-15	6/7	_ <u>6"</u>	Ξ s Ξľ	14	Light brown sand,
	1	1 1 1	t l	F	1	$ \vdash$	
		1			- 6 -		
		·	·	<u></u>	- 7		
		L	·				
				F	- °		
			4/		- 9	1/2-	
	4	18.5-20	4/6	<u>8"</u> F	- <u>-</u>	1	Medium grain sand with trace of small gravel.
					- 1-]-	·	
		1	<u> </u>				Engineer

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

NEV- 3714

Job No.

Project Location of Boring: Water Level Time Date			Boring No. 406 Date 1-25-77 Sheet 2 of 2 Type of Boring Rig Casing used Size Drilling mud used Boring begun Boring completed		
Depth of Casing, ft. Sample No. Sample depth (in feet)	Standard Penetration Resistance Blows/Foot Tot. length of recov. sample	DEPTH IN FEET I Soil FEET I Soil fluct	Field Party: <u>King and Smithson</u> DESCRIPTION type, color, texture, consistency, sampler driving notes s per foot on casing, depths wash water lost, observed uations in water level, notes on drilling ease, etc		
5 23.5-25 5 23.5-25 6 28.5-30	5/ _{6/7} 9"	20 21 21 22 23 - 23 - 24 - 25 - Light - 26 - 27 - 28 - - 29 - 30 - Same - - - - - - - - - - - - -	brown medium grain sand.		
7 33.5-35		34 Light 35 Light 36 37 38	brown to light gray sand.		
8 38.5-40 1		39	5 sample number 7.		

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AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No	•					200	
Compar	ıy						Boring No. <u>406</u> Date <u>1-25-77</u> Sheet <u>3</u> of <u>3</u>
Project	t				- '		Type of BoringRig
Local	tion of B	oring:					Casing used Size Drilling mud used
Mator	Loval	1					Boring begun Boring completed
Time	Level						
Date		-					Field Party: King and Smithson
		 Т с	1	<u>ч</u> о	1	I	DESCRIPTION
h of g, ft.	e No.	s dept n-to eet)	dard ration stance /Foot	ngth o sampl	DEPTH IN	GRAP	Soil type, color, texture, consistency, sampler driving notes
Dept Casin	omp	froi froi (in f	Stan Penet Resi: Slows	ot. le .cov.	FEET	011	fluctuations in water level, notes on drilling ease, etc.
		<u>ن</u>	- 4	<u> </u>			
					± 40 -		
-					- 41 -		
		1					
					$\mathbb{E}^{\frac{1}{2}}$		
					F , -		
	-		18/		E #4 =		
	- 9	43.5-45	1022	9''		1///	Same as sample number 0.
	an de la composition Carlos de la composition						
	-				- yo -		
					- 47 -		
	-						
					- 48 -		
			101		- 49 -	=///	
	10	48.5-50	1742	6"	E -]///E	Medium brown sand w/trace of coal.
	- 10	1010 00	<u></u>				
-					E51-		Water
Ì							
		+	-		- <u>-</u> 52 -		
		-	ļ		- 53 -		
ł					F	177,	
			10/		- 54 -	1///	
	11	53.5-55	14/12	5"	E 55 -][//]	Grayish gravely sand.
				. 	E		
					- 50 -		
	н 1911 - Полония 1912 - Полония Полония (1912)		<u> </u>		Eas		
					E -		-
					- 58 -		
					E so I		
	10	E0 E (0	14/		⊨, _	={///	Cmall grouply cand (dark)
	12	58.5-60	17		-60-]///	Dillatt gravery Sallu (liatk)
		F			E, E		Stopped hole at 60'
				•			-
L	L	1	L	L	<u> </u>		Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING . •

Compan	y <u>Ap</u> Pr	palachiar	Power	Compan	ay Ash Pc	nd	Boring No. 407 Date 10-27-76 Sheet 1 of 3
<u>roject</u> Locati	on of B	oring:				Casing used Size Drilling mud used Boring begun 10-27-76 Boring completed 10-27-76	
Water	_evel	Dry					Ground Elevation 613.27' referred to
Date							Field Party: Roush and Reitmire
Date			·····				
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	1	3-4.5	^{3/} 4/ ₃	8''			Medium coarse and brown sand.
	2	8-9.5	^{3/} 3/3	8" 	7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 -		Same as sample number 1.
	3	13-14.5	³⁷ 4/ ₆	12"			Same as sample number1.
	4	18-19.5	77 ₇₇₆	14"	/3 /6 /7 /8 /9 /9 /20		Same as sample number 1.
			1				Engineer

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EORM CE-5 REV. 3/74		AMERI	CAN E		IC F	GINEERING LABORATORY
Job No				L	OG	GOF BORING
Company Project Location of Bc Water Level	oring:				-	Boring No. 407 Date 10-27-76 Sheet 2 of 3 Type of Boring Rig Casing used Size Drilling mud used Boring begun Boring completed Ground Elevation referred to Date
Time Date						Field Party: <u>Roush and Reitmire</u>
Depth of Casing, ft. Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.

Medium brown and medium coarse sand.

First six tenths fine sand. Second six tenths sand with small gravel.

Fine medium brown sand.

Sand and small gravel.

Engineer

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21-

-22 ---

23

E. 24 -

- 25 -

- 26 -

- 17 --

- 28 -

.29

- 30

- 31

32 -

- 33 -

- 34 -

35 -

36

37

38

39-

40-

1

10"

12"

12"

12"

6/_{6/} 7

6/7/9

97_{10/15}

17/ 19/6

23-24.5

28-29.5

33-34.5

38-39.5

5

6

7

8

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AMERICAN ELECTRIC FOWER SERVICE CORFORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

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on no. Compan	v						Boring No. 407 Date 10-27-76 Sheet 3 of 3
Project	• ••••					-	Type of Boring Rig
Locat	ion of Bo	oring:					Casing used Size Drilling mud used
M/ - 1 -	1 aug!						Boring begun Boring completed Boring completed
Water	Level	+	<u></u>				Ground Elevation referred to Datum
Date					· · · · · · · · · · · · · · · · · · ·	······	Field Party: Roush and Reitmire
		f	5.85	je ef	DEPTH	Hd	DESCRIPTION
۳ ₆ .#	Ň	dep - to	Jard atio tanc	ng th samp	IN	GRA	Soil type, color, texture, consistency, sampler driving notes,
e pt [†] s ing	mple	from fe	neti neti esis	v. ler	FEET	- -	blows per foot on casing, depths wash water lost, observed
ں م	Sai	San (i	<u> </u>	Tot		ŝ	fluctuations in water level, notes on drilling ease, etc.
						1	
+					E - =]	
					<u>-</u> #1_	1	
	•				[-, -]		
					<u>+</u> <i>4</i> ² −		Ran through bolder.
					Eda -	11	
	·		307			1///	Contact the langer growel
	9	43-44.5	2	6"		11/	Sand with larger graver.
					E, -] [/	
		1			EV6 -		
					E 2		
					<u> </u>		
					E , -		
			15/		48 -	$\left \right\rangle$	
	10	48-49.5	2024	12"	E 40 -		First six tenths sand.
					E . =	12	Second six tenths sand and gravel.
			<u></u>		<u>-</u> 50 -	1	
					E_]	
<u>├</u> ──┤					+ 31-		
					E /3 -		
					E^{2}		
			13/		- 53 -	1/1	
	11	53-54 5	20%	1/1		1//	Sand with small gravel.
 	<u> </u>	55 54.5	10	<u> </u>		11/	
			<u> </u>		E 55 -	Π	
			ļ	<u> </u>	<u> </u>		
			- -		E, E		
 			<u> </u>		+- <i>s</i>	1	
					E <8_	11	
			207			1//	
	12	58-59.5	22	14"	- 59 -	11/	Same as sample number 11.
					E, -	₩Ź	<u>Stopped note at 29.2</u> 10-27-76
<u>├</u>			<u> </u>		± 60 -	11	
					<u> </u>	1	
		<u> </u>	<u>L</u>	L	<u> </u>	Ш	Engineer

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AEPMTP-000468

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AMERICAN ELECTRIC POWER SERVICE CORTORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

mpan oject _ocati	y Approximation of Bo	ppalachia roject 13 pring:	in Power 301 – Pi	Compa coposed	iny 1 Ash P	onc	I Area Type of Boring Auger Rig B-61 Casing used Size Drilling mud used Boring begun 10-27-76 Boring completed 10-28-76
ater	Level	59.5		•			Ground Elevation 608.06' referred to Datu
ate							Field Party: Roush and Reitmire
Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	1	34.5	31 ₄₁ 4	8"			Boring offset about 40' because of corn field
	2	8-9.5	3/4/	1 0!!	- 5		Same as sample number 1.
					9		
	3	13-14.5	3/ 3/5	14"	/3 /4 /5 /6		Same as sample number 1.
	4	18-19.5	4/ 3/3	12"	/7 - /8 - /9 -		Same as sample number 1.
					- 1 -		Engineer

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AMERICAN LELCINIC TOWAR ORATION CONTENTS

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.	<u></u>						
Compan	у					-	Boring No. <u>408</u> Date <u>10-27-76</u> Sheet <u>2</u> of <u>3</u>
Project						Type of Boring	
Locati	on of Bo	ring:					Boring begun Boring completed
Water	evel	[Ground Elevation referred to
Time							Datum
Date					<u> </u>		Field Party: Roush and Reitmire
	. 1	2	E 0 +	e e	DEDTU	H	DESCRIPTION
Depth of Casing, ft.	Sample No	Sample dept from-to (in feet)	Standard Penetratio Resistanci Blows/Foo	Tot. length recov. samp	IN FEET	SOIL GRA	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					20 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		
	5	23-24.5	^{3/} 4/ ₅	8"	24		Medium brown fine sand.
					<i>2 2 2 2 2 2 2 2 2 2</i>		
	6	28-29.5	8/ 12/ 14	14"	- 28 - - 29 - - 30 -		Light brown fine sand w/some gravel.
					31-		
	7	33-34.5	¹² ¹⁴ ²⁰	18"	33 - 34 - 35 -		Light brown coarse sand w/some gravel.
			8/		30 - 37 - 37 - 38 - 38 -		
	8	38-39.5	⁵⁷ 8/ ₆	14"			Light brown coarse sand and gravel.
							Engineer

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AMERICAN ELECTRIC POWER SERVICE CORTORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.	<u></u>						
Company	/						Boring No. <u>408</u> Date <u>10-27-76</u> Sheet <u>3</u> of <u>3</u>
Project							Type of BoringRig
Locati	on of Bo	ring:					Boring begun Boring completed
Water I	_evel						Ground Elevation referred to
Time							Datum
Date	<u></u>	I					
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	9	43-44.5	157 30 <u>64</u>	18"	4/0 4/1 4/2 4/3 4/3 4/4 4/5		Light brown sand and gravel.
	10	48-49.5	²⁰ /29½1	18"	46		Light brown coarse sand w/some gravel.
	11	53-54.5	10/11/10	14"			Light brown fine sand.
	12	58-59.5	⁵⁷ 67 ₆	12"			Coarse medium brown sand. Water Stopped hole at 59.5 10-28-76 Engineer

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AMERICAN ELECTRIC FORLY SERVICE CONSTITUTE

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.	A	nolochic		Compa	nv		a second to be the to at the to at a
Compan	y <u>Ap</u>	parachian	1 - Pri	oposed	Ash P	ond	Boring No. 410 Date <u>10-26-76</u> Sheet <u>1</u> of <u>3</u> Area Type of Boring Auger Rig <u>B-61</u>
Project	ion of Ro	rina:					Casing used Size Drilling mud used
Lucat	, , , , , , , , , , , , , , , , , , ,						Boring begun 10-26-76 Boring completed 10-26-76 Ground Elevation 604.65 referred to
Water Time	Level	51.5				<u>,</u>	Glound Elevation Perened to Datum
Date							Field Party: <u>Roush and Retimire</u>
		÷	E 0 +	of le	DEDTH	H	DESCRIPTION
Depth of Casing, ft.	Sample No.	Sample dept from-to (in feet)	Standard Penetratio Resistance Blows/Foo	Tot. length recov. samp	IN FEET	SOIL GRA	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
							Boring offset 5' east.
		9			È -		
					- 2 -		
					F _]	
			2/4/				
	1	3-4.5		5''	<u>+</u> 4 <u>-</u>	11/	Medium brown tine sand.
						<u> </u>	
					F 6 -		
					E , -		
			3/ , ,		8 -		7
	2	8-9.5	4/5	12"	F 9 -	11	<u>Same as sample number 1 w/light colored sand</u>
					F .	$\frac{1}{4}$	4
				1	上/"- 上/"-]	
	ļ		 	ļ	上 ハー	1	
					上,,-		
	<u> </u>				E .		
			5/ ,				
	3	13-14.5	5/6	14"	E 14-	HE	Same as sample number 2.
						╨	
•				-	/5- 	=	
	ļ		ļ				
					- /7		
}	1	<u> </u>			Ę,,,		
			6/		- 18 -	=	1
	4	18-19.5	7/8	14"		ΞV	Same as sample number 2 w/some gravel.
						44	2
				·	±20-		
				<u> </u>		=	
							Engineer
L	1	L	<u> </u>				

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.	- <u></u>						
Compan	У						Boring No. <u>410</u> Date <u>10-22-76</u> Sheet <u>2</u> of <u>3</u>
Project						Type of Boring Rig	
Locat	ion of Bo	oring:					Casing used Size Drifting flud used
Water	Lovel	T			<u> </u>		Ground Elevation referred to
Time							Datum
Date		-					Field Party: Roush and REitmire
FT			[]	0	r	ΓΞ	
~ <u>+</u>	No.	epth)	oot	np l mp l	DEPTH	RAP	DESCRIPTION
t t g	e	e e e	nda trat ista ista	eng.	IN	Ü	Soli type, color, texture, consistency, sampler univing notes,
De p as i	dub	fro (i)	Sta ene Res low	54. L	FEET	0 0 1	fluctuations in water level, notes on drilling ease, etc.
	s	<u> </u>		<u> </u>		1 N	
					<u>-10</u>		
					⊨´´ -		
					E-21-		
					F ²² -		
					En	11_	
			8/10/		E	1//	M 11 hours could and success
	5	23-24.5	10/11	14"	E- 54 -	11//	Medium brown sand and gravel.
					F -	112	
					- 25		
2					E -		
` 		`		·	- 26 -		
					F	1	
	·				-	1	
					E 78 -	11,	
			8/			1///	Come of complex number 5
	6	28-29.5	0/8	13"	- 29 -	1///	Same as sample number 5.
					E -	11/	
·							
					<u></u>		
						1	
					En]	
	-				F -	1	
		<u></u>	6/	<u> </u>	- 33 -	17	
	7	33-34.5	^{9/} 12	15"	= =	11//	Same as sample number 5.
				<u> </u>	- 34 -	11/	
					- 35	11	
•			1		E		
			ļ	 	- 36 -	-	
					F -	1	
·			l	 	<u>-37</u>]	
				1			
			6/		+- ³⁸	177	
	8	38-39.5	10/	13"]1/	Same as sampl e number 5.
1			1	<u>_</u>	E''=][/	-
					± 40 -		
					F -		
		·	<u> </u> ,	 	<u></u>	1	
	an an Arian Taonach						Engineer
L	L.,	L		<u>l</u>	.L		

AEPMTP-000473

AMERICAN ELECTRIC POWER SERVICE CORPORATION

FORM CE-5 REV- 3/74 AEP CIVIL ENGINEERING LABORATORY LOG OF BORING Job No. Company Boring No. 410 Date 10-26-76 Sheet 3 of 3 Type of Boring ______Rig_____ Casing used _____ Size ____ Drilling mud used _____ Project Location of Boring: Boring begun _____ Boring completed _____ Ground Elevation _____ referred to _____ Datum 51.5 Water Level Time Field Party: <u>Roush and Reitmire</u> Date Tot. length of recov. sample GRAPH Sample depth from-to (in feet) DESCRIPTION Standard Penetration Resistance Blows/Foot DEPTH Sample No. т, т Soil type, color, texture, consistency, sampler driving notes, IN Depth o Casing, 1 blows per foct on casing, depths wash water lost, observed FEET SOIL fluctuations in water level, notes on drilling ease, etc. 10-้า 12 ¢3 12/ 17/16 8" 43-44.5 Medium brown sand w/trace of gravel. 9 44 \$5 46 41 48 ⁵10/ 14 Same as sample number 9. 13" 48-49.5 10 49 50 51 Water 52-53 -7/ 10/19 54 53-54.5 17" Same as sample number 9 w/more gravel. 11 55 -56 57 5 8 -147 13/ 13 Same as sample number 11. 16" - 59 -12 58-59.5 Stopped hole at 59.5

10-26-76

Engineer ___

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FORM	CE-5
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AMERICAN ELECTRIC FORCE SERVICE CONTOURS

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.			,				
Compan	уАт	palachia	n Power	: Comaj	ony	- ,	Boring No. <u>411</u> Date <u>10-27</u> 76 Sheet <u>1</u> of <u>3</u>
Project	Br	oject 13	<u>01 - Pr</u>	oposed	l Ash H	°on₫	Area Type of Boring Auger Rig B-01
Locat	ion of Bo	ring:					Boring begun <u>10-22-76</u> Boring completed <u>10-26-76</u>
Water	Level	55'					Ground Elevation 607.25 referred to
Time							Datum
Date		<u> </u>					Field Party: <u>Roush and Refumire</u>
Jepth of asing, ft.	ample No.	mple depth from-to (in feet)	Standard enetration česistance lows/Foot	ıt. İength of cov. sample	DEPTH IN FEET	OIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
- 0	Ň	Sa	<u> </u>	н e	<u></u>	<u>اب</u>	
					<u></u> − 0 − −		Moved boring 5' north
						1	
	-				<u> </u>	-	
				l]	
			3/ / /	<u> </u>	± 3-	17	
	1	3-4.5	4/4	14"	E 4 -	NE	Medium brown fine sand.
						1	
		<u></u>			5		
					E 6 -		
					- -		
					<u> </u>]	
			3/		Ē	IV/	Same as sample number 1
	2	8-9.5	4	12"	- 9 -	1VE	Danie as Bampie Rember 1.
			. •		F 10	1	
			1		E / -		
·		ļ		<u> </u>	-E /1 -]	
					F , -		
		1			E /2 -]	
			87				
	3	13-14.5	3/ ₅	14"	F 14	H	Same as sample number 1.
					E,	11/	
						-	
						=	
		1		1	E / .	- E	
					- 17 -]	
			5/		/ð-	TE	
· · · · · · · · · · · · · · · · · · ·	4	18-19.5	J/5	12"	- 19-	31/	Same as sample number 1.
					- ·	╢╯	/
)		1	1	-	E 20 -		
					+ 1.	-11	
							Engineer
L	1		1		- I	<u>_</u>	
FORM	CE-5						
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REV.	3/74						

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.						
Company					. <u></u>	Boring No. 411 Date 10-20-70 Sheet 2 of 3
Project	Daving					Casing used Size Drilling mud used
Location of	Boring:					Boring begun Boring completed
Water Level	55'					Ground Elevation referred to Datum
Time						Field Party: Roush and Reitmire
			ч н 0	1	TI	DESCRIPTION
Depth of Casing, ft. Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length o recov. sampl	DEPTH IN FEET	SOIL GRAP	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
5	23-24.5	7/ _{5/4}	8"	20 21 22 23 23 24		Medium brown fine sand.
6	28-29.5	5/ _{4/5}	5"	28 28 28 28		Light brown fine sand,
				30		
. 7	33-34.5	6/ 8/5	8"	34-		Medium brown sand w/trace of gravel.
8	38-39.5	4/ _{5/5}	10"	37 - 38 - 39 - 40 -		Light brown fine sand.
		1				Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.			
Company			Boring No. <u>411</u> Date <u>10-26-76</u> Sheet <u>3</u> of <u>3</u>
Project			Casing used Size Drilling mud used
Location of Boring:			Boring begun Boring completed
Water Level 55'			Ground Elevation referred to
Time			Datum
Date			Fleid Faity.
Depth of Casing, ft. Casing, ft. ample No. from-to (in feet)	Standard Penetration Resistance Slows/Foot ot. length of scov. sample	DEPTH HAVE	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
9 43-44.5	$87_{9_{13}}$ 14"	4^{1}	Medium brown sand and gravel. Medium brown sand and gravel. Same as sample number 9 w/less gravel.
11 53-54.5 12 58-59.5	6 ⁷ 9 ⁷ 12 13" 8 ⁷ 6 ⁷ 6 15"	5^{3}	Same as sample number 9 Water Same sample number 9. Stopped hole at 59.5' 10-26-76 Engineer

AEPMTP-000477

FORM CE-5 REV. 3/74---

AMERICAN LEGENCE LEGENCE OLANTON CONTROL CONTROL

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No	•				Ľ	.00	OF BORING
Compar	iy Appa	alachian	Power C	ompany	y		Boring No. <u>412</u> Date <u>1-26-77</u> Sheet <u>1</u> of <u>3</u>
Project	Pro	ject 1301	– Ash	Ponds	-		Type of Boring Auger Rig B-50
Loca	tion of Bo	oring:				Casing used Size Drilling mud used	
Water	Level	52.0'				Ground Elevation 600.49' referred to	
Time							Datum
Date		1-26-77	7				Field Party: <u>King and Smithson</u>
			E 0 to	e e	DEPTH	НЦ	DESCRIPTION
, te (No	dep +to et)	atio tanc Foo	ig th samp	IN	3RA	Soil type, color, texture, consistency, sampler driving notes,
epth sing	mple	from from	tane netr esis	· len	FEET	1	blows per foot on casing, depths wash water lost, observed
Δů	Sa	San	a a a	Tot		S S	fluctuations in water level, notes on drilling ease, etc.
	-						
		· ·			È -		
					E 2 -		
1				-			
		<u> </u>			- 3 -		
	•					17/	
	1	2 5 5	10/	1.011	F -	W	Condu ciltu olou
	L	3.3-5	15	18.		1/4	Sandy, SITLY CLAY.
i.	- -		1		E 6 -		
					<u> </u>		
			<u> </u>	-	<u></u>		
					- 8 -		
			7/ 01			W	
1	2	8.5-10	°/8	8"	E /0 =	11//	Red sand - medium grain.
					Ê -		
 					+ /1-		
		L			- 12 -		
					F]	
		<u> </u>	3/		- 14 -	1//	
	3	13.5-15	4/7	0"		1///	Medium grain brown sand.
			1		E /3 =		
•	ļ		ļ				
					F ,		
					王"三		
·					- 18 -		
		10	3/4/2	r11	E "=		Pine and harm ord
	4	18.5-20	- 3	<u> </u>	- 20 -	14	rine grain brown sand
		-			<u> </u>		
						[
L	L	<u> </u>	1	I <u></u>	<u> </u>		Engineer

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

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Job No.

Project Location Water Leve Time Date	of Boring:			·	:	Boring No. <u>412</u> Date <u>1-26-77</u> Sheet <u>2</u> of Type of Boring <u>Rig</u> Casing used Size Drilling mud used Boring begun Boring completed Ground Elevation referred to Field Party: King and Smtibson
Depth of Casing, ft. Sample No.	23. 2-25	2 Standard Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET -20 -21 -21 -22 -23 -24 -25 -26 -26	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving note blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
6	28.5-30	4/ _{3/3}	9"	27 28 30 30 21 31 32 31 32 31 33		Medium to fine grain sand.
7	33.5-35	6/ 6/ 6/ 6/ 6/ 6/ 6/ 6/ 6/ 6/ 6/ 6/ 6/ 6		54		Same as sample number 6.
					<u>[11</u>	Engineer

AEPMTP-000479

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

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Job No.

Company					
Project			-		Boring No. <u>412</u> Date <u>1-27-77</u> Sheet <u>3</u> of Type of Boring
Locatio	n of Boring:				Casing used Size Drilling mud used
Water Le	evel				Ground Elevation Boring completed
Date					
					Field Party: King and Smithson
Depth of Casing, fr.	Sample No. Sample dept from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length o	PEPTH days	DESCRIPTION Soil type, color, texture, consistency, sampler driving not blows per foot on casing, depths wash water lost, observe fluctuations in water level, notes on drilling ease, etc.
	~			41	
9	43.5-45	¹⁰ / ₉ / ₁₅	7" = 9	y 4	Medium grain sand - light brown Trace of coal.
10	0 48.5-50	9/ 12/ 15 7'		8 9 0	Same as sample number 9 w/no coal.
					Water
11	53.5-55	^{8/} 9/ ₈ 12			Medium grain sand.
12	58.5-60	6/ 9/ ₁₁ -0-			No recovery.
			ı		Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

Compar Project	y <u>Ap</u> Pr	opalachian oject 130	n Power 01 - As	Compa h Pond	ny Area		Boring No. <u>413</u> Date <u>3-3-77</u> Sheet <u>1</u> of <u>3</u> Type of Boring <u>Auger</u> Rig <u>B-50</u>
Locat	ion of Bo	oring:				Casing used Size Drilling mud used Boring begun 3-3-77 Boring completed 3-3-77	
Water Time Date	Level	50'					Ground Elevation referred to Datum Field Party: Smithson and Smith
					1	T	DESCRIPTION
Depth of Casing, ft.	Sample No.	Sample dept from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length c recov. samp	DEPTH IN FEET	SOIL GRAF	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
· · ·		^					
	1	3.55	5/ 5/ <u>6</u>	6''	4		Medium brown sand w/small pea gravel.
					5		
	2	8.5-10	4/ 3/ ₄	7"	- 8 - - 9 -		Same as sample number 1.
					- /0 - 		
					- /2 -		
	3	13.5-15	5/ 3/ ₄	9''	/3 - - /4 -		Medium brown sand w/legnite.
•							
					/6 		
	4	18.5-20	4/ 7/ ₈	10"			Medium brown sand w/some pea gravel.
					20-		
-					- 1 -		Engineer

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Job No	·				•		o of boxino
Compar	ıy						Boring No ⁴¹³ Date 3-3-77 Sheet 2 of 3
Project					•	Type of BoringRig	
Locat	ion of B	oring:				Casing used Size Drilling mud used	
Water	Level					Boring begun Boring completed	
Time							
Date							Field Party: Smithson and Smith
	•		c a t	e e,	DEPTH	H	
Depth of Casing, ft.	Sample No	Sample dep from-to (in feet)	Standard Penetration Resistance Blows/Foo	Tot. length recov. samp	IN FEET	SOIL GRAF	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
		· · · · · · · · · · · · · · · · · · ·			モッー		
	and a second second second second second second second second second second second second second second second]	
		<u> </u>	77				
	5	23.5-25	'' 6/ ₇	8''			Medium brown sand w/trace of pea gravel.
					E^{4}	11/	
					- 25 -	1//	4
	· · · · · · · · · · · · · · · · · · ·	· · ·					
					E _		
			6/7/		E 38 -	,	
	6	28.5-30	"6	7''	- 29 -	1///	Same as sample number 5.
			4.2	-			A
	· · · · · · · · · · · · · · · · · · ·						
					- 31-		
					E 1		
			97		<i>3</i> 3 –		
	7	33.5-35	12/12	11"		V1	Medium brown medium coarse sand and gravel.
						V//	
					- 35 -	14	4
•			_				
					E I		
					- 37 -		
					E 38 -		
	0	20 5 10	6/ 8/-			17	
	0	30.5-40		12"	- 39 -		Same as sample number 7.
					ヒルヨ	14	
					F J		
					F 1-		
·							Engineer

	~		••	~			~	
ĥ	Ξ	٧		3	,	7	4	

Job No.

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Comp	any			•			Roving No 413Data 3-3-77 Shart 2 (2)
Proje	ect						Borning No Sheet _
Loc	ation of f	Boring:					Casing used Size Drilling mud used
Wate	er Level						Boring begun Boring completed
Tim	9		······				referred to
Date	<u>)</u>						Field Party: <u>Smithson and Smith</u>
		-f	E e to	ie et	DEPTH	H	DESCRIPTION
40	Ž	de de t	For For	10 th	IN	RA	Soil type, color, texture, consistency, sampler driving notes
le pt	d E	fron fron	itan ineti sesis	. len	FEET	1	blows per foot on casing, depths wash water lost, observed
	S	Sar	<u> </u>	Tot		100	fluctuations in water level, notes on drilling ease, etc.
					E, -		
		-					
					- 41 -		
1						1	
	1		1		$E^{42} =$		
ļ			127		- 43 -		
Ì.	9	43.5-45	15/	151	E', -	17	Light brown sand and gravel.
	·	-		1.	E 44 -	11//	Very small claylike seam.
					£ 45 -	12	Light brown sand and gravel.
					E', =		
			-		F- 46 -=		
					$E_{i u 7} =$		
					₽''=		
	+		18/		- 48 -		
	10	48.5-50	26/24	10"	- /o -		Dark brown silty sand and gravel.
							· · · · · · · · · · · · · · · · · · ·
	· · ·				- 10 -	44	Water
	1						
· .					- 52 -		
			10/2/		E 83 -		
		53.5-55	1-11	12"	- 54 -		Light brown fine sand w/trace of gravel.
						Ĭ/A	· · · · · · · · · · · · · · · · · · ·
•					- 55		
-					- 56 -		
					57-		
·····			5/		<u> </u>		
	12	58.5-60	³ /8/0	g''		171	Dark brown cilty cond
	+ 4		10		- (9 -	{//ţ	Dark Drown Silly Sana.
					E/0=	1/4	Stopped hole at 60.0'
				-		┝┟	3-3-77
					- 1-	-	
							Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Jób Na	•				1		OF BORING
Compar	ıy	Appalachi	Lan Powe	er Comp	pany		Boring No. 414 Date 3-3-77 Sheet 1 of 3
Project		Project 1	1301 - 1	Ash Por	nd ARea		Type of Boring Auger Rig B-50
Locat	ion of B	oring:					Casing used Size Drilling mud used
Water	Level	48'	·····				Ground Elevation referred to
Time				······			Datur
Date		1					Field Party: <u>Smithson and Smith</u>
		Ę	E o to	of	DEPTH	H	DESCRIPTION
н оf 4, 1	ž	dep 1-to set)	dard ratic tanc	ng th sam	IN	5 R A	Soil type, color, texture, consistency, sampler driving notes,
Dept	du	fron fron in fe	Stan enet esis ows.	r. ler ov.	FEET	ابر ابر	blows per foot on casing, depths wash water lost, observed
ŬŬ	Š	° Sa	ũ a a	Tot		S	fluctuations in water level, notes on drilling ease, etc.
					E _ =		
					È –		
					E 2 -		
					E		
			47		- 3 -		
	1	3.5-5	7/10	12'		///	Light brown silty clay.
					<u> </u>		
					E 6 =		
			1. S.				
					- 7 -		
			1				
	2	8 5-10	4/4/5	Q11		777	Maling human maling atlen and
<u> </u>	<u> </u>	0.0-10		0	- 9 -		Mealum brown, mealum silty sand,
					E		
			· · ·				
					E_{12}		
			5/		- /3		
	3	13.5-15	4/ ₄	7"	$E_{/4}$	VA	Same as sample number 2 w/trace of pea gravel.
						V/	
					- /5 -	 //	
					E ,6 I		
2	·						
					- /7 -		
			61		E /8 =		
	4	18.5-20	۰′ 5/ ۲	1011		17/	Same as sample number 3
	•••••		2	10	- /9	<i>[//</i>];	
					ED	[/]	
							··
					- 1		
L							Engineer

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AMERICAN ELECTRIC FORER SELFTCE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No).					.06	OF BURING
Compa	ny						Boring No. 414 Date 3-3-77 Sheet 2 of 3
Projec	t						Type of BoringRig
Loca	tion of E	Boring:					Casing used Size Drilling mud used
Water	Level	1					Boring begun Boring completed
Time							
Date							Field Party: <u>Smithson and Smith</u>
[Ι.	-=	C 0 +	<u><u><u></u></u></u>	DEDTU	H	DESCRIPTION
₩÷.	Ŷ	et)	ard atio Foo	g th a mp	IN	RAF	Soil type color texture consistency sampler driving notes
epth sing	nple	ple rom fe	tand netri sist ws/	len V. s	FEET	C L	blows per foot on casing, depths wash water lost, observed
Å Ö	San	Sam (i.j.	Per Blo	Tot.		sol	fluctuations in water level, notes on drilling ease, etc.
			· ·	†			
					- 0 -		
<u> </u>					En=		· ·
					F -		
					<u>-</u> 2ر <u>-</u>		
					F ., -		
			7/		E		
	5	23.5-25	. 07 8	11"	- 4 د -	<i> //</i>	Medium brown coarse sand and pea gravel.
					E -		
					25 -	<u> ⁄_</u>	
					E -76 -		
					- 27 -		
			87		- 28 -		
	6	28.5-30	8/9	9"	E 29 =	Y/	Light brown fine sand.
					F		
		<u> </u>		 	F 30 =	1/2	
					- 		
					- 32 -		
			8/		-3^{3}		
	7	33.5-35	8/10	13"	E 34 -		Medium brown coarse sand and gravel (pea)
				-			
					35 -	44	
	-				- 26 -		
		\ <u>`</u>			- 37 -		
	-						
			8/0/		E 38 3	 	
	8	38.5-40	10/10	8"	- 39 -	VA	Same_as_sample_number_7.
					$E_{i} =$	1/A	
	- 				- 40-	$ \mathcal{L} $	
	19. 				E , =		
					· · -]		_
L.,		L					Engineer

FORM CE-5 REV: 3/74

AMERICAN CLECTRIC FORLY SERVICE CORPORATION

Proje	any						Boring No. 414 Date 3-3-77 Sheet 3 of 3 Type of Boring Rig
Loc	ation of t	3oring:					Casing used Size Drilling mud used Boring begun Boring completed
Wate	er Level		·····		·····		Ground Elevation referred to
Date	<u></u>						Data Data
		-#		p of	DEPTH	Ha	DESCRIPTION
Depth of Casing, f	Sample N	Sample det from-to (in feet)	Standard Penetratic Resistant Blows/Fo	Tot. length recov. sam	IN FEET	SOIL GRA	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
			57		- 42 - 43 		
	9	43.5-45	⁶ /8	10"	- 44 - 45 - 45		Dark brown medium to coarse sand and pea_gravel.
					- 46 - - 47 -		
				[!			Water
	10	48.5-50		14"	- 49 -		Medium brown silty sand and pea gravel.
					5 ²		
	11	53.5-55	7/ 8/ ₁₀	4''		体	Medium silty sand w/gravel.
					- 55 -	4- -	
					57		
	12	58.5-60	¹⁵ / _{19/20}	10"	- 58		Medium brown fine to medium coarse sand.
							Stopped hole at 60.0' 3-3-77
	1 I					$ \Gamma$	Engineer

REV-	3/74

Job Nc	э.					LOG	GF BORING
Compa	.ny	Appalachi	ian Powe	r Comp	any		Roving No. 415 Data 3-8-77 Shoot 1 f
Projec	<u>.t</u>	Project]	<u>1301 –</u>	<u>ASh Po</u>	nd Area	3	Type of Boring Auger Rig B-61
Loca	tion of I	Boring:					Casing used Size Drilling mud used
Water	Level						Ground Elevation 3-8-77 referred to 3-8-77
Date							Dat
							Field Party: <u>Roush and Reitmire</u>
~; ÷	No.	epth t)	rd nce oot	th of mple	DEPTH	APH	DESCRIPTION
Depth Casing,	Sample	Sample d from-t (in feet	Standa Standa Penetrat Resista Blows/F	Tot. lengt recov. sa	IN FEET	SOIL GR	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	~						
	1	3-4.5	2/ 4/ ₄	14"			Medium brown clayey silt.
	2	8-9.5	4/ 5/ ₇	13"	- 8		Medium brown clayey silt.
					- /0 -		Medium brown sand.
·	3	13-14.5	^{3/} 4/6	8"	/3 /4		Medium brown, medium grain sand
				م ۲ ۲ ۲ ۲			
					-/6		
	4	18-19.5	² / _{3/5}	8"	- /8 / - /9 /		Medium brown sand.
					- 1		Engineer

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

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Job No.

Compar Projec Loca Water Time Date	ny tion of Level	Boring:					Boring No. <u>415</u> Date <u>3-8-77</u> Sheet <u>2</u> of <u>3</u> Type of Boring <u>Rig</u> Casing used <u>Size</u> Drilling mud used <u>Boring begun</u> Boring completed <u>Ground Elevation</u> referred to <u>Da</u>
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	5	23-24.5	3/ _{4/7}	15"	21 22 23 24 25 26		Medium brown sand w/trace of pea gravel.
	6	28-29.5	5/ 8/8	13"	29		Same as sample number 5 w/more pea gravel. Medium brown coarse sand and pea gravel.
	7	33-34.5	6/ 1042	14"	32 33 34 34 35 35 36		Medium brown sand and pea gravel.
	8	38-39.5	107 2228	16"	<i>3</i> 7 <i>7</i> 8 <i>7</i> 8 <i>7</i> 9 <i>4</i> 0 <i>1</i>		Medium and medium brown coarse sand and gravel. Medium brown medium coarse sand and pea gravel w/trace of large gravel.

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.

Project Location of Water Level Time Date	Boring:					Boring No. <u>415</u> Date <u>3-8-77</u> Sheet <u>3</u> of Type of Boring Rig Casing used Size Drilling mud used Boring begun Boring completed Ground Elevation referred to D
Depth of Casing, ft. Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot.length of recov.sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving note blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
9	43-44.5		13"	4^{1} 4^{2} 4^{3} 4^{4} 4^{5} 4^{6}		Medium brown gravely sand.
10	48-49.5	¹¹ / _{3/5}	14"	- 47 - 48 - 49 - 50 - 50 - 51		Medium brown sand and pea gravel. Water
11	53-54.5	10/ 12/3	10"	52 53 54 55 56		Medium brown sand with pea gravel and lignite.
12	58-59.5					Medium brown coarse sand and pea gravel. Stopped hole at 59.5' 3-8-77

AEPMTP-000489

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

FORM CE-5 REV. 3/74.

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

lob No.					-		
Compan	y <u>A</u>	opalachia	n Power	Compa	iny		Boring No. <u>505</u> Date <u>11-17-76</u> Sheet <u>1</u> of <u>4</u>
Project	Pı	coject 13	01 – Co	nveyor			Type of Boring <u>Auger</u> Rig <u>B-61</u>
Locat	ion of Bo	oring:					Boring begunt1-17-76 Boring completed 11-18-76
Water	Level						Ground Elevation 586.9' referred to
Time		· · · · · · · · · · · · · · · · · · ·					Datum
Date					·····	<u></u>	Field Party: <u>Roush and Reitmire</u>
	•	L E	E 0 5	- -	DEPTH	Ha	DESCRIPTION
÷ ۲	°N N	et)	atio Tanc Foo	gth sam	IN	SRA	Soil type, color, texture, consistency, sampler driving notes,
apth ing	nple	e e e	tand netr sist	len ov. s	FEET	E	blows per foot on casing, depths wash water lost, observed
ق۵	San	Sam Sam	S a a a	Tot		So	fluctuations in water level, notes on drilling ease, etc.
		1	1		E 0 -		
				ļ	<u></u>		
			+		- 2 -	1	
					E 3 -	╢,	
			27			1//	Modium brown glaw silt
	1	3-4.5	5/6	10"	÷ 4-	1//	Medium brown cray stite.
						ť	
			+				
				<u> </u>	- 6 -		
				-			
				+	7		
						1	
			2/			11/	Top 3 medium brown silt
	2	8-9.5		8.	- 9 -	1V	remainder medium brown very wet
	a tha an an an an an an an an an an an an an					IÍ.	pure silt.
		1]	
				<u></u>	<u>+</u> h -		
					E]	
					/2 -		
					E /3 -		
		12-14 5	2/2/			∃¥/	Same as sample number 2.
	3	15-14.5	<u> </u>	0	14	11/	
					E15	1	
1						-	
ļ			-		- 16 -		
						1	
		-		1	E''		
					18 -	-11-,	/
		10 10 5	15/17/	011	E -	31/	Medium grain brown sand with gravel some
	4	118-19.5	2 2.	<u>) 0 – </u>	/9	1V	broken gravel.
					E20	TE	
						=	
			<u> </u>			71	
							Engineer
. I							

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No					
Company				• 	Boring No. <u>505</u> Date <u>11-17-76</u> Sheet <u>2</u> of <u>4</u>
Project					Type of BoringKig
Location of Bo	oring:		,		Boring begun Boring completed
Water Level	[Ground Elevation referred to
Time					Datum
Date	<u> </u>				Field Party: <u>Roush and Retumine</u>
Depth of Casing, ft. Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot Tot. length of	DEPTH	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
			20		
5	23-24.5	16/ 18/ ₂₂	23 10" 24 25		Sand and gravel with more smaller gravel.
6	28-29.5	15/ 17/18	28 10" 29		Light to medium brown sand with medimm amount of gravel.
			30 31 31 32		
7	33-34.5	13/ 11/ ₁₂			Same as sample number 6.
• • • • • • • • • • • • • • • • • • •			³ 6		
8	38-39.5	14/18	10" - 39 		Fine to medium grain sand with gravel. Some broken gravel.
			1		Engineer

AEPMTP-000491

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۰.	1.5			

AMERICAN ELECTRIC POWER SERVICE CORPORATION

Job No				L.	.00	of Boking
Company		·-				Boring No. 505 Date <u>11-17-76</u> Sheet3 of <u>4</u>
Project						Type of BoringRig
Location of E	Boring:					Casing used Size Drilling mud used
Water Level	<u> </u>	.		• (Ground Elevation referred to
Time						Datum
Date						Field Party: <u>Roush & Reitmire</u>
Depth of Casing, ft. Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
				40		Water
9	43-44.5	13/ 18 <u>4</u> 5	6"	4		Sand with small emount of small gravel.
				- 40 - - - - - - - - -		
10	48-49.5	11/ 13/ ₁₁	6"	49		Large grain sand with traces of larger gravel.
11	53-54.5	⁷⁷ 11/13	6"	54		Top.3 large grain sand Remainder small to medium grain sand.
				55		
12	58-59.5	¹¹ / ₁₃ / ₁₅	10"	5		Medium to dark sand with small amount of gravel with traces of coal in the top of spoon.
				- 1 -		Engineer

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AEP CIVIL ENGINEERING LABORATORY

Job No).				L	-06	OF BORING
Compa	ny						Boring No 505 Date 11-18-76 Sheet 4 of 4
Projec	t						Type of BoringRig
Loca	tion of B	oring:					Casing used Size Drilling mud used Boring begun Boring completed
Water	Level						Ground Elevation referred to
Date			<u></u>				Uatum
Duc	T	<u> </u>		т		1	r
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					E60 =		
					$E_{i} =$		
		1		<u> </u>	+ 41		
	ļ.			ļ	E62 =		
					E -		
- 			11/		-63-		
	13	63-64.5	2236	6"	E 1/4 =		Medium brown and grain sand with a few gravels.
		T	* 1gm		F _	 //	
			-		- 45 -		
					E /6 _		
					E (=		
					- 67 -		
				i .	E_{1}		
			11/		E 4° E	V/	
	14	68-69.5	1413	6"	- 49 -	1//	Medium brown with large grain sand with some
	4 P.			ł		HX-I	glaver.
		1			F10-		
· .					E71-		
				Í	E, J		
					± ¹ /2 ∃		
		· · · · · · · · · · · · · · · · · · ·	111/		E 73 -		
	15	73-74.5	12/	0	E'_{-}		No recoverv.
		1			± 14 ∃		
		ļ			E75 -		
					E' -]		
					-76-		
	-	۰. ا			EnJ		
					E' =		
	- <u></u>		651		F 78 -		
	16	78-79.5	2	0	E 79]	VA	Large gravel in end of spoon
			[.			121	
				-	F % =		Rock Stopped hole at 80.6'
					È, <u>–</u>		
	1	1 - F			1 1	1 1	Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

ib No.							
ompan	y <u> </u>	palachia	n Power	Compa	my		Boring No. 506 Date Break 1 of _4
roject	Pr	oject 13	01 - Co	nveyor	•		Type of Boring Auger Rig D-01
Locati	on of Bo	oring:					Boring begun 11-17-76 Boring completed 11-17-76
Nater	evel	37.5	t_	•			Ground Elevation 579.43' referred to
Time							Datu
Date	•	L	•				Field Party: <u>Rousn and Reituire</u>
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
							Elevation changed about 1' lower.
			2/				
	1	3-4.5	-' 4/ <u>4</u>	6''			Dark brown pure silt.
					6		
	2	8-9.5	6/ 2/ 3	6"			Top.2 dark brown silt Remainder medium grain brown sand with small
							pieces of gravel.
					/2		
	3	13-14.5	14/ 18/2	8"	/3		Fine grain light brown sand with some small gravel.
					/5		
	4	18-19.5	15/ 23/2	2"	/8 /9		Gravel with medium grain dark brown sand - one fragments of broken sandstone.
·	I		4	1		4.1	

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AMERICAN LELCING TOWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No)	·			l. I	0G	OF BORING
Compai	ny					·	
Projec	t				•		Type of Boring Rig
Loca	tion of B	loring:					Casing used Size Drilling mud used
Water	Level					<u></u>	Boring begun Boring completed Ground Elevation referred to
Time							Datu
Date							Field Party: Roush and Reitmire
	ò	-	5 8 5	Ple Ple	DEPTH	Ha	DESCRIPTION
Depth of Casing, fi	Sample N	Sample der from-to (in feet)	Standard Penetratic Resistanc Blows/Fo	Tot. length recov. sam	IN FEET	SOIL GRA	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
· · · · · · · · · · · · · · · · · · ·		~	 				
	5	23-24.5	24/ 31/39	12"	22		Medium and light brown sand and gravel.
					- 25 -		
	6	28-29.5	26/ 56/0 • 3	/ 12"	28		Same as sample number 5 w/large gravels in spoon.
					31		
	7	33-34.5	²⁸ / ₃₀ / ₃₃	13"	34		Same as sample number 5.
					36 - - 37 - - 38 -		Water
	8	38-39 . 5	10/ ₁₀	4 ¹¹			Medium brown sand and gravel.

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FORM CE-5			AMERIC	AN EL	ECTRI	C P	UWER SERVICE CONTENT
REV. 3/74	۰ ۲		·	AEP C	IVIL E	ENG	
Job No.					L(0G	Boring No. <u>506</u> Date <u>11-17-76</u> Sheet <u>3</u> of <u>4</u>
Project Locatic	on of Bor	ing:					Type of Boring Rig Casing used Size Drilling mud used Boring begun Boring completed Ground Elevation referred to
Water L Time	evel						Field Party: <u>Roush and Reitmire</u>
Date				4 0 I		Ŧ	DESCRIPTION
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length o recov. sampl	DEPTH IN FEET	SOIL GRAF	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					-40-		
	-				/1 /2		
			1.7		- 43 -		
	9	43-44.5	10/ ₁₃	7"	- 4 -		Medium brown sand and gravel.
					- 45 -		
					- 46 - - - 47 -		
					- 48 -		
	10	48-49.5	5 ¹⁰⁷ 22/3/	6"	E. 49 -		Medium brown, dark brown sand and small gravel w/traces of coal.
					Ē 50 -		
							7/
	11	53-54.	5 ^{13/} 15/1	8 5"			Medium brown sand and gravel.
•			·				
					56		
	12	58-59.	5 17/13/1	4 7"			Same as sample number 11 w/small gravel.
					手		
1			- 1 · 1				Engineer

AEPMTP-000496

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AMERICAN ELECTRIC FORER SERVICE CONTENTS

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No.			
Company			Boring No. <u>506</u> Date <u>11-17-76</u> Sheet <u>4</u> of <u>4</u>
Project Location of Boring:			Casing used Size Drilling mud used Boring begun Boring completed
Water Level			Ground Elevation referred to
Time			Datt
Date			Fleid Party. Rousin and Refemire
Depth of Casiny, ft. Sample No. Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot Tot. length of recov. sample	DEPTH IN 25 Soil FEET 1 blov S fluc	DESCRIPTION type, color, texture, consistency, sampler driving notes, 's per foot on casing, depths wash water lost, observed tuations in water level, notes on drilling ease, etc.
<u>13</u> 3 -64.5	15/ 24 <u>30</u> 14"	62	lium brown sand and gravel.
14 68-69.5	^{12/} 9"	46	me as sample number 13.
15 73-74.5	17/ 26 <u>\$4</u> 6"	$7^{2} = 7^{2} = 7^{3$	me as sample number 13. opped hole at 75.6' -17-76
			Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

Job No.	······		· · · · · · · · · · · · · · · · · · ·		-		
Compan	y <u>App</u>	alachian	Power	Compan	<u>y</u>		Boring No. <u>513</u> Date <u>2-3-77</u> Sheet <u>1</u> of <u>4</u>
<u>Projec</u> t	Pro	ject 130	1 – Coa	1 Hand	ling		Type of Boring Auger Rig B-50
Locat	ion of Bo	oring:					Boring begun 2-3-77 Boring completed 2-3-77
Water	Level	33.5					Ground Elevation 573.73 referred to
Time		0 3 7	7				Datum
Date		2-3-7	/				Field Faily. <u>King and Shi Shi Shi</u>
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sampie	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
· · · · ·			57,				
	1	3.5-5		13"			Medium light and medium brown mottled silty clay.
	2	8.5-10	^{5/} 12 ₁₇	18"			Very stiff mottled brown silty clay.
			5/01				
	3	13.5-15	12	18"	- /4 - - /5 -		Very stiff mottled brown silty clay.
					/6/7/8/8/8		
	4	18,5-20	⁴ ′ 8/ ₁₂	18"	- 19		Same as sample number 3.
			·		+ 1-		
		<u> </u>	<u> </u>	<u> </u>	1	Щ	Engineer

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.			100				
Compan	у	·					Boring No. 513 Date $2-3-77$ Sheet 2 of 4
Project							Casing used Size Drilling mud used
Locati	ion of Bo	oring:					Boring begun Boring completed
Water	Level	33.5	· · · · · · · · · · · · · · · · · · ·				Ground Elevation referred to Datum
Time			·				Field Party: King and Smithson
Date		<u> </u>					Field Party:
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot, length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					20-		
	5	23-24.5	^{3/} 4/ ₅	18"	24		Loose medium brown silty sand.
	6	25-29.5	²³ / ₂₄ / ₂₅	14"	- 27 - - 28 - - 28 - 		Dense medium brown gray sand w/trace of silt.
	7	33.5-35	8/ 12/11	10"	<i>3</i> 3 - <i>3</i> 3 - <i>3</i> 4 - <i>3</i> 4 - <i>3</i> 5 - <i>3</i> 5 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i> 6 - <i>3</i>		Water Medium brown to medium gray sand w/trace of silt.
	8	38.5-40	1/ _{1/4}	6"	37 - 38 - 39 - 40 1		Loose medium brown and gray sand w/trace of silt.
							Engineer
			<u> </u>				

AEPMTP-000499

FORM CE-5 REV. 3/74

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.						00	
Compan	У			· .			Boring No. <u>513</u> Date <u>2-3-77</u> Sheet <u>3</u> of <u>4</u>
Project							Type of Boring <u>Auger</u> Rig <u>B-50</u>
Locat	ion of Bo	ring:					Boring begun Boring completed
Water	l evel	33.5					Ground Elevation referred to
Time							Datum
Date		2-3-77					Field Party: King and Smithson
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	9	43.5-45	5/ _{7/9}	0	43 44 45		Sand and gray wash water.
	10	48.5-50	5/ _{9/11}	4"	40 - 47 - 47 - 47 - 47 - 47 - 47 - 47 -		Medium brown sand and gravel.
	11	53.5-55	9/ 14/ ₁₆	8"	53		Dense medium brown gray sand w/trace of silt.
	12	58.5-60	12/ 2025	10"	57		Dense medium brown, gray sand.
							Engineer

AEPMTP-000500

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AEP CIVIL ENGINEERING LABORATORY

lob No					1	LOG	OF BORING
Compar	•						513 54 2-3-77 54 4 5 4
	יי				· ·		Boring No. <u>915</u> Date <u>$2-5-77$</u> Sheet <u>4</u> of <u>4</u> Type of Boring Auger Big B-50
Locat	tion of Br	hring:					Casing used Size Drilling mud used
Locu							Boring begun Boring completed
Water	Level	33.5					Ground Elevation referred to
Time		2.2.77	· · · · · · · · · · · · · · · · · · ·				Datum
Date		1 2-3-11					Field Party:
, of , ft,	° No.	depth -to et)	dard ation tance Foot	igth of sample	DEPTH IN	SRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes,
Deptl Casing	Sample	Sample fron (in fe	Stan Penet Resis Blows,	Tot. ler recov.	FEET	Soll (blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					$E_{lo} =$		
		en -			Ē, -		
					= 61 =		
					F /2 -	1	
					E -		
			1.37	L	-63-	1	
	12	63 5-65	23/27	611	F' -	1	Very dense medium brown and gray sand w/trace
	15	03.5 05	21		- 44 -		of silt.
					F / 5 -		
		-					
					= 46 =		
					E -		
			<u> </u>		-67-		
		· · ·			- - - -	11	
			11/18/		E°3		
	14	68.5-70	1060	12"	F- (9 -	1//	Same as sample number 13, .2 gray sandstone
]///	In end of tube.
······································			<u>}</u>		- /0 -	 [≁] -	
					E, =]	
					F -	11	Stopped hole at 70.0'
					2		2-3-77
	-				<u> </u>		
					- 3		
	5.				- 4 -		
					F _	1	
					<u> </u>		
·					- , -		
					F 7 -		
					E		
					8 -		
					F _ =		
	- <u> </u>				E'=		
					F- 0 -		
					<u> </u>		
					F 1-		
							Engineer

FORM CE-5 REV: 3/74

AMERICAN ELECTRIC POWER SERVICE CORPORATION

Job No.					-		
Company	y	Appalachi	an Powe	er Com	pany		Boring No.514 Date Sheet 1 of4
Project		Project 1	.301– Co	al Ya	rd		Type of Boring <u>Auger</u> Rig <u>B-50</u>
Locati	on of Bo	pring:					Casing usedSizeDrilling mud used
Water	evel	T					Ground Elevation 573.09 referred to
Time							Datum
Date							Field Party: <u>King and Smithson</u>
		÷	E e t	of ole	DEPTH	Hd	DESCRIPTION
"a #	ž	dep tot-to	ratio tanc For	ng th sam	IN	GRA	Soil type, color, texture, consistency, sampler driving notes,
e pth is ing	uple.	fron fron in fe	stan enet esis ows	r. ler ov.	FEET	1	blows per foot on casing, depths wash water lost, observed
ိပိ	S	Sar	๛๊๛๊๛	Tot		N N	fluctuations in water level, notes on drifting ease, etc.
					E _ =		
		м. С			— —		
┠╂					<u></u>		
					E 2 -		
					- -		
┠╂					- 3 -		
					E 1		
	-	0 5 5	5/	1.011	<u> </u>	11//	Mattled light brown and ructy candy cilty clay
	1	3.5-5	-113	12"	<u> </u>	114	w/rock fragments. Very stiff - dry -
					E 6 -		
					- 7 -		
						\prod_{n}	
			117		- 9 -	11//	
	2	8.5-10	22/27	14"		11/	Medium brown silty clayey sand w/gravel, dense-dry
 +					E / =]]	
					上ハー		
					F / -		
					E " =		
							······································
					E /4 -		
			15/		E		
	3	13.5-15		12"	- /5 -	1	Medium brown coarse sand and gravel dense-dry-
·						1	
		ļ	 	<u> </u>			
					- 10		
] -,	
-	······································		15/		- 19-	1//	
	4	18.5-20	16/20	10"	- 10	11/	Medium brown coarse sand and gravel.
		<u> </u>			E =		dense - dry
·						1	
i 1 a A	· · ·						Engineer

