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FGD LANDFILL-CCR LOCATION RESTRICTION EVALUATION

Amos Plant
Winfield Road
Putnam County
Winfield, West Virginia

October 5, 2016

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Our Ref.:

OH015976.0007

Date:

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ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power Service Corporation
amsl	above mean sea level
Arcadis	Arcadis U.S., Inc.
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
CSM	Conceptual Site Model
FGD	flue gas desulfurization
ft	feet
LCS	Leachate Collection System
PVC	polyvinyl chloride
USGS	United State Geological Survey

1. OBJECTIVE

This report was prepared by Arcadis U.S., Inc. (Arcadis) for American Electric Power Service Corporation (AEP) to assess the location of the landfill relative to the locations 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 offsite flue gas desulfurization (FGD) landfill (CCR Unit) located approximately 2 miles northwest of the AEP Generating Plant (Plant) located on Winfield Road in Winfield, 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 located 2) 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. 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 onsite ash pond system and the offsite FGD landfill (**Figure 2**). This report summarizes the evaluation of the location restriction criteria at the offsite FGD landfill (Site). The evaluation of the onsite ash pond system is not included in this report and will be completed under separate cover.

This evaluation included a review of AEP-provided data associated with previously completed subsurface investigation activities in the vicinity of the FGD landfill, as well as publically-available geologic and hydrogeologic data. The following report presents the current Conceptual Site Model (CSM), developed based on all available historical Site information. This report also presents an evaluation of the 5 location restriction criteria listed above, and will further describe the uppermost aquifer.

2. BACKGROUND INFORMATION

The following section provides background information for the AEP Amos Generating Plant FGD landfill.

2.1 Facility Location Description

The FGD landfill is located in Putnam County approximately 2 miles northwest of the Plant and approximately three-quarters of a mile west of Winfield Road (WV 817) (**Figures 1** and **2**). The Site occupies approximately 258 total acres. The landfill is located in an isolated area, with surrounding land use predominantly residential and agriculture.

2.2 Description of FGD Landfill CCR Unit

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

2.2.1 Landfill Configuration

The landfill location consists of a northern and southern valley surrounded on all sides by ridges. The northern and southern valleys are separated by a topographic high point. The surface of the waste will be covered with 2 ft of low-permeability compacted soil and vegetated with grass cover as construction at each landfill cell is completed. Currently, final cover has not been placed on any section of the landfill. General construction of the landfill is further detailed in the *Class F Industrial Landfill Facility Application* for the Site (GAI, 2006).

2.2.2 Area/Volume

The total area of the Site is approximately 258 acres which includes both disposal and non-disposal use. The current permitted area for disposal is 211 acres, with a permitted waste capacity of approximately 38.6 million cubic yards (GAI, 2006; **Figure 3**).

2.2.3 Construction and Operational History

In March 2006, AEP submitted the *Class F Industrial Landfill Facility Application* (GAI, 2006) to West Virginia Department of Environmental Protection. The application was approved and landfilling activities began in April 2009 according to Appendix N of the landfill application. Landfill construction is planned for 10 individual sequences (i.e. cells), and the designed disposal rate is 2.5 million cubic yards per year. With a maximum design capacity of 38.6 million cubic yards, the landfill design life is approximately 15.4 years (GAI, 2006). The landfill is currently filling cells 1, 2 and 3 in the southern valley.

During landfill construction, a liner is placed at the base of each cell. This liner is described in detail in *Class F Industrial Landfill Facility Application* (GAI, 2006). In general, the landfill liner consists of the following layers:

- Groundwater interceptor drainage system
- 12-inch compacted or in-place clayey-silt subbase
- 18-inch compacted clay liner
- 30-mil polyvinyl chloride (PVC) geomembrane
- Leachate Collection System (LCS)
- 18-inch protective cover (typically bottom ash, potentially WVDOT mortar sand or gypsum)

The CCR byproducts from the three coal-fired generating units at the Plant (Unit 1 through Unit 3) are placed in the landfill. These waste products include fly ash, bottom ash, FGD (synthetic gypsum), and FGD purge stream treatment solids (limestone inerts and solids). A majority of these products are transported from the Amos Plant to the offsite dry handling system via pipelines, which is located immediately adjacent to the landfill. Dry conditioned fly ash from the silo and FGD products are dried and caked at this facility before being trucked to the landfill for disposal. Fly ash is trucked directly from the Amos Plant to the landfill via a private haul road for direct disposal. The landfill is also permitted to receive CCR byproducts from the AEP Plants at Clinch River, Glen Lyn, Mountaineer, Sporn, and Kanawha River (GAI, 2006).

2.2.4 Surface Water Control

Surface water control at the Site is discussed in detail in *Class F Industrial Landfill Facility Application* (GAI, 2006). Structures are in place at the Site that control surface runoff and infiltration of surface runoff.

Surface runoff is managed through a series of collection channels, sediment traps, and pipe culverts that channel flow to 4 sediment collection ponds around the perimeter of the site. Additionally, active areas of the landfill are equipped with vertical chimney drains to capture surface water flow across waste. These vertical drains divert water to the LCS component of the landfill liner, which is a geocomposite drainage net consisting of a high-density polyethylene geonet with needle-punched nonwoven geotextiles heat-bonded to its upper and lower surfaces draining to a network of perforated PVC pipes. The LCS channels leachate and surface flow in active landfilling areas to the leachate pond at the mouth of the southern valley (GAI, 2006). Sedimentation ponds are located in the northwest, southwest, and southeast portions of the landfill. A sedimentation pond is located along the eastern side of the landfill near the divide between the north and south valleys.

2.3 Previous Investigations

Prior to submission of the *Class F Industrial Landfill Facility Application* in March 2006, GAI Consultants, Inc., in coordination with AEP, performed a site investigation to characterize the conditions at the proposed landfill facility. These investigations included hollow stem auger drilling through soil and into rock, split barrel soil sampling and standard penetration testing, undisturbed soil sampling (Shelby tubes), continuous rock coring (where appropriate), and pump or packer testing of select rock units (GAI, 2006).

Soil samples were analyzed for geotechnical parameters to assist with general site characterization and stability analyses. These parameters include grain size distribution, Atterberg limits, specific gravity,

moisture content, compaction, permeability, cation exchange capacity, and X-Ray Diffraction characteristics. Additionally, soil samples were analyzed for physical properties at a proposed onsite borrow site for liner quality determination (GAI, 2006).

During the site investigation, piezometers were installed in 23 of the 25 soil borings advanced in the projected landfill footprint. Ten 2-inch PVC monitoring wells were also installed, generally around the perimeter of the proposed extent of fill. Groundwater samples were collected from monitoring wells in an effort to characterize background water quality.

2.4 Hydrogeologic Setting

The geologic setting surrounding the Site consists of ridges formed by the Pennsylvanian age Monongahela and Conemaugh Formations. The Monongahela and Conemaugh Formations consist of sandstones, shales, limestones, and coal. These rocks have been fractured as stress on the rocks declined during erosion, leading to expansion and a system of stress relief fractures throughout the bedrock. Groundwater occurrence at the Site is primarily in these stress relief fractures, which are nearly vertical with attitude angles ranging from 75˚ to near 90˚. These fractures occur in sets that are oriented roughly parallel and perpendicular to one another, but not necessarily to the valley walls. Bedrock groundwater flow generally follows surface topography, and is generally downslope of the ridge towards the valley floors (GAI, 2006).

Unconsolidated deposits on top of the bedrock consist primarily of weathered bedrock and residuum, with some colluvial deposits consisting of weathered rock, sand, silt, and clay. In valley bottoms, the unconsolidated sediments can be saturated with groundwater at the soil-rock interface. These localized areas of groundwater generally flow down-valley along the top of rock, and are connected to the stress relief fracture system (GAI, 2006).

These features are further illustrated on two lines of cross section that were prepared by AEP with modifications through the FGD landfill, both lines trending from southwest to northeast. One cross section extends through the southern valley of the landfill (A to A') and the other cross section extends through the northern valley of the landfill (B to B'). The cross section location map is included as **Figure 4** and the cross sections are included as **Figure 5a** (A to A') and **Figure 5b** (B to B'). Boring logs and well construction diagrams are included in **Appendix A**.

2.4.1 Climate and Water Budget

The climate of Winfield, West Virginia is characterized as humid continental with an average rainfall of approximately 40 inches annually. The average maximum temperature is 66 ºF and the average minimum temperature is 44 ºF based on information from Southeast Regional Climate Center (SERCC, 2015).

The results of a numerical water budget analysis performed as part of the March 2006 *Class F Industrial Landfill Facility Application* is described in detail in Appendix I of that application (GAI, 2006). The primary objective of this analysis was to estimate the average annual leachate production and estimate the maximum leachate head within the landfill liner system. Using site-specific climate, slope, and soil

characteristics, it was determined that maximum average daily heads, maximum daily peak heads, and average annual leachate heads were all within acceptable ranges (GAI, 2006).

2.4.2 Regional and Local Geologic Setting

2.4.2.1 Unconsolidated

The Site is located in the Appalachian Plateau physiographic province, and unconsolidated soils are limited in extent and are residual and colluvial in origin. Soils in lower topographic areas (i.e. valleys) consist of sand, silt, or clay with increasing rock fragments with depth (colluvium), and grade to weathered bedrock (residuum) with depth. Further up the ridges, soils are composed mainly of residuum. Unconsolidated material is thickest in the valley floors, and average soil thickness is approximately 11 ft (GAI, 2006).

2.4.2.2 Bedrock

The primary regional bedrock units encountered are Pennsylvanian age sedimentary rocks of the Monongahela Formation and Conemaugh Formation, in descending order from youngest to oldest. The depositional environment for these formations is characterized by a gradually subsiding shallow sea with alternating marine and freshwater strata. The sedimentary package associated with the Monongahela and Conemaugh Formations consists 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 principal marker bed in the region is the Pittsburg Coal, which marks the transition from the Monongahela and Conemaugh Formations. However, the Pittsburg Coal is not represented in Site borings (GAI, 2006).

The Monongahela Formation is found capping the hills surrounding the Site. It consists of claystones and sandstones, and to a lesser extent silt shales and siltstones, which have varying degrees of thickness laterally, making correlation difficult (GAI, 2006). Bedrock occurrence is illustrated on both cross sections (**Figures 5a** and **5b**) and detailed in boring logs included in **Appendix A**.

Interpretations regarding shallow geologic structures are based on mapping of the Pittsburg Coal. The Parkersburg Syncline and the Byrnside Anticline appears to dip to the north-northwest through the site. Bedding planes in the site have a strike to the east-northeast and dip to the north-northwest at approximately 20 ft per mile (GAI, 2006).

Deeper bedrock units produce oil and gas. Associated oil and gas wells are located in the vicinity of the FGD Landfill along with wells located within the landfill footprint (079-00611 and 079-00722). These two oil and gas wells have been closed in 2007 and 2006, respectively. Available information on the closure is provided in **Appendix A**.

2.4.3 Surface Water and Surface Water Groundwater Interactions

There are intermittent streams in both the northern and southern area of the Site, Lick Run and Little Hurricane Creek. Groundwater flows following topographic relief and is generally in the direction of each of these creeks. However, sedimentation, leachate, and stormwater ponds have been constructed

around the perimeter of the landfill. The design specifications of these ponds is described in detail in the *Class F Industrial Landfill Facility Application* (GAI, 2006). Groundwater flow, as well as surface water runoff that contacts active landfill areas, is directed to the leachate ponds via the LCS component of the landfill liner. Runoff that contacts covered landfill areas, disturbed borrow areas, or undisturbed areas is contained in the sediment collection ponds which ultimately discharge to either Little Hurricane Creek or Lick Run via principal or emergency spillways (GAI, 2006).

2.4.4 Water Users

There are no active groundwater production wells at the Site. In 2014, a water well inventory for the Amos Plant indicated no information regarding the use of wells located in the vicinity of the Site was available (Banks, 2014). However, the wells that were identified are registered with the United States Geological Survey (USGS) and appear to be used for groundwater monitoring. Six of the ten well locations referenced in that report are located on or immediately adjacent to the Plant. Of those wells not obviously related to the Plant, one is located approximately 1,500 ft west of the Plant's onsite ash pond system. The other three well locations are located approximately 3,500 to 5,000 ft south of the Plant's onsite ash pond system (**Appendix B**).

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 aquifer at the Site is defined by the saturated portion of the stress relief fracture system and is independent of lithologic unit. Stress relief fractures occur in both the Conemaugh and Monongahela Formations. Stress relief fractures are likely hydraulically connected with deeper open horizontal bedding planes. In similar stress relief fracture systems, the aquifers are generally unconfined but water levels in wells can exhibit confined behavior in valley floors if low-transmissivity sediments (i.e. clay) are present (USGS 1981). The uppermost aquifer is horizontally continuous across the entire site.

The upper limit of the uppermost aquifer is generally located beneath the original bedrock surface prior to landfill construction. The potentiometric surface occurs at depths as shallow as 1 ft below the soil-rock interface (beneath valley walls) to nearly 90 ft below the soil-rock interface (beneath ridgetops). This is illustrated on cross sections A to A' and B to B' (**Figures 5a** and **5b**).

There are perched (discontinuous) groundwater zones, limited to areas at the western ends of the northern and southern valleys, that are likely hydraulically connected to the underlying stress relief fracture system. Monitoring wells MW-1 (southern valley), and MW-5 (northern valley) are screened in the perched zone. However, these zones are not considered the uppermost aquifer as they are limited in extent, discontinuous, and are located beyond the lateral extent of landfilled material. Within the limits of the landfill, underdrains located at various depths beneath the landfill liner prevent 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 elevation (GAI, 2006).

3.1.1.2 Overall Flow Conditions

Groundwater flow at the Site occurs within the stress relief fracture system (i.e. uppermost aquifer). Fractures in this system are hydraulically connected via open bedding planes, and groundwater flow directions generally follow topography from ridges towards the valley floor and out the northern and southern valley mouths. Perched in the valley mouths flows along the soil-rock interface. Available groundwater elevations are summarized on **Table 1** for the November 22, 2010 well gauging event. These potentiometric contours are depicted on **Figure 6**.

Packer testing was conducted during piezometer and well installations in 2005 in order to estimate hydraulic properties of the fractured bedrock. Reported hydraulic conductivity estimates from these tests in the uppermost aquifer ranged from 10^{-3} to 10^{-6} centimeters per second (GAI, 2006). No hydraulic testing data is available for perched groundwater in the valley floor.

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 that 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 definition of the uppermost aquifer under 40 CFR 257.53 is 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 saturated portion of the stress relief fracture system in bedrock, which is considered the uppermost aquifer at the Site. The uppermost aquifer is not known to be used locally for groundwater supply or industrial water use.

3.2 Compliance with Isolation Distance

The upper limit of the uppermost aquifer is located beneath the final subgrade surface achieved during landfill construction. As shown on **Figure 5a**, the groundwater level is over 5 ft in distance from the base of the CCR unit (i.e. top of the subgrade). This includes the highest level of groundwater relative to the subgrade at former well 0501 (abandoned), where the subgrade elevation is 766 ft amsl. The groundwater elevation at 0501 as measured in July 2005 was 742.68 ft amsl, which equates to a vertical separation distance of approximately 23 ft. The groundwater interceptor drain, which was installed during landfill construction when perched groundwater was encountered in order to maintain the perched groundwater elevation below the subbase, is also at an elevation of 766 ft amsl in the vicinity of 0501 (AEP Drawing No. 13-30500-03). Note the south valley portion of the landfill was constructed prior to

October 14, 2015 and therefore the isolation distance requirement does not require further evaluation for that portion of the landfill.

Future lateral expansion and landfill operations in the north valley, which are subject to compliance with isolation distance, include waste placement in the area of borings 0523 and 0524 (**Figure 4**, **Figure 5b**). The main track of a groundwater interceptor drain has already been placed in the northern valley at the time of this report, along with No. 2 stone placement along the northern valley opening. Based on AEP as-built drawings of the northern valley subgrade, the elevation of the base of the groundwater interceptor drain in the vicinity of boring 0523 is between 700 and 710 ft amsl. The available water level elevations measured at 0523 range from 668.17 ft amsl (November 2010, **Table 1**) to approximately 675 ft amsl (July 2005, **Figure 5b**). From the available information, the separation distance from the ground surface to the groundwater level is at least 25 ft. Therefore, this CCR unit meets the location restriction for separation from the uppermost aquifer as defined in 40 CFR 257.60(a) for both the current waste extent and expected future waste placement.

4. WETLANDS

CCR Rule 40 CFR Part 257.61 requires that new CCR landfills must not be located in wetlands.

4.1 Local Wetlands

Based on the August 11, 2015 site visit and review of available published information the FGD landfill is not located within any areas that exhibited wetland characteristics that might be classified as a regulated wetland. Photo documentation of the site visit is provided in **Appendix C**.

4.2 Compliance with Wetland Restrictions

Based on the August 11, 2015 site visit and review of available information, the FGD landfill is not located within wetlands (**Figure 7**). Therefore, this CCR Unit meets the location restriction regarding wetlands.

5. FAULT AREAS

CCR Rule 40 CFR Part 257.62 requires that new CCR landfills 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 and alternate setback will prevent damage to the structural integrity of the CCR unit.

5.1 Description of Regional Geologic Structural Features

There are two sets of bedrock structural folds in the vicinity of the landfill. The deepest of these consists of a parallel series of two synclines and an anticline which exhibit a roughly north-south trend. These folds are observed in Mississippian age rocks and are likely the result of oil and gas well installation. In the shallower bedrock, structural folds are assumed to be similar to those observed in the Pittsburg Coal. This includes the Parkersburg Syncline and the Byrnside Anticline, which are roughly parallel and trend in a northeast-southwest direction. Bedrock dips to the north-northwest underneath the site (GAI, 2006).

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 new CCR landfills 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 Ohio, as published by the USGS Earthquake Hazards Program. 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 landfills 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

Embankment slope stability analyses were performed based on final build out grades as part of the *Class F Industrial Landfill Facility Application* in March 2006. These calculations included both circular and wedge-type failure analysis and were executed using the software program SLOPE/W. This analysis concluded that static and seismic stability factors of safety were adequate for long-term stability.

7.1.3 Mass Movements

Figure 10 presents a map of known landslide activity in the area. While this figure indicates the area of the landfill may be susceptible to landslides, a detailed slope stability analysis of the landfill was performed and included in the landfill permit to install. This analysis demonstrates the landfill will be stable, and therefore not susceptible to mass movement. Therefore, the FGD landfill meets the siting criteria for mass movements.

7.1.4 Karst

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

7.1.5 Subsurface Mining

No subsurface mines are known to exist below the FGD landfill.

7.2 Compliance with Unstable Areas Restriction

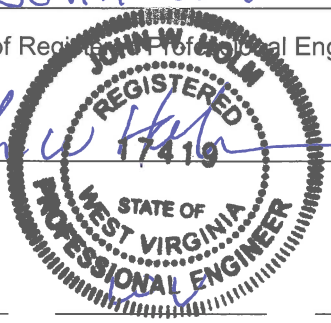
Based on the August 11, 2015 site visit and review of available information, the FGD landfill is not located within unstable areas. Therefore, this CCR unit meets the location restriction requirements for unstable areas.

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 Amos FGD landfill 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 Professional Engineer



Signature

17419		10/5/16
Registration No.	Registration State	Date

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TABLE

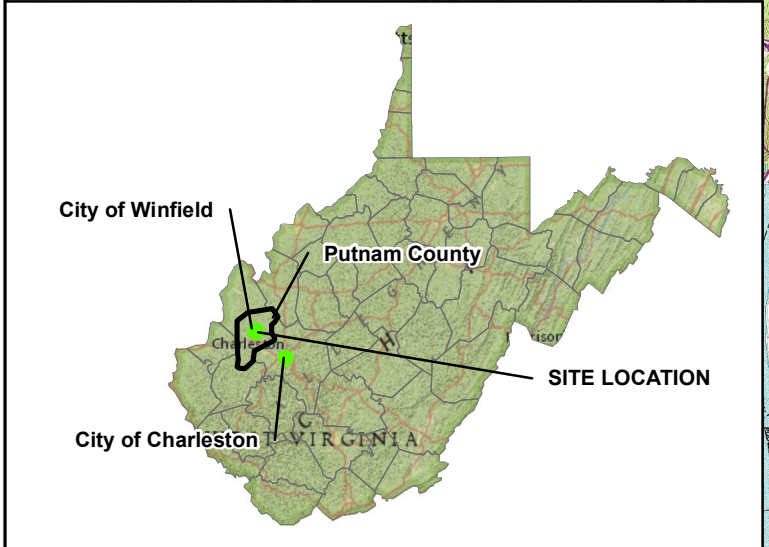
Table 1
Water Level Data
AEP Amos Generating Plant - FGD Landfill
Winfield, West Virginia

Well ID	Nov-10 GW Elev ft amsl
Monitor Wells	
MW-1 [a]	701.81
MW-2 [a]	668.35
MW-3 MW-3R [a] MW-3RA	779.77
MW-4 [a]	656.25
MW-5 [a]	670.50
MW-6 [a]	863.54
MW-7	
MW-7R [a]	782.28
MW-8 [a]	915.20
MW-9 [a]	897.50
MW-10 [a]	810.15
Piezometers	
0501 0502 0503 0504 0505	
0506 [a]	668.16
0507 0508 0509	
0510	
0511 0512 [a] 0513 [a] 0514 0515	781.07 781.24
0517 [a]	894.68
0519 [a]	905.43
0520 [a]	656.86
0521 [a]	948.43
0522 [a]	833.37
0523 [a]	668.17
0524 [a]	693.53
0525 [a]	675.01

Notes:

Shaded - well not verified or closed
Elevation in feet above mean sea level.
a. Source: AEP DWG. No. 13-30500-12-E
amsl = above mean sea level
bls = below land surface
Elev = elevation
ft = feet
GW = groundwater

FIGURES



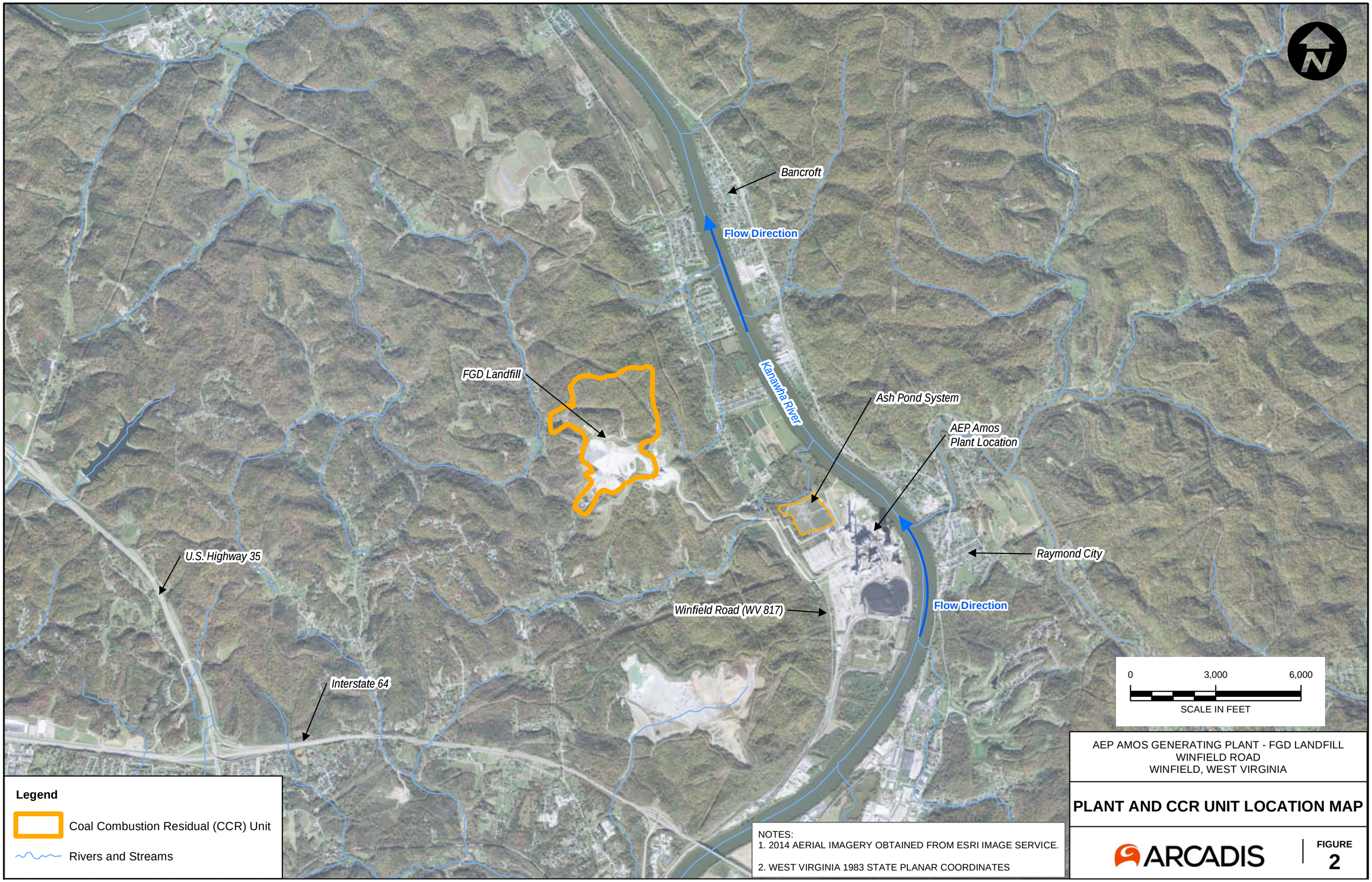
AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

SITE LOCATION MAP

ARCADIS

FIGURE
1

Document Path: Z:\GISPROJECTS_ENV\AEP\Amos\mxd\Landfill Report\F1_ site map.mxd



NOTES:
1. 2014 AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.

2. WEST VIRGINIA 1983 STATE PLANAR COORDINATES

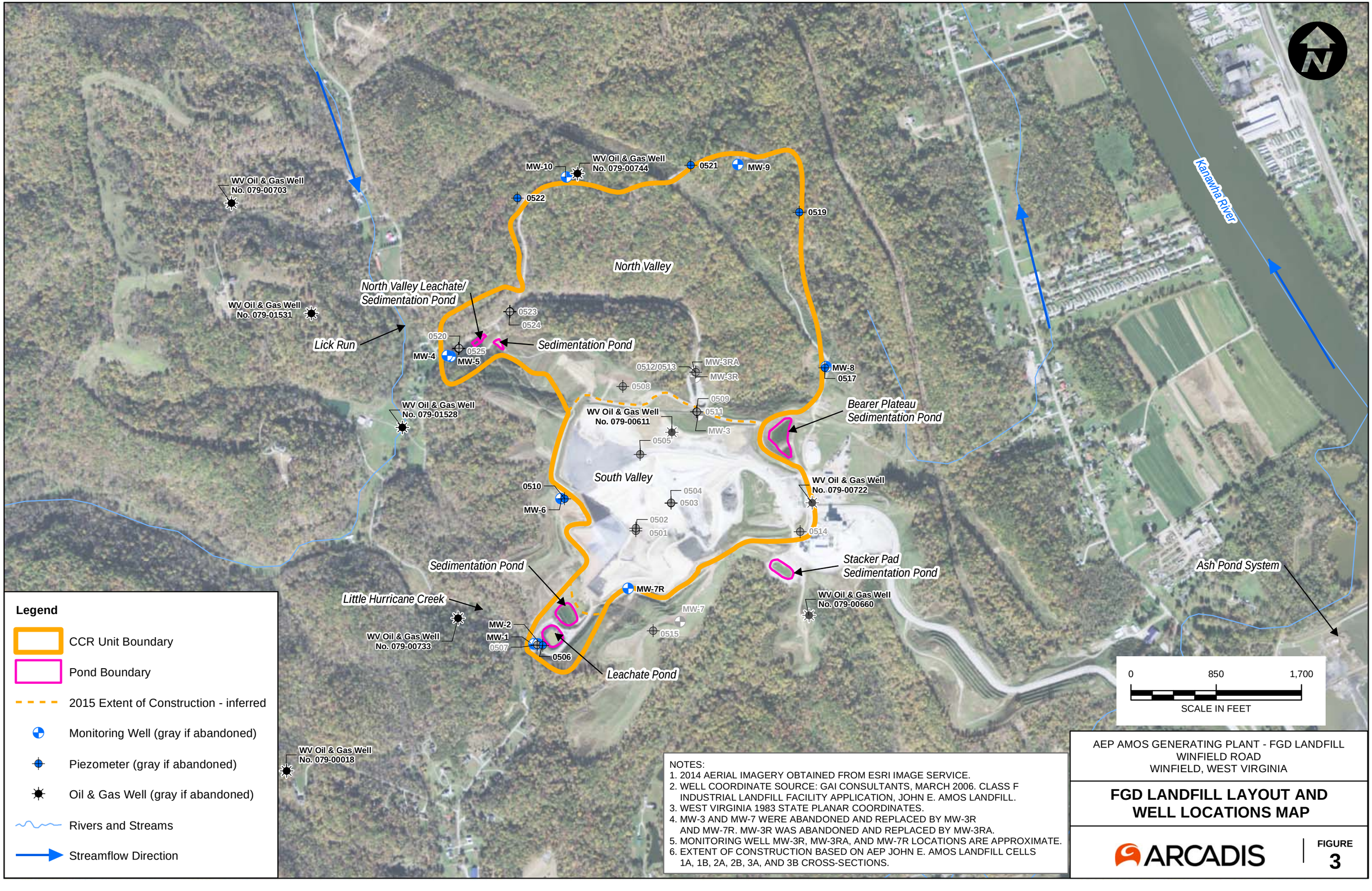
AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

PLANT AND CCR UNIT LOCATION MAP

ARCADIS

FIGURE
2

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
OH015976.0009.00001 (Mountaineer Ash Pond)
Z:\GIS\PROJECTS_ENV\AEP\Amos\mxd\Landfill Report\F2_AmosRegionalMap.mxd 11/4/2015 1:22:46 PM



Legend

- CCR Unit Boundary
- Pond Boundary
- 2015 Extent of Construction - inferred
- Monitoring Well (gray if abandoned)
- Piezometer (gray if abandoned)
- Oil & Gas Well (gray if abandoned)
- Rivers and Streams
- Streamflow Direction

NOTES:
1. 2014 AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. WELL COORDINATE SOURCE: GAI CONSULTANTS, MARCH 2006. CLASS F INDUSTRIAL LANDFILL FACILITY APPLICATION, JOHN E. AMOS LANDFILL.
3. WEST VIRGINIA 1983 STATE PLANAR COORDINATES.
4. MW-3 AND MW-7 WERE ABANDONED AND REPLACED BY MW-3R AND MW-7R. MW-3R WAS ABANDONED AND REPLACED BY MW-3RA.
5. MONITORING WELL MW-3R, MW-3RA, AND MW-7R LOCATIONS ARE APPROXIMATE.
6. EXTENT OF CONSTRUCTION BASED ON AEP JOHN E. AMOS LANDFILL CELLS 1A, 1B, 2A, 2B, 3A, AND 3B CROSS-SECTIONS.

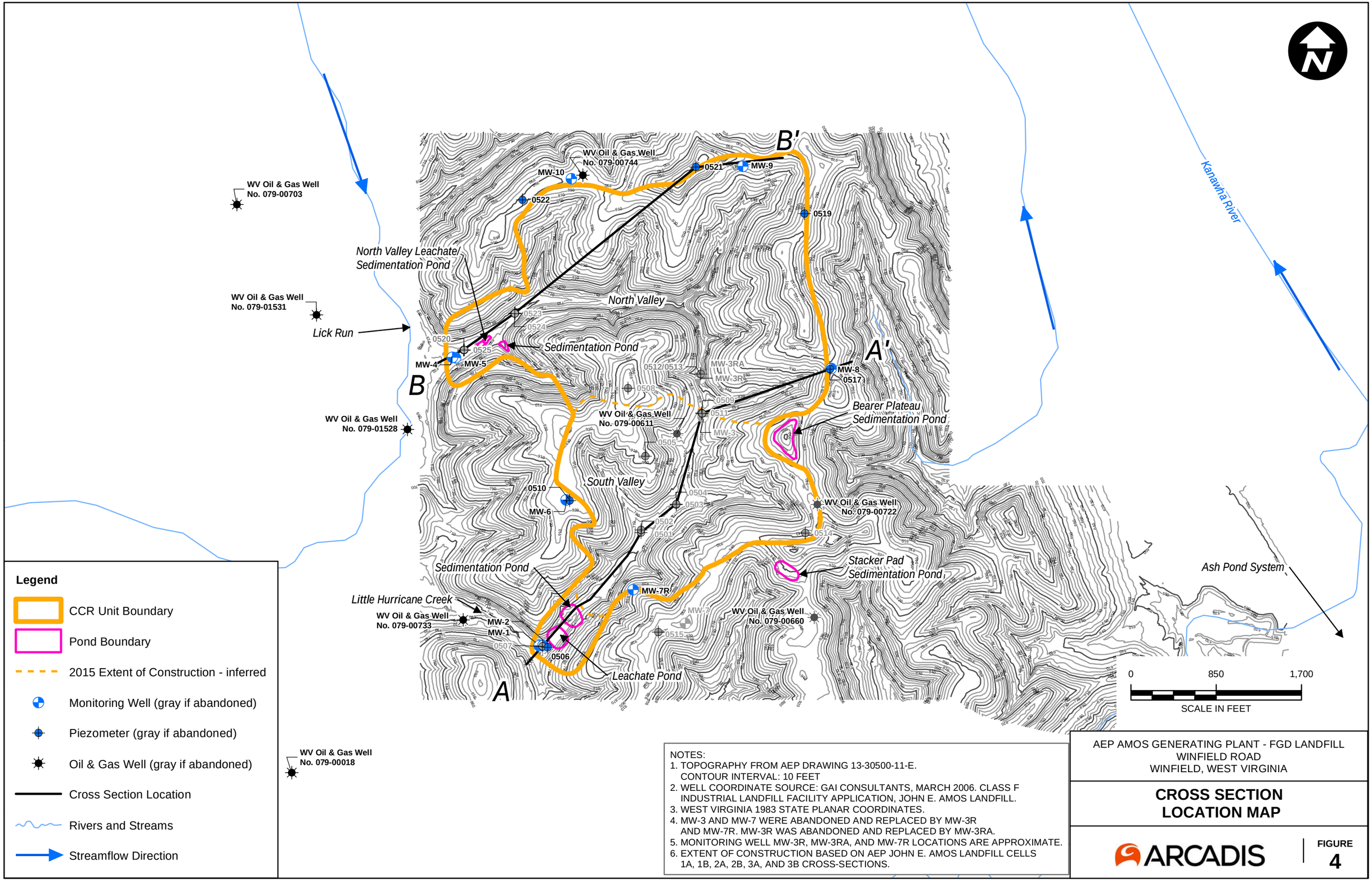
AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

FGD LANDFILL LAYOUT AND WELL LOCATIONS MAP

ARCADIS

FIGURE 3

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
OH015976.0009.00001 (Mountaineer Ash Pond)
Z:\GISPROJECTS_ENV\AEP\Amos\mxd\Landfill Report\F3_FGDLandfill_aerial.mxd 9/15/2016 12:42:16 PM



Legend

- CCR Unit Boundary
- Pond Boundary
- 2015 Extent of Construction - inferred
- Monitoring Well (gray if abandoned)
- Piezometer (gray if abandoned)
- Oil & Gas Well (gray if abandoned)
- Cross Section Location
- Rivers and Streams
- Streamflow Direction

NOTES:
1. TOPOGRAPHY FROM AEP DRAWING 13-30500-11-E. CONTOUR INTERVAL: 10 FEET
2. WELL COORDINATE SOURCE: GAI CONSULTANTS, MARCH 2006. CLASS F INDUSTRIAL LANDFILL FACILITY APPLICATION, JOHN E. AMOS LANDFILL.
3. WEST VIRGINIA 1983 STATE PLANAR COORDINATES.
4. MW-3 AND MW-7 WERE ABANDONED AND REPLACED BY MW-3R AND MW-7R. MW-3R WAS ABANDONED AND REPLACED BY MW-3RA.
5. MONITORING WELL MW-3R, MW-3RA, AND MW-7R LOCATIONS ARE APPROXIMATE.
6. EXTENT OF CONSTRUCTION BASED ON AEP JOHN E. AMOS LANDFILL CELLS 1A, 1B, 2A, 2B, 3A, AND 3B CROSS-SECTIONS.

AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

CROSS SECTION LOCATION MAP

ARCADIS

FIGURE 4

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
OH015976.0009.00001 (Mountaineer Ash Pond)
Z:\GISPROJECTS_ENV\AEP\Amos\mxd\Landfill Report\F4_CrossSectionTrend_topo.mxd 9/15/2016 12:45:03 PM

A
SOUTHWEST

SOUTH VALLEY

A'
NORTHEAST

ELEVATION

PRE-CONSTRUCTION GROUND SURFACE

MW-1 0536 | 0506 | MW-2 0535 | 0507 | 0502 | 0501 | 0504 | 0503 | MW-3 0527 | 0511 | 0509 | MW-8 0534 | 0517

CONTACT WATER CONTAINMENT BERM (CLAY)

TOP OF PROTECTIVE COVER 2014

TOP OF PROTECTIVE COVER 2011

50-MIL PVC (ON TOP OF CLAY)

CONTACT WATER CONTAINMENT BERM (CLAY)

TOP OF PROTECTIVE COVER 2008 (CELL - 1A)

CONTACT WATER CONTAINMENT BERM (CLAY)

TOP OF CLAY LINER INSTALLED 2010

APPROXIMATE TOP OF CCB AS OF 11-30-14

APPROXIMATE TOP OF CCB AS OF 12-2-13

APPROXIMATE TOP OF TOP OF CCB AS OF 11-29-12

APPROXIMATE TOP OF CCB AS OF 12-5-11 (CELLS - 1B & 1A)

0+00 2+00 4+00 6+00 8+00 10+00 12+00 14+00 16+00 18+00 20+00 22+00 24+00 26+00 28+00 30+00 32+00 34+00 36+00 38+00 40+00 42+00 44+00 46+00

1000 950 900 850 800 750 700 650 600

LEGEND:

- SOIL AND DECOMPOSED ROCK
- CLAYSTONE
- SANDSTONE
- SHALE
- SILTSTONE
- INFERRED TOP OF ROCK
- POTENTIOMETRIC SURFACE TRACE
- MW-1 / 0536 MONITORING WELL NUMBER / BORING NUMBER
- LINE INDICATES BORING LOCATION
- SUBBASE
- CLAY LINER
- WATER LEVEL RECORDED IN JULY, 2005
- PVC STICKUP
- BENTONITE SEAL
- SAND PACK
- SCREEN
- BENTONITE SEAL
- PIEZOMETERS AND MONITORING WELLS

HORIZONTAL SCALE: 1"=400'
VERTICAL SCALE: 1"=60'

NOTES:
1. THE HORIZONTAL POSITION OF THE SAMPLED BORING IS CORRECT ON THE CROSS SECTIONS. THE PIEZOMETERS AND MONITORING WELLS HAVE BEEN MOVED OFF LOCATION SO THEIR INFORMATION CAN BE SEEN. THEIR VERTICAL LOCATIONS AND LENGTHS ARE CORRECT.
2. SUBGRADE ELEVATION IS BASED ON THE OVERLAY OF TWO SEPARATE CROSS SECTIONS, AND THEREFORE IS APPROXIMATE.

SOURCES:
1. PRE-CONSTRUCTION CROSS SECTION: AEP DRAWING No. 13-30500-15-A.
2. POST-CONSTRUCTION CROSS SECTION: AEP CROSS SECTIONS YEAR END REPORT 2014.

AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

CROSS SECTION A-A'

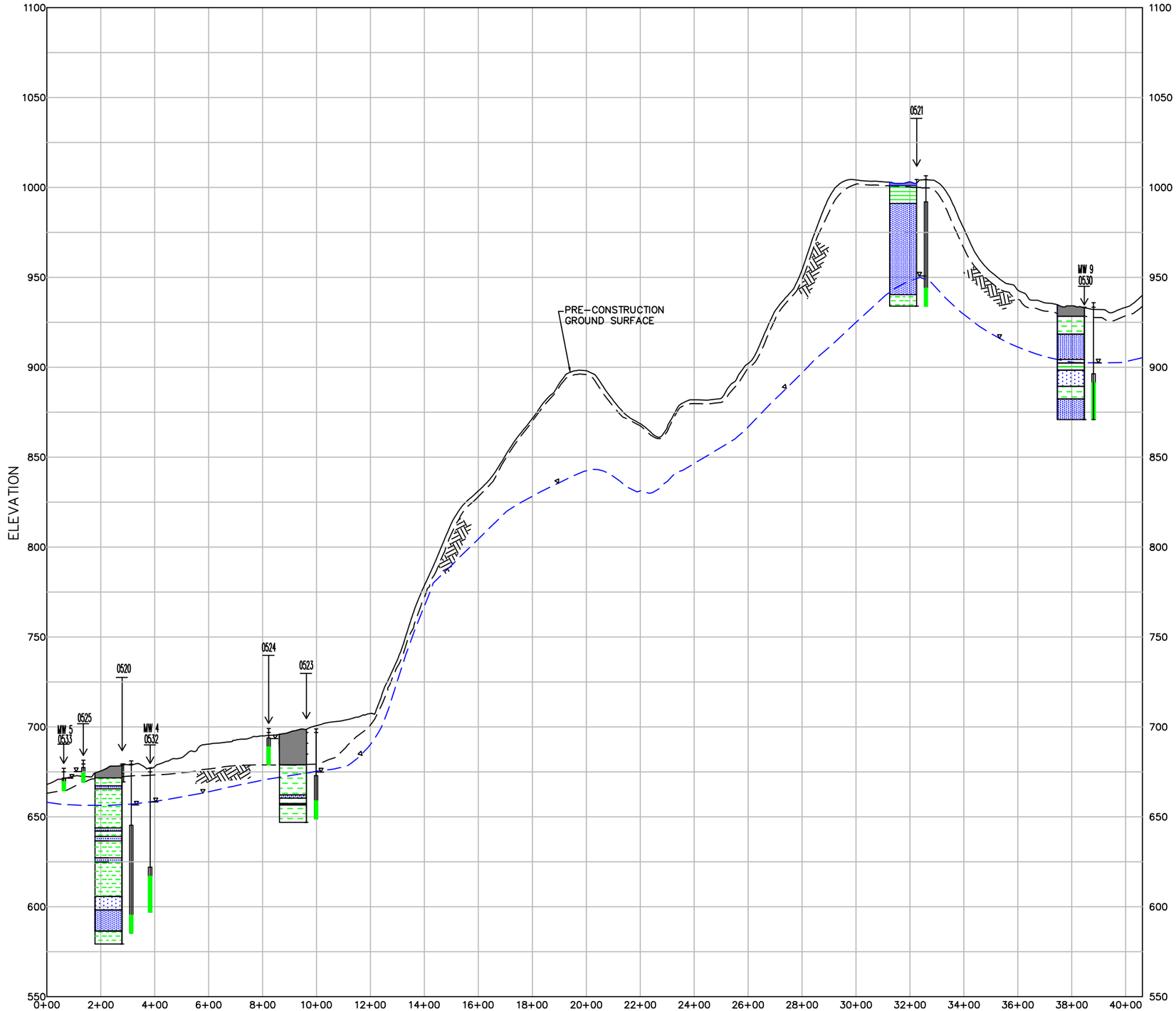
ARCADIS Design & Consultancy for natural and built assets

FIGURE 5A

B
SOUTHWEST

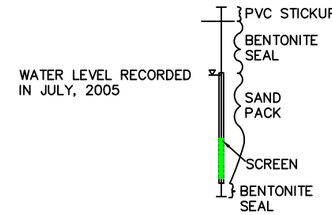
NORTH VALLEY

B'
NORTHEAST



LEGEND:

- SOIL AND DECOMPOSED ROCK
- CLAYSTONE
- SANDSTONE
- SHALE
- SILTSTONE
- INFERRED TOP OF ROCK
- POTENTIOMETRIC SURFACE TRACE
- MW-1 MONITORING WELL NUMBER
- 0536 BORING NUMBER
- LINE INDICATES BORING LOCATION



PIEZOMETERS AND MONITORING WELLS

HORIZONTAL SCALE: 1"=400'
VERTICAL SCALE: 1"=60'

NOTES:
THE HORIZONTAL POSITION OF THE SAMPLED BORING IS CORRECT ON THE CROSS SECTIONS. THE PIEZOMETERS AND MONITORING WELLS HAVE BEEN MOVED OFF LOCATION SO THEIR INFORMATION CAN BE SEEN. THEIR VERTICAL LOCATIONS AND LENGTHS ARE CORRECT.

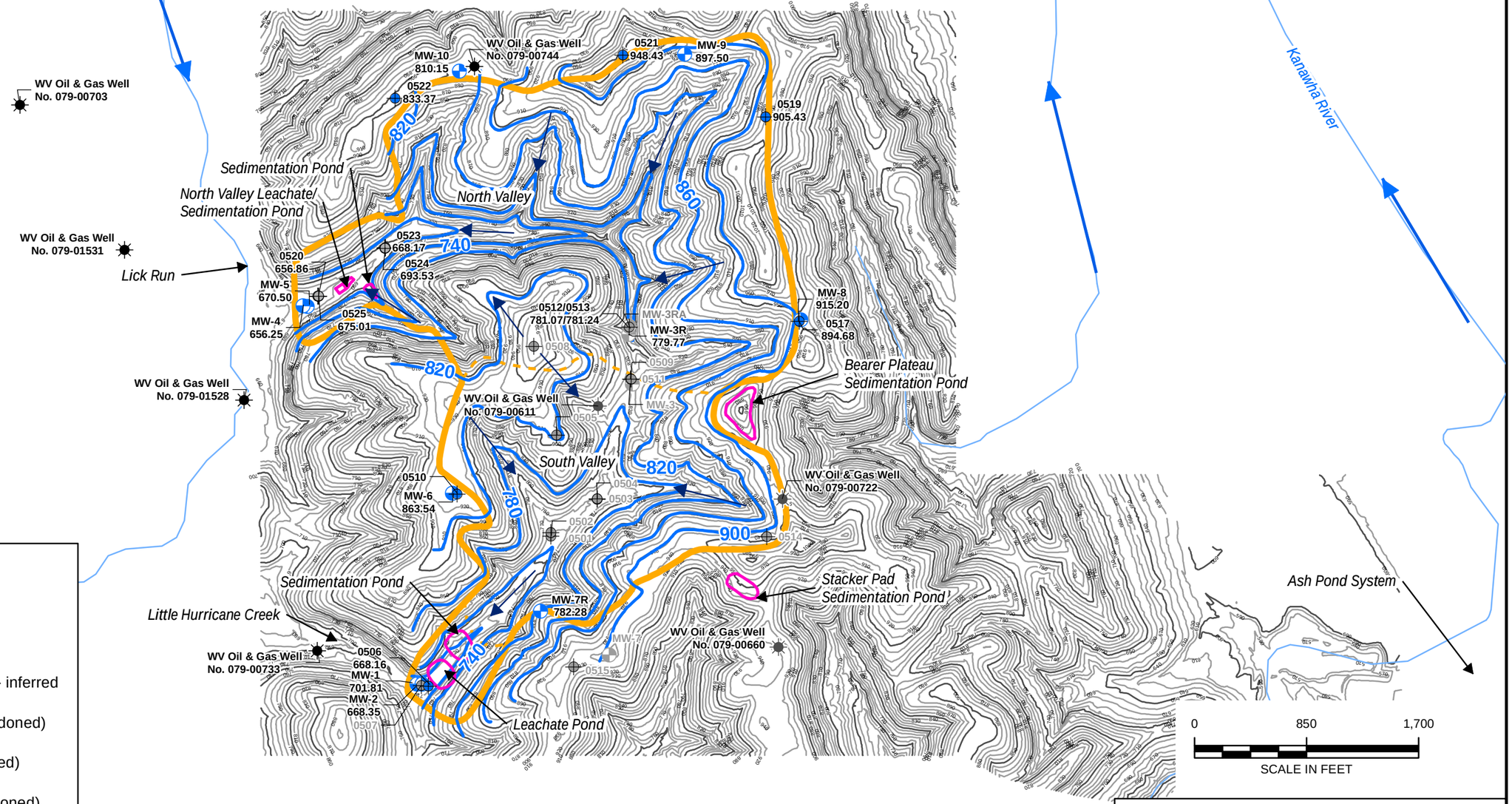
SOURCE:
1. PRE-CONSTRUCTION CROSS SECTION: AEP DRAWING No. 13-30500-14-A.

AEP AMOS GENERATING PLANT -FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

CROSS SECTION B-B'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5B



Legend

- CCR Unit Boundary
- Pond Boundary
- 2015 Extent of Construction - inferred
- Monitoring Well (gray if abandoned)
- Piezometer (gray if abandoned)
- Oil & Gas Well (gray if abandoned)
- Rivers and Streams
- Streamflow Direction
- Potentiometric Surface Contour Lines
- Estimated Groundwater Flow Path

NOTES:
1. TOPOGRAPHY FROM AEP DRAWING 13-30500-11-E. CONTOUR INTERVAL: 10 FEET
2. WELL COORDINATE SOURCE: GAI CONSULTANTS, MARCH 2006. CLASS F INDUSTRIAL LANDFILL FACILITY APPLICATION, JOHN E. AMOS LANDFILL.
3. WEST VIRGINIA 1983 STATE PLANAR COORDINATES.
4. MW-3 AND MW-7 WERE ABANDONED AND REPLACED BY MW-3R AND MW-7R. MW-3R WAS ABANDONED AND REPLACED BY MW-3RA.
5. MONITORING WELL MW-3R, MW-3RA, AND MW-7R AND LOCATIONS ARE APPROXIMATE.
6. EXTENT OF CONSTRUCTION BASED ON AEP JOHN E. AMOS LANDFILL CELLS 1A, 1B, 2A, 2B, 3A, AND 3B CROSS-SECTIONS.

AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

POTENTIOMETRIC SURFACE MAP NOVEMBER 22, 2010

ARCADIS

FIGURE 6

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
OH015976.0009.00001 (Mountaineer Ash Pond)
Z:\GISPROJECTS_ENV\AEP\Amos\mxd\Landfill Report\F6_POTmap_topo.mxd 9/15/2016 12:46:56 PM

Flow Direction
WV Oil & Gas Well No. 079-00703
WV Oil & Gas Well No. 079-00744
MW-10
0521
MW-9
0522
0519
Second Branch
Kanawha River
Flow Direction
Flow Direction
Sedimentation Pond
North Valley Leachate/ Sedimentation Pond
North Valley
WV Oil & Gas Well No. 079-01531
Lick Run
0523
0524
0520
0525
MW-4
MW-5
0512/0513
MW-3RA
MW-3R
MW-8
0517
0508
0509
0511
WV Oil & Gas Well No. 079-01528
WV Oil & Gas Well No. 079-00611
MW-3
Bearer Plateau Sedimentation Pond
0505
South Valley
0510
MW-6
0504
0503
WV Oil & Gas Well No. 079-00722
0502
0501
0514
Sedimentation Pond
Stacker Pad Sedimentation Pond
Ash Pond System
MW-7R
WV Oil & Gas Well No. 079-00733
MW-7
WV Oil & Gas Well No. 079-00660
MW-2
MW-1
0507
0515
Little Hurricane Creek
0506
Leachate Pond
WV Oil & Gas Well No. 079-00018

0 850 1,700
SCALE IN FEET

Legend

- CCR Unit Boundary
- Pond Boundary
- 2015 Extent of Construction - inferred
- Monitoring Well (gray if abandoned)
- Piezometer (gray if abandoned)
- Oil & Gas Well (gray if abandoned)
- Rivers and Streams
- Probable Wetland

National Wetlands Inventory

- Emergent Wetland
- Forested/Shrub Wetland
- Pond
- Riverine
- Intermittent or Perennial Stream/River
- Ephemeral Stream/River
- Artificial Path

NOTES:
1. 2014 AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. WELL COORDINATE SOURCE: AEP DWG. NO. 13-30500-12-E, GROUNDWATER ELEVATIONS AND POTENTIOMETRIC MAP.
3. WEST VIRGINIA 1983 STATE PLANAR COORDINATES.
4. MW-3 AND MW-7 WERE ABANDONED AND REPLACED BY MW-3R AND MW-7R. MW-3R WAS ABANDONED AND REPLACED BY MW-3RA.
5. MONITORING WELL AND PIEZOMETER LOCATIONS ARE APPROXIMATE.
6. EXTENT OF CONSTRUCTION BASED ON AEP JOHN E. AMOS LANDFILL CELLS 1A, 1B, 2A, 2B, 3A, AND 3B CROSS-SECTIONS.

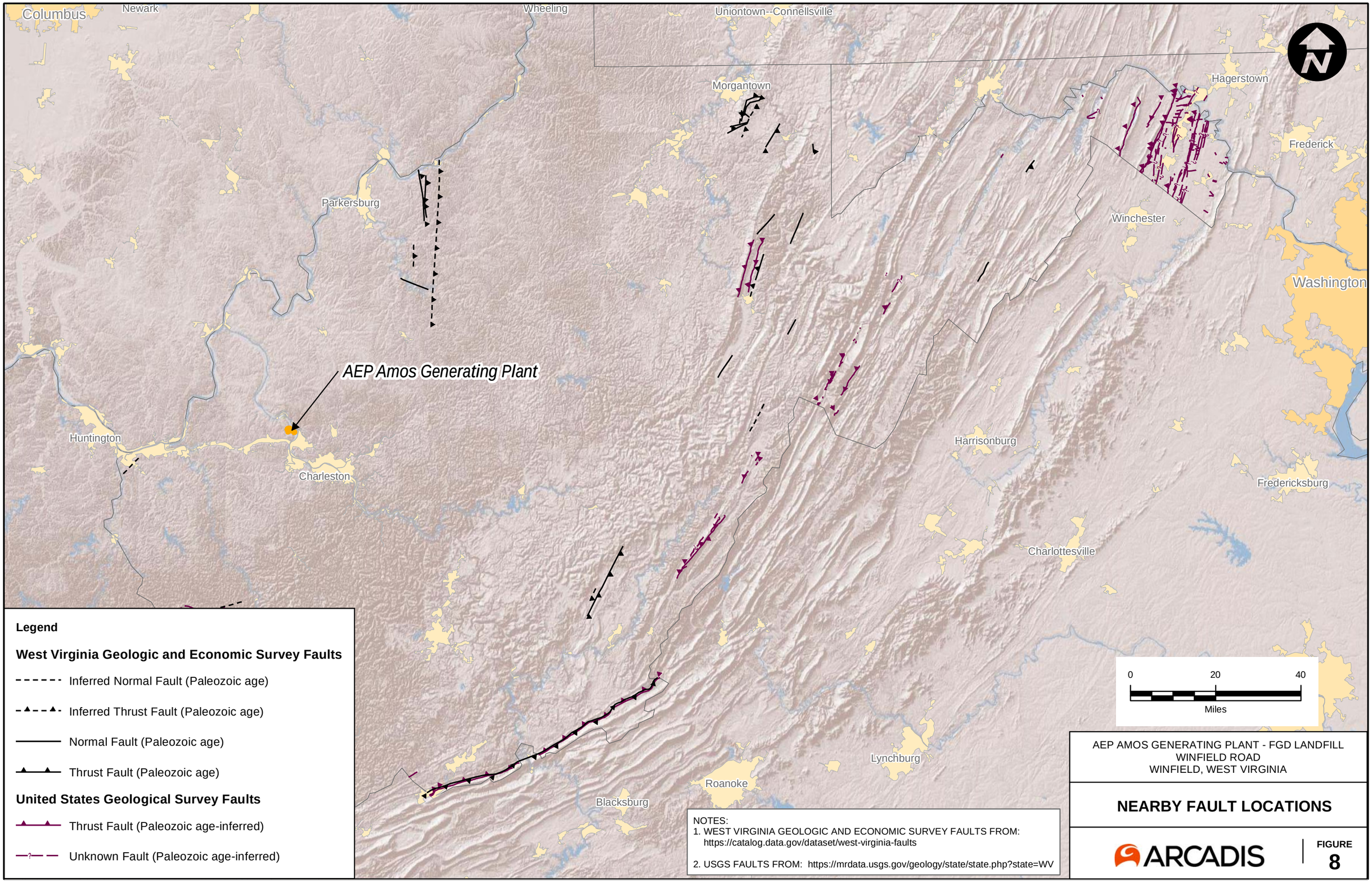
AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

SURFACE WATER FEATURES

ARCADIS

FIGURE 7

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
OH015976.0009.00001 (Mountaineer Ash Pond)
Z:\GISPROJECTS_ENVVAEPVamos\mxd\Landfill Report\F7_FGDLandfill Surface Water Features.mxd 9/15/2016 12:48:28 PM



Legend

West Virginia Geologic and Economic Survey Faults

- Inferred Normal Fault (Paleozoic age)
- Inferred Thrust Fault (Paleozoic age)
- Normal Fault (Paleozoic age)
- Thrust Fault (Paleozoic age)

United States Geological Survey Faults

- Thrust Fault (Paleozoic age-inferred)
- Unknown Fault (Paleozoic age-inferred)

NOTES:
1. WEST VIRGINIA GEOLOGIC AND ECONOMIC SURVEY FAULTS FROM: https://catalog.data.gov/dataset/west-virginia-faults

2. USGS FAULTS FROM: https://mrdata.usgs.gov/geology/state/state.php?state=WV

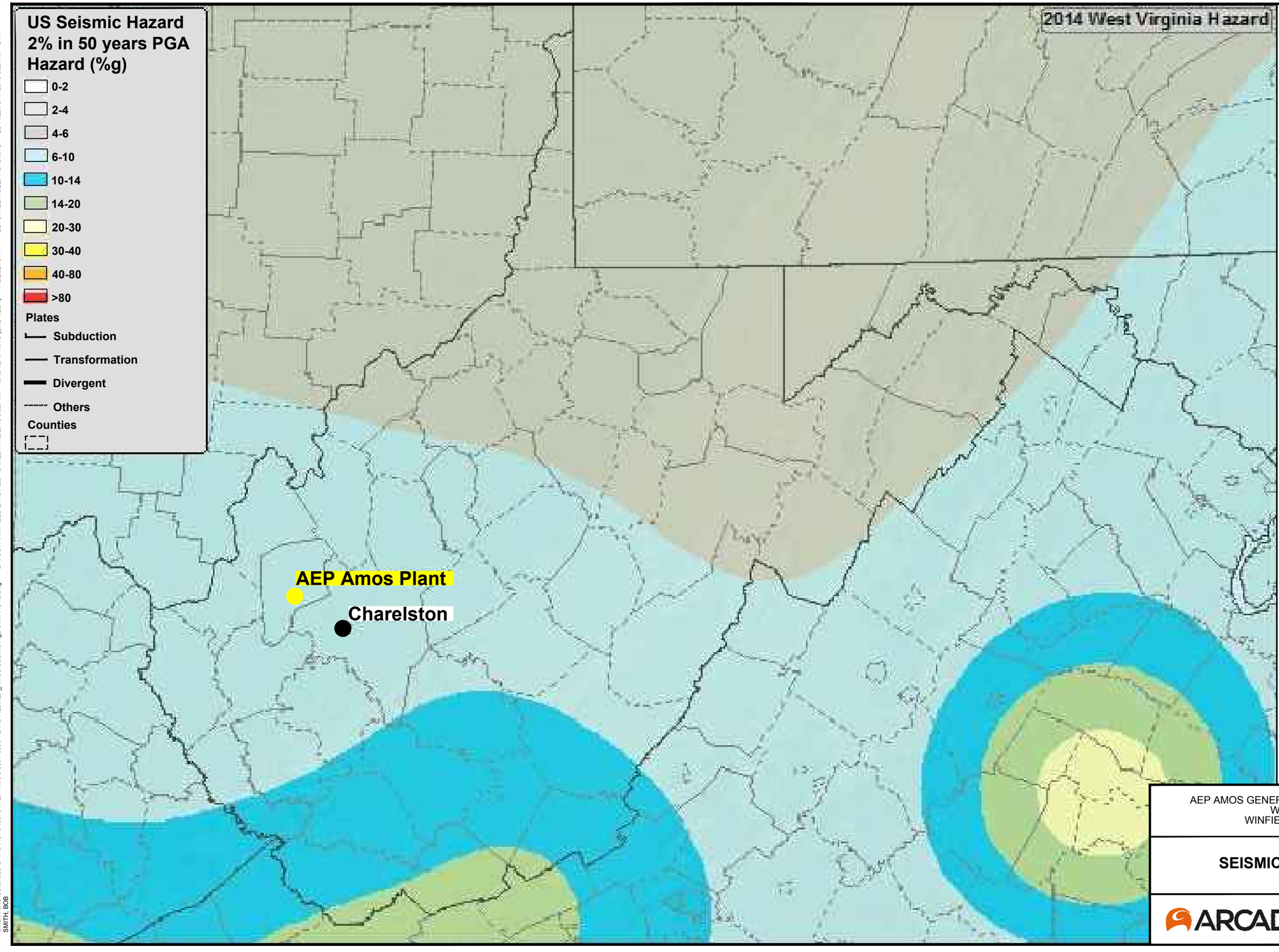
AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

NEARBY FAULT LOCATIONS

ARCADIS

FIGURE
8

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
OH015976.0009.00001 (Mountaineer Ash Pond)
Z:\GISPROJECTS_ENVVAEPVAmos\mxd\Landfill Report\F8_Nearby Fault Locations.mxd 8/16/2016 9:51:27 AM



N

SOURCE:
USGS Earthquake Hazards Program, West Virginia: 2014 Seismic Hazard Map

0 60 120

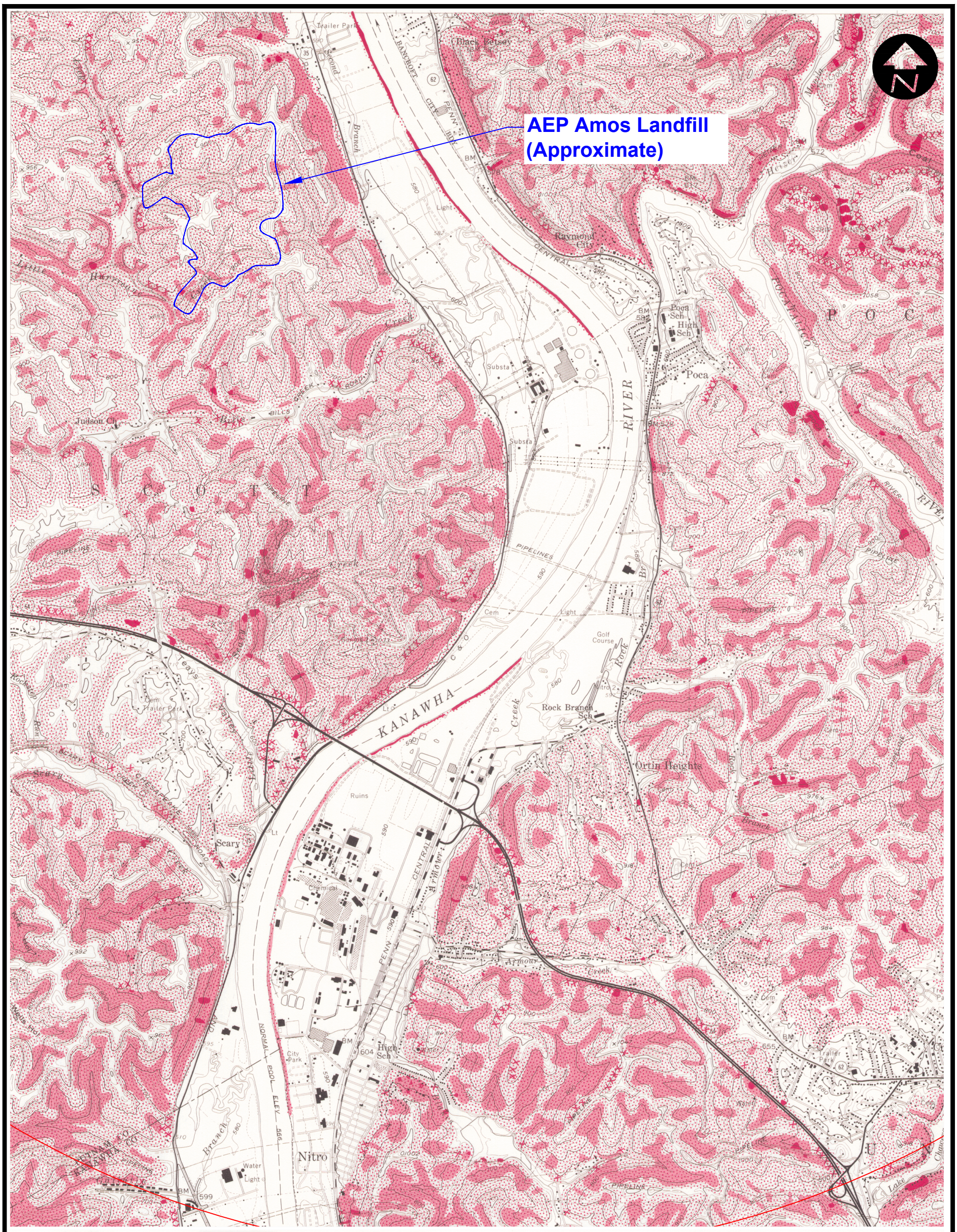
SCALE IN MILES
SCALE IS APPROXIMATE

AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

SEISMIC IMPACT ZONES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
9



EXPLANATION

Information on this map is intended as a general guide and should not be used as a substitute for detailed geological engineering and on-site investigations. Slide-prone areas are based on evidence of new and old slides. Stable slopes may be susceptible to landslides if they are modified by man. Additional information is contained in the report accompanying this map.

RECENT LANDSLIDES

Areas where landslides have been historically recorded or characterized by fresh scars and obvious recent movement.

OLDER LANDSLIDES

Areas lacking evidence of recent movement, but characterized by hummocky ground, slump blocks, flow structures, water seeps, or evidence from aerial photographs. Presently stable but can be reactivated easily.

ROCKFALLS

Areas where rocks have fallen or are highly likely to fall. Normally confined to very steep, natural or man-made slopes and cliffs.

SLIDE-PRONE AREAS

Areas judged to be unstable due to the occurrence of landslides, incompetent rock and soil, steep slope, or other evidence of instability.

RELATIVELY STABLE GROUND

Areas judged to have very low susceptibility to landslides and contain no known evidence of instability.

SOURCE:
West Virginia Landslide Study, West Virginia Geological and Economic Survey by Robert B. Erwin, Director and State Geologist. Saint Albans 7.5' Quadrangle, 1975.

0 0.5 1

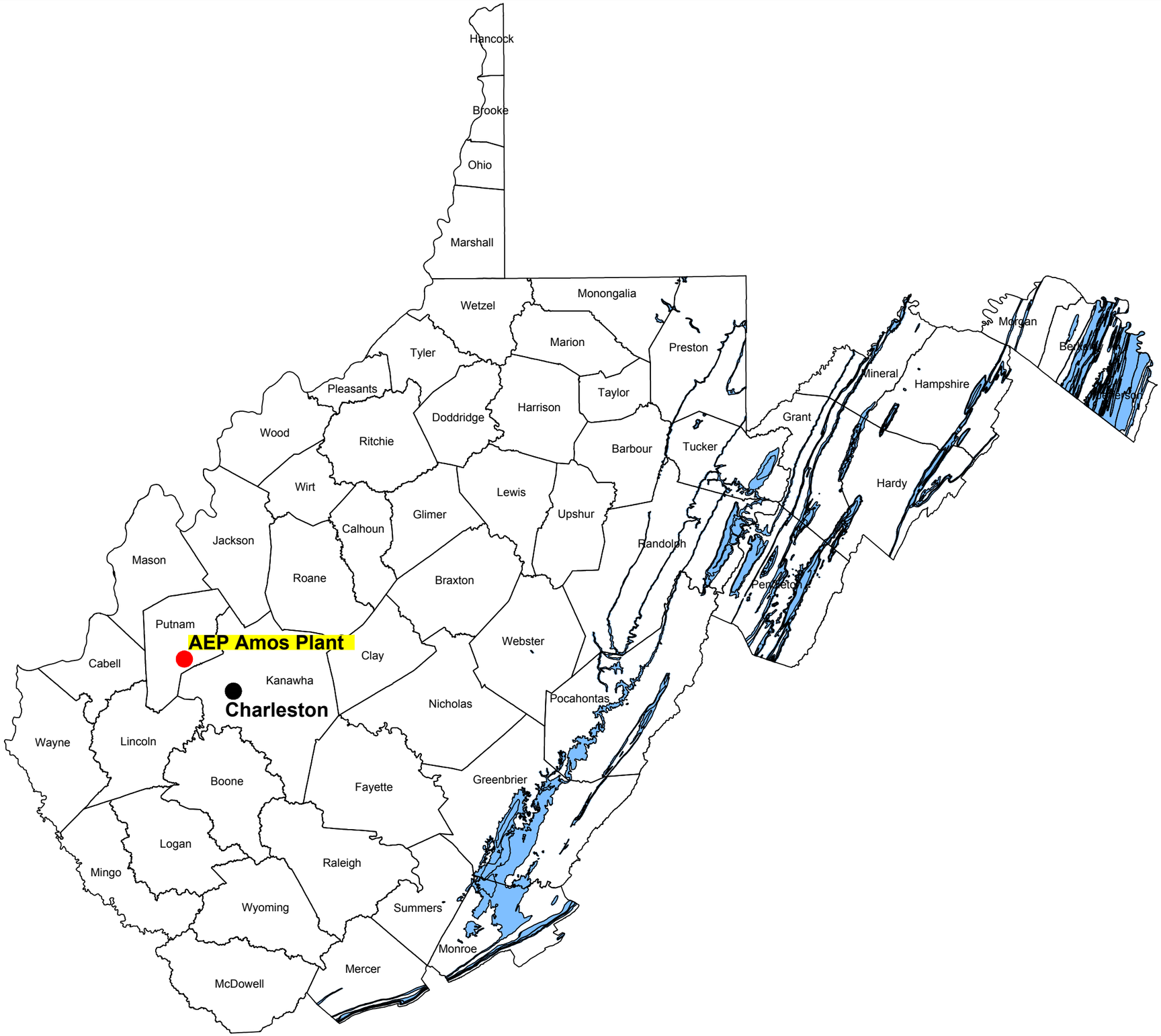
SCALE IN MILES
SCALE IS APPROXIMATE

AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

NEARBY LANDSLIDES AND RELATED FEATURES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
10



LEGEND

KARST AREAS: LIMESTONE AND DOLOMITE, UNDIFFERENTIATED

SOURCE:
KARST REGIONS DERIVED FROM 1968 GEOLOGICMAP OF WEST VIRGINIA, WEST VIRGINIA GIS TECHNICAL CENTER.