FORM	CE-5
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AMERICAN ELECTRIC POWER SERVICE CORFORATION

Job No						
Company		<u></u>		· · · · · · · · · · · · · · · · · · ·		Boring No.514 Date <u>2-4-77</u> Sheet <u>2</u> of <u>4</u>
Project						Type of Boring Auger Rig B-50
Location of E	Boring:					Boring begun Boring completed
Water Level						Ground Elevation referred to
Time						Datum
Date						Field Party: King and Smithson
Depth of Casing, ft. Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
5	23.5-25	19/ 19/ 20	8"	20 21 22 23 23 24 25		Medium brown sand and gravel dense and dry
6	28.5-30	7/ _{9/15}	6"	26 -27 -28 - 29 - 30		Medium brown damp sand and gravel - medium -
7	33.5-35	12/ 15/3	6"	31 32 33 34 34 35		Water Medium brown wet - sand and gravel. - medium -
	20 5 40	4/ 6/7	5"	36 37 37 38 38 39		Medium brown gravelly sand - wet -
δ 	38, 5-40					Engineer

FORM	CE-5
REV.	3/74

AMERICAN LELCTRIC FORER SERVICE CORPORTS

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.						.00	01 Bokino
Compan	У						Boring No. <u>514</u> Date <u>2-4-77</u> Sheet <u>3</u> of <u>4</u>
Project) (Type of Boring <u>Auger</u> Rig <u>B-50</u>
Locati	on of Bo	oring:					Casing usedSizeDrilling mud used Boring begunBoring completed
Water	_evel	1					Ground Elevation referred to
Time							Datum
Date							Field Party: <u>King and Smithson</u>
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					E1/0 -		
		•			E		
					<u>+-</u> <i>4</i> 1 <u>-</u>		
					- 42 -		
					E, -		
		· · · · · · · · · · · · · · · · · · ·			- 43 -		
					E 44 =		Washed out plug 2'
	0	13 5-15	1445	-0-		W	- Lost sample -
	J	43.5-45	15		- 45 -		
					E 1/6 =		
					E, -		
	· · · · · · · · · · · · · · · · · · ·	<u> </u>			+ 47 -		
					- 4/8 -		
						$\frac{1}{17}$	
			11/			11/	
	10	48.5-50	21	7"	- 50 -	 //	Medium brown sand and gravel
							Dense – wet
					- 52 -		
	<u></u>				E 33 -		
			67		- 54 -	1//	
	11	53.5-55	8/2	12"		1//	Medium brown fine to medium sand
 					- 56 -		
						1	
		[\mathbf{F}'		
					- 58 -		
					50		
			13/25/			11/	Washed out plug 2'
	12	58,5-60	17	-0-	= 60 -] 4	Lost_sample
					È , -		
			-		'		
		<u> </u>	1	I	<u></u>	11	Engineer

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FORM	CE-5
851.	3/74

AMERICAN ELECTRIC POWER SERVICE CORFORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No	•				•	.00	
Compan	У						Boring No. <u>514</u> Date <u>2-4-77</u> Sheet <u>4</u> of <u>4</u>
Project							Type of Boring <u>Auger</u> Rig <u>B-50</u>
Locat	ion of Bo	oring:					Casing used Size Drilling mud used
Water	l evel	1					Ground Elevation referred to
Time		-					Datum
Date							Field Party: King and Smithson
T			[]	<u>ب</u> ہ	T	I	DESCRIPTION
~, ≠	No.	÷ ept	tion Tool	amp ¹	DEPTH	RAF	Soil type color texture consistency sampler driving notes.
pth ing,	b e	one of the office andc etro sistc vs/l	leng /. s(FEFT	U L	blows per foot on casing, depths wash water lost, observed	
^e ^c ^c	Sam	fr fr	Per St Res Bloy	ot.		Sol	fluctuations in water level, notes on drilling ease, etc.
				<u> </u>			
					<u>- 10 -</u>		
					En		Augers settled down after drilling 6"
							1 · · ·
					- 62 -		
		<u> </u>			$E^{\mu 3} =$		
					E 64 =		
	10		12/22/2		F _	11/	No recovery * Used stiff spring.
	13	63.5-65	23		- 65 -	1/1	No recovery. Obed Other Spring.
					- 16 -		
					E =		
			ļ		<u>+ 67 -</u>	1	
		<u> </u>			- 48 -		
					E69-		<u></u>
	1/.	69 5-70	30%	911		11/	Modium brown cand and gravel w/trace of sandstone
-	14	00.5-70			//0	#4	fragments in end of spoon.
					E11-		
			<u> </u>		- 1/2 -		Stopped hole at 70°
1				1			
			1		E 13 -		
		<u> </u>	ļ		<u>+</u> 14 -		
					E' -		
				<u> </u>	15		
					E /16 -		
				·	F -	1	
		<u> </u>	<u> </u>	<u> </u>	- 17 -		
					- 10 -	1	
			1		E 7° -		· · · · · · · · · · · · · · · · · · ·
	L	ļ	<u> </u>	 	- 19 -	1	
					F,-		
-					E %0 -		
			ļ	·	E 1		
					1		Engineer
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FORM CE-5 REV. 3/74

AMERICAN ELECTRIC FORER SERVICE SOM SHATTER

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.					-		· • •
Company	yA	ppalachia	in Power	Comp	any	Boring No. 701 Date 2-4-77 Sheet 1 of 5	
Project	F	Project 13	301 - F1	yash	Pipe B	Type of Boring Auger Rig <u>B-50</u>	
Locati	ion of Bo	oring:					Boring begun 2-4-77 Boring completed 2-9-77
Water	Level	40.0	l				Ground Elevation <u>584.92</u> referred to Datum
Time		2_1-	77			Field Party: King and Smithson	
Date		17	T		1	T	
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length o recov. sampl	DEPTH IN FEET	SOIL GRAP	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	1	3.5-5	6/ 9/ ₁₂	15"			Silty medium brown to gray clay.
	2	8.5-10	57 ₅₇₈	8"	6		Sandy silt.
	3	13.5-15	5/ _{9/7}	8"			Medium grain brown sand and silt.
	4	18.5-20	15/ 20/22	11"	/7 - /8 - /9 - /9 - /9 - /1		Medium grain sand w/trace of gravel.
			1	<u> </u>			Engineer

AEPMTP-000506

FORM	CE - 5
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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No.							
Compan	У				-		Boring No. <u>701</u> Date <u>2-7-77</u> Sheet <u>2</u> of <u>5</u>
Project							Type of Boring
Locat	ion of Bo	ring:					Boring beaun Boring completed
Water	Level						Ground Elevation referred to
Time							Datum
Date					• 		Field Party: King and Smithson
[]				e e	DEDTU	H	DESCRIPTION
epth of ising, ft.	mple No.	nple dept from-to in feet)	Standard ∋netratior esistance ows∕Foo	r. length (ov. samp	IN FEET	OIL GRAF	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
ΰ	Š	5ai (<u> </u>	10 10 10	<u> </u>	Ň	
					E.20 =		
		2000 2000 2000			E		
					-21-		
					E 22 -	1	
					- 23 -		
·			8/21		- 24 -	11/	
	- 5	23.5-25	13/17	9"	- 25 -		Fine sand w/trace of coal and some gravel.
			· · · · ·		- 26 -		
				1			
			1]	
					- 28 -		
						$\frac{1}{2}$	
-			7/		- 29 -	11/	
	6	28.5-30	8/11	8"		11/	Medium grain sand w/small gravel.
					-131-][
					+		
-		<u> </u>	-	1			
			<u> </u>	·	- 33 -		
						17	
			5/	1		31/	
	7	33.5-35	6/8	12"		-1//	Medium grain sand - medium brown
•	} .					-	
	 		+	+		1	
	1			·	E 37]	
	<u> </u>	1			F -		
					- 38 -]	
i I .						=17	/
			461	1	E 37 -	3V/	/
	8	38.5-40	11	18"		412	Light brown medium grain sand.
		ļ			E -		water at 40.0
				+		-11	
							Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

Job	No.	·	· · · · · · · · · · · · · · · · · · ·					
Com	pan	У						Boring No. <u>701</u> Date <u>2-8-77</u> Sheet <u>3</u> of <u>5</u>
Proj	ect							Type of Boring Rig
Lo	ocati	ion of Bor	ring:					Boring begun Boring completed
Wa	ter	Level						Ground Elevation referred to
Tir	me							Datum
Da	te							Fletu Party
Depth of	Casing, ft.	Sample No.	Sampie depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot, length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
·	-+		*			- 40 -		
						EME		
						\mathbf{E}		
·						<u> </u>		
						E H3 -		
						E , -		//
				47		+ #4 -		
		^{• 1} • • 9. •	43.5-45	6/ _{7_}	-0	F # 5 -	1//	// No recovery.
						E, -		
,		-				<u>-</u> 46 <u>-</u>		
						E 47 -		
						F		
¦┣─						- 48 -		
						E 49 -	1VE	///
		10	10 5 50	2/ 4/_	- 217	E, E	11/	Medium grain sand w/small gravel.
-		10	40, 5-50			- 50-	++++	
						E51-		
4 1]	
-						<u>– 52 –</u>		
						- 53 -	-	
					1			///
-			·	17/2/		54	31/	
		11	53.5-55	1215	16"		44	// Medium grain sand w/several large gravel.
· •					1	E,		
			<u> </u>					
			<u> </u>	ļ	 	- 57 -		
					1	F		· · · · · · · · · · · · · · · · · · ·
		1			<u> </u>	E 58 -	1	
			ļ	67	<u></u>	- 59-	٦Ľ	V//}
		12	58.5-60	¹² / ₆	8"	F lea		Medium grain sand w/small gravel.
				<u>*</u> ~	1	E -	-	
			 		·	<u>+ 1</u> -	-1	
				1.				Engineer

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AMERICAN ELECTRIC POWER SERVICE CONTORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No.								
Compan	У							Boring No. 701 Date Sheet 5 of 5
Project								Type of BoringRig
Locat	ion of Bo	ring:						Casing used Size Drifting induced
Wator		F						Ground Elevation referred to
Time	Level							Datum
Date								Field Party: King and Smithson
<u>г</u>				ч — 0	I	Ξ	T	DESCRIPTION
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length o recov. sampl	DEPTH IN FEET	SOIL GRAP	Soil blow fluc	type, color, texture, consistency, sampler driving notes, s per foot on casing, depths wash water lost, observed uations in water level, notes on drilling ease, etc.
					<u>-</u> xo -		Auge	refusal at 80.5'
ŀ						1/7	7	
					E'' =	1//	Star	ted coring at 80,5'
					E / 2 -	11/	/	
					F' -	11/	/	
					E-83-]//	/	
					F	±{//	/	
					F 84 -	11/		
	Core	80.5-90.5		7.6'	Els-	31/	/	
						11/	Gray	coarse grain sandstone.
					F- 86 -	11/	/}	
]//E	//	
			<u> </u>		÷ %7 -	1//	//	
					E /8	11/	/	
	-				E°-		/	
				<u> </u>	<u>- 89 -</u>	11/	Λ	
					E	31/	/	
					- 90 -	41/	Stop	ped hole at 90.5'
					E 91 -	ŤĒ	2-8-	77
					E'-			
L				ļ	F-92-			
					E, -][·	
	<u> </u>							
					E 94]	ļ	
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		. <u> </u>	.	<u> </u>	E- 95 -			
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		+	1	1	- 40 -			
				<u> </u>	E 47 -			
	1					-11		
ļ	ļ		+	+]		
					F	1		
	<u> </u>	+	1	1	E49-			
					E/10-][
					F .	=		
	l				F 1-	11		
				1				Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

Job No). 				ļ	-0G	OF BORING
Compa	ny	Appalachi	an Powe	r Comp	any		Boring No. 703 Date 2-1-77 Sheet 1 of 5
Projec	t1	Project 1	301 -	Fly as	h Pond		Type of Boring Auger Rig B-50
Loca	tion of B	oring:					Casing used Size Drilling mud used
Water	Level	39.0)				Ground Elevation <u>567.70</u> referred to
Time		2-1-	77				Date
Date		2-1-					Field Party: <u>King and Smithson</u>
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	1	3.5-5	⁵⁷ 7/ ₇	16"			Silty clay.
	2	8.5-10	^{3/} 4/ ₅	12"	8		Sandy, silty clay.
			I/2/				
	3	13.5-15		12"	/5 /6 /7		Sandy clay.
	4	18.5-20	13/ 22/ 19	5"	/8 /9 20		Sand and medium large gravel. Trace of coal.
			 -				Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

p No. pmpany	·						Boring No. <u>703</u> Date <u>2-1-77</u> Sheet <u>2</u> of
oject							Type of Boring <u>Auger</u> Rig <u>B-50</u> Casing used Size Drilling mud used
_ocati	on of Bò	ring:					Boring begun Boring completed 1
later l	_evel	39.0					Ground Elevation referred to Dat
ime late		2-1-77					Field Party: King and Smithson
		ŧ	E e t	of Ple	DEPTH	НЧ	DESCRIPTION
Depth of Casing, ft.	Sample No	Sample dep from-to (in feet)	Standard Penetratio Resistanc Blows/For	Tot. length recov. sam	IN FEET	SOIL GRA	Soil type, color, texture, consistency, sampler driving notes blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					-20-		
					-1-		
	<u> </u>			-	- 23 -		
		 	10/		- 24 -	1 <i>1</i> /	
а. С	5	23.5-25	15/18	8''			Medium grain sand, light gray.
					- 27 -		
					- 28-]	
					E 29		
		20 5.20	7/	5"			Medium grain sand w/trace of coal.
	0	20. 5-50				-14	/
					-1-31-		
					<u> </u>	E	
						-	
	1		5/6/10	711	E]	Medium grain sand, medium brown.
	7	33.5-35	<u>'</u>	+			
						-	4
		-			38		
					- F 39	J₽.	/ Water
	8	38.5-40	5/5/5	8"	Ello	<u>YE</u>	Same as sample number 7.
		-		1	E	=	
· · ·							
· · ·		<u> </u>					Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.					-		01 00	
Compan	У				·			Boring No. <u>703</u> Date <u>2-1-77</u> Sheet <u>3</u> of <u>5</u>
Project	. <u></u>							Type of Boring Auger Rig B-50
Locati	on of Bo	oring:						Casing used Size Drilling mud used
Water I	_evel	T						Ground Elevation referred to
Time								Datum
Date		2-1-77	1					Field Party: <u>King and Smithson</u>
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sampie	DEPTH IN FEET	SOIL GRAPH	Soil ty blows fluctu	DESCRIPTION pe, color, texture, consistency, sampler driving notes, per foot on casing, depths wash water lost, observed ations in water level, notes on drilling ease, etc.
					$4'_{1}$			
	9	43.5-45	4/ 6/ ₇	1"	- 46 -		Two	arge gravels and medium grain sand.
			5/		47 - 			
	10	48.5-50	^{4/} 6	10"	¥9 50		Same	as sample number 9.
					1 1 1 1 1 1 1 1 1 1			
	11	53.5-55	8/ _{8/}	10"	54		Small	er gravel - medium grain sand.
					>5 			
			15/		- 58 - - 59 -		/	
	12	58.5-60	20 <u>22</u>	8"			Mediu	m brown - medium grain sand.
		<u> </u>					1	Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

Locatio	on of Bo	oring:					Casing used Size Drilling mud used Boring begun Boring completed
Water L	evel.	39.0			Ground Elevation referred to		
Date							Field Party: King and Smithson
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving no blows per foot on casing, depths wash water lost, observ fluctuations in water level, notes on drilling ease, etc.
	······				<u> </u>		
				-		77/	
	13	63.5-65	⁷⁷ 64 14	5"	- 45 -		Several large gravel and medium grain sand.
					= / 6 =		
							1
					= ^q = =		
					- 69 -	17/	
	14	68.5-70	20/22	10"	= 10 =	ļ//	Medium grain sand w/trace of gravel and shale
					- 71 -		

		127			1//	
15	73.5-75	12/4	9"		V//	Large grain sand and small gravel.
				t- 75 -t	44	
		· · · · · · · · · · · · · · · · · · ·		トーるニ		
				$ \vdash $	1 -	
	1			F _ 7		
				ヒルヨ		
				-78-		
				ト コ		
				t 70 -	V/	
		56/		F / 7	٧/,	
16	78 5-80	20/7	10"	トローヨ	V/	Same
10	10.5 00	<u>_</u>			11-	
				F		
	·			上 1 ゴ		
						Engineer
	L	L				

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_ Datum

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AEP CIVIL ENGINEERING LABORATORY Log of Boring

Job No.	•				F	00	
Compan	V						Boring No. 703 Date 2-1-77 Sheet 5 of 5
Draiact					-		Type of Boring Auger Rig B-50
Locat	ion of Bo	rina:					Casing used Size Drilling mud used
Luca		·····y·					Boring begun Boring completed
Water	Level						Ground Elevation Telefied to Datu
Time							Field Party. King and Smithson
Date		L					
Depth of Casing, ft.	°Z = = = = = = S Run #1	4409 electronic (100 electronic) (100 electronic) 82.7-92.	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET 8 0 8	SOIL GRAPH	Field Party: King and Smithson DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc. Rock 82.7' started coring.
					8^{8} 7^{9} 7^{1} 7^{1} 7^{2} 7^{3} 7^{4} 7^{5} 7^{6} 7^{7} 7^{8} 7^{9} 7		All sandstone core 100% recovery. Stopped coring at 92.7! 2-2-77
				-			

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Job No.

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Compa Projec	iny	Appalachi Project 1	an Power 301 - Tr	r Compa	any ridge (Cross	Boring No. 801 Date 3-16-77 Sheet 1 of 5
Loca Water	tion of Level	Boring:					Casing used Size Drilling mud used Boring begur3-16-77 Boring completed 3-16-77 Ground Elevation 594.95 referred to
Date							Field Party: <u>Roush and Reitmire</u> Datum
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	1	2.5-4	21/ 24 <u>/</u> 27	15" 13"			Black fly ash and dark brown sand and gravel. (Fill) Dark_fill brown sand and gravel. Medium brown clayey silt.
	3	12.5-14	2/ 3/4 3/4/5	14"	/1 /2 /3 /4 /5 /6 /7 /7 /8 /9		Medium brown clayey, sandy silt.
	l						Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No.					į	LOG	OF BORING
Company							Boring No. 801 Date 3-16-77 Sheet 2 of 5
Project_				· .	-		Type of Boring Rig
Locatio	n of B	oring:					Casing used Size Drilling mud used
Water Le	evel	1					Ground Elevation referred to
Time							Datu
Date		<u> </u>					Field Party: <u>Roush and Reitmire</u>
		ŧ	E o t	e e	DEPTH	H	DESCRIPTION
Depth of Casing, ft	Sample No	Sample dep from-to (in feet)	Standard Penetratio Resistanc Blows/Foc	Tot. length recov. samp	IN FEET	SOIL GRAI	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	5	22.5-24	¹⁰ / _{15/7}	15"	21 21 21 22 22 22 23 23 23 23 23		Medium brown gravely sand.
					25		
	6	27.5-29	8/ 13 ₁₇	16"	<i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i> ³ <i>J</i>		Same as sample number 5.
	7	32.5-34	57 6/9	15"	<i>3</i> 2 <i>3</i> 3 <i>3</i> 4 <i>3</i> 4 <i>3</i> 5 <i>3</i> 5		Medium brown sand w/trace of gravel.
	8	37.5-39	6/ _{8/11}	14"	36 37 37 38 38 39		Medium brown sand.
					- <u>/</u> 0 -		Engineer

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Job No. ____

AMERICAN ELECTRIC FOREX SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Compa	ny						Boring No. <u>801</u> Date <u>3-16-77</u> Sheet <u>3</u> of
Projec	tt	Poring			·		Type of Boring Rig
Loca		soring:					Boring begun Boring completed
Water	Level						Ground Elevation referred to
Date	-						Eield Party:
r			······	1		· · · · · ·	
Depth of Casing, ft.	Sample No.	Sample depth from-to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving note blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	~						
-			2/3/	-	$\begin{array}{c} 4_2 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $		
	9	42.5-44		13"	+ 4		Medium brown sand w/trace of gravel.
					- 46 - 		
	10	47.5-49	6/ 7/ ₈	1"	- 48 - - - - - - - - - - - - - - - - - - -		Same as sample number 9.
	11	52.5-54	" ^{4/} 7	2"	54		Same as sample number 9.
					- 5 - 5 		
			77		57 -		
	12	57.5-59	12/13	14"	59.		Medium brown sand.
							Engineer

	-				
R	E	۷	•	3/	74

Job No.

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Compa	.ny		<u></u>				Boring No. 801 Date 3-16-77 Sheat 4 of 5
Projec	<u>.t</u>						Type of Boring Rig
Loca	tion of F	Boring:					Casing used Size Drilling mud used
Water	Level						Boring begun Boring completed
Time			·····			····	Ground Elevation referred to
Date				·····			Field Party: Roush and Reitimre
÷	<u>•</u>	ht d	- u e to	ple	DEPTH	Ha	DESCRIPTION
th of 19, f	Z o	a dej n-to eet)	dard ratic stan:	ngth sam	IN	5RA	Soil type, color, texture, consistency, sampler driving notes
Dept Casir	Sampl	Sample fror (in f	Stan Penet Resis Blows	ot. ler ecov.	FEET	2011 0	blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	[+	+		+, -		, , , , , , , , , , , , , , , , , , , ,
!	[-	+		F-60 -	1 E	
[]	· · · · · ·				En=	11	
	l				È -	41 F	
<u>}</u> +	1		+	+	<u></u> <u></u> <u></u> <u></u> <u></u> <u>−</u> <u></u> <u>−</u> <u>−</u> <u>−</u> <u>−</u> <u>−</u> <u>−</u> <u>−</u> <u>−</u> <u></u>		
	 		<u> </u>		EU3 =	17/1	
	1 12	EN E GA	8/9/12	1 101		11//k	t
		62.3-04	13	15	<u>+</u> 4 -	╫╋	Medium brown sand.
	L				F 45 -	41 E	
	1	T	T		E =	<u> </u> -	
·		+			E-66 =	<u> </u> -	
]			'		₣ <i>╻</i> , <u></u>	11 [
	-		T '	1	E' J		
			8/	├ ───┘	E-68 =	1V/A	
	14	67.5-69	10/	<u>10</u> **	F =	11/1-	Same
					E'J	1T-	
+			<u> </u>	├	E-70-]		
			[]		F "]		
	·!		-		E']	1 -	
		<u> </u>			E-12-]		
		<u> '</u>	<u> </u>	<u> </u>	EBE	7/	
	15	70 5-74	4/8/12	1!	F″ ₫	///-	
		12.5		<u> </u>		14-	Same
	/	<u> </u>		LF			
	. 1	1 1		Ē			
		·	F†	·	- 16 -		
		<u> </u>		F	= 17 =		
		1	1 . 1		- +	+	
			107		-781	1/1-	
	16	77.5-79	26/	_ <u>12"</u> F	- 19 =	<u>M</u>	Same
				F	리기 크!	1-	
					- % -]		
					- , =		
					· ·	.	
	L	L	l.	L	IJ	<u> </u>	Engineer

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AMERICI LECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

GRAPH

SOIL

DEPTH

IN

FEET

-8 o

81

1/2

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Company_

P٢	ni	\overline{a}	c	ł	
	11		ŧ.,		

Location	of	Boring:

Sample No.

17

j i

Sample depth from-to (in feet)

82.5-84

Tot. length of recov. sample

6"

Standard Penetration Resistance Blows/Foot

12/ 18/₂₁

Water Level Time

Date

÷.÷ Depth of Casing, f

Boring No. <u>801</u> Date <u>3-16-77</u> Sheet <u>5</u>	of <u>5</u>
Type of BoringRig	
Casing used Size Drilling mud used	
Boring begun Boring completed	
Ground Elevation referred to	
	_ Datu
Field Party: <u>Roush and Reitmire</u>	

DESCRIPTION

Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.

1

		Auger refusal at 86.8'
		<u>3-16-77</u>
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		<u></u> − 1 8	-11	
		E,		
		E /9		
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		E /2		
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r				1	A

Engineer

Medium brown sand and gravel.

AEPMTP-000519

AMERICAN ELECTRIC POWER SERVICE CORPORATION

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AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No)				·		
Compa	ny A	ppalachi	an Powe	r Comp	any		Boring No. 802 Date 3-17-77 Sheet 1 of
Projec	t <u> </u>	Project 1	301 – T	ruck B	ridge (lros	ssing Type of Boring Auger Rig B-61
Loca	tion of E	Boring:					Casing used Size Drilling mud used
Water	Level	34.5					Ground Elevation 588, 46 referred to
Time							
Date							Field Party: Roush and Rietmire
		÷	E 0 +	t e	DEDTU	H	DESCRIPTION
Depth of Casing, ft	Sample Na	Sample dep from-to (in feet)	Standard Penetratio Resistanc Blows/Foc	Tot. length recov. samp	IN FEET	SOIL GRAI	Soil type, color, texture, consistency, sampler driving notes blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					- 1		
					E_2		
					F _		
			. <u> </u>	ļ	- 3 -		
					⊨ , -		
			5/8/		E 4 -		
	1	3.5-5	6/8	17"	<u> </u>	12	Medium brown and gray clayey silt.
					È -		· · · · · · · · · · · · · · · · · · ·
					F 6 -		
					E, Ξ		
	-				- 8 -	11 F	· · · · · · · · · · · · · · · · · · ·
			3/4/-		E =	V	
	2	8.5-10	5	16"	= /0 =	14	Medium brown and gray sandy, clayey silt.
					- /2 -		
	***				E		
			2/		- /4 -	V/A-	
	3	13.5-15	² / ₅ / ₆	147	$\begin{bmatrix} & - \end{bmatrix}$		Medium brown clavey sand.
				* -T	E 7 3		
┣┦					- 16 -		
	· ₹.				F, \exists		
	· · · · · · · · · · · · · · · · · · ·				- 18 -		
					$\begin{bmatrix} - & - \end{bmatrix}$	17/	
			7/		- /9 -	¥//	
	4	18.5-20	°/ 11		E20 3	¥/L	Medium brown gravely sand.
	i						
					- 1		
							Engineer

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Job No	o					LUG	OF BURING
Сотра	iny						Boring No. 802 Date 3-17-77 Shoot 2 of
Projec	ct						Type of Boring Rig
Loca	tion of	Boring:					Casing used Size Drilling mud used
Water	- Level	24 5		·····		Boring begun Boring completed	
Time	Lever					Ground Elevation referred to	
Date	· · · · · · · · · · · · · · · · · · ·				*		Dat Field Party: Roush and Reitmire
	1			<u> </u>	Т	Τr	
ъ. т .	No.	dept -to et)	ard ation ance Foot	gth o ample	DEPTH	RAPI	DESCRIPTION Soil type, color, texture, consistency, complex driving notes
epti	nple	n fe	tanc netr sisisi ws/	len v. s	FEET		blows per foot on casing, depths wash water lost, observed
ں ^م	Sa	San (i	Blag	Tot.		Sol	fluctuations in water level, notes on drilling ease, etc.
					- 20 -		
ļ	L		_		E_{z1}		
			-	<u> </u>	F 2 -		
					F		
				1	E		
L				ļ	- 24 -		
	5	23 5-25	5/10	171	F -		
		23.5 23	/ 10	14	- 25 -	$\mathbb{H}^{\mathbb{Z}}$	Medium brown sand - fine grain
	-						
					E =		
				[- 27 -		
	· · · · · · · · · · · · · · · · · · ·		1		- 28 -		
					$E_{79} =$	V/A	
	6	20 5 20	^{3/} 7/ _a	1/1	F _	1///	
├ ───┤	0	20.5-30		14	- 20 -	 7+	Same as sample number 5 fine grain.
	· .						· · · · · · · · · · · · · · · · · · ·
					E 3		
┠Ң					- 32		
					$\begin{bmatrix} - \\ - \end{bmatrix}$		
	· · · · · · · · · · · · · · · · · · ·						
			107		E 34 I	V/	
	7	33 5-35	14/2	т. ст. 17			
		55.5-55	13	15.	- 35 -	14	<u>Same as sample number 5 w/medium and coarse</u>
							glain Sanc.
			-				
					- 37 -		
						-	
					- 38 -		
					E 39]	1/1	
	c		4/7/		L , 1	[/]-	
	8	38,5-40	., 8	13"	- 1/0 手	ľ4	Same as sample number 5 w/medium and coarse
						╞╞	grain sand,
		,					
		I (<u> </u>	· .		Engineer

REV- 3/74

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No).				L	- 0 _. G	OF BORING
Compa	.ny						Boring No. 802 Date 3-17-77 Sheet 3 of 4
Projec	:t						Type of Boring Rig
Loca	ition of E	Boring:				Casing usedSizeDrilling mud used	
Water	Level	34.5				Ground Elevation referred to	
Time	······						Datu
Date	•				·		Field Party: <u>Roush and Reitmire</u>
	0.0	th de	d ion oot	h of nple	DEPTH	APH	DESCRIPTION
Depth o Casing,	Sample	Sample de from-to (in feet	Standar Penetrati Resistan Blows/Fr	Tot. lengt recov. san	IN FEET	SOIL GR	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					1-10-		
	· · · ·				$E_{n} =$		
				T			
					<u></u> + ⁴ ² −]		
	. 				F 4, -		
			1		E'3		
				 	E 44 =	1//	
	9	43.5-45	5 ⁶ 5/6	13"		1/1	Medium brown sand - medium and coarse grain.
		1					
 	<u></u>			 	- 46 -	╎╎	
					E		
		+			F 47 -		
	• 	ļ		 	$E_{48} =$	╞	
					E , -]	1/	
			6/		- 49 -	V/A	
	10	48.5-50	. ⁸ 10	14"	Eso I	1/	Same as sample number 9, medium grain.
						-	
				 	F51-]		
					$\left[\frac{1}{2} \right]$		
	77 .	· .			E° JI		
	** # /		<u> </u>	·	E-53 -]	-	
					トノゴ	1/	
			5/			//	
	<u> </u>	53.5-55	<u>10</u>	_12"	= 55 ==	14-	Same as sample number 10 - medium grain.
					티고리	┝	
			<u> </u>		-)6 -		
					E 57]	-	
					- , -]	-	·
					- 58	<u> </u>	
					王公王	7/_	
			8/	E		//-	
	12	. 58.5-60	14	13"	- 60 -	4	<u>Same as sample number 11 - medium grain.</u>
					-, 1	E	
		N			- ' -		
	I						Engineer

FORM	C 🗄 - 5
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AMERICAN LEECTRIC TOHER SERVICE CORFORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

Boring No. <u>802</u> Date <u>3-17-77</u> Sheet <u>4</u> of <u>4</u>
Type of BoringRig
Casing used Size Drilling mud used Boring begun Boring completed
Ground Elevation referred to Dat
Field Party: <u>Roush and Reitmire</u>
DESCRIPTION be, color, texture, consistency, sampler driving notes ber foot on casing, depths wash water lost, observed tions in water level, notes on drilling ease, etc.
brown sand - fine grain - medium coarse_
s sample number 13 - medium and coarse
as sample number 13 - medium grain.
as sample number 13 - medium and coarse refusal at 82.5'

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No	D.	1				L00	G OF BORING
Compa	ny <u>Ap</u>	palachia	n Power	Compar	ny		Regina No. 803 Data 3-15-77 Sheet 1 of
Projec	t Pr	oject 13	01 – Tri	ick Bri	idge Cro	ing Type of Boring Auger Rig B-61	
Loca	tion of I	Boring:				Casing usedSizeDrilling mud used	
Water	Level		·····			Boring begun 5-15-77 Boring completed 3-16-77	
Time						Telened to Dat	
Date						Field Party: <u>Roush and Reitmire</u>	
ц÷	.0	pth	of cond	of ple	DEPTH	HA	DESCRIPTION
Depth o Casing, f	Sample N	Sample de from-to (in feet)	Standare Penetrati Resistun Blows/Fo	Tot. length recov. sam	IN FEET	SOIL GRA	Soil type, color, texture, consistency, sampler driving notes blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
		8					*Boring offset about 25'east because of
							power lines.
	<u>`</u>						
					<u> </u>		
					<u> </u>	1/77	
			37				
	1	2.5-4	4/6	14"		14	Medium brown clayey silt.
					<u> </u>		
				<u> </u>			
				ļ	E 6 =		
					E -		
+		1			+ 7-		
	1979-1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1		<u> </u>		- 8 -	V/A	
	2	7.5-9	¹ / ₅	13"		V/λ	Madium brown malian and in a
					E'I		
					- 10 -		
					F , -		
					E']		
			·		- /2 -		
	· ·					1/1	
	3	12.5-14	4/4/5	7"	\mathbf{E}'	¥/A	Same as sample number 2/5/
					- /4 -	f	sand.
					E /5 =		
			· · · · · · · · · · · · · · · · · · ·		- /6 -		
	· .				E /1 3		
		<i>2</i>				7/	
			5/		E / 3	1/15-	
	4	17.5-19	6/7	14"	- /9	¥44-	Medium brown sand and gravel.
					- 1-		
							Engineer

AEPMTP-000524

- 1 4	r.	¥	٠	37	1	4	

Job No.

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Compar	ту						Boring No. <u>803</u> Date <u>3-15-77</u> Sheet <u>2</u> of <u>5</u>
Project	t of F			-	<u> </u>		Type of Boring Rig
Loca		oring:				Boring beaun Boring completed	
Water	Level						Ground Elevation referred to
Time							Datur
Date			······································	- <u>,</u> ,			Field Party: Kousin and Kerchitte
	i	4 t	5 8 5	ple	DEPTH	Hd	DESCRIPTION
1	Z	der 1-to 3et)	Jard ratic Fo	ig th sam	IN	SRA	Soil type, color, texture, consistency, sampler driving notes,
le pti	dw	fron fron in fe	tanc netr esis	. ler ov.	FEET	1	blows per foot on casing, depths wash water lost, observed
ŏ	Sa	Sarr (1	B & P &	Tot recr		So	fluctuations in water level, notes on drilling ease, etc.
				1	F	ΠI	
	[1	1	E20 =	1	
					E21-	[
	ł				F -	11	
	 		+	+	<i>-−2</i> ² <i>−</i>	11	
	l i				F	17/1	t
	[10/	1	E23 =	1///	
	5	22.5-24	11/13	12"	E24 =	44	Medium brown sand and gravel.
	1					11	
	 				- 25 -		·
	1					11	
	í .	1		1	E"=	11	
	ļ				E21 -		
	1 .					╢᠊᠊	<u>I</u> →
	I		67		-28-	1 <i>\//</i>	
1	16	27.5-29	⁶ 8/ ₆	ייך		1//]	Medium brown gravely sand.
1	1				モ"ヨ		
	 	ļ	_		E 30 -		
	ł.	1			F I	! ∙	
<u> </u>	ſ	·'	 		F-31	11 F	
1	i '	-				11	
	1	.		1	E 32 3	11.1	
	ا ا	<u> </u> '	l <u>o</u> t		- 33 -	1///	
	1 7	32 5-34	10/5	611	E J	11/1	
+				0	- 3-	##	Medium Drown, medium grain gravely sanc.
	· · · · · · · · · · · · · · · · · · ·	<u> 1</u>	ا ا		F.35]	[
	1	1	· · ·	1	E _		
1	!	<u>↓</u> '	<u> </u>		-36-	-	
	, i 1	/	1		E E		
	·	<u> </u>	<u> </u>	<u> </u>	-31-	ΙĮ	· ·
		!	<u> '</u>	'	E 38 -	\overline{V}	
		27 E 20	5/6/0		E =	W	
	<u>ا </u>	31.5-37	81	14"	F-39	卍	Same
)		Ľ I	1 '	E./=		
†			[]		= 10 =		
]]	I!	L'	E, 3	il [
			Ē. !	['			
1 1		<u>[</u>	Ĺ	<u> </u>			Engineer

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AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job No.

Compa	ny						
Projec	<u></u>						Boring No.803 Date <u>3-15-77</u> Sheet <u>3 of 5</u> Type of Borina Rig
Loca	ition of	Boring:					Casing used Size Drilling mud used
Water	r Level						Boring begun Boring completed
Time							
Date						······	Field Party: <u>Roush and Reitmire</u>
	ļ	4 a	- 5 3 5	bet	DEPT	H	DESCRIPTION
Depth o Casing, 1	Sample h	Sample de from-to (in feet)	Standard Penetrati Resistan Blows/Fa	Tot. length recov. sam	IN FEET	Soll GRA	Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
	9	42.5-44	^{5/} 4/ ₆	13"			Medium brown, medium coarse grain gravely sand.
					- 40 - - 47 -		
	10	47.5-49	7/ 8/ ₁₀	12"	- 48 - - 49 - - 30 -		Medium brown, coarse grain sand w/some gravel.
			6/		- 51 - - 52 - - 53 -		
		52.5-54			5		Same as sample number 10 w/medium grain sand trace of gravel.
	12	57.5-59	8/ 10/2		- 57 -		Samo
					-59-		
							Engineer

AEPMTP-000526

AEP CIVIL ENGINEERING LABORATORY LOG OF BORING

Job N	0.					LOG	OF BORING
Compa	any <u>A</u> j	opalachia	n Power	Compa	iny		Boring No. 803 Date 3-15-77 Sheet 4 of
Proje	ct Pi	roject 13	01 - Tr	uck Br	idge Cr	COSS	ing Type of Boring Rig
Loca	ation of I	Boring:				Casing used Size Drilling mud used	
Wate	r Level					Ground Elevation referred to	
Time	2		<u></u>		· · · · · · · · · · · · · · · · · · ·		Dat
Date	-		·····				Field Party: <u>Roush and Reitmire</u>
Depth of Casing, ft.	Sample No.	Sample depth from to (in feet)	Standard Penetration Resistance Blows/Foot	Tot. length of recov. sample	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION Soil type, color, texture, consistency, sampler driving notes, blows per foot on casing, depths wash water lost, observed fluctuations in water level, notes on drilling ease, etc.
					41 		
	13	62.5-64	7/ _{11/15}	6"	4 		Medium brown coarse grain gravelly sand.
	14	67.5-69	13/ 17/ 25	5"	6 - 67		Medium brown fine sand.
					/0 /1 /1 /2		
	15	72.5-74	67 _{9/ 13}	13"			Same
					76 -		
. 1	· ·				E' I	 	-
			8/		F-78-]	1/	
	16	77.5-79	13/20	13"	E 10 3	V/I	Same - medium grain.
					$E'_{i} =$	ĺ́⊢	
			;		E, I		
							Engineer

AEPMTP-000527

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lob No	AEP CIVIL	ENGINEERING LABORAT	ORY
Company Project Location of Boring: Water Level Time Date		Boring No <u>8</u> Type of Borin Casing used Boring begun Ground Eleva Field Party:	03 Date 3-15-77 Sheet 5 of 19
Depth of Casing, ft. Sample No. Sample depth from-to (in feet) Standard Penetration	Resistance Resistance Blows/Foot IN LEET - 0 	DE Soil type, color, textu blows per foot on cas fluctuations in water	SCRIPTION re, consistency, sampler driving notes ing, depths wash water lost, observed level, notes on drilling ease, etc.
17 82.5-84 ^{8/} 10	$ \begin{array}{c} $	Medium brown grave	lly sand.
18 87.3-87.4 ⁵⁰	$y_{8} = \frac{1}{9}$	Hit rock at 86.8' No recovery Started coring at 8 100' recovery. 8.0' of +.4 core	37.6'
Run #1 87.6-97.6	$ \begin{array}{c} 10.0 \\ $	10.0' medium gray me	dium grain hard sandstone.
		Stopped hole at 97.6 3-16-77	

Engineer

AEPMTP-000528



AEP 1990, 1996, 1997, 2001, 2008

Monitoring Well Boring Logs

MW-001 to MW-16, 96-01 to 96-06, 96-101 to 96-110, JTMN-1, JTMN-2

JOB NUMBER

TIME DATE

COMPANY						
PROJECT	EPF	RI G	ROUND	WAT	ER STUD	ΟY
COORDINA	res	Ν7	724,498	.7 E	1,733,165	5.9
GROUND EL	_EVA	TION	569.2		SYSTEM	State Plane using NAD27
Water Level,	ft	Ā	24.9	Ţ		Ī

6-18-97

BORING NO. 001	DATE 7/2	3/15	SHEE	T_ 1	OF	2
BORING START 6/18/9	7 во	ORING FIN	IISH	6/18/97		
PIEZOMETER TYPE		WELL T	YPE	WO		
HGT. RISER ABOVE GROUN	D 2.14		DIA	2		
DEPTH TO TOP OF WELL SO	CREEN 2	7.0 вотт	ОМ	37		
WELL DEVELOPMENT	ES	BACK	FILL	QUICK	GROL	JT
FIELD PARTY MCR-WE	В		RIG	BK-81		

AMPLE	AMPLE	SAM DEF IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE	TOTAL ENGTH COVERY	RQD	DEPTH IN	RAPHIC LOG	JSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
0 Z	0	FROM	то	BLOWS / 6"			FEET	U	_				
1	SS	1.5	3.0	4-5-4	1.0		-		ML	Road gravel, grass and fill material SILTY SAND Dark, yellow, brown, 10yr 4\2, with minor cl- silty clay at base, also gravel and limestone aggregate, dry, no contamination no odor, 80% sand, 20% silt, fine to medium grain.			
2	SS	6.5	8.0	4-3-3	1.5				SM	SILTY CLAY Dark yellow, brown, 10 yr 4\2, >50 % fines, 80% clay, 20% silt, dry, no contamination, poorly graded, CL grades into SM medium sand, 10yr 4\2, <15% gravel, well sorted, 95% sand, medium to fine 25% silt, moist, black streaking interbedded, no contamination, grades to CL.			
3	SS	11.5	13.0	1-2-3	.7		-		CL	silty clay Moderate yellow brown, 10 yr 5\4, 80% clay, 20% silty, moist, slight plasticity, no contamination, no odor, grades into SM @15'		11' TO 13' SHELBY TUBE TAKEN 6-25-97.	
NEER.GPJ AEP.GDT 7/23/15	SS	16.5	18.0	1-3-4	.7		- 15		SM	MODERATE BROWN 5 YR 4\4 SILTY SAND 95 % sand, 5% silt and gravel. Sand well washed, medium to fine grain, sub-rounded, no contamin ation, no odor, moist.		18.5 TOP OF SEAL	
	TYPE OF CASING USED							<u></u>		Continued Next Page			
	NQ-2 ROCK CORE							ETED -			= 0P		
ORN		6" x 3.25	HSA	·			SLC)TTE	DS	CREEN, G = GEONOR, P = PNEUMATIC	- 05		
R S		9 x 0.25 HW CAS	SING AD	VANCER	4"		WELL TY	/PE:	٥١	OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON			
	I NW CASING 3" SW CASING 6"					BECORDER TROGERS							
AE	AIR HAMMER 8"												



	AMERICAN ELECTRIC POWER SERVICE CORPORATION
	AEP CIVIL ENGINEERING LABORATORY
	LOG OF BORING
JOB NUMBER	



SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
5	ST	21.5	23.5		.7				MATTER BROWN 5YR 4\4 SILTY SAND 85 % Sand, 15% silt, moist, sand is medium to fine grain, quartz sub-rounded, with minor clay.		SHELBY TUBE TAKEN TO MUCH GRAVEL NO GOOD.
6	SS	26.5	28.0	3-4-9	1.5	- 25 -		SW	DARK YELLOW BROWN 10 YR 4\2 TO MODERATE BROWN 5YR 4\2 GRAVELLY SAND Well graded sand, <15% gravel, 90% sand, course to fine grain, well graded, quartz sub-rounded, wet, no odor, no contamination.		27.0 TOP OF SCREEN.
7	SS	31.5	33.0	7-12-11	1.5	- 30 -			DARK YELLOW BROWN 10 YR 4\2 MODERATE BROWN 5YR3\4 GRAVELLY SAND Well graded, <15 % gravel, 90% sand, course to fine grain, quartz sub-rounded while gravel is sub-angular to sub-rounded, wet, no contamination, no odor, grades into ml @ 35'.		GRAIN SIZE ANALYSIS SAMPLE COLLECTED.
8	SS	36.5	38.0	4-6-4	.9	- 35 -		ML SM	LIGHT BROWN 5 YR5\6 CLAYEY SILT Interval grading in SM. PALE YELLOW BROWN 10YR6\2 SAND 60% sand, fine grain, 40% silty\clay grading into SM, silty sand, 80% sand with minor gravel 20% silty and clay, wet, no odor, no visible contamination.		37.0 BOTTOM OF SCREEN 37.5 BOTTOM OF SAND.



COMPANY _

PROJECT _ EPRI GROUND WATER STUDY COORDINATES _ N 724,857.8 E 1,733,650.5

				, ,	
GROUND ELEVA	TION	580.8		SYSTEM	State Plane using NAD27
Water Level, ft	Ā	37.8	Ţ		$\bar{\mathbf{\Lambda}}$
TIME					
DATE	6	-25-97			

BORING NO. 002	DATE 7/23	/ 15 SHE	et 1	OF <u>4</u>
BORING START 6/1	9/97 BOF	RING FINISH	6/24/97	
PIEZOMETER TYPE		WELL TYPE	WO	
HGT. RISER ABOVE GRO	OUND 1.99	DIA	2	
DEPTH TO TOP OF WELI	SCREEN 60.	5 BOTTOM	70.5	
WELL DEVELOPMENT	YES	BACKFILL	QUICK	GROUT
FIELD PARTY MCR-	NEB	RIG	BK-81	

	UMBER	AMPLE	SAN Def IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE	TOTAL ENGTH COVERY	RQD	DEPTH IN	RAPHIC LOG	SDSL	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES		
U.) Z	S	FROM	то	BLOWS / 6"			FEET	Ū						
										ML	FILL MATERIAL, GRASS AND GRAVEL WITH TOP SOIL				
	1	SS	1.6	3.1	4-11-11	1.4				CL	MODERATE BROWN 5YR4\4 SANDY SILT 60% silt, 40 % sand, minor clay, sub-rounded with quartz gravels 1/2-3/4", dry, no contamination.				
								F							
								5 -							
	2	SS	6.6	8.1	4-4-3	1.5				ä	MODERATE BROWN 5YR4\4 SANDY SILT 60% silt, 40% sand grading to ML, 60% silt, 30% clay, 10% sand ? in gravel (quartz) to CL, dark vellow brown 10 vr4\2 70% clay, 20% silt, 10%				
										CL	sand, sand fine grain, minor gravel and black interbedded clay, moist, no contamination.				
								10 -			<u>SILTY CLAY</u> 90% clay, 10% silt, minor sand, clay very stiff, light gray interbeds with some root zones, moist, no contamination, no odor.				
	3	SS	11.6	13.1	3-5-6	1.1									
C 1/C	4	55	16.6	18.1	3.4.5	15		15 -			MODERATE YELLOW BROWN 10YR5\4				
											SILTY CLAY 90% clay, 10% silt, minor sand, very still, with light gray to black interbedded root zones, moist, no contamination, no odor, some mica present.				
											Continued Next Pasa				
		6" x 3.25 HSA							PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN G = GEONOR P = PNELIMATIC						
5			<u>9" x 6.25</u> HW CAS	SING AD	VANCER	4"		WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN. GM = GEOMON							
		NW CASING 3" VILL TIPE. SW CASING 6"					RECORDER TROGERS								
1		AIR HAMMER 8"				1									

AEP EPRI_SPORN_MOUNTAINEER.GPJ AEP.GDT 7/23/15

DATE 7/23/15 SHEET 2 OF PROJECT _____ EPRI GROUND WATER STUDY 6/19/97 BORING FINISH 6/24/97 BORING START SAMPLE STANDARD RQD SAMPLE NUMBER ᅚᄶ DEPTH GRAPHIC SAMPLE TOTAL LENGT S DEPTH PENETRATION SOIL / ROCK DRILLER'S LOG WELL S S IN IN FEET RESISTANCE % **IDENTIFICATION** NOTES \supset FEET FROM BLOWS / 6" TO ñ SS 21.6 MODERATE BROWN TO LIGHT BROWN 10 5 23.1 2-1-3 1.5 SC YR 5\4 TO 5YR 4\4 SANDY CLAY 60% clay, 40% sand fine grain, mica and quartz , clay moderate stiff, moist, interbedded with CL from above 6" at 22.0 to 22.6. moist. no contamination. no odor. 25 SC MODERATE YELLOW BROWN 10YR5\4 6 SS 26.6 28.1 1-1-2 1.5 SILTY CLAY 80% clay, 20% silt, minor sand-very fine grain, moist, interbedded of black material, very minor , stiff clay, sand is mica and quartz, no contamination, no odor. 30 7 SS 31.6 33.1 1-1-1 0 SS 34.6 36.1 1.5 SC MODERATE BROWN 5YR4\4 SANDY CLAY Sample wet at base 8 1-1-2 35 60% clay, 40% sand, clay moderate stiff, sand (perched). fine grain, mica and guartz, with iron coloring at base, very red minor black (organic ?), sample wet at base. SS 9 36.6 38.1 1-1-1 1.5 LIGHT BROWN 5YR 5\6 SANDY CLAY 60% clay, 40% sand from 36.6 to 36.9 grades to SM SW clayey silty sand, light brown 5yr5\6, 80% sand, 20% silt\clay, sand is guartz, mica, fine grain, grading to reddish brown 10r 4\6 at base, moist. 40 LIGHT BROWN 5YR 6\6 SILTY CLAYEY SAND 10 SS 41.6 43.1 1.5 1-8-13 80% sand, 20% silt\clay, same as above from 41.6-42.3, 42.3-42.7, the color change to dark yellow orange 10yr6\6 to SC sandy , medium gray Water in sample. n5 40% clay 60% sand, clay is moderate stiff, Will add water inside wet, sand is quartz, mica, fine grain, wet, grading augers. into sw at 1.8 -2' well graded sand, dark yellow Water in sample. brown 10yr4\2 medium to coarse sand 90% sand, 45 SW 10% silt\clay, sand quartz, sub-rounded, wet. m=sc

SPORN MOUNTAINEER.GPJ AEP.GDT 7/23/15 EPRI AEP

Continued Next Page

JOB NUMBER

COMPANY	

BORING NO. 002

JOB NUMBER

COMPANY

PROJECT EPRI GROUND WATER STUDY BORING START 6/19/97 BORING FINISH 6/24/97

BORING NO. 002 DATE 7/23/15 SHEET 3 OF

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
11	SS	46.6	48.1	11-12-14	1.5		-			MODERATE YELLOW BROWN SAND Well graded, 95% sand, 5% silt, minor clay sand coarse to fine with gravel quartz, granite(?), minor silt, no clay, wet, no contamination.		
12	SS	51.6	53.1	5-6-7	.2		50 - - - 55			PALE YELLOW BROWN 10 YR 6\2 SAND Well graded, 95% sand, 5% silt\minor clay, quartz, sand medium to fine grain 51.6-52.4 grades medium coarse sand of quartz, granite(?) with gravel and clay, fine sand, light brown 5yr 5\6 to moderate brown 5yr4\4 from 52.4-52.7, grades into medium sand. 95% sand with 5% 52.7-53.1 silty\clay, wet, no contimination.		54.1 Top of seal.
13	SS	56.6	58.1	6-6-7	1.3		-		SP	DARK YELLOW BROWN 10YR 4\2 SAND 95% sand, 5% silt\clay, sand is medium to fine grain with quartz, sandstone grains(quartzite, wet, no contamination.		57.9 Top of sand.
14	SS	61.6	63.1	5-5-10	1.5		 - - 			PALE YELLOW BROWN SAND Poorly graded, 98% sand, 2% silt, sand is clean to white, fine grain , sand has some rounded, medium grain , mostly sub-angular, wet, no contamination.		60.5 Top of screen. Grain size analysis sample cllected.
15	SS	66.6	68.1	8-4-5	.9				SW	BROWN GRAY 5YR 4\1 SAND Well graded, 100% sand from fine to coarse with gravel, sand is quartz, quartzite gravel with angular gneiss pieces, wet, little to no fines-clay, sand is sub-rounded, large quartzite gravel in bottom of spoon, no contimiantion.		
							70 -					70.5 Bottom of screen

Continued Next Page



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JOB NUMBER

COMPANY

BORING NO. 002 DATE 7/23/15 SHEET 4 OF 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/19/97
 BORING FINISH
 6/24/97

SAMPLE NUMBER	SAMPLE	SAM DEF IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
16	SS	FROM 71.7	<u>TO</u> 71.9	BLOWS / 6" 50/.2	.2					LIGHT GRAY SANDSTONE N7 Medium grain sand, friable at top of sample, competent at base, loosely cemented, quartz grain , sub-angular to sub-rounded, dry. Auger return includes sub-angular cobbles and gravel of granite, quartzite, gneiss from bottom of borehole.		71.8 Bottom of sand. Approximately 200 gallons water injected into bore hole during augering.





JOB NUMBER

COMPANY	BORING NO. <u>003</u> DATE <u>7/23/15</u>
PROJECT EPRI GROUND WATER STUDY	BORING START 6/25/97 BORING F
COORDINATES N 719,877.2 E 1,733,713.7	PIEZOMETER TYPE WELL
GROUND ELEVATION 604.9 SYSTEM State Plane using NAD27	HGT. RISER ABOVE GROUND 2.30
Water Level, ft $\ \ \underline{\nabla}$ 31.9 $\ \ \underline{\Psi}$ $\ \ \underline{\Psi}$	DEPTH TO TOP OF WELL SCREEN 32.3 BO
TIME	WELL DEVELOPMENT YES BAC
DATE 6-26-97	FIELD PARTY MCR-WEB

2 INISH 6/25/97 TYPE **OW** dia **2** TTOM **42.3** KFILL QUICK GROUT RIG **BK-81**

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY %	DEPTH IN FEET	GRAPHIC LOG U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES		
1	SS	1.5	3.0	3-5-6	1.5			GRAYISH ORANGE TO DARK YELLOW ORANGE 10YR\72 TO 10YR 6/6 SILTY CLAY 80% clay, 20% silt, dry, mottled, some mica, iron, staining possibly, no cantamination.				
2	SS	6.5	8.0	3-2-4	1.5	- 5-		GRAYISH ORANGE 10YR 7\4 SILTY CLAY 70% clay, 30% silt, moist, clay content decrease with depth, mottled, iron staining, mica no contamination.				
3	SS	11.5	13.0	2-2-3	1.5	- 10 -		MODERATE YELLOW BROWN 10YR 5\4 SILTY CLAY 90% clay, 10% silt, increase in clay, moist to minor water, some mica, no contamination.		Perched water.		
4	SS	16.5	18.0	5-6-8	1.1	- 15 -		MODERATE YELLOW 10yr 5\4 BROWN SAND Well graded, 95% sand, 5% silt, some coarse grain gravel, sand is medium to coarse, sub-rounded, quartz, dry , no contamination.				
		ТҮРЕ	OF C	ASING USED	1	Continued Next Page						
		NQ-2 R0 6" x 3.25	OCK CO	RE		PIEZON		E: PT = OPEN TUBE POROUS TIP, SS	_= OP	EN TUBE		
		9" x 6.25 HW CAS	HSA SING AD	VANCER	4"			W = OPEN TUBE SI OTTED SCREEN G	, M = G	FOMON		
	-	NW CAS	SING SING		<u>3"</u> 6"				0			

AIR HAMMER

8"

JOB NUMBER

COMPANY ____

AEP

PROJECT EPRI GROUND WATER STUDY BORING START 6/25/97 BORING FINISH 6/25/97



2

PLE		Ш	SAM DEF	IPLE PTH	STANDARD PENETRATION	AL STH VERY	RQD	DEPTH	HIC G	s S	SOIL / ROCK		DRILLER'S
SAM		SAM	IN F	EET	RESISTANCE	LENC	%	IN FEET	GRAF LO	U S (IDENTIFICATION	ME	NOTES
5	S	SS	21.5	23.0	8-9-9	1.2		- 25 -			MODERATE YELLOWISH BROWN 10YR 5\4 SAND 95% sand, 5% silt\fine sand, some coarse gravel of quartzite\granite, sand is medium to coarse grain quartz, dry, subrounded, no contamination.		
6	S	SS	26.5	28.0	4-4-5	1.2		- 30 -			DARK YELLOW BROWN 10YR 4\2 SILTY SAND 95% sand, 5% silt, sand sand medium to coarse minor silt, sand rounded to sub-rounded quartz, minor mica, some gravel, moist, sand increase in sorting, no comtamination.		25.3 Top of seal. 28.1 Top of sand.
8	9	6S	31.5 33.0	33.0 34.5	3-2-3 2-2-2	1.2 1.5				SM	DARK YELLOW BROWN 10YR 4\2 SILTY SAND 95% sand, 5% silt, no gravel, sand fine to medium, poorly graded, wet, no contamination, SW at bottom sand. DARK YELLOW BROWN 10YR 4\2 SILTY SAND 95% sand, 5% silt, sand is fine to		32.3 Top of screen.
/15 6	S	SS	36.5	38.0	1-1-2	1.4		35		DARK YELLOW BROWN 10YR 4\2 SILTY SAND 95% sand, 5% silt, sand medium to fine grain quartz, where poorly graded.		Grain size analysis sample 35.3-36.8	
RI_SPORN_MOUNTAINEER.GPJ_AEP.GDT_7/2:) s	55	41.5	43.0	7-10-7	1.5		40 -			DARK YELLOW BROWN 10YR 4\2 SILTY SAND 95% sand, 5% silt, sand medium to fine , quartz, wet, poorly graded and uniform grain size, no contamination.		 100 gallons of water used in augers. Filled augers with water. 42.4 Bottom of screen. 43.4 Bottom of sand. Advance augers to 43.4 to install screen.