0 50 100

SCALE IN MILES
SCALE IS APPROXIMATE

AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

WEST VIRGINIA KARST AREAS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
11

APPENDIX A

Boring/Well Construction Logs and Closure Information

ARCADIS

GAI Consultants, Inc. 2006

Boring Logs

B-0501 to B-0525 & MW-1 to MW-10

gai consultants
transforming ideas into reality

N 540558.4978
E 1723508.1269 Grade El. 759.08

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. 0501

ELEVATION _____ GWL 0 HRS 8.4 PROJECT NO. C240387.42-01

HRS _____

DATE 18-19 APR 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 1	S-1			V. LOOSE	BROWN	SANDY SILT	ml	SLIGHTLY MOIST
1.5	1	REC 0.2							
	1	S-2							
3.0	3 3	REC 0.8			LOOSE	BROWN	SANDY SILT AND SMALL ROCK FRAGS.	ml	SLIGHTLY MOIST
	1 1	S-3			V. STIFF	BROWN	SILTY CLAY	cl	* 2.0 TSF
4.5	3	REC 0.9				GRAY & BROWN MOTTLED			
	1	S-4							
6.0	3 6	REC. 0.8			V. STIFF	GRAY & BROWN MOTTLED	SANDY CLAY MOIST	cl	* 2.75 TSF
	5 6	S-5				GRAY &			WATER @ 6'
7.5	4	REC 1.3			V. STIFF	BROWN MOTTLED	SANDY CLAY MOIST	cl	* 3.0 TSF
	4	S-6							
9.0	4 4	REC 1.5				GRAY &			
	3 6	S-7			V. STIFF	BROWN MOTTLED	SANDY CLAY MOIST	cl	* 3.0 TSF
10.5	7	REC							
	5	S-8				GRAY &			
12.0	8 10	1.3			V. STIFF	BROWN MOTTLED	SANDY CLAY MOIST	cl	* 3.75 TSF
	3 7	S-9			HARD	GRAY & BROWN	SANDY CLAY : DECOMP. CLAYSTONE	Cl	* 4.5 TSF
13.5	8	REC 1.5				MOTTLED			
	4	S-10				GRAY &			
15.0	6 10	REC. 1.5			HARD	BROWN MOTTLED	SANDY CLAY : DECOMP. CLAYSTONE	cl	* 4.5 TSF
	35	S-11			HARD		SANDY CLAY: DECOMP. CLAYSTONE	cl	* 4.0 TSF
16.5	5	REC. 1.5							
	3	S-12							
18.0	4 4	REC 1.5			HARD	GRAY	SANDY CLAY: DECOMP CLAYSTONE	cl	* 4.25 TSF
	2 2	S-13			HARD	GRAY	SANDY CLAY: DECOMP CLAYSTONE	cl	* 4.5 TSF
19.5	2	REC. 1.5							
	3	S-14				GRAY, BLUE & BROWN MOTTLED			
21.0	6 16	REC. 1.5			HARD		SANDY CLAY: DECOMP CLAYSTONE	cl	* 4.5 TSF
22.3	16 26 50/0.3	S-15 REC. 1.3		22.3	SOFT	GRAY	DECOMPOSED SANDY CLAYSTONE		
					V. SOFT TO SOFT	GRAY & MAROON MOTTLING	HIGHLY WEATHERED CLAYSTONE	UBR-BR	30° SLICKENSIDED FRACTURES AT 23.5, 23.7, 24.9
									LOW ANGLE FRACTURES AT
									22.7, 23.0, 23.6, 23.9, 24.05
	9.2 9.2	100%	71	27.4					24.2, 24.5, 24.6, 25.2, 26.0,
					SOFT	GRAY	SANDY CLAYSTONE	BR-BL	26.3, 27.7, 28.0, 28.4,
				25.0					29.6, 30.3
					SOFT TO	GRAY	INTERBEDDED SANDY SILT STONE AND SAND STONE	BL	45° FRACTURE 27.25 - 27.4

REMARKS ** DRILLED BY [illegible] IN [illegible] 4000-T2 TRUCK RIG.
BORING ADVANCED USING 5 1/4" SOLID STEM AUGERS, 4" Ø CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0501

(B-3)

gai consultants
transforming ideas into reality

PROJECT AREA 2/3 AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0501

ELEVATION _____ GWL 0 HRS 8.4 PROJECT NO. C040384.40-01

HRS •

DATE 18-19 APR 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. SOFT	GRAY	INTERBEDDED SANDY SILTSTONE	BL	
31.5							AND SANDSTONE (CON'T)		LOW ANGLE FRACTURES
									33.6, 34.4, 36.0, 36.2,
									36.7, 37.35, 37.8, 38.0, 38.2,
				34.6					41.1,
					SOFT	GRAY & MAROON MOTTLED	CLAYSTONE	VBR-	
	10.0	10.0	100%	70				BR	30° FRACTURES W/ SLICKEN-
									SIDES 35.4, 39.25, 39.75,
									40.0, 41.3-41.5
									BROKEN ZONES 35.6-35.8
									40.0-41.0, 41.5-42.3
41.5									
				42.3					
					M. SOFT TO M. HARD	GRAY	SANDSTONE	BL	LOW ANGLE FRACTURES
									42.3, 43.25, 48.0, 48.1,
									48.5, 50.2, 51.5, 51.7
									52.2, 52.7 53.4
	9.3	10.0	93%	88					
				48.0					
				48.5	SOFT	DK GRAY	SANDY CLAYSTONE	BR	
					M. SOFT TO M. HARD	GRAY	INTERBEDDED SANDSTONE AND SANDY SILTSTONE	BL	
51.5									
				53.4					
					SOFT	GRAY + MAROON MOTTLED	SANDY TO SILTY CLAYSTONE	VBR-	LOW ANGLE FRACTURES
								BR	53.7, 54.05, 54.3, 54.85,
									55.4, 55.55, 55.7, 55.85
	9.3	10.0	93%	31					56.05, 56.5, 56.7, 56.9
									57.2, 58.0, 58.5, 58.95 59.4
									60.6, 60.85, 61.35
									BROKEN ZONE 59.3-60.6

REMARKS ** ~30° SLICKENSIDED FRACS. 54.4, 57.55, 57.9, 58.25, 58.75, 61.1

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0501

gai consultants
transforming ideas into reality

PROJECT AREA 2-3 AMOS POWER PLANT ST ALBANS, WV BORING NO. B0501

ELEVATION _____ GWL 0 HRS 8.4 PROJECT NO. C040384.40-01

HRS _____

DATE 18-19 APR 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
61.5				61.6					
					SOFT	MAROON W/ GRAY, YELLOW, AND PURPLE MOTTLING	CLAYSTONE HIGHLY WEATHERED - CORE IS HIGHLY PITTED	VBR-BR	61.5-65.9 APPARENT ZONE OF CORE LOSS
									BROKEN ZONE: 69.5-66.7
									LOW ANGLE FRACTURES
	5.6 / 10.0	56%	28%						66.9, 67.15, 67.3, 67.75,
									67.85, 68.9, 69.1, 69.65,
									70.6
71.5									
									30° SLICKENSIDED
									FRACTURE 69.9, 71.1,
									71.4, 74.2, 75.0
	7.6 / 8.5	89%	27						BROKEN ZONE 71.5-72.3
									APPARENT CORE LOSS 72.3-
									73.2
									LOW ANGLE FRACTURES
80.0				80.0					74.55, 74.7, 75.35, 75.55,
							BOTTOM OF BORING : 80.0'		75.8, 76.1, 76.75, 77.5,
									77.65, 77.85, 78.2, 78.5
									78.65, 78.75, 78.85,
									79.0, 79.2, 79.5, 79.8,
									79.9

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B0501

N 540563.2422
E 1723508.0316 Grade El. 759.46

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0502

ELEVATION 758± GWL 0 HRS _____ PROJECT NO. C040384.40-01

HRS _____

DATE 21 APR 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
							AUGER W/O SAMPLING		
							TO 22'		
							SET PIEZOMETER -		
							TIP AT 21'		
				22.0			BOTTOM OF BORING: 22'		

REMARKS ** DRILLED BY TERRA TESTING INC. USING A SIMCO 4000 TX TRACK-MOUNTED DRILL
BORING ADVANCED USING 5 1/4" ID SOLID STEM AUGERS

* POCKET PENETROMETER READINGS
** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0502
(3-4)

N 540843.8055
E 1723858.5630 Grade El. 775.00

gai consultants
transforming ideas into reality

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. 0503

ELEVATION _____ GWL 0 HRS 11.4 PROJECT NO. C040384.40-A

HRS

DATE 18-19 APR 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 2

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 W.O.H	S-1			V. LOOSE	BROWN	CLAYEY SILT	ml	MOIST
1.5	W.O.H	REC 1.0							
	1	S-2							
3.0	1 1	REC 1.1			V. LOOSE	BROWN	CLAYEY SILT, TRACE SAND	ml	MOIST
	1 1	S-3			V. SOFT	BROWN	SILTY CLAY	cl	WET, * 0.5
4.5	3	REC 0.1				GRAY +			
	2	S-4							
6.0	4 6	REC 1.4			HARD	BROWN MOTTLED	SANDY CLAY	cl	SLIGHTLY MOIST, * 4.5
	3 6	S-5			M. DENSE	BROWN	SANDY SILT	ml	SLIGHTLY MOIST
7.5	8	REC. 0.4				GRAY +			
	3	S-6							
9.0	9 12	REC. 1.2			HARD	BROWN MOTTLED	SANDY CLAY: DECOMP. CLAYSTONE	cl	SLIGHTLY MOIST, * 4.5 TSF
	3 3	S-7			STIFF		SANDY CLAY " "	cl	MOIST * 3.75 TSF
10.5	4	REC. 0.4				GRAY +			
	6	S-8							
12.0	5 5	REC. 1.2			HARD	BROWN MOTTLED	SANDY CLAY " "	cl	SLIGHTLY MOIST * 4.5 TSF
	3 3	S-9			HARD	GRAY + BROWN MOTTLED	SANDY CLAY " "	cl	SLIGHTLY MOIST * 4.5 TSF
13.5	5	REC. 1.3							
	3	S-10							
15.0	5 5	REC. 1.0			HARD	GRAY	SANDY CLAY " "	cl	SLIGHTLY MOIST, 4.5 TSF
	3 3	S-11			HARD	GRAY	SANDY CLAY " "	cl	SLIGHTLY MOIST 4.5 TSF
16.5	4	REC 1.3							
	1	S-12							
18.0	2 1	REC 1.4			V. STIFF	GRAY	SANDY CLAY, SOME SILT "	cl	MOIST, * 3.75 TSF
	1 3	S-13			V. STIFF	DARK GRAY	SANDY CLAY, TRACE ORGANICS	cl	SLIGHTLY MOIST, * 3.75 TSF
19.5	6	REC. 1.3							
	6	S-14							
21.0	5 6	REC 1.2			V. STIFF	DARK GRAY	SANDY CLAY, TRACE ORGANICS	cl	SLIGHTLY MOIST, * 3.5 TSF
	2 2	S-15			LOOSE	BLUE + GRAY	CLAYEY SAND, TRACE ROCK FRAGMENTS	sc	MOIST
22.5	4	REC 1.3							
	28	S-16			SOFT	BLUE-GRAY	DECOMPOSED CLAYSTONE FRAGMENTS		
23.4	50/3.4	REC 0.9		23.4					
				1/4 MK 24.0	SOFT	GRAY	DECOMPOSED CLAYSTONE	VBR	TOP OF ROCK 23.4
					M. SOFT TO M. HARD	GRAY	SILTY SANDSTONE	VBR	CLAY SEAM 24.7, 29.?
								BR	VERTICAL FRACTURES 23.4-24.4, 25.25-25.3, 27.45-27.55
	7.5 7.5	100%	35						LOW ANGLE FRACTURES: 23.6, 23.8, 24.05 24.15, 24.3, 24.4, 24.55, 24.9, 25.05, 25.15

REMARKS ** DRILLED BY TERRA TESTING USING A SIMCO 4000 T2 TRACK MOUNTED DRILL RIG. BORING ADVANCED USING 5 1/4" ϕ SOLID STEM AUGERS, NQ CASING, NQ-2 WIRELINE COARING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0503

(B-5)

gai consultants
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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0503

ELEVATION _____ GWL 0 HRS 11.4 PROJECT NO. C040384.40-01

HRS _____

DATE 18-19 APR 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 2

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
30.9				30.7					25.25, 25.3, 25.35, 25.5,
				32.0	SOFT	GRAY	CLAYSTONE	VBR-BR	25.55, 25.75, 26.0, 26.15,
					SOFT	GRAY	SANDY CLAYSTONE	BR	26.25, 26.5, 26.7, 26.95, 27.2
				33.9	↓	↓	↓	↓	27.35, 27.45, 27.85, 27.95,
					M-SOFT	GRAY	SANDY SILTSTONE	BR	28.5, 28.75, 29.15, 29.35,
	10.0 10.0	100%	77	36.3	↓	↓	↓	↓	29.7, 30.3, 30.4, 30.9, 31.1
					SOFT	GRAY	CLAYSTONE		31.4, 31.7, 32.15, 32.4
						GRAY + MAROON MOTTLED			32.7, 32.8, 33.4, 33.9, 34.4
									35.1, 35.5, 35.9, 36.7, 36.9
40.9									37.1, 37.6, 38.0, 38.75,
									39.2, 39.3, 39.5, 40.9,
									41.6, 42.3, 42.75, 43.0,
				42.5	↓	↓	↓	↓	44.2, 44.8, 45.05, 45.6,
					M. SOFT	GRAY	INTERBEDDED SANDY SILTSTONE AND	BR	46.15, 46.95, 47.6, 49.2,
							SANDSTONE		49.4, 50.0
	8.9 9.1	98%	82					BR-BL	30° FRACTURES 28.85,
				47.4	↓	↓	↓	↓	39.35, 42.7
					SOFT	GRAY + MAROON MOTTLED	SANDY CLAYSTONE	BR-BL	BROKEN ZONE 40.9-41.6
50.0				50.0	↓	↓	↓	↓	
							BOTTOM OF BORING 50.0		

REMARKS** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0503

(B-5)

N 540840.0544
E 1723859.8367 Grade El. 775.40

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0504

ELEVATION _____ GWL 0 HRS _____ PROJECT NO. C040384.40-01

HRS _____

DATE 20APR 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
							AUGER W/O SAMPLING		
							TO 24' SET PIEZOMETER		
							TIP AT 23.2'		
				24.0					
							BOTTOM OF BORING: 24.0'		

REMARKS ** DRILLED BY PEN LAR TESTING USING A SIMCO 4000 T2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5 1/4" Ø SOLID STEM AUGERS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B0504

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transforming ideas into reality

N 541325.3505
E 1723551.3362 Grade El. 910.89

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B 0505

ELEVATION _____ GWL 0 HRS 84.0 PROJECT NO. C040384.45.01

HRS _____

DATE 2025 APR 2025 CLASSIFIED BY DAN SANGER PAGE 1 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 3	S-1			LOOSE	TAN	SANDY SILT, SLIGHTLY MOIST	ml	
1.5	3	REC 0.7			↓	↓	↓	↓	
	5	S-2							
3.7	12 30	REC. 1.5			DENSE				DECOMPOSED SANDSTONE/
3.8	12 50/0.3	S-3 REC 0.8		3.8	V.DENSE	↓	↓	↓	SANDY SHALE
				4.2	SOFT	TAN	SANDSTONE: HIGHLY WEATHERED	BR-VBR	TOP OF ROCK: 3.8'
				6.2	V.SOFT	TAN	SANDSTONE: COMPLETELY WEATHERED	VBR	
					M.SOFT TO M. HARD	TAN	SANDSTONE: MODERATELY WEATHERED,	BR-BL	VERTICAL FRACTURE 6.2-6.5
	7.2 7.2	100%	62		↓	↓	MICACEOUS, FINE TO MEDIUM GRAINED	↓	LOW & FRACTURES: 6.7, 7.25,
							↓		8.4, 9.8, 11.2, 11.45, 11.6
11.0							↓		
				11.6	V.SOFT	TAN	SANDSTONE: COMPLETELY WEATHERED,	VBR	
					↓	↓	MICACEOUS, FINE TO MEDIUM GRAINED	↓	
				14.0			↓		
					SOFT	TAN	SANDSTONE: HIGHLY WEATHERED,	BR	LOW & FRACTURES: 14.0, 14.2,
	10.0 10.3	100%	36		↓	↓	MICACEOUS, FINE TO MEDIUM GRAINED	↓	14.3, 14.35, 14.45, 14.55, 15.75,
							↓		16.5, 17.0,
				18.5			↓	VBR	
					V.SOFT TO SOFT	TAN	SANDSTONE: COMPLETELY WEATHERED,		
					↓	↓	MICACEOUS, FINE TO MEDIUM GRAINED		
21.0				21.0	↓	↓	↓	↓	
					SOFT	TAN	SANDSTONE: HIGHLY WEATHERED	BR	LOW & FRACTURES: 21.1,
					↓	↓	MICACEOUS, FINE TO MEDIUM GRAINED	↓	22.3, 22.45, 22.55, 22.7, 23.0,
							↓		23.1, 23.5, 23.75, 24.05,
									24.55,
	8.7 10.0	87%	55						
									STAINED 30° FRAC-
									TURE 21.9
					↓	↓	↓	↓	

REMARKS** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000-T2 TRACK MOUNTED DRILL BORING ADVANCED USING 5¼" SOLID STEM AUGERS, CONTINUOUS SPT, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B 0505

gai consultants
transforming ideas into reality

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0505 ("27)

ELEVATION _____ GWL 0 HRS 84.0 PROJECT NO. C040384.40-01

HRS _____

DATE 20- APR 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
31.0				31.0					
				32.0	U. SOFT	TAN	SANDSTONE: COMPLETELY WEATHERED	VBR	
					M. HARD	BROWN	SANDSTONE: MODERATELY WEATHERED	BR-BL	
							MICACEOUS, MEDIUM GRAINED		
									70° HIGHLY STAINED
	10.0 10.0	100%	41						FRACTURE 34.6 - 35.1
				36.5	SOFT TO	BLUE-GRAY	SHALE	BR	VERTICAL FRACTURE 35.7-36.6
					M. SOFT				LOW ∠ FRACTURES: 35.1,
				39.2					35.3, 35.45
				40.0	M. SOFT	TAN	SILTSTONE	VBR	STAINED VERT. FRAC. 39.7-40.0
41.0				41.3	M. HARD	DK GRAY	SILTY SANDSTONE	BR	HIGH ∠ STAINED FRACS:
					M. HARD	OLIVE	SANDSTONE: V. FINE GRAINED		40.0-40.3, 40.55-40.7
									LOW ∠ STAINED FRAC 41.8
				43.7					NEAR VERTICAL STAINED —
					M SOFT	BLUE-GRAY	SILTY SHALE	VBR	FRACTURE 41.8-42.2
	10.0 10.0	100%	44		SOFT TO				HIGH ∠ STAINED FRACTURE
				47.0					45.6-46.1
					M. SOFT	OLIVE-GRAY	SANDSTONE, FINE GRAINED, SOME	BR	HIGH ∠ STAINED FRACTURE
							CROSS BEDDING		49.5-49.9, 52.1-52.9,
									54.15-54.3, 55.7-55.9
51.0									VERTICAL STAINED FRAC-
									TURE 51.5-52.2,
				55.4					
	10.0 10.0	100%	36		SOFT	GRAY	SANDY SHALE	VBR-	
									VERTICAL STAINED FRACS
									55.1-56.7,
									HIGH ∠ + VERTICAL STAINED
								BR	FRACTURES 57.2-59.6

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0505 ("27)

gai consultants
transforming ideas into reality

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST ALBANS, WV BORING NO. B-0505

ELEVATION _____ GWL 0 HRS 84.0 PROJECT NO. C040384.40-01

HRS _____

DATE 20-25 APR 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
61.0				61.2	↓	↓	↓	↓	30° STAINED FRAC. 60.3'
					SOFT TO	GRAY	CLAY SHALE	BR-	HIGH & STAINED FRAC-
					M-SOFT			BL	TURE AT 62'
					↓	↓ MAROON MOTTLING	↓	↓	
	10.0 10.0	100%	52	65.5					
				66.1	M-HARD	GRAY	SANDSTONE	BL	
				66.9	SOFT	GRAY + MAROON	CLAY SHALE	BR	HIGH & STAINED FRAC. 66.5-66.7
					M-HARD	LT GRAY	SANDSTONE		HIGH & FRACTURE 67.7-67.9
				68.8	↓	↓	SHALY 67.7-68.8	↓	VERTICAL FRACTURE 68.2-68.6
					V-SOFT	BROWN-	CLAYSTONE - COMPLETELY WEATHERED	VBR-	:
71.0						GRAY		BR	
					↓	↓	↓	↓	
				73.0					
					SOFT TO	DK GRAY TO GRAY	CLAYSTONE	BR	SLICKENSIDES 73.55,
					M-SOFT				74.7, 74.8, 75.6, 75.9
	10.0 10.0	100%	40						76.5, 77.0, 77.35
				78.0	↓	↓	↓	↓	VERTICAL STAINED
					M-HARD	BROWN + GRAY	SANDSTONE: FINE TO MEDIUM GRAINED	BR	FRACTURE 77.7-80.5
81.0									
								BL	
						↓ BROWN			
	10.0 10.0	100%	76						
								BR	VERTICAL STAINED
									FRACTURE 87.5-88.8
					↓	↓	↓	↓	

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B0505

gai consultants
transforming ideas into reality

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0505

ELEVATION _____ GWL 0 HRS 84.0 PROJECT NO. C040384.40-01

HRS _____

DATE 20-25 APR 2005 CLASSIFIED BY DAN SANGER PAGE 4 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
91.0					M. HARD	BROWN	SANDSTONE (CON'T)	BR -	
								BL	LOW & FRACTURES
									93.8, 94.2, 95.1,
									95.2, 95.6,
	10.0 10.0	100%	86			GRAY			
101.0									
				101.5					
					SOFT	GRAY	SILTY SHALE	VBR	MUCH OF CORE IS
									PIECES 0.1-0.2'
							: BECOMES SANDY AT 104.75		LOW & FRACTURES 101.4,
	10.0 10.0	100%	18						102.0, 102.5, 102.9, 103.4,
									104.3, 104.5, 104.75
				108.7					VERTICAL FRACTURE 106.7-
									107.7
					M. HARD	GRAY	SANDSTONE: FINE GRAINED		U. BROKEN ZONE 107.0 - 107.7
111.0									STAINED NEAR VERTICAL
				112.2					FRACTURE 108.1 - 108.7
					SOFT TO M. SOFT	DK GRAY ↓ MAROON	CLAYSTONE	VBR	
									45° SLICKENSIDE 112.9-113.0
									U. BROKEN ZONE 114.2 - 114.8
	9.2 10.0	92%			M. SOFT	GRAY			
									LOW & FRACTURE 17.8, 19.6,
									120.4
					SOFT	GRAY MAROON			

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0505

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0505

ELEVATION _____ GWL 0 HRS 84.0 PROJECT NO. C04038.40-01

HRS _____

DATE 20-25 APR 2005 CLASSIFIED BY DAN SANGER PAGE 5 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
121.0					SOFT	GRAY & MAROON	CLAYSTONE (CONT) MODERATELY	VBR-	LAM & FRACTURES
						MAROON	TO HIGHLY WEATHERED	BR	121.4, 121.7, 122.3, 122.6,
									122.9, 123.1 123.4, 123.8
									124.1
					V. SOFT TO		: HIGHLY WEATHERED		
	6.0	10.0	60%		SOFT			VBR	124.8-132.0 HIGHLY
									BROKEN ZONE
						GREEN-GRAY			
131.0									
						MAROON		BR	
									45° SLICKENSIDES
									133.3, 134.2, 134.9,
									136.9, 139.2-139.4
	9.2	10.0	92%	67	136.0				
					M. SOFT	GRAY WITH MAROON CLASTS + STRINGERS	SANDY CLAYSTONE	BR-	
								BL	SLICKENSIDES AT
									142.35, 143.9, 144.7
									145.1, 145.35, 146.25
141.0									148.3, 148.9, 150.4,
									150.65
								VBR-	
	10.0	10.0	100%	55				BR	
							: BECOMES SILTY AT 144.6		
					SOFT	MAROON			
								BR	

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0505 (#27)

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0505

ELEVATION _____ GWL 0 HRS 84.0 PROJECT NO. C040384.40-01

HRS _____

DATE 20-25APR2005 CLASSIFIED BY DAN SANGER PAGE 6 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
151.0				151.5	M. HARD	GREEN-GRAY	SANDSTONE	BR	
				153.2	M. SOFT	GRAY	SANDY SHALE	BR	LOW ∠ FRACTURE 153.4, 153.65
	10.0 / 10.0	100%	86	156.1	M. HARD	GRAY	SHALY SANDSTONE	BR-BL	45° FRACTURE 154.35 - 154.5
				157.5	M-HARD	GRAY	SANDSTONE		LOW ∠ FRACTURE 157.35
161.0									
	10.0 / 10.0	100%	84						
				168.5	M. SOFT TO SOFT	GRAY TO DK GRAY	CLAYSTONE	VBR-BR	CLAY SEAM 167.55 - 167.70 LOW ∠ FRACTURES 168.75, 168.85, 169.15, 169.20, 170.7, 171.2, 171.6, 174.8, 174.95
171.0				173.4					
	9.3 / 10.0	93%	6.1		M. SOFT TO M. HARD	GRAY + MAROON	SANDY CLAYSTONE	BL	45° ∠ FRACTURE 169.75 - 170.1, 172.35, 172.7 LOW ∠ SLICKENSIDES 170.4, 170.7, 171.85, 172.9, 173.1; 173.4
				179.0	M. SOFT	MAROON	CLAYSTONE	BR-VBR	45° SLICKENSIDES 179.2 - 179.4, 179.7 - 180.0

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0505

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0505

ELEVATION _____ GWL 0 HRS 84.0 PROJECT NO. C040384.40-01

HRS _____

DATE 20-25APR2005 CLASSIFIED BY DAN SANGER PAGE 7 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
181.0					M. SOFT	MAROON	CLAYSTONE		LOW ANGLE SLICKENSIDE 181.9, 182.2, 183.2, 183.6, 184.0, 184.15, 184.4
				185.0				VBR	V. BROKEN 184.4-185.0
	10.0 / 10.0	100%	67		M. HARD	GRAY	SANDSTONE	BL	CLAY SEAM 188.7
				190.0					
191.0				191.0	M. SOFT	MAROON	CLAYSTONE	BR	
					M. HARD	GRAY	SANDSTONE	BL	
	9.0 / 9.0	100%	88						
				198.1					
					M. SOFT	GRAY & MAROON	SANDY CLAYSTONE	VBA-BR	SLICKENSIDES 198.45, 198.9, 199.25, 199.35, 199.6, 199.8
200.0							BOTTOM OF BORING: 200.0'		

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0505

N 539424.9688
E 1722518.6810 Grade El. 709.52

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, W.V. BORING NO. B-0506

ELEVATION _____ GWL 0 HRS 21.3 PROJECT NO. C04J384.43-01

HRS _____

DATE 21 APR 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 2	S-1			LOOSE	BROWN	SANDY SILT SOME ORGANICS	ml	FILL
1.5	4	REC 0.6							
	4	S-2							
3.0	5 6	REC 0.9			M. DENSE	RED-BROWN	SANDY SILT MOIST	ml	
	3 5	S-3							
4.5	6	REC 1.5							
	7	S-4			M. DENSE	RED BROWN	CLAYEY SILT / SILTY CLAY W/ R.F.	ml/cl	
6.0	8 33	REC 1.5							
	4 5	S-5			M. DENSE	RED-BROWN	CLAYEY SILT AND ROCK FRAGMENTS	ml	VARIES
7.5	6	REC 0.2							
	11	S-6							
9.0	10 11	REC 0.6			M. DENSE	RED BROWN	CLAYEY SILT AND ROCK FRAGMENTS	ml	MOIST
	7 12	S-7					(DECOMPOSED CLAYSTONE)		
10.5	15	REC 1.5							
	16	S-8							
12.0	18 18	REC 1.0			DENSE	RED BROWN	CLAYEY SILT AND ROCK FRAGMENTS	ml	SLIGHTLY MOIST
	8 11	S-9					(DECOMPOSED CLAYSTONE)		
13.5	18	1.5							
	22	S-10			DENSE	RED, BROWN, YELLOW, GRAY	DECOMPOSED CLAYSTONE		DRY
15.0	26 30	REC 1.2			V. DENSE		DECOMPOSED CLAYSTONE		DRY
	18 25	S-11			V. DENSE		DECOMPOSED CLAYSTONE		DRY
16.5	36	REC 1.5							
	12	S-12							
18.0	50/3.6	REC. 1.5		18.0	HARD		DECOMPOSED CLAYSTONE		DRY
				11/17/21	SOFT TO M. SOFT	MAROON	CLAYSTONE	BL	LOW % FRACTURES 19.65, 20.05, 21.6
	4.0 4.0	100%	90						
22.0									
							: SANDY 24.7 - 25.4		BROKEN ZONE: 22.0-22.5
									45° & FRACTURE W/ SLICKEN-SIDES 22.75-22.95
	9.6 10.0	96%	86				: SANDY 27.4 - 29.4		LOW % FRACTURES 24.6, 45° % SLICKENSIDE 28.3-28.55

REMARKS** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000 T2 TRACK MOUNTED DRILL. BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" I.D. STEEL CASING, CONTINUOUS SPT, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0506

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0506

ELEVATION _____ GWL 0 HRS 21.3 PROJECT NO. C040384.43-01

HRS _____

DATE 22-2 APR 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					SOFT TO	MAROON	CLAYSTONE (CONT)		LOW % FRACTURES W/
32.0					M. SOFT		: CORE SURFACE WEATHERED		SLICKENSIDES: 32.65
								↓	33.0, 33.25, 33.75,
								BL	34.05, 35.55, 36.65,
									38.4,
								↓	45° FRACTURES W/
	9.9	10.0	99%	58			: IRREGULAR CALCAREOUS	BR	SLICKENSIDES: 36.9,
							CLASTS 37.5 - 38.7	↓	37.25 - 37.45, 38.85 -
								BL	38.95
42.0									
									LOW % FRACTURES W/
									SLICKENSIDES 42.4,
									42.65 42.95, 44.25
									45.25, 45.7, 45.9,
	10.0	10.0	100%	76					47.75,
									45° & FRACTURES W/
				51.0	↓	↓	↓		SLICKENSIDES = 48.6,
52.0				51.7	M. SOFT	GRAY	SANDY CLAYSTONE		48.8, 49.0
					↓	MAROON	CLAYSTONE	↓	
					↓	↓	↓	BR	LOW % FRACTURES W/
				54.9	HARD	GRAY	SANDSTONE 54.6 - 54.9	↓	SLICKENSIDES: 52.3, 52.4
							SANDY CLAYSTONE	BL	53.5, 54.2
	10.0	10.0	100%	73	56.5	↓	↓		
					M. SOFT	MAROON	CLAYSTONE		45° FRACTURES W/ SLICK.
									ENSIDES 53.55 - 53.75
					↓	↓	↓	↓	54.45 - 54.6

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0506

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0506

ELEVATION _____ GWL 0 HRS 21.3 PROJECT NO. C040384.40-01

HRS _____

DATE 22-27 APR 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
				62.4	M. HARD	GRAY	SHALY SILTSTONE	BL	
62.0									
				64.1	M. HARD TO HARD	LT GRAY	SANDSTONE		VERTICAL FRACTURE
	10.0 10.0	100%	76						64.7-65.7
									65° FRACTURE 65.9-66.2
				71.5					
72.0				72.7	M. SOFT TO M. SOFT	BRAY + MAROON + GRAY	SILTY SHALE	BR	LOW ∠ FRACTURE 72.6
							CLAYSTONE	BR-BL	
	8.0 8.0	100%	78						30° FRACTURE W/SLICKEN-SIDE: 74.3
80.0				80.0					
							BOTTOM OF BORING: 80.0'		

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0506

N 539428.8146
E 1722523.7682 Grade El. 709.99

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS W/ BORING NO. B-0507

ELEVATION _____ GWL 0 HRS DRY PROJECT NO. 5 [illegible]

HRS _____

DATE 26 APR 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
							AUGER W/O SAMPLING		
							TO 18 FT.		
							PIEZOMETER INSTALLED,		
							T.P AT 17 FT		
18.0				18.0			↓		
							BOTTOM OF BORING: 18'		

REMARKS** DRILLED BY TERRA TESTING USING A SIMCO 4000-T2 TRACK MOUNTED DRILL
BORING ADVANCED USING 5¼" SOLID STEM AUGERS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0507

N 541996.9754
E 1723377.3436 Grade El. 979.22

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0508

ELEVATION 982± GWL 0 HRS 87.3 PROJECT NO. C040384.40-01

HRS

DATE 27-28 APR 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
1.5	1 4 7	S-1 REC 1.0			M. DENSE	TAN	SILT AND DECOMPOSED SHALE FRAGMENTS	M	SLIGHTLY MOIST
	18	S-2			↓	↓	↓	↓	
3.0	34 50/0.4	REC 1.2			V. DENSE				
4.5	37 30 22	S-3			↓	↓	↓	↓	
5.2	19 50/0.2	S-4 REC 0.7		5.2	↓	↓	↓	↓	
					SOFT	TAN TO BROWN	CLAY SHALE - HIGHLY WEATHERED	BR	LOW & FRACTURES: 5.7, 6.25, 6.75, 6.9
	5.7 5.7	100%	38		↓	↓	↓	↓	7.4, 7.7, STAINED: 9.2, 9.6,
10.9				11.5	↓	↓	↓	↓	RED STAINED 65° FRAC-TURE: 8.4-8.6, 9.0,
				12.6	SOFT	TAN	SILTY SHALE	BR	10.4-10.7, 12.0-12.4
				13.7	S-FT	TAN + GRAY	SHALY SANDSTONE - WEATHERED		LOW FRACTURE 12.9, 13.5
					SOFT	TAN	SHALE - GRADES FROM SILT TO CLAY - WEATHERED		BROKEN 14.1-14.3
	9.7 10.0	97%	50		↓	↓	↓	↓	VERTICAL FRACTURE 14.8-15.0
				16.4					LOW FRACTURES 15.6, 15.9
					SOFT	MAROON	CLAYSTONE	BR-BL	16.3, 16.45, 17.0, 17.3,
					↓	↓	↓	↓	18.2, 18.65, 20.6
									VERTICAL FRACTURE 20.9-21.3
20.9									70° FRAC. W/ SLICKENSIDES AT 22.2-22.4
								BL	
	10.0 10.0	100%	64						
					↓	↓	↓	BR	

REMARKS** DRILLED BY TERRA TESTIN INC. USING A SIMCO 4000-T2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5¼" ID SOLID STEM AUGERS, CONTINUOUS SPT, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0508
(25)

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0508

ELEVATION 982± GWL 0 HRS 87.3 PROJECT NO. C040384.10-01

HRS

DATE 27-28APR2005 CLASSIFIED BY DAN SANGER PAGE 2 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
30.9					SOFT	MAROON	CLAYSTONE	NBR	LOW & FRACTURES W/
								BR	SLICKENSIDES 31.0, 31.15,
									31.3, 31.5, 32.4, 33.0,
									NEAR VERTICAL FRACTURE
									31.8 - 32.1
	9.1.6	10.0	96%	65					70° FRAC W/ SLICKENSIDES
						GRAY+			32.4 - 32.65
				38.5		MAROON			70° FRAC W/ SLICK. 34.2
					M. SOFT	OLIVE-GRAY	SHALY SANDSTONE - V. FINE GRAINED	BR	LOW & FRACTURE 35.8, 37.3,
40.9									37.5 37.85
									LOW & ORANGE STAINED
									FRACTURE 39.0
									NEAR VERTICAL STAINED
									FRACTURE 39.4-39.7
				45.3					HIGH & FRACTURE 40.4
	10.0	10.0	100%	91	SOFT TO	BROWN-	SANDY SHALE	BR	BROKEN 40.4-40.9
				46.2	M. SOFT TO M. HARD	GRAY	SANDSTONE: FINE TO MED. GRAINED, MICACEOUS	BR-BL	LOW & FRACTURE 43.0
								BL	
50.9				51.0					
				51.9	M. SOFT	OLIVE	SANDY SHALE		
					M. SOFT TO M. HARD	OLIVE-GRAY	SANDSTONE		
				54.3					
				55.0	M. SOFT	OLIVE	SANDY SHALE		
	10.0	10.0	100%	87		MAROON TO GRAY	CLAYSTONE	BR	BROKEN ZONE 55.2-55.4
									LOW & FRACTURE 56.6,
									57.75
				59.7					

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0508

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0508

ELEVATION 982± GWL 0 HRS 87.3 PROJECT NO. C04D384.40-01

HRS

DATE 27-28 APR 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
60.9				60.8	M. SOFT	GRAY	SANDY CLAYSTONE	BL	
					SOFT	GRAY	CLAY SHALE	BR	LOW % FRACTURES 61.5, 62.2, STAINED 45° FRACTURE
				64.2					
	10.0	10.0	100%	65.8		GRAY + MAROON	CLAY SHALE, TRACE SAND	BR	62.6-62.8, 63.6-63.8.
					SOFT TO V. SOFT	MAROON	CLAYSTONE - WEATHERED		STAINED VERTICAL FRAC 64.2-64.3, 64.7-64.8, 65.3-65.45
70.9									45° FRACTURES 72.9, 73.5
				73.5				BR	
				74.0			SANDY SHALE		
	10.0	10.0	100%		M. SOFT TO M. HARD	GRAY	SANDSTONE: V. FINE TO FINE GRAINED		SHALE PARTING 77.6
80.9				92.0					
	9.3	10.0	93%		M. HARD	GRAY	SANDSTONE: FINE TO MEDIUM GRAINED	BL	
				88.1					STAINED VERTICAL FRACTURE
					SOFT	DK GRAY	CLAYSTONE	BR	87.6-88.15 30° FRAC. W/ SLICKEN SIDES

REMARKS ** F8.9

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 7/3 JOHN E. AMOS POWER PLANT ST. ALBANS WV BORING NO. B-0508

ELEVATION 982± GWL 0 HRS 87.3 PROJECT NO. C0403844.40-01

HRS

DATE 27-28 APR 2005 CLASSIFIED BY DAN SANGER PAGE 4 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TOR/VANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
90.9					SOFT	DK GRAY	CLAYSTONE (CON'T)	BR	45° SLICKENSIDED FRACTURES 92.0-92.1, 92.55-92.65 BROKEN 92.9-93.2 30° SLICKENSIDED FRACTURES AT 93.0, 93.25, 93.6,
	10.0	10.0	100% 37	96.4					
					M-SOFT TO M. HARD	GRAY	SILTY FINE GRAINED SANDSTONE	BL	93.9, 94.3 45° FRACTURES W SLICKEN SIDES 94.05, 94.85, 95.75
100.9				101.1					
				102.2	SOFT	GRAY & MAROON	CLAYSTONE	VBR	NEAR VERTICAL FRACTURE 98.5-99.0
				104.0	M. SOFT	GRAY	SILTSTONE	BL	60° FRACTURE W/SLICKENSIDE 101.6-101.9, INTERSECTED BY 45° SLICKENSIDE
				105.2	SOFT	MAROON & GRAY MOTTLED	CLAYSTONE	BR	
	10.3	10.0	100% 75		M. HARD	GRAY	SANDSTONE	BL	45° SLICKENSIDE @ 104.5
				106.8					VERTICAL FRACTURE (NO STAINING) 105.4-106.8
				108.9	M. SOFT	GRAY	SILTSTONE	BL	
110.9					SOFT TO M. SOFT	MAROON & GRAY MOTTLED	SILTY CLAYSTONE	BR BL	30° SLICKENSIDE 111.3
				112.3	M. SOFT	GRAY	SILTSTONE		SHALE PARTING 114.3
				114.7					
	10.0	10.0	100% 92	116.0		GRAY	SANDSTONE. FINE GRAINED SILTSTONE		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0508

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0508

ELEVATION 982± GWL 0 HRS 87.3 PROJECT NO. C040384.40-01

HRS

DATE 27-28 APR 2005 CLASSIFIED BY DAN SANGER PAGE 5 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
120.9				120.1	M. HARD	GRAY	SANDSTONE	BR	HEAVILY STAINED VERTICAL
				121.9	↓	↓	↓	↓	FRACTURE 120.2 – 122.2
				123.4	M. SOFT	GRAY	SILTSTONE	BL	SHALE PART. NO. 122.3
					M. HARD	GRAY	SANDSTONE	BL	
				125.5	↓	↓	↓	↓	
	10.0 10.0	100%	85		M. SOFT	GRAY	ARGILLACEOUS SILTSTONE	BL	
130.9									
							132.8-133.4 MAROON CLAYSTONE		
							133.4-134.0 SANDY		
	10.0 10.0	100%	79						
				132.4	↓	↓	↓	↓	
					M. SOFT TO M HARD	GRAY	SANDY SILTSTONE W/ THIN	BR	NEAR VERTICAL FRAC-
							INTERMITTENT SANDSTONE		TURE (NO STAINING)
				140.0	↓	↓	STRINGERS	↓	138.1 – 140.0
140.9				141.4	M. SOFT	GRAY	ARGILLACEOUS SILTSTONE	BR	SLICKENSIDES 141.2
					SOFT	GRAY - MAROON - YELLOW	CLAYSTONE		LOW ∠ SLICKENSIDES
									141.4, 142.0, 143.5
									30° SLICKENSIDES 142.3,
						GRAY			142.5, 142.75, 144.9,
	10.0 10.0	100%	78	146.0	↓	↓	↓		145.6
				147.2	M. HARD	LT GRAY	SANDSTONE; MICACEOUS		
							INTERBEDDED SHALY SILTSTONE		
							AND SILTY SHALE		
				150.0	↓	↓	↓	↓	

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0508

gai consultants
transforming ideas into reality

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0508

ELEVATION 982± GWL 0 HRS 87.3 PROJECT NO. C040384.40-01

HRS

DATE 27-28 APR 2005 CLASSIFIED BY DAN SANGER PAGE 6 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN		SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION				USCS OR ROCK BROKENNESS	REMARKS*
					PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1	2		3	4	5	6	7	8	9	10
150.9					150.0	M. HARD	GRAY	SANDSTONE: FINE TO MEDIUM GRAINED, MICACEOUS	BL	
	10.0	10.0	100%	100						
160.9										
	10.0	10.0	100%	100						
170.9										
					173.0	M. SOFT	GRAY	ARGILLACEOUS SILTSTONE	BR-BL	PARTING 173.4, 176.25
	10.0	10.0	100%	96						
					177.8	M. SOFT TO M. HARD	LT. GRAY	SHALY SANDSTONE: MICACEOUS	BL	

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0508

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transforming ideas into reality

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0508

ELEVATION 982± GWL 0 HRS 87.3 PROJECT NO. C040384.40-01

HRS

DATE 27-28 APR 2005 CLASSIFIED BY DAN SANGER PAGE 7 of 7

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
180.9				181.6					
					M. SOFT	GRAY	SILTSTONE		
				184.3					
					SOFT TO	GRAY	SILTY CLAYSTONE	BR-BL	
	10.0	10.0	100%		M. SOFT				45° SLICKENSIDES 185.6 -
						MAROON			185.75, 186.6-186.7,
						GRAY	: SANDY 187.3-188.8		186.9-187.05
									30° SLICKENSIDES 186.9,
									187.2, 187.3
190.9									
							: 191.8-200.9 IRREGULAR	BL	
							CALCAREOUS CLASTS AND		
						MAROON AND GRAY	STRINGERS THROUGHOUT		
	10.0	10.0	100%	96					
								BR	
200.9									
							BOTTOM OF BORING: 200.9'		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0508

N 541748.6664
E 1724111.6219 Grade El. 824.40

gai consultants

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0509

ELEVATION 825± GWL 0 HRS 53.4 PROJECT NO. C040384.40-01

23 HRS 16.0 (after drilling)

DATE 28APR-02MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 2	S-1			M. STIFF	TAN	SILTY CLAY MOIST	CL	* 0.75 TSF
1.5	2	REC 1.0							
	3	S-2							
3.0	3 4	REC 1.2			STIFF				* 1.5 TSF
	4 8	S-3			M. DENSE		CLAYEY SILT : DECOMPOSED	ML	DRY
4.5	10	REC 1.5				TAN & GRAY	CLAYSTONE		
	13	S-4							
6.0	15 19	REC 1.5			DENSE				DRY
	6 7	S-5			M. DENSE				DRY
7.5	12	REC 1.5							
	15	S-6							
9.0	15 16	REC 1.4			V. STIFF		SILTY CLAY : DECOMPOSED	CL	SLIGHTLY MOIST * 3.5 TSF
	5 7	S-7			V. STIFF		CLAYSTONE		" " "
10.5	10	REC 1.5							
	10	S-8							
12.0	11 15	REC 1.5			V. STIFF				" " * 4.0 TSF
	9 7	S-9			V. STIFF				" " * 4.0 TSF
13.5	10	REC 1.5							
	10	S-10							
15.0	11 12	REC 1.5			V. STIFF		: TALC ROCK FRAGMENTS		" " * 3.25 TSF
	4 8	S-11			M. DENSE		CLAYEY SILT : DECOMPOSED CLAYSTONE	ML	" "
16.5	9	REC 1.5							
	6	S-12							
18.0	8 12	REC 1.5			STIFF		SILTY CLAY : DECOMPOSED CLAYSTONE	CL	MOIST * 1.5 TSF
	3 5	S-13			STIFF				MOIST * 1.75 TSF
19.5	6	REC 1.5							
	8	S-14							
21.0	11 9	REC 1.5			V. STIFF				MOIST * 2.25 TSF
	5 7	S-15			STIFF				MOIST * 2.0 TSF
22.5	6	REC 1.5							
	10	S-16							
24.0	10 8	REC 1.5			STIFF				MOIST * 1.5 TSF
	W.O.R. 7	S-17			M. DENSE	GRAY	DECOMPOSED SANDSTONE		
25.5	14	REC 1.5		25.9	V. DENSE	GREEN-GRAY			TOP OF ROCK: 25.9
25.9	50/0.4	5.1B RECOV		11:17	SOFT	BROWN	SANDSTONE : HIGHLY TO COMPLETELY	WR	
							WEATHERED		
	1.1 6.1	18%	0						

REMARKS ** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000 T2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5¼ SOLID STEM AUGERS, 4" I.D. STEEL CASING, NQ-2 WIRELINE CORING TOOLS.

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0509

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0509

ELEVATION 825± GWL 0 HRS 53.4 PROJECT NO. C0403844.00

22HRS 16.0

DATE 28 APR-02 MAY 2005 CLASSIFIED BY D. AND SANGER PAGE 2 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
				32.0					
32.0					SOFT	MAROON	CLAYSTONE	BR-BL	
	7.1	71%	46						
					M. SOFT	GREEN-GRAY	: IRREGULAR CALCAREOUS CLAYEY AND SANDY LAMINATIONS (TO 1/3")		LOW & FRACTURES @ 44.4, 44.55, 46.2, 46.45, 46.95, 47.4, 49.0
42.0									
	98	98%	79						
				49.7	M HARD	LIGHT GRAY	SANDSTONE		
				SOFT	M. SOFT	GREEN-GRAY	CLAYSTONE		
52.0									
				53.9				BR	
	10.0	100%	85		M. SOFT	GREEN-GRAY	SILTY TO SANDY CLAYSTONE : IRREGULAR MAROON CLAYSTONE CLASTS : SANDY 56.7 TO 57.3	BR-BL	LOW & FRACTURES @ 54.9, 55.5, 57.2, 59.7, 59.0, 60.0

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0509

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS WV — BORING NO. B-0509

ELEVATION 825± GWL 0 HRS 53.4 — PROJECT NO. C040384.40-01

23HRS 16.0

DATE 28APR-02MAY 2005 CLASSIFIED BY DAN SANGER — PAGE 3 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
							CLAYSTONE (CON'T)		LOW & FRACTURES
62.0									62.2, 62.6 62.8, 63.4,
									63.7 64.1, 64.3, 64.5,
									64.9, 65.2
				66.5					
	10.0	100%	67		M. SOFT	GRAY	INTERBEDDED SILTSTONE AND	BL	
							CLAYSTONE		
72.0									
				76.6					
	10.0	10.0	100%	92	M. HARD	GRAY	SANDSTONE	BL	
				81.2					
82.0					M. SOFT	DK GRAY	SILTY TO SANDY SHALE	BR	LOW & FRACTURES 81.3,
				83.6					81.45, 82.7, 83.1 83.6
					SOFT	GRAY	CLAYSTONE		LOW & FRACTURES
									83.9, 84.1, 84.2, 84.7,
	10.0	10.0	100%	77					85.1, 85.5
									HIGH & FRAC W/SLICKENSIDES
							: BECOMES SILTIER @ 87.5		87.0-87.2

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0509

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT BORING NO. B-0509

ELEVATION 825± GWL 0 HRS 53.4 PROJECT NO. C0407844.40.01

23 HRS 16.0

DATE 28 APR - 02 MAY 2005 CLASSIFIED BY PAGE 4 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
				91.0	↓	↓	↓	↓	
92.0					M. HARD	LT GRAY	SANDSTONE	BR	
				93.6					
					SOFT TO	MAROON	CLAYSTONE	BR	
					M. SOFT				30° FRACTURES 95.1,
	8.0	83	100%						95.6, 96.4, 97.3,
									98.4, 98.6
									60° SLICKENSIDE 98.0-
				98.9	↓	↓	↓	↓	98.2
100.2				100.0	M. HARD	GRAY	SILTY SHALE/SILTSTONE	BL	
							BOTTOM OF BORING 100.2'		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

N 540879.8326
E 1722795.6504 Grade El. 925.74

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C040324.40-01

HRS

DATE 03-04 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 1	S-1			V. LOOSE	TAN	SANDY SILT	ml	MOIST
1.5	1	REC 1.2							
	2	S-2							
3.0	4 7	REC 1.3			M. DENSE	TAN + GRAY	CLAYEY SILT	ml	SLIGHTLY MOIST
	7 7	S-3			V. STIFF		SILTY CLAY	cl	DRY
4.5	10	REC 1.2							
	10	S-4							
6.0	12 10	REC. 1.3			V. STIFF	GRAY	SILTY CLAY	cl	DRY
	13 13	S-5			HARD	GRAY	SILTY CLAY: DECOMPOSED CLAYSTONE		DRY
7.5	13	REC.			HARD	MAROON + YELLOW	DECOMPOSED CLAYSTONE		
8.4	14 50/0.4	S-6 REC 0.9		8.4	SOFT	LT. BROWN + OLIVE	INTERBEDDED CLAY SHALE AND	BR	TOP OF ROCK 8.4
	23 23	100%	30				CLAYEY SILTSTONE: HIGHLY		HEAVILY STAINED HIGH
10.7							WEATHERED		& FRACTURE 9.4, 9.7,
									LOW & STAINED FRACTURES
									9.8, 10.4, 10.7, 11.3, 12.6, 12.75
				14.0					13.9,
	10.0 10.0	100%	58		M. SOFT	BROWN	SANDSTONE: WEATHERED TO	BR-BL	
					M. HARD	GRAY	~15.25, MICACEOUS, FINE TO		
							MEDIUM GRAINED		STAINED LOW & FRACTURES
									17.0, 17.3, 18.0
20.7				20.7					
				22.0	SOFT	GRAY	CLAYSTONE	VBR	
					M. SOFT	GRAY	SILTSTONE / SILTY SHALE	BR	STAINED HIGH &
				23.9					FRACTURE (60-70°)
					SOFT	LT. GRAY	CLAYSTONE	VBR-	22.8-23.0
	10.0 10.0	100%	65			OK GRAY + MAROON		BR	NEAR VERTICAL PARTIALLY
									STAINED FRACTURE 23.3-23.9

REMARKS ** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000-T2 TRACK MOUNTED DRILL
BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" I.D. STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS
** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510
(26)

gai consultants
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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS WV BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C040384.43-01

HRS _____

DATE 03-04 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
30.7					SOFT		CLAYSTONE (CONT) HIGHLY WEATHERED	BR-BL	
				35.0					
	9.5 10.0	95%	60		M. SOFT TO M. HARD	GREENISH GRAY	INTERBEDDED SILTY CLAYSTONE WITH CALCAREOUS CLASTS AND SANDY SILTSTONE	BR-BL	30° FRACTURE 36.2 60° FRACTURE 36.2-36.65
40.7						MAROON		VBR	
						GRAY		BL	
	10.0 10.0	100%	91			MAROON + GRAY (MOTTLED)			LOW ∠ FRACTURE 45.8, 46.0, 48.0, 52.5, 52.6, 53.5, 55.1, 55.5, 57.85
50.7								BR	
	10.0 10.0	100%	76						SLIGHTLY STAINED VERTICAL FRACTURE 55.75-56.1

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510 (2)

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PROJECT AREVA 3/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C040384.40-01

HRS _____

DATE 03-04 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2,	3	4	5	6	7	8	9	10
60.7					M-SFT	MAROON + GRAY	INTERBEDDED CLAYSTONE AND SILTSTONE (CONT)	BR-BL	LOW % FRACTURES 61.1, 61.6, 62.0, 63.2 63.5, 63.75, 63.9, 64.65, 65.0
	10.0 10.0	100%	92						
70.7							SANDY SILTSTONE 73.0-75.0		
	10.0 10.0	100%	96						
80.7								BR	30° SLICKENSIDES 81.3, 81.5, 81.8 82.1, 82.7, 82.9, 83.8, 84.1
	10.0 10.0	100%	60						
				87.6	M. HARD	GRAY	SANDSTONE FINE TO MEDIUM GRAINED, MICACEOUS	BL	

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510

gai consultants
transforming ideas into reality

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C040384.40-01

HRS _____

DATE 03-04 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 4 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN		SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION				USCS OR ROCK BROKENNESS	REMARKS*
					PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION		
1	2		3	4	5	6	7	8	9	10
90.7						M. HARD	LT GRAY	SANDSTONE (CONT'D)	BL	
	10.0	10.0	100%	100						
100.7										
	10.0	9.0	100%	100						
110.7										
					112.0	M-SOFT TO M-HARD	GRAY	INTERBEDDED SANDSTONE AND SILTSTONE, SOME THIN SHALE UNITS	BR-BL	LOW ∠ FRACTURE 112.4, 114.4, 114.55, 114.7, 119.1
	10.0	10.0	100%	91						

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C040384.40-01

HRS

DATE 03-04 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 5 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
120.7				121.5					
					SOFT TO M. SOFT	GRAY + MAROON	CLAYSTONE: IRREGULAR CALCAREOUS CLASTS + STRINGERS: 122.6-124.0, 135.0-138.7	BR-VBR	LOW & FRACTURES W/ SLICKENSIDES 122.35, 122.8, 123.35, 124.2
	10.0	10.0 100%	47						124.7, 124.9, 125.4, 126.1, 127.65, 128.3, 129.1, 130.1, 130.45, 130.7, 131.5, 131.9, 132.6, 134.5
									135.3
130.7									HIGH & SLICKENSIDE 133.25-133.6
	10.0	10.0 100%	60						
140.7				140.7					
					M. SOFT	GREEN-GRAY, MAROON, YELLOW MOTTLED	SILTY CLAYSTONE: INTERMITTENT IRREGULAR CALCAREOUS CLASTS AND STRINGERS	BR	MOST PIECES 0.2-0.4' LONG
	10.0	10.0 100%	73						

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510

(26)

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C0J384.40->1

HRS _____

DATE 03- MAY 2005 CLASSIFIED BY DAN SANGER PAGE 6 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
150.7							SILTY CLAYSTONE (CON'T)		
				153.2					
					M-HARD	LT GRAY	SANDSTONE: FINE TO MEDIUM	BL	
							GRAINED, MICACEOUS		
	10.0	10.0	100%						1 PIECE OF CORE: 7.6'
160.7									
									1 PIECE OF CORE 6.7'
	10.0	10.0	100%	100					
170.7									
				175.1					
	10.0	10.0	100%	53	SOFT TO M-SOFT	GRAY + MAROON	CLAYSTONE	VBK	MOST PIECES 0.2'
									~30° SLICKENSIDES
									176.0, 176.35, 177.55, 177.7,
									178.1, 178.45, 178.65, 179.0,
									60° SLICKENSIDES 179.1-
									179.35, 179.65-179.85

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C040384.40-01

HRS _____

DATE 03-14 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 7 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
180.7							CLAYSTONE (CONT)		
				181.5	M. SOFT	GRAY	SANDY SILTSTONE	BR-BL	
	10.0	10.0	100%	185.8	SOFT TO M. SOFT	MAROON	CLAYSTONE	BR	LOW & SLICKENSIDES 187.0, 187.6, 187.8, 189.0
				190.2					
190.7					M. HARD	LT GRAY	SILTY SANDSTONE	BL	
				194.0					
	10.0	10.0	100%	198.2	M. SOFT	GRAY + MAROON	INTERBEDDED SANDY CLAYSTONE AND SILTSTONE	BR	LOW & SLICKENSIDES 194.15, 196.1, 196.75, 197.15, 197.5, 197.85, 198.2,
				200.0	M. SOFT TO M. HARD	GRAY + LT GRAY	INTERBEDDED SILTSTONE AND SANDSTONE	BR-BL	
200.7									
	10.0	10.0	100%	209.7	SOFT TO M. SOFT	MAROON	SILTY CLAYSTONE	BR	LOW & SLICKENSIDES 204.25, 205.0, 205.25, 205.8, 206.7, 206.85, 207.25, 207.7, 207.85

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510

gai consultants
transforming ideas into reality

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C040384 (13-01

HRS _____

DATE 03-04 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 8 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
210.7					M. SOFT	GRAY	SHALY SILTSTONE, SOME SAND	BL-BR	
									VERTICAL FRACTURE
									(NOT STAINED)
									212.75 - 214.3
	10.0 / 10.0	100%	79			GRAY + MAROON			
						GRAY			
220.7									
				221.3					
					M. SOFT TO SOFT	MAROON + GRAY	SILTY CLAYSTONE	BR-BL	
									45° SLICKENSIDE 223.0
	10.0 / 10.0	100%	34					BR	225.2, 226.0, 226.6
								VBR	226.8
									LOW & SLICKENSIDES
									223.75, 224.25, 224.4,
230.7									224.7, 224.8, 225.0,
									225.4, 225.7, 226.0,
									226.1, 226.3
									226 - 233 VBR
	9.7 / 10.0	97%						BR	PIECES 0.1 - 0.2' W
									SLICKENSIDES (LOW
									& HIGH ∠)
									HIGH ∠ SLICKENSIDES 233.4
									233.9, 234.1, 236.6,
									237.6, 238.3, 240.2

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0510

ELEVATION _____ GWL 0 HRS 36.0 PROJECT NO. C040384.45.01

HRS _____

DATE 03-04 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 9 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
240.7					M. SOFT TO SOFT	MAROON + GRAY + PURPLE	CLAYSTONE	VBR	PIECES ~ 0.1-0.2' W/ SLICKENSIDES
								BR	30° SLICKENSIDES APPROX. EVERY 0.4-0.5'
	10.0 10.0	100%	56						
				248.3				VBR	
					M. SOFT	MAROON + GRAY	INTERBEDDED SANDY CLAYSTONE AND SILTSTONE	BR-BL	
250.7									
							BOTTOM OF BORING: 250.7'		

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0510

N 541746.9425
E 1724116.3536 Grade El. 824.57

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0511

ELEVATION _____ GWL 0 HRS _____ PROJECT NO. C040384.40-01

HRS _____

DATE 03-04 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
							AUGER W/6 SAMPLING		
							TO 26 FT		
							PIEZOMETER INSTALLED		
							TIP AT 25.5 FT		
				26.0					
							BOTTOM OF BORING: 26'		

REMARKS** DRILLED BY TERRATESTING, INC USING A SIMCO 4000-T2 TRUCK MOUNTED DRILL

RIG. BORING ADVANCED USING 6¼" SOLID STEM AUGERS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0511

(8)

N 542140.8876
E 1724101.7636 Grade El. 784.29

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0512

ELEVATION 795± GWL 0 HRS 2.6 PROJECT NO. C040384.40-01

HRS

DATE 04-05 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 1	S-1			V. LOOSE	BROWN	SILT, TRACE ORGANICS	ml	MOIST
1.5	2	REC 0.8							
	2	S-2							
3.0	2 3	REC 1.0			STIFF	BROWN	SILTY CLAY	cl	MOIST * 1.5 TSF
	2 3	S-3			LOOSE	BROWN	SANDY SILT, SOME ROCK FRAGMENTS	ml	SLIGHTLY MOIST
4.5	5	REC 1.3							
	5	S-4							
6.0	5 9	REC 1.2			STIFF	GRAY + BROWN	SILTY CLAY, TRACE ROCK FRAGMENTS	cl	SLIGHTLY MOIST * 1.5 TSF
	3 1	S-5			M. STIFF			cl	WET * 1.0 TSF
7.5	2	REC 0.8							
	9	S-6		8.0					
9.0	26 43	REC 1.5			V. DENSE	MAROON + GRAY	ROCK FRAGMENTS AND SANDY SILT:	gm	DRY
	32 32	S-7					DECOMPOSED CLAYSTONE	gm	DRY
10.5	36	REC 1.5							DRY
	13	S-8							
12.0	18 18	REC 1.5		12.0				gm	TOP OF ROCK: 12.0'
12.0	50/0.0	S-9 REC 0.0			M. SOFT	GREEN-GRAY, MAROON, PURPLE MOTTLED	SILTY CLAYSTONE	BR	
								VBR	
								BR	
	10.0 10.0	100%	40						
22.0				22.15					
					M. HARD	LT GRAY	SILTY SANDSTONE	BR	
	10.0 10.0	100%	91	28.5					
					M. SOFT TO M. HARD	GRAY	SILTY TO SANDY SHALE	BR-BL	

REMARKS ** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000-T2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" SD STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0512

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0512

ELEVATION 795± GWL 0 HRS 2.6 PROJECT NO. C04 0384.40-01

HRS

DATE 04-05 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. SOFT TO M. HARD	GRAY	SHALE (CON'T)	BR-BL	
32.0									
				35.7					
	10.0	10.0	100%		M. SOFT TO M. HARD	GRAY	INTERBEDDED SANDY SHALE AND SILTSTONE	BL	
42.0									
				42.95					
					SOFT	DK GRAY	CLAYSTONE	BR	LOW & SLICKENSIDE 43.1
									44.15, 45.0, 45.2, 45.8
				46.0					
	10.0	10.0	100%	47.6	M. SOFT	GRAY	SANDY SHALE	BR-BL	
					SOFT	GRAY + MAROON	CLAYSTONE	BR	
				49.7					LOW & FRACTURE 49.0
					M. SOFT TO M. HARD	LT GRAY	SANDY SILTSTONE	BL	
52.0				52.25					
					M. SOFT	MAROON	CLAYSTONE	BR	LOW X SLICKENSIDES
									52.55, 53.0, 53.6, 53.85,
									54.4, 54.65, 55.35
	9.9	10.0	99%	57.1					
					M. SOFT TO M. HARD	LT GRAY	INTERBEDDED SANDY SHALE AND SILTSTONE	BL	

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0512

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0512

ELEVATION 795± GWL 0 HRS 2.6 PROJECT NO. C04384.40-01

HRS

DATE 04-05 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. SOFT TO	LT GRAY	INTERBEDDED SANDY SHALE AND		
62.0					M. HARD		SILTSTONE (CONT.)		
							CLAYSTONE 62.7-63.2	VBR	
				64.2					
					SOFT TO	MAROON	CLAYSTONE	BR	VERTICAL FRACTURE 64.2-
				65.1	M. SOFT				64.6
	10.0	10.0	100%	94	M. HARD	LT GRAY	SHALY SANDSTONE: FINE TO	BL	
							MEDIUM GRAINED, MICACEOUS		
72.0									
				73.3					
					M. SOFT	MAROON + GRAY	SILTY CLAYSTONE	BR	VERTICAL FRACTURE 75.1-
									75.3
				76.5					45° FRACTURE 75.65
	10.0	10.0	100%	87	M. HARD	LT GRAY	SANDSTONE: MICACEOUS	BL	
82.0									
				85.0					
					M. SOFT	GRAY	SILTSTONE	BR	LOW ∠ FRACTURES
	9.8	10.0	98%	77					85.0, 86.35, 86.5, 88.0
									89.3
				89.7					

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0512

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT BORING NO. B-0512

ELEVATION 795± GWL 0 HRS 2.6 PROJECT NO. C0403841.01

HRS

DATE 04-05 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 4 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. SOFT	MAROON + GRAY	INTERBEDDED CLAYSTONE	BR	
92.0							AND SILTSTONE		
				96.7					
	12.0	12.0	100%		M. SOFT	OLIVE-GRAY + MAROON + YELLOW	CLAYSTONE W/ INTERMITTENT	BR	
			67		TO SOFT		IRREGULAR CALCAREOUS CLASTS +		30° SLICKENSIDES 97.0,
							STRINGERS. PITTED CORE SURFACE		97.2, 97.6, 98.75,
									99.25, 99.35, 99.7
									100.1, 100.6, 102.3,
102.0									102.5, 103.8, 104.1,
								BL	109.15, 109.5, 109.75
	6.8	8.0	85%						
			52					BR	
110.0				110.0					
							BOTTOM OF BORING: 110.0'		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0512

N 542140.8876
E 1724101.7636 Grade El. 784.29

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0513

ELEVATION _____ GWL 0 HRS _____ PROJECT NO. C040384.40-01

HRS _____

DATE 06 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
							BORING NOT DRILLED		
							LOG INCLUDED FOR CON-		
							TINUITY AND COMPLETENESS		
							PIEZOMETER INSTALLED		
							IN SAME BOREHOLE		
							AS B-0512		

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0513

(10)

N 540555.6419
E 1725145.9412 Grade El. 948.40

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0514

ELEVATION _____ GWL 0 HRS 32.1 PROJECT NO. C041038.W3-01

HRS _____

DATE 09-10 MAY 2005 CLASSIFIED BY DANIEL SANGER PAGE 1 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	4 4	S-1			LOOSE	BROWN	SILTY SAND, SOME ROCK	SM	
1.5	2	REC 0.9					FRAGMENTS		
	4	S-2							
3.0	3 2	REC. 0.2							
	2 5	S-3			V. STIFF	MAROON	SILTY CLAY	CL	* 3.5 TSF
4.5	4	REC 1.1							
	4	S-4							* 3.0 TSF
6.0	4 9	REC. 1.3							
	7 7	S-5							* 3.0 TSF
7.5	10	REC. 0.6							
	7	S-6							
9.0	9 9	REC 0.4			HARD		: DECOMPOSED		* > 4.5 TSF
	12 13	S-7					CLAYSTONE		* > 4.5 TSF
10.5	15	REC. 1.0		10.5					
	17	S-8			DENSE	TAN	DECOMPOSED SANDY SHALE	SM	
12.0	15 16	REC 1.4							
	21 20	S-9							
13.5	22	REC 1.5							
14.2		S-10 REC 0.7		14.2	V. DENSE	DK BROWN	DECOMPOSED SANDSTONE FRAGMENTS	SM	
					SOFT	LT. BROWN	HIGHLY WEATHERED SHALY	VBR-	HEAVILY STAINED
							SANDSTONE / SANDY SHALE	BR	VERTICAL FRACTURE
							HEAVILY STAINED		14.3-14.5, 17.5-17.7,
	7.8 7.8	100%	45						18.2-18.3
				19.3					STAINED SURFACES
					M. HARD	BROWN	SANDSTONE : STAINED TO		11.2, 15.5, 16.05, 16.15
							~ 22.2'		17.1, 17.6
22.0						GRAY			
				22.8					
				24.2	M. SOFT	GRAY	SILTSTONE STAINED 23.85-24.25	BR	LOW & STAINED FRACS 24.1, 24.15
					M. SOFT	DK	CLAYSTONE W/ CALCAREOUS	BR	LOW & STAINED FRACTURE
					SOFT TO SOFT	GRAY	CLASTS + STRINGERS		25.4, 26.6,
	10.0 10.0	100%	62				: SANDY 25.8-26.25		LOW & FRACTURES 27.4
				28.2					27.8
					M. SOFT	GRAY	INTERBEDDED SANDY SHALE AND	BR	
							SILTSTONE		

REMARKS ** DRILLED BY TERRA TESTING USING A SIMCO 4000-TR TRACK MOUNTED RIG.
BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 1" I.D. STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS
** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0514
(22)

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0514

ELEVATION _____ GWL 0 HRS 32.1 PROJECT NO. C04038410-01

HRS _____

DATE 09-10 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. SOFT	GRAY	SHALE / SILTSTONE (CONT)	BR	LOW % FRACTURES 29.5
32.0									31.0, 31.15, 32.9,
									33.45, 34.5
				34.8					
					SOFT	MAROON	CLAYSTONE	BR	~30° FRACTURES W/
	10.0 11.0	100%	52						SLICKENSIDES 35.8,
									37.8, 39.2, 39.8, 40.7
									41.15, 41.35
42.0				42.0	N				
					M. SOFT TO M. HARD	GRAY	INTERBEDDED SANDY SHALE AND SILTSTONE	BR-BL	
	10.0 10.0	100%	89	47.0					
					M. HARD	LT GRAY TO [illegible]	SANDSTONE	BL	
52.0									
	10.0 10.0	100%	97	57.9					
				59.3	M. SOFT	GRAY	SILTY SHALE	BR	~30° FRACTURES 57.9,
						DK. GRAY	CLAYSTONE, SLIGHTLY CALCAREOUS	VBR-BR	58.4

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0514

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS WV BORING NO. B-0514

ELEVATION _____ GWL 0 HRS 32.1 PROJECT NO. C040384.40-01

HRS _____

DATE 09-13 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. SOFT	GRAY + MAROON	CLAYSTONE (CON'T)	BR	LOW ∠ FRACTURES
62.0									59.5, 59.9, 60.4, 61.2
									45° FRACTURE W/
									SLICKENSIDE 62.1-62.25
									30° FRACTURES 62.6
	10.0	10.0	100%	86	66.7				62.7, 62.8, 63.0, 63.4
					M. SOFT TO M. HARD	GRAY	SANDY SHALE/SILTSTONE W/ NUMEROUS IRREGULAR CALCAREOUS CLASTS AND STRINGERS	BL	63.5, 64.1, 64.4, 65.25, 65.5, 65.75 66.1, 66.5
72.0							: MAROON CLAYSTONE 71.25-71.55, 72.0-72.4		SLICKENSIDES 71.4, 72.0
				76.0					
	10.0	10.0	100%	92	M. SOFT	MAROON	CLAYSTONE W/ NUMEROUS IRREGULAR CALCAREOUS CLASTS AND STRINGERS	BR	
						GRAY + MAROON MOTTLED			
82.0				82.2					
					M. SOFT TO M. HARD	GRAY	SILTY SHALE W/ INTERMITTENT CALCAREOUS STRINGERS, SOME THIN (≤ 2") SANDSTONES	BL	
									VERTICAL FRACTURE
	10.0	10.0	100%	90				BR	86.6-87.6
								BL	

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0514

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0514

ELEVATION _____ GWL 0 HRS 32.1 PROJECT NO. C040384.40-01

HRS _____

DATE 09-10 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 4 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
				90.65	M. HARD	LT. GRAY	SANDSTONE	BL	
92.0				93.0					
					M. SOFT	GRAY	SILTY TO SANDY SHALE	BL	
	10.0	10.0	100%	95					
							* CLAY SHALE 98.4-99.0	BR	LOW ϕ FRACTURES 98.4,
								BL	98.6, 98.95
102.0						MAROON + GRAY MOTTLED			SLICKENSIDE 102.0
									111.0 (~45°)
				104.3	M. HARD	LT GRAY	SANDSTONE	BL	
	10.0	10.0	100%	98					
112.0									
	10.0	10.0	100%	73					

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0514

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PROJECT NEEA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0514

ELEVATION _____ GWL 0 HRS 32.1 PROJECT NO. C040384.40-01

HRS _____

DATE 29-10 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 5 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. HARD	LT GRAY	SANDSTONE: MICACEOUS (CON'T)	BL	
122.0									
	10.0 / 10.0	100%	100						
132.0									
	10.0 / 10.0	100%	100						
142.0									
				143.2	M. SOFT	DK GRAY	CLAY SHALE	BR-BL	~30° FRACTURE/SLICK
	8.0 / 8.0	100%	87						143.7, 146.3, 148.8
									LOW ANGLE FRACTURE 146.3
150.0									

BOTTOM OF BORING: 150.0'

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0511

(22)

N 539572.1065
E 1723680.1660 Grade El. 933.64

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 42.3 PROJECT NO. C040384.40-01

HRS _____

DATE 10 - 11 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
1	2	3	4	5	6	7	8	9	10
	1 3 4	S-1 REC 1.3			STIFF	ORANGE-BROWN	SANDY CLAY	CL	@ 1.5 TSF
1.5	3	S-2							
	3 5 5	REC 1.3			V. STIFF	BROWN & GRAY	SANDY CLAY	CL	@ 2.5 TSF DRY
3.0	7 10	S-3			DENSE	BROWN	DECOMPOSED SANDSTONE FRAGMENTS		
4.6	20	REC 1.2			V. DENSE	BROWN & GRAY	DECOMPOSED SANDSTONE AND SANDY CLAY	RC	
5.1	16 50/0.4	S-4 REC. 0.9		5.4					TOP OF ROCK 5.4
				11P/10/1 6.5	SOFT	BROWN	HIGHLY WEATHERED SANDSTONE	VBR-BR	
	3.6 4.9	73%	40		M. SOFT TO M. HARD	BROWN GRAY	MODERATELY WEATHERED SAND-STONE	BR	
				8.8					
10.3					SOFT	MAROON TAN	CLAYSTONE : HIGHLY WEATHERED	VBR	~30° FRACTURE W/ SLICKENSIDE
								BR	10.5, 11.0, 11.4, 12.2, 13.9
								BL	
	10.0 10.0	100%	65						
				17.3					
					M SOFT TO SOFT	OLIVE-GRAY	CLAY SHALE: MODERATELY TO HIGHLY WEATHERED	BR	FOUND 2 FRACTURES @ 20° & 30° W/ SLICKENSIDES
20.3									
				21.0					ITEM VERTICAL FRACTURE
				22.2	M. SOFT		SILTY SHALE	BR	FRACTURE @ 21.7
					M. SOFT TO M. HARD	OLIVE-GRAY	SILTY SANDSTONE : MICACEOUS	BL	
	10.0 10.0	100%	83						
						GRAY			

REMARKS ** DRILLED BY TERRA TESTING USING A SIMCO 1000CT2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0515

(24)

gai consultants
transforming ideas into reality

PROJECT ALLEN S. KING & JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 42.3 PROJECT NO. C24038.00-01

HRS _____

DATE 12-14 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
30.3							SANDSTONE (CON'T)		~65° STAINED FRACTURE
				32.1					30.6-31.0, LOST WATER
					SOFT	GRAY + MAROON	INTERBEDDED CLAY SHALE AND	UBR	1 JW & FRACTURES
				34.3			CLAYSTONE: HIGHLY WEATHERED	BR	32.2, 32.6, 32.9, 33.05,
	8.8	10.0	88%	51		GRAY W MAROON MOTTLING	CLAYSTONE	BR	34.0, 34.3, 35.1
					SOFT				
42.3				42.8					
				42.6	M. SOFT TO M. HARD	GRAY	SANDY SILTSTONE	BR	VERTICAL FRACTURE 41.1 - 42.6
					M. SOFT	GRAY	CLAYSTONE W/ INTERMITTENT	BR	~25-30° FRACTURE
							IRREGULAR CALCAREOUS		W/SLICKENSIDES 43.15
	10.0	10.0	100%	63			NODULES AND STRINGERS		44.55, 45.45, 47.4,
						MAROON			47.75, 42.6, 49.85,
									53.5
50.3						GRAY	: BECOMES SANDY AT 50.1		
				53.7					
					M. SOFT	GRAY	SANDY SHALE: INTERMITTENT	BR	
	10.0	10.0	100%	93			SMALL (± 2 mm) CALCAREOUS		
						MAROON	NODULES		
						GRAY			

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0515

(24)

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST ALBANS, WV BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 42.3 PROJECT NO. C040384.40-01

HRS _____

DATE 10-11 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
62.3							SANDY SHALE (CON'T)		LOW & FRACTURES
									63.0, 63.4, 68.0
							: MAROON CLAYSTONE 62.9-		(SLIGHT SLICKENSIDE),
							63.4		68.6,
									VERTICAL FRACTURE 69.1-
	10.0	10.0	100%	86					69.6, 70.3- 70.7,
									70.85- 71.05, 74.8-
									75.1, 76.25- 77.4
72.3									LOW & FRACTURE
									72.7, 79.4, 79.45,
									80.05
	10.0	10.0	100%	80					
80.3									
				83.5					
					SOFT	DK GRAY	CLAYSTONE		PITTED CORE SURFACE.
									LOW & FRACTURES W/ SLICKEN-
	9.2	10.0	92%	72					SIDES 83.6, 83.95,
				87.7					84.2, 84.55, 84.7, 85.0,
									85.45
					M. SOFT	GRAY	SANDY SHALE	BR-BL	HIGH & FRACTURE W/ SLICKEN-
									SIDES 86.2- 86.35

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0515 (2 of 11)

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PROJECT ARER 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 42.3 PROJECT NO. C2030384.20-01

HRS _____

DATE 10-11 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 4 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
90.3				90.5	SOFT TO M. SOFT	GRAY	CLAY SHALE	BL-BR	NEAR VERTICAL IRREGULAR FRACTURE W/ SLICKENSIDES 91.65-92.05 (NO STAINING)
				94.4	M. SOFT TO M. HARD	LT. GRAY	SHALY SANDSTONE : MICACEOUS	BR - BL	VERTICAL FRACTURE 92.4-92.8, 93.35-93.85
	10.0 10.0	100%	75					BL	
100.3								BL	
	10.0 10.0	100%	100						
110.3							: SHALE CLASTS 112.5-113.4		
	10.0 10.0	100%	97	117.0					
					SOFT TO M. SOFT	GRAY	CLAY SHALE	BR	V. BROKEN 118.4-119.1 HIGH X FRACTURE 119.0-119.2

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0515

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 42.3 PROJECT NO. C040384.45-01