JOB NUMBER

BORING NO. 004 DATE 7/23/15 SHEET 1 OF 3 COMPANY PROJECT EPRI GROUND WATER STUDY PIEZOMETER TYPE _____ WELL TYPE _____ COORDINATES N 724,865.9 E 1,733,643.4 GROUND ELEVATION 581.1 SYSTEM State Plane using NAD27 HGT. RISER ABOVE GROUND 2.05 DIA 2 DEPTH TO TOP OF WELL SCREEN _37.6 BOTTOM _47.6 Water Level, ft $\mathbf{\nabla}$ 37.6 T V WELL DEVELOPMENT YES BACKFILL QUICK GROUT TIME FIELD PARTY MCR-WEB RIG BK-81 DATE 6-30-97

SAMPLE NUMBER	SAMPLE	SAM DEF IN F	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
							- - 10 —	-				
P.GDT 7/23/15							- - - - -	-				
INEER.GPJ AE							-	-				
TNUC		TYPE	OF C	ASING USED						Continued Next Page		
SPORN_MC	NQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCER 4" NW CASING 3"						PIEZOMI SLC	eter DTTE (PE [.]	TYPI ED S O\	E: PT = OPEN TUBE POROUS TIP, SS SCREEN, G = GEONOR, P = PNEUMATIC W = OPEN TUBE SLOTTED SCREEN GI	= OP ; / = G	EN TUBE EOMON
	NW CASING 3" SW CASING 6" AIR HAMMER 8"								RECORDER TROGERS			



JOB NUMBER

COMPANY

BORING NO. 004 DATE 7/23/15 SHEET 2 OF 3

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/26/97
 BORING FINISH
 6/30/97

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
									-				
1	S	бΤ	26.0	28.0					-				26.0 Shelby tube.
								30	-				30.0 Top of seal. 32.8 Top of sand.
								35	-				37.6 Top of screen.
U AEP.GDT 7/23/15	2 5	SS	41.5	43.0	4-6-7	1.5		40		SC	MEDIUM GRAY N5 CLAYEY SAND 60% sand,		
EPRI_SPORN_MOUNTAINEER.GF	ss	SS	43.5	45.0	8-13-21	1.2		45		SW	40 % clay, clay slight plasticity, sand is medium to fine , quartz, mica, wet, well sorted. DARK YELLOW BROWN 10YR 4\2 BROWN SAND Well greaded, sand is medium to coarse, 90% sand, 10 % silt\clay, sand quartz, sub-angular, wet, no contamination.		Grain size analysis 43.5-45.0

AEP

Continued Next Page

JOB NUMBER

COMPANY

AEP

BORING NO. 004 DATE 7/23/15 SHEET 3 OF 3 PROJECT _ EPRI GROUND WATER STUDY BORING START _ 6/26/97 BORING FINISH _ 6/30/97

SAMPLE	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	ТО	BLOWS / 6"	~		-					47.6 Bottom of screen. 48.2 Bottom of sand.
EPRI_SPORN_MOUNTAINEER.GPJ_AEP.GDT_7/23/15												



JOB NUMBER

COMPANY	BORING NO. 005 DATE 7/23/15 SHE	ET <u>1</u> OF <u>3</u>
PROJECT EPRI GROUND WATER STUDY	BORING START 7/1/97 BORING FINISH	7/1/97
COORDINATES N 719,152.8 E 1,734,428.9	PIEZOMETER TYPE WELL TYPE	OW
GROUND ELEVATION 591.0 SYSTEM State Plane using NAD27	HGT. RISER ABOVE GROUND DIA	2
Water Level, ft 🕎 33.8 🕎 🕎	DEPTH TO TOP OF WELL SCREEN BOTTOM	47.7
TIME	WELL DEVELOPMENT YES BACKFILL	QUICK GROUT
DATE 7-2-97	FIELD PARTY MCR-WEB RIG	BK-81

	FROM	PTH EET TO	PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVEI	%	IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
S	5 2.0	3.5	3-3-4	1.1		-		ML	GRASS, ORGANIC MATTER SOILS, SILT, FINE SAND		
S	Г 7.0	9.0		2.0		5		SC	Sample from bottom of shelby tube MOTTLED YELLOW BROWN 10YR 5/4 CLAYEY SAND 80% sand, 20% silt/sand, moist, sand is fine grain w/ subrounded quartz, no contamination.		
S	Г 12.0	14.0		1.8		- 10 - - - - - -		SM	Sample from bottom of shelby tube MOTTLED YELLOW BROWN 10 YR 5/4 CLAYEY SAND 90% sand 10% silt/clay, moist, sand is fine to medium grain subrounded, quartz, no contamination.		
S	SS 18.5 20.0 6-6-7 1.25			-		SW	MOTTLED YELLOW BROWN 10YR 5/4 SAND Well graded 95% sand, 5% silt, sand is medium to coarse grain quartz subrounded, moist, no contamination, some gravel is granite.				
	TYP	E OF C	ASING USED			Continued Next Page					
NQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCER NW CASING SW CASING 6"						PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON PECORDER TROCERS					
		- FROM SS 2.0 SS 2.0 ST 7.0 ST 7.0 ST 12.0 ST 12.0 SS 18.5 TYPI NQ-2 R 6" x 3.21 9" x 6.21 HW CA SW CA SW CA SW CA	- FROM TO SS 2.0 3.5 SS 2.0 3.5 ST 7.0 9.0 ST 7.0 9.0 ST 12.0 14.0 SS 18.5 20.0 SS 18.5 20.0 TYPE OF C 0 NQ-2 ROCK CC 6" x 3.25 HSA WY CASING AE NW CASING AE NW CASING SW CASING AUD HAMMED AUD HAMED	- TO BLOWS / 6" SS 2.0 3.5 3-3-4 ST 7.0 9.0	Image: Second system FROM TO BLOWS / 6" Image: Second system SS 2.0 3.5 3-3-4 1.1 ST 7.0 9.0 2.0 ST 7.0 9.0 2.0 ST 12.0 14.0 1.8 SS 18.5 20.0 6-6-7 1.25 NQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA 1.25 MQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA 1.25 MQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA 6" x 3.25 HSA	TYPE OF CASING USED SS 18.5 20.0 6-6-7 1.25 ST 18.5 20.0 6-6-7 1.25	FROM TO BLOWS / 6" C TELL SS 2.0 3.5 3-3-4 1.1 - SS 2.0 3.5 3-3-4 1.1 - ST 7.0 9.0 2.0 - - ST 7.0 9.0 2.0 - - ST 12.0 14.0 1.8 - - ST 12.0 14.0 1.8 - - SS 18.5 20.0 6-6-7 1.25 - NO-2 ROCK CORE - - - - - WCASING ADVANCER 4" - - - - WCASING 6" 3" - WELL T WELL T	TYPE OF CASING USED TYPE OF CASING USED NO-2 ROCK CORE 6" 6" x3.25 HSA 9" 9" x6.25 HSA 9" PW CASING 3" SW CASING 6"	TYPE OF CASING USED NUL SM NQ-2 ROCK CORE 6" 1.25 Y 18.5 20.0 6-6-7 1.25	ST 12.0 14.0 1.1 SK Sample from bottom of shelby tube MUL GRASS. ORGANIC MATTER SOLS. SILT. FINE SAND ST 2.0 3.5 3-3-4 1.1 ML DARK YELLOW. ORANGE 10YR 8/6 CLAYEY SOLS. SILT 60 % silt, 40 % clay, silty w/fine grain, mottled, root, some of black organic, iron stain, dark ST 7.0 9.0 2.0 SC Sample from bottom of shelby tube MOTTLED YELLOW BROWN 10YR 5/4 CLAYEY SAND 80% sand, 20% siltsand, moist, sand is fine grain wisubrounded quartz, no contamination. ST 12.0 14.0 1.8 10 SM Sample from bottom of shelby tube MOTTLED YELLOW BROWN 10YR 5/4 CLAYEY SAND 80% sand, 20% siltsand, moist, sand is fine to medium grain subrounded quartz, no contamination. SS 18.5 20.0 6-6-7 1.25 TYPE OF CASING USED Continued Next Page MUC 2800K CORE PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS SLOTTED SCREEN, G = GENORD, P = PNEUMATIC WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, G = SUCOTED SCREEN, G = GENORD, P = PNEUMATIC WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, G = RECORDER _ T ROGERS	ST 7.0 9.0 2.0 M. GRASS. ORGANIC MATTER SOILS. SILT. FINE SAND ST 7.0 9.0 2.0 M. DARK YELLOW, ORANGE 10YR 6/6 CLAYEY SILT 60 % silt 40 % day, silty wfine grain, mottled, root, some of black organic, iron stain, dark , no contamination. ST 7.0 9.0 2.0 SC Samule from bottom of shelby tube MOTTLED YELLOW BROWN 10YR 5/4 CLAYEY SAND 80% sand, 20% siltsand, moist, son contamination. ST 12.0 14.0 1.8 10 SM Samule from bottom of shelby tube MOTTLED YELLOW BROWN 10YR 5/4 CLAYEY SAND 80% sand, 20% siltsand, moist, son contamination. ST 12.0 14.0 1.8 15 SW MOTTLED YELLOW BROWN 10YR 5/4 CLAYEY SAND 90% sand 10% siltclay, most, son contamination. SS 18.5 20.0 6-6-7 1.25 SW MOTTLED YELLOW BROWN 10YR 5/4 SAND Weil graded 95% sand, 5% silt, sand is medium to coarse grain quart subrounded, most, no contamination, some gravel is granite. TYPE OF CASING USED Continued Next Page PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OP SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC WEIL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = G WU CASING ADVANCER 4"



JOB NUMBER

 COMPANY
 BORING NO. 005
 DATE 7/23/15
 SHEET 2
 OF 3

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/1/97
 BORING FINISH
 7/1/97

BORING NO. 005 DATE 7/23/15 SHEET 2 OF

	SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	5	SS	23.5	25.0	2-1-2	1.4		-		SP	MOTTLED YELLOW BROWN 10YR 5/4 SAND Poorly grade, 95% sand, 5% silt, sand is medium to fine grain , very well sorted, moist, sand subrounded quartz, no contamination, stringers of coal .25" thick at 22.7'.		
	6	SS	28.5	30.0	3-4-5	1.5		25 -		SW	DARK YELLOW ORANGE 10YR 6/6 SAND Well graded sand, 95 % sand, 5% silt, medium to coarse with fine interbedded rounded quartz, grades into SP, poorly graded sand DARK YELLOW ORANGE 10YR 6/6 SAND, 95 % sand 5% silt, sand is medium to fine grain , well sorted, subrounded quartz, wet.		29.7 Top of seal.
	7	SS	33.5	35.0	2-3-4	1.2				SW	DARK YELLOW ORANGE 10YR 6/6 SAND Well graded, 95% sand, 5% fine sand, sand is medium to coarse, well rounded, quartz, wet, stringers of coal at bottom of spoon 33.5', no contamination.		33.5 Top of sand. Rods wet 34.5.
EP.GUI //23/15	8	SS	38.5	40.0	3-4-4	1.5		- - - - - - - -		SM	SM/SW MODERATE YELLOW BROWN 10YR 5/4 SILTY SAND, TO WELL GRADED SAND 100% sand, fine to coarse, w\minor gravel, sand is subrounded quartz, wet, no contamination.		Adding water to augers 125 gallons. 37.7 Top of screen.
	9	SS	43.5	45.0	3-4-7	1.4		45 -		SP	MODERATE YELLOW BROWN 10YR 5/4 SAND 100% sand, medium grain, well sorted quartz, subrounded to rounded, wet, no contamination, minor clay at bottom 1/2".	• • <td></td>	

11 SS 45.0 46.5

4-4-6

1.5

Continued Next Page

Sample 10 grain size

MODERATE YELLOW BROWN SAND Poorly



JOB NUMBER

COMP

SAMPLE NUMBER

СОМ	PAN	Y							BC	RING NO. 005 D	ATE 7/23/15	SHEET	3 OF 3	
PRO	JECT	EPR	I GRO	UND WATER	STU	DY			BC	RING START 7/1/97	BORING FI	NISH <u>7/</u>	1/97	
SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / RC IDENTIFICA	DCK TION	WELL	DRILLER'S NOTES	
10	SS	48.5	50.0	4-4-6	1.5		-			graded, 100% sand, medium including gravel layers, wet, I MODERATE YELLOW BRO SAND Medium grain, quartz, subrounded, wet, no visible o	a grain quartz, no contamination. WN 10YR 5/4 , well rounded to contamination.		analysis from 45.5-47.0 47.7 Bottom of screen. 48.8 Bottom of san	d.
							50 –							



JOB NUMBER

COMPANY				BORING NO. 006	DATE 7/23/15	SHEET 1	OF	4
PROJECT EPR	I GROUND W	VATER STUD	Y	BORING START 7/1/97	BORING FIN	NISH 7/8/9	7	
COORDINATES	N 720,255.7	E 1,735,680.	0	PIEZOMETER TYPE	WELL T	YPE OW		
GROUND ELEVATI	ION 601.3	SYSTEM	State Plane using NAD27	HGT. RISER ABOVE GROUN	0.26	DIA 2		
Water Level, ft	⊈ 50.3	⊻ 61.0	⊻ 70.0	DEPTH TO TOP OF WELL SC	REEN 81.1 BOTT	гом 91.1		
TIME				WELL DEVELOPMENT	BACK	FILL QUIC	K GRO	UT
DATE	7-29-97	7-7-97	7-8-97	FIELD PARTY MCR-WE	B	RIG BK-8	1	

-					1									
		SAMPLE STANDARD				_− ≿	RQD	DEPTH	O					
	۲ ۳ ۳	Ľ	DEF	PTH	PENETRATION	ATE			Ξo	S S	SOIL / ROCK	1	DRILLER'S	
	ĮΝ	M	IN F	EET	RESISTANCE	6zó	0/_	IN	ΡŎ	S		μ	NOTES	
0	ທ ຊ∣	S		то		F⊒ñ	/0	FEET	ц Ц Ц		IDENTIFICATION	>	NOTES	
╞			FROM	10	BLOWS/0	<u>ш</u>								
											ASPHALT, BOTTOM ASH, GRAVEL ROAD BED			
								5						
								-				10 V		
	1	SS	6.0	7.5	18-22-24	1.5				SW	LIGHT BROWN 5YR 5/6 SILTY SAND Well			
									-		graded, fill, 90% sand, 10% slit, fine sand, sand is	10 V		
	2	66	7 5	0.0	0 15 12	15					subrounded, no contamination, dry.			
	2	33	7.5	9.0	9-10-13	1.5		-				10 V		
												6		
	3	SS	9.0	10.5	9-13-15	1.5		-				6		
	-							- 10						
						1.5		10 -				6		
	4	SS	10.5	12.0	7-9-9	1.5					LIGHT BROWN 5YR 5/6 SAND Well graded, fill,	19 V		
											95% sand, 5% silt, sand is medium to coarse with			
								-	*****			19 V		
	5	SS	12.0	13.5	7-9-11	1.4				SM	DARK YELLOW BROWN 10YR 4/2 SILTY			
									-	1	SAND 95% sand, 5% siny, minor graver, sand is guartz dry no contamination fill?	19 V		
	6	99	13.5	15.0	9-10-12	11					LIGHT BROWN 5YR 5/6 SILTY SAND/GRAVEL			
	0	33	13.5	15.0	9-10-12	1.4		-			90% sand, 10% silt, sand medium grain.	6		
											MODERATE YELLOW BROWN 10YR 5/4	6		
F	7	SS	15.0	16.5	7-9-13	1.5		15 -			SILTY CLAY TO CLAYEY SILT 10% clay, 90%	88		
											silt, fine grain , minor sand, dry, no contamination.			
5								-				6		
123/1	8	SS	16.5	18.0	7-9-10	1.8								
7 7												6		
P.G	•	~~	10.0	40 -		4 -			-					
AE	9	SS	18.0	19.5	5-5-11	1.5								
GPJ						-	-			10 V				
EER	10	SS 19.5 21.0 6-9-9 1.5									6			
TAIN														
NNO								Continued Next Page						
≥ z		NQ-2 ROCK CORE						PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE						
NOR.	6" x 3.25 HSA 9" x 6.25 HSA					SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC								
SI SE	HW CASING ADVANCER 4"					WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN. GM = GEOMON					EOMON			
E -	NW CASING 3"													
₽ 	SW CASING 6" AIR HAMMER 8"					RECORDER <u>T ROGERS</u>								
~ -		AIR HAMMER 8"					1			1				



JOB NUMBER

COMPANY

_____ DATE <u>7/23/15</u> SHEET <u>2</u> OF _____ BORING NO. 006



Р	RO	ROJECT EPRI GROUND WATER STUDY								BC	RING START	BORING FINISH	_//8/9/
	NUMBER	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCH	(DN	d DRILLER'S NOTES
	11	SS	21.0	22.5	4-6-7	1.3		-	_				
	12	SS	22.5	24.0	5-7-11	1.5		-	_				
	13	SS	24.0	25.5	9-10-9	1.5		-	_				
	14	SS	25.5	27.0	7-7-8	1.4		25 -	_				
	15	SS	27.0	28.5	5-8-9	1.3		-	_				
	16	SS	28.5	30.0	5-5-6	1.5		-	_				
	17	SS	30.0	31.5	6-7-8	1.5		30 -	_				
	18	SS	31.5	33.0	4-6-9	1.5		-	-				
	19	SS	33.0	34.5	5-5-8	1.3		-	_				
	20	SS	34.5	36.0	3-6-9	1.5							
	21	SS	36.0	37.5	3-3-6	1.5		35	-				
	22	SS	37.5	39.0	3-3-5	1.5		-	_				
2	23	SS	39.0	40.5	3-4-6	1.5		40 -	_				
	24	SS	40.5	42.0	4-4-6	1.5		-	_				
	25	SS	42.0	43.5	2-4-4	1.5		-	_				
	26	SS	43.5	45.0	3-3-3	1.5		-					
	27	SS	45.0	46.5	1-2-2	1.4		45					

Continued Next Page



4

JOB NUMBER

AEP

BORING NO. 006 DATE 7/23/15 SHEET 3 OF 4
 COMPANY
 BORING NO. 006
 DATE 7/23/15
 SHEET 3
 OF 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/1/97
 BORING FINISH
 7/8/97



SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
:	28	SS	46.5	48.0	2-3-4	1.5		-	_				
:	29	SS	48.0	49.5	3-3-4	1.5		-	-				
:	30	SS	49.5	51.0	1-2-3	1.5		50					
;	31	SS	51.0	52.5	3-4-4	1.5		- 50 -	-				
:	32	SS	52.5	54.0	1-1-2	1.5		-					52.5 Wet.
;	33	SS	54.0	55.5	2-3-4	1.5		- 55	-				53.2 Wet zone.
:	34	SS	55.5	57.0	2-3-3	1.5		-					
:	35	SS	57.0	58.5	1-3-3	1.5		-	-				
:	36	SS	58.5	60.0	3-3-4	1.56		-	_				
;	37	SS	60.0	61.5	3-4-4	1.5		60 -					
:	38	SS	61.5	63.0	1-2-4	1.5		-	-				62.2 Wet at 62.2-63.0
:	39	SS	63.0	64.5	3-4-5	1.5		-					
4	40	SS	64.5	66.0	3-3-3	1.5		65					
GDT 7/23/15	41	SS	66.0	67.5	3-3-4	1.5		-	_				66 Wet .2" zone.
SPJ AEP.	42	SS	67.5	69.0	3-4-4	1.5		-					
	43	SS	69.0	70.5	3-4-4	1.5		- 70	-				
EPRI_SPORN_M(44	SS	70.5	72.0	1-4-4	1.5		-	-				

JOB NUMBER

COMPANY

BORING NO. 006 DATE 7/23/15 SHEET 4 OF 4
 COMPANY
 BORING NO. 006
 DATE 7/23/15
 SHEET 4
 OF 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/1/97
 BORING FINISH
 7/8/97

SAMPLE	SAMPLE	SAMPLE DEPTH IN FEET FROM TO		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
45 46	SS SS	72.0	73.5 75.0	1-3-4 4-4-5	1.5		-	_				73.6 Top of seal.
47	SS	75.0	76.5	4-4-5	1.5		- 75 -	-				
49	ss	78.0	79.5	2-3-3	1.5		-	_				77.0 Top of sand.
50	SS	79.5	81.0	2-5-9	1.5		80 -	_				79.5 Water in sand base (80.8-81.0)
51	SS	81.0	82.5	11-11-11	1.5		-	_				water added to augers. 81.1 Top of screen.
52	SS	82.5	84.0	9-11-11	.9		-	_				4 4 4 4 4 4
54	ss	85.5	87.0	8-10-15	1.2		85	_				
55	SS	87.0	88.5	7-14-7	1.2		-	_				
56	SS	88.5	90.0	7-7-10	1.2		-	_				
57 <u>-</u> 59	SS	90.0	91.5	7 14 14	1.5		90 –	_				Total of 250 gallon of water added to bore hole. 91.1 Bottom of
50 50	SS	93.0	93.0	16-29-50/.2	1.2		-	_				screen.
							95 -	-			<u> • •</u>	93.7 Bottom of sand.
							-					

5 EPRI AEP
AEP

PROJECT EPRI GROUND WATER STUDY

COORDINATES N 718,915.8 E 1,736,153.5

GROUND ELEVA	HON		SYSTEM	NAD27
Water Level, ft	⊻ 13.8	Ţ		$\bar{\mathbf{\Lambda}}$
TIME				
DATE	7-21-97			

BORING NO. 008	DATE 7	//23/15 SHE	ET <u>1</u> OF <u>2</u>
BORING START	7/14/97	BORING FINISH	7/22/97
PIEZOMETER TYPE		WELL TYPE	OW
HGT. RISER ABOVE (GROUND 2.10	DIA	2
DEPTH TO TOP OF W	/ELL SCREEN	23.8 BOTTOM	33.8
WELL DEVELOPMEN	⊤ YES [−]	BACKFILL	QUICK GROUT
FIELD PARTY MC	R-WEB	RIG	BK-81

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	S	ŝS	1.9	3.4	4-3-2	.7		-		CL	ORGANIC MATERIAL, GRASS, WEEDS, ROOT ZONE IN SILTY CLAY AND CLAYEY SILT MODERATE BROWN 5YR 4/4 SILTY CLAY 90% clay, 10% silt, dry, some organics, roots zone, no contamination.		
2	2 S	ŝS	6.9	8.4	4-2-3	1.5		5 -			MODERATE BROWN 5YR 4/4 TO YELLOW ORANGE 10YR 6/6 SILTY CLAY 90% clay, 10 % silt, grading to no silt and yellow color at base, mica, dry to top moist at bottom , purged water, no visible contamination.		
3	3 5	SS 11.9 13.4 4-3-2 1.4						10 -		CL SM	MODERATE BROWN-DARK YELLOW ORANGE 5YR 4/4 TO 10YR 6/6 SILTY CLAY From above grading into SM at 12.6. MODERATE BROWN 5YR 3/4 CLAYEY SAND 70% sand, 30% clay, sand is v-fine grain quartz, moist no contamination.		
	ı s	ŝS	16.9	18.4	2-2-1	1.2		-			MODERATE YELLOW BROWN 10YR 5/4 CLAYEY/SILT SAND 80% sand, 20% clay, moist,sand is v-fine grain, quartz, mica flakes, no visible contamination.		16.0 Top of seal.
		•	TYPE	OF C	ASING USED						Continued Next Page		
		NQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCER							ETER DTTE	TYPI ED S	E: PT = OPEN TUBE POROUS TIP, SS CREEN, G = GEONOR, P = PNEUMATIC	= OP	
		1	NW CAS			3" 6" 8"			176.		RECORDER <u>TROGERS</u>	wi - C	

AEP

DATE **7/23/15** SHEET **2** OF 2 COMPANY BORING NO. 008 PROJECT EPRI GROUND WATER STUDY 7/14/97 BORING FINISH 7/22/97 BORING START STANDARD PENETRATION HOUSE STANCE OUS SAMPLE RQD GRAPHIC LOG SAMPLE NUMBER DEPTH SAMPLE S DEPTH SOIL / ROCK DRILLER'S WELL S S IN IN FEET % **IDENTIFICATION** NOTES \supset FEET FROM BLOWS / 6" TO ñ MODERATE YELLOW BROWN 10YR 5/4 CLAYEY/SILTY SAND 80% sand, 20% clay, 21.4 Top of sand. ••••••• sand is v-fine grain, quartz with some silty and SS 21.9 23.4 1.5 5 1-1-1 clay, sand is wet and contains mica, no visible contamination. 。 。 23.8 Top of screen. 25 MODERATE YELLOW BROWN 10YR 5/4 SS 26.9 28.4 6 1-1-2 1.5 Wet. SILTY/CLAYEY SAND 80%sand, 20% clay/silt grading to 90% sand, 10% silt at base, fine sand at bottom of spoon, guartz, mica(minor) no visible contamination. 30 MODERATE BROWN 5YR 4/4 SILTY SAND SS 31.9 Grain sized 7 31.9 33.4 3-1-2 1.3 95% sand, 5% silt, sand is fine grading to medium analysis. at 32.3', quartz, f's par, mica flakes, wet, no visible contamination. 8 SS 33.4 34.9 2-2-4 11 ŀF MODERATE BROWN 5YR 4/4 SILTY SAND 33.8 Bottom of •••• 95%sand, 5% silt, sand is fine to medium grain, screen. quartz, subrounded, wet, no contamination, then fine sand and clay at base. 34.9 Bottom of sand. 39.9 Added water to augers.

JOB NUMBER

JOB NUMBER

BORING NO. 009	DATE 7/2	<u>3/15</u>	SHEET	1	OF	3
BORING START 7/15/9	7 ВС	ORING FINIS	SH <u>7</u>	/15/97		
PIEZOMETER TYPE		WELL TY	PE _C	W		
HGT. RISER ABOVE GROUN	D 1.57	C	DIA <u>2</u>			
DEPTH TO TOP OF WELL SC	REEN 4	2.3 вотто	DM <u>5</u>	2.3		
	S	BACKFI		UICK	GROL	JT
FIELD PARTY MCR-WE	B-JCM	R	IG E	K-81		

1 SS 1.9 3.4 4-4-4 1.5 ASH -4/-4 -4/-4 -4/-4 ELY ASH With coal stringers, some clay,interbedded, dry, compact.	
2 SS 6.9 8.4 8-7-5 1.5 CL MODERATE YELLOW BROWN 10YR 5/4 SILTY SAND 95% sand, 5% silt, sand medium grain with quartz grading into CL SILTY CLAY DARK GRAY N3, v-fine grain, stiff, 90%, clay, 10	
3 SS 11.9 13.4 2-2-3 1.4 Image: Constraint of the state of the sta	
4 SS 16.9 18.4 2-2-2 1.5 MODERATE YELLOW BROWN 10YR 5/4 SILTY CLAY 90% clay, 10% silt, very stiff, wet, no visible contamination, trace of black organics.	
TYPE OF CASING USED Continued Next Page	
NQ-2 ROCK CORE PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN T 6" x 3.25 HSA SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC	TUBE
Image: Construct of the second structure 4" Well type: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOM NW CASING 3" SW CASING 6" Recorder TROGERS	JON

AEP

DATE 7/23/15 SHEET 2 OF BORING NO. 009 3 PROJECT EPRI GROUND WATER STUDY BORING START 7/15/97 BORING FINISH 7/15/97 SAMPLE STANDARD RQD 파 SAMPLE NUMBER DEPTH GRAPHIC SAMPLE S DEPTH PENETRATION TOTAL LENGTH RECOVE LOG SOIL / ROCK WELL DRILLER'S s S S IN IN FEET RESISTANCE % **IDENTIFICATION** NOTES \supset FEET FROM BLOWS / 6" ТО **MODERATE YELLOW BROWN 10YR 5/4** 21.9 5 SS 23.4 2-2-1 1.5 SILTY CLAY 70% clay, 30% silty/sand, fine to 22.4 Sandy zone. medium grain at bottom, wet, no contamination, clay is little stiff. 25 DARK GRAY N3 SILTY CLAY 90% clay, 10% SS 26.9 28.4 1-2-2 1.5 6 silt, very stiff, moist. 30 DARK GRAY N3 SILTY CLAY 70% clay 30% SS 31.9 33.4 1.5 7 1-2-1 silt, fine sand, wet throughout, sand v-fine grain with interbedded in section, no visible contamination. 35 34.8 Top of seal. DARK GRAY N3 SILTY CLAY 90% clay, 10% SS 36.9 38.4 15 1-1-1 8 silt, moist, clay is v-stiff, trace of black organic material. 38.5 Top of sand. 40 41.9-43.9 Shelby tube 800 PSi, 20 sec., 42.3 Top of screen. SS 42.9 MEDIUM DARK GRAY N4 SILTY GRAVEL 60% 9 44.4 8-17-27 1.5 GM gravel, 40% sand/silty, gravel subrounded, quartz, quartzite wet, no contamination. 45

SPORN MOUNTAINEER.GPJ AEP.GDT 7/23/15 EPRI AEP

Continued Next Page

COMPANY

JOB NUMBER

COMPANY

AEP



SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
10 SAMPL	SS	DEF IN F FROM 46.9	РТН ЕЕТ 48.4 53.4	PENETRATION RESISTANCE BLOWS / 6" 15-15-10 10-15-20	1.5 1.5	%	IN FEET			SOIL / ROCK IDENTIFICATION MEDIUM DARK GRAY N4 60% gravel, 40% sand/silt, gravel is quartz, subrounded, sand is fine to coarse, wet, quartzite, wet, no contamiantion. MEDIUM DARK GRAY N4 SILTY SANDY GRAVEL 60% gravel, 40% sand/silt, gravel is subrounded, quartzite, quartzite, other rock, sand medium to coarse, with silt, quartz subrounded, wet, no contamination.	WELL	DRILLER'S NOTES 46.9-48.4 Grain size analysis. 52.3 Bottom of screen. 54.5 Bottom of sand.
EPRL_SPORN_MOUNTAINEER.GPJ AEP.GDT 7/23/15												

JOB NUMBER

COMPANY _

PROJECT EPRI GROUND WATER STUDY

COORDINATES N 717,666.4 E 1,736,450.7 State Plane using

GROUND ELEVA	TION	SYSTEM _	NAD27
Water Level, ft	⊻ 32.0	⊥	$\bar{\mathbf{\Lambda}}$
TIME			
DATE	7-24-97		

BORING NO. 011	DATE	7/23/15	SHEE	T <u>1</u>	OF _	3
BORING START	7/22/97	BORING FIN	ISH _	7/23/97	,	
PIEZOMETER TYPE		WELL TY	ΈE	WO		
HGT. RISER ABOVE	GROUND)	DIA	2		
DEPTH TO TOP OF	WELL SCREEN	36.3 BOTT	OM	46.3		
WELL DEVELOPMEN	NT YES	BACKF	ILL _	QUICK	GRO	UT
FIELD PARTY	CR-WEB	F	RIG _	BK-81		

SAMPLE NUMBER	SAMPLE	SAM DEF IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION NOTES	
1	SS	1.5	3.0	6-8-8	.8		-		ML	GRASS, OM,ML, SILT, GRAYISH ORANGE, 10YR 7/4 Dry. MEDIUM DARK GRAY N4 ASH V-fine grain, dry, no contamination, ash is very dusty, coarse, bottom ash 1.8-2.4	
2	SS	6.5	8.0	7-7-10	1.3		5	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,		MEDIUM DARK GRAY N4 ASH sandy texture, dry at top moist at base.	
3	SS	11.5	13.0	5-3-5	1.4		10			DARK GRAY N4 ASH/BOTTOM ASH V-fine sand texture, dry throughout with thin coal layers, no contamination.	
EER.GPJ AEP.GDT 7/23/15	SS	16.5	18.0	4-5-10	1.5		15		CL	SAME AS ABOVE 16.5-17.0 MODERATE YELLOW BROWN 10YR 5/4 SILTY CLAY Clay is moderately stiff with silt and fine sand, interbedded, moist, no contaminate.	
		ТҮРЕ	OF C	ASING USED						Continued Next Page	
	NQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCED						PIEZOM SLC	eter DTTE	TYPI D S	E: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SCREEN, G = GEONOR, P = PNEUMATIC	
		NW CAS NW CAS SW CAS	SING AL SING SING MER		4 3" 6" 8"		WELL T	YPE:	0	W = OPEN TUBE SLOTTED SCREEN, GM = GEOMON RECORDER <u>TROGER</u>	_



JOB NUMBER

COMPANY

BORING NO. 011 DATE 7/23/15 SHEET 2 OF 3

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/22/97
 BORING FINISH
 7/23/97



SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
5	5	SS	21.5	23.0	5-5-5	1.5			X X X X X X X X X X X X X X X X X X X		BROWNISH GRAY 5YR 4/1 BOTTOM ASH Fine sand texture, moist, includes coal, no contamination.		
6	5	SS	26.5	28.0	3-2-5	1.5		25 -	X, Q,		MEDIUM DARK GRAY N4 BOTTOM ASH V-fine to fine sand texture, some cinders, wet, no visible contamination.		28.2 Top of seal.
7		SS	31.5	33.0	3-2-2	1.5		30 -		GM	MODERATE YELLOW BROWN 10YR 5/4 SILTY SAND 90% sand, 10% silty, and clay, wet, sand fine grain, quartz, no contamination.		34 0 Top of sand
	3	SS	36.5	38.0	4-2-2	1.2		35 -			SAME AS ABOVE		36.3 Top of screen.
MOUNTAINEER.GPJ AEP.GDT 7/23/15)	SS	41.5	43.0	4-2-2	1.3		40 -			MODERATE YELLOW BROWN 10YR 5/4 CLAYEY SAND 70% sand, 30% clay, sand fine to medium grain, quartz, subrounded, wet, no visible contamination.		41.5-43.0 Grain size analysis.
PRI_SPORN								45 -					

SPORN MOUNTAINEER.GPJ AEP.GDT EPRI AEP

Continued Next Page



JOB NUMBER

COMPANY

BORING NO. 011 DATE 7/23/15 SHEET 3 OF 3 PROJECT EPRI GROUND WATER STUDY BORING START 7/22/97 BORING FINISH 7/23/97

10 SS 46.5 46.0 8-11-12 1.5 46.3 Bottom of screen. 11 SS 51.5 53.0 12-14-14 1.5 50 50.0 Bottom of screen. 50.0 Bottom of screen. 50.0 Bottom of screen. 11 SS 51.5 53.0 12-14-14 1.5 50.0 Bottom of screen. 50.0 Bottom of screen. 50.0 Bottom of screen. 12 SS 56.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55.5 58.0 9-7-6 1.2 55	SAMPLE	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
11 SS 51.5 53.0 12-14-14 1.5 11 SS 51.5 53.0 12-14-14 1.5 12 SS 66.6 58.0 9-7-6 1.2 MODERATE YELLOW BROWN 10YR 5/4 SILTY SAND 90% (grading into CM. grading into CM. grading into CM. MODERATE YELLOW BROWN 10YR 5/4 SANDY/SILTY SAND 90% (GAM SS 66.6 58.0 9-7-6 1.2 MODERATE YELLOW BROWN 10YR 5/4 SANDY/SILTY RAVEL 80% gravel. 20% sand siture is subrounded, gravel. 30% sand sandy sandy	10	SS	46.5	48.0	8-11-12	1.5					CL DARK YELLOW ORANGE 10YR 6/6 SILTY CLAY 90% clay, 10% silt, wet. MODERATE BROWN 5YR 4/4 SILTY SAND 80% sand, 20% silt/clay, sand medium to coarse grain with some gravel, subrounded, wet.		46.3 Bottom of screen.
12 SS 56.5 58.0 9.7-6 1.2 MODERATE YELLOW BROWN 10YR 5/4 SANDY/SIL TY GRAVEL 80% gravel, 20% sand /silt, minor catzle, subrounded, quartz, gravel is subrounded, quartz, wet, no contamination. Very regarding Image: subrounded state	11	SS	51.5	53.0	12-14-14	1.5		50 -		GM	YELLOW BROWN 10YR 5/4 SILTY SAND 90% sand, 10% silt, sand medium grain, quartz, wet grading into GM. MODERATE YELLOW BROWN SANDY GRAVEL 70% gravel, 30% sand/silt, gravel subrounded, granite, quartzite, sand medium to fine grain, wet, no contamination.	_	50.0 Bottom of sand.
	EPRI_SPORN_MOUNTAINEER.GPJ_AEP.GDT_7/23/15	SS	56.5	58.0	9-7-6	1.2		55			MODERATE YELLOW BROWN 10YR 5/4 SANDY/SILTY GRAVEL 80% gravel, 20% sand /silt, minor clay, gravel is subrounded, quartz, granite, quartzite, sand medium to fine quartz, wet, no contamination.		

JOB NUMBER

DATE

COMPANY				BOR
PROJECT EP	RI GROUND V	VATER STUD	Y	BOR
COORDINATES	N 718,753.1	E 1,737,045	.5	PIEZ
GROUND ELEVA	TION 580.0	SYSTEM _	State Plane using NAD27	HGT.
Water Level, ft	⊻ 38.8	Ţ	$ \mathbf{\bar{T}} $	DEPT
TIME				WEL

7-30-97

BORING NO. 012	DATE 7/23/15	SHEET	1	OF
BORING START 7/23/	BORING F	INISH 7	/29/97	
PIEZOMETER TYPE	WELL	TYPE _	W	
HGT. RISER ABOVE GROUN	ND 2.02		2	
DEPTH TO TOP OF WELL S	CREEN 62.3 BO	гтом _7	2.3	
WELL DEVELOPMENT	ES BAC	KFILL	QUICK	GROUT
FIELD PARTY MCR-WE	B	rig E	3K-81	

SAMPLE	SAMPLE	SAM DEI IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	SS	3.0	4.5	3-2-2	1.5					MEDIUM DARK GRAY TO GRAY N3-N4 BOTTOM ASH Ash dust, some interbedde, dry, top of spoon. MODERATE YELLOW BROWN		
2	SS	8.0	9.5	3-3-4	1.5			-				
3	SS	13.0	14.5	1-2-2	1.5			-				
INEER.GPJ AEP.GDT 7/23/15	SS	18.0	19.5	2-3-3	1.5		-	-				
DUNTA		TYPE	OF C	ASING USED						Continued Next Page		
		NQ-2 R 6" x 3.25 9" x 6.25	OCK CO 5 HSA 5 HSA	RE			PIEZOMI SLC	eter DTTE	typi D S	E: PT = OPEN TUBE POROUS TIP, SS CREEN, G = GEONOR, P = PNEUMATIC	= OP ;	EN TUBE
PRIS	-	HW CAS	SING AD	VANCER	4" 3"		WELL TY	YPE:	٥١	N = OPEN TUBE SLOTTED SCREEN, G	√l = G	EOMON
AEP E	_	SW CAS	SING		6" 8"					RECORDER TROGERS		

JOB NUMBER

COMPANY

BORING NO. 012 DATE 7/23/15 SHEET 2 OF 4
 COMPANY
 BORING NO. 012
 DATE 7/23/15
 SHEET 2
 OF 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/23/97
 BORING FINISH
 7/29/97

SAMPLE	SAMPLE	SAM DEI IN F FROM	1PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
5	SS	23.0	24.5	2-3-3	1.5			-				
6	SS	28.0	29.5	3-3-4	1.5			-				
7	SS	33.0	34.5	2-2-3	1.5			-				
0T 7/23/15 &	SS	38.0	39.5	2-2-2	1.5		- - 40	-				Spoon wet.
PORN_MOUNTAINEER.GPJ AEP.GC	SS	43.0	44.5	2-2-2	1.5		- - - 45	-				
										Continued Next Page		45.5 Water on rods.



JOB NUMBER

AEP

 COMPANY
 BORING NO. 012
 DATE 7/23/15
 SHEET 3
 OF 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/23/97
 BORING FINISH
 7/29/97
 BORING NO. 012 DATE 7/23/15 SHEET 3 OF 4

SAMPLE	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
10	SS	48.0	49.5	2-3-3	1.5		- 50 -	-				
11	SS	53.0	54.5	22-24-29	1.3			-				
12	SS	58.0	59.5	17-15-19	1.1		- 55 -	-				57.4 Top of seal.
13	SS	63.0	64.5	10-16-22	1.1		- 60 -	-				61.4 Top of sand. 62.3 Top of screen.
UNTAINEER.GPJ AEP.GDI 7/23/15	SS	68.0	69.5	3-3-5	1.5		65 -	-				68.0-69.5 Grain size analysis.
							70 -	-				

Continued Next Page

COMPANY

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
15	SS	73.0	74.5	50/.3	.3		-					72.3 Bottom of screen. 73.9 Bottom of sand.
							75 — -					
							-					

JOB NUMBER

<u>'</u>11

JOB NUMBER

COMPANY	BORING NO. <u>MW-015</u> DATE <u>7/23/15</u> SHEET <u>1</u> OF <u>4</u>
PROJECT EPRI GROUND WATER STUDY	BORING START 12/6/01 BORING FINISH 12/11/01
COORDINATES N 719,504.2 E 1,736,239.5	PIEZOMETER TYPE SS WELL TYPE OW
GROUND ELEVATION 599.9 SYSTEM State Plane using NAD27	HGT. RISER ABOVE GROUND 1.73 DIA 2
Water Level, ft 🕎 22.6 🕎 🕎	DEPTH TO TOP OF WELL SCREEN 78.2 BOTTOM 87.2
TIME	WELL DEVELOPMENT BACKFILL QUICK GROUT
DATE 12/10/01	FIELD PARTY MCR-REB RIG BK-81

SAMPLE	NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	MELL	DRILLER'S NOTES
	1	SS	1.9	3.4	6-7-8	1.5		-	Q.Q.Q.Q.Q.Q.Q. N.D.N.D.N.D.D.		BOTTOM ASH Dry		Grounding procedures not in use on this boring. This boring used to collect soil samples to determine where to set well. Potable water for drilling from old C E Lab site. Flushed lines for approx. 1 hr
	2	SS	6.9	8.4	2-3-3	1.5		5	×, Q,		LOOSE 5B 7/1 LIGHT BLUISH GRAY FLY ASH Dry; 0.2' moist area @ 18.0'	-	before using.
	3	SS	11.9	13.4	2-2-2	1.5							
	4	SS	16.9	18.4	2-2-2	1.5		- 15	\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\\$\				
			ТҮРЕ	OF C	ASING USED	1		<u> </u>	1		Continued Next Page	<u> </u>	1
≥⊢ ≥⊢	v		NQ-2 RO		RE			PIEZOMI	ETER	TYP	E: PT = OPEN TUBE POROUS TIP, SS	= OP	EN TUBE
۲ ک			o x 3.25 9" x 6.25	HSA HSA				SLC	DTTE	D S	SCREEN, G = GEONOR, P = PNEUMATIC	;	
<u>z</u> -	_				VANCER	4"			/PE:	0	W = OPEN TUBE SLOTTED SCREEN, GI	VI = G	EOMON
ᆂᄂ			SW CAS	SING		5 6"					RECORDER MCR		
μ				/MER		8"							

JOB NUMBER

COMPANY

AEP

BORING NO. <u>MW-015</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF <u>4</u>

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 12/6/01
 BORING FINISH
 12/11/01



SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
Ę	5 :	SS	21.9	23.4	2-3-3	1.5			<u> </u>		LOOSE 5B 7/1 LIGHT BLUISH GRAY FLY ASH Moist throughout, some areas larger grain size than others		SWL @ 22.6' on 12/10/01. This is about 80 hrs since bore hole was disturbed; HSA's to
6	;	SS	26.9	28.4	1-1-2	1.5		25 -	<u> </u>		LOOSE 5B 7/1 LIGHT BLUISH GRAY FLY ASH Wet		51.9'. Water coming from saturated fly ash from 6.0' to 43.4'
7		SS	31.9	33.4	2-2-3	1.5		30 -	2, 12, 12, 12, 12, 12, 12, 12, 12, 12, 1		LOOSE 5B 7/1 LIGHT BLUISH GRAY FLY ASH Moist in some areas, wet in others		
3	3	SS	36.9	38.4	1-1-1	1.5		35 -	0. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 7. 1. 6. 6. 6. 6. 6. 6. 6. 6. 7. 6. 7.		LOOSE 5B 7/1 LIGHT BLUISH GRAY FLY ASH Wet		
) :	SS	41.9	43.4	0-0-0	1.5		40 -	1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1		VERY LOOSE 5B 5/1 MEDIUM BLUISH GRAY FLY ASH Saturated, very fine		Weight of hammer pushed spoon.
								40	, Ц., Ц., Ц., Ц., Ц., Ц., Ц., Ц.,				

Continued Next Page

JOB NUMBER

COMPANY

PROJECT EPRI GROUND WATER STUDY

BORING NO. <u>MW-015</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF _ BORING START **12/6/01** BORING FINISH **12/11/01**



STANDARD PENETRATION PENETRATI SAMPLE RQD GRAPHIC LOG SAMPLE NUMBER DEPTH SAMPLE S DEPTH SOIL / ROCK WELL DRILLER'S USC IN IN FEET % **IDENTIFICATION** NOTES FEET FROM ТО Ą.Ą Ď ĺ SS 46.9 STIFF 10YR 5/4 MODERATE YELLOWISH 10 48.4 3-4-6 1.5 **BROWN CLAYEY SILT** 1.5 tsf, moist 50 11 SS 51.9 53.4 3-4-5 1.4 Started adding drill mud to inside of HSA's to prevent heaving sand @ 51.9' 55 MEDIUM STIFF 10YR 5/4 MODERATE SS 12 56.9 58.4 2-3-3 1.5 YELLOWISH BROWN CLAYEY SILT 1.0 tsf. moist 60 MEDIUM STIFF N5 MEDIUM GRAY CLAYEY SS 61.9 63.4 2-2-2 13 1.5 SILT 1.0 tsf, moist 65 EPRI SPORN MOUNTAINEER.GPJ AEP.GDT 7/23/15 14 SS 66.9 68.4 2-2-2 1.5 70

AEP

Continued Next Page



4

JOB NUMBER

COMPANY

PROJECT ______ EPRI GROUND WATER STUDY

BORING NO. <u>MW-015</u> DATE <u>7/23/15</u> SHEET <u>4</u> OF _____ BORING START **12/6/01** BORING FINISH **12/11/01**

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
15	SS	71.9	73.4	2-3-3	1.5		75 -			LOOSE BROWN & GRAY FINE GRAIN SAND Wet		
16	SS	76.9	78.3	19-39-50/.4	1.3					VERY DENSE 10YR 5/4 MODERATE YELLOWISH BROWN MEDIUM to COARSE GRAIN SAND With little gravel		Gravely area @ 77.0'-88.4' (set well)
17	SS	81.9	83.4	30-37-21	1.5		80 -			VERY DENSE 10YR 6/6 DARK YELLOWISH ORANGE MEDIUM to COARSE GRAIN SAND With little gravel		
18	SS	86.9	88.4	11-12-12	1.5		85 -			MEDIUM DENSE N5 MEDIUM GRAY MEDIUM to COARSE GRAIN SAND With trace gravel, wet		
19	SS	91.9	93.4	15-16-17	1.5		90 -			DENSE N5 MEDIUM GRAY MEDIUM to COARSE GRAIN SAND Wet		
20	SS	94.3	94.5	50/.2	0.2			<u>, , , , , , , , , , , , , , , , , , , </u>		N7 LIGHT GRAY SANDSTONE		Stopped boring at auger and spoon refusal @ 94.5' on 12/11/01.



4

Tremie grouted from 94.5' to grade using approx. 150 gallons of

quick grout.

JOB NUMBER

COMPANY	BORING NO. <u>MW-16</u> DATE <u>7/23/15</u> SHE	et <u>1</u> of <u>4</u>
PROJECT EPRI GROUND WATER STUDY	BORING START 6/17/08 BORING FINISH	6/18/08
COORDINATES N 721,431.5 E 1,732,814.2	PIEZOMETER TYPE N/A WELL TYPE	OW
GROUND ELEVATION 586.8 SYSTEM NAD27	HGT. RISER ABOVE GROUND 1.787 DIA	2
Water Level, ft $\ \ \underline{\nabla}$ $\ \ \underline{\nabla}$	DEPTH TO TOP OF WELL SCREEN 67.5 BOTTOM	77.5
TIME	WELL DEVELOPMENT <u>Yes/Reclaimer</u> BACKFILL	Quick Grout
DATE	FIELD PARTY MCR / ZLR RIG	D-120

SAMPLE	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
								-				GROUNDING PROCEDURES IN USE ON THIS BORING; DIGGING PERMIT IN HAND; NO SPT TAKEN @ 1.7' BECAUSE OF POSSIBLE UNDERGROUNDS - CUTTINGS SHOW MOIST SILTY CLAY
1	SPT	6.7	8.2	3-3-6	1.5		- - - 10 –			STIFF 10YR 6/6 DARK YELLOWISH ORANGE SILTY CLAY tsf 2.75, moist		
2	SPT	11.7	13.2	1-1-3	1.5		-			SOFT 5YR 5/6 LIGHT BROWN CLAYEY SILT tsf 0.5, very moist		
EER.GPJ AEP.GDT 7/23/15	SPT	16.7	18.2	10-13-15	1.2		- 15 - - -			5YR 5/6 LIGHT BROWN FINE to MEDIUM SAND w/trace of fine gravel, moist		
		ТҮРЕ	OF C	ASING USED						Continued Next Page		
	NQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCER 4"						PIEZOMI SLC		TYPI ED S	E: PT = OPEN TUBE POROUS TIP, SS SCREEN, G = GEONOR, P = PNEUMATIC	= OP	
AEP EPR	NW CASING 3" SW CASING 6" AIR HAMMER 8"								RECORDER	- C		

JOB NUMBER

COMPANY

BORING NO. <u>MW-16</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF _____

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/17/08
 BORING FINISH
 6/18/08

SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	MELL	DRILLER'S NOTES
4	SPT	21.7	23.2	8-10-13	1.1		-					
5	SPT	26.7	28.2	5-8-13	1.2		25 -			MEDIUM DENSE 10YR 5/4 MODERATE YELLOWISH BROWN COARSE SAND w/trace of fine gravel, moist	-	
6	SPT	31.7	33.2	6-8-12	.8		- 30 -			MEDIUM DENSE 5YR 6/4 LIGHT BROWN COARSE SAND w/some coarse gravel, moist	_	
7	SPT	36.7	38.2	1-3-6	1.2		35			LOOSE 10YR 4/2 DARK YELLOWISH BROWN SAND medium moist to wet		SWL = 36.4' 06/18/08 w/ HSA'S @ 36.7' 14 hr READING WATER ON SPOON @ 37.5'; STARTED INDUCING WEAK DRILLING MUD TO
8	SPT	41.7	43.2	3-4-5	1.2		45 -			LOOSE 5 YR 4/4 MODERATE BROWN MEDIUM SAND w/trace of coarse gravel, wet	-	TO PREVENT HEAVING SANDS

Continued Next Page



4

JOB NUMBER

COMPANY

BORING NO. <u>MW-16</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>4</u>
 COMPANY
 BORING NO.
 MW-16
 DATE
 7/23/15
 SHEET
 3
 0F
 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/17/08
 BORING FINISH
 6/18/08

SAMPLE		SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
9	SI	PT	46.7	48.2	3-3-3	1.5		-			LOOSE 5YR 4/4 MODERATE BROWN MEDIUM GRAIN SAND w/trace of fine gravel, wet		
10) SI	PT	51.7	53.2	2-3-5	1.4		50 -			LOOSE 5YR 4/4 MODERATE BROWN MEDIUM GRAIN SAND w/trace of fine gravel, wet	-	
11	SI	PT	56.7	58.2	6-10-15	1.5		55 -			MEDIUM DENSE 5YR 3/4 MODERATE BROWN COARSE GRAIN SAND wet		
12	2 51	PT	61.7	63.2	4-7-12	1.5		- 60 - - -			MEDIUM DENSE 10YR 5/4 MODERATE YELLOWISH BROWN MEDIUM GRAIN SAND wet		
	s si	PT	66.7	68.2	6-12-15	1.5		65 - - - - 70 -			MEDIUM DENSE 5YR 5/2 PALE BROWN MEDIUM to COARSE GRAIN SAND wet		
								-					

EPRI SPORN MOUNTAINEER.GPJ AEP.GDT 7/23/15 AEP

Continued Next Page

JOB NUMBER

COMPANY

BORING NO. <u>MW-16</u> DATE <u>7/23/15</u> SHEET <u>4</u> OF <u>4</u>

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/17/08
 BORING FINISH
 6/18/08

NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
14	SPT	71.7	73.2	10-15-17	1.0		- 75			MEDIUM DENSE 10YR 6/2 PALE YELLOWISH BROWN FINE SAND and FINE GRAVEL wet		
15	SPT	76.7	78.2	15-18-25	1.3		-			DENSE N5 MEDIUM GRAY COARSE SAND w/some coarse gravel, wet		
16	SPT	81.7	82.0	50/3	.2		- 80 -			N6 MEDIUM LIGHT GRAY WEATHERED		STOPPED BORING @ 82.0'; INSTALLED 2" MONITORING WELL



JOB NUMBER

COMPANY ____

PROJECT EPRI GROUND WATER STUDY

COORDINATES N 717,700.5 E 1,735,921.2

GROUND ELEVA	TION 592.7	:	SYSTEM _	STATE PLANE
Water Level, ft	⊻ 27.9	Ţ		Ī
TIME				
DATE	6-20-96			

BORING NO. 96-01	DATE	7/23/15	SHE	et <u>1</u>	OF _	3
BORING START	6/14/96	BORING FI	NISH	6/20/96	6	
PIEZOMETER TYPE		WELL T	YPE			
HGT. RISER ABOVE	GROUND		DIA			
DEPTH TO TOP OF	WELL SCREEN	BOT	ТОМ			
WELL DEVELOPMEN	NT	BACK	FILL	QUICK	GRO	UT
FIELD PARTY MC	R-WEB		RIG	BK-81		

SAMPLE	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		0.0	1.5				-			ROAD BASE		
2	SS	3.0	4.5	11-10-7	1.5		_	· · · · · · · · · · · · · · · · · · ·	SW	BLACK BOTTOM ASH Moist.		
3	SS	5.0	6.5	8-9-11	1.3		5			YELLOWISH ORANGE GRAVELLY SAND Dry to moist, 3/4" max size.		
4	SS	8.5	10.0	10-25-30	1.2		- 10 —	0.0.0.0.0.0.		BLACK BOTTOM ASH Moist.		
5	SS	11.7	13.2	11-12-16	1.5		- - - 15			DARK BROWN SANDY SILT Moist, v-fine grain sand.		
EER.GPJ AEP.GDT 7/23/15 9	SS	16.7	18.2	7-7-11	1.5		-			BLACK BOTTOM ASH Dry.		
	_1	ТҮРЕ	OF C	ASING USED	ı			IK N		Continued Next Page		
SPORN_MO	NQ-2 ROCK CORE X 6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCER 4"						PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC					
AEP EPR		NW CAS SW CAS	SING MMER		3" 6" 8"		VVELL IY	RECORDER WEB				

JOB NUMBER

 COMPANY
 BORING NO. 96-01
 DATE 7/23/15
 SHEET 2
 OF

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/14/96
 BORING FINISH
 6/20/96

 BORING NO. <u>96-01</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF <u>3</u>

SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
7	SS	21.7	23.2	7-3-2	1.5					<u>Moist this area</u>		
8	SS	26.7	28.2	1-1-1	1.5		25 -			Saturated this area		
9	SS	31.7	33.2	1-2-2	1.5		30 -		CL	GREENISH BROWN SANDY CLAY Saturated, low plasticity.	-	
10	SS	36.7	38.2	3-2-2	1.2				CL	MULTI-COLORED BROWN SANDY CLAY Wet to saturated, low plasticity, v-fine sand.		
11	ST	41.7	43.7		0		40 -				-	Belive material to soft to pickup in tube.
12	ST	43.7	45.7		0		45 -	_				

EPRI_SPORN_MOUNTAINEER.GPJ AEP.GDT 7/23/15 AEP

Continued Next Page



AEP

____ DATE **7/23/15**___ SHEET <u>3</u>__ OF __ COMPANY 3 BORING NO. 96-01 PROJECT EPRI GROUND WATER STUDY BORING START 6/14/96 BORING FINISH 6/20/96 STANDARD PENETRATION RESISTANCE BLOWS / 6" SAMPLE SAMPLE NUMBER SAMPLE GRAPHIC LOG DEPTH USCS DEPTH SOIL / ROCK WELL DRILLER'S IN IN FEET **IDENTIFICATION** NOTES FEET FROM ТО 50 13 SS 51.7 53.2 1-1-2 1.0 CL DARK GRAY SANDY CLAY Saturated, v-fine sand. Stopped boring at 53.2' grouted from 53.2 to grade with approximately 60 gallons of quick grout.