HRS _____

DATE 10-11 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 5 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
120.3				120.5					
					M. SOFT	GRAY	SANDY SHALE	BR	
				122.6					
					M. SOFT TO M. HARD	LT GRAY	SHALY SANDSTONE: MICACEOUS	BR	
				125.55					
	10.0	10.0	100%		M. SOFT TO SOFT	GRAY & MAROON MOTTLED	CLAYSTONE	BR	45° SLICKENSIDE 126.9-127.05.
									PIECES ~0.2-0.4'
								VBR	LOW & FRACTURE EVERY 0.1-0.85'
130.3									25-30° SLICKENSIDES
									131.1, 131.25, 131.3
									131.75
									V. BROKEN ZONE 131.75-137.1: NUMEROUS ~30° SLICKENSIDES
	10.0	10.0	100%	32					PIECES 0.1-0.3'
						MAROON			CALCAREOUS NODULES
				138.5					137.2-138.0
					M. SOFT	GRAY;	SHALE WITH NUMEROUS IRREGULAR CALCAREOUS NODULES AND STRINGERS	BR-BL	
148.3									
	10.0	10.0	100%	9.1					
							: SANDY 148.3-148.6, 149.35-150.15		

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT — BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 42.3 — PROJECT NO. C040384 41-01

HRS _____

DATE 10 - 11 MAY 2005 — CLASSIFIED BY DAN SANGER — PAGE 6 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
150.3							SHALE (CONT)		
							: SANDY 154.6 - 155.7		60° IRREGULAR
							157.0 - 160.2 (FGN NODULES)		FRACTURE 155.2-155.5
	10.0 10.0	100%	88						
160.3				161.0					
					M. SOFT	GRAY & PURPLE	CLAYSTONE	BR-VBR	20-30° SLICKENSIDES
									161.4, 161.8, 162.2, 163.2, 163.35, 163.65
				164.7					164.0, 164.1
	10.0 10.0	100%	77		M. SOFT	GRAY	SANDY SHALE	BR-BL	
170.3				171.7					
					M. HARD	LT GRAY	SANDSTONE : MICACEOUS	BL	
				174.8					
	10.0 10.0	100%	100		M. SOFT	GRAY	SANDY SHALE	BL	

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT — BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 42.3 — PROJECT NO. C040384.40-01

HRS _____

DATE 10-11 MAY 2005 — CLASSIFIED BY DAN SANGER — PAGE 7 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
180.3							SANDY SHALE (CON'T)		
				184.0	SOFT TO M-SOFT	DK GRAY	CLAY STONE	VBR-BR	~30° SLICKENSIDES EVERY 0.2-0.4'
	10.0 10.0	100%	50			MAROON			
190.3				190.3	M. SOFT	GRAY + MAROON	SILTY TO SANDY SHALE	BL-BR	LOW ∆ FRACTURE 194.1, 194.3, 195.0, 196.05, 196.4, 196.9 197.6, 197.9
	10.0 10.0	100%	82	197.0	SOFT TO M. SOFT	MAROON	CLAY STONE	BR-VBR	30° FRACTURE 196.15 30° SLICKENSIDES ~ EVERY 0.4'
200.3				200.5	M. SOFT	MAROON	SILTY SHALE	BL	GRADES INTO SILTY SHALE
	10.0 10.0	100%	100	201.55	M. SOFT TO M. HARD	GRAY	SHALY SANDSTONE	BR	
					M. HARD	LT GRAY	SAND STONE	BR	

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 423 PROJECT NO. C040384.40-01

HRS _____

DATE 10-11 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 8 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
210.3				210.3	M. SOFT TO M. HARD	GRAY	SANDY SHALE	BR	
				212.4					
				214.3	M. SOFT	MAROON	SILTY SHALE	BR	
					M. SOFT	BROWN, MAROON, GRAY MOTTLED	CLAYSTONE	BR	25-30° SLICKENSIDES
	10.0	10.0	100%						215.0, 215.20, 215.55
			88						216.15, 217.85, 218.15
									60° SLICKENSIDE 215.3-215.45
				218.8					
220.3					M. HARD	LT GRAY	SHALY SANDSTONE	BR	
				221.5	M. SOFT	GRAY + MAROON	SANDY CLAYSTONE	BR	
				223.5	M. SOFT	GRAY	SANDY SHALE	BR-BL	30° SLICKENSIDE 123.1
									LOW ∠ FRACTURES
	10.0	10.0	100%						125.55, 125.8
			90						
				229.7					
230.3					M. SOFT TO SOFT	GRAY, OLIVE, MAROON MOTTLED	CLAYSTONE	BR	20-30° SLICKENSIDES
									229.9, 231.4, 231.5
									232.2, 232.4, 232.5
									233.0, 233.2, 233.8,
									234.4 235.6, 236.1
	10.0	10.0	100%						236.4, 237.5, 237.9,
			56						238.9, 239.1 239.6,
									239.8, 240.1

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0515

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0515

ELEVATION _____ GWL 0 HRS 42.3 PROJECT NO. C040384.40-01

HRS _____

DATE 10-11 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 9 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
240.3					SOFT	MAROON	CLAYSTONE (CON'T)	VBR	20-30° SLICKENSIDES
									EVERY 0.1-0.3'
	10.0 10.0	100%	0						
250.3									
							BOTTOM OF BORING: 250.3'		

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0515

N 540842.6369
E 1724930.8565 Grade El. 864.94

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PROJECT AREA 3/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-05 16

ELEVATION _____ GWL 0 HRS N/A PROJECT NO. C040384.40-01

HRS _____

DATE 13 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
1.5	4 4 5	S-1 Rec 1.5			LOOSE	BROWN	SANDY SILT, FEW ROCK FRAGMENTS	ml	DRY
	7	S-2							
3.0	9 22	REC. 1.2			M. DENSE	BROWN & MAROON	SILTY SAND AND ROCK FRAGMENTS;	SM-GM	DRY
3.9	34 50/0.4	S-3 Rec 0.9		3.9 FILL			DECOMPOSED CLAYSTONE		
							BORING CANCELLED AND BACKFILLED		

REMARKS ** DRILLED BY TERRA TESTING, INC USING A SIMCO 4000-T2 TRACK MOUNTED DRILL.
BORING ADVANCED USING 5¼" SOLID STEM AUGERS

* POCKET PENETROMETER READINGS
** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0516
(23)

N 542185.2965
E 1725391.3276 Grade El. 945.55

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0517

ELEVATION 948± GWL 0 HRS 18.1 PROJECT NO. C040384.40-01

HRS

DATE 16-17 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	3 3	S-1			V. STIFF	MAROON-RED	SILTY TO SANDY CLAY (DECOMPOSED	cl	* 2.5 TSF
1.5	4	REC. 1.5			↓	↓	CLAYSTONE)	↓	
	3	S-2			STIFF		↓		* 1.5 TSF
3.0	5 7	REC 0.8			HARD		DECOMPOSED CLAYSTONE,		> 4.5 TSF
	6 9	S-3					TRACE CALCAREOUS NODULES		
4.5	13	REC. 1.5							
	17	S-4							
6.0	19 22	REC. 1.2							
	9 20	S-5							
7.5	18	REC. 1.5							
	8	S-6		8.0	↓	↓	↓	↓	
9.0	25 42	REC 1.5			V. DENSE	YELLOW-GRAY	DECOMPOSED SANDY SHALE	sm	
9.9	28 50/0.4	S-7 REC 0.9		9.9	↓	↓	↓	↓	
	2.0 2.1	95%	81		M. SOFT	OLIVE	SANDY SHALE	BR	
12.0				11.1	M. HARD	LT. GRAY	SANDSTONE	BR	
				12.9	↓	↓	↓	↓	
					M. SOFT	OLIVE-GRAY	INTERBEDDED SANDY SHALE	BR-	
							AND SHALY SANDSTONE	BL	STAINED ~60° FRACTURE
	10.0 10.0	100%	74						13.45-13.6, 19.05-19.3,
									19.7-19.9, 20.2-20.5
									LOW ∠ FRACTURES 14.3,
									15.25, 15.4, 15.65
22.0									16.9, 19.3, 20.1, 20.65
									STAINED V. BROKEN
							: SANDSTONE 22.5-23.5		ZONE 19.3-19.7
				24.9	↓	↓	↓	↓	STAINED LOW ∠ FRAC-
	9.9 10.0	99%	84		SOFT	MAROON	CLAYSTONE	OR-	TURES 22.35, 23.45,
				27.1	↓	↓	↓	VBR	23.9, 24.15, 24.25, 25.0
					M-SOFT TO M. HARD	OLIVE-GRAY	SHALY SANDSTONE - MICACEOUS	BR- BL	VBR 25.7-26.2
					↓	↓	↓	↓	

REMARKS ** DRILLED BY TERRATESTING USING A SIMCO 4000-T2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" ϕ STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B0517

ELEVATION 948± GWL 0 HRS 18.1 PROJECT NO. C040384.40-01

HRS

DATE 16-17 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. HARD	GRAY	SANDSTONE (CON'T)		
32.0									
									STAINED LOW ⅋ FRAC-
									TURES 32.3, 34.15
				36.2					
	10.0 10.0	100%	82		SOFT	MAROON	CLAYSTONE	BR	20-30° SLICKENSIDES
									36.7, 37.4, 37.8, 38.4
								VBR	38.8, 38.95, 39.2
				40.5					
					M. SOFT	GRAY	INTERBEDDED SHALE AND	BR	
42.0							SANDSTONE		
									44.6 CLAY SEAM
	9.6 10.0	96%	96	47.6					
					M. HARD	LT. GRAY	SANDSTONE - FINE TO MED GRAINED,	BL	
							MICACEOUS		
52.0									
									VERTICAL FRACTURE
									(NO STAINING) 53.3-54.4
				55.7					
	10.0 10.0	100%	70	56.7	M. HARD	LT GRAY	CALCAREOUS SANDSTONE	BR	LOW ⅋ FRACTURES 55.7,
									56.2, 56.7, 57.5, 58.1
					SOFT	GRAY	CLAY SHALE, SOME SILT	BR	59.25, 59.55, 59.7, 60.0,
				59.7					60.25,

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B 0517

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0517

ELEVATION 948± GWL 0 HRS 18.1 PROJECT NO. C0403440-01

HRS

DATE 16 - 17 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					SOFT	DARK GRAY to MAROON	CLAYSTONE	BR - VBR	.25-35° SLICKENSIDES ~EVERY 0.2-0.4'
62.0									
	10.0 10.0	100%	67	66.7					
					M. HARD	GRAY	SILTSTONE W/ INTERMITTENT IRREGULAR CALCAREOUS NODULES AND STRINGERS, SOME SAND	BL	LAM & FRACTURE 70.35, INTERSECTING 45° FRACTURE AND 35° FRACTURE 71.6-71.9
72.0									NEAR VERTICAL FRACTURE 72.9-73.4
				75.5					
	10.0 10.0	100%	79		SOFT	MAROON	CLAYSTONE	BR - VBR	30° SLICKENSIDES ~EVERY 0.2-0.3'
				78.0					
					M. SOFT to M. HARD	GRAY	SANDY SILTSTONE W/ INTERMITTENT IRREGULAR CALCAREOUS NODULES (≤ ½") AND STRINGERS	BR-BL	~45° FRACTURE AT LARGE CALC. NODULE AT 78.6-78.8
82.0				82.0					
					SOFT TO M. SOFT	MAROON to GRAY	INTERBEDDED CLAYSTONE AND SANDY SILTSTONE (UNITS ARE 0.9-1.5' IN THICKNESS) W/ INTERMITTENT IRREGULAR CALCAREOUS NODULES (1½") AND STRINGERS	BR - BL	SLICKENSIDES (30°) 82.25
	10.0 10.0	100%	97						

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0517

gai consultants
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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST-ALBANS, WV BORING NO. B-0517

ELEVATION 948 ± GWL 0 HRS 18.1 PROJECT NO. C040384.40-01

HRS

DATE 16-17 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 4 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
				90.2	M. HARD	LT GRAY	SHALY SANDSTONE: MICACEOUS	BL-	
92.0									
	10.0 10.0	100%	90	97.4					
					SOFT TO M. SOFT	GRAY + MAROON	SILTY SHALE	BR	LOW ANGLE FRACTURE 98.15, 98.8, 101.0
									60° FRACTURE 99.1-99.4
102.0				101.8					100.0 - 100.5
				103.0	M. HARD	LT. GRAY	SHALY SANDSTONE		
					M. SOFT	GRAY	SILTSTONE	BL	
				106.0					
	10.0 10.0	100%	94		M. SOFT	GRAY + MAROON	INTERBEDDED SILTSTONE AND SANDY CLAYSTONE		30° SLICKENSIDE 106.8
				109.7		MAROON BROWN, LGRAY	CLAYSTONE W/ INTERMITTENT IRREGULAR CALCAREOUS NODULES (±½") AND STRINGERS	BR	20-30° SLICKENSIDES 109.2, 109.85, 110.95, 111.2, 111.45,
112.0				112.0					
					M. SOFT TO M. HARD	GRAY	SANDSTONE WITH SOME SHALE SEAMS TO 120.6	BL	
	10.0 10.0	100%	100						

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0517

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST. ALBANS, WV — BORING NO. B-0517

ELEVATION 948± GWL 0 HRS 18.1 — PROJECT NO. C040384.40-01

HRS

DATE 16-17 MAY 2005 — CLASSIFIED BY DAN SANGER — PAGE 5 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. HARD	GRAY TO	SANDSTONE (CONT)	BL	
122.0						LT. GRAY			
	10.0 / 10.0	100%	100						
132.0				132.0					
					M. SOFT	GRAY	SANDY SHALE	BL	
				136.0					
	10.0 / 10.0	100%	96		M. HARD	LT GRAY	SANDSTONE		
				139.0					
					M. SOFT	GRAY	SANDY SHALE		
				142.7					
142.0				142.0	M. SOFT	LT. GRAY	SILTY SANDSTONE		
					M. SOFT	GRAY	SANDY CLAYSTONE	BR	SLICKEN SIDES
					TO SOFT				142.3, 143.65, 144.2,
						DK GRAY			144.7, 145.0 145.15,
	8.0 / 8.0	100%	95	146.0					145.75. NUMEROUS BREAKS DURING CORE EXTRACTION
					M. SOFT	GRAY	SILTSTONE	BL	CALCAREOUS NODULES
									146.0-146.2
150.0							BOTTOM OF BORING: 150'		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0517

N 541508.473
E 1724947.2614 Grade El. 1015.78

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT BORING NO. B-0518

ELEVATION 1005± GWL 0 HRS 14.2', BACKFILLED PROJECT NO. C040384.40-01

HRS

DATE 17 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	2 2 4	S-1 REC 1.4			LOOSE	BROWN	FINE TO MEDIUM SAND	SP	
1.5	5	S-2							
	8 13	REC 1.3			M. DENSE				
3.0									
3.6	50 50/0.1	S-3 REC 0.6		3.6	V. DENSE				TOP OF ROCK: 3.6'
					SOFT	YELLOW BROWN	SANDSTONE; MICACEOUS, COMPLETELY WEATHERED	VBR	AFTER THIS RUN, DROVE CASING TO 10.8'
	5.0 7.2	69%	0						
10.8									
							HIGHLY WEATHERED	BR	PIECES 0.3-0.6'
							COMPLETELY WEATHERED	VBR	PIECES ± 0.2'
	9.4 10.0	94%	46						
20.8									
	6.8 10.0	68%	18						

REMARKS ** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000-T2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0518

gai consultants

PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0518

ELEVATION 1005± GWL 0 HRS 14.2, BACKFILLED PROJECT NO. C040384.40-01

HRS

DATE 17 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
30.8					SOFT	YELLOW-BROWN	SAND STONE (CONT)	VBR	
							; HIGHLY WEATHERED	BR	70° STAINED FRACTURE
									30.8 - 31.3
	10.0	10.0	100%	39					
				-36.8					
					M. SOFT	BROWN	SANDY TO SILTY SHALE	BR	30° STAINED
				39.0		GRAY			FRACTURES 37.6,
40.8					SOFT	MAROON, PURPLE, YELLOW, GRAY	CLAYSTONE	BR	38.6, 39.0
									SLICKENSIDES: 41.05,
									41.3, 41.7, 42.9, 43.5,
									44.9, 45.15, 45.85,
									46.5, 47.3, 47.95,
									48.15, 49.25, 49.8,
	10.0	10.0	100%	64					50.15, 50.45, 50.8,
									51.1, 51.4, 51.8, 52.2,
									52.75, 53.15, 53.7
									54.2
50.8									
	9.5	10.0	95%	64					
								VBR	VERTICAL FRACTURE
									56.4 - 58.7

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0518

ELEVATION 1005± GWL 0 HRS 14.2, BACKFILLED PROJECT NO. C040384.40-01

HRS

DATE 17 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
60.8					SOFT	MAROON,	CLAYSTONE (CONT)	BR-	
					↓	GRAY, PURPLE		VBR	
	4.2			62.8	↓	YELLOW	↓	↓	
					M. SOFT	GRAY	SANDY SILTSTONE W/ CALCAREOUS	BR-	
65.0				65.0	↓	↓	NODULES AND STRINGERS	BL	
							BOTTOM of BORING: 65' 1"		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0518

N 543732.8856
E 1725136.5233 Grade El. 991.07

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0519

ELEVATION _____ GWL 0 HRS 3285 PROJECT NO. C040384.41-01

HRS _____

DATE 17-19 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 2 3	S-1 REC. 1.2		0.7	V. LOOSE	BROWN	TOP SOIL		
1.5	8	S-2			LOOSE	BROWN	SANDY SILT	ML	
3.0	6 5	REC. 1.3			M. DENSE				
	7 10	S-3					SILT, TRACE CLAY		
4.5	12 15	REC. 1.2							
	18 30	S-4							
6.0		REC. 1.0			DENSE	BROWN + GRAY	DECOMPOSED SHALE	GM	
	28 41	S-5			V. DENSE				
7.4	50/0.4	REC 1.3		7.4					TOP OF ROCK 7.4
	3.1 3.1	100%	0	TERR	SOFT	BROWN + GRAY	CLAYSHALE: COMPLETELY WEATHERED	WBR	NUMEROUS LOW & FRACTURES
10.5									HIGHLY BROKEN ZONE 8.1-8.7
				13.7					
				14.7	SOFT		CLAYSTONE: COMPLETELY WEATHERED	BR	HIGH & FRACTURE 13.7
	9.5 10.0	95%	49	15.5	M. HARD		SANDSTONE	BR	
					SOFT	MAROON W/ YELLOW MOTTLING	CLAYSTONE: HIGHLY WEATHERED	BR	30° SLICKENSIDES 18.7, 19.4, 19.85 23.0, 23.3, 23.6, 23.9, 24.05
20.5									
					SOFT TO M. SOFT		: SOME CALCAREOUS NODULES		
					M. SOFT				45° FRACTURE 22.2
					M. SOFT	GRAY			
	10.0 10.0	100%	60			GRAY W/ MAROON MOTTLING	: PIECES 0.2-0.4' LONG		STAINED 20-30° FRACTURES 24.7, 25.2, 25.8, 26.0

REMARKS ** DRILLED BY TERRA TESTING USING A SIMCO 4000-T2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0519

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST ALBANS, WV BORING NO. B-0519

ELEVATION _____ GWL 0 HRS _____ PROJECT NO. C040384.40-01

HRS _____

DATE 17-19 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
30.5				31.4			CLAYSTONE (CON'T)	VBR	
					M. SOFT	OLIVE-GRAY	SANDY SILTSTONE	BR	STAINED LOW & FRACTURE 32.2, 33.0, 33.3
				33.2	↓	GRAY	↓		
					SOFT TO M. SOFT	GRAY	CLAY SHALE		34.3, 34.8, 35.1, 35.45
				35.1	↓	↓	↓		
	10.0	10.0	100%	36.4	M. SOFT	OLIVE-GRAY	SANDY SILTSTONE	↓	
					SOFT TO M. SOFT	MAROON + GRAY	CLAYSTONE	BR-BL	
					↓	↓	↓	↓	
40.5				41.5					20° SLICKENSIDE, 40.5
									70° SLICKENSIDE 41.0-41.3
					M. HARD	GRAY	SANDSTONE: MICACEOUS	BR-BL	
				43.8	↓	↓	↓	↓	NEAR VERTICAL FRACTURE
					M. SOFT	GRAY	SHALY SILTSTONE, SOME SAND	BR	42.85 - 43.8
	10.0	10.0	100%	47.4	↓	↓	↓	↓	
					M. SOFT	GRAY + MAROON + DK GRAY	SILTY CLAYSTONE	BR	
					↓	↓	↓	↓	20-30° SLICKENSIDES
50.5									48.65, 49.6, 50.2
									50.8, 52.8, 53.2,
									53.5, 54.2 54.8,
									55.3, 55.6, 55.8, 56.0,
									56.6, 57.0, 57.4,
									57.8, 58.1, 58.4, 59.2,
	10.0	10.0	100%	53					
					↓	↓	↓	↓	

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0519

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0519

ELEVATION _____ GWL 0 HRS 32.85 PROJECT NO. C040384.43-01

HRS

DATE 17-19 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
60.5					SOFT TO	MAROON	CLAYSTONE (CONT)	BR	20°-30° SLICKENSIDES
					M. SOFT			↓	EVERY ~ 0.2-0.5'
								VBR	
								BR	
	8.7 / 10.0	87%	41						
								↓	
								VBR	
									30° SLICKENSIDES
70.5								↓	70.9, 71.7
								BR	VERTICAL FRACTURE
				71.9	↓	↓	↓	↓	70.5-70.8, 71.9-72.1
					M. SOFT	GRAY	SANDSTONE; V. FINE GRAINED,	BR-BL	
					M. HARD		ARGILLACEOUS, SOME		
							CROSS BEDDING, FEW		
	10.0 / 10.0	100%	78				IRREGULAR CALCAREOUS		
							NODULES		
									VERTICAL FRACTURE
80.5									78.5-78.8, 80.0-80.5
									CLOSED VERTICAL FRAC-
	10.0 / 10.0	100%	95	86.2	↓	↓	↓	↓	TURE 84.3-85.3
					M. SOFT	MAROON + GRAY	SANDY CLAYSTONE	BR	
									30° SLICKENSIDE 88.5,
				89.6	↓	↓	↓	↓	89.15
					M. SOFT/M. HARD	LT GRAY	THIN SANDSTONE	BR	

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0519

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0519

ELEVATION _____ GWL 0 HRS 32.85 PROJECT NO. C040384.40-01

HRS _____

DATE 17-19 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 4 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
90.5					M. SOFT TO M. HARD	LT GRAY	SHALY SANDSTONE (CONT)	BR	10-20° FRACTURES
									91.1, 91.55, 92.0,
				94.0					92.4, 92.6, 93.1,
	10.0	10.0	100%	95.8	M. SOFT	GRAY + MAROON MOTTLED	SANDY CLAYSTONE	BR	VERTICAL FRACTURE
									92.6 - 93.1, 94.3-94.6
					M. SOFT TO SOFT	MAROON	CLAYSTONE	BR-VBR	20-30° SLICKENSIDES
									EVERY ~0.1-0.3'
100.5									100.5 - 102.7 VERY
								VBR	BROKEN ZONE, HEAVILY
						GRAY			STAINED 100.5 - 101.7
				104.5					
	10.0	10.0	100%		M. SOFT TO M. HARD	LT. GRAY	SILTY SANDSTONE	BR-BL	
110.5				110.5					
					M. HARD	LT. GRAY	SANDSTONE; MICACEOUS	BL	110.5 - 114.7 - 1 PIECE
				114.7					
	10.0	10.0	100%		M. SOFT	GRAY	SANDY SHALE	BL	VERTICAL FRACTURE
				117.5					115.25 - 115.75
					M. SOFT	GRAY + MAROON MOTTLED	CLAYSTONE	BR	20-30° SLICKENSIDES
									EVERY ~0.3-0.5'

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0519

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0519

ELEVATION _____ GWL 0 HRS 32.85 PROJECT NO. C040384.03-01

HRS

DATE 17-19 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 5 of 5

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
120.5					M. SOFT	GRAY - MAROON	CLAYSTONE (CONT)	VBR-	20-30° SLICKENSIDES
								BR	@ EVERY 0.1-0.3'
							; SANDY 124.0-125.1		
	10.0	10.0	100%	47					
				125.9	M. HARD	LT GRAY	SHALY SANDSTONE	BR	RQD IN THIS UNIT
				129.15					
					M. SOFT	GRAY W/ MAROON MOTTLING	INTERBEDDED SANDY CLAYSTONE AND SILTSTONE	BR	
130.5							SOME SANDSTONE		
				133.8					
	10.0	10.0	100%	76	M. SOFT	MAROON	CLAYSTONE	VBR	
				135.3	M. SOFT TO M. HARD	GRAY	SANDY CLAYSTONE WITH SMALL CALCAREOUS NODULES AND STRINGERS	BR	LOW % FRACTURES 136.05, 136.4, 136.8, 137.3, 137.9, 138.4, 138.9, 139.8
140.5					M. SOFT	MAROON			
				142.0					
					M. SOFT TO M. HARD	LT GRAY	SHALY SANDSTONE	BL	
							; CLAYSTONE SEAM		
	10.0	10.0	100%	80			144.1 - 144.65		
				146.3	M. SOFT	GRAY	SANDY CLAYSTONE	BR	VERTICAL FRACTURE 147.2 -
				147.4		MAROON	CLAYSTONE		148.15
				148.8					
150.5					M. HARD	GRAY	SANDY SHALE/SHALY SANDSTONE	BL	

REMARKS ** BOTTOM OF BORING 150.5

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0519

N 542378.3755
E 1721739.7942 Grade El. 679.31

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PROJECT AREA 3/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0520

ELEVATION _____ GWL 0 HRS 18.6 PROJECT NO. C0403849.40-01

HRS _____

DATE 23 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 3 4	S-1 REC 0.4			STIFF	MAROON	SANDY CLAY AND ROCK FRAG-	CL	* 2.0 TSF
1.5	4	S-2					MENTS		
3.0	4 4	REC. 1.5							* 2.5 TSF
	5 5	S-3							* 2.0 TSF
4.5	6	REC. 1.5							
	5 6 10	S-4			M. DENSE	BROWN + BLACK	CLAYEY SILT AND ORGANICS	ML	WET
6.0		REC. 1.5							
	8 13 35	S-5		7.0					
7.5		REC. 1.5							
7.6	50/0.1	S-6 REC 0.1		7.6	V. LOOSE	GRAY + MAROON	DECOMPOSED CLAYSTONE	GM	TOP OF ROCK: 7.6'
				10.0	SOFT	MAROON	CLAYSTONE: HIGHLY WEATHERED	VBR-BR	MOST PIECES 0.2'
	4.4 4.4	100%	12				: GRAY 10.9 - 11.2		
12.0				12.0					
					SOFT	GRAY	SANDY SHALE: WEATHERED	VBR-BR	
				13.7					
					SOFT	MAROON	CLAYSTONE	BR	VERTICAL FRACTURE
									16.6 - 17.4
						GRAY	: CALCAREOUS NODULES 16.0-16.5		
	9.3 10.0	93%	51				: SANDY 16.5-17.1		
						MAROON			25° SLICKENSIDE 19.75
22.0									
									30° SLICKENSIDE 26.4
	9.2 10.0	92%	65						27.7, 28.7, 29.25, 29.8

REMARKS ** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000-T2 TRACK MOUNTED DRILL

BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0520

(15)

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0520

ELEVATION _____ GWL 0 HRS 18.6 PROJECT NO. C040384.40-01

HRS

DATE 23 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					SOFT	MAROON	CLAYSTONE (CONT)	BR	
32.0									
				35.5					
	9.9 10.0	99%	47	37.2	M. HARD	LT. GRAY	SHALY SANDSTONE / SANDY SHALE	BL	
					M. SOFT	MAROON	CLAYSTONE	BR	
				40.2					
					M. HARD	LT GRAY	SHALY SANDSTONE/SANDY SHALE	BR	VERTICAL FRACTURE
42.0				41.7					40.4-41.0, 42.0-42.3
					M. SOFT	MAROON + GRAY	INTERBEDDED SANDY CLAYSTONE	BR-BL	
					M. HARD		AND SANDY SHALE, FEW THIN		
							(≤0.5') SANDSTONE UNITS,		
	10.0 10.0	100%	85				FEW IRREGULAR CALCAREOUS		
							NODULES AND STRINGERS		
52.0				52.1					
					M. HARD	LT GRAY	SHALY SANDSTONE	BL	
				54.4					
					M. SOFT	MAROON + GREEN-GRAY	CLAYSTONE W/ NUMEROUS IRREGULAR	RL-BR	SLICKENSIDES 56.1,
							CALCAREOUS NODULES AND		56.5, 56.7, 57.0,
	10.0 10.0	100%	81				STRINGERS		60.7, 61.0, 61.3,

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0520 (15)

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0520

ELEVATION _____ GWL 0 HRS 18.6 PROJECT NO. C040384.40-01

HRS _____

DATE 23 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 4

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. SOFT	MAROON + GRAY	CLAYSTONE (CON'T)	BR	
62.0									
				66.2					
	10.0	10.0	100%	75	M. SOFT	GRAY	SANDY CLAYSTONE, FEW SANDY SILTSTONE SEAMS	BR	
72.0									
				73.6					
					M. SOFT	GRAY	INTERBEDDED SILTSTONE AND FINE GRAINED SANDSTONE	BR-BL	
	10.0	10.0	100%	96					
				81.1					
82.0					M-HARD	LT. GRAY	SANDSTONE	BL	
	9.9	10.0	99%	100					

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0520

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0520

ELEVATION _____ GWL 0 HRS 18.6 PROJECT NO. C0403840.YD-J1

HRS

DATE 23 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 4/ of 4/

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					M. HARD	LT GRAY	SANDSTONE (CON'T)	BL	
A2.0									
	7.6 8.0	95%	77						
				97.8					
					M. SOFT	GRAY + MAROON	CLAYSTONE	BR	
100.0									
							BOTTOM OF BORING: 100'		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0520

(5)

N 544199.5521
E 1724054.5791 Grade El. 1004.35

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PROJECT AREA 3/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0521

ELEVATION ~1003 GWL 0 HRS 24.6 PROJECT NO. C-040384.40-01

HRS

DATE 23 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	2 3	S-1			V. STIFF	MAROON	SILTY CLAY / CLAYEY SILT	CL/ML	≤ 3.0 TSF
1.5	4	REC. 1.2							
	6	S-2			DENSE	BROWN-GRAY	SANDY SILT, FEW SHALE FRAGMENTS	ML	
3.0	7 24	REC. 1.2			↓	↓	↓	↓	
3.4	50/0.4	S-3 REC 0.3		3.4	V. DENSE		DECOMPOSED SANDY SHALE		
						OLIVE-BROWN			
					SOFT		SILTY SHALE, SOME SAND	BR	STAINED VERTICAL
									FRACTURE 4.5 - 5.1,
									6.1 - 6.7
	7.0 7.0	100%	40						LOW ∠ STAINED FRACTURES
									4.0, 5.1, 5.5, 6.1, 8.0,
10.4				10.3				↓	8.55, 9.55
					M. SOFT	BROWN-GRAY	SANDY SHALE	VBR-BR	
				13.3					PIECES 0.1 - 0.4'
					M-HARD	BROWN-GRAY	SANDSTONE: MEDIUM GRAINED	BL	
	10.0 10.0	100%	78						
20.4									
	10.0 10.0	100%	92						LOW ∠ FRACTURES
									28.2, 28.45, 28.85, 29.35,
									29.85, 30.15, 30.3
									VERTICAL STAINED
					↓	↓	↓	↓	FRACTURE 29.3 - 29.7

REMARKS ** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000-T2 TRACK MOUNTED DRILL
BORING ADVANCED USING 5¼ SOLID STEM AUGERS, 4" STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS
** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0521
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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0521

ELEVATION 1003± GWL 0 HRS 24.6 PROJECT NO. C040384.40-01

HRS

DATE 23 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
30.4					M. HARD	BROWN-GRAY	SANDSTONE: MEDIUM GRAINED, MICACEOUS (CON'T)	BL	ALL BREAKS ARE MECHANICAL - CORE IN 4' AND 6' PIECES - BROKE DURING HANDLING
	10.0 10.0	100%	100						
40.4									
	10.0 10.0	100%	100						
50.4									
	9.7 10.0	97%	94						0.05' CARBONACEOUS SHALE AT 59.8

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0521

ELEVATION 603 ± GWL 0 HRS 24.6 PROJECT NO. C040384.40-21

HRS

DATE 23 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 3

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
60.4					M. HARD	BROWN-GRAY	SANDSTONE (CONT)	BL	
				64.0					
				65.1	M-SOFT	LT. GRAY	SANDY CLAYSTONE W/ CALCAREOUS NODULES	BR	
	9.6 10.0	96%	58	66.5		GRAY	SILTY CLAYSTONE		
						MAROON	CLAYSTONE		30° SLICKENSIDES 66.75, 67.6, 68.0, 68.25, 68.4, 68.6, 69.1, 69.45, 69.7, 70.3, 70.4
70.4				70.4					
							BOTTOM OF BORING: 70.4'		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0521

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N 543873.4417
E 1722326.4148 Grade El. 901.64

PROJECT ARCH 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0522

ELEVATION 902± GWL 0 HRS 56.8 PROJECT NO. C040384.4/0-01

HRS

DATE 24-25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	2 2	S-1			V. STIFF	MAROON	SILTY CLAY	CL	* 3.5 TSF
1.5	3	REC 0.6							
	3	S-2							
3.0	5 6	REC. 1.2		3.4					
	18 38	S-3			V. DENSE	OLIVE-GRAY	DECOMPOSED SANDY SHALE		
4.2	50/0.2	REC 1.0		4.2					
				11:11:1	SOFT TO M. SOFT	OLIVE + GRAY	INTERBEDDED SANDY SHALE AND SHALY SANDSTONE	BR	TOP OF ROCK: 4.2' LOW & FRACTURES
									4.7, 5.1, 6.1, 6.65,
	6.3 6.3	100%	63						6.95, 7.35
									STAINED 30° FRAC
									TURE 8.4
10.5									VERTICAL STAINED
									FRACTURE 8.85-9.2
									STAINED LOW & FRAC-
									TURES 10.8, 11.6, 12.55,
									12.65, 14.7, 14.9, 15.2,
	10.0 10.0	100%	36					V BR	15.3, 15.9, 16.05,
								VBR	16.45, 16.5, EVERY 0.1
								BR	TO 0.3' 16.5-
				20.0					
20.5					SOFT TO V. SOFT	MAROON + GRAY	CLAYSTONE	BR	
								BL	
	8.8 10.0	88%	46					VBR-BR	
				27.0	M. HARD	GRAY	SHALY SANDSTONE	BR	STAINED VERTICAL
									FRACTURE 27.0-28.0
									30.7-30.9

REMARKS ** DRILLED BY TERRA TESTING, INC USING A SIMCO 4000-T2 TRACK MOUNTED DRILL
BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" STEEL CASING, NQ-2 WIRELINE CORING TOOLS

* POCKET PENETROMETER READINGS
** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0522
(1.0)

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0522

ELEVATION 902± GWL 0 HRS 56.8 PROJECT NO. C040384.40-01

HRS

DATE 24-25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
30.5				31.1					
					V. SOFT	MAROON	CLAYSTONE	VBR	NO RECOVERY IN THIS UNIT
	3.6 10.0	36%	24						
				37.5					
					M. SOFT	OLIVE + GRAY	INTERBEDDED CLAYSTONE AND SANDY SHALE	BR	LOW & FRACTURES 41.45, 41.7, 41.9, 43.7, 43.8, 46.8, 48.4, 49.4, 50.0, 50.9, 51.1, 51.4, 52.2 STAINED HIGH & FRACTURES 45.5-46.5 47.4-47.9, 48.7-48.95,
40.5									
	10.0 10.0	100%	56						
50.5									
				52.3					
					M. SOFT	OLIVE-GRAY	SANDY SHALE	BR	LOW & FRACTURES 52.7, 53.9, 54.3, 54.65, 55.1, 56.4, 57.45, 59.3 STAINED LOW & FRACTURE 53.45, 55.75-55.9, 56.5, 57.1, 58.4 60.0
	10.0 10.0	100%	80						
				57.9					
					SOFT TO M. SOFT	MAROON + GRAY	CLAYSTONE	BR- VBR	HIGH & STAINED FRACTURE 58.7-59.3

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0522

ELEVATION 902± GWL 0 HRS 56.8 PROJECT NO. C0403P4.4J-01

HRS

DATE 24 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 3 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
60.5				60.7					
					M. SOFT	GRAY	SANDY SHALE	BR	STAINED LOW & FRAC-
				63.0	↓	↓	↓	↓	TURES 60.75, 61.0,
				64.0	M. SOFT	MAROON	CLAY STONE		61.5, 61.9
					M. SOFT	GRAY	SHALY SANDSTONE / SANDY		HEAVILY STAINED NEAR
	10.0 10.0	100%	36				SHALE		VERTICAL FRACTURE 65.35-67.2
									67' 100% WATER LOSS *
									STAINED VERTICAL FRAC-
								↓	TURE 68.1-68.7, 69.2-
70.5				70.4		↓	↓	VBR	70.3
						MAROON + GRAY	CLAY STONE	BR	
									VERTICAL FRACTURE
									74.6-76.5
								↓	
								VBR	
	10.0 10.0	100%	61					BR	
								↓	
							: SANDY 78.5-80.5	BR	
								↓	LOW & FRACTURE 80.8,
80.5								↓	81.2, 83.1, 83.7, 84.5
								VBR	V. BROKEN ZONE 81.3-83.1
						↓		↓	
						DK GRAY		↓	
								BR	HIGH & FRACTURE 84.2-
	10.0 10.0	100%	57	86.1	↓	↓	↓	↓	84.45
					M. SOFT	GRAY	SILTSTONE	BR	LOW & FRACTURE 87.1, 87.65
									88.3,
									NEAR VERTICAL STAINED
					↓	↓	↓	↓	FRACTURE 88.5-89.2

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0522

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT, ST. ALBANS, WV — BORING NO. B-0522

ELEVATION 902± — GWL 0 HRS 56.8 — PROJECT NO. C040384.40-01

HRS

DATE 24-25 MAY 2005 — CLASSIFIED BY DAN SANGER — PAGE 4 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
90.5				90.0	MI HARD	LT GRAY	SHALY SANDSTONE MICACEOUS	BL	
	10.0 10.0	100%	93						
100.5									
	10.0 10.0	100%	95				: SHALE 107.0 – 107.6 (BA)		
110.5							: SHALE PEBBLES/CHIPS 108.6 – 109.8		
	10.0 10.0	100%	95						

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0522

ELEVATION 902± GWL 0 HRS 56.8 PROJECT NO. C040384.40-01

HRS

DATE 24-25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 5 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
120.5					M-HARD	LT GRAY	SANDSTONE (CONT)	BL	
					HARD				
	10.0 10.0	100%	100						
130.5									
	10.0 10.0	100%	100						
140.5									
	10.0 10.0	100%	100						

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0522

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0522

ELEVATION 902± GWL 0 HRS 56.8 PROJECT NO. C040384.40-01

HRS

DATE 24-25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 6 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
150.5				150.8			SANDSTONE (CONT)		
					S>FT	MAROON, GRAY, PURPLE, YELLOW	CLAYSTONE, SOME SAND	BR	30° SLICKENSIDES 153.05, 153.6, 154.0
				154.5	M. SOFT TO M. HARD	GRAY TO LT. GRAY	INTERBEDDED SANDY SHALE AND SANDSTONE	BR	
	10.0	10.0	100%						
160.5									
	10.0	10.0	100%						
170.5									
				173.0					
				174.7	S>FT	GRAY	CLAY SHALE	BR	
	10.0	10.0	100%		S. FT	DK GRAY + MAROON	SILTY TO SANDY CLAYSTONE - IRREGULAR CALCAREOUS STRINGERS 179.4-180.0	BR	20-30° SLICKENSIDES 175.0, 175.4, 175.55, 176.1, 176.6, 177.35, 177.65, 177.75 178.35, 179.15, 179.4,
	10.0	10.0	100%	72					

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0522

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST ALBANS, WV BORING NO. B-0522

ELEVATION 902± GWL 0 HRS 56.8 PROJECT NO. 04338.01

HRS

DATE 24-25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 7 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
180.5				180.0	M. SOFT	GRAY	SHALY SILTSTONE	BL	
				183.0					
					M. SOFT TO SOFT	MAROON + GRAY	CLAYSTONE	BL-BR	30° SLICKENSIDES AT 185.1, 185.3, 185.5, 186.4, 186.7, 187.0, 187.2, 187.55, 188.1
	10.0	10.0	100%	78					
				188.6					
190.5					SOFT TO M. SOFT	MAROON + GRAY	INTERBEDDED CLAYSTONE AND SANDY SHALE, SOME SANDSTONE,	BL	
	10.0	10.0	100%	90					
200.5				200.5					
					M. SOFT	MAROON + GRAY	CLAYSTONE	BR-BL	20-30° SLICKENSIDES 202.3, 202.65, 202.9, 203.2, 203.45, 203.7
	10.0	10.0	100%	86					
				206.5					
					M. HARD	GRAY	SANDY SILTSTONE	BL	
				209.7					

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0522

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0522

ELEVATION 902 ± GWL 0 HRS 56.8 PROJECT NO. C0403841.40-01

HRS

DATE 24-25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 8 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
210.5					M. HARD	LT. GRAY	SANDSTONE: FINE TO MEDIUM GRAINED, MICACEOUS	BL	
	10.0 10.0	100%	100						
220.5				220.0	M. SOFT TO SOFT	MAROON, GRAY, PURPLE, GREEN-GRAY	CLAYSTONE: SILTY 220-225'	BR	
	10.0 10.0	100%					: CALCAREOUS NODULES 227.5-235.5'		225-250.5 - CORE PIECES 0.2-0.4' W/20-30° SLICKENSIDES
230.5									
	10.0 10.0	100%							

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0522

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0522

ELEVATION 902± GWL 0 HRS 56.8 PROJECT NO. C040384.40-01

HRS

DATE 24-25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 9 of 9

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
240.5					M. SOFT TO SOFT	MAROON, GRAY, PURPLE, GREEN-GRAY	CLAYSTONE (CON'T)	BR	CORE PIECES 0.2-0.4' 4/20-30° SLICKENSIDES
	10.0 10.0	100%					: SILTY 247.8-248.9		
250.5							BOTTOM OF BORING: 250.5'		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0522 (18)

N 542742.2422
E 1722248.6749 Grade El. 696.90

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST ALBANS, WV BORING NO. B-0523

ELEVATION _____ GWL 0 HRS 22.0 PROJECT NO. C040384.10-01

HRS _____

DATE 24 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 2

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
	1 1	S-1			V. LOOSE	BROWN	SILT, SOME CLAY	ml	
1.5	1	REC 0.7		2.0	↓	↓	↓	↓	
	2	S-2			LOOSE				
3.0	4 4	REC 1.2							
	4 5	S-3					CLAYEY SILT AND ROCK		
4.5	5	REC. 0.6					FRAGMENTS		
	4	S-4							
6.0	4 3	REC. 0.5		6.0	↓	↓	↓	↓	
	4 4	S-5			STIFF	BROWN/ GRAY/ MAROON	CLAYEY SILT / SILTY CLAY AND	ml-cl	MOIST * 2.0 TSF
7.5	7	REC. 0.3					ROCK FRAGMENTS		
	8	S-6			V. STIFF		SILTY CLAY - DECOMPOSED		* 3.0 TSF
9.0	8 5	REC 1.5					CLAYSTONE		
	5 10	S-7							
10.5	10	REC 1.1							
	10	S-8							
12.0	13 38	REC. 0.6		12.0	HARD	↓	↓	↓	* > 4.5 TSF
	10 23	S-9			V. DENSE	MAROON + GRAY + YELLOW	DECOMPOSED CLAYSTONE	gm-gc	
13.5	34	REC. 1.3							
	23	S-10							
15.0	25 34	REC 0.9							
	17 28	S-11							
16.5	38	REC. 0.8							
	20	S-12							
17.9	38 50/0.4	REC 0.4		17.9	↓	↓	↓	↓	TOP OF ROCK: 17.9'
				17.9	SOFT	MAROON	CLAYSTONE: HIGHLY	BR-BL	LOW & FRACTURE
	3.4 4.1	83%	41			BROWN + GRAY	WEATHERED		19.5, 20.3, 20.5
									21.0, 21.2
22.0									45° SLICKENSIDE
									20.5 - 20.65
									LOW & FRACTURES
									23.6, 24.55, 24.85
									26.4, 27.9, 29.1
	10.0 10.0	100%	88						30.3, 30.6, 31.2,

REMARKS ** DRILLED BY TERRA TESTING, INC USING A SIMCO 4/1000-T2 TRACK MOUNTED DRILL. BORING ADVANCED USING 5¼" SOLID STEM AUGERS, 4" STEEL CASING, NQ-2 WIRELINE CORING TOOLS.

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0523

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0523

ELEVATION 690± GWL 0 HRS 22.0 PROJECT NO. C0403B4 40-0

HRS

DATE 24 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 2 of 2

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
					SOFT TO M. SOFT	MAROON + GRAY	CLAYSTONE (CON'T)	BR	
32.0									LOW % FRACTURES 34.0, 34.5, 34.7
				34.7					
				36.5	M. SOFT	GRAY	SHALY SANDSTONE		
	10.0	10.0	100%		SOFT	MAROON	CLAYSTONE	VBR-	LOW % FRACTURES
				38.5				BR	37.05, 37.9, 38.1
					M. SOFT	GRAY	SHALY SANDSTONE	BR	
				40.3	TO M. HARD				LOW % FRACTURE 39.95
					SOFT	MAROON + GRAY	CLAYSTONE	BR	LOW % FRACTURES 40.5, 40.6, 40.8, 40.9, 41.1, 42.4, 43.3, 43.45 43.7 38 SLICKENSIDES 42.75, 43.9, 44.2, 44.4, 44.7, 44.85, 45.0 45.75, 48.0, 49.4
42.0									
	8.0	8.0	100%						
50.0			73						VERTICAL FRAC. 48.0-48.5
							BOTTOM OF BORING: 50.0'		

REMARKS **

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

N 542745.0961
E 1722251.4149 Grade El. 696.91

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PROJECT AREA 2/3 JOHN E. AMOS POWER PLANT ST. ALBANS, WV BORING NO. B-0524

ELEVATION _____ GWL 0 HRS DRY PROJECT NO. C040384.40-01

HRS _____

DATE 25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
							AUGER W/O SAMPLING		
							TO 18 FT		
							INSTALL PIEZOMETER,		
							TIP AT 18 FT		
							SEE BORING B-0523 FOR SOIL		
							DESCRIPTIONS		
18.0				18.0					
							BOTTOM OF BORING: 18.0 FT		

REMARKS ** DRILLED BY TERRA TESTING USING A SIMCO 4000-T2 TRACK MOUNTED DRILL
BORING ADVANCED USING 5¼" SOLID STEM AUGERS

* POCKET PENETROMETER READINGS
** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0524

N 542379.9472
E 1721745.3670 Grade El. 679.43

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PROJECT AREA 2/3, JOHN E. AMOS POWER PLANT, ST. ALBANS, WV BORING NO. B-0525

ELEVATION _____ GWL 0 HRS DRY PROJECT NO. C0403814.40-01

HRS _____

DATE 25 MAY 2005 CLASSIFIED BY DAN SANGER PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
							AUGER W/O SAMPLING TO 10 FT.		
							INSTALL PIEZOMETER, TIP AT 10 FT		
							SEE BORING B-0520 FOR SOIL DESCRIPTION		
							↓		
10.0				10.0			↓		
							BOTTOM OF BORING 10.0 FT		

REMARKS ** DRILLED BY TERRA TESTING, INC. USING A SIMCO 4000-T2 TRACK MOUNTED DRILL. BORING ADVANCED USING 5¼" SOLID STEM AUGERS

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. B-0525

(16)

N 539371.31
E 1753962.87 Grade El. 709.57 Top of PVC Riser El. 711.47

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PROJECT Area 2/3 John E. Amos Power Plant BORING NO. 0536 (MW-1)

ELEVATION _____ GWL 0 HRS Dry PROJECT NO. C0Y0384.40.01

24 HRS 13.8

DATE 7-12-05 CLASSIFIED BY TR Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						Red	Clayey Silt and Rock		Start 1:35
						BR	Fragments - Trace Sand		Moist
				8.0		↓	↓		
						BR	Sand and Rock Fragments		Damp, RF > 2" ϕ
				10.0		↓	↓		
						Red	Clayey Silt and Rock		Moist RF < 2" ϕ
				11.0		BR	Fragments		
						Red	Decomposed Claystone		Damp.
						↓	↓		Dry @ 14'
				19.0					
							Bottom @ 19.0'		Finish 2:00
							Installation		Material
							Sand 19.0' to 18.0'		10' Screen, cap
							10' Screen 18.0 to 8.0'		9 Bags Sand
							Sand 18.0' to 6.0'		1 3/4 Bucket Pellets
							Bentonite Pellets 6.0' to 3.0'		10 Bags Concrete Mix
							Water added to pellets		16"x5' steel Casing
							1.9' Stick up PVC		
							2.3' Stick up Steel Casing		

REMARKS** 4 1/4" ID Hollow Stem Augers to 19.0', 4000-TZ Simco Track Drill
Doug Novotny Driller, Terra Testing

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0536 (MW-1)

N 539367.47
E 1753964.89 Grade El. 709.41 Top of PVC Riser El. 711.01

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PROJECT Area 2/3 John E Amos Power Plant BORING NO. 0535 (MW-2)

ELEVATION _____ GWL 0 HRS 40.1' PROJECT NO. C040384.40.01

24 HRS 38.2'

DATE 7-12-05 CLASSIFIED BY T. R. Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						Red	Clayey Silt and Rock		Moist, Start 8:45
						BRN	Fragments - trace sand		RF 72" ϕ
				10.0		↓	↓		
						Red	Decomposed Claystone		Dry
				18.0		↓	↓		TOR 18.0'
				20.0		Red	weathered Claystone		Auger to 20.0'
						BRN	Fine Grain Sandstone w/		
				23.0		Red	Interbedded Claystone		
					Hard	Gray	Interbedded sandstone &		
					↓	↓	Siltstone - few thin Red		
				30.0	↓	↓	Claystone Seams		
						Red	Claystone		few sec. of moist
				54.2		↓	↓		cuttings @ 42.0'
						Gray	Siltstone/shale		[illegible]
				58.0		↓	↓		[illegible]
				60.0		Red	Claystone		Moist cuttings back
						Gray	Siltstone		@ 62 wait 15 min
				62.5		↓	↓		water in hole
							Bottom @ 62.5'		End 10:35 AM
							Installation		Materials
							Sand 62.5 to 62.0'		20' 2" ϕ PVC Screen
							Screen 62.0' to 42.0'		4 Bags Sand
							Sand 62.0' to 37.0'		1/4 Bucket Pellets
							Bentonite Pellets 37.0 - 34.0		4 Bags Volclay grout
							Pellets into water		10 Bag Concrete Mix
							Volclay to 4.0'		
							Concrete 4.0 to 0.0', 6' ϕ Pad		
							Steel Casing 2.1' stick up		

REMARKS** 4¼" ID Hollow Stem Augers to 20', 4" ϕ Air Rotary to 62.5', Simco 4000-T2 Track Drill, Doug Novotny Driller, Terra Testing

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

N 541672.50
E 1755563.50 Grade El. 823.00 Top of PVC Riser El. 825.00

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PROJECT Area 2/3 John E Amos Power Plant BORING NO. 0527 (MW-3)

ELEVATION _____ GWL 0 HRS Dry PROJECT NO. C040384.40.01

48 HRS 17.0

DATE 6-24-05 CLASSIFIED BY T R Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						Red-BR.	Silty Clay		Start 10:15 AM
				2.0'			↓		Damp
						BR ↓	Clayey Silt ↓		Dry
				12.0'					
						Red-BR. ↓	- Silty Clay to Decomposed claystone ↓		Dry, slow augering damp at ≈16'
				25.5		Gray BR ↓	Weathered sandstone - with fine mica grains ↓		moist at ≈25' Auger Refusal 25.5' 6-27-05 WL=17'
				30.0		Red ↓	Siltstone ↓		Start air rotary @ 8:30 AM
				41.0			Bottom @ 41.0'		Finish @ 9:00 AM
									Clean hole 9:00 to 11:00. Drilling while cleaning 41.0' Material
							Installation:		
							Pellets 41 to 32.5'		20' 2" ϕ screen
							Sand 32.5 to 32.0		2 caps
							20' Screen 32.0'-12.0'; 1½" cap		12 bags sand
							32.0 to 9.0' Sand		1 bucket pellets
							Bentonite pellets 9.0' to 7.0'		½ Bag Volclay
							1 bucket water poured on pellets		10 Bags Concrete Mix
							Volclay grout to 3.3'		6" x 5' Steel Casing
							Concrete Mix 10 Bags		
							5' steel pipe 6" ϕ 2.5' stick up		
							2' PVC stick up		
							2.5' steel Casing stick up		

REMARKS ** 30' south of 0509, 4¼" ID HSA to 25.5', 4" ϕ air rotary w/hammer to 41.0'
Simco 4000-T2 Track Rig, Doug Novotny Driller, Terra Testing

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0527 (MW-3)

N 542305.16
E 1753086.04 Grade El. 674.76 Top of PVC Riser El. 676.36

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PROJECT Area 2/3 John E Amos Power Plant BORING NO. 0532 (mw-4)

ELEVATION _____ GWL 0 HRS 19.2' PROJECT NO. C040384.40.01

24 HRS 17.9'

DATE 7-7-05 CLASSIFIED BY T R Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
				2.0		BR	Sandy Silt		Damp, start 9:45
						BR	Sand and Rock Fragments		Damp
				6.0		↓	of shale		
						BR	Sandy Clay - some Rock		RF < 2" ϕ, moist
				9.0		↓	Fragments of Sandstone		Auger to 10.0' refusal
						Red	Decomposed claystone		Damp, TOR 10.0'
						↓	weathered to claystone		
				12.5		↓	↓		
						Gray	Siltstone Interbedded with		
						Red	Claystone/clayshale		
				41.0		↓	↓		
						Gray	Silt shale/Siltstone - trace		
				49.0		↓	Red seams of claystone		
					Soft	Red	Claystone		
				53.0		↓	↓		
						Gray	Interbedded Silt shale &		
				58.0		Red	claystone		
						Gray	Siltstone		Wet cuttings last
				70.0		↓	↓		dust @ 58.0', water
						Gray	Sandstone		from hole by 62.0'
				78.5		↓	↓		more water @ 71.0'
							Bottom @ 78.5'		
							Installation		Materials
							Sand 78.5 to 78.0', 20'		4 Bags Sand
							Screen 78.0 to 58.0', Sand		½ bucket pellets
							78.0 to 53', Bentonite to		2 bags Volclay grout
							49.0', Volclay grout to 3'		10 Bags Concrete Mix
							Concrete to 0.0, 6'ϕ Pad		6"x5' Steel Casing
							PVC stickup 1.6', Steel 2.1'		

REMARKS** 4¼" ID HSA to 10.0', 4" ϕ Air Rotary 10.0' to 78.5', Simco 4000-TZ Track Rig
Doug Novotny Driller, Terra Testing.

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0532 (mw-4)

N 542305.96
E 1753080.68 Grade El. 674.84 Top of PVC Riser El. 676.84

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PROJECT Area 2/3 John E BORING NO. 0533 (MW-5)

ELEVATION _____ GWL 0 HRS Dry PROJECT NO. C040384.40.01

24 HRS 8.16'

DATE 7-7-05 CLASSIFIED BY T R Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						BR	Sandy Silt		Damp
				3.0		↓	↓		
						BR	Sand and Rock Fragments		Damp
				6.0		↓	↓		
						BR	Sandy Clay and Rock		Moist
				9.0		↓	Fragments		
				10.2		Red	Decomposed claystone		Dry
							Bottom @ 10.2'		
							Installation:		Material
							3" sand to 10.0'		4 Bag Sand
							5' Screen w/ cap 10.0'-5.0'		1/2 Bucket Pellets
							Sand 10.0 to 4.0'		10 Bags Concrete Mix
							Bentonite Pellets 4.0'-3.0'		6"x5' Steel Casing
							Cemment 3.0'-0', c'ϕPad		
							2' stick up PVC		
							2.2' stick up steel casing		

REMARKS** 4¼" ID HSA to 10.2', Simco 4000 -T2 Track Rig
Doug Novotny Driller, Tetra Testing

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0533 (MW-5)

N 540837.74
E 1754220.53 Grade El. 927.29 Top of PVC Riser El. 929.59

gai consultants

PROJECT Area 2/3 John E. Amos Power Plant BORING NO. 0526 (MW 6)

ELEVATION ____ GWL 0 HRS 62.5' in well PROJECT NO. C040384.40.01

24 HRS 62.5'

DATE 6-23-05 CLASSIFIED BY TR Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						Red Brn.	Clayey Silt ↓		Start 9:00 AM
				10.5		Yellow BR	Highly weathered siltstone to fine grain claystone		
				13.5					Auger to 14'
						Lt Brn Gray	Sandstone @ 25'		Air Hammer 14' to 91'
				28.0			↓		8'/10min in sandstone
						Gray	Shale		
				30.0			↓		
						Red	Claystone		
				36.0			↓		
						Gray	Sandstone		
				38.0			↓		
						Gray Red	Interbedded shale and siltstone / fine sandstone		
			WL	76.0			water @ 76'		Water encountered @ 76'
				91.0			↓		End 11:30 AM
							Bottom of Boring @ 91.0'		
							Installation		Material
							Clean hole 11:30-12:25		
							Stabilize water @ 62.55' 2:00		
							Place bentonite pellets 91.0'		2 buckets bentonite
							to 78.5', Sand 78.5' to 78.0'		4 50lbs bags sand
							Set 20' screen @ 78' to 58'		2½ 50lb bag volclay
							3" screen cap on end, stick up		10 Bags Concrete Mix
							2.3', Sand 78.0 to 55',		6" x 5" steel casing
							bentonite pellets 55' to 50'		
							Volcay grout to 4.0' 6-29-05		
							Concrete to surface, 2.5' Steel Stick-up		

REMARKS** 4¼" ID Hollow Stem Augers to 14', 4" ϕ downhole hammer w/air to 91.0'
Simco 4000-T2 Track Rig, Doug Novotny Driller, Terra Testing

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0526 (MW-6)

N 539635.79
E 1755425.04 Grade El. 943.15 Top of PVC Riser El. 945.15

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PROJECT Area 2/3 John E Amos Power Plant BORING NO. 0528 (MW-7)

ELEVATION _____ GWL 0 HRS 40.0 PROJECT NO. C040384.40.01

18 HRS 37.0

DATE 6-27-05 CLASSIFIED BY TR Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						BR	Silty Sand and Sandstone		Start 3:50 PM
				2.0		↓	Rock Fragments		Dry
						Yellow	Decomposed Sandstone		Dry
				6.0		BR	↓		Auger Refusal @ 6.0'
						Gray	Sandstone		Dry
						BR	↓		
				22.0	Hard	Gray	18.0' to 22.0'		≈ 1"/min
						BR	Siltstone		
						to Gray	↓		
						Red	from 24'		Water Encountered
						& Gray	↓		@ 40.0'
				55.5		↓	↓		End 5:00 PM
							Bottom @ 55.5'		Clean with air
									until 5:40PM
							Installation		Materials
							Sand 55.5' to 52.0'		4 bag sand
							20' Screen 52.0 to 32.0'		1/4 bucket pellets
							Sand 52.0 to 30.0'		2 Bags Volclay
							Bentonite Pellets 30.0' to 28.0'		1.0 Bags Concrete
							Bucket of water on Pellets		6" Φ steel Casing
							Volclay Grout to 3.3'; 3.3' of		5' total length
							Concrete. Pad 6' diameter		
							2' stickup PVC		
							2.5' stickup steel casing		

REMARKS** 4 1/4" ID HSA to 6.0', 4"ϕ Air Rotary w/hammer to 55.5'

Simco 4000-T2 Track Rig, Doug Novotny Driller, Terra Testing

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0528 (MW-7)

N 542134.95
E 1756839.14 Grade El. 945.01 Top of PVC Riser El. 947.01

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PROJECT Area 2/3 John E Amos Power Plant BORING NO. 0534 (MW-8)

ELEVATION _____ GWL 0 HRS 19.8' PROJECT NO. C040384.40.01

48 HRS 23.8'

DATE 7-11-05 CLASSIFIED BY T R Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						Red	Silty Clay		Start 11:00 AM
				6.0		↓	↓		Moist
						Red	Decomposed Claystone		Dril
				9.0		↓	↓		
						Gray/	Sandy shale / Sandstone		TOR 10.0'
				23.0		BR	Med Grain.		10:30 a/n Rotary.
						Red	Claystone		Slight Hammering
				26.0		↓	↓		
				28.0		BR	Sandstone / Sandy shale		
					Hard	Gray	Sandstone		
					↓	BR	@ 34		
				37.0	↓	↓	↓		
						Red	Claystone		Moist @ top 6"
				41.0		↓	↓		Moist cuttings back
					Hard	Gray	Sandstone / Sandy shale		@ 1/2 of 10' Run
					↓	↓	↓		
				60.5	↓	↓	↓		End 12:35 PM
							Bottom @ 60.5'		
							Installation		Material
							60.5' to 60.0' Sand		20' screen, 2 caps
							3" cap on bottom 20' Screen		5 Bags Sand
							Screen 60.0 to 40.0',		1/4 Bucket Pellets
							Sand 60.0 to 30.0',		3 Bags Volclay
							Bentonite Pellets to 27.0'		11 Bags Concrete Mix
							Volclay Grout to 3.0'		6"x5' Steel Casing
							Concrete 3.0 to 0.0', 6' ϕ Pad		
							2' stick up of NC		
							2.5' Stickup of steel Casing		

REMARKS** 4¼" ID Hollow Stem Augers to 10.0', 4" ϕ Air Rotary to 60.5', 4000-T2 Simco Track Rig, Doug Novotny Driller, Terra Testing

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0534 (MW-8)

N 544221.98
E 1756158.78 Grade El. 933.39 Top of PVC Riser El. 935.39

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PROJECT Area 2/3 John E Amos BORING NO. 0530 (MW-9)

ELEVATION _____ GWL 0 HRS 47.4' PROJECT NO. C040384.40.01

24 HRS 30.2'

DATE 6-30-05 CLASSIFIED BY T. R. Gower PAGE 1 of 1

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						Red	Silty Clay		Start 11:10 AM
				2.0			↓		Moist
						Red	Decomposed Claystone		Dry, Augr to 5.0'
				5.0			↓		Air Rotary 11:30
						Red	Claystone / clayshale		Hammer in claystone
				15.0		trace gray	↓		Less @ 12'
						BR	Fine grain Sandstone		
				29.0	Hard	Gray	18 to 20'		
				31.0		BR	Sandy shale		
						Red	Claystone / clayshale		
				35.0			↓		
						Gray trace red	Siltstone w/sandstone seams / siltshale		
				44.0			Water Encountered @ 42'		Water Encountered 42'
						Red	Claystone		
				51.0			↓		
					Hard	Gray	Sandstone		End Drilling 12:40PM
				62.5			↓		
							Bottom @ 62.5'		Let sit 15min blow
									out water = 30 sec
							Installation		then dry, 15 min
							62.5 to 62.0' Sand		on 15 sec of water
							20' Screen 62.0' to 42.0'		Add potable water to
							Sand 62.0' to 37.0'		clean hole 50 gal total
							Bentonite Pellets 37.0'-34.5'		Material
							Volclay grout to 3.0'		5 Bags Sand
							Concrete 3.0'-0.0', 6' Diameter		20' Screen
							Pad, 2' stickup PVC		1/4 bucket pellets
							2 1/2' stick up 6" ϕ steel		water added, 2 bags
							Casing 2.5' stickup		Volclay, 9 bags Concrete

REMARKS ** 25 ft N345°W from Survey Pt. 307, 4 1/4" ID HSA to 5.0', 4" ϕ Air rotary w/hammer to Simco 4000-T2 Track Rig, Doug Novotny-Driller, Terra Testing

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0530 (MW-9)

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N 544019.11
E 1754183.58 Grade El. 909.43 Top of PVC Riser El. 911.43

PROJECT Area 2/3 John E Amos Power Station BORING NO. 0531 (MW-10)

ELEVATION _____ GWL 0 HRS Dry PROJECT NO. 040384.40.01

24 HRS 102'

DATE 6-30-05 CLASSIFIED BY T. R. Gower PAGE 1 of 2

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
				9.0		BR	Clayey Silt		Start 4:00.
						Red	Decomposed Claystone		Dry
				11.0		↓	weathered to claystone		Auger to 10.0'
						Lt BR	Silty Shale / siltstone		
				20.0		↓	↓		
						BR	Sandstone		
				26.0		↓	↓		
						Lt Gray	Siltstone - Red @ 29.0'		
				34.0		↓	Gray @ 31.0'		
				36.0		Red	Claystone		
					Hard	Gray	Fine grain Sandstone		
				40.5		↓	↓		
						Red	Claystone		
				46.0		Gray	↓		
				58.0		Gray	Siltstone		Stop 5:00 @ 52'
				60.0		Red	Claystone		
						Gray	Siltstone / v. Fine Grain		
				71.0		↓	Sandstone, shaley		
					Hard	Gray	Sandstone		
				76.0	↓	↓	↓		
					Soft	Red	Siltstone / Claystone		
				81.0	↓	↓	↓		
				82.0	Hard	Gray	Sandstone		
						Gray	Siltstone		
				84.0		↓	↓		
					Hard	Gray	Sandstone w/ 6" seams		
					↓	↓	of softer siltstone		Stop @ 112' 11:05 AM
				125.0		↓	↓		
						Red	Claystone		
				138.0		↓	↓		

REMARKS** 4¼" ID Hollow Stem Augers to 10.0', 4" ϕ Air Rotary w/hammer 10.0' to 157.0'
Simco 4000-T2 Track Rig, Doug Novotny Driller, Terra Testing.

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

BORING NO. 0531 (MW-10)

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PROJECT Area 2/3 John E Amos Power Station BORING NO. 0531 (MW-10)

ELEVATION _____ GWL 0 HRS Dry PROJECT NO. 040384.40.01

24 HRS 102

DATE 7-1-05 CLASSIFIED BY T. R. Gower PAGE 2 of 2

DEPTH (FT.)	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO., TYPE & RECOVERY OR % ROCK RECOVERY	RQD (%) OR TORVANE	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY - CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS*
1	2	3	4	5	6	7	8	9	10
						Gray	Siltstone		Dry
				149.0		↓	↓		
						Gray	Sandstone		
				152.0		↓	↓		
				153.0		Red	Claystone		
				154.0		DK Gray	Sandstone w/mica grains		
						Gray	Siltstone		
						↓	↓		
				157.0		↓	↓		End 12:05 PM
							Bottom @ 157.0'		
							Installation		Material
							Hole measured @ 154.0'		11 bags sand
							Sand to 153.0', 20' screen		1/4 bucket pellets
							153.0' to 133.0', Sand		4 1/2 bags volclay
							153.0 to 85.0', bentonite		10 Bags Concrete Mix
							pellets to 81.0', Volclay		6" ϕ x 5' Steel
							to 3.5', Concrete 3.5 to 0.0'		Casing
							6" ϕ x 5' steel casing, 6'		
							diameter Pad		
							2' stick up PVC		
							2.5' stick up steel casing		

REMARKS ** _____

* POCKET PENETROMETER READINGS

** METHOD OF ADVANCING AND CLEANING BORING

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Definition of Terms
Used to Describe Subsurface Materials

SOILS

DENSITY OF GRANULAR SOILS BASED ON STANDARD PENETRATION RESISTANCE

DESIGNATION	STANDARD PENETRATION RESISTANCE (BLOWS/FOOT)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	OVER 50

CONSISTENCY OF COHESIVE SOILS IS BASED ON FIELD AND/OR LABORATORY TESTS

CONSISTENCY	UNC COMPRESSIVE STR. (TONS PER SQUARE FOOT)	FIELD IDENTIFICATION
VERY SOFT	LESS THAN 0.25	EASILY PENETRATED SEVERAL INCHES BY FIST
SOFT	0.25 TO 0.50	EASILY PENETRATED SEVERAL INCHES BY THUMB
MEDIUM STIFF	0.50 TO 1.0	CAN BE PENETRATED SEVERAL INCHES BY THUMB WITH MODERATE EFFORT
STIFF	1.0 TO 2.0	READILY INDENTED BY THUMB BUT PENETRATED ONLY WITH GREAT EFFORT
VERY STIFF	2.0 TO 4.0	READILY INDENTED BY THUMBNAIL
HARD	MORE THAN 4.0	INDENTED WITH DIFFICULT BY THUMBNAIL

ADDITIONAL TERMS USED IN THE DESCRIPTION OF SOILS:

AND	INDICATES APPROXIMATELY EQUAL AMOUNTS OF MATERIALS, SUCH AS A SAND AND GRAVEL MIXTURE. IF THE MATERIALS OCCUR IN THIN SEPARATE SEAMS, IT IS NOTED IN THE DETAILED WORD CLASSIFICATION. THE THICKNESS IS GIVEN WHERE POSSIBLE.
SOME	INDICATES A SIGNIFICANT AMOUNT OF THE ACCESSORY MATERIAL. EXAMPLE: MEDIUM DENSE SILTY SAND - SOME GRAVEL
TRACE	INDICATES A MINOR AMOUNT OF THE ACCESSORY MATERIAL EXAMPLE: LOOSE SILTY SAND - TRACE OF GRAVEL
INTERBEDDED	USED TO DESCRIBE THIN ALTERNATING SEAMS. THICKNESS IS GIVEN WHERE POSSIBLE EXAMPLE: HARD INTERBEDDED SILT AND CLAY (APPROXIMATELY 1/16" THICK)

ROCK

TERM	DEFINITION
SEAM	THIN (12 INCHES OR LESS) PROBABLY CONTINUOUS LAYER
SOME	INDICATES SIGNIFICANT (15 TO 40 PERCENT) AMOUNTS OF THE ACCESSORY MATERIAL EXAMPLE: ROCK COMPOSED OF SANDSTONE (70%) AND SEAMS OF SHALE (30%) WOULD BE: SANDSTONE - SOME SHALE SEAMS
FEW	INDICATES: MINOR (0-15 PERCENT) AMOUNTS OF THE ACCESSORY MATERIAL EXAMPLE: ROCK COMPOSED OF SANDSTONE (90%) AND SEAMS OF SHALE (10%) WOULD BE: SANDSTONE - FEW SHALE SEAMS
INTERBEDDED	USED TO INDICATE THIN OR VERY THIN ALTERNATING SEAMS OF MATERIAL OCCURRING IN APPROXIMATELY EQUAL AMOUNTS EXAMPLE: ROCK COMPOSED OF SANDSTONE (50%) AND SHALE (50%) SEAMS WOULD BE INTERBEDDED SANDSTONE AND SHALE. THE DEGREE OF BROKENNESS OF THE ROCK IS DESCRIBED BY ONE OF THE FOLLOWING TERMS:

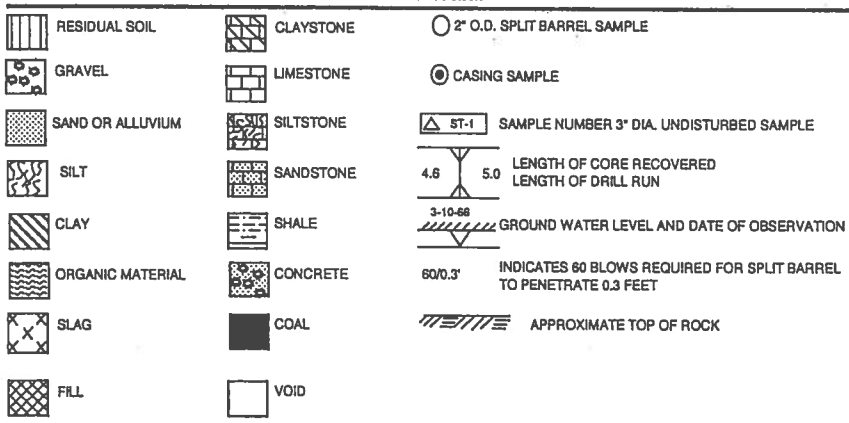
DESCRIPTIVE TERMS	ABBREVIATION	SPACING
VERY BROKEN	(V. BR.)	LESS THAN 2 INCHES
BROKEN	(BR.)	2 INCHES - 1 FOOT
BLOCKY	(BL.)	1 FOOT - 3 FEET
MASSIVE	(M.)	3 FEET - 10 FEET

RQD-ROCK QUALITY DESIGNATION IS CUMULATIVE LENGTH OF PIECES OF CORE EQUAL TO OR GREATER THAN FOUR INCHES IN LENGTH DIVIDED BY THE TOTAL LENGTH OF CORE RUN, EXPRESSED AS A PERCENTAGE.