JOB NUMBER



JOB NUMBER

COMPANY ____

PROJECT ______ EPRI GROUND WATER STUDY

COORDINATES N 718,158.5 E 1,736,270.7

GROUND ELEVAT	ION <u>594.6</u>	SYSTE	M STATE PLANE
Water Level, ft	Z	Ţ	Ā
TIME			
DATE			

BORING NO. <u>96-02</u>	DATE	7/23/15	SHEE	T <u>1</u>	OF _	3
BORING START	6/13/96	BORING FIN	NISH _	6/13/96	;	
PIEZOMETER TYPE		WELL T	YPE _			
HGT. RISER ABOVE			DIA			
DEPTH TO TOP OF V	VELL SCREEN	ВОТ	ТОМ _			
WELL DEVELOPMEN	ΙТ	BACK	FILL _	QUICK	GRO	UT
FIELD PARTY MC	R-WEB		RIG _	BK-81		

		SAMPLE	SAM DEF IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE	TOTAL LENGTH ECOVERY	RQD	DEPTH IN	SRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION		DRILLER'S NOTES
	1	 	FROM	TO	BLOWS / 6"					1	CRAY POTTOM ASH Dry with 2 to 2" of condy		
	1	22	0.0	1.5	10-12-13	1.2		-			Clay.		
	2	SS	3.0	4.5	10-13-13	1.5		- 5			GRAY BOTTOM ASH Dry.		
	3	SS	5.0	6.5	9-8-7	1.3		-		CL	LIGHT BROWN CLAY Dry, medium to high plasticity.		
	4	SS	8.5	10.0	16-16-12	1.1		10 -		GP	DARK BROWN SAND AND GRAVEL Dry, 3/4" max size, rounded with some fines.		
	5	SS	11.9	13.4	8-10-8	1.4		-					
	6	SS	16.9	18.4	6-11-9	1.3		- 10			DARK BROWN SAND AND GRAVEL Moist, quartz, 1/2" max size, rounded with some fines.		
			TYPE	OF C	ASING USED	<u> </u>		I			Continued Next Page		
	X	NQ-2 ROCK CORE X 6" x 3.25 HSA 9" x 6.25 HSA						PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC					
	HW CASING ADVANCER 4" NW CASING 3"					WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON					EOMON		
SW CASING 6" RECORDER WEB					RECORDER WEB								

JOB NUMBER

COMPANY

BORING NO. <u>96-02</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF <u>3</u>
 COMPANY
 BORING NO. 96-02
 DATE 7/23/15
 SHEET 2
 OF

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/13/96
 BORING FINISH
 6/13/96

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	7	SS	21.9	23.4	7-7-7	1.3		-			DARK BROWN SAND AND GRAVEL Saturated, rounded, 1" max size, quartz with some fines.		
	8	SS	26.9	28.4	1-1-2	1.5		- 25 -	\$		DARK GRAY FLY ASH Saturated.		
	9	SS	31.9	33.4	1-1-1	1.5		- 30 -	× × × × × × × × × × × × × × × × × × ×				
3/15	10	SS	36.9	38.4	1-1-1	1.5		- 35	×				
MOUNTAINEER.GPJ AEP.GDT 7/2	11	SS	41.9 43.9	43.4 45.9	4-4-6	1.3		- 40	☆ ☆ ☆ ☆ ☆ ↓ ☆ ☆ ☆ ☆	CL	DARK GRAY CLAY Wet, medium to high plasticity, trace of organic material.	-	
EPRI_SPORN								45 -					

SPORN MOUNTAINEER.GPJ FPRI AEP

Continued Next Page



JOB NUMBER

COMPANY

AEP

BORING NO. <u>96-02</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>3</u>

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/13/96
 BORING FINISH
 6/13/96

SAMPLE NUMBER	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
13	ST	46.9	48.9		2.0		- 50					
14	SS	51.9	53.4	3-3-4	1.5		- 55					
PRI_SPORN_MOUNTAINEER.GPJ AEP.GDT 7/23/15	SS	56.9	58.4	1-3-4	1.5		55					Grouted hole from 58.4' to grade with approximately 75 gallons of quick grout.



JOB NUMBER

COMPANY _

PROJECT ______ EPRI GROUND WATER STUDY

COORDINATES N 718,215.9 E 1,736,382.8

GROUND ELEVA	TION 566.9		SYSTEM	STATE PLANE
Water Level, ft	⊻ 22.2	Ţ		Ī
TIME				
DATE	6-18-96			

BORING NO. 96-03	DATE	7/23/15 s	HEET	1	OF _	3
BORING START	6/17/96	BORING FINIS	н <u>6</u>	6/18/96	;	
PIEZOMETER TYPE	<u> </u>	WELL TYP	'E			
HGT. RISER ABOVE		DI	A			
DEPTH TO TOP OF	WELL SCREEN	вотто	M			
WELL DEVELOPME	- NT	BACKFIL	L	QUICK	GRC	UT
FIELD PARTY M	CR-WEB	RI	GE	3K-81		
			_			

SAMPLE	SAMPLE	SAM DEF IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	SS	0.0	1.5	1-2-4	1.3					GRAY FLY ASH Moist.		Boring was grouted from grade to 60' w∖ 60 gallons of quick grout
2	SS	3.0	4.5	6-5-4	1.5		-	, Q,		<u>GRAY BOTTOM ASH</u> Moist.		
3	SS	5.0	6.5	3-2-2	1.5		5	4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:4:				
4	SS	8.5	10.0	4-6-6	1.5		10 -		SC	BLACK COAL LIGHT BROWN SANDY CLAY v-fine grain sand.		
5	SS	11.7	13.2	4-3-3	1.5		-		CL	DARK GRAY CLAY Wet, medium to hight plasticity, trace of grganic material.		
IEER.GPJ AEP.GDT 7/23/15 9	SS	16.7	18.2	7-1-1	1.5		15 -					
		ТҮРЕ	OF C	ASING USED	11					Continued Next Page	1	
N NS X		NQ-2 R0 6" x 3 25	DCK CO	RE			PIEZOM	ETER	TYPI	E: PT = OPEN TUBE POROUS TIP, SS	= OP	PEN TUBE
SPOI		9" x 6.25 HW CAS	5 HSA SING AD	VANCER	4"		SLC WFIL T		ב ח יט	W = OPEN TUBE SLOTTED SCREEN G	, M = (-	GEOMON
	NW CASING 3" SW CASING 6"							RECORDER WEB				

JOB NUMBER

COMPANY

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
-	7	ST	21.7	23.7		2.0		-				Ţ	
	8	SS	26.7	28.2	1-1-1	1.5		- 25 -					
-	9	ST	31.7	33.7		2.0		- 30 – - - -					
115	10	SS	36.7	38.2	1-2-2	1.5		35		SP	DARK GRAY AND BROWN SILTY SAND Wet to saturated, quartz, fine grain.		
ORN_MOUNTAINEER.GPJ AEP.GDT 7/23	11	SS	41.7	43.2	7-14-19	.6		40	0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -	GW	<u>GRAY SAND AND GRAVEL</u> Saturated, quartz, 1/2" max size, rounded.		
PRI_SP(8				

SPORN MOUNTAINEER.GPJ AEP.GDT EPRI AEP

Continued Next Page



3

JOB NUMBER

COMPANY

BORING NO. <u>96-03</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>3</u> PROJECT _ EPRI GROUND WATER STUDY BORING START _ 6/17/96 BORING FINISH 6/18/96

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
12	SS	46.7	47.6	37-50/.4	.9		-	00,000		<u>Brown</u>		
							- 50 —					
13	SS	51.7	53.2	18-19-20	1.5		-			Same with 3/4" max size.		
							55					
14	SS	56.7	57.0	50/.3	.3		-	0.00.00		Brown		
-15	SS	59.8	60.0	50/.2	.2		60 —			¬_ <u>LIGHT GRAY SANDSTONE</u> Fine grain		

EPRI_SPORN_MOUNTAINEER.GPJ AEP.GDT 7/23/15 AEP





JOB NUMBER

COMPANY _

PROJECT EPRI GROUND WATER STUDY

V

COORDINATES N 717,954.5 E 1,735,752.5

GROUND ELEVATION 593.5 SYSTEM STATE PLANE Water Level, ft \Box T TIME DATE

BORING NO. <u>96-04</u>	DATE 7/23/15	SHEE	⊤_ 1	OF 4
BORING START 6/1	8/96 BORIN	G FINISH	6/19/96	
PIEZOMETER TYPE	WE	LL TYPE		
HGT. RISER ABOVE GRO		DIA _		
DEPTH TO TOP OF WEL	L SCREEN	BOTTOM _		
WELL DEVELOPMENT	E	ACKFILL	QUICK	GROUT
FIELD PARTY MCR-	WEB	_ RIG _	BK-81	

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
			0.0					-			ROAD BASE		Grouted boring from 88' to grade w\ 80 gallons of quick grout and placed concrete plug in road bed.
	2	SS	3.0	4.5	11-12-13	1.3		-		SC	DARK BROWN CLAYEY SAND Moist, trace of small gravel.		
	3	SS	5.0	6.5	11-19-16	1.5		5		SP	DARK BROWN GRAVELLY SAND Moist, 1/2" max size, rounded with fines.		
	4	SS	8.5	10.0	9-12-10	1.5		10 -					
	5	SS	11.6	13.1	16-22-17	1.5			0,0,0,0,0,0,0,0 0,0,0,0,0,0,0		BLACK BOTTOM ASH Moist with 1" layer of silty clay with slight plasticity.		
U AEP.GDT 7/23/15	6	SS	16.6	18.1	9-9-7	.4		-			DARK BROWN, BLACK CLAYEY SAND Moist, some organic, may be older road base.		
INEER.GF													
UNTA			TYPE	OF C	ASING USED						Continued Next Page		
SPORN_MO	X		NQ-2 R0 6" x 3.25 9" x 6.25	OCK CO 5 HSA 5 HSA		۸"		PIEZOMI SLC	eter DTTE	TYPI ED S	E: PT = OPEN TUBE POROUS TIP, SS SCREEN, G = GEONOR, P = PNEUMATIC	= OP	EN TUBE
AEP EPRI			NW CAS SW CAS	SING AD SING SING MER		4 3" 6" 8"		WELL TY	YPE:	0	W = OPEN TUBE SLOTTED SCREEN, GN RECORDER WEB	/I = G	JEOMON

4

JOB NUMBER

COMPANY

BORING NO. <u>96-04</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF _____

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/18/96
 BORING FINISH
 6/19/96

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	7	SS	21.6	23.1	5-5-6	1.5		-	↔ ↔ ↔ \C`\C` ↔ ↔ ↔ \C`\C`		BLACK BOTTOM ASH Saturated. BLACK FLY ASH Saturated.		
	8	SS	26.6	28.1	1-2-2	1.2		- 25					
	9	SS	31.6	33.1	1-1-1	1.5		- 30	$\begin{array}{c} & & & & \\ & & & & \\ & & & & \\ & & & & $				
23/15	10	SS	36.6	38.1	.2-3-3	1.5				CL	ORANGE AND LIGHT BROWN MOTTLED SILTY CLAY Wet to saturated, medium to low plasticity.		
DRN_MOUNTAINEER.GPJ AEP.GDT 7/2	11	SS	41.6	43.1	3-3-3	1.5					Same as sample with trace of organic material.		
EPRI_SP(+5					

AEP

Continued Next Page

JOB NUMBER

COMPANY

BORING NO. <u>96-04</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF _____

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/18/96
 BORING FINISH
 6/19/96

	SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	12	ST	46.6	48.6		2.0							
	13	SS	51.6	53.1	1-1-1	1.5		- 50 -		SC	<u>GRAY AND BROWN CLAYEY SAND</u> Wet to saturated, v-fine grain sand, slight to non plasticity.	_	
								55					
	14	SS	59.3	60.8	3-3-3	.8		60 -		SP	DARK BROWN SAND Saturated, fine grain, with some fines, quartz.		
EER.GPJ AEP.GDT 7/23/15	15	SS	64.3	65.8	15-16-2	1.5		65			DARK BROWN SAND Saturated, v-fine grain with some fines, quartz.		
PRI_SPORN_MOUNTAINE	16	SS	69.3	70.8	8-9-11	1.5		70 -		SW	DARK BROWN SAND Saturated, quartz.	-	
AEP EI		_	_	_				_			Continued Next Page	_	

4

JOB NUMBER

COMPANY

AEP

BORING NO. <u>96-04</u> DATE <u>7/23/15</u> SHEET <u>4</u> OF <u>4</u>

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/18/96
 BORING FINISH
 6/19/96

SAMPLE	SAMPLE	SAN DE IN F FROM	1PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
17	, SS	74.3	75.8	14-14-19	1.5		75 -					
18	SS	79.3	80.8	8-10-8	1.5		80 -		SP	DARK BROWN AND GRAY SAND Saturated, quartz, fine grain.		
19	SS	84.3	85.1	8-50/.3	.8		85 -		GW	BROWN SAND AND GRAVEL Saturated, quartz, 1/2" max size, rounded.	-	
20	SS	87.7	87.9	50/.2	.2		-			GRAY CLAY SHALE Dry.	-	
RN_MOUNTAINEER.GPJ AEP.GDT 7/23/15												
EPRI_SPORN_MOUNTAINEER.GPJ /												



JOB NUMBER

COMPANY _

PROJECT ______ EPRI GROUND WATER STUDY

COORDINATES N 718,463.6 E 1,736,113.5

GROUND ELEVA	TION 597.4		SYSTEM	STATE PLANE
Water Level, ft	⊻ 48.8	Ţ		Ī
TIME				
DATE	6-12-96			

BORING NO. <u>96-05</u>	DATE 7/23/15	SHEETOF	3
BORING START 6/12	/96 BORING F	INISH 6/12/96	
PIEZOMETER TYPE	WELL	. TYPE	
HGT. RISER ABOVE GROU	JND	DIA	
DEPTH TO TOP OF WELL	SCREEN BO	ОТТОМ	
WELL DEVELOPMENT	BAC	KFILL QUICK GROU	UT
FIELD PARTY MCR-W	/EB	RIG BK-81	

SAMPLE	NUMBER	SAM DEI IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE	TOTAL LENGTH LECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	N S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	SS	6 0.0	1.5	14-22-35	1.0					GRAY BOTTOM ASH		Boring grouted from grade to 58.2.
2	SS	3.0	4.5	11-12-15	1.2		-		SP	DARK BROWN GRAVELLY SAND Moist, 1/2" max size, some fines. BROWN CLAYEY SILT Moist, slight to non plasticity. Moist, slight to non		
3	SS	5.0	6.5	10-10-15	1.3		5		SM	LIGHT BROWN SILTY SAND Dry, v-fine grain.		
5	s	8.5	10.0	8-13-15	1.5		- 10 -		SC	LIGHT AND DARK BROWN CLAYEY SAND Moist, trace of small gravel.		
6	SS	11.7	13.2	11-11-13	1.2		- - 15		GP	DARK BROWN CLAYEY SAND AND GRAVEL Moist, quartz, 3/4" max size, rounded.		
7	SS	16.7	18.2	3-2-4	1.5		-		SM	LIGHT BROWN SILTY SAND Moist, v-fine grain sand. DARK GRAY SILTY CLAY Wet , medium to low plasticity,trace of organic material.		
		ТҮРЕ	OF C	ASING USED	ı I.					Continued Next Page	L	<u> </u>
	<u> </u>	NQ-2 R0 6" x 3.25	DCK CO 5 HSA	RE			PIEZOMI	ETER		E: PT = OPEN TUBE POROUS TIP, SS	= OP	EN TUBE
		9" x 6.25 HW CAS	5 HSA SING AD	VANCER	4"		WELL TY	/PF·	ני עב חו	W = OPEN TUBE SLOTTED SCREEN G	/ = ር-	FOMON
		NW CAS	SING SING		3" 6"					RECORDER WEB		
! _		AIR HAMMER 8"										

JOB NUMBER

BORING NO. <u>96-05</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF <u>3</u>

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/12/96
 BORING FINISH
 6/12/96

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
8	SS	21.7	23.2	3-4-6	1.5		05		CL	LIGHT BROWN CLAYEY SILTY Moist to wet, slight plasticity.	-	
9	SS	26.7	28.2	2-2-1	1.1		25 -			GRAY BOTTOM ASH Saturated.		
10	SS	31.7	33.2	1-2-2	1.3		30 -		CL	DARK GRAY CLAY Wet to saturated, medium to low plasticity, trace of organic.	-	
11	SS	36.7	38.2	1-1-1	1.5		35 -			GRAY FLY ASH Saturated.		
12	SS	41.7	43.2	1-1-1	1.5		40 -	* * * * * * * *	CL	DARK GRAY SILTY CLAY Moist, low to medium plasticity, trace of organic material.		
							45 -					

EPRI SPORN MOUNTAINEER.GPJ AEP.GDT 7/23/15 AEP

Continued Next Page



COMPANY

JOB NUMBER

COMPANY

BORING NO. <u>96-05</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>3</u>
 COMPANY
 BORING NO. 96-05
 DATE 7/23/15
 SHEET 3
 OF 3

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/12/96
 BORING FINISH
 6/12/96

SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
13	SS	46.7	48.2	1-1-2	1.5		-			BROWN CLAY Wet to saturated, medium to low plasticity.	Ţ	
14	ST	51.7	53.7		2.0		50					
15	SS	56.7	58.2	2-2-3	1.5		-			DARK GRAY SILTY CLAY Wet to saturated, low to medium plasticity, trace of v-fine grain sand lens.		


JOB NUMBER

COMPANY ____

PROJECT EPRI GROUND WATER STUDY

COORDINATES <u>N 718,519.1 E 1,736,243.1</u>

GROUND ELEVA	TION 566.1		SYSTEM _	STATE PLANE
Water Level, ft	⊻ 23.6	Ţ		Ā
TIME				
DATE	6-18-96			

BORING NO. <u>96-06</u>	DATE DATE S	HEET <u>1</u> OF <u>2</u>
BORING START 6/18	/96 BORING FINIS	н 6/18/96
PIEZOMETER TYPE	WELL TYP	E
HGT. RISER ABOVE GROU	JND DI	Α
DEPTH TO TOP OF WELL	SCREEN BOTTO	Μ
WELL DEVELOPMENT	BACKFIL	L QUICK GROUT
FIELD PARTY MCR-W	/EB RI	G BK-81

SAMPLE	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	SS	0.0 3.0	1.5 4.5	1-1-4 5-6-4	1.5		-			GRAY FLY ASH Moist.		
3	SS	5.0	6.5	3-3-2	1.5		- 5 -	\$.\$\.\$\.\$\.\$\.\$\.\$\.\$\.\$\.\$\.\$\.\$\.\$\.\$\		GRAY BOTTOM ASH Saturated.		
4	SS	8.5	10.0	5-5-6	1.5		10 -		CL	BROWN SILTY CLAY Moist, low to medium plasticity (DIKE MATERIAL).		
		11.5	13.0	J-4-Z	1.0		15			medium to low plasticity, (DIKE MATERIAL).		
INEER.GPJ AEP.GDT 7/23/15	SS	16.5	18.0	4-4-3	1.5		-		SM	GRAY SILTY SAND Saturated, v-fine grain, quartz.		
DUNTAI		TYPE	OF C	ASING USED						Continued Next Page		
KN MC	NQ-2 ROCK CORE						PIEZOM		TYP	E: PT = OPEN TUBE POROUS TIP, SS	= OP	EN TUBE
SPO		9" x 6.25 HW CAS	HSA SING AD	VANCER	4"		WELLT	νι⊏ γPF·	ים שבי הס	W = OPEN TUBE SLOTTED SCREEN GN	/I = G	FOMON
	NW CASING 3" SW CASING 6" AIR HAMMER 8"											

JOB NUMBER

COMPANY

AEP

SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
7	SS	21.5	23.0	1-1-2	1.3		-				Ţ	
8	SS	26.5	28.0	1-1-1	1.5		20 -		CL	DARK GRAY CLAY Saturated, medium to low plasticity with v-fine grain sand lens.		
9	SS	31.5	33.0	2-3-3	1.5		- 30 -					
:PR_SPORN_MOUNTAINEER.GPJ_AEP.GDT_7/23/15												



JOB NUMBER

COMPANY _

DATE

PROJECT EPRI GROUND WATER STUDY

V

COORDINATES N 720,983.0 E 1,734,516.1

GROUND ELEVATION 619.0 SYSTEM STATE PLANE Water Level, ft \Box T TIME

BORING NO. <u>96-101</u>	DATE 7/23/15	SHEET	1 OF	3
BORING START 6/5/96	BORING FI	NISH 6/5	/96	
PIEZOMETER TYPE SS	WELL	TYPE		
HGT. RISER ABOVE GROUN	D	DIA		
DEPTH TO TOP OF WELL SC	REEN	том 33.	4	
	D BACH	KFILL QU		JUT
FIELD PARTY MCR-REE	3	RIG BK	-81	

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
1			0.0			0		-			<u>No sample taken boring in road way</u>			
2		SS	3.0	4.5	12-13-16	1.1		-		SM	BROWN SILTY GRAVELLY SAND Dry to moist, 1/2" max size, rounded, quartz.			
3		SS	5.0	6.5	7-9-9	1.2		5						
3		SS	8.5	10.0	3-4-5	1.2		10 -		SC	BROWN CLAYEY SAND Moist, fine grain with trace of gravel.			
4		SS	11.5	13.0	17-27-38	1.2		-		SM	BROWN SILTY GRAVELLY SAND Moist, fine grain, trace of gravel, quartz.			
JEER.GPJ AEP.GDT 7/23/15 GT		SS	16.5	18.0	12-19-26	1.1		15 - - -						
	TYPE OF CASING USED								1.[.]]		Continued Next Page			
	NQ-2 ROCK CORE X 6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCER 4"									TYPI ED S	E: PT = OPEN TUBE POROUS TIP, SS = CREEN, G = GEONOR, P = PNEUMATIC	= OP		
AEP EPR	NW CASING 3" SW CASING 6" AIR HAMMER 8"								176.	RECORDER REB				

JOB NUMBER

 COMPANY
 BORING NO. 96-101
 DATE 7/23/15
 SHEET 2
 OF 3

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/5/96
 BORING FINISH
 6/5/96

SAMPLE	SAMPLE	SAM DE IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
6	SS	3 21.5	23.0	16-21-27	1.1		-		SW	BROWN GRAVELLY SAND Moist, trace of small gravel, quartz, rounded.		20.0 Top of seal. 22.0 Top of sand.
7	SS	\$ 26.5	28.0	12-20-23	1.2		25 -		GP	BROWN SAND AND GRAVEL Moist to wet, quartz, rounded, 3/4" max size, some fines.		24.4 Top of screen.
8	SS	31.5	33.0	4-5-7	1.1		30 -		SM	BROWN SILTY SAND Moist, 100% fine grain.		
9	S	33.5 36.5	35.5 38.0	4-6-8	1.6		35 -		CL	Push 2.0 Time 5 sec. PSI 800 Top of sample, BROWN SILTY SAND Bottom of sample, LIGHT GRAY CLAY Moist, low to medium plasticity.		34.0 Bottom of pipe.34.4 Bottom of screen.35.0 Bottom of sand.
INTAINEER.GPJ AEP.GDT 7/23/15	SS	6 41.5 - 43.5	43.0	4-5-6	1.1		40		SM	DARK GRAY SILTY SAND Wet, non to slight plasticity, with reddish brown quartz sand lens.		
							45 -			<u>TIME 5 SEC</u> <u>PSI 800</u> <u>Bottom of sample, Drillers identification fly ash</u> <u>believe it is a light gray clay</u>		

AEP



JOB NUMBER

COMPANY _

AEP

PROJECT EPRI GROUND WATER STUDY

BORING NO. <u>96-1</u>	01	DATE	7/23/15	SHE	ET _	3	OF	
BORING START	6/5/96		BORING FI	NISH	6/	5/96		

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
13	SS	46.5	48.0	7-9-11	1.1		-		SP	????????????????????????????????????		
7/23/15												
GPJ AEP.GDT												
MOUNTAINEER												



3



COMPANY ____

PROJECT EPRI GROUND WATER STUDY

V

COORDINATES N 720,707.5 E 1,734,001.7

GROUND ELEVATION 619.6 SYSTEM STATE PLANE Water Level, ft $|\nabla$ Ţ TIME DATE

BORING NO. 96-102	DATE 7/23/15	_ SHEET <u>1</u> OF <u>3</u>
BORING START 6/5/9	6 BORING F	INISH 6/5/96
PIEZOMETER TYPE	WELL	TYPE
HGT. RISER ABOVE GROUI	ND	DIA
DEPTH TO TOP OF WELL S	CREEN BOT	ттом
WELL DEVELOPMENT	BAC	KFILL QUICK GROUT
FIELD PARTY MCR-RE	B	RIG BK-81

SAMPLE	SAMPLE	SAN DEF IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
1		0.0			0					NO SAMPLE TAKEN BORING IN ROAD AUGER CUTTINGS INDICATE BROWN SAND AND GRAVEL		Boring was grouted from grade to 48.2' with quick grout.	
2	SS	3.0	4.5	12-16-19	1.1				SP	BROWN GRAVELLY SAND Moist, 1/2" max size, rounder, quartz with fines.			
3	SS	5.0	6.5	17-21-26	1.2		5 -						
4	SS	8.5	10.0	13-16-19	1.2		10 -	-					
5	SS	11.7	13.2	15-28-32	1.2								
EER.GPJ AEP.GDT 7/23/15 9	SS	16.7	18.2	17-21-26	1.2		15 -						
		ТҮРЕ	E OF C	ASING USED						Continued Next Page			
N MOL	X NQ-2 ROCK CORE						PIEZOM	ETER	TYPI	E: PT = OPEN TUBE POROUS TIP, SS	= OP	EN TUBE	
SPOR	6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCED 4"						SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC						
		NW CAS	SING AD	VANCER	$\frac{3}{6}$ WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON					BEOMON			
₽—	SW CASING 6" AIR HAMMER 8"									RECORDER REB			

JOB NUMBER

COMPANY

AEP

BORING NO. <u>96-102</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF ____ COMPANYBORING NO. 96-102DATE 7/23/15SHEET 2OFPROJECTEPRI GROUND WATER STUDYBORING START6/5/96BORING FINISH6/5/96

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROCK IDENTIFICATION	MELL	DRILLER'S NOTES
	7	SS	21.7	23.2	19-21-24	1.1		-			Sample moist to wet.		
	8	SS	26.7	28.2	9-9-11	1.1		25 -		SM	DARK BROWN SANDY SILT Moist, non-plastic.	_	
	9 10	SS ST	31.7 33.7	33.2 35.7	3-4-5	1.1 ?				SC	BROWN SANDY CLAY Moist, low plasticity, with v-fine sand lens. Time 5 sec. Push 2.0 PSI 1000	-	
15	11	SS	36.7	38.2	4-4-5	1.1		35 -		SM	BROWN SILTY SAND Moist, with very fine sand lens.		
MOUNTAINEER.GPJ AEP.GDT 7/23/	12	SS	41.7	43.2	3-5-8	1.1		40		SP	BROWN GRAVELLY SAND Moist, 3/4" max size, rounded, quartz.		
EPRI_SPOR								45 -					

3

Continued Next Page

JOB NUMBER

COMPANY

BORING NO. <u>96-102</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>3</u>

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/5/96
 BORING FINISH
 6/5/96

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
13	SS	46.7	48.2	13-15-21	1.2							





JOB NUMBER	
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COMPANY ____

PROJECT EPRI GROUND WATER STUDY COORDINATES N 719,785.3 E 1,734,133.3

GROUND FLEVATION 618.0

GROUND ELEVA	TION	618.0		SYSTEM	STATE PLANE
Water Level ft	∇				V
			-		
DATE					

BORING NO. 96-103	DATE 7/23/15	SHEET OF3
BORING START 6/4/9	BORING	FINISH 6/4/96
PIEZOMETER TYPE	WEL	L TYPE
HGT. RISER ABOVE GROUI	ND	DIA
DEPTH TO TOP OF WELL S	CREEN BO	
WELL DEVELOPMENT	BA	ACKFILL QUICK GROUT
FIELD PARTY MCR-RE	B	RIG BK-81

MPLE	MPLE	SAMPLE STANDARD → → → → → → → → → → → → → → → → → → →				RQD	DEPTH IN	APHIC OG	scs	SOIL / ROCK	ίει.	DRILLER'S		
SAI	SAI	FROM	ТО	BLOWS / 6"	С П П П П П П П П	%	FEET	GR	Š	IDENTIFICATION	3	NOTES		
1		0.0			0					NO SAMPLE TAKEN BORING LOCATED IN ROAD CUTTINGS INDICATE BROWN SAND AND GRAVEL.		Boring grouted from grade to 48.1 w∖ 60 gallons of quick grout.		
2	SS	3.0	4.5	12-19-24	1.1		-		SP	DARK BROWN GRAVELLY SAND Moist, rounded, quartz, with fines, 3/4" max size.				
3	SS	5.0	6.5	14-17-19	1.2		5 -							
4	SS	8.5	10.0	17-21-25	1.1		10 -							
5	SS	11.6	13.1	19-25-28	1.1		-							
6	SS	16.6	18.1	12-19-25	1.2		15 - - -							
	I	TYPE	OF C	ASING USED	<u> </u>		Continued Next Page							
X		NQ-2 R0	RE			PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE								
5	9" x 6.25 HSA HW CASING ADVANCER 4"						WELL TYPE OW = OPEN TUBE SLOTTED SCREEN GM = GEOMON							
	NW CASING 3" SW CASING 6" AIR HAMMER 8"						RECORDER REB							

JOB NUMBER

BORING NO. <u>96-103</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF ____
 COMPANY
 BORING NO.
 96-103
 DATE
 7/23/15
 SHEET
 2
 OF

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/4/96
 BORING FINISH
 6/4/96

SAMPLE	NUMBER	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	7	SS	21.6	23.1	5-14-21	1.1		-					
	8	SS	26.6	28.1	11-17-28	1.2		- 25 -					
	9	SS	31.6	33.1	8-9-10	1.1		30 - - -		CL	BROWN SILTY CLAY Moist, with fine grin sand lens, low plasticity.		
23/15	10	ST	36.6	38.6		1.6		35		SP	time 5 sec. Push 2.0 PSI 700 LIGHT BROWN SAND Fine grain.		
PORN_MOUNTAINEER.GPJ AEP.GDT 7/	11	SS	41.6	43.1	4-5-6	1.1					BROWN SAND Moist, 100% fine grain, with fines.		
S IS									· · · ·				

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3

COMPANY

JOB NUMBER

COMPANY

BORING NO. <u>96-103</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>3</u> PROJECT EPRIGROUND WATER STUDY BORING START 6/4/96 BORING FINISH 6/4/96

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
12	SS	46.6	48.1	6-6-5	?		-					





JOB NUMBER

COMPANY ____

PROJECT EPRI GROUND WATER STUDY

COORDINATES N 719,229.2 E 1,734,600.2 618 7

GROUND ELEVA	TION	618.7		SYSTEM	STATE PLANE
Water Level, ft	$\overline{\Sigma}$		Ţ		Ā
TIME					
DATE					

BORING NO. <u>96-104</u>	DATE	7/23/15	SHE	ет <u>1</u>	1	OF _	3	
BORING START 6/4/96		BORING FI	NISH	6/4/9	96			
PIEZOMETER TYPE SS		WELL 1	TYPE					
HGT. RISER ABOVE GROUND	DC		DIA					
DEPTH TO TOP OF WELL SC	REEN	24.1 BOT	ТОМ	33.1				
WELL DEVELOPMENT)	BACK	FILL	QUI	ск	GRC	UT	
FIELD PARTY MCR-REE	3		RIG	BK-	81			
								1

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION → DRILLER'S NOTES	8
1	1	SS	0.0		2-4-8	1.1		-		CL	-	
2	2	SS	3.0	4.5	9-14-18	1.2		-		SP	DARK BROWN CLAY Moist, medium to high plasticity trace of sand.	
3	3	SS	5.0	6.5	73	1.1		5	00 00 00 00	GW	max, rounded. DARK BROWN SAND AND GRAVEL Dry, quartz, 1/2" max, rounded.	
2	4	SS	8.5	10.0	9-18-25	1.2		- 10 -	- 00 - 00 - 00		Same as above some fines, moist	
Ę	5	SS	11.7	13.2	19-26-31	1.2		-		SP	DARK BROWN GRAVELLY SAND Dry, 3/4" max, rounded, quartz.	
EER.GPJ AEP.GDT 7/23/15	6	SS	16.7	18.2	18-21-26	1.2		15 - -		SC	DARK BROWN CLAYEY SAND Moist, trace of gravel.	
			TYPE	OF C	ASING USED				<u> </u>		Continued Next Page	
PORN_MC	X		NQ-2 RC 6" x 3.25 9" x 6.25	OCK CO HSA HSA	RE			PIEZOMI SLC	eter DTTE	TYPI ED S	E: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE CREEN, G = GEONOR, P = PNEUMATIC	
EPRIS			HW CAS	SING AD SING	VANCER	4" 3"		WELL T	YPE:	0\	V = OPEN TUBE SLOTTED SCREEN, GM = GEOMON	
AEP I			SW CAS	SING /MFR		<u>6"</u> 8"					RECORDER REB	

AFP GDT SPORN MOUNTAINEER.GPJ FPRI AFP



JOB NUMBER

COMPANY

BORING NO. <u>96-104</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF <u>3</u>

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/4/96
 BORING FINISH
 6/4/96

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
7	7	SS	21.7	23.2	17-21-25	1.2				SP	LIGHT BROWN GRAVELLY SAND Dry, quartz, 3/4" max, rounded.		20.4 Top seal. 22.5 Top of sand. 24.1 Top of screen.
ξ	3 :	SS	26.7	28.2	4-6-8	1.1		25 -		CL	LIGHT BROWN SILTY CLAY Moist, low to medium plasticity.		
ç)	ST	31.7	33.7		1.6		30 -			PUSH 2.0 PSI 900 TIME 6 SEC. BROWN CLAYEY SAND Fine grain?		33.1 Bottom of screen. 34.7 Bottom of sand
23/15	0 :	SS	36.7	38.2	3-3-5	1.2		- 40 -			LIGHT BROWN SILTY CLAY Moist, low to medium plasticity.		
PORN_MOUNTAINEER.GPJ AEP.GDT 7/2	1	SS	41.7	43.2	4-4-7	1.1		45 -		SM	LIGHT BROWN SILTY SAND Moist. v-fine grain 100%.		
PRI_SF													

G EPRI AEP

Continued Next Page

JOB NUMBER

COMPANY

BORING NO. <u>96-104</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>3</u> PROJECT EPRIGROUND WATER STUDY BORING START 6/4/96 BORING FINISH 6/4/96

SAMPLE	NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	2	ST	46.7	48.7		1.5		-			<u>PUSH 2.0</u> <u>PSI 1200</u> <u>TIME 6 SEC.</u> <u>DARK BROWN SANDY CLAY</u> Fine grain.		





JOB NUMBER

COMPANY ____

PROJECT EPRI GROUND WATER STUDY

COORDINATES N 718,782.8 E 1,735,084.7

GROUND ELEVA	TION	619.3		SYSTEM	STATE PLANE
Water Level, ft	$\overline{\Delta}$		Ţ		Ā
TIME					
DATE					

BORING NO. <u>96-105</u>	DATE 7/23/15	SHEET <u>1</u> OF <u>3</u>
BORING START 6/3/96	BORING FIN	NISH 6/3/96
PIEZOMETER TYPE	WELL T	ТҮРЕ
HGT. RISER ABOVE GROUN	ID	DIA
DEPTH TO TOP OF WELL S	CREEN BOT	ТОМ
WELL DEVELOPMENT	BACK	KFILL QUICK GROUT
FIELD PARTY MCR-RE	В	RIG BK-81

	SAMPLE	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
								-			No sample taken. Boring located in road bed. Auger cuttings sand and gravel.		Boring grouted from grade to 48.5' with 75 gallons of quick grout
	1	SS	3.0	4.5	7-10-11	1.1		-		SW	BROWN SAND Dry, quartz, rounded with trace of gravel.		
	2	SS	5.0	6.5	12-16-21	1.2		5	- · · · · · · · · · · · · · · · · · · ·		BROWN GRAVELLY SAND Dry quartz, rounded, 1/2" max size.		
	3	SS	8.5	10.0	9-15-17	1.2		- 10 -			<u>3/4" max size trace of fines.</u>		
	4	SS	11.5	13.0	9-16-19	1.1		-					
23/15	5	SS	16.5	18.0	9-14-17	1.2		15			Moist		
NEER.GPJ AEP.GDT 7/								-					
UNTAI			TYPE	OF C	ASING USED						Continued Next Page	-	
RN_MOI	X		NQ-2 R0	DCK CO	RE			PIEZOM	ETER	TYPE		= OP	EN TUBE
SPOF			9" x 6.25			4"		SLC		US C	CREEN, G = GEONOR, P = PNEUMATIC		
EPRI			NW CAS	SING				WELL T	YPE:	01	v = OPEN TUBE SLOTTED SCREEN, GN	/I = G	EUMUN
EP		-	SW CAS	MG MFR		<u>6"</u> 8"					RECORDER REB		

JOB NUMBER

COMPANY

BORING NO. <u>96-105</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF <u>3</u> PROJECT EPRI GROUND WATER STUDY BORING START 6/3/96 BORING FINISH 6/3/96

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	6	SS	21.5	23.0	7-9-14	1.1		-		SM	DARK BROWN SILTY SAND Moist, with trace of small gravel.		
	7	SS	26.5	28.0	5-6-7	1.2		25		CL	BROWN SILTY CLAY Moist, low to medium plasticity.		
	8	ST	31.5	33.5		1.7		30 - - - -			<u>PUSH 2.0</u> PSI 700 TIME 8 SEC.		
15	9	SS	36.5	38.0	3-3-5	1.1		35					
N_MOUNTAINEER.GPJ_AEP.GDT_7/23/	10	SS	41.5	43.0	4-4-5	1.2		40		SP SC	LIGHT BROWN CLAYEY SAND Moist, 100% v-fine grain.		
EP EPRI_SPOR								45			Continued Next Page		



JOB NUMBER

COMPANY

BORING NO. <u>96-105</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>3</u>

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/3/96
 BORING FINISH
 6/3/96

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
11	ST	46.5	48.0		1.8		-			<u>TIME 5 SEC</u> <u>PSI 800</u> PUSH 2.0		



JOB NUMBER

COMPANY ____

PROJECT EPRI GROUND WATER STUDY

COORDINATES N 719,271.8 E 1,735,858.4

GROUND ELEVA	TION <u>618.9</u>		SYSTEM	STATE PLANE
Water Level, ft	⊻ 60.2	Ţ		Ī
TIME				
DATE	5-28-96			

BORING NO. <u>96-106</u>	DATE 7/23/15 SHE	ET 1 OF 3
BORING START 5/28/96	BORING FINISH	5/28/96
PIEZOMETER TYPE	WELL TYPE	
HGT. RISER ABOVE GROUND) DIA	
DEPTH TO TOP OF WELL SC	REEN BOTTOM	
WELL DEVELOPMENT	BACKFILL	QUICK GROUT
FIELD PARTY MCR-REB	RIG	BK-81

SAMPLE	SAMPLE	SAM DEI IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
							-			NO SAMPLE TAKEN BORING IN ROAD BED.		
1	SS	3.0	4.5	15-17-21	1.1		-		GP	DARK BROWN SAND AND GRAVEL Moist, 1/2" max, rounded, quartz, some fines.	-	
2	SS	5.0	6.5	17-24-30	1.1		5			<u>1" max size</u>		
3	SS	8.5	10.0	13-17-20	1.2		10 -			<u>1/2" max size</u>		
4	SS	11.5	13.0	11-11-14	1.2		-					
IEER.GPJ AEP.GDT 7/23/15	ss	16.5	18.0	13-15-17	1.1		15 - - -			<u>1/2" max size</u>		
		ТҮРЕ	E OF C	ASING USED						Continued Next Page		
		NQ-2 R0 6" x 3.25 9" x 6.25	OCK CO 5 HSA 5 HSA	RE			PIEZOMI	eter DTTE	TYPE D S	E: PT = OPEN TUBE POROUS TIP, SS CREEN, G = GEONOR, P = PNEUMATIC	= OP	EN TUBE
		HW CAS	SING AD SING	VANCER	4" 3"	=	WELL TY	YPE:	0\	V = OPEN TUBE SLOTTED SCREEN, GM	И = G	EOMON
AEP	SW CASING 6" AIR HAMMER 8"					RECORDER REB						

3

JOB NUMBER

COMPANY

BORING NO. <u>96-106</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF ____

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 5/28/96
 BORING FINISH
 5/28/96

	MPLE MBER	MPLE	SAN DEF	IPLE PTH	STANDARD PENETRATION)TAL VGTH DVERY	RQD	DEPTH	APHIC OG	scs	SOIL / ROCK	ELL	DRILLER'S
	SAI	SAI	FROM	TO	BLOWS / 6"	RECE	%	FEET	GR	D	IDENTIFICATION	3	NOTES
-	6	SS	21.5	23.0	6-8-10	1.2		-		SC	BROWN SANDY CLAY Dry, slight to low plasticity.		
-	7	SS	26.5	28.0	4-6-6	1.2		25 -			GRAY FLY ASH Dry.		
-	8	SS	31.5	33.0	1-1-1	1.2		30 -			Saturated		
/15	9	SS	36.5	38.0	1-1-1	1.2		35 -					
RN_MOUNTAINEER.GPJ AEP.GDT 7/23	10	SS	41.5	43.0	1-1-1	1.2		40 -					
FRI_SPO								45 -					
AEP E											Continued Next Page		

JOB NUMBER

COMPANY

_	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC	NSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
_	11	SS	46.5	48.0	3-2-2	1.1		- 50 -					
	12	SS	51.5	53.0	2-2-2	1.2							
	13	SS	56.5	58.0	3-4-4	1.2		55		CL	DARK GRAY SILTY CLAY Wet, low to medium plasticity, trace of organic material.	-	
	14	ST	61.5	63.5		1.6		60 -			Time 7 sec. Push 2.0 PSI 600 BROWN SILTY CLAY Trace of fine sand.		
PORN_MOUNTAINEER.GPJ AEP.GDT 7/23/15	15	SS	66.5	68.0	3-4-5	1.2		65 -			BROWN CLAY Wet, medium to high plasticity.	-	Boring grouted from 68.0' to grade with 125 gallons quick grout.
AEP EPRIS													



JOB NUMBER

COMPANY ____

PROJECT EPRI GROUND WATER STUDY

COORDINATES N 719,691.4 E 1,736,040.0

GROUND ELEVA	TION <u>618.8</u>		SYSTEM	STATE PLANE
Water Level, ft	∑ 39.1	Ţ		Ā
TIME				
DATE	5-29-96			

BORING NO. <u>96-10</u>	DATE_	7/23/15 SHE	ET 1 OF 4
BORING START	5/29/96	BORING FINISH	5/29/96
PIEZOMETER TYPE	≡	WELL TYPE	
HGT. RISER ABOVI	E GROUND	DIA	
DEPTH TO TOP OF	WELL SCREEN	BOTTOM	
WELL DEVELOPME	ENT	BACKFILL	QUICK GROUT
FIELD PARTY	CR-REB	RIG	BK-81

SAMPLE	SAMPLE	SAM DEI IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
							-			NO SAMPLE TAKEN BORING IN ROAD BED. AUGER CUTTINGS INDICATE BROWN SAND AND GRAVEL.		Boring was grouted from 73.1 to grade w/approximately 100 gallons of quick grout.
1	SS	3.0	4.5	14-17-21	1.1		-		GP	BROWN SAND AND GRAVEL Moist, quartz, rounded, some fine 3/4' max size.		
2	SS	5.0	6.5	17-21-28	1.2		- 5					
3	SS	8.5	10.0	14-18-24	1.1		10 -			<u>1/2" max size</u>		
4	SS	11.6	13.1	13-16-21	1.2		-					
EER.GPJ AEP.GDT 7/23/15	SS	16.6	18.1	5-8-10	1.1		- 15 - - -		ML	BROWN SILT Moist, non to v-slight plasticity.		
		ТҮРЕ	E OF C	ASING USED						Continued Next Page		
		NQ-2 R 6" x 3.25 9" x 6.25	OCK CO 5 HSA 5 HSA	RE			PIEZOMI SLC	ETER DTTE	typi D S	e: PT = OPEN TUBE POROUS TIP, SS : CREEN, G = GEONOR, P = PNEUMATIC	= OP	EN TUBE
EPRI	+	HW CAS	Sing Ad Sing	VANCER	4" 3"		WELL TY	YPE:	0\	W = OPEN TUBE SLOTTED SCREEN, GN	1 = G	EOMON
AEP	_	SW CAS	SING MMER		<u>6"</u> 8"					RECORDER REB		

JOB NUMBER

 COMPANY
 BORING NO. 96-107
 DATE 7/23/15
 SHEET
 2
 0F
 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 5/29/96
 BORING FINISH
 5/29/96

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	6	SS	21.6	23.1	8-8-11	1.2		25		SM	Attempted shelby tube lifted rig BROWN SILT SAND Moist, 100% v-fine grain.		
	7	SS	26.6	28.1	4-5-9	1.2		20 -			GRAY FLY ASH Moist.		
	8	SS	31.6	33.1	5-8-11	1.2		30 -			Saturated		
/15	9	SS	36.6	38.1	1-1-1	1.1		35 -				Ţ	
RN_MOUNTAINEER.GPJ AEP.GDT 7/23	10	SS	41.6	43.1	1-1-1	1.2		40 -					
P EPRI SPC								40 -	Å Å Å		Continued Nevt Page		
AEF											Commueu Next Page		

JOB NUMBER

COMPANY

AEP

SAMPLE	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
11	SS	46.6	48.1	1-1-1	1.2		- 50 -					
12	SS	51.6	53.1	2-1-1	1.2		- 55 -					
13	SS	56.6	58.1	0	1.3		60 -	* * * * * * * * * * * * * * * * * *				Weight of 140# hammer.
14	SS	61.6	63.1	4-7-10	1.2		65 -	→ ☆ ☆ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	CL	DARK BROWN CLAY Moist. medium to high plasticity.		
IOUNTAINEER.GPJ AEP.GDT 7/23/15	ST	66.6	68.6		1.5		70 -			Push 2.0 Time 5 sec. PSI 600 BROWN CLAY		
THE SPORN N	SS	71.6	73.1	4-6-7	1.2		-					

Continued Next Page

JOB NUMBER

COMPANY

BORING NO. <u>96-107</u> DATE <u>7/23/15</u> SHEET <u>4</u> OF <u>4</u> PROJECT EPRI GROUND WATER STUDY BORING START 5/29/96 BORING FINISH 5/29/96

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES





JOB NUMBER

COMPANY ____

PROJECT EPRI GROUND WATER STUDY

 COORDINATES
 N 719,761.8
 E 1,736,125.4

 GROUND ELEVATION
 603.4
 SYSTEM
 STATE PLANE

GROUND ELEVATION	603.4		SYSTEM _	STA
Water Level, ft \Box		Ţ		Ā
TIME				
DATE				

BORING NO. <u>96-108</u> DATE	7/23/15 SHE	ET <u>1</u> OF <u>4</u>
BORING START6/11/96	BORING FINISH	6/11/96
PIEZOMETER TYPE SS	WELL TYPE	
HGT. RISER ABOVE GROUND	DIA	
DEPTH TO TOP OF WELL SCREEN	63.3 BOTTOM	72.3
WELL DEVELOPMENT NO	BACKFILL	QUICK GROUT
FIELD PARTY MCR-WEB	RIG	BK-81

MBER	MPLE	SAM DEF IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE	OTAL NGTH OVERY	RQD	DEPTH IN	APHIC -0G	scs	SOIL / ROCK	VELL	DRILLER'S
SA	SA	FROM	TO	BLOWS / 6"	REL T	%	FEET	GR	⊃	IDENTIFICATION	5	NOTES
1	SS	3.0	4.5	11-15-16	1.2		-			No sample road base BLACK SAND AND BOTTOM ASH Moist.		
3	SS	5.0	6.5	12-17-21	1.5		5					
4	SS	8.5	10.0	12-16-29	.9		10 -		SC	DARK BROWN CLAYEY SAND Moist, with fine sand lens.		
5	SS	11.6	13.1	9-18-22	1.2		-		SP	DARK BROWN GRAVELLY SAND Moist, quartz, some fine, 1/2" max size.		
6	SS	16.6	18.1	18-24-21	.8		15 - - -		SC	DARK BROWN CLAYEY SAND Moist, trace of small gravel and ash.		
		TYPE	OF C	ASING USED	. I			/ /	. 1	Continued Next Page	- / /)	
X		NQ-2 R0 6" x 3.25	DCK CO 5 HSA	RE			PIEZOM	ETER	TYPE	E: PT = OPEN TUBE POROUS TIP, SS	= OP	EN TUBE
		9" x 6.25 HW CAS	5 HSA SING AD	VANCER	4"		WELL T	YPE:	د تــ ٥٧	V = OPEN TUBE SLOTTED SCREEN. GI	, M = G	EOMON
		NW CAS SW CAS AIR HAN	SING SING MMFR		3" 6" 8"					RECORDER REB		

JOB NUMBER

COMPANY

BORING NO. <u>96-108</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF <u>4</u>
 COMPANY
 BORING NO.
 96-108
 DATE
 7/23/15
 SHEET
 2
 OF
 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/11/96
 BORING FINISH
 6/11/96

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	7	SS	21.6	23.1	6-6-8	1.5		-		CL	LIGHT BROWN SILTY CLAY Moist, low plasticity.		
	8	SS	26.6	28.1	4-4-4	1.0		25 -			BLACK BOTTOM ASH Saturated.		
-	9	SS	31.6	33.1	2-1-2	1.1		30 -			GRAY FLY ASH Saturated.		
15	10	SS	36.6	38.1	2-1-1	1.5		35	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$				
ORN_MOUNTAINEER.GPJ AEP.GDT 7/23/	11	SS	41.6	43.1	3-5-7	.8		40	×××××××××××××××××××××××××××××××××××××	CL	LIGHT GRAY CLAY Moist to wet, medium to high plasticity.		
PRI_SP													

EPRI AEP

Continued Next Page

JOB NUMBER

COMPANY

AEP

BORING NO. <u>96-108</u> DATE <u>7/23/15</u> SHEET <u>3</u> OF <u>4</u>
 COMPANY
 BORING NO.
 96-108
 DATE
 7/23/15
 SHEET
 3
 0F
 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/11/96
 BORING FINISH
 6/11/96

Continued Next Page

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SAMPLE	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
12	ST	46.6	48.6		2.0		-			<u>PUSH 2.0</u> <u>TIME 7 SEC.</u> <u>PSI 1000</u>		
13	SS	51.6	53.1	2-2-3	?				CL	DARK GRAY SILTY CLAY Wet, low plasticity, trace of organic and sand.		
14	SS	56.6	58.1	2-2-3	1.5		55					57.0 Top of seal.
15	SS	61.6	63.1	3-4-5	1.5		60					60.6 Top of sand. 63.3 Top screen.
OUNTAINEER.GPJ AEP.GDT 7/23/15 91	SS	66.6	68.1	4-4-5	1.5							
EPRI_SPORN_M(SS	71.6	73.1	4-5-6	1.5		-					

JOB NUMBER

COMPANY

AEP

BORING NO. <u>96-108</u> DATE <u>7/23/15</u> SHEET <u>4</u> OF <u>4</u> PROJECT EPRI GROUND WATER STUDY BORING START 6/11/96 BORING FINISH 6/11/96

SAMPLE	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
AINEER.GPJ AEP.GDT 7/23/15	SA SA	FROM		BLOWS / 6"		70	FEET	GR				72.3 Bottom of screen. 74.0 Bottom of sand.