THE FOLLOWING BASIC NAMES ARE APPLIED TO SEDIMENTARY ROCK:

ROCK TYPE	CHARACTERISTICS
SANDSTONE	MADE UP PREDOMINANTLY OF GRANULAR MATERIALS RANGING BETWEEN 1/16 AND 2MM IN DIAMETER
SILTSTONE	MADE UP OF GRANULAR MATERIALS LESS THAN 1/16 MM IN DIAMETER. FRACTURES IRREGULARLY, MEDIUM THICK TO THICK BEDDED
CLAYSTONE	VERY FINE GRAINED ROCK MADE UP OF CLAY MATERIALS. FRACTURES IRREGULARLY, VERY SMOOTH TO TOUCH. GENERALLY HAS IRREGULARLY SPACED PITTING ON SURFACE OF DRILLED CORES.
SHALE	A FISSILE VERY FINE GRAINED ROCK. FRACTURES ALONG BEDDING PLANES
LIMESTONE	ROCK MADE UP PREDOMINANTLY OF CALCITES (CA CO3) EFFERVESCES UPON THE APPLICATION OF HYDROCHLORIC ACID
COAL	ROCK CONSISTING MAINLY OF ORGANIC REMAINS

LEGEND



ARCADIS

GAI Consultants, Inc. 2006

Well Construction Diagrams

B-0501 to B-0515, B-0517, B-0519 to B-0525 & MW-1 to MW-10

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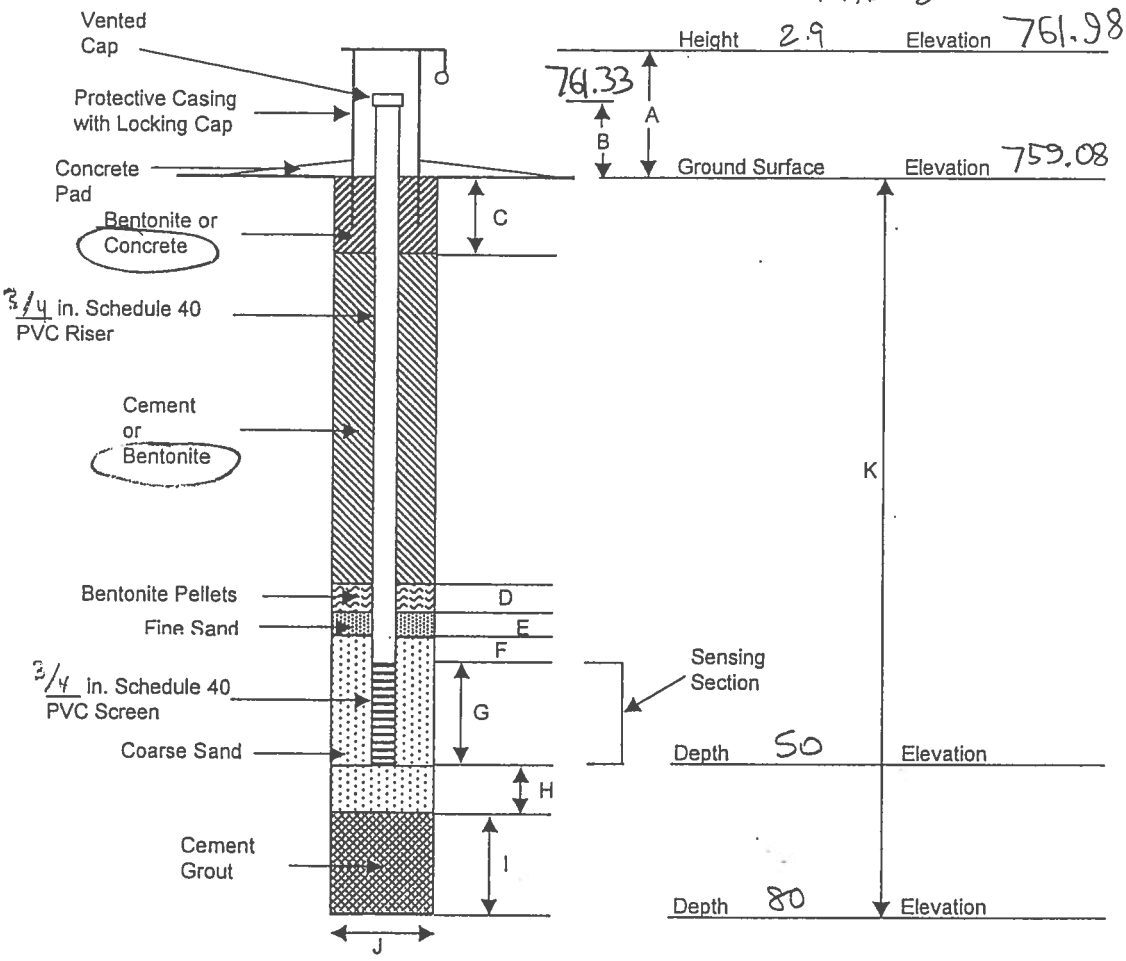
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 JOHN E. AMOS POWER PLANT Project No. C040384.40-01

Date 21 APR 2005 Engineer/Geologist DRS Well No. B-0501

N 540,558.4978
E 1723508.1269
NAD 83 WV SOUTH



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.9	2.25	35	0	0	5
G	H	I	J	K	
10	3	30	0.25	80.0	

Remarks _____

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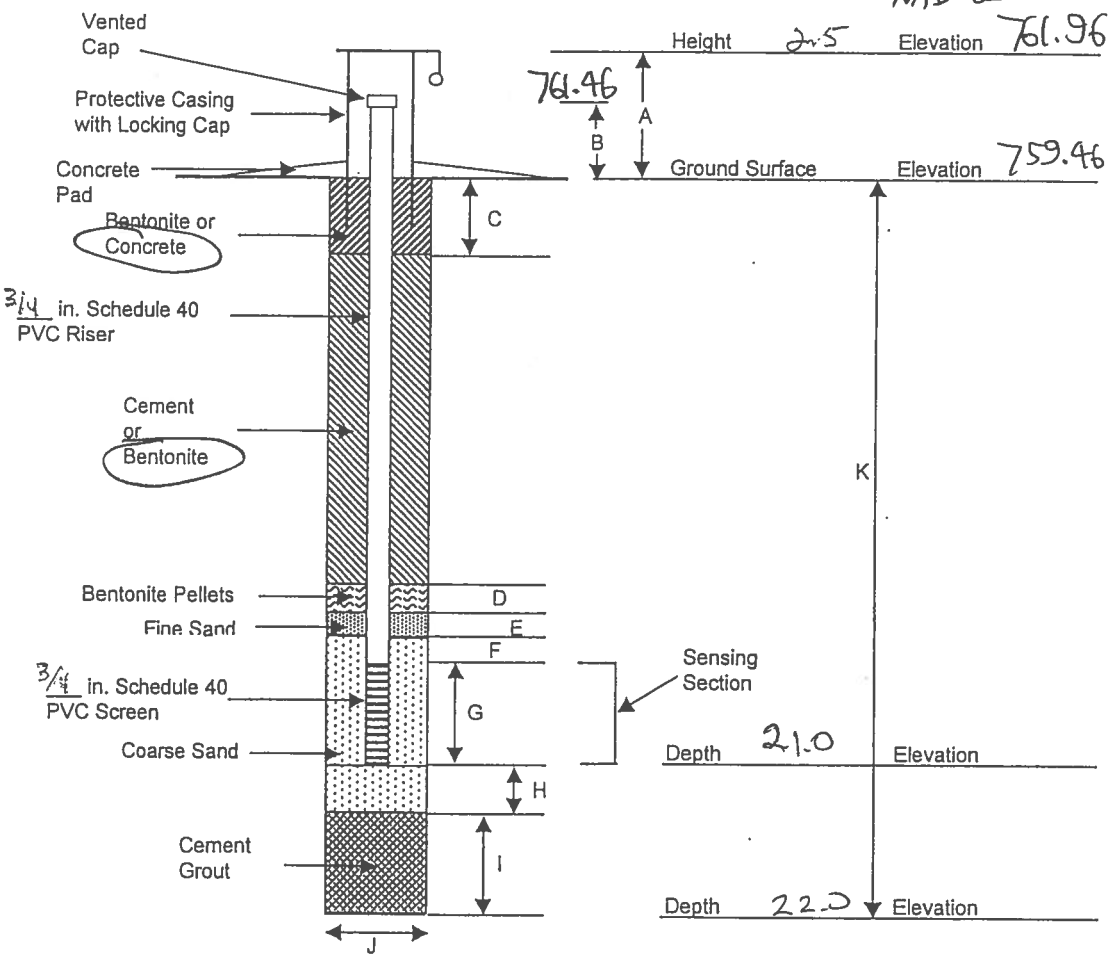
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 JOHN E. AMOS POWER PLANT Project No. C040384.40-01

Date 21 APR 2005 Engineer/Geologist DBS Well No. B0502

N 540563.2422
E 1723508.0316
NAD 83 WV SOUTH



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.5	2.0	7.0	0	0	4
G	H	I	J	K	
10	1	0	0.25	22.0	

Remarks _____

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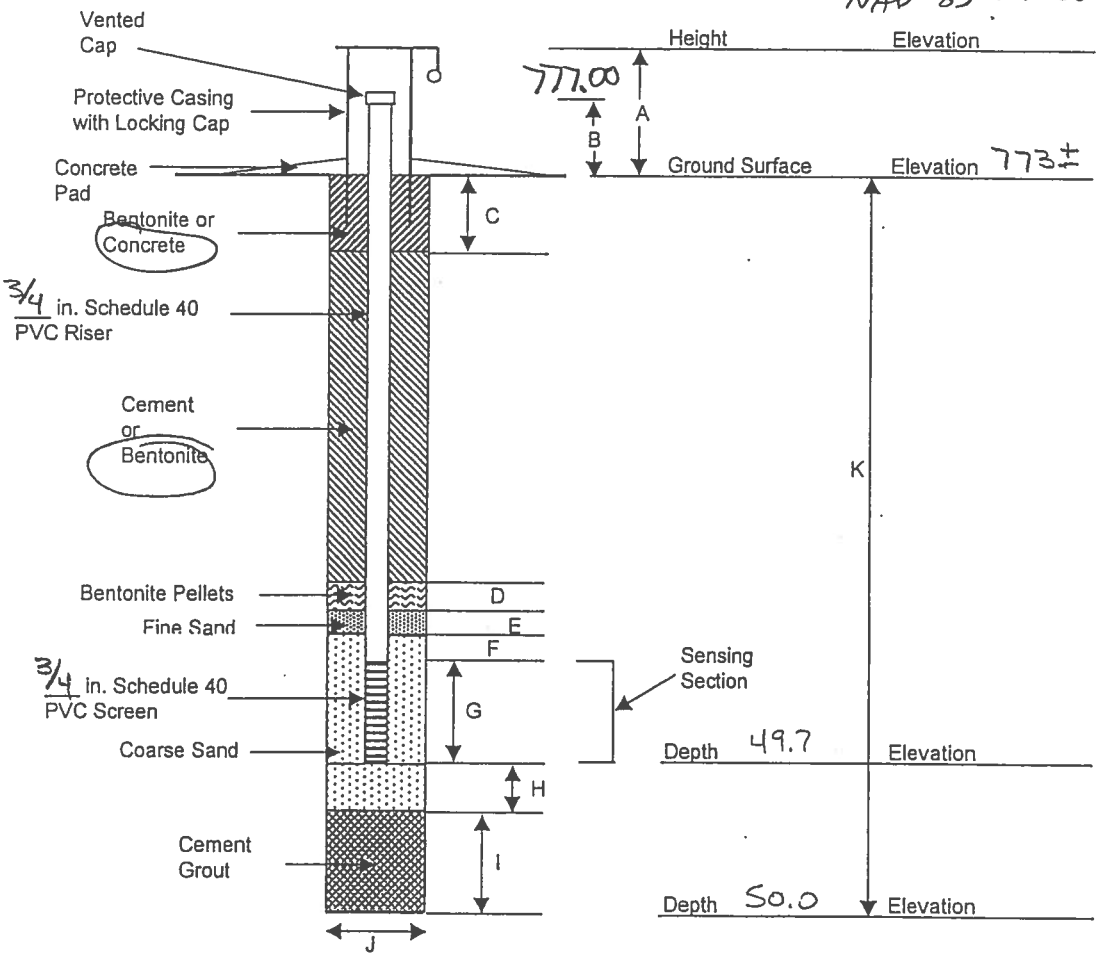
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C2403x41.40-01

Date 20 APR 2005 Engineer/Geologist DRS Well No. 0503

N 540843.8055
E 1723858.5630
NAD 83 WV SOUTH



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.6	2.0	34.7	0	0	5
G	H	I	J	K	
10	0.3	0	0.25	50.0	

Remarks _____

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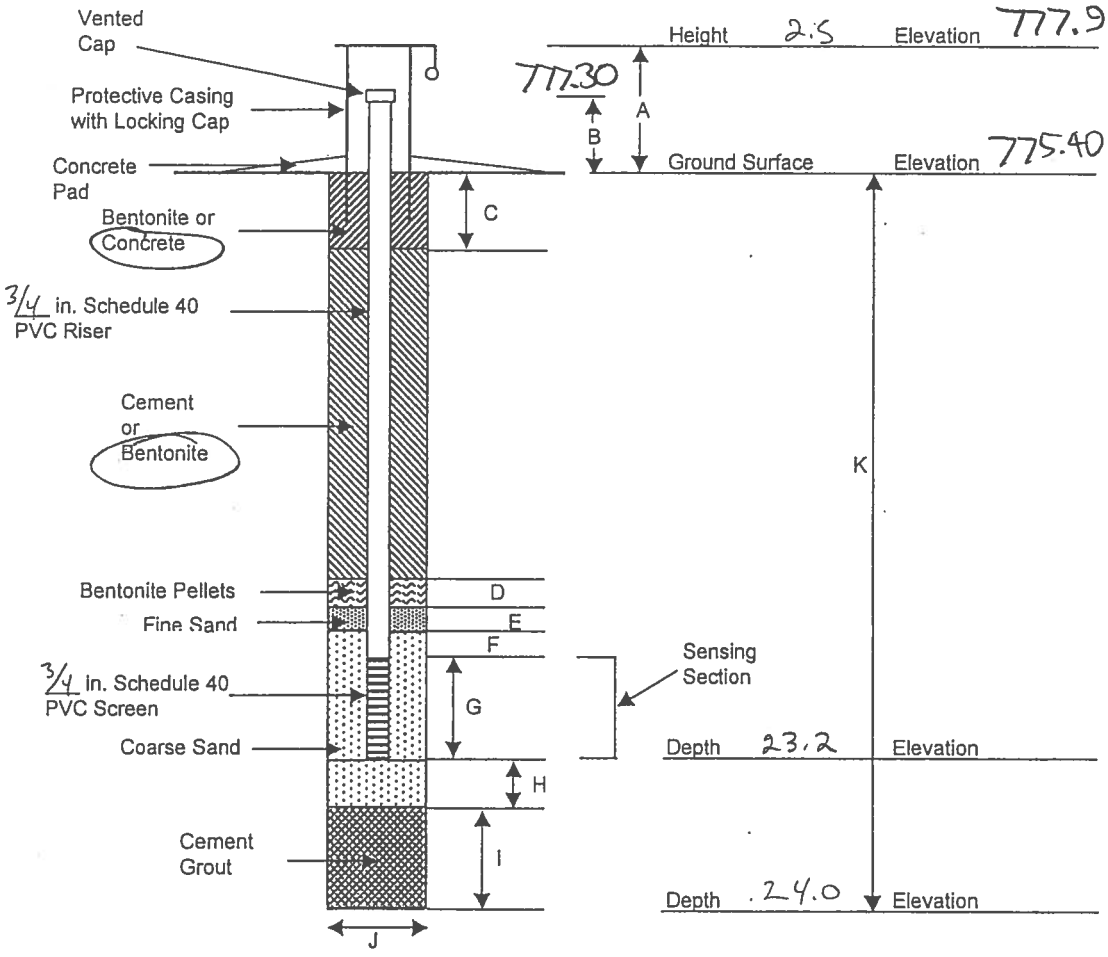
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 JOHN E. AMOS POWER PLANT Project No. C040384.40-01

Date 20 APR 2005 Engineer/Geologist DBS Well No. B 0504

N 540840.0544
E 1723859.8367



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.5	1.9	8.2	0	0	5
G	H	I	J	K	
10	0.8	0	0.25	24.0	

Remarks _____

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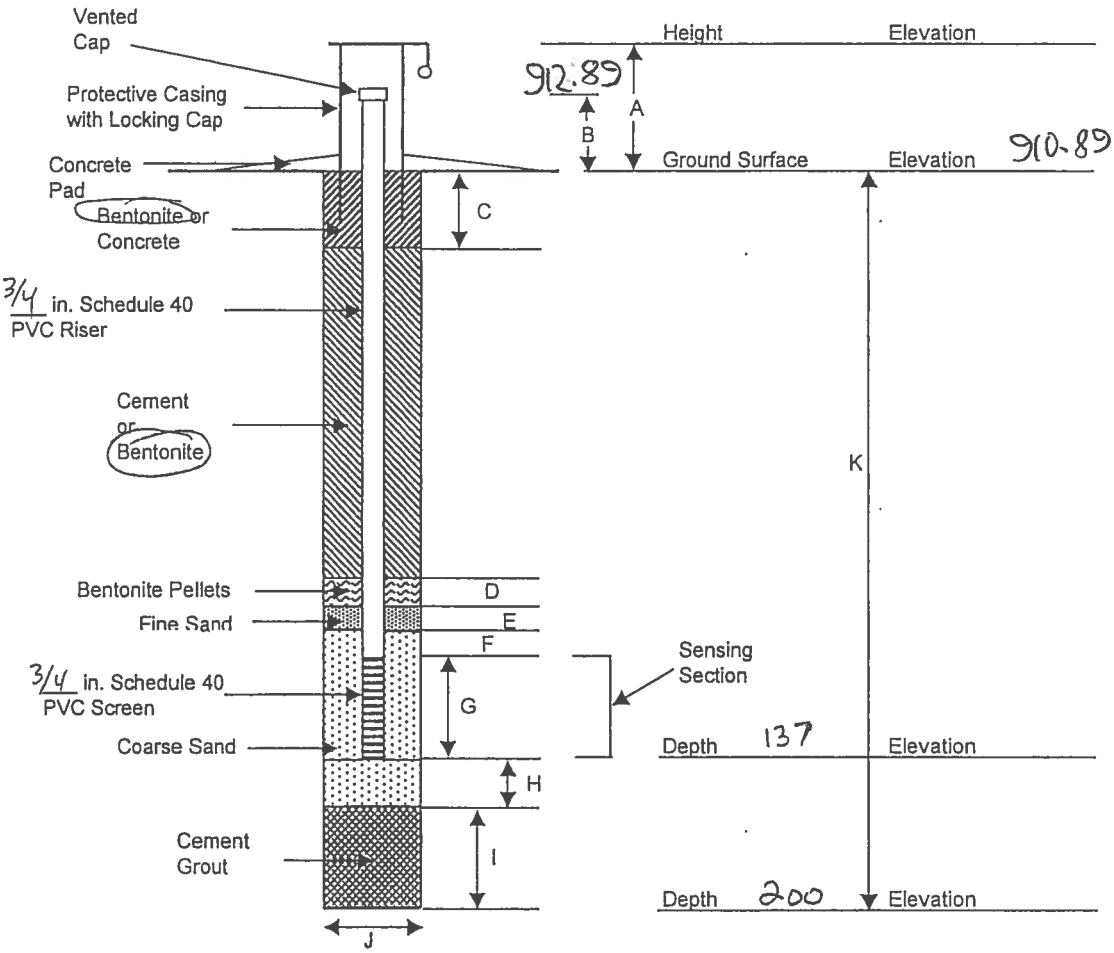
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 JOHN E. AMOS POWER PLANT Project No. C040384.40-01

Date 27 APR 2005 Engineer/Geologist DBS Well No. B 0505 ~~(27)~~

N 541325.3505
E 1723551.3362



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.5	2.0	10	0	0	107
G	H	I	J	K	
20	3	60	0.25	200	

Remarks _____

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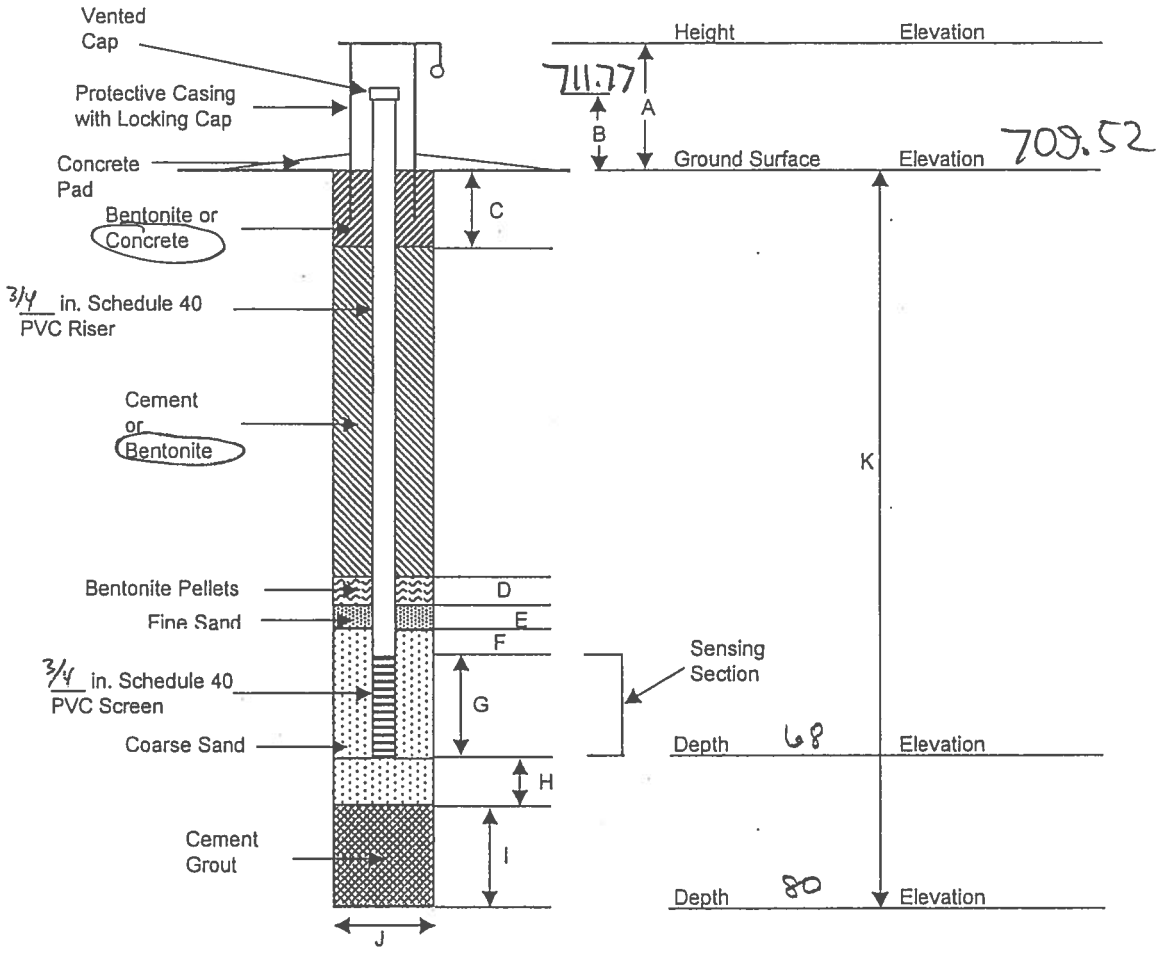
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C04038Y.40-01

Date 28 APR 2005 Engineer/Geologist DBS Well No. B0506

N 539424.9688
E 1722518.6810



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.55	2.25	20	0	0	38
G	H	I	J	K	
10	2	10	0.25	80	

Remarks _____

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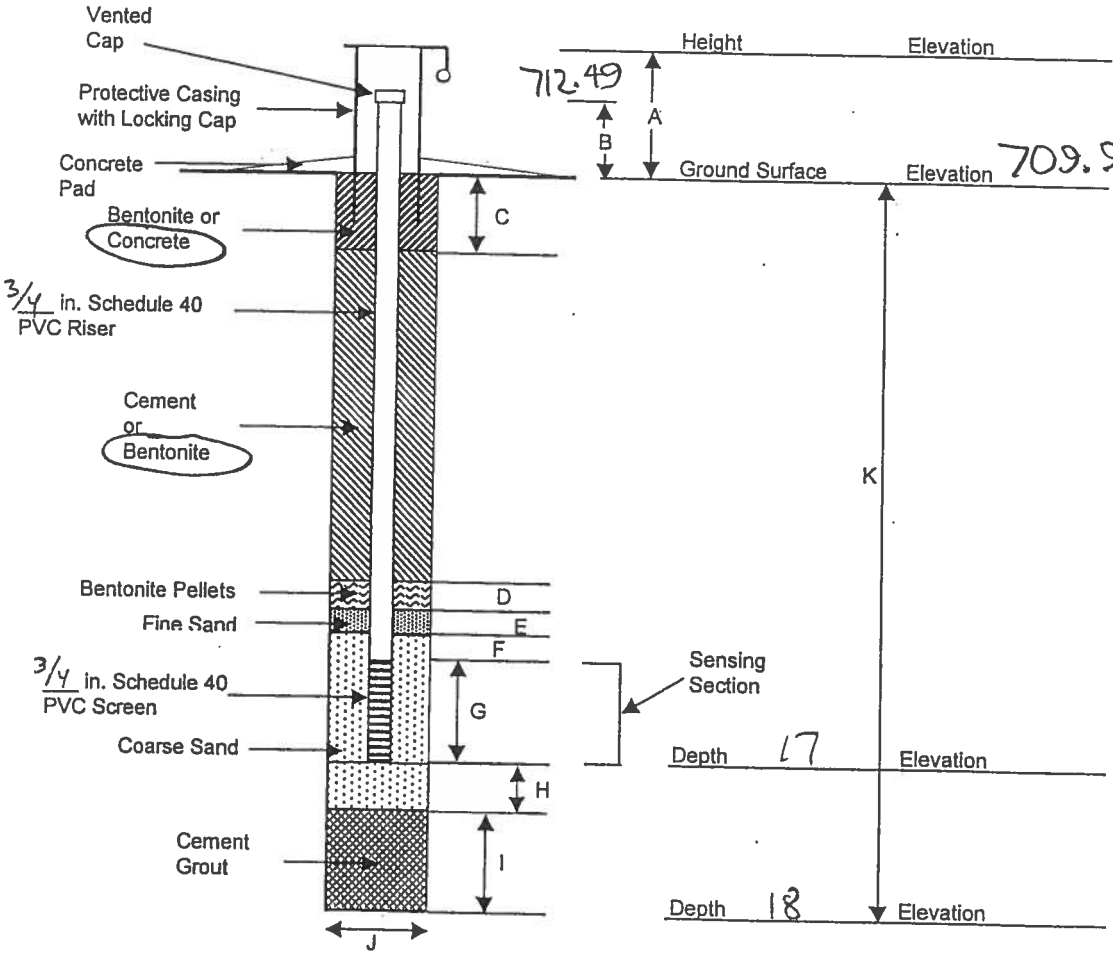
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 JOHN E. AMOS POWER PLANT Project No. C040384.40-01

Date 22 APR 2005 Engineer/Geologist DBS Well No. B0507

N 539428.8146

E 1722523.7682



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.72	2.50	4	0	0	3
G	H	I	J	K	
10	1	0	0.25	18	

Remarks _____

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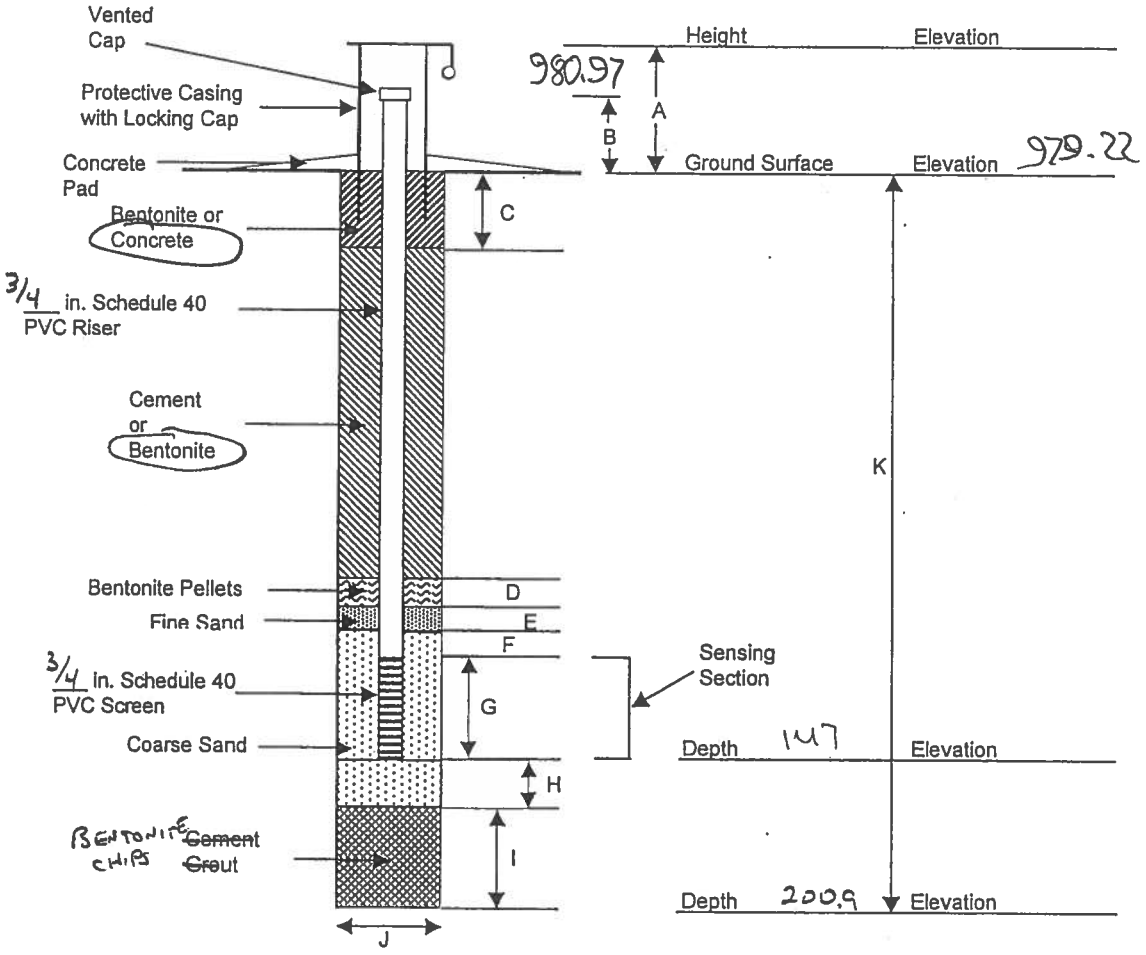
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. CO40384.40-01

Date 03 MAY 2005 Engineer/Geologist JBS Well No. B-0508

N 541996.9754
E 1723377.3436



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.5	1.75	77	—	—	50
G	H	I	J	K	
20	3	50.9	0.25	200.9	

Remarks _____

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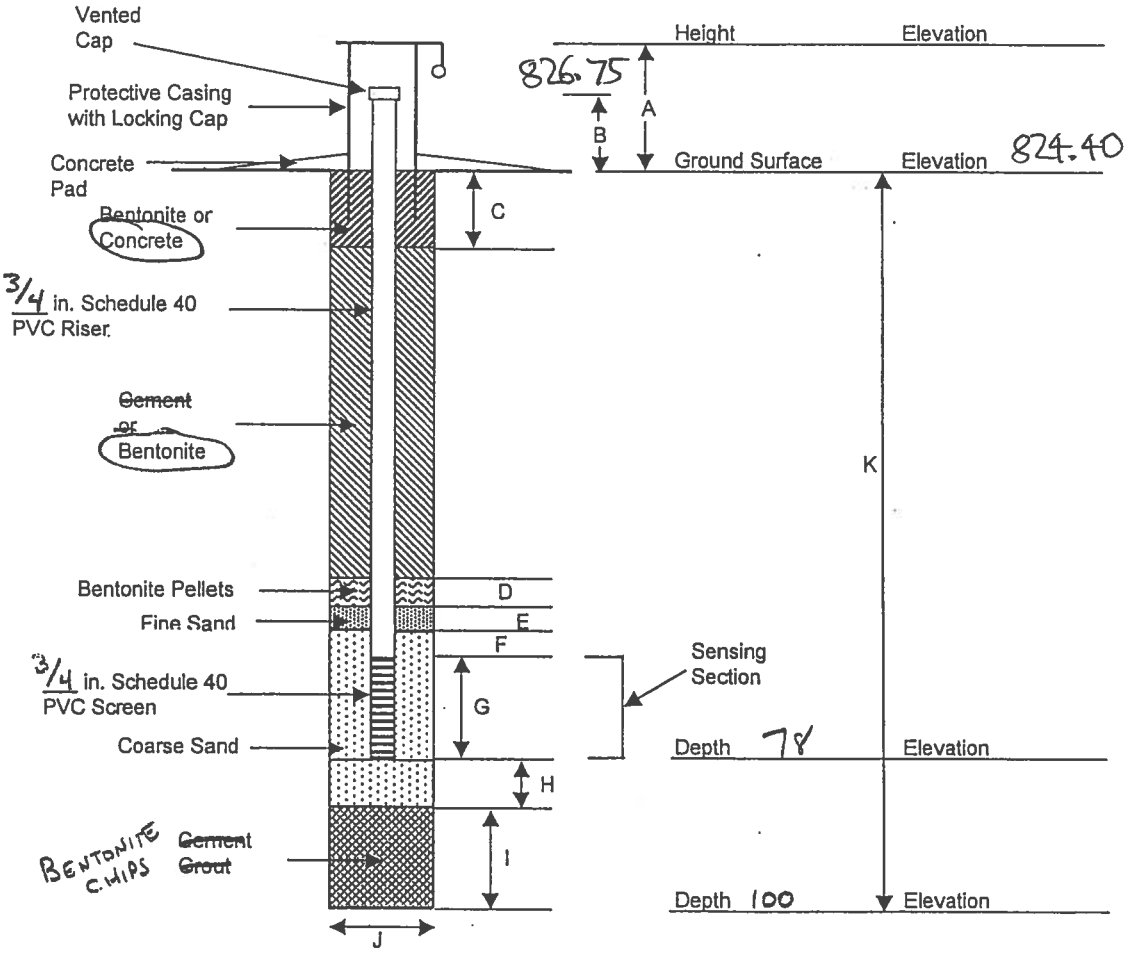
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C040384.40-01

Date 03 MAY 2005 Engineer/Geologist DBS Well No. B-0509

N 541748.6664
E 1724111.6219



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2-6	2.35	20	—	—	48
G	H	I	J	K	
10	2.0	20	0.25	100	

Remarks _____

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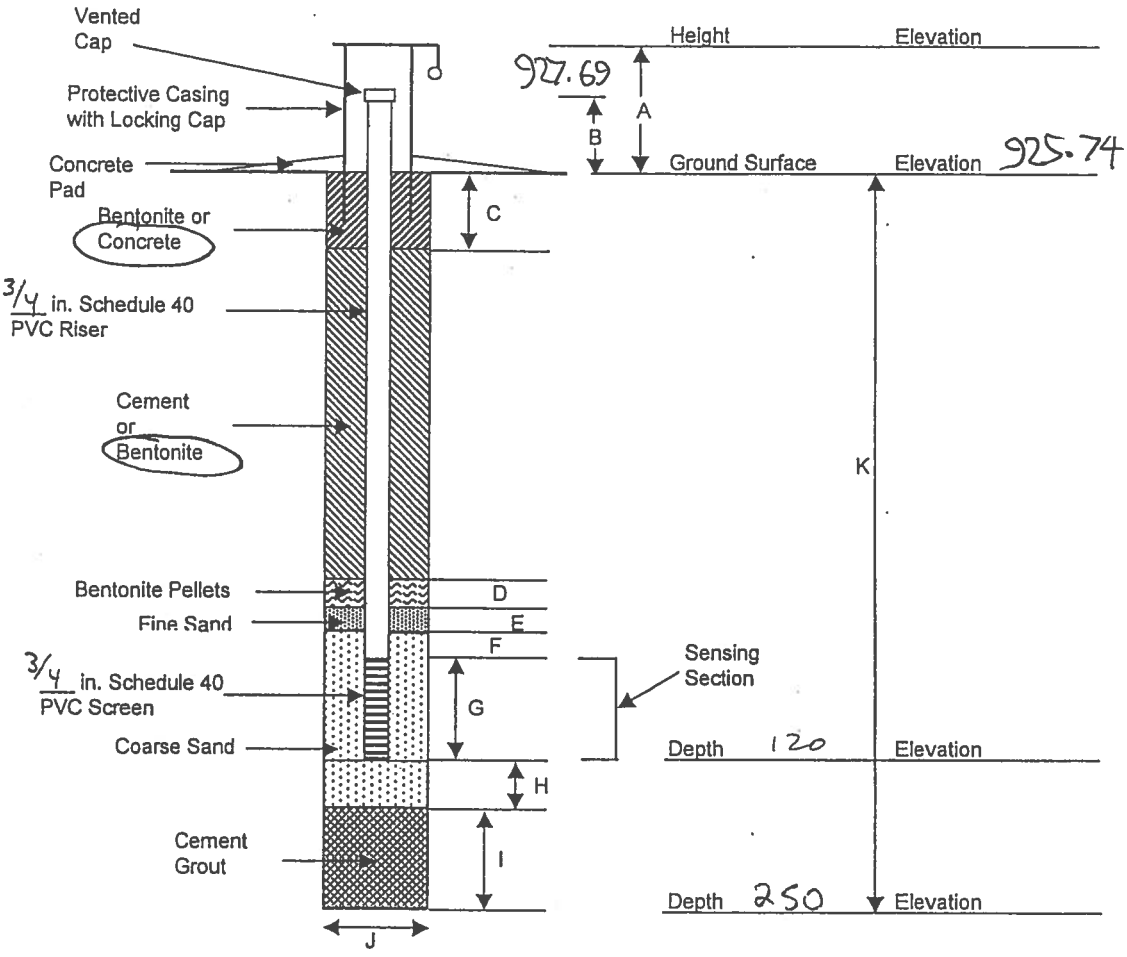
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C040384.40-01

Date 10 MAY 2005 Engineer/Geologist DBS Well No. B-0510 ~~(TW)~~

N 540879.8326
E 1722795.6504



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.6	1.95	30	—	—	70
G	H	I	J	K	
20	2	128.7	0.25	250.7	