JOB NUMBER

COMPANY _

PROJECT ______ EPRI GROUND WATER STUDY

COORDINATES N 720,227.5 E 1,735,579.0

GROUND ELEVA	TION 619.6		SYSTEM	STATE PLANE
Water Level, ft	⊻ 20.5	Ţ		Ī
TIME				
DATE	5-30-96			

BORING NO. <u>96-109</u> DATE	E_7/23/15SHE	ET <u>1</u> OF <u>4</u>
BORING START 5/29/96	BORING FINISH	5/30/96
PIEZOMETER TYPE	WELL TYPE	
HGT. RISER ABOVE GROUND	DIA	
DEPTH TO TOP OF WELL SCREEN	BOTTOM	
WELL DEVELOPMENT	BACKFILL	QUICK GROUT
FIELD PARTY MCR-REB	RIG	BK-81

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
								-			NO SAMPLE TAKEN BORING LOCATED IN ROAD BASE. AUGER CUTTINGS INDICATE BROWN SAND AND GRAVEL.		Boring grouted from 73.2 to grade with 150 gallons quick grout.
1	I	SS	3.0	4.5	13-19-24	1.2		-		GP	DARK BROWN SAND AND GRAVEL Moist, 1/2" max size, quartz, rounded, some fines.		
2	2	SS	5.0	6.5	15-18-21	1.1		- 5					
	3	SS	8.5	10.0	15-18-21	1.2		10 -					
	1	SS	11.7	13.2	12-13-14	1.0		- - - 15		SP	DARK BROWN SAND Moist, fine grain.	-	
IEER.GPJ AEP.GDT 7/23/15	5	SS	16.7	18.2	4-5-6	1.1		-		ML	BROWN SANDY SILT Moist, non plasticity.		
			TYPE	OF C	ASING USED					1	Continued Next Page	I	
SPORN MOI	X NQ-2 ROCK CORE 6" x 3.25 HSA 9" x 6.25 HSA HW CASING ADVANCER							PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC					
P EPRI	NW CASING 3" SW CASING 6"							WELL TYPE: OW = OPEN IUBE SLOTTED SCREEN, GM = GEOMON					EOMON
ΨĒ	AIR HAMMER 8"												

JOB NUMBER

COMPANY

BORING NO. <u>96-109</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF _____
 COMPANY
 BORING NO. 96-109
 DATE 7/23/15
 SHEET 2
 OF 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 5/29/96
 BORING FINISH
 5/30/96

	SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
-	6	SS	21.7	23.2	4-6-8	1.2		-				Ţ	
-	7	ST	26.7	28.7		1.5		- 25 -			Time 10 sec PSI 1200 Push 2.0 By watching rig psi possible .4 to .5 of fly ash in bottom of tube. GRAY FLY ASH Moist.	ţ	
	8	ST	31.7	33.2	4-7-10	1.1		- 30 -					
3/15	9	SS	36.7	38.2	1-1-1	1.2					Saturated		
ORN_MOUNTAINEER.GPJ AEP.GDT 7/2	10	SS	41.7	43.2	1-1-1	1.2		40 -	$\begin{array}{c} & & & & \\ & & & & \\ & & & & \\ & & & & $				
PRI_SF									¢ ¢				



4

JOB NUMBER

COMPANY

SAMPLE	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1'	I SS	46.7	48.2	1-1-3	?							
12	2 SS	51.7	66.7	1-1-2	1.2		55					
1:	3 SS	56.7	58.2	1-1-4	1.2		60 -	× × × × × × × × × × × × × × × × × × ×				
14	I SS	61.7	63.2	4-6-8	?		65	→ → → → → → → → → → → → → → → → → → →	CL	DARK BROWN CLAY Moist, medium to high plasticity.		
N_MOUNTAINEER.GPJ AEP.GDT 7/23/15	5 ST	66.7	68.7		1.7		70			<u>Time 8 sec.</u> <u>Push 2.0</u> <u>PSI 1000</u> <u>Material same as sample no. 14</u>		
							-					

AEP



JOB NUMBER

COMPANY

AEP

BORING NO. <u>96-109</u> DATE <u>7/23/15</u> SHEET <u>4</u> OF <u>4</u> PROJECT EPRI GROUND WATER STUDY BORING START 5/29/96 BORING FINISH 5/30/96

SAMPLE	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
SPORN_MOUNTAINEER.GPJ_AEP.GDT_7/23/15	SS	FROM 71.7	TO 73.2	BLOWS / 6" 3-4-5	1.2							
RR.												



JOB NUMBER

COMPANY _

PROJECT _____ EPRI GROUND WATER STUDY

V

COORDINATES N 720,277.1 E 1,735,665.6

GROUND ELEVATION 602.3 SYSTEM STATE PLANE Water Level, ft \Box **DRY** T TIME DATE 6-10-96

BORING NO. <u>96-110</u>	DATE 7/23/15 SHE	ET <u>1</u> OF <u>4</u>
BORING START 6/6/96	BORING FINISH	6/10/96
PIEZOMETER TYPE SS	WELL TYPE	
HGT. RISER ABOVE GROUN	D DIA	
DEPTH TO TOP OF WELL SC	CREEN 43.7 BOTTOM	52.7
WELL DEVELOPMENT	D BACKFILL	QUICK GROUT
FIELD PARTY MCR-REI	B RIG	BK-81

_	_													
ц	J K	щ	SAM	IPLE	STANDARD	דא	RQD	DEPTH	<u>ں</u>	S				
	MBE	MPL		PTH EET	PENETRATION	NGTAL OVE		IN	PH 0G	Ű	SOIL / ROCK		DRILLER'S	
0	ŚĐ	SAI				ЦЩŬ	%	FEET	GR	\supset	IDENTIFICATION	3	NOTES	
-			FROIVI	10	BLOWS/0						No sample taken, boring in road.		Grouted grade to	
											<u>no campio takoni somiyini cuui</u>		73.1' with	
								-					approximately 80	
								-	╡┣║				ganoris.	
	1	SS	3.0	4.5	13-18-24	1.1		-	<i>A</i> , A		DARK GRAY BOTTOM ASH Dry.	19 12		
								-	1, 12, 1 					
									7: A					
\vdash	2	SS	5.0	6.5	10-11-14	1.2		5 -	- <u>`</u>					
									1. <u>1.</u> 1. <u>1</u> . <u>1</u> .					
									. Å. É					
								-	4; A A A					
									4.4					
								-	-, Å, Å -, Å,					
	3	SS	8.5	10.0	5-7-9	1.1		-		GP	DARK BROWN SAND AND GRAVEL Dry,			
											qualtz, foundeu, 3/4 max.			
-								10 -						
		~~	44.0	40.4	0 7 40									
	4	55	11.6	13.1	6-7-10	1.1		-						
									2.			88		
								-				88		
								15				88		
								15-						
								-	-			88		
23/15	5	SS	16.6	18 1	8-10-10	12				CI	BROWN CLAY Dry low to medium plasticity	88		
1 2/2	5	00	10.0	10.1	0-10-10	1.2		-	1	OL	with trace of v-fine sand.	88		
P.GD								-						
J AE	6	<u> </u>	10.0	20.1	0 11 12	10			77	SC	Attempted to push tube lifted drill, destroyed en			
R.GP	0	33	10.0	20.1	9-11-12	1.2		-			<u>of tube.</u>			
											BROWN SANDY CLAY Moist, low to medium			
			TYPE	OF C	ASING USED						Continued Next Page			
ĭ z⊢	X		NQ-2 R0		RE			PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE						
POR			<u>0 x 3.25</u> 9" x 6.25	HSA				\sim SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC						
		-		SING AD	VANCER	<u>4"</u> 3"		WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON						
	SW CASING 6"									RECORDER REB				
۳L		AIR HAMMER 8"												

JOB NUMBER

COMPANY

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 6/6/96
 BORING FINISH
 6/10/96

BORING NO. <u>96-110</u> DATE <u>7/23/15</u> SHEET <u>2</u> OF _____

4

SAMPLE	NUMBER	SAMPLE	SAN DEF IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
7	, (SS	21.6	23.1	5-7-11	1.2		-			plasticity with v-fine grain sand lens. Grading to more sand		
			23.6					25 -			Attempted to push tube, top hole broken in tube pushed approximately 1' lifted rig.		
g) 5	SS	26.6	28.1	5-7-11	1.2		-			GRAYISH BROWN SILTY CLAY Moist, low to medium plasticity.		
1	0 5	SS	31.6	33.1	7-10-9	1.3		30 -		CL	Could not move or knock tube off to the side of lead auger, pulled augers grouted hole moved approximately three feet down stream to start new hole. No spt taken on new hole untill this point. SWL dry augers to 26.6'. Auger set all weekend at this point. REDDISH BROWN CLAY Dry to moist, medium to high plasticity.		
1	1 5	SS	36.6	38.1		1.5		35 -		CL	MEDIUM GRAY CLAY Moist to dry, medium to		
1:	2 \$	ST	38.6	40.6		2.0		40 -			PUSH 2.0 PSI 1200 TIME 6 SEC. Top DARK BROWNISH GRAY SANDY CLAY Bottom BROWN SANDY CLAY		39.1 Top of seal.
	3 5	SS	41.6	43.1	3-5-7	1.5		-			DARK GRAY CLAY Moist to wet, medium to high plasticity, strong odor of organic.		41.7 Top of sand. 43.7 Top of screen.
								45 -					< < < <

EPRI AEP

Continued Next Page



JOB NUMBER

PROJECT EPRI GROUND WATER STUDY

BORING FINISH 6/10/96

SAMPLE STANDARD RQD ΗH SAMPLE NUMBER DEPTH GRAPHIC SAMPLE S DEPTH PENETRATION TOTAL LENGTH RECOVE SOIL / ROCK WELL DRILLER'S LOG USC IN IN FEET RESISTANCE % **IDENTIFICATION** NOTES FEET FROM BLOWS / 6" то •••••••••••••••••• GRAY BROWN CLAY Moist to wet, medium to 46.6 14 SS 48.1 3-4-4 1.5 high plasticity, odor of organic with v-fine grain sand lens, water on out side of spoon. 50 SS 51.6 53.1 3-3-5 15 1.5 52.7 Bottom of screen. 53.3 Bottom of sand. 55 SS 56.6 58.1 1.5 16 3-4-4 **PUSH 2.0** 17 ST 58.6 60.6 2.0 TIME 7 SEC. PSI 770 60 -DARK GRAY SILTY CLAY DARK GRAY CLAY Moist to wet, medium to SS 61.6 63.1 ? 18 high plasticity, strong odor of organic material. 65 19 SS 66.6 68.1 3-4-5 1.5 70 20 SS 71.6 73.1 4-7-11 1.4

Continued Next Page



COMPANY

JOB NUMBER

COMPANY

AEP

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
								-					
23/15													
J AEP.GDT 7/													
NTAINEER.GP													
SPORN_MOU													




JOB NUMBER

COMPANY

DATE

 PROJECT
 EPRI GROUND WATER STUDY

 COORDINATES
 N 723,463.5
 E 1,734,069.7

 GROUND ELEVATION
 582.2
 SYSTEM
 State Plane using NAD27

7/19/90

V

	GROUND ELEVA	TION	582.2					
	Water Level, ft	Ā	38.0	Ţ				
	TIME							

BORING NO. JTMN-1 DATE	7/23/15 SHE	ET <u>1</u> OF <u>4</u>
BORING START 7/19/90	BORING FINISH	7/19/90
PIEZOMETER TYPE	WELL TYPE	
HGT. RISER ABOVE GROUND 1.	5 DIA	2
DEPTH TO TOP OF WELL SCREEN	56.7 BOTTOM	75.7
WELL DEVELOPMENT	BACKFILL	Benseal
FIELD PARTY MCR / JD	RIG	B-61

_													
L	ЦЩ	Ц	SAM	IPLE PTH	STANDARD PENETRATION	HH HH	RQD	DEPTH	с Н С	S	SOIL / BOCK	_	DRILLER'S
		AMP	IN F	EET	RESISTANCE		%	IN	KAPI	s		VEL	NOTES
Ċ	א אלי איז	S	FROM	то	BLOWS / 6"	L E E	70	FEET	ъ	\supset		_	NOTED
													20' North of well hub.
								-					
								-					
	1	SS	2.7	4.2	4-8-7	1.4		-			BROWN SANDY SILT	-	
											Moist, w/some quartz sand (fill)		
								-					
								5 -					
								U					
								-					
								-					
	2	SS	7.7	9.2	3-3-3	0.9		-					
								-					
								10 -					
								-					
								-					
	3	SS	12.7	14.2	4-7-9	1.3		-			MULTI-COLORED BROWN CLAY		
											Moist, med to low plasticity		
								=					
+								15 -					
15								=	<u> </u>				
7/23/								-					
GDT	4	22	17 7	10.2	4-7-9	13					w/ trace of very fine sand		
AEP	-	00	17.7	10.2	-1-5	1.0		-			w trace of very fine sand		
CGPJ								-					
NEE													
UNTAI			ТҮРЕ	OF C	ASING USED						Continued Next Page		
μ M			NQ-2 RO		RE			PIEZOMI	ETER	TYP	E: PT = OPEN TUBE POROUS TIP, SS	= OP	EN TUBE
POR	Х		<u>o x 3.25</u> 9" x 6.25	HSA HSA				SLC	DTTE	DS	SCREEN, G = GEONOR, P = PNEUMATIC	;	
PRI-			HW CAS	<u>Sing ad</u> Sing	VANCER	4" 3"		WELL T	PE:	0	W = OPEN TUBE SLOTTED SCREEN, GM	∕ I = G	EOMON
			SW CAS	SING		6"					RECORDER JCM		
¥I		1	AIR HAN	лмеr		8"							

JOB NUMBER

 COMPANY
 BORING NO. JTMN-1
 DATE 7/23/15
 SHEET 2
 OF 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/19/90
 BORING FINISH
 7/19/90



SAMPLE	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
5	SS	22.7	24.2	4-7-9	1.4		25			BROWN SILTY CLAY w/ trace of very fine sand, low to medium plasticity	-	
6	SS	27.7	29.2	3-4-6	1.4		20 -			BROWN SAND Moist to wet, 100% fine grain		
7	SS	32.7	34.2	3-4-4	1.3		- 30 -					
8	SS	37.7	39.2	6-6-10	1.3			ο, ο		BROWN CLAYEY SAND & GRAVEL Saturated, quartz - 3/4" max size, rounded	· <u> </u>	
	SS	42.7	44.2	6-8-10	1.1					BROWN SAND & GRAVEL Saturated, quartz - 3/4" max size, rounded, w/ trace of fines	-	

5 EPRI AEP

Continued Next Page



JOB NUMBER

COMPANY

BORING NO. JTMN-1 DATE 7/23/15 SHEET 3 OF 4
 COMPANY
 BORING NO. JTMN-1
 DATE
 7/23/15
 SHEET
 3
 0F
 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/19/90
 BORING FINISH
 7/19/90

SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
10	SS	47.7	49.2	12-16-25	0.4		- 50 -			1" max size		
11	SS	52.7	54.2	10-12-16	0.9		-			BROWN SAND Saturated, 70% fine grain, w/ some fines		
12	SS	57.7	59.2	10-12-17	1.3		- 55			BROWN SAND Saturated, 90% medium to fine grain		
13	SS	62.7	64.2	12-17-15	0.9		60 -			BROWN SAND Saturated, 80% medium to fine grain quartz, trace of fines		
14	SS	67.7	69.2	17-16-16	1.0		- 00			BROWN SILTY SAND Saturated, quartz, w/ trace of small gravel		
							70	-				

SPORN MOUNTAINEER.GPJ AEP.GDT 7/23/15 EPRI AEP





JOB NUMBER

COMPANY

AEP

BORING NO. JTMN-1 DATE 7/23/15 SHEET 4 OF 4
 COMPANY
 BORING NO. JTMN-1
 DATE 7/23/15
 SHEET
 4
 OF
 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/19/90
 BORING FINISH
 7/19/90

SAMPLE NUMBER	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
15	SS	72.7	74.2	9-18-19	0.4		- 75 -			BROWN SAND Saturated, quartz, w/ trace of fines	-	
												Auger refusal @ 76.6'. Installed 2" observation well.
EPRI_SPORN_MOUNTAINEER.GPJ AEP.GDT 7/23/15												

JOB NUMBER

COMPANY	BORING NO. JTMN-2 DATE 7/23/15 SHEET 1 OF 4	
PROJECT EPRI GROUND WATER STUDY	BORING START 7/17/90 BORING FINISH 7/18/90	
COORDINATES N 723,392.8 E 1,734,106.4	PIEZOMETER TYPE WELL TYPE	
GROUND ELEVATION 582.2 SYSTEM State Plane using NAD27	HGT. RISER ABOVE GROUND 1.9 DIA 2	
Water Level, ft	DEPTH TO TOP OF WELL SCREEN 57.9 BOTTOM 76.9	
TIME	WELL DEVELOPMENT BACKFILL Benseal	
DATE 7/18/90	FIELD PARTY MCR / JD RIG B-61	

SAMPLE	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD DEPTH % IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	MELL	DRILLER'S NOTES
1	SS	2.7	4.2	5-2-12	0		-		NO RECOVERY - DROVE SPOON ON COBBLES		100' North of potable well hub.
2	SS	7.7	9.2	2-2-8	0		-		CONCRETE FRAGMENTS & SAND ON SPOON		
3	SS	12.7	14.2	4-5-8	0.9				BROWN CLAY Moist, medium to low plasticity		
4	SS	17.7	19.2	3-5-8	1.0						
		ТҮРЕ	OF C	ASING USED					Continued Next Page		
		NQ-2 R		RE		PIEZOM	ETER 1	ΓΥΡ	E: PT = OPEN TUBE POROUS TIP, SS	= OP	EN TUBE
X	X 9" x 6.25 HSA HW CASING ADVANCER 4"					SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC					
2'		NW CAS	SING AD		4 3"	WELL T	YPE:	0	W = OPEN TUBE SLOTTED SCREEN, G	<u>л = G</u>	JEOMON
<u>ا</u>		AIR HAN	MG MFR		<u>6</u> " 8"				RECORDER JCM		



JOB NUMBER

COMPANY

BORING NO. JTMN-2 DATE 7/23/15 SHEET 2 OF
 COMPANY
 BORING NO. JTMN-2
 DATE
 7/23/15
 SHEET
 2
 0F
 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/17/90
 BORING FINISH
 7/18/90

	SAMPLE NUMBER	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
-	5	SS	22.7	24.2	3-4-7	0		- 25 -					
	6	SS	27.7	29.2	3-5-4	0.4		30 -			BROWN SILTY SAND Moist, 100% fine grain		
_	7	SS	32.7	34.2	4-5-5	1.3		35 -			BROWN CLAY Moist, medium to low plasticity BROWN SAND Quartz, 95% fine grain, trace of fines		
7/23/15	8	SS	37.7	39.2	3-5-7	1.3		40 -			BROWN CLAYEY SAND Wet to saturated.		
SPORN_MOUNTAINEER.GPJ AEP.GDT	9	SS	42.7	44.2	10-11-8	1.0		45 -			BROWN SAND & GRAVEL Quartz, rounded, 3/4" max size, w/ fines		Started washing out augers.
AEP EPRI									, , , , , , , , , , , , , , , , , , ,		Continued Next Page		

4

JOB NUMBER

COMPANY

SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
10	SS	47.7	49.2	8-11-11	0.3							
11	SS	52.7	54.2	9-14-10	0.5		55 -					
12	SS	57.7	59.2	7-7-7	0.9		- 60 -			BROWN SAND Quartz, saturated, trace of gravel	-	
13	SS	62.7	64.2	8-14-12	1.1		- 65			BROWN SAND Quartz, saturated, trace of gravel, trace of fines	-	
14	SS	67.7	69.2	7-13-14	1.2							

Continued Next Page



JOB NUMBER

COMPANY

BORING NO. JTMN-2 DATE 7/23/15 SHEET 4 OF 4

 PROJECT
 EPRI GROUND WATER STUDY
 BORING START
 7/17/90
 BORING FINISH
 7/18/90

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
15	SS	72.7	74.2	8-13-16	1.2		-			BROWN SAND Saturated		
16	SS	77.7	77.8	50/0.1	0.1		75 -			LIGHT BROWN SANDSTONE		Auger refusal @ 77.8' Installed 2" observation well.
PRI_SPORN_MOUNTAINEER.GPJ_AEP.GDT_7/23/15												



AEP 1990, 1996, 1997, 2001, 2008

Monitoring Well Construction Diagrams

MW-001 to MW-16, 96-101, 96-104, 96-108, 96-110, JTMN-1, JTMN-2















































AEP 2008, 2010

Production Well Information

East 1, West 1, Well 4 to Well 6

MOUNTAINEER SUPPLY WELLS												
DATUM: I	NAD27 / NGVD2	9 WV S			Surveyed: 2/24/2010							
WELL	NORTH	EAST	ELEV.	DESC.	NOTE							
EAST 1	722087.67	1734564.25	588.47	WELL PUMP	Top of PVC @ Inspection Hole							
			585.91	GROUND								
-												
WEST 1	721864.73	1734247.03	587.32	FGD	Top of Inspection Hole							
			585.64	GROUND								
			l.									
WELL 4	721739.55	1734875.42	583.43	WASTEWATER WELL	Top of Inspection Hole							
-			581.95	GROUND								
WELL 5	721130.76	1733439.50	589.09	WAREHOUSE	Top of Inspection Hole							
			586.64	GROUND								
WELL 6	722576.53	1732461.99	588.45	OLD LAB	Top of Inspection Hole							
			587.45	GROUND								

- 6

0

H:\Survey\DATA\MOUNTAINEER\WELLS\WATER SUPPLY WELLS 2010\MT_SUPPLY WELLS_2-10.xls

AEP-DOLAN CIVIL LAB

MT PLANT - WELL CONVERSIONS

25 February 2010

INPUT

State Plane, NAD27 4702 - West Virginia South, U.S. Feet

OUTPUT

Geographic, NAD27

EAST 1

1/5

Northing/Y: 722087.67 Easting/X: 1734564.25

Latitude: 38 58 45.45449 Longitude: 81 56 01.14811

Convergence: -0 34 37.84628 Scale Factor: 1.000021856

WEST 1

Northing/Y: 721864.73 Easting/X: 1734247.03

Latitude: 38 58 43.21944 Longitude: 81 56 05.13625

2/5

Convergence: -0 34 40.31173 Scale Factor: 1.000021706

WELL 4

Northing/Y: 721739.55 Easting/X: 1734875.42

3/5

Latitude: 38 58 42.04479 Longitude: 81 55 57.16376

Convergence: -0 34 35.38317 Scale Factor: 1.000021627

WELL 5

4/5

Latitude: 38 58 35.88458 Longitude: 81 56 15.26701

Convergence: -0 34 46.57452 Scale Factor: 1.000021213

Northing/Y: 721130.76

Easting/X: 1733439.50

AEP-DOLAN CIVIL LAB

MT PLANT - WELL CONVERSIONS

25 February 2010

INPUT

State Plane, NAD27

OUTPUT

Geographic, NAD27

4702 - West Virginia South, U.S. Feet

WELL 6

5/5 Latitude: 38 58 50.07601 Longitude: 81 56 27.82955

Northing/Y: 722576.53 Easting/X: 1732461.99

Convergence: -0 34 54.34062 Scale Factor: 1.000022168

	Reynolds, Inc.							
				6451	1 Germantown Ro	ad * Middleto	own, Ohio 45042 * P	'hone: (513) 424-7287
							Date:	<u>12/12/2008</u>
					FST		JUD NU	
			FRODU		LUI			Fage 1013
			FG	D West Well				
Owner:	AEP - Mountaineer	Plant		City:	New Haven		State:	WV
Well No.:	FGD West	Location:	in gravel ar	ea	`			
Measured fr	om Top Casing: X	Total Depth	77'	Inside Diam.	16"	Static Lev Standing	vel / Water Level	44.70'
Type Well:	Gravel Wall	х	Tubular		Rock		New	Х
	Old		Cleaned		Gravel Wall Diam.		30"	
Screen:	Length	15'	Diam.	16"	Slot Size	60		
	Type	Stainless St	eel-Pipe Siz	e	Depth to top	62'		
Driven By :	Electric		Engine		Pump Bowl		Stages	
Length Suct	ion Pipe	None X		Well Top to B	ottom of Suction			
Orifice Size	6	Ву	5	Water discha	rged 200' from w	ell into pi <u>t i</u> r	n building	
Well Top to Bottom of Air Line		N/A	N/A Gauge Reads: Feet P				Pounds	
			1	1	PUMPING		SPECIFIC	COMMENTS
TIME	ON	G.P.M.	P.S.I.	AMPS	LEVEL (ft)	DOWN (ft)	CAPACITY	
8:27 AM					44.70			SWL
9:10 AM	6.0	305						Pump on
9:12 AM					47.50	2.80		
9:14 AM					47.60			
9:17 AM					47.70	3.00		
9:21 AM					47.70			
9:30 AM					47.75			
9:34 AM	6.5	317			47.78	3.08	.	
9:38 AM					47.81			14
9:45 AM					47.83			
9:50 AM					47.86	3.16	100.0	
9:55 AM					47.89			
								Step 2
9:57 AM					49.40		•	

I

Tested and Witnessed By Terry Breckenridge Witnessed By For Purchaser TC during test - 32" above gr.

1
Date	12/12/2008		Job No.	68658			PAGE:	2 of 3
TIME	INCHES ON ORIFICE	G.P.M.	P.S.I.	AMPS	PUMPING LEVEL (ft)	DRAW DOWN (ft)	SPECIFIC CAPACITY	COMMENTS
9:59 AM	13.5	457			49.35			
10:01 AM					49.36	4.66	98.0	
10:07 AM					49.40		· · ·	
10:12 AM					49.43			
10:16 AM					49.50			
10:21 AM					49.50	4.80	95.0	
10:28 AM					49.55			
10:32 AM					49.56			
10:35 AM					49.57	4.87	94.0	
10:40 AM								Step 3
10:40 AM	23.5	603						
10:41 AM	24.5	616		<u> </u>	51.00	6.30	98.0	
10:43 AM					51.05			
10:45 AM	·····				51.06			
10:52 AM					51.12			
10:55 AM	·				51.13	6.43	96.0	
11:02 AM	,				51.18	6.48		
11:08 AM					51.21			
11:09 AM					39.50			FGD East
11:11 AM					51.23			
11:14 AM					51.24	6.54	94.0	
11:20 AM					51.26	6.56		
11:25 AM					51.28			
11:30 AM								Step 4
11:32 AM	30.0	682			51.85	7.15		4 .
11:35 AM					51.98	7.28	94.0	
11:40 AM					52.00	7.30		
11:46 AM					39.70			FGD East
11:50 AM	·				52.01	7.31		
11:55 AM					52.05	7.35		

Date	12/12/2008		Job No.	68658			Page No.	3 of 3
TIME	INCHES ON ORIFICE	G.P.M.	P.S.I.	AMPS	PUMPING LEVEL (ft)	DRAW DOWN (ft)	SPECIFIC CAPACITY	COMMENTS
12:00 PM					52.07	7.37	92.5	· · · ·
12:15 PM	30	682			52.13	7.43	91.7	
12:30 PM					52.16	7.46		
12:35 PM					39.80			FGD East
12:45 PM					52.19	7.49		
1:00 PM					52.23	7.53		
1:05 PM					52.23	7.53		
1:09 PM					52.24	7.54		
1:10 PM								Pump off
1:11 PM					45.60	0.90		
1:12 PM					45.60	0.90		
1:13 PM					45.75	1.05		
1:14 PM					40.20			FGD East
1:17 PM					45.70	1.00		
1:18 PM					45.70	1.00		
1:20 PM					45.64	0.94		
1:30 PM					45.50	0.80		
1:37 PM					45.40	0.70		
1:44 PM				•	45.35	0.65		
2:30 PM					45.12	0.42		
2:35 PM					40.20			FGD East
							,	
								1
					•			

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Revnolds. Inc.

EAST Germantown Road * Middletown, Or Date Job I PRODUCTION TEST FGD East Well	12/17/2008
Job I PRODUCTION TEST FGD East Well	No :
FGD East Well	NU
FGD East Well	Page 1 of 4
Owner: AEP - Mountaineer Plant City: New Haven State	e: [/] WV
Woll No EGD East Location: along railroad tracks	
Static Level / Static Level /	45 29
Measured from Ground Level: Total Depth 78' Inside Diam. 16" Standing Water	<u>Level 45.36</u>
Type Well: Gravel Wall X Tubular Rock New	Х
Old Cleaned Gravel Wall Diam. 30"	
Screen: Length 15' Diam. 16" Slot Size 60	
Type Stainless Steel - Pipe Size Depth to top 63'	
Driven Ry : Electric Engine Pum Bowl Stag	/
Diver By . Electric Lingme Party Bown etage	
Length Suction Pipe None: X Well Top to Bottom of Suction	
Orifice Size By Water Discharged 600' + /- from	well into pit in building
Well Top to Bottom of Air Line N/A Gauge Reads: Feet Pound	ds
TIME ON G.P.M. P.S.I. AMPS LEVEL DOWN C. (ft) (ft)	PECIFIC COMMENTS APACITY
10:30 AM	Stop surging east well
10:52 AM 45.45 + 0.07	
11:00 AM 45.45 + 0.07	
11:15 AM / 45.40 + 0.02	
11:25 AM 44.59	FGD West
11:27 AM 45.38 0	SWL
11:30 AM	Pump on
11:31 AM 48.27 2.89	Rate 1
11:32 AM 48.30 2.92	
11:33 AM 48.33 2.95	
11:35 AM 48.35 2.97	
11:40 AM 6.0 305 48.85 3.47	
11:44 AM 48.90 , 3.52	95
11:50 AM 49.00 3.62	

Tested and Witnessed By Terry Breckenridge Witnes TC 2.7' above ground, 450' + / - north of Ohio Drilling well (original FGD well)

Date	12/17/2008		Job No.				PAGE:	Page 2 of 4
TIME	INCHES ON ORIFICE	G.P.M.	P.S.I.	AMPS	PUMPING LEVEL (ft)	DRAW DOWN (ft)	SPECIFIC CAPACITY	COMMENTS
11:55 AM	5.0	278			49.15	3.77	74	
12:00 PM					49.14	3.76		
12:04 PM					44.60			FGD West
12:10 PM					49.19	3.81		
12:14 PM					49.20	3.82		
12:15 PM			-					Rate 2
12:19 PM					50.91	5.53		
12:20 PM	· · · ·				50.94	5.56		
12:23 PM	10.5	403			50.97	5.59	72	
12:25 PM					50.97	5.59		
12:29 PM					44.62			FGD West
12:34 PM					51.02	5.64		
12:38 PM					51.04	5.66	71	
12:43 PM					51.05	5.67		
12:50 PM					51.08	5.7		
12:51 PM	······································				44.67			FGD West
12:55 PM					51.10	5.73		
1:00 PM								Rate 3
1:07 PM	23.5	603			54.20	8.82		·
1:08 PM					54.20	8.82		
1:10 PM					54.21	8.83	·	
1:11 PM					47.67			FGD West
1:13 PM					54.22	8.84		
1:18 PM					54.23	8.85		
1:27 PM					54.28	8.9		
1:35 PM	·····				54.30	8.92		-
1:40 PM					54.32	8.94		
1:45 PM								Rate 4
1:47 PM	41.5	802			56.88	11.5	70	
1:50 PM					57.92	12.24		
1:52 PM					57.60	12.22		
1:54 PM					57.65	12.27		

Date	12/17/2008		Job No.				Page No.	Page 3 of 4
TIME	INCHES ON ORIFICE	G.P.M.	P.S.I.	AMPS	PUMPING LEVEL (ft)	DRAW DOWN (ft)	SPECIFIC CAPACITY	COMMENTS
1:57 PM	I				57.6	12.28	·	
1:58 PM					44.71			FGD West
2:00 PM					57.69	12.31		
2:04 PM			-		57.70	12.32	65	
2:06 PM					57.70	12.32		
2:07 PM					57.72	12.34		
2:08 PM	, 41.5	802			57.71	12.33		
2:10 PM					57.75	12.37		
2:13 PM					57.76	12.38		
2:15 PM	······							Rate 5
2:19 PM	52.5	902			58.85	13.47	67	
2:22 PM					59.59	14.21		
2:24 PM					59.60	14.22		
2:25 PM					59.60	14.22		
2:27 PM					59.63	14.25		
2:30 PM					59.64	14.26		
2:31 PM					44.73			FGD West
2:40 PM					59.73	14.35		
2:43 PM					59.75	14.37		
2:45 PM								Rate 6
2:47 PM	64.5	1000			60.55	15.17		
2:48 PM					61.20	15.82		
2:50 PM					61.25	15.87		
2:51 PM					44.72			FGD West
2:52 PM					61.28	15.9		
2:54 PM					61.30	15.92		
2:58 PM					61.34	15.96		
3:01 PM					61.35	15.97		
3:05 PM			2		61.39	16.01		
3:08 PM					61.40	16.02		
3:12 PM					61.41	16.03		
3:14 PM					61.44	16.06	62.5	

Date	12/17/2008		Job No.				Page No.	Page 4 of 4
TIME	INCHES ON ORIFICE	G.P.M.	P.S.I.	AMPS	PUMPING LEVEL (ft)	DRAW DOWN (ft)	SPECIFIC CAPACITY	COMMENTS
3:15 PM								Pump off
3:16 PM					47.00	1.65		Recovery
3:18 PM					46.70	1.32		
3:19 PM					46.66	1.28		
3:20 PM					46.55	1.17		
3:21 PM					46.53	1.15		· · · · · · · · · · · · · · · · · · ·
3:22 PM					46.50	1.12		
3:23 PM					46.48	1.1		
3:25 PM					46.41	1.03		
3:30 PM					46.30	0.92		
3:40 PM					44.72		١	FGD West
			-					
							1	
			-					
			·					
				*1				

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Reynolds, Inc.

6451 Germantown Road * Middletown, Ohio 45042 * Phone: (513) 424-7287

	**//						Date: Job No.:	7/8/2008 68570
			PRODU		EST		Page 1 of 1	
Owner:	AEP-Mountaineer P	Plant		City:	New Haven		State:	WV
Well No.:	Fire Well #1	Location:	50' +/- fron	n old Fire Well #	1 (Abandoned)			
Measured fr	om Ground Level:	Total Depth		Inside Diam.	10	Static Le Standing	vel / Water Level	40.52
Type Well	Gravel Wall	16	Tubular		Rock		New	Х
Type Wen.		10	Cleaned		Gravel Wall Dia		16"	
Screen'	Length	15'	Diam.	10" PS	Slot Size	80		
0010011.	Type	Johnson			Depth to top		63 (Bel, Gr.)	
Driven Rv ·	Electric	X	Engine		Pump Bowl	Test Pump	Stages	
Length Sucti	on Pipe	None		Well Top to B	ottom of Suction	NA	0	
Orifice Size	6	Bv	5	Water Discha	rged	300	from Well into	Cooling Tower
Well Top to I	Bottom of Air Line	N/A		Gauge Reads	: Feet		Pounds	
TIME	INCHES ON ORIFICE	G.P.M.	P.S.I.	AMPS	PUMPING LEVEL	DRAW DOWN	SPECIFIC CAPACITY	COMMENTS
11:00 AM	6	305			45.22	4.70		
11:10 AM					45.45	4.93		·
11:20 AM					45.47	4.95	61.2	
11:30 AM	14	466			49.61	9.09		
11:40 AM					49.59	9.07		
11:50 AM					49.54	9.02	51.8	
12:00 PM	22	584			52.00	11.48		
12:30 PM					52.25	11.73		
1:00 PM					52.30	11.78		
1:30 PM					52.25	11.73	49.8	
								Water clèar
								at end of test

Tested and Witnessed By

Steve Back

Witnessed By For Purchaser

dev 3008 DATE THE WELL STATE OF TORM SW-236 T7CO USE ONLY WAS COMPLETED WEST VIRGINIA THIS REPORT MUST BE MM DD YY 07 08 08 WEST VIRGINIA SUBMITED WITHIN 30 DAYS MM DD YY PRMITNO. REPORT SITE WELL COMPLETION PRMITNO. REPORT FILL IN THIS FORM Well Owner X000000000000000000000000000000000000
T/CO USE ONLY WAS COMPLETED WEST VIRGINIA MM DD YY OF 08 08 WATER WELL SUBMITTED WITHIN 30 DAYS MM DD YY PERMITNO. REPORT SUBMITTED WITHIN 30 DAYS MOW DYY PERMITNO. REPORT SUBMITTED WITHIN 30 DAYS LOCATION OF WELL WASCAMAKAK AEP XXXXMAKAK Mountaineer Power Plant Wellowier:XXXXXXXXXXX AEP XXXXXXXXXXXX Mountaineer Power Plant TYPE OF WELL: Lafude: 38 Deg 56.6240 Min County Mason TYPE OF WELL: Plantic Well #1 Replacement Well Price Well #1 Replacement Well Geothermal X Industrial Commercial Dewatering Irrigation C rest/Exploratory Other State the kind of formation penetrated, their color, caves, and if water bearing with estimate flow (GPM). Rotary Hammer D Other Other No. of Bags:Bulk Installation Method: 0 3 Top Soil Same Gother State Well. VIELD Estimated at 500 G.P.M 3 Same Same Gother Gother State Water Level 40.5 (ft) 3 Same Same Gother State Water Level 40.5 (ft) State Water
Description Description WATER WELL APTER WELL IS COMPLETED OT 08 08 OT 08 08 COMPLETION REPORT APTER WELL IS COMPLETED MM DD YY PERMIT NO. REPORT COMPLETEION REPORT FILL IN THIS FORM COMPLETELY DOCATION OF WELL Well Owner.XXXXXXXXXX AEP XXXXXXXXXXXX Mountaineer Power Plant Well Owner.XXXXXXXXXX AEP County Mason Zip Code 25265-0419 Latitude: 38 Deg 56.240 Min Acquired By: K OPS Topo Other Fire Well #1 Replacement Well TYPE OF WELL: Depth State the kind of formation penetrated, their color, caves, and if water bearing with estimate flow (GPM). DRILLING METHOD (ARIA CASING TYPE K State the kind of gravel CROUTING RECORD Grouting Material: Casing Diameter 16 (in) Total depth 78 (ft) CASINGS RECORD Tremic PUMP INSTALLED By Driller [X] Yes 0.56 (GRUTTING RECORD Grouting Material: Casing Diameter 10 (in) Wall Thickness 0.365 (in) State Water Level 40.5 (ft) *Dump (evel below lad surface 52 (ft) after 2.5 hrs. at 53 40 Same 0 3 Top Soil 1 Casing CLiner Used Casing Length 63 (ft) Casing Length 63 (ft) Casing Liner Diameter (in) Length (ft) from (ft) SCREEN RECORD - SS Not Installed & Installed Material: Bronze Plastic The Diameter 2.5 hrs. at 52 (ft) after 2.5 hrs. at 52 (ft) Type of Well Cap Baker Installed & Installed Material: Bronze Plastic
DATE ROUTING PERMIT NO. COMPLETION FILL IN THIS FORM MM DD YY DW
MM DD YY PERMIT NO. REPORT COMPLETELY DW
Image: Determined by: DW
LOCATION OF WELL Well Owner:XXXXXXXXXX AEP XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
DOCHTON FUEL XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Street/Road Route 62 County Mason Zip Code 25265-0419 Street/Road 2 pode 25265-0419 Industrial Latitude: 38 Deg 56.240 Min
Latitude: _38Deg 58.603 Min Longitude: <u>81Deg 56.240 Min</u> Acquired By: X GPS ☐ Topo ☐ Other AREA NAME/LOCATION: Fire Well #1 Replacement Well TYPE OF WELL: Potable ☐ Public Water Supply Geothermal X Industrial Dewatering Drigition ☐ Test/Exploratory Other WELL LOG DRILLING METHOD X Cable Tool ☐ Rotary Depth DRILLING METHOD State the kind of formation penetrated, their color, caves, and if water bearing with estimate flow (GPM). DRILLING METHOD X Cable Tool ☐ Rotary ☐ Not of Bags:Bulk Installation Method: Tremic GROUTING RECORD Grouting Material: ∑ Cement ☐ Bentonite Clay Other 0 3 Top Soil 3 Same 3 Casing Length G3 Gasing Length G3 Cher 3 Estimated at500 G.P.M. 3 35 Same 40 Br. medium sand 11ttle gravel Casing Inter Diameter(in) 3 Gasing/Liner Diameter(in) 3 Same(ft) from(ft) 3 Well HeAD COMPLETION Casing height above grade 2(ft) 7 Well Cap Baker 1 45 60 Br. medium sand 1 Cher(ft) from(ft) 3 Cher(ft) from(ft) 3 Well Cap Baker 1
Latitude: 38 Deg 56.240 Min
Longitude: BL Deg 50.240 Fill Pope Other Acquired By: C GPS Topo Other WELL LOG DRILLING METHOD CROUTING RECORD Well No. of Bags:Bulk Installed Installed PUMP INSTALLED By Driller Well Br. sand and gravel State the gravel 0 3 Top Soil 3 15 Br. sand and gravel 30 Br. sand and gravel 40 45 Br. medium sand 1ittle gravel Casing/Liner Diameter Casing/Liner Diameter 60 78 Br. medium sand 1ittle gravel C(ft) Casing/Liner Diameter Citt 0 (ft) Casing/Liner Diameter Citt 40 45 Br. medium sand Casing/Liner Diameter Citt 1ittle gravel Cittle gravel Citt Citter RECORD - SS No. (ft) 790 Br. medium sand Cittle gravel Diff from Top Scitt 30 Br. medium sand Casing/Liner Diameter Citter Topo Scitter Cop Public Water Supply <t< td=""></t<>
Acquired by: El OFS Top Depth State the kind of formation penetrated, their color, caves, and if water bearing with estimate flow (GPM). DRILLING METHOD GROUTING RECORD Tom To (ft.) (ft.) State the kind of formation penetrated, their color, caves, and if water bearing with estimate flow (GPM). Detection [] Rotary GROUTING RECORD 0 3 Top Soil Total depth 78 (ft) No. of Bags:Bulk 3 15 Br. sandy clay Stele Plastic Other 30 35 Same Other Casing Diameter 10 (in) 30 35 Same Other Casing Diameter 10 (in) 31 Br. medium sand Other Casing Clarer Liner Used 52 (ft) after 2.5 hrs. at 340 Same Other Casing/Liner Diameter (in) 40 45 Br. medium sand Chip (ft) from Scele [] Plastic 10 Other Casing/Liner Diameter (in) 26 Br. medium sand Length (ft) from (ft) 11ttle gravel Installed (Liner RECORD - SS Not Installed (Liner Score 10 PS (in)
WELL LOG DRILLING METHOD GROUTING RECORD Depth State the kind of formation penetrated, their color, caves, and if water bearing with estimate flow (GPM). To Rotary Hammer Other GROUTING RECORD (ft.) (ft.) (ft.) Top Soil Total depth 78 (ft) No. of Bags:Bulk 0 3 Top Soil MAIN CASING TYPE No. of Bags:Bulk 3 15 Br. sandy clay Stele I Plastic Other 30 35 Same Other Casing Diameter 10 (in) 30 Br. medium sand Ittle gravel Grouting Material: No. of Bags:Bulk 40 45 Br. medium sand Other Stele I Plastic Dother 1 Ittle gravel Other Casing/Liner Diameter
WELL LOG DRILLING METHOD GROUTING RECORD Depth State the kind of formation penetrated, their color, caves, and if water bearing with estimate flow (GPM). Rotary Hammer □ Other Other Grouting Material: 0 3 Top Soil Hole Diameter 16 (in) No. of Bags:Bulk 3 15 Br. sandy clay MAIN CASING TYPE PUMP INSTALLED 30 Br. sand and gravel Same Other ESTIMATED WELL YIELD 30 Br. sand and gravel Main CASING TYPE By Driller ☑ Yes □ No No. of Gags: Bulk 40 45 Br. medium sand Other Casing Length 63 (ft) Static Water Level 40.5 (ft) 45 60 Br. medium sand Iittle gravel Other Casing/Liner Diameter
WFLLEDOG Main construction penetrated, their color, caves, and if water bearing with estimate flow (GPM). Main construction of the casing with estimate flow (GPM). Rotary Hammer in Other Other installation Method: 0 3 Top Soil Total depth78 (ft) No. of Bags:Bulk installation Method: 0 3 Top Soil MAIN CASING TYPE By Driller [X] Yes installation Method: 0 3 Top Soil Same Other By Driller [X] Yes installation Method: 0 3 Top Soil Same Other By Driller [X] Yes installation Method: 30 Br. sandy clay Same Other Casing Diameter 10 (in) Static Water Level 40.5 (ft) 35 Same Other Casing or Liner Used Type instruction Static Water Level 40.5 (ft) Static Water Level 40.5 (ft) 40 45 Br. medium sand Dother Casing/Liner Diameter
Depth State the kind of formation penetrated, their color, caves, and if water bearing with estimate flow (GPM). Rotary Hammer Other K Cement Bentonite Clay Other No. of Bags:Bulk Installation Method: Installation Method: Installation Method: 0 3 Top Soil CASINGS RECORD Installation Method: 3 15 Br. sandy clay Steel Plastic PUMP INSTALLED 30 Br. sand and gravel Steel Plastic Other Estimated at 500 G.P.M 30 Br. sendium sand Iittle gravel Gother Steel Plastic 40 45 Br. medium sand Other Casing Length 63 (ft) 45 60 Br. medium sand Iittle gravel Type Steel Plastic 60 78 Br. medium sand Length (ft) ScrEEN RECORD - SS 60 78 Br. medium sand Installed Installed 1 Ittle gravel ScrEEN RECORD - SS Not Installed WELL HEAD COMPLETION Casing height above grade 2 (ft) Type Of Well Cap Baker Installed: Pitless adaptor
Depth Data tails are flow (and a their color, caves, and if water bearing with estimate flow (GPM). Other Other No. of Bags:Bulk Image: Strength of the stimate flow (GPM). 0 3 Top Soil Image: Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). 0 3 Top Soil Image: Strength of the stimate flow (GPM). 0 3 Top Soil Image: Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). 3 15 Br. sandy clay Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). 30 35 Br. sand and gravel Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). Image: Strength of the stimate flow (GPM). 30 35 Same Same Image: Strength of the stimat
From To and if water bearing with estimate flow (GPM). Hole Diameter 16 (fin) No. Of Bags, Dulk (ft.) (ft.) estimate flow (GPM). Total depth 78 (ft.) Installation Method: 0 3 Top Soil CASINGS RECORD Installation Method: 3 15 Br. sandy clay MAIN CASING TYPE By Driller Static Water Level 40.5 (ft) 35 40 Same Other Casing Length G3 (ft) Static Water Level 40.5 (ft) Static Static Static Static Static Static Static Static Static
Prom 10 estimate flow (GPM). Potal depth75(ft) Tremic (ft.) (ft.) estimate flow (GPM). CASINGS RECORD MAIN CASING TYPE Tremic 0 3 Top Soil MAIN CASING TYPE By Driller X YesNo 3 15 Br. sandy clay Other By Driller X YesNo 30 Br. sand and gravel Other Casing Diameter(in) Estimated at0O G.P.M 30 Same Other Casing or Liner Used (ft) Static Water Level0.5 (ft) 30 Br. medium sand Other Casing or Liner Used Type Steel
(II.) (II.) <td< td=""></td<>
0 3 Top Soil 3 15 Br. sandy clay 30 35 Same 30 35 Same 35 40 Same 40 45 Br. medium sand 11ttle gravel Dittle gravel 45 60 Br. medium sand 60 78 Br. medium sand 11ttle gravel Casing/Liner Diameter(in) 11ttle gravel Casing/Liner Diameter(in) 11ttle gravel Casing/Liner Diameter(in) 11ttle gravel Methydref 11ttle gravel Methydref 11ttle gravel Casing/Liner Diameter(in) 11ttle gravel Methydref 11ttle gravel Installed ½ 11ttle gravel Methydref 11ttle gravel Installed ½ 11ttle gravel Methydref 11ttle gravel
0 3 Top Soil 3 15 Br. sandy clay 30 Br. sand and gravel 30 35 Same 30 35 Same 35 40 Same 40 45 Br. medium sand 11ttle gravel Other 45 60 Br. medium sand 160 78 Br. medium sand 11ttle gravel Ittle gravel 11tttle grave
3 15 Br. sandy clay Casing Diameter10(in) Estimated at500G.P.M 30 Br. sand and gravel Wall Thickness0.365(in) Static Water Level40.5(ft) 30 35 Same Casing Length63(ft) Static Water Level40.5(ft) 30 40 A5 Br. medium sand Dittle gravel Other Casing or Liner Used For Public Water Supply 45 60 Br. medium sand Other(ft) Casing/Liner Diameter(in) Hength(ft) from(ft) 46 1ittle gravel Casing Charlet(ft) Mall Thickness(in) Static Water Level(ft) 45 60 Br. medium sand Other(in) Casing/Liner Diameter(in) Hength(ft) from(ft) *Note: For Public Water Supply 40 1ittle gravel Installed X(ft) from(in) WELL HEAD COMPLETION 40 Casing height above grade 2(ft) Type Of Well Cap Baker 40 Installed X
30 Br. sand and gravel Wall Thickness 0.365 (III) Static Water Level 40.5 (ft) 30 35 Same Casing Length 63 (ft) Pumping level below land surface 35 40 Same Other Casing or Liner Used Fr. medium sand Dittle gravel 45 60 Br. medium sand Dother Other Casing/Liner Diameter (in) Note: For Public Water Supply 45 60 Br. medium sand Length (ft) from (ft) Length (ft) from (ft) Wellt HEAD COMPLETION 60 78 Br. medium sand Length (ft) from (ft) Material: Bronze Plastic Wellt HEAD COMPLETION 60 78 Br. medium sand To (ft) Screen RECORD - SS Wellt HEAD COMPLETION 60 78 Br. medium sand To (ft) Screen RECORD - SS Wellt HEAD COMPLETION 60 78 Br. medium sand To (ft) Screen RECORD - SS Wellt HEAD Complexitor 60 78 Br. medium sand To (ft) To (ft) Screen I O PS (in) 79 Other To (ft) Screen I O PS (in) Yep Of Well Cap Baker
30 35 Same 35 40 Same 40 45 Br. medium sand 1ittle gravel Other Casing or Liner Used 45 60 Br. medium sand 60 78 Br. medium sand 1ittle gravel Casing/Liner Diameter(in) Length(ft) from(ft) Length(ft) from(ft) SCREEN RECORD - SS Not Installed X Installed Material: BronzePlastic Diameter of screen1O PS(in) VABIANCE ISSUEDYesNo
40 40 Br. medium sand little gravel 40 45 Br. medium sand little gravel 45 60 Br. medium sand little gravel 40 45 Br. medium sand little gravel 45 60 Br. medium sand little gravel 46 Br. medium sand little gravel Casing/Liner Diameter(in) Length(ft) from(ft) 46 Br. medium sand little gravel Screen record - SS Not Installed & Installed Material: Well HEAD COMPLETION Casing height above grade 2 (ft) Type Of Well Cap Baker Installed: 45 Plastic Diameter of screen 10 PS (in) VARIANCE ISSUED Yes No
45 60 Br. medium sand 60 78 Br. medium sand 1ittle gravel
45 60 Br. medium sand 60 78 Br. medium sand 1ittle gravel Casing/Liner Diameter(if) wells please submit required yield 1ittle gravel to(ft) mod drawdown tests. SCREEN RECORD - SS Not Installed Material: Bronze Plastic Diameter of screen 10 PS (in) VARIANCE ISSUED Yes No
60 78 Br. medium sand little gravel Length(ft) from(ft) to(ft) SCREEN RECORD - SS and drawdown tests. Installed X Installed Material: Installed Bronze Mell HEAD COMPLETION Casing height above grade 2(ft) Type Of Well Cap Baker Installed: Type Of Well Cap Baker Installed: Diameter of screen 10 PS(in) VARIANCE ISSUED Yes
little gravel to(ft) SCREEN RECORD - SS SCREEN RECORD - SS Not Installed & Installed Casing height above grade 2 (ft) Type Of Well Cap Baker Installed: Pitless adaptor Diameter of screen 10 PS (in) VARIANCE ISSUED Yes No
SCREEN RECORD - SS Casing height above grade 2 (ft) Not Installed X Installed Type Of Well Cap Baker Material: Bronze Plastic Diameter of screen 10 PS (in) VARIANCE ISSUED Yes
Image: Stand of the stand
Diameter of screen 10 PS (in) VARIANCE ISSUED Yes No
VARIANCE ISSUED Yes NO
Slot size 70
Length 15 (ft) from (ft) Request Number
to(ft) COMMENTS BY INSTALLER:
Gravel Pack: Ves No New Fire Well #1 -
additional space is needed, use Graver rack. [-] ros [
top. Well #1
thereby certify that this well has been constructed in accordance with state tries and in construction is accurate all conditions stated in the above captioned permit, and that the information presented herein is accurate
OLD FITE WELL #1
and complete to the best of my knowledge.
and complete to the best of my knowledge. abandoned/sealed Company Name Reynolds, Inc. Wy Contractor No. Wy 000825 Company Name Reynolds, Inc. My Contractor No. Wy 000825
and complete to the best of my knowledge. Company Name <u>Reynolds</u> , Inc. <u>WY Contractor No. <u>WVO00825</u> abandoned/sealed Business Registration No Business Registration No</u>
and complete to the best of my knowledge. Company Name <u>Reynolds</u> , Inc. <u>WY Contractor No. <u>WV000825</u> abandoned/sealed Business Registration No. <u>Master Well Driller Certification No. </u> Master Well Driller (print) John Workman Master Well Driller Signature</u>
and complete to the best of my knowledge. Company Name <u>Revnolds</u> , Inc. <u>WY Contractor No. <u>WVO00825</u> Business Registration No. <u>Master Well Driller Certification No. </u> Waster Well Driller (print) <u>John Workman</u> Waster Well Driller Signature</u>
and complete to the best of my knowledge. Company Name <u>Reynolds</u> Inc. <u>WY Contractor No. <u>WV000825</u> Business Registration No. <u>Master Well Driller Certification No. </u> Waster Well Driller (print) <u>John Workman</u> Vaster Well Driller Signature E SUPERVISOR (SIGNATURE OF DRILLER OR JOURNEYMAN RESPONSIBLE FOR CEWORK IF DIFFERENT FROM MASTER DRILLER.) </u>
and complete to the best of my knowledge. Company Name <u>Reynolds</u> , Inc. <u>WY Contractor No. <u>WV000825</u> Business Registration No. <u>Master Well Driller Certification No. </u> Master Well Driller (print) John Workman Master Well Driller Signature E SUPERVISOR (SIGNATURE OF DRILLER OR JOURNEYMAN RESPONSIBLE FOR A FEWORK IF DIFFERENT FROM MASTER DRILLER.) </u>
and complete to the best of my knowledge. Company Name <u>Reynolds</u> , Inc. <u>WV Contractor No. <u>WVOO0825</u> Business Registration No. <u>Master Well Driller Certification No</u> Master Well Driller (print) <u>John Workman</u> Master Well Driller Signature <u></u> E SUPERVISOR (SIGNATURE OF DRILLER OR JOURNEYMAN RESPONSIBLE FOR A FEWORK IF DIFFERENT FROM MASTER DRILLER.) Iourneyman Well Driller Certification No Iourneyman Well Driller (please print)</u>

	-	and the second s			
Rev	3/08		DATE THE WELI	- STATE OF	FORM SW-258
ami		T ONLY	WAS COMPLETE	D WEST VIRGINIA	THIS REPORT MUST BE
5170	COUSE	UNLY	MM DD YY	WATER WELL	SUBMITTED WITHIN 30 DAYS
'DA'	TE REC	EIVED	<u>12 10 08</u>	COMPLETION	AFTER WELL IS COMPLETED
		8	PERMIT NO.	COMPLETION	FILL IN THIS FORM
ΜN	I DD	· YY		REPORT	COMPLETELY
			DW-		PI FASE PRINT OR TYPE
			ĭ	- 1	TLEASETKINTOKTITE
Well	Owner: 1	ast Name	American Electri	c Power XXXXXXXX Mountain	eer Plant
Street	/Road	Boute 62	Nor United		Zin Code 26265 0410
011001		ROULE 02	, New naven		20205-0419
Latitu	da	Dan	Mar Car	AREA NAME/LUCATION:	TYPE OF WELL:
Lanui	uc.	Ueg	Min Sec		Potable Public Water Supply
Acqui	red By	TX GPS [Topo Other	FGD WEST WEIT	
requi	iou by:				
					Irrigation Test/Exploratory
					Other
		WELI	LOG	DRILLING METHOD	GROUTING RECORD
				X Cable Tool Rotary	Grouting Material:
D	enth	State the	kind of formation	Rotary Hammer Other	X Cement Bentonite Clay
	-Pui	penetrate	d, their color, caves.		Other
		and if wa	ter bearing with	Hole Diameter 30 (in)	No. of Bags: Bulk
rom A	10	estimate	flow (GPM).	Total depth 78 (ft)	Installation Method:
п.)	(TT.)			CASINGS RECORD	
				MAIN CASING TYPE	PUMP INSTALLED
~	12	12:17 /4		X Steel Plastic	By Driller & Yes No
0	13	сттт (1	ily asn/	Other	ESTIMATED WELL VIELD
,	50	Nond I	ittle group	Casing Diameter 16 (in)	Estimated at 850 G P M
`	52	Danu, 1	TULLE GLAVET	Wall Thickness 0.375 (in)	Static Water Level A4 70 (ft)
2	78	Med- Cr	arse sand and	Casing Length 63 (ft)	*Pumping level below land surface
-	/0	orave		Other Casing or Liner Used	52-24 (ft) after 4 hrs at
		grave	• od=	Type Steel Plastic	<u>682</u> G P.M (Estimated)
		Clav		Other	*Note: For Public Water County
Ĭ		ordy		Casing/Liner Diameter (in)	Note: For Fublic water Supply
			8	Length (ft) from (ft)	wens please submit required yield
- A -				to (ft)	and drawdown tests.
				SCREEN RECORD	WELL HEAD COMPLETION
				Not Installed X Installed	Casing height above grade 2 (ft)
				Material: Bronze B XBLASSINGS	Type Of Well Cap
				Diameter of screen 16 (in)	Installed: Baker Pitless
				Slot size 0.06	VARIANCE ISSUED Yes No
				Length 15 (ft) from 63^{\checkmark} (ft)	Request Number
	1			to 78 (ft)	COMMENTS BY INSTALLER.
	[GRAVEL PACK RECORD	
	1	If additional :	space is needed, use	Gravel Pack: X Yes No	Pump Test noted above
		additional sh	ects and attach w/permit # at	From 25 (ft) to 78 (ft)	was Step Test at:
	pri fu thet	this wall been	been constructed in accord	noe with state sules and in applormance with	217
conditi	ons stated	in the above	captioned permit, and that the	the information presented herein is accurate	51/ gpm 457
l comp	lete to the	best of my k	nowledge.	· · · · · · · · · · · · · · · · · · ·	457 gpm
mpon	Name	Reynold		V Contractor No. WV 000825	682 com
siness	Registrat	ion No.	Master We	ell Driller Certification No.	Josz gpill
ster W	ell Drille	r (print)	John Workman		
ster W	ell Drille	r Signature			
чести	DEDVICO	0 /01/1514 7		NUDNEVMAN DEPRONCIPIER POD	
r sui Newo	RK IF DI	FFERENT	FROM MASTER DRILLE	R.)	
5110			NOT MADE BY DIVEDUE		
	an Well	Driller Certi	fication No		
irneym	an Well l	Driller (pleas	se print)		
rneyn		me (s)			
irneyn irneyn prentio	e and Na				I
irneyn irneyn prentic	e and Na			1	
rneyn rneym)rentic	e and Na				

Re	v 3/08		DATE THE WEL	L STATE OF	FORM SW-258
07			WAS COMPLETE	ED WEST VIRGINIA	THIS REPORT MUST BE
I SI	/CO US	EONLY	· MM· DD YY	WATER WELL	SUBMITTED WITHIN 30 DAYS
(A	TE RE	CEIVED	<u>12 12 08</u>	COMPLETION	AFTER WELL IS COMPLETED
		- /	PERMIT NO.		FILL IN THIS FORM
M	M DD	YY		REPORT	COMPLETELY
		·	DW	-	PLEASE PRINT OR TYPE
LO	CATIO	N OF WEL	نل		
Wel	Owner:	Last Name	American Electric	Power NKXXXXXX Mountain	eer Plant
Stree	et/Road I	Route 62,	New Haven	County Mason	Zip Code 26265–0419
				AREA NAME/LOCATION:	TYPE OF WELL:
Latit	ude:	Deg	Min Sec	FGD East Well	Potable Public Water Supply
Long	gitude;	Deg	Min Sec		Geothermal X Industrial
ACGL	птеа ву:	M UPS L	J Topo [] Other		Commercial Dewatering
			······································		Irrigation Test/Exploratory
			•		[_] Other
		WELL	LOG	DRILLING METHOD	GROUTING RECORD
				Cable Tool Rotary	Grouting Material:
	Depth	State the	kind of formation	Rotary Hammer Other	X Cement Bentonite Clay
-	-1	penetrate	d, their color, caves,		. Other
From	То	and if wa	ter bearing with	Hole Diameter <u>30</u> (in)	No. of Bags: Bulk
(ft.)	(fl.)	estimate	flow (GPM).	Total depth <u>78</u> (ft)	Installation Method:
			· · ·	CASINGS RECORD	
				WAIN CASING IYPE	PUMP INSTALLED
0	12	Fill (6	sand and gravel)	Cother	By Driller X Yes No
10		(.	June and graves,	Casing Diameter 16 (in)	ESTIMATED WELL YIELD
12	49	Sand, I	Little gravel	Wall Thickness 0.275 (in)	Estimated at <u>900</u> G.P.M
			5	Casing Length 63 (ff)	Static Water Level 45.38 (ft)
49	78	Med -co	barse sand and	Other Casing or Liner Used	*Pumping level below land surface
		grav	/el	Type Steel Plastic	$\frac{61.44}{1000}$ (ft) after <u>4</u> hrs. at
70		~		Other	1000 G.P.M. (Estimated)
/8		Cray		Casing/Liner Diameter (in)	"Note: For Public water Supply
				Length (ft) from (ft)	and drawdown tests
			4.	to(ft)	WELL HEAD COMPLETION
				SCREEN RECORD	Casing height above grade 2 (ft)
				Not Installed Installed	Type Of Well Can
				Material: Bronze X: SS	Installed Baker Pitless
			· ·	Diameter of screen 16"	
				Slot size 0.06"	VARIANCE ISSUED Yes NO
		• 		Length <u>15</u> (ft) from <u>63</u> (ft)	
					COMMENTS BY INSTALLER:
		If additional s	nace is needed use	Gravel Pack: www.Ves. No.	Pump West noted above was
		additional she	ets and attach w/permit # at	From 25 (ft) to 78 (ft)	Step Test at:
		top.	<u> </u>		270
all condition	cently that	this well has	peen constructed in accordan	re with state rules and in conformance with	2/0 gpm
and com	plete to the	best of my kn	owledge.	a manufactor protonto incom to doubrate	603 cmm
Compan	v Name	Revnolda	, Inc. w	V Contractor No. WV 000825	802 gpm
Business	Registrati	ion No	Master We	Il Driller Certification No.	902 gpm
(Vell Drille	r (print)	John Workman		1000 gpm
Waster V	Vell Drille	r Signature _	- <u>, ,</u>		
SITE SU	PERVISO	R (SIGNATI	URE OF DRILLER OR JO	URNEYMAN RESPONSIBLE FOR	
SITEWO	RK IF DI	FFERENT F	ROM MASTER DRILLE	R.)	
Lours or		Dellar Cartif	ication No.		
Journeyn	nan Well I	Driller (niease	e prinf)		

Apprentice and Name (s)



H.C. Nutting Company 2009

Piezometer Construction Diagrams

PZ-09-03 to PZ-09-05

		TERRACON PROJECT	NO. N2095020
PROJECT MOUNTAINEER BOTTOM ASH POND COMPLE	<u>Ex</u>	SUMM	ARY ELEVATIONS
COORDINATES	/)(NGVD29 WV_S)	((FT. NGVD)
DATE INSTALLED02/17/09		PIEZON	NETER NO
REF. DATUM	PT.:	REF.	DATUM PT.
TOP OF PROTEC VAULT/GROUND SUR	FACE		
GROUND SURFACE/TOP OF PAD			GRADEO' (621.6')
	0.5'] ~{{{}}{{}}{{}}{{}}{{}}{{}}{{}}{{}}{{}}{	
		- 	DEPTH (ELEV.)
		BENT	TOP OF DNITE SEAL <u>1.0' (620.6')</u>
			TOP OF
		GRAV	EL PACK (019.0)
(5)		_	
1 GROUT SEAL CEMENT BENTONITE MATERIAL:	6		
2 BENTONITE SEAL BENTONITE CHIPS			OF.
3 SCREEN 0.010" SLOT		SCRE	EN (616.6')
4 GRAVEL PACK #5 QUARTZ SAND		SCRE	EN50.4' (571.2')
5 BOREHOLE DIAMETER 7" 6" MIN	3'		
6 <u>1.92" DIA. PVC CASING (O.D.)</u>	3	BOTT	OM OF K SEC
7 CONCRETE PAD 3'x3'x8" THICK (MIN.) DIMENSIONS:3'x3'x8" THICK (MIN.)		BOTT	OM OF
8 PROTECTIVE STEEL H2 RATED VAULT COVER		GRAVEL	PACK
	(4)	BOTTO	M OF EHOLE50.4' (571.2')
		2011	
	GRAVE	– L PACK L SCREEN	
		-	
NOTE: DEPTHS OF MATERIALS ARE TAKEN FROM TOP OF	VAULT/GROUND SURFACE		SCALE: NTS
GEOTECHNICAL ENGINEERING SECTION		REVISION	OBSERVATION
APP'D.	DR.	C.K. DATE	
AMERICAN ELECTRIC POWER SERVICE CORP.			CDS-04A SH.
AMERICAN ELECTRIC POWER		GEOLOGIST/	ENGINEER:

AMERICAN ELI	ECTRIC PO	DWER		
MOUNTAINEER	BOTTOM	ASH	POND	COMPLEX

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	TERRACON PROJECT NO. <u>N2095020</u>
PROJECT	SUMMARY ELEVATIONS
COORDINATES	<u>WV_S)</u>
DATE INSTALLED02/19/09	PIEZOMETER NO. PZ-09-04
REF. DATUM PT.: TOP OF PROTECTIVE VAULT/GROUND SURFACE	REF. DATUM PT
CROLIND SURFACE /TOP OF PAD	GRADE <u>0' (597.1')</u>
	DEPTH (ELEV.)
	TOP OF
	(1) TOP OF
1 GROUT SEAL CEMENT BENTONITE MATERIAL: CEMENT BENTONITE CHIPS 2 BENTONITE SEAL BENTONITE CHIPS 3 SCREEN 0.010" SLOT 3 SCREEN 0.010" SLOT 4 GRAVEL PACK #5 QUARTZ SAND 5 BOREHOLE DIAMETER 7" 6 1.92" DIA. PVC CASING (0.D.) 7 CONCRETE PAD 3'x3'x8" THICK (MIN.) 0 PROTECTIVE STEEL H2 RATED VAULT COVER	TOP OF SCREEN 5.0' (592.1') BOTTOM OF SCREEN 24.8' (572.3') 3' BOTTOM OF BLANK SEC. N/A BOTTOM OF GRAVEL PACK BOTTOM OF GRAVEL PACK 25.0' (572.1') BOTTOM OF BOREHOLE 25.0' (572.1')
	GRAVEL PACK BELOW SCREEN
NOTE: DEPTHS OF MATERIALS ARE TAKEN FROM TOP OF VAULT/GRO	DUND SURFACE SCALE: NTS
GEOTECHNICAL ENGINEERING SECTION CIVIL DESIGN STANDARD	REVISION 0 OBSERVATION
APP'D. DR.	C.K. DATE
AMERICAN ELECTRIC POWER SERVICE CORP.	CDS-04A SH.
AMERICAN ELECTRIC POWER	GEOLOGIST/ENGINEER:
MUUNTAINEER BUTTOM AST FUND COMFLEX	TODD GRIFFITH H.C. NUTTING CO.

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AEPMTP-000160

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i.

TODD GRIFFITH H.C. NUTTING CO.

	TERRACON PROJECT NO. N2095020
PROJECT	SUMMARY ELEVATIONS
COORDINATES	S)(FT. NGVD)
DATE INSTALLED02/18/09	PIEZOMETER NO. PZ-09-05
REF. DATUM PT.: TOP OF PROTECTIVE VAULT/GROUND SURFACE	REF. DATUM PT
GROUND SURFACE/TOP OF PAD	GRADE
	DEPTH (ELEV.)
	TOP OF
1	TOP OF GRAVEL PACK(609.7')
5	
1 GROUT SEAL CEMENT BENTONITE (6)	
2 BENTONITE SEAL BENTONITE CHIPS	
3 SCREEN 0.010" SLOT	BOTTOM OF 50 2' (561 5')
4 GRAVEL PACK #5 QUARTZ SAND	SCREEN (301.3)
5 BOREHOLE DIAMETER 7" 6" MIN	
6 <u>1.92" DIA. PVC CASING (O.D.)</u>	BOTTOM OF BLANK SEC
7 CONCRETE PAD 3'x3'x8" THICK (MIN.) DIMENSIONS:	BOTTOM OF CRAVEL PACK 50.2' (561.5')
8 PROTECTIVE STEEL H2 RATED VAULT COVER	
	BOTTOM OF BOREHOLE 50.2' (561.5')
	GRAVEL PACK BELOW SCREEN
NOTE: DEPTHS OF MATERIALS ARE TAKEN FROM TOP OF VAULT/GROUND	SURFACE SCALE: NTS
CIVIL DESIGN STANDARD	OBSERVATION WELL
APP'D. DR.	C.K.
AMERICAN ELECTRIC POWER SERVICE CORP.	CDS-04A SH.
AMERICAN ELECTRIC POWER	GEOLOGIST/ENGINEER:



H.C. Nutting Company 2009

Soil Boring Logs

B-09-01, B-09-02, PZ-09-03 to PZ-09-05, B-09-06

	LOG OF BOF	RIN	G N	0.	B-C)9-0)1				Р	age 1 of 2
CLI	ENT											
SIT	American Electric Power		PRO	JEC	Τ							
	New Haven, West Virginia		1110	020	Mo	untai	ineer	Botto	m As	h Pon	d Com	plex
	Boring Location: 719673.518, 1733588.509					SAN	IPLES	6		1	TESTS	
GRAPHIC LOG	DESCRIPTION Approx. Surface Elev.: 621.5 ft		DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N** BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	1 FILL, gravel base for roadway 62	20.5		GP	1	SS	18	27				
	FILL , poorly graded sand, some gravel and silt, fine grained, brown, medium dense to dense, moist			SP	2	SS	18	35	5			
			5	SP	3	SS	18	29				
				SP	4	SS	18	32				
			10	SP	5	SS	18	38	11			
	12.5 FILL, silty sand, grayish brown to brown, very dense to dense, moist to wet	609		SM	6	SS	18	53				
			15— —	SM	7	SS	18	51	8			
	, ,			SM	8	SS	18	48				
			20	SM	9	SS	18	49				
ş	22.5	599				00	10			ļ		
	HILL, poorly graded sand, some gravel and silt, fine grained, brown to light brown, dense, saturated			SP	10	55	18	44				
TERRAC			25	SP	11	SS	18	38	14			
I ASH GPJ	<u>SILTY SAND</u> , very fine to fine grained, some thin sandy silt seams, brown to light	594		SM	12	SS	18	12				
IT BOTTON	prown, measum dense to loose, wet to moist		30	SM	13	SS	18	9				
ER PLAN	Continued Next Page											
The betv	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.			<u></u>	L			L <u></u>	**CME	140H S	SPT autor	natic hammer
WA	ATER LEVEL OBSERVATIONS, ft	• • • ÷ .	والر الأصورية اليراد				BOR	ING S	TART	ED	, Anna a thaire	2-16-09
WL	¥ 22.5 WD ¥ AB	ø '	-	-	P V		BOR	ING C	OMPL	ETED)	2-16-09
	¥ 22.0 24 hour ¥		CIL				RIG		Tra T	ack F		AN JW
		A. S. M. M. L. M.		at Alaman Bara		an weak state	LOG	GEU		na j	UD #	112090020

			u 1	I U .	D-U	19-0	1				P	age 2 of 2
C	CLI	JENT										
5	SIT	TE	PR	DJEC	Т							
_	····	New Haven, West Virginia			Mo	unta		Botto	m Asl	h Pon		olex
		DESCRIPTION	EPTH, ft.	SCS SYMBOL	UMBER	ZPE	ECOVERY, in.	PT - N** LOWS / ft.	ATER ONTENT, %	RY UNIT WT	NCONFINED TRENGTH, psf	
e E Té	5	SILTY SAND, very fine to fine grained.		_⊃ SM	Z 14	⊢ SS	<u>۳</u> 18	<u>9</u>	SÖ	Ωă.	Si⊂	
		some thin sandy silt seams, brown to light brown, medium dense to loose, wet to moist	35	SM	15	SS	18	9				
				SM	16	SS	18	11	14			
			40-	SM	17	SS	18	8				
				SM	18	SS	18	10				
		45 576.5 POORLY GRADED SAND with SILT, brown to dark brown, medium dense to	45-	- SP SM	19	SS	18	25				
			- - - - -	SP SM	20	SS	18	27	8			
		51.5 570	50-	SP SM	21	SS	18	54				
NEER PLANT BOTTOM ASH GPJ TERHACON GDT 3/9/09												
T with a second	The Detv	e stratification lines represent the approximate boundary lines tween soil and rock types: in-situ, the transition may be gradual.	n an that an the						**CME	140H S	SPT autor	natic hammer
	NA	ATER LEVEL OBSERVATIONS, ft				Ī	BOR	ING S	TARTI	ED		2-16-09
	VL	L ¥ 22.5 WD + AB		C f	זר		BIG	ING C	UMPL Tre	ETED		2-16-09
	٧L				ی کر میں ا		LOG	GED	T/	AG J	OB #	N2095020

LOG OF BORING NO. B-09-02

Page 1 of 1

C	L	ENT American Electric Power										
S	IT		PRC	JEC	Т							
		New Haven, West Virginia			Mo	unta	ineer	Botto	m Asł	ו Por	nd Comp	lex
		Boring Location: 719744.754, 1733658.992				SAN	1PLES	6				
SEAPHICLOG		DESCRIPTION Approx. Surface Elev.: 594.5 ft	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N** BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
<u>x7.</u> ,	. <u>,1</u>	TOPSOIL, lean clay, high organic content,	-	CL	1	SS	18	4	19			
	<u>.,</u>	dark brown, very soft, saturated (possible seepage from dike) <u>SANDY SILT</u> , fine grained, brown, loose, wot to moist		- ML	2	SS	18	9	19			
		wet to motor	5-	- MI	3	SS	18	7				
			-									
				ML	4	SS	18	5				
			10-	ML	5	SS	18	6				
				ML	6	SS	14	6				
		16 578.	15-	- SP SM	7	SS	18	9				
		<u>GRAVEL</u> , light to dark brown, medium dense to dense, moist		- SP SM	8	SS	18	22	6			
6			20-	SP	9	SS	18	14	-			
GDT 3/9/(SP SM	10	SS	15	19				
RRACON		26.5	25- 8	- - SP - SM	11	SS	18	30				
SH.GPJ TE		BORING COMPLETED										
BOTTOM A												
ER PLANT												
S MTNE	The bet	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.							**CME	140H	SPT auton	natic hammer
ر ۲ او	NA	TER LEVEL OBSERVATIONS, ft					BOR	ING S	TARTE	ED	and the second state	2-18-09
V NN	٧L	▼ 0 WD ¥ 26.0 AB		-			BOR	ING C	OMPL	ETEI	D	2-18-09
μ M M M	VL	Σ IICL	J		Jſ		RIG		Tra	ick I	FOREMA	N JW
N N	٧L						LOG	GED	TA	۹G ,	JOB #	N2095020

[LOG OF	BORIN	g No). I	PZ-(09-	03				Pa	age 1 of 2
CLI	ENT American Electric Power											
SIT	E American Electric Power		PRO	JEC	Т							
<u> </u>	 New Haven, West Virginia				Мо	unta	ineer	Botto	m Asl	h Por	nd Comp	olex
	Boring Location: 719441.213, 1733850.227					SAN	APLES	S			TESTS	
GRAPHIC LOG	DESCRIPTION		DEPTH, ft.	USCS SYMBOL	NUMBER	түрЕ	RECOVERY, In.	SPT - N** BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	1 FILL, gravel base for roadway	620.5		SP	1	SS	18	26				
	FILL, poorly graded sand with silt, some	020.0		SM								
	gravel, brown, medium dense to dense, moist			SP SM	2	SS	18	31	6			
			5	SP SM	3	SS	18	28				
				SP SM	4	SS	18	39				
			10	SP SM	5	SS	18	42				
				SP SM	6	SS	18	49	10			
		Ā	15	SP SM	7	SS	18	39				
	17.5 FILL, poorly graded sand, some gravel and silt, fine grained, brown, dense, saturated	604		SP	8	SS	18	38			-	
		Ţ	20	SP	9	SS	18	42				
N.GDT 3/9/0	22.5 <u>CLAYEY GRAVEL with SAND</u> , fine sand with rounded gravel, dark gray, medium \dense, moist to wet	<u>599</u>		SC	10	SS	18	11				
I TERRACO	LEAN CLAY with SAND, brown to light brown, stiff, moist		25	CL	11	SS	18	12	19		4500*	LL = 29 Pl = 10
DM ASH.GPU	30	501 5		CL	12	SS	18	13			3500*	
PLANT BOTT	SILTY CLAY with sand, brown to light brown, stiff, moist		30	CL ML CL	13 1	SS ST	18 22	11	20		4500*	LL = 25 PI = 5 LL = 25
	Continued Next Page			1				-				
Signature Signat	stratification lines represent the approximate boundary lin veen soil and rock types: in-situ, the transition may be gra	ies adual.					0.0-		**CME *C	140H S Calibrat	SPT auton ted Hand	natic hammer Penetrometer
		L .				ŀ	BOR	ING S	IARTI	ED		2-16-09
	$\frac{1}{2}$ 17.5 WD $\frac{1}{2}$ 20.2 72 $\frac{1}{2}$ 15.8 2/25 $\frac{1}{2}$	277	36				BOR RIG	ING C	OMPL Tra	ETED Ick F	OREMA	2-17-09 N JW
S WL						-	LOG	GED	T	AG J	IOB #	N2095020

	LOG OF BORIN	G N	0.	PZ-	09-1	03				P	age 2 of 2
CLI	ENT American Electric Power										
SIT		PRC	JEC	т							
 	New Haven, West Virginia			Mo	unta		Botto	m As	h Pon		olex
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N** BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
	34 587 5	-		1 4	00	14	10				PI = 7
	SILTY SAND, very fine grained, trace gravel, many thin sandy silt seams, brown to light brown, loose to medium dense, moist	35-	- SM	15	SS	18	11				
			SM	16	SS	18	8	13			
		40	-SM	17	SS	18	7				
			SM	18	SS	18	8				
		45	SM	19	SS	18	10				
	48.5 573 POORLY GRADED GRAVEL with SAND		SM	20	SS	18	12				
	and SILT, subrounded to rounded gravel, brown, loose to medium dense, wet 51.5 570	50-	GP	21	SS	18	8	8			
The bety	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.							**CME **	 140H S Calibrat	PT autor ed Hand	natic hammer Penetrometer
WA	TER LEVEL OBSERVATIONS, ft			an nagy a		BOR	ING S	TART	ED		2-16-09
WL WI	¥ 17.5 WD ¥ 20.2 72 ∏ ¥ 15.8 2/25 ¥			זר]	BOR	ING C	OMPL Tr	ETED		2-17-09
WL						LOG	GED	T	AG J	OB #	N2095020

REVISED BORING LOGS MTNEER PLANT BOTTOM ASH GPJ TERRACON GDT 39/09

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[LOG OF BORIN	G NO). I	2-(09-(04				Р	age 1 of 1
CL	ENT American Electric Power										
SIT	E American Electric Fower	PRO	JEC	Г					,		
	New Haven, West Virginia		,	Мо	untai	ineer	Botto	m As	h Poi	nd Com	plex
	Boring Location: 719506.02, 1733919.514				SAN	APLES	5			TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N** BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
17 18 - Z	<u>TOPSOIL</u> , saturated		CL	1	SS	11	9				
11- 211	2 595	_									
	SANDY SILT , trace clay, fine to very fine grained, brown, loose, layered, wet		ML	2	SS	18	9	21			
		5	ML	1	ST	24					
			ML	3	SS	18	10		· · · · · · · · · · · · · · · · · · ·		
		10	ML	4	SS	18	5			-	
									<u> </u>		
			ML	5	SS	18	6	23			
		15	ML	6	SS	18	5				
			MI	7	22	18	7				
					00						
	21.4 575.5	20	ML	8	SS	18	13				
	and SAND, subrounded gravel, brown with gray, medium dense to dense, very moist		GP GM	9	SS	12	19	6			
	26.5 570.5	25	GP GM	10	SS	18	43				
SH.GPJ TE	BORING COMPLETE										
OTTOM A.											
ER PLANT B											
The bet	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual	!	1		1		 	**CME	140H	SPT autor	natic hammer
Ψ.	ATER LEVEL OBSERVATIONS, ft	adam, a ng sila na			T	BOR	ING S	TARTI	ED		2-19-09
WL WL	⊻N/E WD ¥N/E AB		_			BOR	ING C	OMPL	ETEI	5	2-19-09
۵ WL	¥ N/E 48 ¥ 25.5 2/25 IPT	ðľ		Jľ		RIG		Tra	ack I	FOREM	AN JW
ML						LOG	GED	T۸	AG .	JOB #	N2095020

LOG OF BORING NO. PZ-09-05

Page 1 of 2

CLI	ENT American Electric Power										
SIT	E	PRC	JEC	т			_		_		
	New Haven, West Virginia		1		untai	neer	Botto	m Asl	n Por	Id Com	blex
LOG	Boring Location: 718483.249, 1734990.193 DESCRIPTION		MBOL		SAIV	RY, in.	ft.	T, %	T W T	TH, psf	
GRAPHIC	Approx. Surface Elev.: 611.5 ft	DEPTH, f	USCS SY	NUMBER	ТҮРЕ	RECOVE	SPT - N**	WATER CONTEN	DRY UNI pof	UNCONF	
	0.3 \ <u>TOPSOIL</u> 611	-	SP	1	SS	18	20				
	FILL, poorly graded sand, some silt and trace fine gravel, fine to medium grained sand, brown, dense, moist		SP	2	SS	18	30	4			
	5 606.5 POORLY GRADED SAND trace silt, fine grained, brown, loose to very loose, moist	5	- SP	3	SS	18	10				
			SP	4	SS	18	5				
		10-	SF	2 5	SS	18	5				
		15-	SF	° 6	SS	18	4	7			
		15	SF	° 7	SS	18	3				
	20 591.5	20-		8	SS	13	4				
60/6	POORLY GRADED SAND, trace silt, fine grained, brown, very loose to loose, moist	-			55	18	5				
CON GDT 3		25-		2 10	33	10	5				
GPJ TERRA		-		2 12	SS	18	5				
ASH	29 582.	5	1				ļ				
	POORLY GRADED GRAVEL with SAND, subrounded gravel with fine to coarse sand, brown to dark brown, loose to medium dense, moist	30-	- GF	P 13	SS	18	10				
Ч Ч С	Continued Next Page						+	-		_	
The set	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.				1. 19 1. 19			**CME	140H	SPT auto	natic hammer
W W						BOF	RING S	TART	ED		2-18-09
		7			7	BOF	RING C	OMPI	ETE		2-18-09
JW U						LOG	GED	T	AG	JOB #	N2095020

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		L(DG OF BO		G N(ן. ו)-2-	09-0	5				Р	age 2 of 2
CLI	ENT	American Electric Pow	/er											
SIT	E	New Haven, West Virgi	nia		PRO	JEC	⊺ Mo≀	untai	neer	Botto	m As	h Pon	d Com	plex
								SAN	1PLES	6		1	TESTS	r
GRAPHIC LOG		DESCRIPTION			DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, In.	SPT - N** BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
00					_	GP	14	SS	18	19				
0°C	35	POORLY GRADED SAND, som fine to coarse sand, brown, loo	ne gravel, se to	576.5	35	SP	15	SS	18	10				
		medium dense, moist					10	00	10	10				
									10	10	ļ	ļ	ļ	
	40	POORLY GRADED SAND with brown, dense to medium dense	GRAVEL , e, moist	571.5	40	SP	17	SS	18	30	3			
						SP	18	SS	18	20				
					45	SP	19	SS	18	21				
	47.5			564										
		POORLY GRADED SAND, son fine to medium grained sand, b brown, medium dense, moist	ne gravel, prown to light		-	- SP - -	20	SS	18	14				
	51.5			560	50	SP	21	SS	18	13				
The	e stratif ween s	ication lines represent the approximate oil and rock types: in-situ, the transitio	boundary lines on may be gradual	n							**CME	140H :	SPT auto	matic hamme
W	ATER	LEVEL OBSERVATIONS, ft							BOF	RING S	TART	ED		2-18-09
WL WI	. ¥ N ⊻ ⊾	$ /E WD \neq N/E A $		f f:	7		77	ן	BIC	(ING C	UMPI Tr			2-18-09
	· · · · · · · · · · · · · · · · · · ·				1		و کھ			GED	יו ד			N2095020
					2 1. 7 S	a survey and a	WALLY MARKED					nu lu		

LOG OF BORING NO. B-09-06

Page 1 of 1

CL	ENT American Electric Power										
SI	E	PRO	JEC	T							
	New Haven, West Virginia			Μοι	untai	neer	Botto	m Ash	Pon	d Comp	lex
	Boring Location: 718535.672, 1735062.716				SAN	IPLES	;			TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N** BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	0.3 \TOPSOIL	4 -	SC	1	SS	14	11				
	FILL, clayey sand, fine to medium grained, organics such as roots fragments throughout, brown, medium dense to loose, moist to wet SILTY CLAY with SAND, fine sand, light		SC CL	2	SS ST	18 24	5			2000*	
	brown, medium stin, moist		CL	3	SS	18	7	23		2000*	LL = 25
			ML	4	55	18	7	23		2500*	$\frac{PI = 6}{II = 26}$
			ML				, 	20		2000	PI = 6
	10.5 58	4 10 -	SP	5	SS	18	13				
	fine to coarse sand, some silt, rounded to										
	to loose, moist		SP	6	SS	14	8				
		15-	0.5								
			SP	7	SS	14	6				
			SP	8	SS	14	5				
		20	SP	9	SS	14	11				
80 00 00 00 00 00 00 00 00 00 00 00 00 0	22.5 57	2 _		10		10	10				
GDT 3	brown, medium dense, moist		SP SM		55	18	19	4			
ACON		25-	SP	11	SS	18	14				
	26.5 56 BORING COMPLETED	8	SM						·		
NEER PLANT BOTTOM ASH.GPJ											
S be	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.							**CME 1* *C	40H S alibrat	PT auton ed Hand I	natic hammer Penetrometer
W le	ATER LEVEL OBSERVATIONS, ft				Τ	BOR	ING S	TARTE	D		2-18-09
W W			= p			BOR	ING C	OMPLI	ETED	H	2-18-09
W ISED	$\underline{\Psi}$ 24 hour $\underline{\Psi}$	CIL				RIG		Tra	ck F	OREMA	W JW
iW ∭						LOG	GED	TA	\G J	OB #	N2095020



Arcadis 2016

Boring Logs

SB-1601, MW-1601A to MW-1608

.IOB	NUM	BFR	OH015	5976.0009				LO	GΟ	FBORING			
COM		γ Δm	nerican	Flectric F	Power	_			BC	RING NO SB-1601 DATE 10	/ 05/16 s⊦	IFFT	1 OF 4
PRO	JECT	· <u> </u>	Intaine	er Plant	onei				BC	RING START 05/05/16 B	ORING FINISH	0	<u> </u>
 			Not S	Surveved					PIF	ZOMETER TYPE NA	WFLL TYPE	: <u> </u>	A
GRO	UND	ELEVA		NA	SYSTEM	1 N	A		HG	T. RISER ABOVE GROUND NA	DIA	<u>N</u>	A
Wat		ol ft	V 57				,		DE	PTH TO TOP OF WELL SCREEN		N	Α
тил		/61, 11	<u> </u>	.0 -		<u>*</u>	-		W	ELL DEVELOPMENT NA	BACKFILL	G	rout
	- F		5/6/	2016					FIE	LD PARTY NA	RIG	H a	ollow Stem Auger
Bitti	_		0/0/2				1						
SAMPLE NUMBER	SAMPLE	SAM DEI IN F FROM	IPLE PTH EET TO	STANDAF PENETRAT RESISTAN BLOWS /	LENGTH LENGTH LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION		WELL	DRILLER'S NOTES
0	NR	0.0	8.0				- 5 -	-		No recovery, boring was pre-drilled clearance; no samples were taken.	for utility		
1 2 3 4	SH SS SS	8.0 10.0 12.0 14.0	10.0 12.0 14.0 16.0	0-3-3-1 1-1-1-1 0-0-1-1 1-1-2-2	12 12 18 18		- 10 -			Sand, fine to coarse; some silt; little angular to subrounded; trace mediu subangular gravel; wet; dark yellowi (10YR 4/2). Silt with clay with fine sand; moist; s non-plastic; very dark gray (N 3/). Silt, some clay, some fine sand, tra fragments; moist; soft.	e fine gravel, im ish brown soft; 		

ΔL	1	SW CAS	SING		6"	BECORDER J. Wanner
NA		HW CAS	SING AD'	VANCER	4" 3"	WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON
NA		<u>9" x 6.25</u>	HSA		/ "	SLUTTED SCREEN, G = GEUNUR, P = PNEUMATIC
NA		NQ-2 R0 6" x 3.25	DCK COF 5 HSA	RE		PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE
		TYPE	OF CA	SING USE)	Continued Next Page
5	SS	16.0	18.0	2-1-1-2	18	
4	SS	14.0	16.0	1-1-2-2	18	
3	SS	12.0	14.0	0-0-1-1	18	
2	SS	10.0	12.0	1-1-1-1	12	Non-plastic; very dark gray (N 3/). Silt, some clay, some fine sand, trace coal fragments; moist; soft.
1	SH	8.0	10.0	0-3-3-1	12	Sand, fine to coarse; some silt; little fine gravel, angular to subrounded; trace medium subangular gravel; wet; dark yellowish brown (10YR 4/2).
						clearance; no samples were taken.

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>SB-1601</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>4</u> BORING START 05/05/16 BORING FINISH 05/06/16

SAMPLE NUMBER	SAMPLE	SAN DEF IN F	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
6	SS	18.0	20.0	1-1-1-1	19							
7	SS	20.0	22.0	1-1-2-1	48		20 -					
8	SS	22.0	24.0	0-1-3-7	21		-		SM	Silty sand, fine to coarse; moist; loose;		
9	SS	24.0	26.0	4-5-4-5	21		- 25		ML	yellowish brown (10YR 5/4). Silt, some very fine sand; dry; rapid dilatancy;		
10	SS	26.0	28.0	1-1-3-3	18		-	-	ML	stratified; gray (5Y 6/1) with 30% iron staining as dark as dusky red (7.5R 3/3).		
11	SS	28.0	30.0	1-1-2-2	22		-	-		Note: Very finely stratified from 27.8 to 28 feet.		
12	SS	30.0	32.0	1-1-3-9	19		30 -		e D	Note: Color change to grav (N 5/) abrupt upper		
13	SS	32.0	34.0	2-2-3-4	17		-		SP	and lower boundaries from 31 to 31.1 feet. Sand with silt, some clay; moist; loose; brown (7.5YR 4.3); sand is fine to coarse. Sand, little to some silt; moist; yellowish brown (10YR 5/4); loose; sand is fine to coarse.		
14	SS	34.0	36.0	2-4-7-7	12		35 -		- - - - -	Note: Dry from 34 to 36 feet.		
15	SS	36.0	38.0	5-7-8-7	12		-			Note: Dry grades to moist from 36 to 38 feet.		
16	SS	38.0	40.0	2-4-5-6	19		-			Note: Moist from 38 to 44 feet.		
17	SS	40.0	42.0	5-5-6-5	19		40 -					
										Continued Next Page		

AEP - AEP.GDT - 10/05/16 15:21 - C./CHERYL/PROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCEAEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER GPJ

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>SB-1601</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>4</u> BORING START 05/05/16 BORING FINISH 05/06/16

Continued Next Page

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
18	SS	42.0	44.0	1-4-5-5	17				· · · ·	Note: Slight increase in silt content from 43 to		
19	SS	44.0	46.0	2-4-6-7	13		45 -			44 feet.		
20	SS	46.0	48.0	5-5-7-7	17							
21	SS	48.0	50.0	8-10-10-10	18				•	Note: Weakly stratified from 48.5 to 50 feet.		
22	SS	50.0	52.0	6-6-7-8	16		50 -	-				
23	SS	52.0	54.0	2-3-8-8	18				- - - - - - -			
24	SS	54.0	56.0	4-4-5-6	13		55 -		- - - - -			
25	SS	56.0	58.0	4-4-6-8	19					Note: Trace subrounded medium to coarse gravel, sedimentary very thinly bedded, pitted along bedding at 55.5 feet. Note: Trace subrounded coal (250 mm	Ā	
26	SS	58.0	60.0	2-4-6-4	13					internal coal appearance is well preserved) at 56.1 feet. Note: Includes little amount of fine subangular gravel from 57.5 to 58 feet. Note: Weakly stratified from 59 to 59.5 feet.		
27	SS	60.0	62.0	2-4-4-6	14		60 -		•			
28	SS	62.0	64.0	4-4-4-5	18				0.0			
29	SS	64.0	66.0	5-6-9-10	17		-		52	Sana, fine to meaium, little to some silt; moist; loose; yellowish brown (10YR 5/4).		

AEP - AEP.GDT - 10/05/16 15:21 - C./CHERYL/PROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCEAEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER GPJ

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>SB-1601</u> DATE <u>10/05/16</u> SHEET <u>4</u> OF <u>4</u> BORING START 05/05/16 BORING FINISH 05/06/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
30 31	SS	66.0 68.0	68.0 70.0	5-6-7-8 6-6-5-7	17		65			Note: Thin layer of coal fragments up to 10 mm in size). Note: Includes a little amount of fine subrounded gravel from 67 to 68 feet.		
32	SS	70.0	71.3	12-15-50/4	16		70		GP SP ML	Gravel, some sand; moist; loose; gravel is fine to medium, rounded and subrounded. Sand, some silt, little fine to medium gravel; dry; loose; yellowish brown (10YR 5.4); sand is fine to coarse. Silt, little very fine sand; dry; hard; very dark brown (7.5YR 2.5/2). Bedrock, weak, thin plates; looks like shale, but fine party crystals (like mica) are abduct; olive gray (5Y 5/2). Bedrock, weak, thin plates; looks like shale, but fine party crystals (like mica) are abduct; olive gray (5Y 5/2). End of boring at 71.3 feet.		

JOB	NUM	BER _	OH01	59/6.00	09						
сом	PAN	Y <u>An</u>	nerica	n Electr	ic Pow	er				BC	RING NO
PRO	JECT	Mo	untain	eer Plar	nt					BC	RING ST
000	RDIN	ATES	N 71	7,305.0	E 1,73	4,094.	2			PIE	ZOMETE
GRO	UND	ELEVA	TION_	607.5	SY	STEM _	NA	D 1927		HG	T. RISER
Wate	er Lev	vel, ft	<u>⊻</u> 6	3.0	Ţ		Ţ			DE	РТН ТО 1
TIME	-									WE	ELL DEVE
DAT	E		6/8	2016						FIE	LD PART
LE ER	LE	SAN	MPLE PTH	STAN	DARD RATION	AL TH ERY	RQD	DEPTH	HIC	s	

_ _ _

BORING NO. MW-1601A DATE	10/05/16 SHE	ET_1_OF_4
BORING START 06/08/16	BORING FINISH	06/08/16
PIEZOMETER TYPE NA	WELL TYPE	WO
HGT. RISER ABOVE GROUND 3.1	19 DIA	2"
DEPTH TO TOP OF WELL SCREEM	м 67.0 воттом	77.0
WELL DEVELOPMENT NA	BACKFILL	Grout
FIELD PARTY NA	RIG	Hollow Stem Auger

SAMPLE	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY % DU	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
0	NR	0.0	10.0		0				Straight drill to 10 feet, boring was pre-drilled for utility clearance; no samples were taken.		
							-				
5 5 5						F					
						- 5-					
							-				
							_				
	88	10.0	12.0	1245	12	- 10 -		NAL			
	33	10.0	12.0	1-2-4-5	13				10YR 4/4 to 4/3.		
2	SS	12.0	14.0	3-4-5-5	16						
									Silt with clay and sand: moist: soft		
3	SS	14.0	16.0	4-5-4-7	13				Interbedded sand and clay; dry; loose and soft;		
2						- 15 -			sands are fine to coarse; 10YR 4/4; silt/clay layers are silt with clay, some fine sand, dry,		
4	SS	16.0	18.0	3-4-6-5	14				soft, black (10YR 2/1).		
								sw	Sand, fine to coarse, little silt, trace fine gravel; moist: loose: 10YR 5/4 to 4/4: instratified		
		40.0									
5	SS	18.0	20.0	2-2-2-3	16				Note: Dry from 18 to 19 feet.		
								SP	Note: Abrupt boundary at 19 feet.		
20.01 0		TYPE	OF C	ASING USED			<u>10 - 17 - 1</u>	4	Continued Next Page	1	
		NQ-2 R0 6" x 3 2'	OCK CC	DRE		PIEZON	IETER			= OF	PEN TUBE
SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC											
		NW CAS	SING		3" 6"	WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON					
		AIR HAI	MMER		8"	RECORDER J. Wanner					

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. MW-1601A DATE 10/05/16 SHEET 2 OF 4 BORING START 06/08/16 BORING FINISH 06/08/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
6 7	SS SS SS	20.0 22.0 24.0	22.0 24.0 26.0	2-2-2-4 1-3-3-3 3-6-8-7	17				SW SW	Fine sand, some silt, dry; loose; 10YR 5/4. Silty sand; moist; soft; 10YR 4/4. Sand, fine to coarse, little to some silt, trace fine to medium gravel; dry; loose; 10YR 5/4 to 10YR 4/4. Note: Gravel fraction is subrounded sedimentary and chert, both fine in size from 22 to 26 feet.		
9	SS	26.0	28.0	3-5-4-5	14		25 -			Note: Some gravel at 26 feet. Note: No gravel at 26.7 to 28 feet.		
10	SS	28.0	30.0	5-6-7-5	18		30 -	- 				
12	SS	32.0	34.0	1-4-7-6	13							
13	SS	34.0	36.0	3-8-5-8	14		35 -			Note: Moist at 34.5 feet.		
14	SS	36.0	38.0	3-8-12-12	17					Note: No gravel from 36 to 37 feet.		
15	SS	38.0	40.0	6-8-6-8	18			- - - - - - - - - - - - - - - - - - -		subangular to subrounded, from 37 to 38 feet. Note: Moist from 38 to 38.5 feet.		
16	SS	40.0	42.0	8-12-17-20	17		40 -		SW SW	Sand, fine, with silt; dry; loose; brown. Sand, fine to coarse, little to some fine gravel, little to some silt; dry; loose; brown; gravel is subangular to subrounded.		
17	SS	42.0	44.0	0.10.12.6	16					Note: No gravel from 42.5 to 43.5 feet.		
	33	44.0	40.0	9-10-12-0	13		45 -					

Continued Next Page

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

 BORING NO.
 MW-1601A
 DATE
 10/05/16
 SHEET
 3
 OF
 4

 BORING START
 06/08/16
 BORING FINISH
 06/08/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD D	EPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
19	SS	46.0	48.0	12-12-15-20	17			****		Note: Igneous and sedimentary rock types from		
							-			40 10 32 1881.		
20	SS	48.0	50.0	12-12-10-12	17		-	***** *****		Note: Moist from 48 to 50 feet.		
							-	•••••				
21	SS	50.0	52.0	9-10-14-16	16		50 -	•				
							-	•••••				
22	SS	52.0	54.0	6-10-13-14	13		-	· · · · · · · · · · · · · · · · · · ·	SW	Sand with fine gravel, little silt, little amount of	-	
							-	•••••		medium size gravel; dry; loose; sand is fine to coarse; gravel is subround dominant.		
23	SS	54 0	56 0	14-20-22-11	14		-			Note: Includes trace coarse gravel (subangular		
							55 -			igneous, and subrounded sedimentary. from 54 to 56 feet.		
24	22	56.0	58.0	9-12-14-24	17		-	•••••		Note: Includes trace coarse subrounded gravel		
27		00.0	00.0	5-12-14-24	17		-			from 56 to 60 feet.		
25	00	59.0	60.0	14 15 20 15	17		-	· · · · · · · · · · · · · · · · · · ·				
25	33	0.00	00.0	14-15-20-15	17		-					
	00			00 00 44 44	10		60	***** ***** ****	0.44			
20	55	60.0	62.0	20-20-14-14	18		-	• • • • • • • • • • • • • • • • • • •	500	brown; sand is fine to coarse.		
							-					
27	SS	62.0	64.0	8-8-8-6	12		_		SW	Note: Moist from 62 to 62.5 feet. Sand some silt, little fine to medium gravel;	\Box	
							_			loose; weakly stratified. Note: Wet at 63 feet.	_	
28	SS	64.0	66.0	7-9-7-8	14		6E					
							05 -					
29	SS	66.0	68.0	5-4-3-12	16		-		SW	Sand, some gravel, fine to medium, little silt, trace coarse rounded gravel; wet; loose;		
							-			unstratified; brown.		
30	SS	68.0	70.0	1-4-6-9	14		-			Note: Wet at 68 feet.		
								•••••				
31	SS	70.0	72.0	5-15-15-18	0.9		70 -		SW	Sand, little to some silt, trace fine gravel; wet; loose; unstratified; sand is very fine to medium dominant.		
								<u>•ڏ•ُ•ُ</u>		Continued Next Page		

AEP - AEP.GDT - 10/05/16 15:32 - C:/CHERYL/PROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCEAEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER GPJ

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. MW-1601A DATE 10/05/16 SHEET 4 OF 4 BORING START _______ BORING FINISH _______ 66/08/16

SAMPLE	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
32	SS	72.0	74.0	NM-NM-NM-NM	0					No sample attempted; heaving sands from 72 to 76 feet.		
33	SS	74.0	76.0	9-12-13-12	0		- 75	-				
34	SS	76.0	78.0	3-9-13-13	0.9		-	••••• •••••	SW	Sand with silt, trace fine gravel; wet; loose; brown; sand is fine to medium.	-	
35	SS	78.0	80.0	9-13-22-23	0.6		-					
_							80 -			End of boring at 80 feet.	-	
										See well construction log for development information.		

JOB	NUM	BER _	OHU	15976.00	109		_				
COM	IPAN	Y <u>An</u>	nerica	an Electr	ic Pow	er				BO	RING NO. <u>MW-1602</u>
PRO	JECT	Mo	untai	neer Pla	nt					BO	RING START 05/09
соо	RDIN	ATES	N 7	17,671.9	E 1,73	3,519).1			PIE	ZOMETER TYPE NA
GRO	UND	ELEVA	TION	602.4	SY	STEM	N	AD 192	7	HG	T. RISER ABOVE GRO
Wate	er Lev	vel, ft	∇	57.0	V		V			DE	PTH TO TOP OF WELL
ТІМЕ	=				-					WE	
DAT	E		5/	9/2016			+			FIE	LD PARTY NA
SAMPLE NUMBER	SAMPLE	SAN DE IN F	MPLE PTH FEET TC	STAN PENET RESIS	IDARD RATION TANCE VS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL IDENTI
			1 10 1								Straight drill to 10 feet

BORING NO. MW-1602 DATE	10/05/16 SHE	ET <u>1</u> OF <u>3</u>
BORING START 05/09/16	BORING FINISH	05/10/16
PIEZOMETER TYPE NA	WELL TYPE	OW
HGT. RISER ABOVE GROUND 2.7	75 DIA	2"
DEPTH TO TOP OF WELL SCREEN	м <u>61.0</u> воттом	71.0
WELL DEVELOPMENT NA	BACKFILL	Grout
FIELD PARTY NA	RIG	Hollow Stem Auger

SAMPLE	NUMBER	SAMPLE	DEF IN F	PTH EET	PENETRATION RESISTANCE	LENGTH LENGTH RECOVERY	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	0	NR	0.0	10.0	blows/u	0	- 5	-		Straight drill to 10 feet, boring was pre-drilled for utility clearance; no samples were taken.		
								-				
	2	SS SS	10.0 12.0	12.0 14.0	1-0-0-1 0-3-5-2	18	- 10	-	ML	Silt, trace clay; wet; soft; rapid dilatancy; dark yellowish brown (10YR 4/4). Note: From 12 to 13 feet wet.		
	3	SS	14.0	16.0	0-3-3-4	18	- 15 -	-	SP	Note: From 13 to 15 feet coarsely interbedded with sand, little silt, loose. Sand, little to some silt; loose; dry; yellowish		
	4	SS	16.0	18.0	2-2-3-3	18	-			brown (10YR 5/4). Note: From 16 to 26.5 feet dry.		
	5	SS SS	20.0	20.0	3-2-3-3	17	- 20 -					
							-			Note: At 21 feet trace fine gravel.		
202			TYPE	OFC	ASING USED		Continued Next Page					
			NQ-2 R	RE		PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE						
į			<u>0 x 5.2</u> 9" x 6.2	5 HSA		411	SLO	OTTE	ED S	SCREEN, G = GEONOR, P = PNEUMATI	С	
	NA NA	HW CASING ADVANCER 4" NW CASING 3"					WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON					GEOMON
1 		SW CASING 6" A AIR HAMMER 8"					RECORDER J. Wanner					

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1602</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>3</u> BORING START 05/09/16 BORING FINISH 05/10/16

	SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	7	SS	22.0	24.0	1-2-3-5	17		-			Note: At 22 feet little amount of fine gravel.		
	8	SS	24.0	26.0	3-7-10-14	17		- 25 -			Note: At 24 feet trace medium subrounded gravel.		
ER.GPJ	9	SS	26.0	28.0	7-10-10-13	17		-		00	Note: From 25.8 to 26 feet little coarse sand.		
016/AEP MOUNTAINEE	10	SS	28.0	30.0	2-3-7-10	17			52	gravel is fine to medium, angular to subrounded; sand is fine to coarse.			
LOGS 9-2	11	SS	30.0	32.0	2-5-5-8	14		30 -		SP	Sand, little to some silt; dry; loose; sand is fine		
NEER BORING I	12	SS	32.0	34.0	4-7-7-10	13		-		SP	Sand, fine to coarse, little to some silt, little fine gravel, trace medium gravel; dry; loose.		
EP MOUNTAI	13	SS	34.0	36.0	7-11-11-11	18					gravel, igneous.		
REFERENCE/	14	SS	36.0	38.0	7-10-13-16	17		-					
ERVER USE FOF	15	SS	38.0	40.0	7-10-13-17	17					Note: At 39 feet, trace coarse rounded gravel,		
MBUS SE	16	SS	40.0	42.0	10-11-13-13	13		40 -			igneous.		
T SAVED TO COLUI	17	SS	42.0	44.0	6-10-11-14	19		יי היי יי יי יי יי יי יי יי			Note: At 41 feet, trace coarse rounded gravel, igneous.		
OJECTS/GIN	18	SS	44.0	46.0	8-10-12-15	14		-					
- C:\CHERYL\PR	19	SS	46.0	48.0	6-9-11-14	16		40 -					
10/05/16 15:36	20	SS	48.0	50.0	6-10-13-16	18		-					
AEP.GDT	21	SS	50.0	52.0	9-11-21-27	18		50 -					
AEP -											Continued Next Page		

JOB NUMBER 0H015976.0009

PROJECT Mountaineer Plant

LOG OF BORING

COMPANY American Electric Power

BORING NO. MW-1602 DATE 10/05/16 SHEET 3 OF 3 BORING START **05/09/16** BORING FINISH 05/10/16

PENETRATION HESISTANCE BLOWS / 6" SAMPLE SAMPLE NUMBER DEPTH GRAPHIC SAMPLE USCS DEPTH SOIL / ROCK DRILLER'S LOG WELL IN IN FEET **IDENTIFICATION** NOTES FEET FROM ΤO Note: From 51 to 52 feet, includes some fine gravel, angular to subangular. 22 SS 52.0 54.0 10-14-16-17 17 Note: From 52.5 to 53.5 feet includes trace medium subrounded gravel. SS 54.0 56.0 9-10-10-9 16 23 55 SP Sand, little to some silt, little to some fine gravel, trace medium to coarse gravel; dry; loose; sand is fine to coarse. 24 SS 56.0 58.0 5-2-4-3 18 ∇ Note: From 57 to 58 feet wet. 25 SS 58.0 60.0 5-6-6-10 18 60 60.0 62.0 6-7-7-10 0.8 26 SS 62.0 8-7-9-11 No recovery; driller said drilling conditions have 27 SS 64.0 0 not changed. 66.0 0 Note: From 64 to 66 feet all baskets replaced. 28 SS 64.0 7-9-13-18 65 29 SS 66.0 68.0 8-8-10-12 12 SP Sand, some silt, trace fine rounded gravel; wet; loose; sand is fine to coarse. 30 SS 68.0 70.0 6-9-8-11 Note: At 69.5 feet, subrounded gravel 70 70.0 31 SS 89.0 3-4-46-50 composed of coal (17 mm in size). Bedrock, competent. End of boring at 71.6 feet. See well construction log for development information.

AEP.GDT = 10/05/16 15:36 - C:\CHERYLIPROJECTS\GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCEIAEP MOUNTAINEER BORING LOGS 9-2016\AEP MOUNTAINEER GPJ AEP -
RIG Hollow Stem Auger

JOB	NUM	BER _	OH01	5976.00	09		_		LU	00	DORINO						
CON	IPAN	Y A m	nericar	Electr	ic Pow	er				BC	RING NO. <u>MW-1603</u>	_ DATE_1	0/05/16	SHE	ЕТ_	<u>1</u> c	F
PRO	JECT	_ Μοι	untaine	er Plar	nt					BC	RING START	8/16	BORING FII	NISH	05/	04/16	
coo	RDIN	ATES _	N 719	9,516.2	E 1,73	32,495	5.0			PIE	ZOMETER TYPE NA		WELL T	YPE	٥V	/	
GRO	UND	ELEVA		602.9	SY	STEM	N	AD 192	27	HG	T. RISER ABOVE GROU	UND 3.38		DIA	2"		
Wate	er Le	vel, ft	V 57	7.0	V		V			DE	PTH TO TOP OF WELL	SCREEN_	60.0 BOT	ТОМ	75.	0	
TIME	Ξ			-						WE		A	BACK	FILL	Gro	out	
DAT	E		5/3/2	2016						FIE	LD PARTY NA			RIG	Ho	llow S	<u>tem Aug</u>
SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STAN PENET RESIS BLOV	IDARD RATION TANCE VS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL	/ ROCK FICATION				DRI N(LLER'S DTES
0	NR	0.0	9.0			0		-	-		Straight drilled to 9.5 fe pre-drilled for utility cle were taken.	eet, boring arance, no	was samples				

DGS 9-2016/AEP MOUNTAINEER.GPJ	0	NR	0.0	9.0		0		Straight drilled to 9.5 feet, boring was pre-drilled for utility clearance, no samples were taken.
ERENCE/AEP MOUNTAINEER BORING LC	1	SS	9.0	11.0	1-2-3-3	21		ML Silt, trace clay; dry; rapid dilatancy; brown
O COLUMBUS SERVER USE FOR REFI	2 3	SS SS	11.0 13.0	13.0 15.0	2-2-3-4 3-4-4-5	20		CL (7.5YR 4/4). Grades to silt with clay; dry; non-dilatant; non-plastic; brown (7.5YR 4/4). Sand, fine to medium, trace gravel, trace silt; moist; loose; dark yellowish brown (10YR 4/4). Silt with little to some clay; moist; non-dilatant; non-plastic; yellowish brown (10YR 5/4). SIt with clay; dry; non-dilatant; ML Sand, fine to medium; dry; loose. Silt, some clay; dry; non-dilatant; non-plastic; yellowish brown (10YR 5/4).
- C:\CHERYL\PROJECTS\GINT SAVED T	4 5 6	SS SS SS	15.0 17.0 19.0	17.0 19.0 21.0	2-2-2-6 2-2-4-5 2-3-3-5	18 16 18	— 15 –	Sand, fine to coarse, trace gravel, fine to medium, subangular to subrounded, little silt; dry; loose. Note: From 19 to 21 feet no gravel present; moist.
16 15:44 -			TYPE	OF C	ASING USED			Continued Next Page
T - 10/05/	NA NA		NQ-2 R0 6" x 3.25 9" x 6 25	DCK CO 5 HSA 5 HSA	RE			IETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE DTTED SCREEN, G = GEONOR, P = PNEUMATIC
AEP.GD	NA NA		HW CAS	SING AE	VANCER	4" 3"	WELL T	YPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON
AEP - A	NA		SW CAS AIR HAI	SING		6" 8"		RECORDER J. Wanner

JOB NUMBER **OH015976.0009**

PROJECT Mountaineer Plant

LOG OF BORING

COMPANY American Electric Power

BORING NO. MW-1603 DATE 10/05/16 SHEET 2 OF 4 BORING START 05/03/16 BORING FINISH 05/04/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN FI FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
7	SS	21.0	23.0	3-2-4-4	18							
8	SS	23.0	25.0	2-5-8-8	17		05			Note: From 23.3 to 25 feet, includes trace gravel, fine to medium, subangular to subrounded.		
9	SS	25.0	27.0	4-4-5-6	20		25 -			Note: From 25 to 27 feet no gravel; moist.		
10	SS	27.0	29.0	4-4-6-8	18					Note: From 26 to 26.3 feet includes some gravel, fine to medium, subangular to subrounded. Note: From 27.5 to 28.5 feet weakly stratified.		
11	SS	29.0	31.0	2-6-7-7	20			-	· · · ·	Note: At 28.5 feet trace very fine coal fragments.		
12	SS	31.0	33.0	4-4-5-7	20		30 -		· · · · ·	Note: From 30 to 30.9 feet includes some fine gravel.		
13	SS	33.0	35.0	6-5-7-11	21				SW	Note: From 33 to 33.6 feet; moist. Fine sand with silt; moist; loose; yellowish brown (10YR 5/4).		
14	SS	35.0	37.0	10-8-10-10	21		35 -	• • • • • •	SP/	\uparrow Sand, little silt, little gravel; moist; loose; sand \int		
15	SS	37.0	39.0	13-8-10-9	18				SP	is fine to coarse; gravel is fine to medium. Sandy silt, some fine gravel, trace clay; moist; very soft; sand is fine to coarse; dark yellowish brown (10YR 4/4). Gravelly sand; dry; loose; sand is fine to coarse, gravel is fine to medium, both fractions are angular to subrounded		
16	SS	39.0	41.0	5-7-10-10	20			_	SP	Sand, fine to medium, little silt; dry; loose; yellowish brown (10YR 5/4).		
17	SS	41.0	43.0	6-9-10-12	17		40 -					
18	SS	43.0	45.0	6-11-20-18	21				· · · · ·	Note: From 42.6 to 42.9 feet includes some fine to medium gravel; subrounded. Note: From 44 to 44.8 feet includes some fine		
19	SS	45.0	47.0	9-12-14-14	20		45 -	-		to mealum gravel; round to subrounded.		

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY <u>American Electric Power</u> PROJECT <u>Mountaineer Plant</u>

BORING NO. <u>MW-1603</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>4</u>

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
20	SS	47.0	49.0	10-13-16-18	22					Note: From 46 to 46.9 feet includes some fine to medium gravel, subangular to subrounded.		
21	SS	49.0	51.0	6-7-10-14	18		50 -			Note: At 48 feet includes fine to medium gravel.		
22	SS	51.0	53.0	13-16-22-25	20					Note: From 50.5 to 51 feet slight increase in silt content.		
23	SS	53.0	55.0	7-9-12-15	20					Note: At 52 feet trace coal fines. Note: At 53 feet moist.		
24	SS	55.0	57.0	10-14-17-23	20		55 -		SM SP	Note: From 54.2 to 54.3 feet includes coal fines. Sandy silt, some clay; moist; soft; dark yellowish brown (10YR 4/4).		
25	SS	57.0	59.0	7-6-7-9	18					Sand, little silt; moist; loose; yellowish brown (10YR 5/4). Note: At 57 feet wet.	Ā	
26	SS	59.0	61.0	4-5-7-9	19		60 -			Gravelly sand; wet; loose; gravel is fine to medium sand is fine to coarse: vellowish		
27	SS	61.0	63.0	9-13-15-19	0.9				SP	Sand, little silt; wet; loose; sand is fine to coarse.		
28	SS	63.0	65.0	13-27-50/5	24							
29	SS	65.0	67.0	10-6-6-9	12		65 -			Note: From 64 to 65 feet heaving sands.		
30	SS	67.0	69.0	6-6-8-9	0.9				GP SP SP	Gravel, some coarse sand; wet; loose; gravel is fine to medium, subangular to subrounded dominant; washed. Sand, fine to medium, little silt; wet; loose; yellowish brown (10YR 5/4).		
31	SS	69.0	71.0	6-8-7-8	0.8		70 -		SP	Sand with fine gravel, little silt; wet; loose; sand is fine to coarse. Sand with little fine gravel, little silt; wet; loose.		
32	SS	71.0	73.0	4-5-4-5	0.9							

AEP - AEP.GDT - 10/05/16 15:44 - C./CHERYL/PROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCEAEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER GPJ

Continued Next Page

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power PROJECT Mountaineer Plant

BORING NO. MW-1603 DATE 10/05/16 SHEET 4 OF 4 BORING START 05/03/16 BORING FINISH 05/04/16

SAMPLE	NUMBER	SAMPLE	SAM DEF IN F	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
SIGINT SAVED TO COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER.GPJ COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER.GPJ COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER.GPJ COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER.GPJ COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER.GPJ COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER.GPJ COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER.GPJ COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER.GPJ COLUMBUS SERVER USE	S S	S	SAM DEF IN F FROM 73.0	PLE PTH EET TO 76.0	STANDARD PENETRATION RESISTANCE BLOWS / 6" 4-5-5-6	6.0 CTOTAL LENGTH	RQD %	DEPTH IN FEET	CAPHIC LOG LOG LOG LOG LOG LOG LOG LOG LOG LOG		SOIL / ROCK IDENTIFICATION End of boring at 76 feet. See well construction log for development information.	MELL	DRILLER'S NOTES
EP - AEP.GDT - 10/05/16 15:44 - C.\CHERYL\PROJECT													

JOB	NUM	BER _	OH	015	976.00	09		_		LU	90	FBURING
СОМ	PAN	Y <u>An</u>	neri	can	Electr	ic Pow	er				BC	RING NO. MW
PRO	JECT	_ Mo	unta	aine	er Plar	nt					BC	RING START
coo	RDIN	IATES	Ν	720	,194.0	E 1,73	33,082	2.0			PIE	ZOMETER TY
GRO	UND	ELEVA		N_5	95.6	SY	STEM	N/	AD 192	7	HG	T. RISER ABC
Wate	er Lev	/el, ft	$\overline{\nabla}$	51	.0	Ţ		Ī			DE	PTH TO TOP
TIME	=										WE	ELL DEVELOP
DAT	E		4	26/	2016						FIE	LD PARTY
SAMPLE NUMBER	SAMPLE	SAN DE IN F	/PLE PTH EE1	- 0	STAN PENETI RESIS BLOW	DARD RATION TANCE /S / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	
			-							-		

BORING NO. MW-1604D DATE	10/05/16 SHE	ET_ 1 _OF_ 4
BORING START 04/26/16	_ BORING FINISH	04/26/16
PIEZOMETER TYPE NA	WELL TYPE	OW
HGT. RISER ABOVE GROUND 2.	53 DIA	2"
DEPTH TO TOP OF WELL SCREE	N <u>69.0</u> ВОТТОМ	79.0
WELL DEVELOPMENT NA	BACKFILL	Grout
FIELD PARTY NA	RIG	Hollow Stem Auger

	SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	D DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
NCEVAEP MOUNTAINEEK BORING LOGS 9-2016/AEP MOUNTAINEER.GPJ	1	SS	8.8	8.8	2-2-3-3	0	- 5 -		SM	Fine sand with silt, trace clay; dry; loose;		
	2	SS	10.0	12.0	3-2-3-4	19	- 10 -			ycilowish blown (1011X 0/4).		
BUS SERVER USE FO	3	SS	12.0	14.0	3-1-5-10	18			ML	Silt, little clay, trace fine sand; moist; non-dilatant; non-plastic; yellowish brown		
	4	SS	14.0	16.0	9-9-8-9	0.9	45		SF	Sand, some gravel, little silt; dry; loose; gravel is fine to medium, subrounded to rounded, vollouigh brown (10XP 5/4)		
JECTS/GINT SAVED	5	SS	16.0	18.0	10-12-11-11	12	- 15 -			yellowish brown (10 rk 5/4).		
- C:\CHERYL\PRO	6	SS	18.0	20.0	11-11-9-10	14						
6 15:47	I		TYPE	OF C	ASING USED	ı <u> </u>				Continued Next Page		
10/05/1	NA		NQ-2 R(DCK CC	RE		PIEZON			E: PT = OPEN TUBE POROUS TIP, SS	; = OI	PEN TUBE
- Idbi	NA NA		9" x 6.25 HW_CAS	5 HSA SING AL	DVANCER	4"			שבים היים	N = OPEN TUBE SLOTTED SODEEN O	с м – 4	GEOMON
P - AEF	NA NA		NW CAS	SING SING		3" 6"		IPE.		RECORDER J. Wanner	- IVI - 1	
H A	NA		AIR HAN	MMER		8"						

PROJECT Mountaineer Plant

LOG OF BORING

COMPANY American Electric Power

BORING NO. <u>MW-1604D</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>4</u> BORING START 04/26/16 BORING FINISH 04/26/16

	SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
F	7	SS	20.0	22.0	8-9-12-12	18							
ER.GPJ	8 9	SS	22.0	24.0 26.0	5-10-12-13 7-10-13-14	16		-			Note: At 24 feet wet.		
AINE								25					
ORING LOGS 9-2016/AEP MOUNT	10 11	SS SS	26.0 28.0	28.0 30.0	8-10-18-22 3-10-16-22	16 18				SP	Sand, little fine gravel, little silt; moist; loose; sand is fine to coarse, subangular to rounded; yellowish brown (10YR 5/4).	-	
ER B(
AINE	12	SS	30.0	32.0	11-11-16-22	16		30 -					
FERENCE/AEP MOUNT	13	SS	32.0	34.0	10-12-19-17	14		-			Note: At 32 feet dry.		
JSE FOR RE	14	SS	34.0	36.0	6-11-16-18	18		-					
OLUMBUS SERVER L	15	SS	36.0	38.0	8-8-10-12	14		35 -					
GINT SAVED TO C	16	SS	38.0	40.0	6-7-7-10	17		-					
CTS/	17	SS	40.0	42.0	7-11-10-19	19		40 -					
15:47 - C:\CHERYL\PROJE	18	SS	42.0	44.0	6-8-14-17	19		-					
- 10/05/16	19	SS	44.0	46.0	10-8-8-9	19			-				
AEP.GDT								45 -					

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Continued Next Page

JOB NUMBER **OH015976.0009**

PROJECT Mountaineer Plant

LOG OF BORING

COMPANY American Electric Power

 BORING NO.
 MW-1604D
 DATE
 10/05/16
 SHEET
 3
 OF
 4

 BORING START
 04/26/16
 BORING FINISH
 04/26/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
20	SS	46.0	48.0	8-10-14-11	19		-			Note: From 46.3 to 46.45 feet black, fine, soft, organic layer, weak platy structure.		
21	SS	48.0	50.0	5-5-7-10	21		-		SP	Sand, little silt; moist; loose; sand is very fine to medium; yellowish brown (10YR 5/4).		
22	SS	50.0	52.0	5-8-8-10	21		50 -			Note: From 51 to 54 feet wet.	Ţ	
23	SS	52.0	54.0	8-8-10-12	19		-					
24	SS	54.0	56.0	6-5-6-8	21		55			Note: From 54 to 55.6 feet color changes to very dark grayish brown (10YR 3/2); wet.		
25	SS	56.0	58.0	4-8-30-42	18		-		SP	Note: From 55.6 to 55.9 feet stratified with little clay, black color.		
26	SS	58.0	60.0	5-5-10-11	16		-					
27	SS	60.0	62.0	7-10-12-18	21		60 -					
28	SS	62.0	64.0	9-10-15-16	18		-			Note: From 60.9 to 61 feet little fine rounded gravel. Note: From 61.4 to 61.6 feet is about 25-35% fine black material, possible coal.		
29	SS	64.0	66.0	9-12-15-15	16		65					
30	SS	66.0	68.0	3-8-10-15	20		-					
31	SS	68.0	70.0	3-8-16-24	20		-					
32	SS	70.0	72.0	6-20-32-30	20		70 —			Note: At 69.3 feet color is very dark gray (10YR 3/1). Note: At 69.4 feet color is dark yellowish brown (10YR 4/6). Note: From 70 to 71.7 feet color changes to		
<u> </u>	L		<u> </u>					191419		Continued Next Page		

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1604D</u> DATE <u>10/05/16</u> SHEET <u>4</u> OF <u>4</u> BORING START 04/26/16 BORING FINISH 04/26/16

S MADI E	NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	33 34	SS SS	72.0 74.0	74.0 76.0	9-14-17-21 9-14-14-19	21 17		- 75		SM SP	Silty fine sand; wet; loose; rapid dilatant grades to medium dilatant, yellowish brown (10YR 5/4). Sand, some silt, trace clay; wet; loose; trace fine to medium gravel, subrounded, grayish brown (10YR 5/2).		
INTAINEER.GPJ	35	SS	76.0	78.0	4-10-11-18	14							
3S 9-2016/AEP MOL	36	SS	78.0	80.0	6-14-15-17	18		-					
JEER BORING LOG								80 –			End of boring at 80 feet. See well construction log for development information.		
CE/AEP MOUNTAIN													
JSE FOR REFEREN													
LUMBUS SERVER													
SINT SAVED TO CC													
HERYL/PROJECTS/0													
/05/16 15:47 - C:\CH													
EP - AEP.GDT - 10													

			N 720	120 2	E 1 7	23 077	2						- <u>-</u>	<u></u>
	חועא			595 5	<u> </u>	00,011	. <u>2</u> N/	107	7			59 DV	<u>יט</u> : ייכ א	, vv
эко		ELEVP		555.5	 	STEIVI		AD 192			DTH TO TOD OF WELL SODE		\ <u>2</u>	<u>م</u>
Wate	er Lev	/el, ft	<u>⊻</u> 51	.0	<u> </u>		<u> </u>						- <u>- 53</u> C	rout
TIME													. <u>О</u>	ollow Stom /
DAT	E		4/28/	2016						FIE			, <u>I</u>	JIIOW Stellin
		SAM	IPLE	STAN	IDARD	_≿I	RQD	ПЕРТН	O					
1PLE 1BEF	4PLE	DE	PTH	PENET	RATION	A D D D D D D D D D D D D D D D D D D D			Hg	CS	SOIL / ROCK	C C C C C C C C C C C C C C C C C C C		DRILLER'
SAN	SAN	IN F		RESIS	TANCE		%	FFFT	GRA	S U	IDENTIFICATIO	N	Ň	NOTES
0	ND	FROM	TO	BLOV	VS / 6"	<u>۳</u>					Straight drilled from 0 to 40 for	at: goologic		
								- 5 -			descriptions adapted from the MW-1604D.	adjacent boring		
									-					
		TYP	EOFC	ASING	USED						Continued Next	Page		
		NQ-2 R		DRE				PIEZON	1ETEF		PE: PT = OPEN TUBE PC	DROUS TIP, SS	= OF	PEN TUBE
			<u>5 ПЗА</u> 5 ЦСЛ					SL	OTTE	ED S	SCREEN, G = GEONOR, I	P = PNEUMATIO	3	
NA NA		9°X 6.2	<u>3 113A</u>											
NA NA NA		9" x 6.2 HW CA	SING AL	DVANCE	R	4"		WELL T	YPE:	0	N = OPEN TUBE SLOTTE	ED SCREEN, G	M = 0	GEOMON

PROJECT Mountaineer Plant

LOG OF BORING

COMPANY American Electric Power

BORING NO. MW-1604S DATE 10/05/16 SHEET 2 OF 3 BORING START 04/28/16 BORING FINISH 04/28/16

SAMPLE NUMBER	SAMPLE	SAMI DEP IN FE FROM	PLE TH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
							-	-				
							-	-				
							25 – -	-				
							-	_				
							30 -	-				
							-	-				
							35	-				
							-	-				
							-	-				
							40 -	-				
							-	-				
							45 -	-		Continued Next Page		

AEP.GDT - 10/05/16 15:51 - C.:CHERYLIPROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER. GPJ AEP -

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1604S</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>3</u> BORING START _______ 04/28/16 ______ BORING FINISH _______ 04/28/16 ______

SAMPLE		SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	S S S S S S S S S S S S S S S S S S S	S S S S S S S S S S S S S S S S S S S	SAM DEF IN F FROM 51.0 53.0 55.0 57.0	PLE PTH EET TO 51.0 53.0 55.0 57.0 60.0	STANDARD PENETRATION RESISTANCE BLOWS / 6" 4-7-10-13 6-6-11-10 3-10-25-50/3 3-5-9-15 12-15-20-28	LOTAL LOTAL LUTAL LENGTH 57 57 57 57 57 57 57 57 57 57 57 57 57	RQD	DEPTH IN FEET 	Contraction of the second s	SP	SOIL / ROCK IDENTIFICATION Sand some silt, trace clay; moist to wet; loose; yellowish brown (10YR 5/4). Note: From 50 to 50.2 feet includes black, fine material likely coal. Note: At 53 feet wet. Note: At 54 feet trace medium subrounded gravel. Note: High blow count cause by heaving sand. Note: From 55 to 60 feet wet. End of boring at 60 feet. See well construction log for development information.	MELL WELL	DRILLER'S NOTES
0 - AEP.GDT - 10/05/16 15:51 - C.\CHERYL\PROJ													

JOB NUMBER OH0159	76.0009	LO		NG			
COMPANY American E	Electric Power		BORING NO	<u>MW-1605D</u>	DATE 10/05/16 SH	HEET	OF
PROJECT Mountainee	r Plant		BORING ST/	ART 05/09/	16 BORING FINISH	⊣_ 0	5/10/16
COORDINATES N 720,1	17.3 E 1,733,468.6	i	PIEZOMETE	R TYPE NA	WELL TYPE	<u> </u>	W
GROUND ELEVATION 58	8.5 SYSTEM	NAD 1927	HGT. RISER	ABOVE GROU	ND 2.50 DIA	۹_ <u>2'</u>	
Water Level, ft 🛛 44.0) 🔻	\mathbf{V}	DEPTH TO T	OP OF WELL S	CREEN 69.0 BOTTON	л <u>7</u> 9	9.0
TIME			WELL DEVE	LOPMENT N	BACKFILI	L <u> </u>	rout
DATE 5/9/20		FIELD PART	Y NA	RIC	э <u>Н</u>	ollow Stem Auger	
SAMPLE BAL DEPTH P WY WY IN FEET F	STANDARD		v C V	SOIL /	ROCK	VELL	DRILLER'S

MPLE		MPL	DEF IN F	PTH EET	PENETRATION RESISTANCE	OTAL NGTH SOVE	0/	IN	LOG	sco	SOIL / ROCK	VELL	DRILLER'S
V.	SZ	SA	FROM	то	BLOWS / 6"		70	FEET	д В –		IDENTIFICATION	>	NOTES
0GS 9-2016VAEP MOUNTAINEER.GPJ	0	NR	0.0	8.0		0		-	_		Straight Drilled to 8 feet, utility pre-clearance straight drilled; no samples taken.		
ERENCE/AEP MOUNTAINEER BORING L(1	SS	8.0	10.0	3-3-5-6	24		5		CL CH	Clay with silt; medium to high plasticity; slow dilatancy; dry; soft; brown (10YR 5/3).		
USE FOR REFE	2	SS	10.0	12.0	3-3-4-4	24		10 -		ML	Silt, little clay; low plasticity; little sand, very fine to fine; moist; soft; yellowish brown (10YR 5/4).		
MBUS SERVER	3	SS	12.0	14.0	1-1-2-3	22		-		ML	Silt; non-plastic; rapid dilatancy; little sand, very fine; moist; soft; yellowish brown (10YR 5/4).		
AVED TO COLU	4	SS	14.0	16.0	3-3-2-4	22		15 -					
ROJECTS/GINT S/	5	SS	16.0	18.0	1-1-2-3	21		-		SM	Sand, very fine; and silt; trace gravel, small pebbles, subangular to subround, poorly sorted; wet; yellowish brown (10YR 5/4).		
i4 - C:\CHERYL\PI	6	SS	18.0	20.0	1-4-7-10	10		-		SM	Sand, fine to very coarse; little silt; little gravel, small pebbles, subangular to subround; poorly sorted; dry; brown (7.5Y 5/4).		
16 15:5			TYPE	OF C	ASING USED						Continued Next Page		
GDT - 10/05/	NA NA		NQ-2 R(6" x 3.25 9" x 6.25		<u> </u>		PIEZOM SLC	IETEF	R TYF ED S	PE: PT = OPEN TUBE POROUS TIP, SS SCREEN, G = GEONOR, P = PNEUMATI	= OI C	PEN TUBE	
P - AEP.	NA NA	NW CASING ADVANCE 4 NW CASING 3" SW CASING 6"						WELL T	YPE:	0\	V = OPEN TUBE SLOTTED SCREEN, G RECORDER T. Darmon	IVI = (GEOMON
Ā	NA		AIR HAN	MMER		8"							

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. MW-1605D DATE 10/05/16 SHEET 2 OF 4 BORING START 05/09/16 BORING FINISH 05/10/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE	TOTAL LENGTH ECOVERY	RQD %	DEPTH IN FEFT	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
7	SS	FROM 20.0	22.0	BLOWS / 6"	19 19							
0	00	20.0	24.0	7 10 10 10	14		-		CM	Cond fine to person little city little group		
0	55	22.0	24.0	7-10-12-10	14		-		SIVI	small pebbles, subangular to subround; poorly sorted; dry; brown (7.5Y 5/4).		
9	55	24.0	26.0	10-7-7-9	16		25 –		SP	Sand, fine to coarse; trace silt; trace gravel, small pebbles, subround; well sorted; dry; yellowish brown (10YR 5/4).		
10	SS	26.0	28.0	4-5-12-7	17		-		SW	Sand, coarse, some gravel; small to medium pebbles, subangular to subround; poorly sorted; dry; light yellowish brown (10YR 6/4).		
11	SS	28.0	30.0	4-5-6-5	3		-		SP SP	Sand, medium, subangular to subround; little \silt; poorly graded; dark brown (10YR 8/2).		
							- 30			Sand, coarse; some gravel; small pebbles, subround; well sorted; dry; light gray (7.5Y 7/3).		
12	SS	30.0	32.0	5-9-10-8	2		-		SP	Sand, medium to coarse, subangular to subround; poorly graded; dry; brown (10YR 5/3).		
13	SS	32.0	34.0	3-4-9-6	17		-		SP	Sand, fine to medium, subround; poorly graded; dry; yellowish brown (10YR 5/4).		
14	SS	34.0	36.0	2-6-7-6	18		35 -					
15	SS	36.0	38.0	6-6-6-8	19		-		SP	Sand, fine to coarse; little gravel; granules to small pebbles; subangular to subround;		
16	SS	38.0	40.0	5-7-8-9	24		-			moderate to poorly graded; dry; yellowish brown (10YR 5/4).		
17	SS	40.0	42.0	5-6-7-8	17		40 -					
18	SS	42.0	44.0	5-6-7-7	16		-					
19	SS	44.0	46.0	4-5-6-5	23		45			Note: From 44 to 46 feet, moist.	Ţ	
				1						Continued Next Page		

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1605D</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>4</u> BORING START 05/09/16 BORING FINISH 05/10/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
20	SS	46.0	48.0	3-5-7-7	24		-		SP	Sand, fine to coarse; trace gravel, small pebbles, subround; little silt; poorly graded; wet; light yellowish brown (10YR 6/4).		
21	SS	48.0	50.0	NM	0		50	-		No Recovery, augers dropped to 49.5 feet overnight due to heaving sands. Sands heaved 10.5 feet into auger.		
22	SS	50.0	52.0	5-11-23-39	24		- 50		SP	Sand, medium to coarse, subangular to subround; little silt; moderate to poorly graded; wet; light yellowish brown (10YR 6/4).		
23	SS	52.0	54.0	4-7-9-9	5		-					
24	SS	54.0	56.0	3-3-7-7	14		55 -					
25	SS	56.0	58.0	7-10-10-9	12		-					
26	SS	58.0	60.0	9-15-10-11	20		-			Note: From 59 to 60 feet black discoloration		
27	SS	60.0	62.0	9-10-13-13	24		60		SW	Sand, fine to coarse, angular to subround; little to some silt; well graded; wet; grayish brown (10YR 5/2).		
28	SS	62.0	64.0	9-13-17-6	24		-		SW	Sand, fine to coarse; trace coal fragments at 62 to 62.5 feet; subangular to subround; poorly sorted; wet; pale brown (10YR 6/3).		
29	SS	64.0	66.0	5-9-4-4	8		65 –		SW	Sand, fine to medium; trace to little silt; subround; poorly graded; wet; pale brown (10YR 6/3).		
30	SS	66.0	68.0	9-10-10-19	24		-		SP	Sand, medium to coarse; trace gravel, small pebbles, subangular to subround; well sorted; wet; light gray (10YR 7/2).		
31	SS	68.0	70.0	9-14-22-20	8		-		SW	Sand, coarse; small pebbles, subround; poorly sorted; wet; very pale brown (10YR 7/4).		
32	SS	70.0	72.0	9-8-8-7	12		70					

Continued Next Page

JOB NUMBER **OH015976.0009**

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. MW-1605D DATE 10/05/16 SHEET 4 OF 4 BORING START 05/09/16 BORING FINISH 05/10/16

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	33 34	SS SS	72.0 74.0	74.0 76.0	7-8-14-11 9-21-8-10	14 20		- - 75					
MOUNTAINEER.GPJ	35	SS	76.0	78.0	10-13-21-10	13		-		SP	Sand, medium, subround; well sorted; wet; light gray (10YR 7/2).		
G LOGS 9-2016/AEP N	36	SS	78.0	80.0	13-14-29-14	16		- 80 –		SW	Sand, coarse; some gravel, small pebbles, subangular to subround; poorly sorted; wet; very pale brown (10YR 7/4). End of boring at 80 feet.		
IOUNTAINEER BORIN											See well construction log for development information.		
DR REFERENCE/AEP N													
1BUS SERVER USE FC													
NT SAVED TO COLUN													
HERYL/PROJECTS/GI													
- 10/05/16 15:54 - C:\C													
EP - AEP.GD1													

Water				588 5	ev	STEM	N/	102 [.]	7	μс		35	2	
vvater					_ 31	STEIV		AD 192	<u> </u>	DE		EN 49.0 BOTTOM	<u> </u>	9.0
	r Lev	el, π	<u>⊻</u> 44	·.0	_		<u> </u>			WF		BACKFILI	<u> </u>	rout
	-		EIAAI	2016						FIE			- <u>-</u> - H	ollow Stem Au
DATE	_		5/11/	2010										
SAMPLE NUMBER	SAMPLE	SAN DE IN F FROM	IPLE PTH EET TO	STAND PENETR RESIST BLOWS	ARD ATION ANCE S / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROC IDENTIFICATI	K ON	WELL	DRILLER'S NOTES
	NR							- 5			Straight drilled from 0 to 48 fe descriptions adapted from the MW-1605D.	et; geologic e adjacent boring		
		TYP			ISED			<u> </u>			Continued Nevt	Page		
	NQ-2 ROCK CORE						-+) <u></u>			- ^	
NA								SLC		ED S	CREEN, G = GEONOR.	P = PNEUMATI	- 01 C	

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1605S</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>3</u> BORING START 05/11/16 BORING FINISH 05/12/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN FI FROM	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
							-	-				
							-	-				
							25 — -					
							-	-				
							30 —	-				
							-	-				
							- 35 —					
							-	-				
							- 40 —	-				
							-	-				
							-				Ā	
							45 —					

Continued Next Page

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1605S</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>3</u> BORING START _______ BORING FINISH _______ 05/12/16

SAMPI F	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	nscs	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
ER.GPJ	1	SS	48.0	50.0	1-2-3-4	16		- - 50 —		SP	Sand, medium to coarse; trace to little silt and gravel, small pebbles, subangular to subround; moderate to poorly graded; wet; light yellowish brown (10YR 6/4).		
3 LOGS 9-2016/AEP MOUNTAINEE	3	SS	52.0 54.0	54.0 56.0	5-6-5-5	12		-		SP	Note: Poor recovery caused by drilling equipment failure at 51 feet. Sand, medium to coarse; trace to little gravel, small pebbles, subangular to subround; little silt; moderate to poorly graded; wet; pale brown (10YR 6/3).		
EP MOUNTAINEER BORING	5	SS	56.0	58.0	8-3-3-7	20		55 — - -					
AEP.GDT - 10/05/16 15:56 - C:\CHERYL\PROJECTS\GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCE\AEF	6	SS	58.0	60.0	10-13-50/6	24		-			End of boring at 59.5 feet spoon refusal. Note: Heaving sand. See well construction log for development information.		

RIG Hollow Stem Auger

JOB NUM	IBER _	OH01	5976.00	09		_		LO	GΟ	FBORING			
COMPAN	Y An	nericar	n Electr	ic Pow	er				BC	RING NO. MW-1606D DAT	E 10/05/16 SH	HEET	_1_OF_4
PROJECT	r_ Mo u	untaine	eer Plar	nt					BC	RING START 05/12/16	BORING FINISH	+ <u>0</u>	5/13/16
COORDIN	NATES	N 719	9,653.7	E 1,73	33,935	5.3			PIE	ZOMETER TYPE NA	WELL TYPE	<u> </u>	W
GROUND	ELEVA		587.3	SY	STEM	NA	D 1927	7	HG	T. RISER ABOVE GROUND 2	. .85 DIA	<u>2</u> ۱	
Water Le	vel. ft	☑ 43	3.0	V		V			DE	PTH TO TOP OF WELL SCREI	en <u>65.0</u> Botton	1 _7	5.0
TIME	,			-		-			WE	ELL DEVELOPMENT NA	BACKFILL	<u> </u>	Grout
DATE		5/12	/2016						FIE	ELD PARTY NA	RIG	э_ <u>н</u>	lollow Stem Aug
SAMPLE SAMPLE	SAN DE IN F FROM 0.0	APLE PTH EET TO 8.0	STAN PENETI RESIS BLOV	DARD RATION TANCE VS / 6"	LENGTH LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	L S C S	SOIL / ROCH IDENTIFICATION Straight drilled to 8 feet, borin for utility clearance; no sample	< ON g was pre-drilled es were taken.	MELL	DRILLER'S NOTES
							-	_					

8.0 10.0 3-3-4-5 25 ML Silt and sand, very fine; non-plastic; non-plastic; no dilatancy; moist; soft; light yellowish brown (10YR 6/4). 10 10.0 12.0 1-3-5-4 22 SC Sand, very fine; little silt; little clay; moist; light SM yellowish brown (10YR 6/4). 12.0 14.0 3-7-14-21 22 SW Sand, fine to coarse; little gravel, small to medium pebbles; subround; trace to little silt; well graded; dry; yellowish brown (10YR 5/4). 16.0 6-10-13-8 14.0 20 15 16.0 18.0 10-13-10-10 17 17 18.0 20.0 6-6-7-10

TYPE OF CASING USED Continued Next Page NQ-2 ROCK CORE PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE NA 6" x 3.25 HSA SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC NA 9" x 6.25 HSA NA HW CASING ADVANCER 4" WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON 3" NW CASING NA NA SW CASING 6" RECORDER T. Darmon AEP. 8" NA AIR HAMMER

AEP.GDT - 10/05/16 15:59 - C:/CHERYLIPROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER. GPJ

1 SS

2 SS

3 SS

4

5 SS

6 SS

SS

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1606D</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>4</u> BORING START 05/12/16 BORING FINISH 05/13/16

MPLE MBER	MPLE	SAM DEF IN F	IPLE PTH FFT	STANDARD PENETRATION RESISTANCE	DTAL NGTH OVERY	RQD	DEPTH IN	APHIC .0G	scs	SOIL / ROCK	/ELL	DRILLER'S
SAI	SAI	FROM	TO	BLOWS / 6"		%	FEET	GR/ L	ñ	IDENTIFICATION	3	NOTES
7	SS	20.0	22.0	10-10-7-6	23		-					
8	SS	22.0	24.0	10-10-13-14	21		-		SP	Sand, medium to coarse; trace gravel, small pebbles, subround; dry; light yellowish brown (10YR 6/4).		
9	ss	24.0	26.0	6-8-9-8	24		- 25			A		
10	SS	26.0	28.0	5-4-3-4	18				SP	Sand, medium to coarse; trace gravel, small pebbles, subround; poorly graded; dry; brownish yellow (10YR 6/6).		
11	SS	28.0	30.0	4-5-4-4	22		-	•••••	SW SP	Sand, fine to coarse, subround; well graded; dry; light yellowish brown (10YR 6/4) with black staining coal (10YR 2/1).		
12	SS	30.0	32.0	4-4-5-6	17		30 -		SP	small pebbles, subround; moderate to poorly graded; yellowish brown (10YR 5/4). Note:		
							-			Sand, medium to coarse; trace gravel, small pebbles, subround; poorly graded; dry; yellowish brown (10YR 5/4).		
	55	32.0	34.0	2-2-5-5	24		-	••••• ••••• •••••	Svv	Sand, medium to coarse; trace gravel, small pebbles, subangular to subround; some coal, highly weathered; stratified; well graded; dry; nale brown (10XP 6/3)		
14	SS	34.0	36.0	6-6-6-6	22		35	^				
15	SS	36.0	38.0	0-6-6-6	19		-		SP	Sand, fine to coarse, subround; trace to little silt; poorly graded; dry; yellowish brown (10YR 5/4).		
16	SS	38.0	40.0	2-3-3-2	20							
17	SS	40.0	42.0	2-2-3-5	22		40 -					
18	ss	42.0	44.0	1-3-5-6	24		-			Note: From 42 to 43 feet moist.	 	
19	SS	44.0	46.0	8-9-10-13	24		۸ E		SP	Sand, medium to coarse, subround; trace to little silt; poorly graded; wet; yellowish brown		
							40 -			(10YR 5/4). Note: Recovered sample was all heaved		

JOB NUMBER **OH015976.0009**

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1606D</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>4</u> BORING START 05/12/16 BORING FINISH 05/13/16

APLE ABER	APLE	SAM DEF	IPLE PTH	STANDARD PENETRATION	ITAL IGTH DVERY	RQD	DEPTH IN	VPHIC OG	scs	SOIL / ROCK	ELL	DRILLER'S
SAN	SAN	IN F	TO	BLOWS / 6"	RECC	%	FEET	GRA	n S	IDENTIFICATION	×	NOTES
20	SS	46.0	48.0	10-15-23-23	29				SP	\sands.		
										Sand, medium to coarse, subround; poorly graded; wet; yellowish brown (10YR 5/4). Note heaving sands.		
21	SS	48.0	50.0	4-4-2-3	13			-	SP	Sand, fine to coarse, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
22	SS	50.0	52.0	9-9-3-2	16		50 -	-	SP	Sand, medium to coarse; trace fine, subangular to subround; poorly graded; wet; yellowish brown (10YR 5/4).		
23	SS	52.0	54.0	3-2-9-9	19				SP	Sand, medium to coarse; trace silt and gravel, small pebbles, subangular to subround; poorly graded; wet; yellowish brown (10YR 5/4).		
24	SS	54.0	56.0	3-9-13-30	24		55 -					
25	SS	56.0	58.0	9-13-13-3	21				SW	Sand, fine to coarse; little gravel, small to		
					10				0.5	moderate to well graded; wet; yellowish brown (10YR 5/4).		
26	55	58.0	60.0	10-15-13-14	19				SP	sand, fine to medium, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
									SP	Sand, medium to coarse, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
27	SS	60.0	62.0	7-12-15-10	16		60 -	-				
28	SS	62.0	64.0	7-10-10-11	24			-	SP	Sand, medium to coarse: trace gravel, small to		
										medium pebbles, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
29	SS	64.0	66.0	9-12-18-19	19		65 -	-				
30	SS	66.0	68.0	7-13-18-32	13			- • • • • • • • • • • • • • • • • • • •	SW	Sand, fine to coarse, subangular to subround; moderate to well graded; wet; light brownish gray (10YR 6/2).		
31	SS	68.0	70.0	8-8-24-7	13							
							70		SM	Note: At 60 feet 40% granules to small pebbles.		
32	SS	70.0	72.0	8-23-7-11	19		70 -	_	SP	Sand, fine to coarse; some silt; trace clay; well graded; wet; yellowish brown (10YR 5/4).		
								**** ****	SW	\graded; wet; yellowish brown (10YR 5/4).		

Continued Next Page

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power PROJECT Mountaineer Plant

BORING NO. <u>MW-1606D</u> DATE <u>10/05/16</u> SHEET <u>4</u> OF <u>4</u> BORING START _______ BORING FINISH _______ 05/13/16

	NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	33 34	SS SS	72.0 74.0	74.0	13-20-22-23 14-13-10-10	15 15		- 75 —		SP	Sand and gravel, medium to coarse, small to medium pebbles; subround to round; well graded; wet; yellowish brown (10YR 5/4). Sand, medium to coarse, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
ER.GPJ								-			End of boring at 76 feet.		
- 10/05/16 15:59 - C:/CHERYL/PROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER											End of boring at 76 feet. See well construction log for development information.		
EP - AEP.G													

COM	IPAN'	Y <u>An</u>	nerican	Electr	ic Pow	er	_			BC	DRING NO. <u>MW-1606S</u> DATE <u>10/05/16</u> SH	HEET	1 OF;
PRO	JECT	Mo	untaine	er Pla	nt					BC	RING START BORING FINISH	- <u>0</u>	5/17/16
00	RDIN	IATES	N 719	,649.2	E 1,73	33,939	.3			PIE	ZOMETER TYPE NA WELL TYPE	<u> </u>	W
GRO	UND	ELEVA	TION_5	587.3	SY	'STEM	Ν	DA 192	7	HG	T. RISER ABOVE GROUND 2.87 DI	A <u>2</u> '	•
Wate	er Lev	/el, ft	⊻ 43	3.0	Ţ		Ţ			DE	PTH TO TOP OF WELL SCREEN 49.0 BOTTOM	/ <u>5</u>	9.0
ГІМЕ	Ξ									W	ELL DEVELOPMENT NA BACKFILI	G	rout
DAT	E		5/17/	2016						FIE	ELD PARTY NA RIC	• <u>H</u>	ollow Stem A
		0.44		0.741									
SAMPLE NUMBER	SAMPLE	SAM DE IN F FROM	APLE PTH EET TO	STAN PENET RESIS BLOV	IDARD RATION TANCE VS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
0	NR	0.0	44.0					- 5 - - - - - - - - - - - - - - - - - -			Straight drilled from 0 to 44 feet; geologic descriptions adapted from the adjacent boring MW-1606D.		
	I	TYP	E OF C	ASING	USED			I		I	Continued Next Page		I
	NQ-2 ROCK CORF						-+) -) /-		- 0	
NA	NA 6" x 3.25 HSA						PIEZOM	IE TEF OTTF	k TYF ED S	CREEN. G = GEONOR P = PNFLIMATI	: = 01 C	PEN TUBE	
NA NA		<u>9" x 6.2</u> нw с^	5 HSA		R	۵"	-		~ 1 1 L			<u> </u>	
NA		NW CA	SING		-1.\	3"		WELL T	YPE:	0	W = OPEN TUBE SLOTTED SCREEN, G	IVI = (GEOMON
NA		SW CA	SING			6"					RECORDER <u>T. Darmon</u>		

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1606S</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>3</u> BORING START 05/17/16 BORING FINISH 05/17/16

SAMPLE	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
							-					
GPJ							-					
							25 —					
JGS 9-2016/AEP							-	-				
							- 30 —	-				
							-	-				
OR REFERENCE							-	-				
SERVER USE F							35 —	-				
0 TO COLUMBUS							-	-				
							- 40 —	-				
CHERYLVPROJEC							-					
05/16 16:01 - C:\(SS	44.0	46.0	5-7-15-15	24		-		SP	Sand, fine to coarse, subround; poorly graded:	Ţ	
AEP.GD1 - 10/(45 —			wet; yellowish brown (10YR 5/4).		
Ани - х										Continued Next Page		

JOB NUMBER **OH015976.0009**

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1606S</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>3</u> BORING START 05/17/16 BORING FINISH 05/17/16

	SAMPLE NUMBER	SAMPLE	SAM DEF IN F	PLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	2	SS	46.0	48.0	2-2-5-5	13		-					
GPJ	3	SS	48.0	50.0	3-7-11-11	24		-		SP	Sand, medium to coarse, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
MOUNTAINEER.	4	SS	50.0	52.0	5-7-7-8	24		- 50		SP	Sand, fine to coarse, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
GS 9-2016\AEP	5	SS	52.0	54.0	5-5-4-4	18		-		SP	Sand, fine to coarse; trace silt; trace gravel, small pebbles, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
EER BORING LO	6	SS	54.0	56.0	10-22-15-22	24		55 —			Note: From 55 to 56 feet increase small to medium pebbles.		
AEP MOUNTAINE								-			End of boring at 56 feet. See well construction log for development information.		
R REFERENCEV													
SERVER USE FC													
O COLUMBUS													
S\GINT SAVED T													
ERYLVPROJECTS													
6 16:01 - C:\CHE													
EP.GDT - 10/05/1													
EP - A													

JOB NUMBER	OH015976.00	09		LUG UI
COMPANY An	nerican Electr	ic Power		во
PROJECT MO	untaineer Plai	nt		ВО
COORDINATES	N 719,235.7	E 1,734,361	.8	PIE
GROUND ELEVA	TION 590.8	SYSTEM	NAD 1927	HG
Water Level, ft	⊻ 46.0	Ţ	Ī	DE
TIME				WE
DATE	5/18/2016			FIE

BORING NO. MW-1607D	DATE 10/05/16	SHEET	1	_ OF	4
BORING START 05/18/	6 BORING	FINISH 0	5/18/1	6	
PIEZOMETER TYPE NA	WELL	TYPE 0	W		
HGT. RISER ABOVE GROUN	ND 3.18	DIA	•		
DEPTH TO TOP OF WELL S	CREEN 70.0 BC	оттом 8	0.0		
	BAG	CKFILL <u>G</u>	rout		
FIELD PARTY NA		rig <u>H</u>	ollow	Stem	n Auger

	SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	LENGTH LENGTH RECOVERY %	DEPTH IN FEET	GRAPHIC LOG	NSCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
LOGS 9-2016/AEP INCUN LAINEER.GPJ	0	NR	0.0	8.0		0	- 5 -	-		Straight drill boring to 8 feet, boring was pre-drilled for utility clearance; no samples were taken.		
OUN LAINEEK BORING							-	-				
	1	SS	8.0	10.0	1-2-3-4	24	-	-	ML	Silt, trace to little clay, non-plastic, none to slow dilatancy; trace sand, very fine; moist; soft; very pale brown (10YR 7/4).		
	2	SS	10.0	12.0	1-3-4-4	22	- 10 -		SC SM	Sand, very fine to fine; silt; trace to little clay; well graded; moist; light yellowish brown (10YR 6/4).		
MBUS SERVER	3	SS	12.0	14.0	2-4-5-5	20	-		CL	Clay; little silt; medium to high plasticity; trace to little very fine to fine sand; moist; medium stiff; yellowish brown (10YR 5/4).		
	4	SS	14.0	16.0	4-6-8-10	22	- 15 -	-	SM	Sand and silt; fine; medium to well graded; dry; yellowish brown (10YR 5/4).		
CUECIS/GINI S	5	SS	16.0	18.0	6-9-10-8	18	-		SW	Sand, medium to coarse; some gravel, small to medium pebbles, little fine, subangular to subround; well graded; dry; yellowish brown (10YR 5/4).		
- C:/CHEKYL/PK	6	SS	18.0	20.0	6-9-8-11	14	-			Note: At 19.5 feet coal fines present.		
0.16:03			TYPE	OF C	ASING USED	II		1.2.2		Continued Next Page	I	
11/90/0			NQ-2 R	ОСК СС	DRE		PIEZOM	ETER	R TYF	PE: PT = OPEN TUBE POROUS TIP. SS	= OF	PEN TUBE
	NA NA		<u>6" x 3.2</u> 9" x 6.2	5 HSA 5 HSA			SLC		ED S	CREEN, G = GEONOR, P = PNEUMATI	0	
	NA			SING AL	DVANCER	4" 2"	WELLT	YPE:	O١	N = OPEN TUBE SLOTTED SCREEN, G	M = (GEOMON
- A	NA	A SW CASING 3" A SW CASING 6"					-			RECORDER T. Darmon		
۲F	NA	1 .	AIR HAI	MMER		8"						

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1607D</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>4</u> BORING START 05/18/16 BORING FINISH 05/18/16

	NUMBER	SAMPLE	SAM DEF IN F	PLE PTH EET	STANDARD PENETRATION RESISTANCE	TOTAL LENGTH RECOVERY	DEPTH	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
-	7	SS	20.0	22.0	9-13-13-6	24			SM	Sand and silt; fine to coarse; little to some		
	8	SS	22.0	24.0	5-5-9-10	19				gravel, small to medium pebbles, subangular to subround; trace clay; well graded; moist; yellowish brown (10YR 5/4).		
0	0	22	24.0	26.0	8 8 0 G	20			SP	Sand, medium to coarse; trace silt; subround; poorly graded; dry; yellowish brown (10YR 5/4).		
	9	33	24.0	20.0	0-0-9-0	20	25 -		300	subround; well graded; dry; yellowish brown (10YR 5/4).		
	10	SS	26.0	28.0	6-5-6-5	24			SW	Sand, fine to coarse; some gravel, angular to subround; trace silt; well graded; dry; yellowish		
	11	SS	28.0	30.0	5-6-6-5	22				biowii (101K 5/4).		
	12	SS	30.0	32.0	4-4-4-6	22	- 30 -		SP	Sand, fine to medium, subround; trace silt;	-	
								-	•	poorly graded; dry; brown (10YR 5/3).		
	13	SS	32.0	34.0	4-9-9-9	24			SW	Sand, fine to medium; trace coarse gravel; small to medium gravel; pebbles; subangular to subround; dry; brown (10YR 5/3).		
	14	SS	34.0	36.0	5-7-9-4	24	- 35 -		> > >			
	15	SS	36.0	38.0	5-6-6-9	21			SW	Note: From 35.8 to 36 feet includes coal.		
	16	SS	38.0	40.0	4-6-8-8	18			• • •	pebbles, subangular to subround; well graded; satinfin <1" thick, pale brown (10YR 6/3).		
							10	-	•	Note: From 26 to 39 feet includes trace to little amount of coal fragments.		
	17	SS	40.0	42.0	4-4-6-8	22	40 -		SP	Sand, fine to medium, subround: trace to little silt; poorly graded; dry; yellowish brown (10YR 5/4).		
	18	SS	42.0	44.0	3-6-8-8	20			•			
2010000	19	SS	44.0	46.0	4-6-7-8	24	45					
							45			Note: At 46 feet, saturated.	$\overline{\nabla}$	

Continued Next Page

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1607D</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>4</u> BORING START 05/18/16 BORING FINISH 05/18/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN F	IPLE PTH EET	STANDARD PENETRATION RESISTANCE	TOTAL LENGTH ECOVERY	^{IQD} DEPTH IN % FFFT	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
20	SS	46.0	48.0	BLOWS / 6"	24			SW	Sand, fine to coarse, subround; well graded; wet; yellowish brown (10YR 5/4).		
21	SS	48.0	50.0	NM	0				No recovery; heaving sands.		
22	SS	50.0	52.0	1-3-7-9	28	50 -	-	SP	Sand, medium to coarse; trace to little silt; subround; poorly graded; wet; yellowish brown (10YR 5/4).		
23	SS	52.0	54.0	5-6-9-15	28		-	· · · · ·			
24	SS	54.0	56.0	7-9-14-15	15	55 -		SW	Note: At 53.5 feet coal present. Sand, fine to coarse; little gravel, small pebbles; subround; medium to well graved, dark brown (10YR 7/4).		
25	SS	56.0	58.0	7-10-10-13	13			SW	Sand, fine to coarse; trace to little small pebbles, subround; well graded; wet; pale brown (10YR 7/4).		
26	SS	58.0	60.0	5-6-10-11	14						
27	SS	60.0	62.0	6-10-11-13	11		-	SP	Sand, medium to coarse; trace small pebbles, subround; poorly graded; wet; yellowish brown (10YR 5/4).		
28	SS	62.0	64.0	8-10-13-11	0				No recovery.		
29	SS	64.0	66.0	5-10-13-5	15			SP	Sand, medium to coarse; trace fine; trace silt; trace gravel; small to medium pebbles, subround, poorly graded; wet; yellowish brown (10YR 5/4)		
30	SS	66.0	68.0	10-15-20-22	18		-	SP	Sand, medium to coarse, subround; medium to poorly graded; wet; yellowish brown (10YR 5/4).		
31	SS	68.0	70.0	11-15-15-7	20			SW	Sand, fine to very coarse, subround; little to some silt; medium to well graded; wet; light brownish gray (10YR 6/2).		
32	SS	70.0	72.0	2-6-14-14	15		- * * * * * * * * * * * * * * * * * * *				
L			I	1		I	**		Continued Next Page	I	

AEP - AEP.GDT - 10/05/16 16:03 - C:/CHERYL/PROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCEAEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER GPJ

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power PROJECT Mountaineer Plant

BORING NO. <u>MW-1607D</u> DATE <u>10/05/16</u> SHEET <u>4</u> OF <u>4</u> BORING START 05/18/16 BORING FINISH 05/18/16

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
	33 34	SS SS	72.0 74.0	74.0 76.0	10-15-18-18 9-12-12-7	12		-					
UNTAINEER.GPJ	35	SS	76.0	78.0	6-6-8-8	24		- 75 -		SP	Sand, medium to coarse, subround; poorly graded; wet; pale brown (10YR 6/3).		
LOGS 9-2016/AEP MO	36	SS	78.0	80.0	20-30-22-11	24		- - 80 –			End of boring at 80 feet		
UNTAINEER BORING											See well construction log for development information.		
REFERENCE/AEP MC													
BUS SERVER USE FOI													
VIT SAVED TO COLUM													
HERYL\PROJECTS\GIN													
- 10/05/16 16:03 - C:\CH													
EP - AEP.GDT													

COMPANY American Electric Power BORING NO. MM.49275 DATE Selectric Mountaineer Plant COMPANY Maria Leval, 10 F.3. BORING NO. MM.49275 DATE Selectric Mountaineer Plant COMPANY Maria Leval, 10 F.3. Maria Leval, 10 F.3. SROUND ELEVATION, 580.8 SYSTEM NAD 1927 Maria Leval, 10 F.3. Maria Leval, 10 F.3. SROUND ELEVATION, 580.8 SYSTEM NAD 1927 Maria Leval, 10 F.3. Maria Leval, 10 F.3. SROUND ELEVATION, 580.8 SYSTEM NAD 1927 Maria Leval, 10 F.3. Maria Leval, 10 F.3. SROUND ELEVATION, 580.8 SYSTEM NAD 0 Y PETH State 100 F.3. Maria Leval, 10 F.3. Maria Leval, 10 STATE DESCRUE State 10 State 10 Maria Leval, 10 F.3. Notes Notes Notes Maria Leval, 10 State 10 State 10 State 10 State 10 Notes Notes Notes Notes State 10 State 10 State 10 State 10 Notes <t< th=""><th>JOB N</th><th>NUM</th><th>BER _</th><th>OH015</th><th>5976.00</th><th>09</th><th></th><th>-</th><th></th><th>LU</th><th>30</th><th>BORING</th><th></th><th></th><th></th></t<>	JOB N	NUM	BER _	OH015	5976.00	09		-		LU	30	BORING					
ROUED (Mountaineer Plant DORING START DSZR/16 DSZR/16 DORING START DSZR/16 <th colspan="2" dor<="" th=""><th>COMF</th><th>PAN</th><th>An An</th><th>nerican</th><th>Electri</th><th>c Pow</th><th>er</th><th></th><th></th><th></th><th>BO</th><th>RING NO. <u>MW-1607S</u> DAT</th><th>'E 10/05/16 SH</th><th>HEET .</th><th>1_OF_3_</th></th>	<th>COMF</th> <th>PAN</th> <th>An An</th> <th>nerican</th> <th>Electri</th> <th>c Pow</th> <th>er</th> <th></th> <th></th> <th></th> <th>BO</th> <th>RING NO. <u>MW-1607S</u> DAT</th> <th>'E 10/05/16 SH</th> <th>HEET .</th> <th>1_OF_3_</th>		COMF	PAN	An An	nerican	Electri	c Pow	er				BO	RING NO. <u>MW-1607S</u> DAT	'E 10/05/16 SH	HEET .	1_OF_3_
SOORDINATES NY 19,222.0 E1,724,385.1 PIEZOMETER TYPE NA WELL TYPE OW Water Level, ft V V V V V Continued Next Page BACKTURE GOUL GOUL <th>PROJ</th> <th>ECT</th> <th>Mo</th> <th>untaine</th> <th>er Plar</th> <th>t</th> <th></th> <th></th> <th></th> <th></th> <th>BO</th> <th>RING START 05/26/16</th> <th>BORING FINISH</th> <th>+ <u>05</u></th> <th>5/26/16</th>	PROJ	ECT	Mo	untaine	er Plar	t					BO	RING START 05/26/16	BORING FINISH	+ <u>05</u>	5/26/16		
BROUND ELEVATION 590.8 SYSTEM NAD 1927 Hot Risker Adove GROUND, 320 Dottor 50 Government Stress Mater Level, nt 46.0 Y Y BACKFILL Grout Mater Level, nt S26/2016 File BACKFILL Grout Grout SAMPLE STANDARD Y Resistance S00 PROMPTION 070 OF WELL SCREEN 50 BACKFILL Grout SAMPLE STANDARD Y N S01/ ROCK Hollow Stem Aug No 0 500 N S01/ ROCK BACKFILL BACKFILL Grout SAMPLE STANDARD Y RESISTANCE S00 DEPTH S01/ ROCK BACKFILL Grout No 0 500 0 N S01/ ROCK DENTIFICATION BACKFILL	COOF	RDIN	ATES	N 719	,232.0	E 1,73	34,365	5.1	D 1007		PIE	ZOMETER TYPE NA	WELL TYPE	<u> </u>	<u>W</u>		
Water Level, IT Y 46.0 Y Depth 10 TO PO For WELL SCREEN, 50, BOTTON 50, FOR TAIDARD, SOL 700, FOR TAIDARD,	GROL	JND	ELEVA	TION	590.8	SY	STEM	NA	D 1927		HG	T. RISER ABOVE GROUND 3	3.20 DI/	× <u>2'</u>			
TIME SACHEL SCOUL WELD PARTY_NA BACKFILL Grout US SMPLE STANDARD	Wate	r Lev	el, ft	⊻ 46	6.0	Ţ		Ā			DE	PTH TO TOP OF WELL SCRE	EN <u>50</u> BOTTON	<u> </u>)		
DATE 528/2016 FIELD PARTY_NA RG Hollow Stem Aug SMMPLE SMMPLE IN FEET STANDARD PEET STANDARD PEET STANDARD PEET SOUL/ROCK IDENTIFICATION III 0 NR 0.0 50.0 0 III IDENTIFICATION IIII 0 NR 0.0 50.0 0 IIII IDENTIFICATION IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	TIME										WE	LL DEVELOPMENT NA	BACKFIL	_ <u>G</u>	rout		
Homework SMMPLE DEPTH PENETRATION STANDARD PEET REDISTANDARD BLOWS / 6' DEPTH N EESTANDARD	DATE	Ξ		5/26/	2016						FIE	LD PARTY NA	RIC	• <u>H</u>	ollow Stem Auge		
0 NR 0.0 50.0 0 0 Straight drill boing to 50 feet, boing was pre-drilled for utility clearance; no samples -	SAMPLE NUMBER	SAMPLE	SAN DE IN F	MPLE PTH EET	STAN PENETF RESIS	DARD RATION FANCE	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCI IDENTIFICATI	K ON	WELL	DRILLER'S NOTES		
TYPE OF CASING USED Continued Next Page NQ-2 ROCK CORE PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC NA 9" x 6.25 HSA NA 9" x 6.25 HSA NA HW CASING ADVANCER NA NW CASING NA SW CASING NA SW CASING NA SW CASING SU RECORDER T. Darmon		NR	FROM	TO 50.0	BLOW	<u>'S / 6"</u>			- 10			Straight drill boring to 50 feet, pre-drilled for utility clearance were taken.	boring was ; no samples				
NA 9" x 6.25 HSA SECTED SCREEN, G = GEONOR, P = PNEOMATIC NA HW CASING ADVANCER 4" NA NW CASING 3" NA SW CASING 6" NA 10000000000000000000000000	NA	TYPE OF CASING USED							PIEZOM			Continued Next	<i>Page</i> OROUS TIP, SS	= OF	PEN TUBE		
NA NW CASING 3" WELL TYPE: OW = OPEN IUBE SLOTTED SCREEN, GM = GEOMON NA SW CASING 6" RECORDER T. Darmon	NA		$\frac{9}{100} \times 6.2$	5 HSA		D	⊿"		SLC		с с С	UNEEN, G - GEUNUR,			0501/01		
NA SW CASING 6" RECORDER T. Darmon	NA		<u>NW CA</u>	SING AL	JVANCE		3"		WELL T	YPE:	0\	V = OPEN TUBE SLOTT	ED SCREEN, G	M = (GEOMON		
	NA		SW CA	SING			6"					RECORDER T. Darmon	n				

PROJECT Mountaineer Plant

LOG OF BORING

COMPANY American Electric Power

BORING NO. <u>MW-1607S</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>3</u> BORING START 05/26/16 BORING FINISH 05/26/16

SAMPLE NUMBER	SAMPLE	SAMI DEP IN FE FROM	PLE TH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
							-	-				
							-	-				
							25 -	-				
							-	_				
							30 -	-				
							-	-				
							35 -	-				
							-	-				
							-	_				
								-				
							-	-				
							45			Continued Next Page	∇	

AEP.GDT - 10/05/16 16:06 - C:/CHERYLIPROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCE/AEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER. GPJ AEP -

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power PROJECT Mountaineer Plant

BORING NO. <u>MW-1607S</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>3</u> BORING START ________ BORING FINISH ________

	SAMPLE NUMBER	SAMPLE	SAN DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
ER.GPJ	1	SS	50.0	52.0	NA	0		- - 50 —	-		Augers dropped 4 foot into hole due to heaving		
9-2016/AEP MOUNTAINE	2	SS	52.0	54.0	NA	0		-	-		sands, no samples collected.		
BORING LOGS	3	SS	54.0	56.0	WOH-WOH-2-2	0		- 55 —	-		No sample collected, no recovery, attempted resample but auger dropped additional 2 feet due to heaving sands.		
MOUNTAINEER	4	SS	56.0	58.0	4-5-6-10	15		-	•••••	SW	Sand; fine to coarse; trace to little gravel; small pebbles; subround; moderate to well graded; wet; pale brown (10YR 7/4).		
REFERENCE/AEP	5	SS	58.0	60.0	5-5	20		-					
AEP - AEP.GDT - 10/05/16 16:06 - C:\CHERYL\PROJECTS\GINT SAVED TO COLUMBUS SERVER USE FOR								60 —			End of boring at 60 feet. See well construction log for development information.		

PRO	JECI	Mo	untaine	er Plant				BC	DRING START 06/02/16 BORING FINISH 06/07/16				
200	RDIN	IATES	N 723	8,642.8 E 1,7	30,611.2	2		PI	PIEZOMETER TYPE NA WELL TYPE OW				
GROUND ELEVATION 587.3 SYSTEM NAD 1927									GT. RISER ABOVE GROUND 3.39 DIA 2"				
Water Level, ft								DE	PTH TO TOP OF WELL SCREEN 46.0 BOTTOM 56.0				
TIME								W	ELL DEVELOPMENT NA BACKFILL Grout				
DAT	E		6/2/2	2016				FII	ELD PARTY NA RIG Hollow Stem Auge				
SAMPLE NUMBER	Z SAMPLE	SAM DE IN F FROM	APLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	DENCIAL LENGTH RECOVERY	QD DEP N % FEE	GRAPHIC LOG	USCS	SOIL / ROCK				
1 4 5	SS	12.0 14.0 16.0	14.0 16.0 18.0	5-4-5-5 3-1-1-2 1-1-1-3	24 21 21	1(1(ML	Silt; little clay; trace fine sand; dry; slow dilatancy; (10YR 4/5).				
6	SS	18.0	20.0	1-2-4-3	21			• • • • • •					
	1	TYP	E OF C	ASING USED)		• • •	<u> • I</u>	Continued Next Page				
NQ-2 ROCK CORE PIF7OMFTFF									PE: PT = OPEN TUBE POROUS TIP. SS = OPEN TUBE				
NA		<u>6" x 3.2</u>	5 HSA			S	SLOTT	ED S	SCREEN, G = GEONOR, P = PNEUMATIC				
NA		<u>9 x 6.2</u> <u>HW</u> CA	<u>SING</u> AI	DVANCER	4"			\sim					
NA		NW CA	SING		3"		L I I PE.		W - OF LIN TODE SLOTTED SOREEIN, GIVI - GEOWION				
NA		SW CA	SING		6"				RECORDER J. Wanner				

JOB NUMBER **OH015976.0009**

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1608</u> DATE <u>10/05/16</u> SHEET <u>2</u> OF <u>3</u> BORING START 06/02/16 BORING FINISH 06/07/16

SAMPLE NUMBER	SAMPLE	SAM DEF IN F FROM	IPLE PTH EET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
7	SS	20.0	22.0	14	14							
8	SS	22.0	24.0	7-13-15-14	13		-		SW	Sand; some gravel; fine to medium; angular; dry; loose; unstratified; gravel is igneous dominant; (10YR 4/3).		
9	SS	24.0	26.0	10-16-14-11	13		25 -					
										Note: At 25 feet trace coal and gravel (metamorphic; rounded); foliated.		
10	SS	26.0	28.0	8-12-12-14	17		-		SW	Sand; some gravel, fine to medium; angular; dominant; little silt; dry; loose; unstratified; gravel is igneous dominant; (10YR 4/3).		
11	SS	28.0	30.0	9-15-12-14	14		-					
12	SS	30.0	32.0	6-8-9-17	18		30 -	- • • •				
10					00		-	· · · · · · · · · · · · · · · · · · ·	0.44			
13	55	32.0	34.0	11-10-9-9	20		-	**** **** ***** *****	500	gravel, fine to coarse; little to some slit; trace gravel, fine to medium, angular to rounded; dry; loose; unstratified; (10YR 4/3).		
14	SS	34.0	36.0	7-10-12-9	24		-		SW	Sand, fine to coarse; little to some silt; little to		
15	SS	36.0	38.0	10-8-5-6	16		35 -			some gravel, fine to medium dominant; igneous, sedimentary and metamorphic; rounded dominant; dry; loose; unstratified; (10YR 4/3).		
16	SS	38.0	40.0	9-8-11-10	17		-		SW	Sand; some silt; trace gravel, coarse, round, limestone; dry; loose; unstratified; (10YR 4/3).		
17	SS	40.0	42.0	5-5-8-8	19		40 -	<u>.</u>	SW	Note: At 39.5 feet very thin coal fragment layer.		
							-			fine, subrounded; dry; loose; unstratified; (10YR 4/3).		
18	SS	42.0	44.0	7-5-6-5	18		-	••••• •••••	SW	Note: At 42.5 feet, coarse, rounded, igneous gravel.		
19	ss	44.0	46.0	2-3-5-3	19		45 -			4/3). Note: From 44 to 46 feet wet; trace coarse gravel, rounded, igneous.		
										Note: Heaving sands.		
										Continued Next Page		

AEP - AEP.GDT - 10/05/16 16:08 - C:/CHERYL/PROJECTS/GINT SAVED TO COLUMBUS SERVER USE FOR REFERENCEAEP MOUNTAINEER BORING LOGS 9-2016/AEP MOUNTAINEER GPJ

JOB NUMBER **OH015976.0009**

LOG OF BORING

COMPANY American Electric Power

PROJECT Mountaineer Plant

BORING NO. <u>MW-1608</u> DATE <u>10/05/16</u> SHEET <u>3</u> OF <u>3</u>

l	1PLE 1BER	1 PLE	SAM DEF	PLE PTH	STANDARD PENETRATION	TAL IGTH IVERY	RQD	DEPTH	PHIC DG	C S	SOIL / ROCK	ELL	DRILLER'S
:		SAN	IN F FROM	EET TO	RESISTANCE	LEN RECC	%	FEET	GRA L(N S	IDENTIFICATION	WE	NOTES
-	20 21	SS SS	46.0 48.0	48.0	4-4-5-4	 17 17		-		SW	Sand; little to some silt; some gravel; wet; loose; unstratified; gravel is fine to coarse; fine fraction is fine to rounded; sand is subrounded to round; gravel is igneous to sedimentary; gravel colors range from red and green and brown; (looks like outwash); includes trace coal fragments, up to 2cm in size. Note: From 48 to 49.5 feet wet.	Ţ	
AOUNTAINEER.GF	22	SS	50.0	52.0	6-8-11-9	16		50 — -		SW	Silty sand; wet; loose; unstratified; sand is fine to medium; brown. Note: From 50 to 52 feet wet; incluse 20% coal material, fragments up to 3cm in size.		
9-2016\AEP N	23	SS	52.0	54.0	5-7-7-10	13		-		SW	Sand with silt; wet; loose; unstratified; sand is fine to coarse grades to fine to medium.		
BORING LOGS	24	SS	54.0	56.0	8-11-15-17	13		- 55 —			Note: At 53.5 feet coal fragments up to 2 cm in size. Note: From 54 to 56 feet wet; no coal fragments.		
MOUNTAINEER	25	SS	56.0	58.0	11-15-16-13	14		-		SM	Silt and sand; wet; loose; sand is fine to medium; brown.		
REFERENCE/AEP	26	SS	58.0	60.0	8-15-18-13	16		-		SW	Sand with silt; trace gravel; wet; loose; unstratified; sand is fine to coarse; gravel is medium to coarse, subrounded; brown.		
RVER USE FOF	27	SS	60.0	62.0	9-14-16-20	14		60 —		SW	Silty sand; trace fine gravel; wet; loose; unstratified; sand is fine to coarse; (10YR 4/3).		
COLUMBUS SEF	28	SS	62.0	64.0	2-12-40-50/2	19		-					
NT SAVED TO	29	SS	64.0	66.0	20-50/4	24		- 65 —		SW	Recovery was all heaved sand.		
RYL/PROJECTS/GII	30	SS	66.0	68.0	12-20-25-30	0.9		-		SP	Fine sand with silt; wet; loose; sand is very fine to fine dominant; bottom of recovery includes coarse gravel (chert), subangular; (10YR 5/2).		
16 16:08 - C:\CHEF	31	SS	68.0	70.0	12-15-20-20	17		- 70		SW SP SP	Note: At 68 feet coursing with depth. Sand and gravel; trace silt; clean-washed interval; wet; loose. Sand with silt; little fine; gravel; wet; loose.		
3DT - 10/05/								70			End of boring at 70 feet. See well construction for development		
EP - AEP.(Information.		



Arcadis 2016

Well Construction Diagrams

MW-1601A to MW-1608


	3.0' (Pro-Cover stick-up)			
 Ц	↓ LAND SURFACE	Project <u>AEP - M</u>	lountaineer	Well <u>MW-1601A</u>
И		Town/City	New Haven	
И		County	Mason County	State WV
Ø	drilled hole	Permit No	N/A	
И		Land-Surface (LS) E	Elevation and Datum:	
И	X	LS: 607.47; TOC: 67	10.66 feet	X Surveyed
И	Well casing,			Estimated
И	2 inch diameter,	Installation Date(s)	6/9/20	016
И	Schedule 40	Drilling Method	Hollow Stem	Auger
И	Backfill	0		
И	X Grout 270 gallons	Drilling Contractor	DLZ Ohio, In	с
И		Drilling Fluid	None	
2	58ft* Top of pellets			
	Top of secondary			
	Bentonite slurry	Develop	oment Technique(s) an	nd Date(s)
	62 ft* Top of Global #6 secondary filter pack	Submer	sible Impeller Pump (6	6/15/16)
	63 ft* Top of Global #5 primary filter pack			
	Top of Primary			
			rilling N//	
	<u>67.0</u> ft*			<u>g</u> ailons
	(Top of screen)	Water Removed Du	ring Development	<u> 30 </u> gallons
	Well Screen.	Static Depth to Wate	er <u>65.81</u>	feet below M.P.
	2 inch diameter	Pumping Depth to V	Vater <u>80</u>	feet below M.P.
	Total screen length 9.6'	Pumping Duration	<u>NM</u> hour	S
		Yield N	/A gpm	Date <u>6/15/2016</u>
	Gravel Pack	Specific Capacity	N/A gpm	/ft
			0.	
	Formation Collapse	Well Purpose	Monitoring we	ell
	ft*	Remarks Well Ins	stalled in the alternate	#1 boring at
	ft*	this loca	ation.	
	86 tt Natural collapse from 78 to 86 ft			
	Measuring Point is Top of Well Casing			
	Unless Otherwise Noted.	Droporod by	1	
	Depth Below Land Surface	Prepared by	Judd Wannel	Г



Γ	3.0' (Pro-Cover stick-up)		untainear	
	\downarrow LAND SURFACE	Town/City	New Haven	
F	after grout subsided	County	Mason County	State WV
F	8 inch diameter	Permit No	N/A	
E	drilled hole	Land-Surface (LS) El	levation and Datum:	
E			5 12 feet	
Ē	Well casing	<u></u>	<u></u>	Stiveyed Estimated
F	2 inch diameter	Installation Date(s)	5/10/2	D16
F	Schedule 40	Drilling Method	Hollow Stem	Auger
F		Drining Method		
F	Grout <u>378 gallons</u>	Drilling Contractor	DLZ Ohio, Inc	
F		Drilling Fluid	None	
2	<u>52</u> ft* Top of pellets			
	Reptopite Top of secondary			
	X pellets (100 pounds)	Developr	ment Technique(s) an	d Date(s)
	 ▲ 57 ft* Top of global #6 secondary filter pack (50 58 ft* Top of global #5 primary filter pack (100 pt)) pounds) <u>Waterra (</u> pounds)	(6/7/16)	
		Submers	ible Impeller Pump (6	6/15/16)
	Top of Primary			
	61.0 ft*	Fluid Loss During Dri	illing <u>N/A</u>	gallons
	(Top of screen)	Water Removed Duri	ing Development	<u>37.9</u> gallons
	Well Screen.	Static Depth to Water	r <u>59.82</u>	feet below M.P.
	2 inch diameter	Pumping Depth to W	ater 70	feet below M.P.
	Total screen length 9.6'	Pumping Duration	NM hours	3
		Yield N/A	Agpm	Date <u>6/15/2016</u>
	Gravel Pack	Specific Capacity	N/A gpm/	ft
	X Sand Pack			
		Well Purpose	Monitorina we	
	ft*			
	ft*			
	Measuring Point is Top of Well Casing			
	Unless Otherwise Noted. * Depth Below Land Surface	Prepared by	Judd Wanner	



	<u>3.0' (</u> Pro-Cover stick-up)	Desired				14/-11	NUM 4000
	↓ LAND SURFACE	Project	AEP - MC	New Haven		vveii	<u>IVIVV-1603</u>
8	after grout subsided	County		Mason Cour		Stata	
8		County		Mason Cou	nty	State	VVV
81	drilled hole	Permit No.		N/A			
8		Land-Surfa	ace (LS) El	evation and L	Jatum:	_	
1 I		LS: 602.92	2; TOC: 606	6.30	feet	X Sur	veyed
Иł	└── Well casing,					Est	imated
Иł	inch diameter, Schedule 40	Installation	Date(s)		5/4/201	16	
Яł	Backfill	Drilling Me	thod	Hollo	w Stem A	uger	
A E	X Grout 459 gallons	Drilling Co	ntractor	DLZ (Ohio, Inc.		
A E		Drilling Flu	iid	None			
A E	53 ft* Top of pellets	0					
	✓ Top of secondary						
	Bentonite Slurry		Dovelopp	nont Toobnig		Deta(a)	
	<u>56</u> ft* Top of global #6 secondary filter pack (50 p	pounds)	Waterra ((6/10/16)	Je(s) and	Date(s)	
┢	<u>57</u> ft* Top of global #5 primary filter pack (250 pc	ounds)	Submers	ible Impeller I	Pump (6/	15/16)	
	Top of Primary						
		Fluid Loss	During Dri	lling	N/A		gallons
	60.0 ft* (Top of screen)	Water Ren	noved Duri	ing Developm	ient	47.5	gallons
		Static Dep	th to Water	r i	61.35	feet	 below M.P.
	Well Screen.	Dumming F			70		helew M.D.
	<u>PVC</u> , <u>0.10</u> slot			ater		leet	Delow IVI.P.
	Total screen length 9.6'	Pumping D	Duration	NM	hours		
		Yield	N/A	Agpm		Date	e <u>6/15/2016</u>
	Gravel Pack	Specific Ca	apacity	N/A	gpm/fl	t	
	x Sand Pack						
	Formation Collapse	Well Purpo	ose	Monit	oring wel	I	
	<u>75</u> ft*	Pemarke					
	ft*	. tomanto					
	Measuring Point is Top of Well Casing						
	Unless Otherwise Noted. * Depth Below Land Surface	Prepared b	Dγ	Judd	Wanner		



П	3.0' (Pro-Cover stick-up) ↓ LAND SURFACE	Project <u>AEP - M</u>	lountaineer	Well <u>MW-1604D</u>
88	175 pounds of hole plug were used after grout subsided	Town/City	New Haven	
		County	Mason County	State WV
66	8 inch diameter	Permit No.	N/A	
44	drilled hole	Land-Surface (LS) E	Elevation and Datum:	
1 K	1	LS: 595.59; TOC: 59	98.22 feet	X Surveyed
66	Well casing.			Estimated
17 F	2 inch diameter	Installation Date(s)	5///20	16
11	Schedule 40		Jellew Sterr	Auger
88	Backfill	Drilling Method	Hollow Stem	Auger
	X Grout270 gallons	Drilling Contractor	DLZ Ohio, In	c
66		Drilling Fluid	None	
8 F	<u>62</u> ft* Top of pellets			
•	Top of secondary			
	X pellets (50 pounds)	Develop	oment Technique(s) ar	id Date(s)
	65 ft* Top of global #6 secondary filter pack (50	pounds) <u>Waterra</u>	and Submersible Pur	np (6/9/16)
	Top of Primary			
		Fluid Loss During D	rillingN/A	gallons
	69.0 ft* (Top of screen)	Water Removed Du	ring Development	45.1 gallons
	(···········	Static Depth to Wat	or 54.56	feet below M.P.
	Well Screen.			
	PVC , 0.10 slot	Pumping Depth to V	Vater <u>NM</u>	feet below M.P.
	Total screen length 9.6'	Pumping Duration	<u>NM</u> hour	S
		Yield N	Mgpm	Date <u>6/9/2016</u>
	/ Gravel Pack	Specific Capacity	<u>NM</u> gpm	/ft
	x Sand Pack			
		Well Purpose	Monitoring w	ell
	<u></u>	Remarks Primary	filter pack is #5 globa	sand; secondary
	8 8() TT [*]	C 11	k is global #6 cand	
	<u> </u>	filter pac	sk is global #0 saliu.	
		filter pac	K IS GIODAI #0 Salid.	
	Measuring Point is Top of Well Casing	Tilter pac		



	<u>3.0' (</u> Pro-Cover stick-up)	Droigat					MM/ 46046
	↓ LAND SURFACE	Town/City	AEP - IVIC	New Haven		_vven	10043
00	after grout subsided	County		Mason Cour	atv	State	
01	9 inch diameter	Dormit No.		N/A	пу	State	
81	drilled hole	Lond Surfe		N/A) otum:		
		Land-Suna			alum:		
81		LS: 595.48	3; 100: 598	8.07	feet		veyed
81							Imated
81	2 inch diameter, Schedule 40	Installation	Date(s)		5/2/201	6	
81		Drilling Me	thod	Hollow	v Stem A	uger	
81	Grout162 gallons	Drilling Co	ntractor	DLZ (Dhio, Inc.		
ИИ		Drilling Flu	iid	None			
88	42ft* Top of pellets						
	Top of secondary						
	Bentonite slurry X pellets (75 pounds)		Developr	ment Techniau	ue(s) and	Date(s)
	45 ft* Top of global #6 secondary filter pack (50	pounds)	Waterra	(6/9/16)	()		
		unas)	Submers	ible Impeller F	Pump (6/	16/16)	
	Top of Primary						
		Fluid Loss	During Dri	illing	N/A		gallons
	(Top of screen)	Water Ren	noved Duri	ing Developm	ent	30.8	gallons
		Static Dep	th to Wate	r	54.49	feet	below M.P.
	Well Screen. 2 inch diameter	Pumping D	Depth to W	ater	62	feet	below M.P.
	PVC, 0.10 slot	Pumping F	Duration	NM	hours		
		Yield	N/A			Date	e 6/16/2016
		Specific C		<u> </u>	apm/f	Duu	0/10/2010
		opecine of	арасну	N/A	gpm/n	L	
	Sand Pack						
	Formation Collapse	Well Purpo	ose	Monite	oring wel	I	
	<u>59</u> ft*	Remarks					
	<u>00</u> II"						
	Measuring Point is						
	Top of Well Casing						
	* Depth Below Land Surface	Prepared b	ру	Judd	Wanner		



	3.0' (Pro-Cover stick-up)	Project AFP - M	ountaineer	Well MW-1605D
	\downarrow LAND SURFACE	Town/City	New Haven	
01	after grout subsided		Mason County	Stata W/V
01			Mason County	
ИК	drilled hole	Permit No.	N/A	
И		Land-Surface (LS) E	levation and Datum:	_
ИP		LS: 588.51; TOC: 59	1.01 feet	X Surveyed
66	└── Well casing,			Estimated
0	2 inch diameter, Schedule 40	Installation Date(s)	5-9-16	to 5-11-16
1 A		Drilling Method	Hollow Stem	Auger
0				
01				
ИК		Drilling Fluid	Potable water	
Ηł	62ft* Top of pellets			
	Top of secondary			
	X pellets (75 pounds)	Develop	ment Technique(s) an	d Date(s)
	<u>65</u> ft* I op of global #6 secondary filter pack (50 <u>66</u> ft* Top of global #5 primary filter pack (200 p	ounds) <u>Waterra</u>	and Submersible Pun	np (6/8/16)
	Top of Primary			
	60.0 #*	Fluid Loss During Dr	illing 400	gallons
	(Top of screen)	Water Removed Dur	ring Development	<u>65</u> gallons
		Static Depth to Wate	er 47.51	feet below M.P.
	Well Screen. 2 inch diameter	Pumping Depth to W	/ater NM	feet below M.P.
	PVC, 0.10 slot	Pumping Duration	NM bour	
		Yield N/	A gpm	Date <u>6/8/2016</u>
	Gravel Pack	Specific Capacity	N/A gpm/	ft
	X Sand Pack			
	Formation Collapse	Well Purpose	Monitoring we	ell
	<u>79</u> ft*			
	60ft*	Remarks		
	Measuring Point is			
	Top of Well Casing Unless Otherwise Noted.			
	* Depth Below Land Surface	Prepared by	Tom Darmon	



		3.0' (Pro-Cover stick-up)	Project	AEP - Mo	ountaineer	Well	MW-1605S
	H	↓ LAND SURFACE 350 pounds of hole plug were used	, Town/City		New Haven	_	
	ß	after grout subsided	County		Mason County	State	WV
	Ø F	8.25 inch diameter	Permit No		N/A	_	
	Ø	drilled hole	Land-Surfa	ace (LS) Fl	evation and Datum:		
	8		1 8: 588 5	1. TOC. 59) 86 feet		rveved
	8	Well casing		1, 100.000	100		timated
	8	2 inch diameter	Installation	n Date(s)	5/1	2/2016	innatou
	8	Schedule 40		thed	Hollow Stom	Augor	
	8	Backfill	Drilling Me	elliou	Hollow Stell	Auger	
	И	Grout <u>162 gallons</u>	Drilling Co	ontractor	DLZ Ohio, Inc	D.	
	8		Drilling Flu	uid	Potable wate	r	
	8	42 ft* Top of pellets					
		Top of secondary					
		Bentonite slurry X pellets (150 pounds)		Developn	nent Technique(s) an	d Date(s	.)
		45 ft* Top of global #6 secondary filter pack (75	pounds)	Waterra ((6/8/16)		,
			ounus)	Submers	ible Impeller Pump (6	/16/16)	
		Top of Primary					
			Fluid Loss	During Dri	lling 200		gallons
		t* (Top of screen)	Water Rer	moved Duri	ing Development	36.1	gallons
			Static Dep	oth to Water	r <u>47.36</u>	feet	below M.P.
		Well Screen.	Pumping [Depth to Wa	ater <u>61.5</u>	feet	below M.P.
		PVC , 0.10 slot Total screen length 9.6'	Pumping [Duration	NM hour	S	
			Yield	N/A	Agpm	Dat	e <u>6/16/2016</u>
		/ Gravel Pack	Specific C	apacity	N/A gpm/	′ft	
					•• •• •		
			well Purp	ose	Monitoring we	ell	
		59 ft*					
		ft*	Remarks	Fluid loss	due to heaving sand	lestimate	ed.
1				Remove	d water could not be	quantifie	d to clean
		Measuring Point is		out auger	rs.		
		Top of Well Casing Unless Otherwise Noted.					
		* Depth Below Land Surface	Prepared I	by	Tom Darmon		



	3.0' (Pro-Cover stick-up)						
		Project	AEP - Mo	ountaineer		Well	MW-1606D
	100 pounds of hole plug were used	Town/City		New Haven			
И		County		Mason Count	у	State	WV
И	8.25 inch diameter	Permit No		N/A			
И	drilled hole	Land-Surfa	ace (LS) E	levation and Da	atum:		
И	×.	LS: 587.25	5; TOC: 59	0.10 f	eet [X Sur	veved
Ø	Well casing.		,		ſ	— □ Esti	mated
8	2 inch diameter	Installation	n Date(s)	5	∟ 16-16 to-		16
8	Schedule 40	Drilling Mc	thed	Hollow	Stom Au	gor	
8	Backfill	Drining we	eurioù		Stern Au	iyei	
8	Grout	Drilling Co	ontractor	DLZ O	hio, Inc.		
И		Drilling Flu	uid	Potable	e water		
8	58ft* Top of pellets						
	Top of secondary						
	Bentonite slurry		Develop	ment Technique	a(s) and [Date(s)	
	61_ft* Top of global #6 secondary filter pack (25	ō pounds)	Waterra	and Submersib	le Pump	(6/9/16	6)
	62ft* Top of global #5 primary filter pack (200	pounds)	Submers	ible Impeller P	ump (6/1	5/16)	
	Top of Primary						
		Fluid Loss	Durina Dr	illing	250		gallons
	<u>65</u> ft*	Water Per	moved Dur	ing Developme	nt	67	gallons
		Statia Dan	th to Wate		-	fact	
	Well Screen.	Static Dep		i <u> </u>	0.03	leet	Delow IVI.P.
	2 inch diameter PVC . 0.10 slot	Pumping [Depth to W	ater	77.5	feet	below M.P.
	Total screen length 9.6'	Pumping [Duration	NM	hours		
		Yield	N//	A gpm		Date	e <u>6/15/2016</u>
	Gravel Pack	Specific C	apacity	N/A	_gpm/ft		
	x Sand Pack						
			000	Monito	ring woll		
		weirrup	USE		nng wen		
	75 ft*	. <u> </u>					
	76 ft*	Remarks					
	· _ · · ·						
	Measuring Point is						
	Top of Well Casing						
	* Depth Below Land Surface	Prepared I	by	Tom D	armon		



	<u>3.0' (</u> Pro-Cover stick-up)	Ducient				14/-11	MW 40000
	↓ LAND SURFACE	Project	AEP - MC	Now Hoven		vveii	10005
	after grout subsided	Country		Masan Cau		Ctata	
		County		Mason Cou	nty	State	<u></u>
81	drilled hole	Permit No.		N/A			
		Land-Surfa	ace (LS) El	levation and L	Jatum:	_	
ИĽ		LS: 587.28	3; TOC: 590	0.15	feet	X Sur	veyed
Иł	└── Well casing,					Est	imated
Иł	inch diameter, Schedule 40	Installatior	n Date(s)		5/17/16	- 5/18/1	6
88		Drilling Me	ethod	Hollo	w Stem A	Auger	
88	X Grout 108 gallons	Drilling Co	ntractor	DLZ	Ohio, Inc		
88		Drilling Flu	ıid	None	•		
88	38 ft* Top of pellets	-					
	Top of secondary						
	Bentonite slurry		Developr	ment Technia	ue(s) and	I Date(s))
	41 ft* Top of global #6 secondary filter pack (100) pounds)	Waterra	(6/8/16)		Duto(0	
	<u>42</u> tt* I op of global #5 primary filter pack (250 po	ounds)	Submers	ible Impeller	Pump (6/	15/16)	
	Top of Primary						
		Fluid Loss	During Dri	illing	0		gallons
	45_ft* (Top of screen)	Water Rer	noved Duri	ing Developm	nent	29.5	gallons
		Static Dep	th to Wate	r	46.02	feet	below M.P.
	Well Screen.	Pumping [Penth to W	ater	57	feet	below M P
	PVC , 0.10 slot	Duraning			hauna		Sciew Will .
	Total screen length 9.6		Juration		nours	Det	0/45/0040
		Yield	N/#	<u>A</u> gpm		Date	€ <u>6/15/2016</u>
		Specific C	apacity	N/A	gpm/f	t	
	X Sand Pack						
	Formation Collapse	Well Purpo	ose	Monit	toring we	I	
	<u>55</u> ft*	Remarks					
	<u>56</u> ft*						
	Top of Well Casing						
	Unless Otherwise Noted. * Depth Below Land Surface	Prepared I	by	Tom	Darmon		



	<u>3.0' (</u> Pro-Cover stick-up)					
		Project	AEP - Mo	ountaineer	_Well	<u>MW-1607D</u>
И	after grout subsided	Town/City		New Haven		
И	×	County		Mason County	_State	WV
И	8.25 inch diameter	Permit No	·	N/A		
N I		Land-Surfa	ace (LS) El	levation and Datum:		
8		LS: 590.75	5; TOC: 59	<u>3.93</u> feet	X Su	rveyed
Ø	Well casing,				Est	timated
И	2 inch diameter,	Installation	n Date(s)	5/1	9/2016	
8		Drilling Me	ethod	Hollow Stem	Auger	
И						
И	X Grout216 gallons	Drilling Co	ontractor	DLZ Ohio, Inc).	
И		Drilling Flu	uid	Portable wate	er	
4	63 ft* Top of pellets					
	Top of secondary					
	X pellets (100 pounds)		Developr	ment Technique(s) an	d Date(s)
	<u>4⁻ 66</u> ft [*] Top of global #6 secondary filter sand (50 67 ft [*] Top of global #5 primary filter sand (250 pc	pounds) ounds)	Submers	ible Impeller Pump (6	/15/16)	
	`Top of Primary					
	70 4*	Fluid Loss	During Dri	illing <u>300</u>		_gallons
	(Top of screen)	Water Rer	moved Dur	ing Development	8.5	gallons
		Static Dep	oth to Wate	r 46.72	feet	below M.P.
	` [—] Well Screen. 2 inch diameter	Pumpina [Depth to W	ater 80	feet	below M.P.
	PVC , 0.10 slot	Dumina		NINA karm		
	rotai screen length 9.6		Juration	nour	5	
		Yield	N//	Agpm	Dat	e <u>6/15/2016</u>
	Gravel Pack	Specific C	apacity	N/A gpm/	ft	
	x Sand Pack					
	Formation Collapse	Well Purp	ose	Monitoring we	ell	
	80ft*					
	<u>81</u> ft*	Remarks	Fluid loss	s due to heaving sand	estimate	ed.
					quantine	
	Measuring Point is		out auge	10.		
	i op ot Well Casing Unless Otherwise Noted.					
	* Depth Below Land Surface	Prepared I	by	Tom Darmon		



New Haden County New Haden County Mason County State WV drilled hole Land-Sufface (L5) Elevation and Datum: Ls: 500.79 TOC: 593.99 feet Surveyed 2 Inch diameter Installation Date(s) S28/16 - 527/16 Date 3 ft* Top of decondary Drilling Method Hollow Stem Auger 43 ft* Top of pellets Drilling Fluid Portable water 43 ft* Top of secondary Bertonias Submersible lmpeller Pump (6/15/16) 47 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 47 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 48 (Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) Estimated 49 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) Estimated 49 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) Estimated 40 ft* ft* Removed water <td< th=""><th></th><th>3.0' (Pro-Cover stick-up) ↓ LAND SURFACE</th><th>Project</th><th>AEP - Mo</th><th>ountaineer</th><th></th><th>Well</th><th>MW-1607S</th></td<>		3.0' (Pro-Cover stick-up) ↓ LAND SURFACE	Project	AEP - Mo	ountaineer		Well	MW-1607S
8.25 inch diameter drilled hole Permit No. N/A Land-Surface (L3) Elevation and Datum: Lasson.county State 2 inch diameter, Installation Date(s) 5/26/16 - 5/27/18 Backful Drilling Method Hollow Stem Auger Backful Drilling Contractor DLZ Oho, Inc. Backful Drilling Contractor DLZ Oho, Inc. Top of pale Bis (125 pounds) Subergule (3) Subergule (3) State Surf Top of global #5 primary filter sand (150 pounds) Subergule (15) pounds) Development Technique(s) and Date(s) 46 Top of global #5 primary filter sand (150 pounds) Subergule Pump (0/15/16) 400 47 Tr Top of global #5 primary filter sand (150 pounds) Subergule Pump (0/15/16) Top of of screen) Water Removed During Development 8.5 gallons Static Depth to Water 40.56 feet below M.P. PUC 0.10 stot Pumping Depth to Water 60 feet below M.P. Viel N/A gpm Date _6/15/2016 Static Depth to Water 60 feet below M.P. Pumping Duration N/A			Town/City		New Haven		<u></u>	
a.25 inch diameter Permit No N/A Land-Surface (LS) Elevation and Datum: Land-Surface (LS) Elevation and Datum: Land-Surface (LS) Elevation and Datum: 2 inch diameter, Installation Date(s) 5/26/16 - 5/27/16 3 Schedule 40 Drilling Method Hollow Stem Auger Backfill Drilling Contractor DLZ Ohio, Inc. 43 ft* Top of pollets Bentontle Spellets Development Technique(s) and Date(s) Submersible Impeller Pump (6/15/16) Submersible Impeller Pump (6/15/16) 47 ft* Top of global #5 primary filter sand (150 pounds) 50 ft* Fluid Loss During Drilling 400 50 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 47 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 48 ft* Removed Water 45.6 feet below M.P. Vec , 0.10 slot Pumping Depth to Water 45.6 feet below M.P. Veld N/A gpm Date _6/15/2016 Speclific Capacity N/A	И		County		Mason County	/	State	WV
Land-Surface (LS) Elevation and Datum: Land-Surface (LS) Elevation and Datum: LS: 590.79; TOC: 593.99fet [] Surveyed	И	drilled hole	Permit No		N/A			
LS: 590.75; TOC: 593.99 [et] Surveyed	И		Land-Surf	ace (LS) E	levation and Dat	tum:		
Well casing.			LS: 590.79	9; TOC: 59	<u>3.99</u> fe	eet	X Sur	veyed
2 inch diameter, Installation Date(s) 5/26/16 - 5/27/16 Backdill Drilling Method Hollow Stem Auger Backdill Drilling Contractor DLZ Ohio, Inc. Y Top of pellets Drilling Fluid Portable water 43 t* Top of secondary Development Technique(s) and Date(s) Submersible Impeller Pump (6/15/16) Submersible Impeller Pump (6/15/16) Development 1 46 tt* Top of global #6 secondary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 47 tt* Top of global #6 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 50 ft* Top of global #6 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 46 tt* Top of global #6 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 50 ft* Of screen) Water Removed During Development 8.5 90 ft* Of screen Static Depth to Water 60 feet below M.P. Pumping Duration NM hours Yield N/A gpm/ft 60 ft* Removed water could not be quantified to dean out auger	0	Well casing,				[Esti	mated
Backfill Drilling Method Hollow Stem Auger Backfill Drilling Contractor DLZ Ohio, Inc. Drilling Fluid Portable water 43 ft* Top of pellets Bentonite Top of secondary Bentonite Surry A6 ft* Top of global #6 secondary filter sand (150 pounds) Development Technique(s) and Date(s) Submersible Impeller Pump (6/15/16) Submersible Impeller Pump (6/15/16) Top of global #6 secondary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 50 ft* Top of global #6 secondary filter sand (150 pounds) 50 ft* Top of global #6 secondary filter sand (150 pounds) 50 ft* Fluid Loss During Drilling 400 90 ft* Fluid Loss During Development 8.5_ gallons Static Depth to Water 60 feet below M.P. Pumping Duration NM hours Yield N/A gm/ft * Static Depth to Water 60 feet below M.P. Pumping Duration N/A gm/ft * Static Depth to Water 60 feet below M.P.	0	2inch diameter, Schedule 40	Installation	n Date(s)	5	/26/16 -	5/27/16	3
Grout 216 gallons Drilling Contractor DLZ Ohio, Inc. Image: Contractor DLZ Ohio, Inc. Drilling Fluid Portable water Image: Contractor Portable water Drilling Fluid Portable water Image: Contractor DLZ Ohio, Inc. Drilling Fluid Portable water Image: Contractor DLZ Ohio, Inc. Drilling Fluid Portable water Image: Contractor DLZ Ohio, Inc. Drilling Fluid Portable water Image: Contractor Development Technique(s) and Date(s) Submersible Impelier Pump (6/15/16) Image: Contractor Top of global #5 primary filter sand (150 pounds) Development 1 400 gallons Image: Contractor Fluid Loss During Drilling 400 gallons gallons Static Depth to Water 60 feet below M.P. Pumping Duration NM hours Image: Contractor NA gpm Date 6/15/2016 Specific Capacity N/A gpm./ft Image: Contractor Image: Contractor NA gpm./ft Remarks Fluid loss due to heaving sand estimated. Image: Contractor Image: Contractor Remarks Fluid	0	Backfill	Drilling Me	ethod	Hollow	Stem Au	ıger	
All article Display Heat of the secondary survey solution in the secondary survey solution in the secondary survey solution in the secondary solution in the secondary solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solution is solution in the secondary solution is solutio	0	X Grout 216 gallons	Drillina Co	ontractor	DLZ Oh	io. Inc.		
43 ft* Top of pellets 43 ft* Top of secondary 9 Jump Jump 9 pellets (125 pounds) Development Technique(s) and Date(s) 46 ft* Top of global #5 primary filter sand (150 pounds) 47 ft* Top of global #5 primary filter sand (150 pounds) 50 ft* Fluid Loss During Drilling 400 50 ft* Fluid Loss During Drilling 400 50 ft* Fluid Loss During Drilling 400 50 ft* Gallons Static Depth to Water 60 60 feet below M.P. Pumping Depth to Water 60 feet below M.P. 7 O.10 slot Pumping Duration NM hours Yield N/A gpm Date 6/15/2016 Gravel Pack Specific Capacity N/A gpm/ft Gravel Pack Formation Collapse Weil Purpose Monitoring well 60 ft* Remarks Fluid loss due to heaving sand estimated. 81 ft* Removed water could not be quantified to clean <	0		Drilling Flu	uid	Portable	e water		
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Bentonite siurry Development Technique(s) and Date(s) 46 ft* Top of global #5 primary filter sand (150 pounds) 47 ft* Top of global #5 primary filter sand (150 pounds) 50 ft* Top of Primary 50 ft* Fluid Loss During Drilling 400 90 gallons Static Depth to Water 8.5 91 0.10 slot Static Depth to Water 46.56 92 inch diameter Pumping Depth to Water 400 feet below M.P. 92 inch diameter Pumping Depth to Water 60 feet below M.P. 94 Total screen length 9.6° Pumping Duration NM hours Yield N/A gpm Date 6/15/2016 93 Specific Capacity N/A gpm/ft 40 rt* Remarks Fluid loss due to heaving sand estimated. 60 ft* Removed water could not be quantified to clean 04 Port Weil Casing Unitess Otherwise Noted. Torn Darmon		Top of secondary						
46 ft Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 47 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 47 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 47 ft* Top of global #5 primary filter sand (150 pounds) Submersible Impeller Pump (6/15/16) 40 gallons gallons 50 ft* Fluid Loss During Drilling 400 50 ft* Fluid Loss During Drilling 400 50 ft* Static Depth to Water 46.56 7 inch diameter Pumping Depth to Water 60 feet below M.P. 2 inch diameter Pumping Duration NM hours Yield N/A gpm Date 6/15/2016 Gravel Pack Specific Capacity N/A gpm/ft § Sand Pack Formation Collapse Well Purpose Monitoring well 60 ft* Remarks Fluid loss due to heaving sand estimated. 8 Top of Well Casing ut augers. out augers. <td></td> <td>Bentonite Slurry</td> <td></td> <td>Dovelop</td> <td>mont Toobnique</td> <td>(a) and</td> <td></td> <td></td>		Bentonite Slurry		Dovelop	mont Toobnique	(a) and		
47 ft* Top of global #5 primary filter sand (150 pounds) Top of Primary		46 ft* Top of global #6 secondary filter sand (150	0 pounds)	Submers	sible Impeller Pu	(s) and mp (6/1	5/16)	
Top of Primary Fluid Loss During Drilling400gallons 50ft* Water Removed During Development8.5gallons Vell Screen. Static Depth to Water60feet below M.P.		ft* Top of global #5 primary filter sand (150 p	ounds)					
Fluid Loss During Drilling 400 gallons 9 50 ft* Water Removed During Development 8.5 gallons 1 2 inch diameter 9 9 feet below M.P. 1 2 inch diameter 60 feet below M.P. 1 PVC , 0.10 slot 9 mpping Depth to Water 60 feet below M.P. 1 PVC , 0.10 slot NM hours 1 1 1 Gravel Pack Specific Capacity N/A gpm/ft 1 1 1 Formation Collapse Well Purpose Monitoring well		Top of Primary						
50 ft* (Top of screen) Water Removed During Development			Fluid Loss	During Dr	illing	400		gallons
Well Screen.		50ft* (Top of screen)	Water Rei	moved Dur	ing Developmer	nt	8.5	gallons
Well Screen. 2 inch diameter Pumping Depth to Water 60 feet below M.P. PVC , 0.10 slot Pumping Duration NM hours Total screen length 9.6' Pumping Duration NM hours Yield N/A gpm Date 6/15/2016 Specific Capacity N/A gpm/ft Specific Capacity N/A gpm/ft Formation Collapse Well Purpose Monitoring well 60 ft* Remarks Fluid loss due to heaving sand estimated. Removed water could not be quantified to clean out augers. Unless Otherwise Noted. Tom Darmon Prepared by			Static Dep	oth to Wate	er 46	6.56	feet l	below M.P.
PVC .0.10 slot Total screen length 9.6' Pumping Duration Marking Doparto Math NM hours Yield Sand Pack Specific Capacity Formation Collapse Well Purpose 60 ft* 61 ft* 70 of Well Casing Out and Surface Prepared by Tom Darmon		Well Screen.	Pumping I	Depth to W	ater	60	feet l	pelow M P
Image: Street Height 9.0 Putipling DutationNwnours Image: Street Height 9.0 YieldN/AgpmDate6/15/2016_ Specific CapacityN/Agpm/ft Specific CapacityN/Agpm/ft Image: Street Height 9.0 Well PurposeMonitoring well Image: Street Height 9.0 Monitoring well Image: Street Height 9.0		PVC , 0.10 slot	Dumping			bours		
Image: Constraint of the constraint			Vield	Duration N/		-110013	Date	6/15/2016
Specific Capacity N/Agpm/nt Image: Specific Capacity N/Agpm/nt Image: Specific Capacity N/Agpm/nt Image: Specific Capacity N/Agpm/nt Image: Specific Capacity N/Agpm/nt Image: Specific Capacity N/Agpm/nt Image: Specific Capacity N/Agpm/nt Image: Specific Capacity N/Agpm/nt Image: Specific Capacity Monitoring well Image: Specific Capacity Remarks Fluid loss due to heaving sand estimated. Image: Specific Capacity Image: Specific Capacity Measuring Point is Top of Well Casing Image: Specific Capacity Image: Specific Capacity Image: Specific Capacity Image: Specific Capacity Image: Specific Capacity Image: Specific Capacity Image: Specific Capacity <					<u>A</u> gpin		Date	0/13/2010
Image: Sand Pack Well Purpose Monitoring well Image: Formation Collapse Well Purpose Monitoring well Image: Good fit* Remarks Fluid loss due to heaving sand estimated. Image: Good fit* Remarks Fluid loss due to heaving sand estimated. Image: Good fit* Remarks Fluid loss due to heaving sand estimated. Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good fit* Image: Good f			Specific C	apacity	N/A	_gpm/ft		
Formation Collapse Well Purpose Monitoring well 60 ft* Remarks Fluid loss due to heaving sand estimated. 61 ft* Remarks Fluid loss due to heaving sand estimated. Measuring Point is out augers. Top of Well Casing out augers. Unless Otherwise Noted. Prepared by Tom Darmon		Sand Pack						
60 ft* 61 ft* Remarks Fluid loss due to heaving sand estimated. Remarks Fluid loss due to heaving sand estimated. Removed water could not be quantified to clean out augers. Measuring Point is out augers. Top of Well Casing unless Otherwise Noted. * Depth Below Land Surface Prepared by Tom Darmon		Formation Collapse	Well Purp	ose	Monitor	ing well		
60 ft* 61 ft* Remarks Fluid loss due to heaving sand estimated. Removed water could not be quantified to clean out augers. Measuring Point is Top of Well Casing Unless Otherwise Noted. * Depth Below Land Surface Prepared by Tom Darmon								
60 ft* 61 ft* Remarks Fluid loss due to heaving sand estimated. Removed water could not be quantified to clean out augers. Measuring Point is Top of Well Casing Unless Otherwise Noted. * Depth Below Land Surface Prepared by Tom Darmon								
61 ft* Removed water could not be quantified to clean out augers. Measuring Point is Top of Well Casing Unless Otherwise Noted. * Depth Below Land Surface Prepared by Tom Darmon		ft*	Remarks	Fluid loss	s due to heaving	sand e	stimate	d.
out augers. Measuring Point is Top of Well Casing Unless Otherwise Noted. * Depth Below Land Surface Prepared by Tom Darmon		<u>61</u> ft*		Remove	ed water could ne	ot be qu	antified	to clean
Intersection Intersection Top of Well Casing		Managina Datati		out auge	rs.			
Unless Otherwise Noted. * Depth Below Land Surface Prepared by Tom Darmon		Top of Well Casing						
		Unless Otherwise Noted. * Depth Below Land Surface	Prepared	by	Tom Da	armon		



	3.0' (Pro-Cover stick-up)					
		Project <u>AEI</u>	P - Mountai	neer	Well	MW-1608
	125 pounds of hole plug were used	Town/City	Nev	v Haven		
11		County	Mas	son County	State	WV
11	8 inch diameter	Permit No.	N/A			
6	drilled hole	Land-Surface (I	LS) Elevati	on and Datum:		
ĺκ		1 S: 587 26: TO	° , 200 65	feet		rveved
17 F		20. 007.20, 10	0. 000.00	1001		livestad
11	— Weir casing,					limated
11	2inch diameter, Schedule 40	Installation Date	ie(s)	6/9/16 - 6/	10/16	
66		Drilling Method	I	Hollow Stem A	Auger	
66		Drilling Contrac	ctor	DI Z Obio, Inc		
ΠF		Drillin n Eluid		News	•	
11		Drilling Fluid		None		
ΗK	<u>39</u> ft* Top of pellets					
	Top of secondary Bentonite					
	X pellets (150 pounds)	Dev	velopment ⁻	Technique(s) and	d Date(s)
	▲ 42 ft* Top of global #6 secondary filter sand (50 43 ft* Top of global #5 primary filter sand (300 p	pounds) <u>Suk</u> ounds)	bmersible li	npeller Pump (6/	17/16)	
		, 				
	Top of Primary					
		Fluid Loss Duri	ing Drilling	N/A		gallons
	46.0 ft* (Top of screen)	Water Remove	ed Durina D	evelopment	33	gallons
k		Static Depth to	Water	. 47.66	feet	below M P
	Well Screen.		(Tato)			
	PVC , 0.10 slot	Pumping Depth	n to Water	60	feet	below M.P.
	Total screen length 9.6'	Pumping Durati	tion	NM hours		
		Yield	N/A	gpm	Dat	e <u>6/17/2016</u>
	/ Gravel Pack	Specific Capaci	city	N/A gpm/	ť	
	Formation Collapse	Well Purpose		Monitoring we	ll	
	<u>56</u> ft*	Remarks				
	ft*					
	70 tt* Natural Collapse from 57 to 70 tt					
	Measuring Point is					
	Unless Otherwise Noted.					
	* Depth Below Land Surface	Prepared by		Judd Wanner		

APPENDIX B

Banks Well Inventory Report



Prepared for:

ARCADIS U.S., INC.-Columbus 630 Plaza Drive, Suite 600 Highlands Ranch, CO 80129



Water WellAEP Water Well InventMOUNTAINEER PLANTReport1347 GRAHAM STATIC

AEP Water Well Inventory MOUNTAINEER PLANT 1347 GRAHAM STATION ROAD NEW HAVEN, WV MASON County PO #: OH015976.0004 ES-112028 Monday, September 08, 2014

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Geographic Summary	3
Maps	
Summary Map - 0.5 Mile Buffer	4
Topographic Overlay Map - 0.5 Mile Buffer	5
Current Imagery Overlay Map - 0.5 Mile Buffer	6
Water Well Details	7
Database Definitions and Sources	8
Disclaimer	9

Geographic Summary AEP Water Well Inventory



ocation					
IASON County, WV					
Target location is 0.131 square miles and has a 1.	Farget location is 0.131 square miles and has a 1.5 mile perimeter				
Coordinates					
Longitude & Latitude in Degrees Minutes Seco	onds NA				
Longitude & Latitude in Decimal Degrees	NA				
X and Y in UTM	NA				
Elevation					
NA					
Zip Codes Searched					
Zip Codes Searched Search Distance	Zip Codes (historical zip codes included)				
Zip Codes Searched Search Distance Target Property	Zip Codes (historical zip codes included) 25253, 25247, 25264, 25265				
Zip Codes Searched Search Distance Target Property 0.5 miles	Zip Codes (historical zip codes included) 25253, 25247, 25264, 25265 25253, 25247, 25264, 25265				
Zip Codes Searched Search Distance Target Property 0.5 miles Topos Searched	Zip Codes (historical zip codes included) 25253, 25247, 25264, 25265 25253, 25247, 25264, 25265				
Zip Codes Searched Search Distance Target Property 0.5 miles Topos Searched Search Distance	Zip Codes (historical zip codes included) 25253, 25247, 25264, 25265 25253, 25247, 25264, 25265 Topo Name				
Zip Codes Searched Search Distance Target Property 0.5 miles Topos Searched Search Distance Target Property	Zip Codes (historical zip codes included) 25253, 25247, 25264, 25265 25253, 25247, 25264, 25265 Topo Name New Haven (1977)				

Summary Map - 0.5 Mile Buffer





Topographic Overlay Map - 0.5 Mile Buffer





Current Imagery Overlay Map - 0.5 Mile Buffer





Water Well Details AEP Water Well Inventory



Map ID	Source ID	Dataset	Owner of Well	Type of Well	Depth Drilled	Completion Date	Longitude	Latitude	Elevation	Driller's Logs
1	USGS- 385802081 552602	WW USGS	USGS	Not Reported	80	01/01/1950	-81.923748	38.967302	585 ft	N/A

Well Summary

Water Well Dataset	# of Wells
WW USGS	1
Total Count	1

Dataset Descriptions and Sources AEP Water Well Inventory



Dataset	Source	Dataset Description	Update Schedule	Data Requested	Data Obtained	Data Updated	Source Updated
WV WW - West Virginia Water Wells	West Virginia Department of Health and Human Resources	This dataset contains groundwater well information provided by West Virginia Department of Health and Human Resources.	As requested	N/A	N/A	N/A	N/A
OH WW - Ohio Water Wells	Ohio Department of Natural Resources	This dataset contains all historical water well records searched from Ohio Department of Natural Resources Division of Water	As requested	N/A	N/A	N/A	N/A
WW USGS - USGS Water Wells	U.S. Geological Survey	This dataset contains groundwater well records from the U.S. Geological Survey.	Quarterly	06/30/2014	06/30/2014	07/13/2014	06/30/2014

Disclaimer AEP Water Well Inventory



The Banks Environmental Data Water Well Report was prepared from existing state water well databases and/or additional file data/records research conducted at the state agency and the U.S. Geological Survey. Banks Environmental Data has performed a thorough and diligent search of all groundwater well information provided and recorded. All mapped locations are based on information obtained from the source. Although Banks performs quality assurance and quality control on all research projects, we recognize that any inaccuracies of the records and mapped well locations could possibly be traced to the appropriate regulatory authority or the actual driller. It may be possible that some water well schedules and logs have never been submitted to the regulatory authority by the water driller and, thus, may explain the possible unaccountability of privately drilled wells. It is uncertain if the above listing provides 100% of the existing wells within the area of review. Therefore, Banks Environmental Data cannot fully guarantee the accuracy of the data or well location(s) of those maps and records maintained by the regulatory authorities.

APPENDIX C

Photographic Log







Photo No.	Date:	and the start of the second second second second second second second second second second second second second
001	8/12/2015	
Direction Ph	noto Taken:	
Southeast		
Description	:	
South of Rec	claim Pond.	
		2015-08-12-16-31



AEP Mountaineer Generating Plant CCR Compliance New Haven, WV OH015976.0009



Photo No.	Date:	
003	8/12/2015	
Direction Ph	oto Taken:	
South		
Description:		
West side of Pond-West.	Bottom Ash	
		2015-08-12-16-38



AEP Mountaineer Generating Plant CCR Compliance New Haven, WV OH015976.0009



Photo No.	Date:	
005	8/12/2015	
Direction Pl	noto Taken:	and the second se
South		and the second second second second second second second second second second second second second second second
oodan		And and a second s
Description	:	
North side of	f Bottom Ash	
Pond-West.		
		A STATE OF A STATE OF A STATE OF A STATE OF A STATE OF A STATE OF A STATE OF A STATE OF A STATE OF A STATE OF A
		the second second second second second second second second second second second second second second second s
		2015 78:12 16 40



AEP Mountaineer Generating Plant CCR Compliance New Haven, WV OH015976.0009



Photo No.	Date:	
Direction Pr	0/12/2015	
Direction 11	loto raken.	
Northeast		
Description	:	
Upland area	north of	
Bottom Ash	Pond-West.	