Remarks _____

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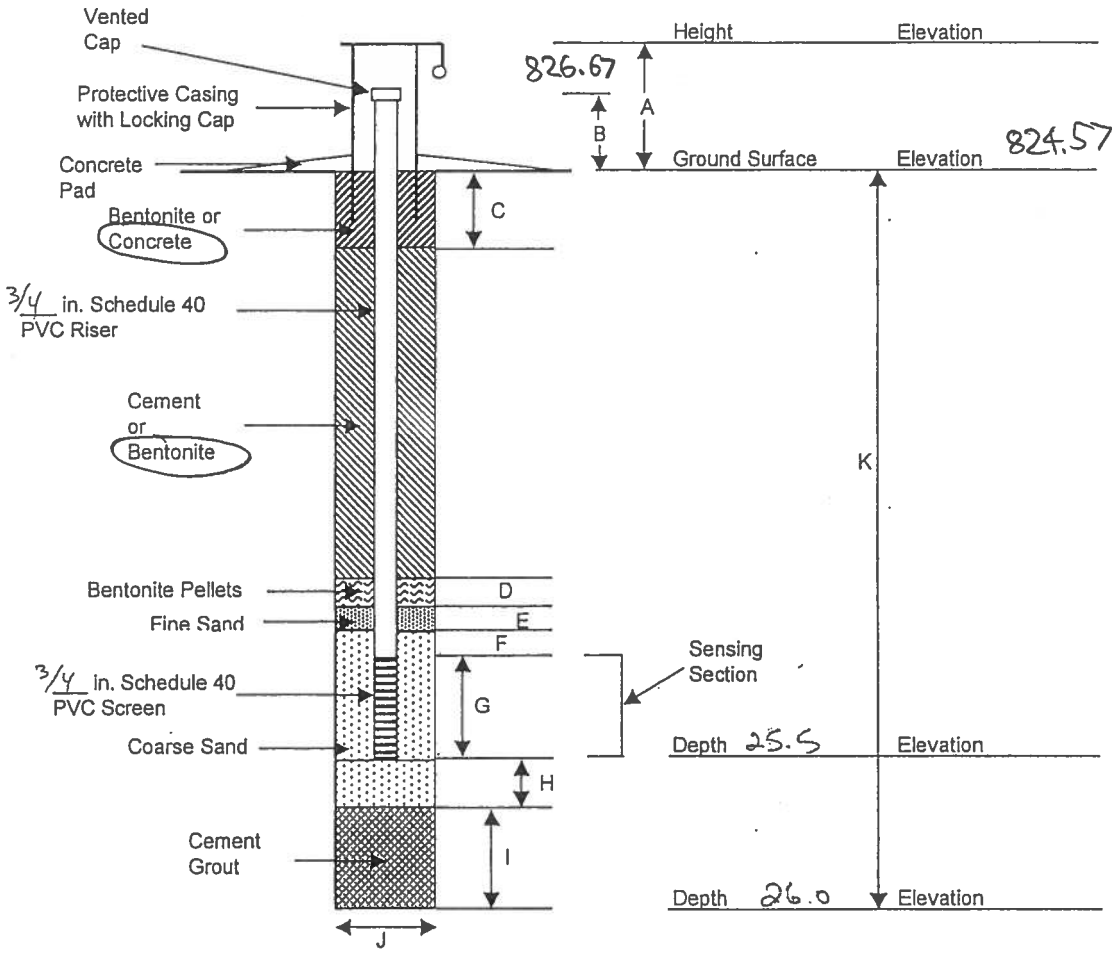
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3, JOHN E. AMOS POWER PLANT Project No. C040324.45-01

Date 04 MAY 2005 Engineer/Geologist DBS Well No. B-0511

N 541746.9425
E 172416.3536



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.45	2.1	3.5	—	—	12.0
G	H	I	J	K	
10	0.5	—	0.25	26.0	

Remarks _____

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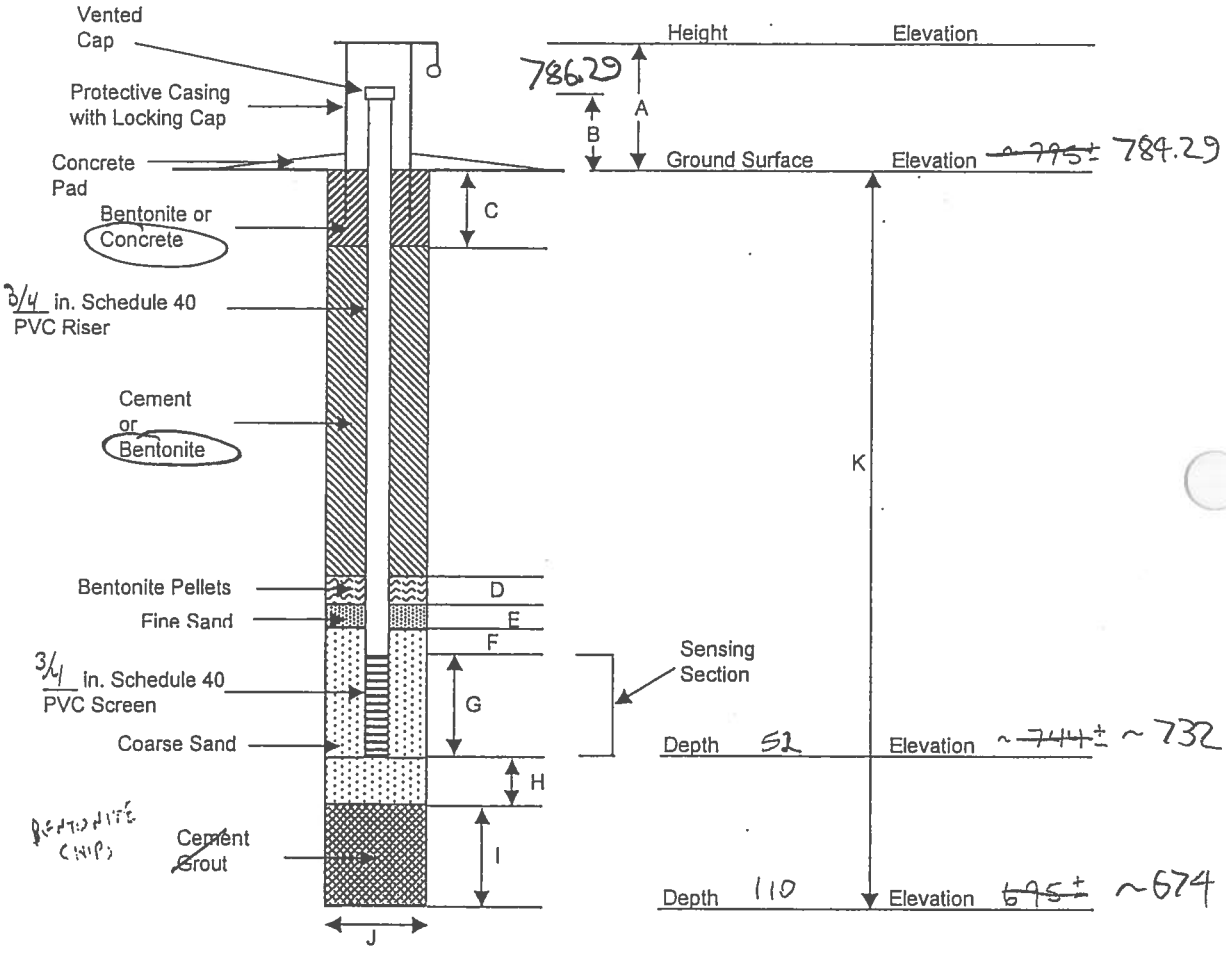
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C0403Z4.41-01

Date 06 MAY 2005 Engineer/Geologist DBS Well No. B-0512

N 542140.8876
E 1724101.7636



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.6	2.0	20.0	—	—	22.0
G	H	I	J	K	
10	2	56	0.25	110	

Remarks PIEZOMETER B-0513 INSTALLED IN SAME BORE HOLE (TIP AT 14/FT)

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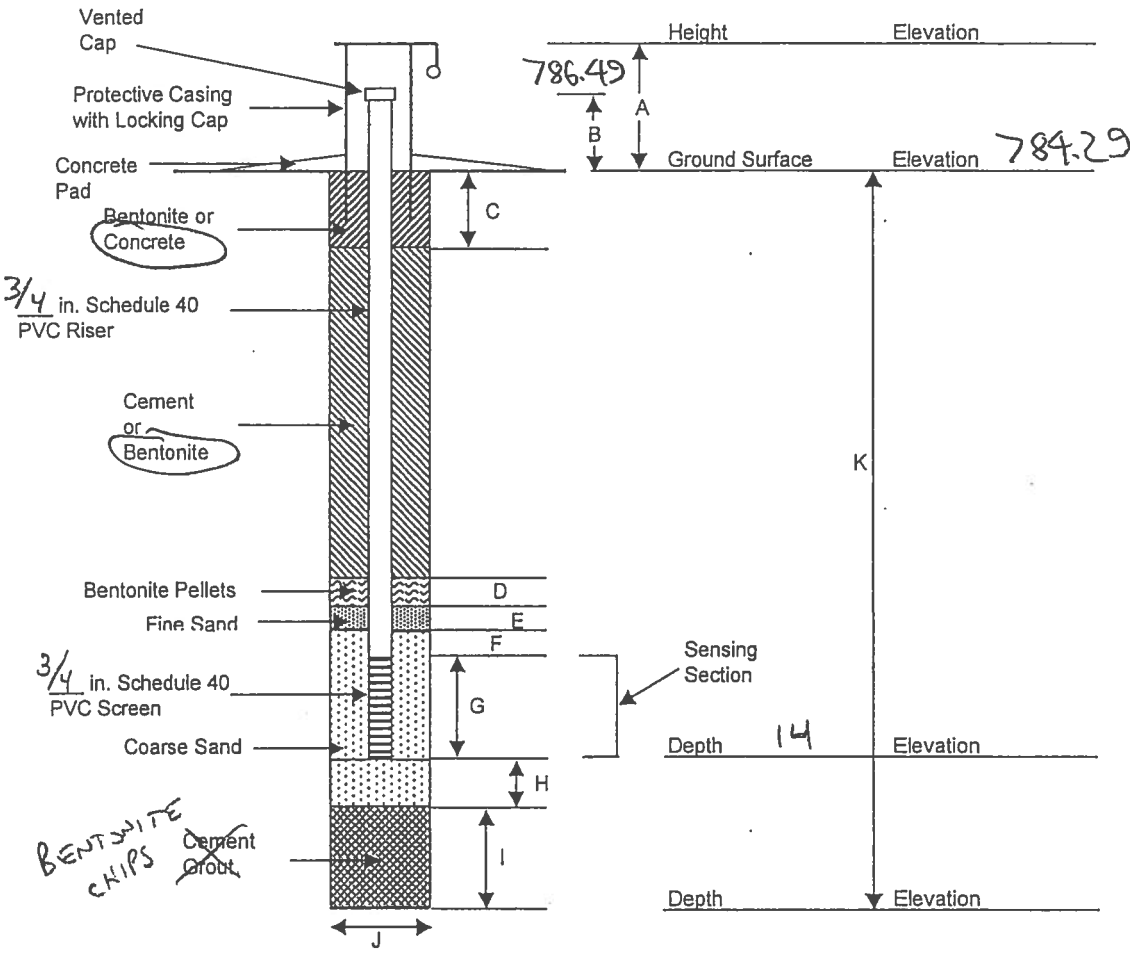
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C040384.40-01

Date 06 MAY 2005 Engineer/Geologist DBS Well No. B-0513

N 542140.8876
E 1724101.7636



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.6	2.2	3	—	—	1.5
G	H	I	J	K	
10	2	3**	0.25	*	

Remarks *NOTE: PIEZOMETER INSTALLED IN SAME BORE HOLE AS B-0512

** 2 FT SEAL BETWEEN SAND PACK FOR B-0512 AND SAND PACK FOR B-0513

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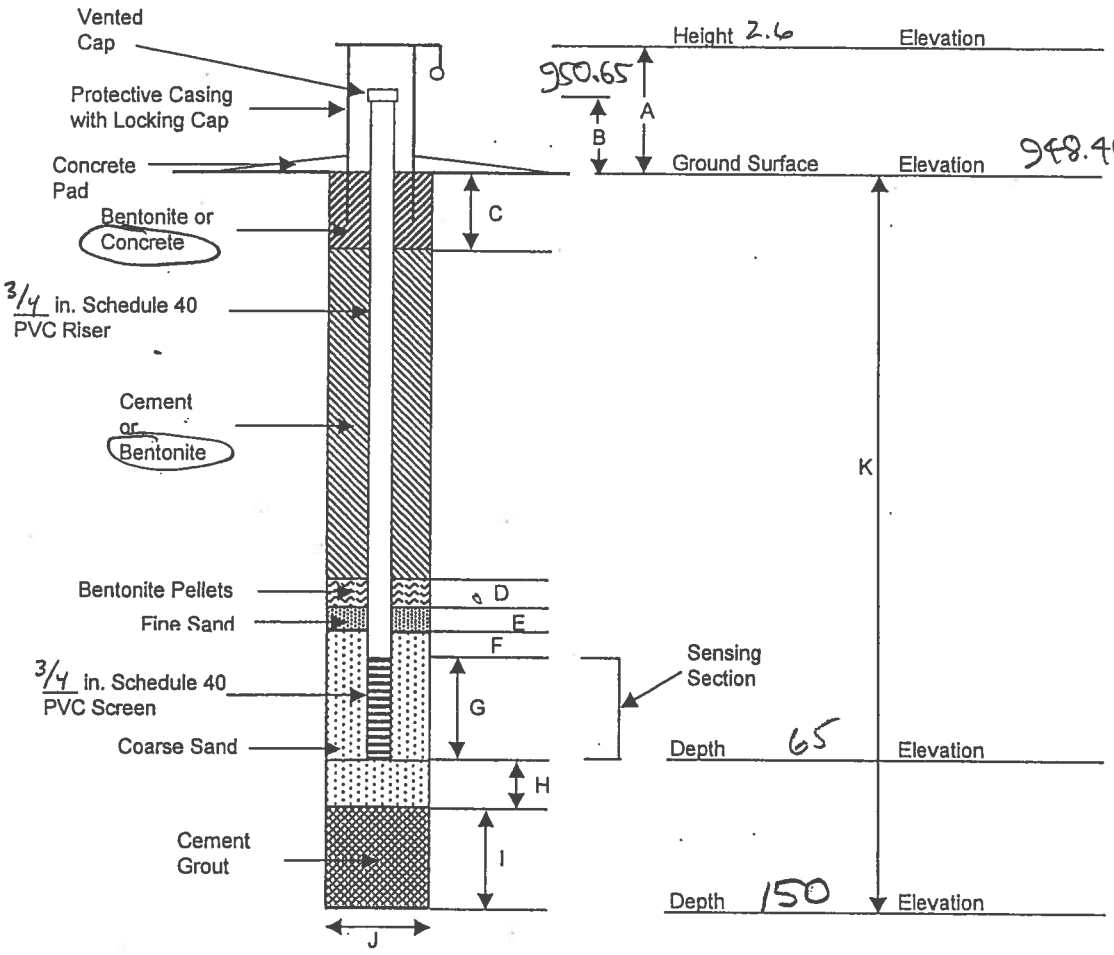
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C040384.40-01

Date 12 MAY 2005 Engineer/Geologist DBS Well No. B-051 (+22)

N 540555.6419
E 1725145.9412



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.6	2.25	17	—	—	38
G	H	I	J	K	
10	2	83	0.25	150	—

Remarks _____

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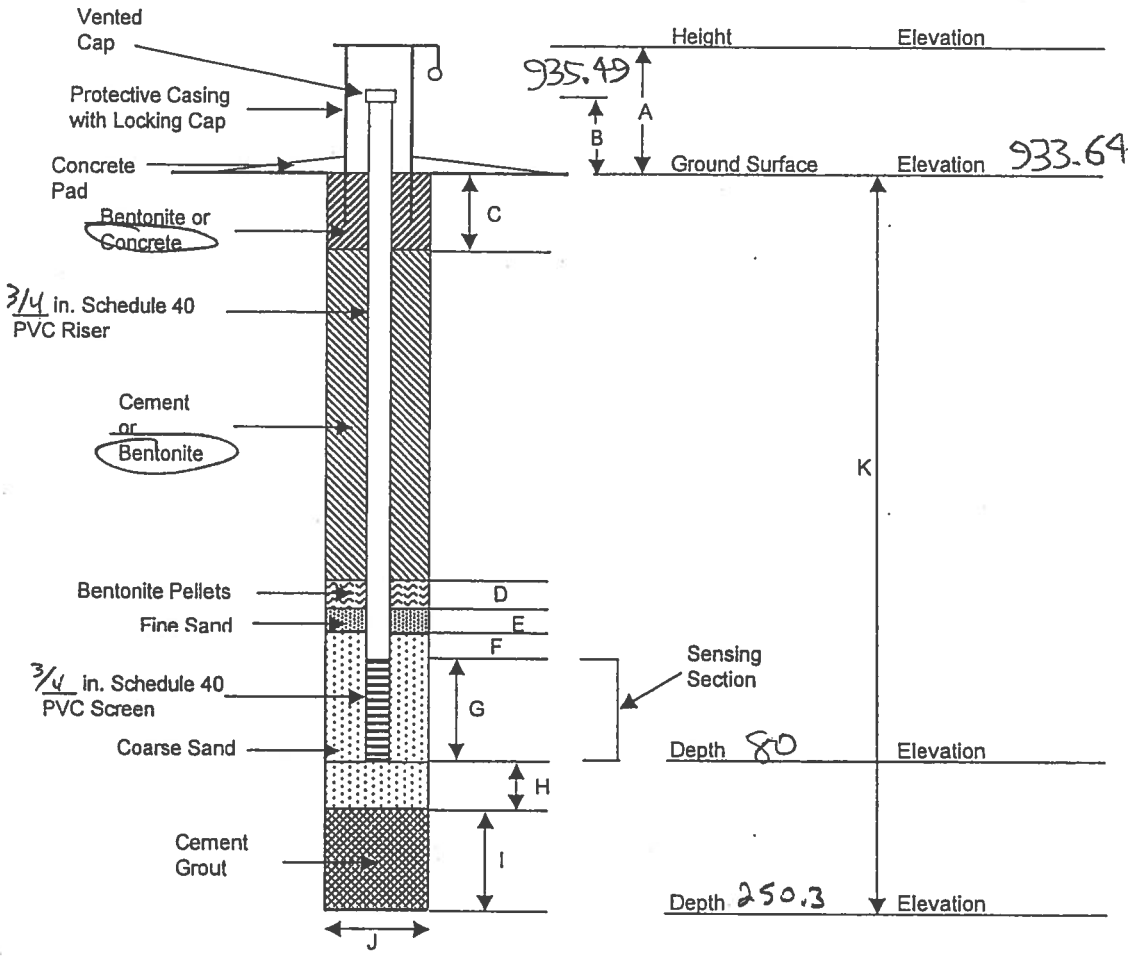
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3, JOHN E. AMOS POWER PLANT Project No. C040384.40-01

Date 16 MAY 2005 Engineer/Geologist DBS Well No. B-0515

N 539572.1065
E 1723680.1660



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.1	1.85	20.0	—	—	50
G	H	I	J	K	
10	2	168.3	0.25	250.3	

Remarks _____

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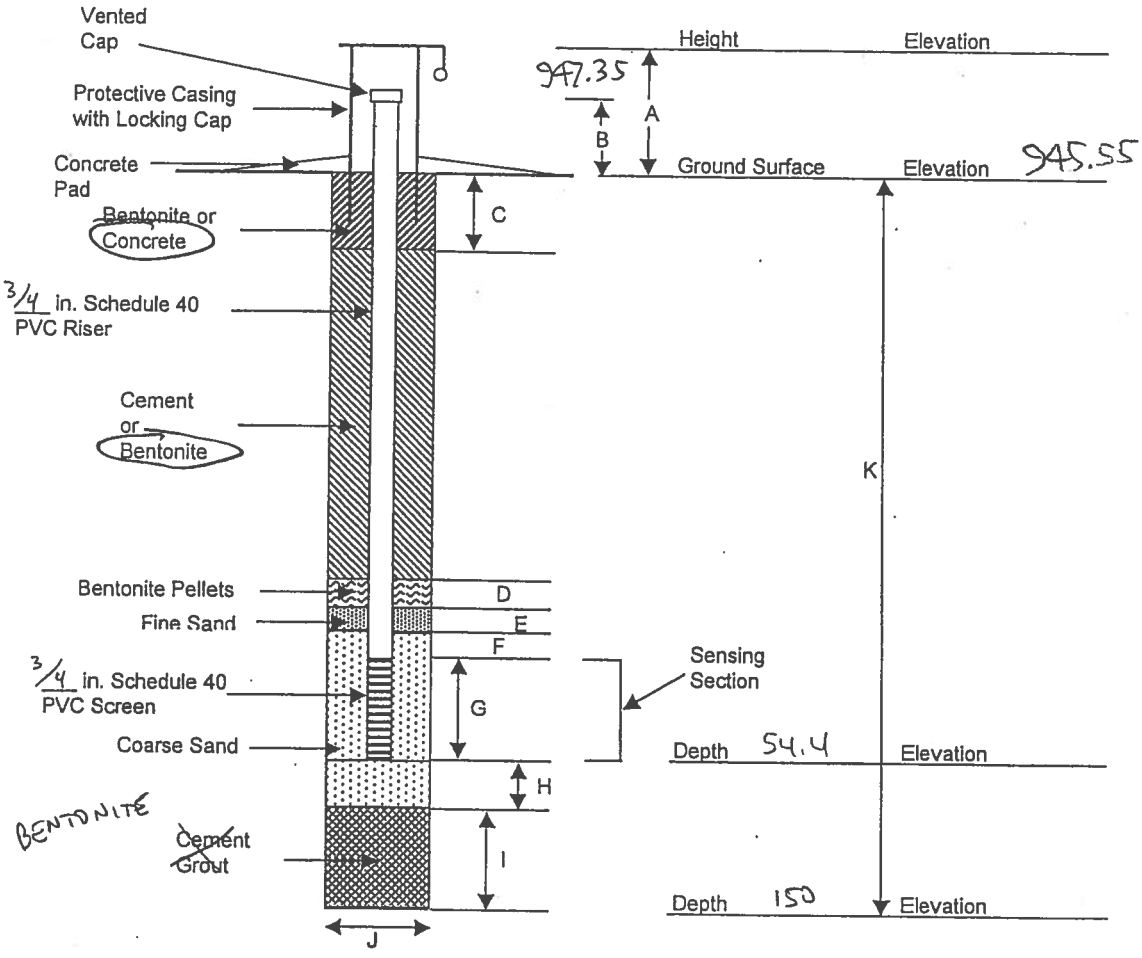
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C040384.40-01

Date 19 MAR 2005 Engineer/Geologist DBS Well No. B-0517

N 542185.2965
E 1725391.3276



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.3	1.8	14	—	—	30.4
G	H	I	J	K	
10	2	93.6	0.25	150	

Remarks PACKER ASSEMBLY STUCK IN HOLE. SALVAGED UPPER PACKER AND PUMP. PUSHED REMAINDER DOWN HOLE.

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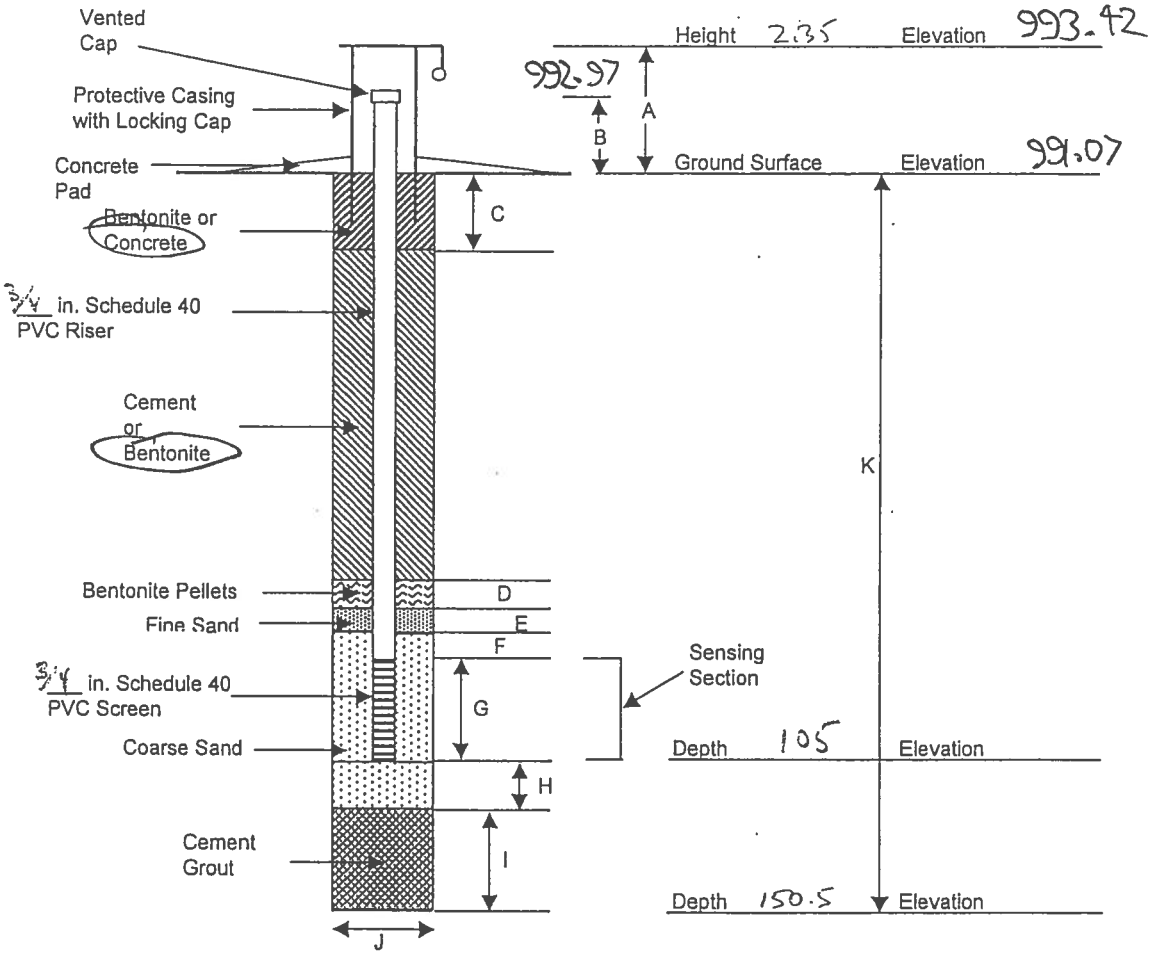
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project RAER 3/9 CONDENSATE FORCE MAIN Project No. C040384.45-01

Date 19 MAY 2005 Engineer/Geologist DBS Well No. B-0517

N 543732.8856
E 1725136.5233



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.35	19	15	—	—	80
G	H	I	J	K	
10	3	42.5	0.25	150.5	

Remarks _____

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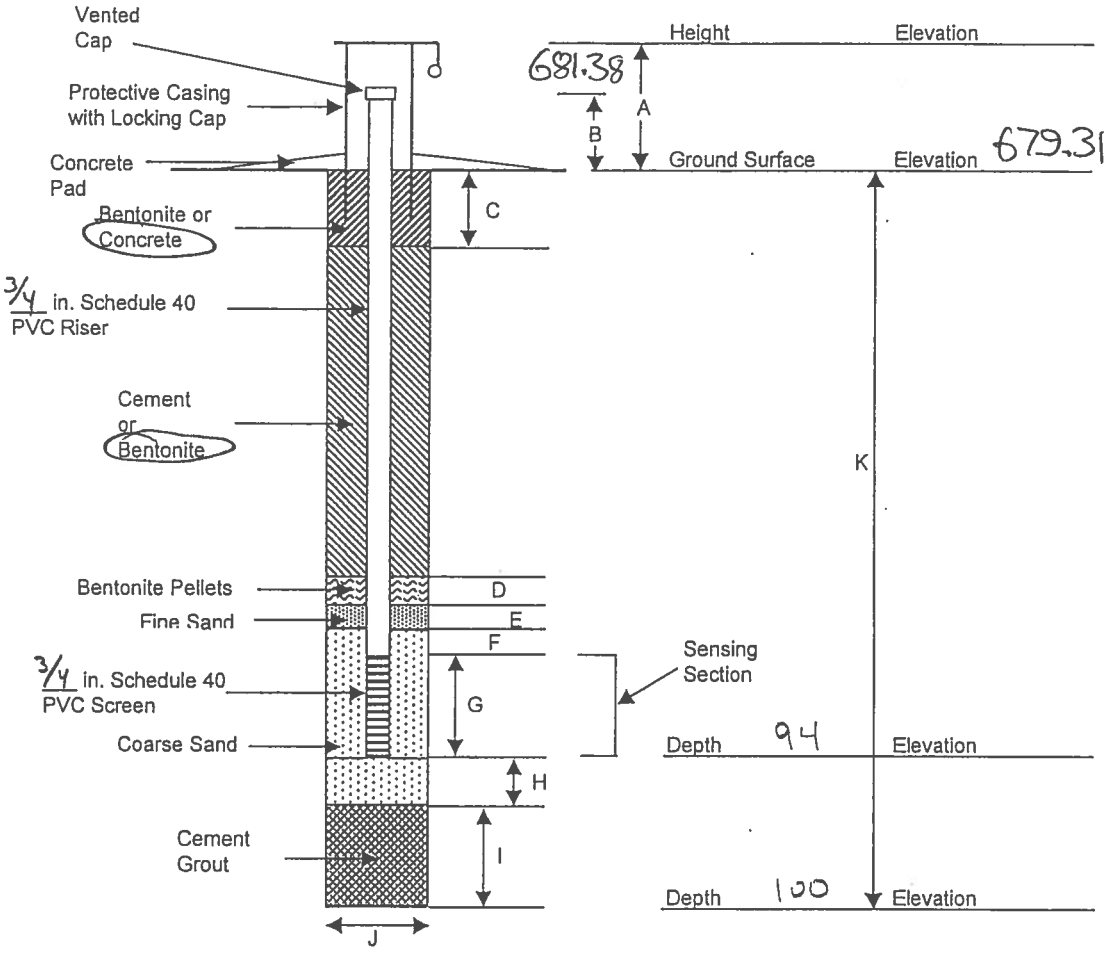
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT — Project No. C04037.84.V5-01

Date 24 MAY 2005 — Engineer/Geologist DBS — Well No. B-0520

N 542378.3755
E 1721739.7942



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.4	2.07	34	—	—	50
G	H	I	J	K	
10	2	4	0.25	100	

Remarks _____

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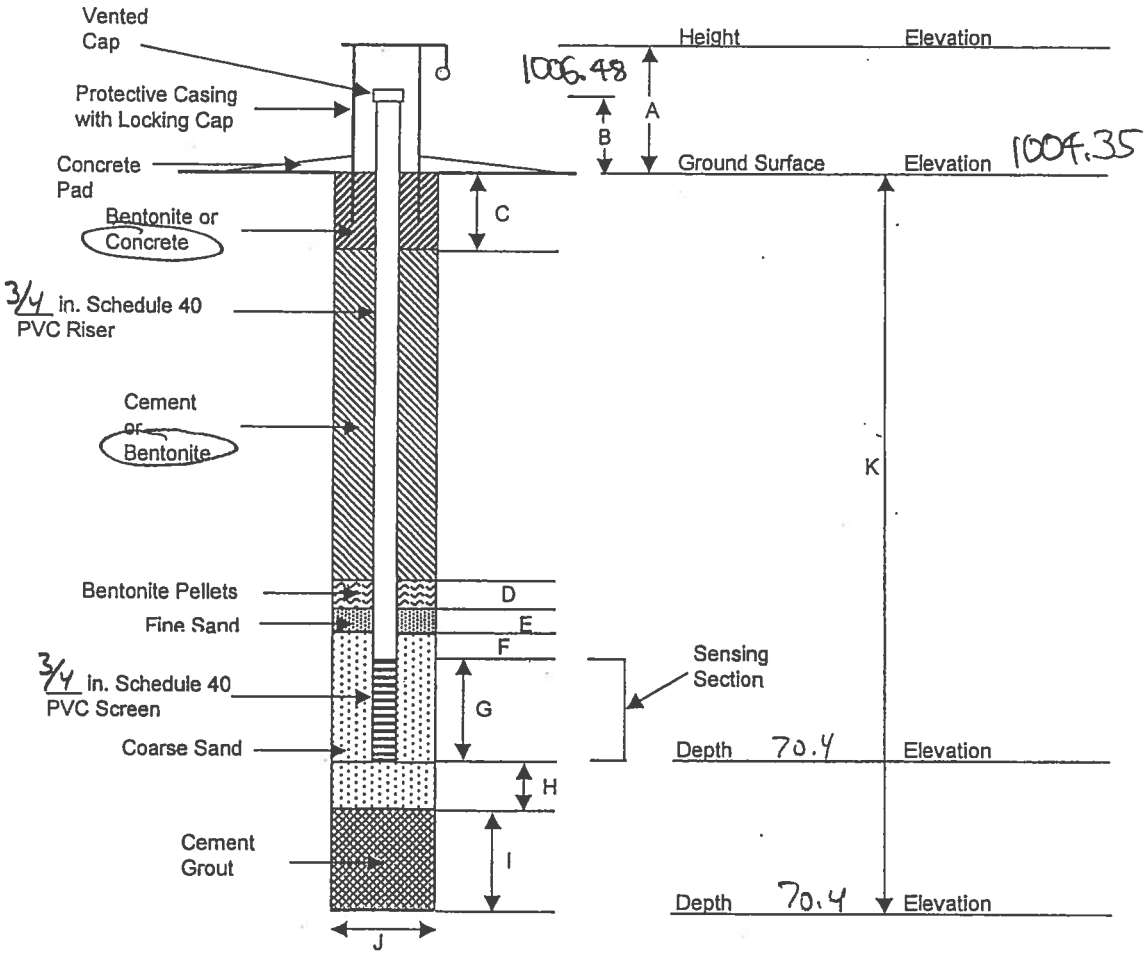
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3, AMOS POWER PLANT Project No. C040384.40-01

Date 23 MAY 2005 Engineer/Geologist DBS Well No. B-0521

N 544199.5521
E 1724054.5791



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.58	2.13	12.4	—	—	48
G	H	I	J	K	
10	—	—	0.125	70.4	

Remarks _____

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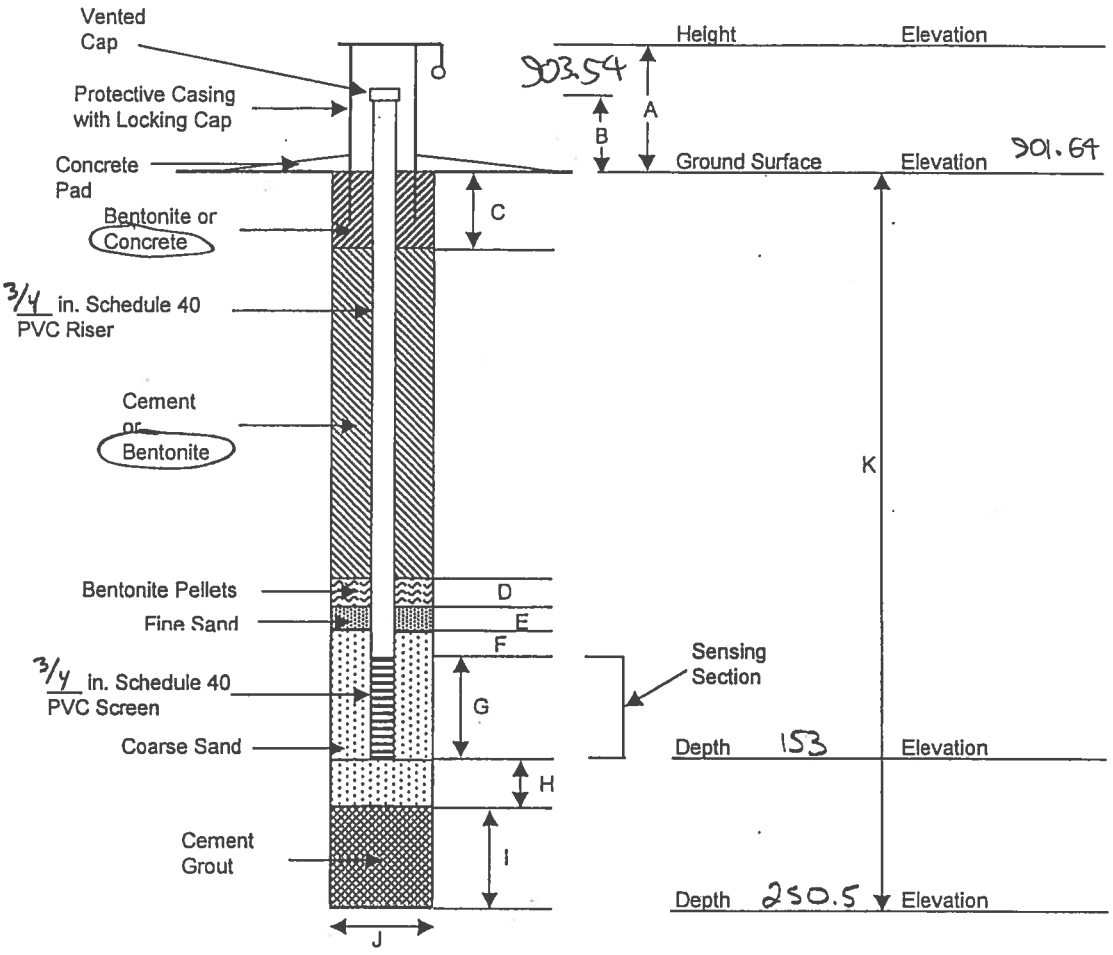
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C040384.40-01

Date 25/26 MAY 2005 Engineer/Geologist DBS Well No. B-0522

N 543873.4417
E 172326.4148



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.18	1.9	35	—	—	98
G	H	I	J	K	
20	2	95.5	0.25	250.5	

Remarks _____

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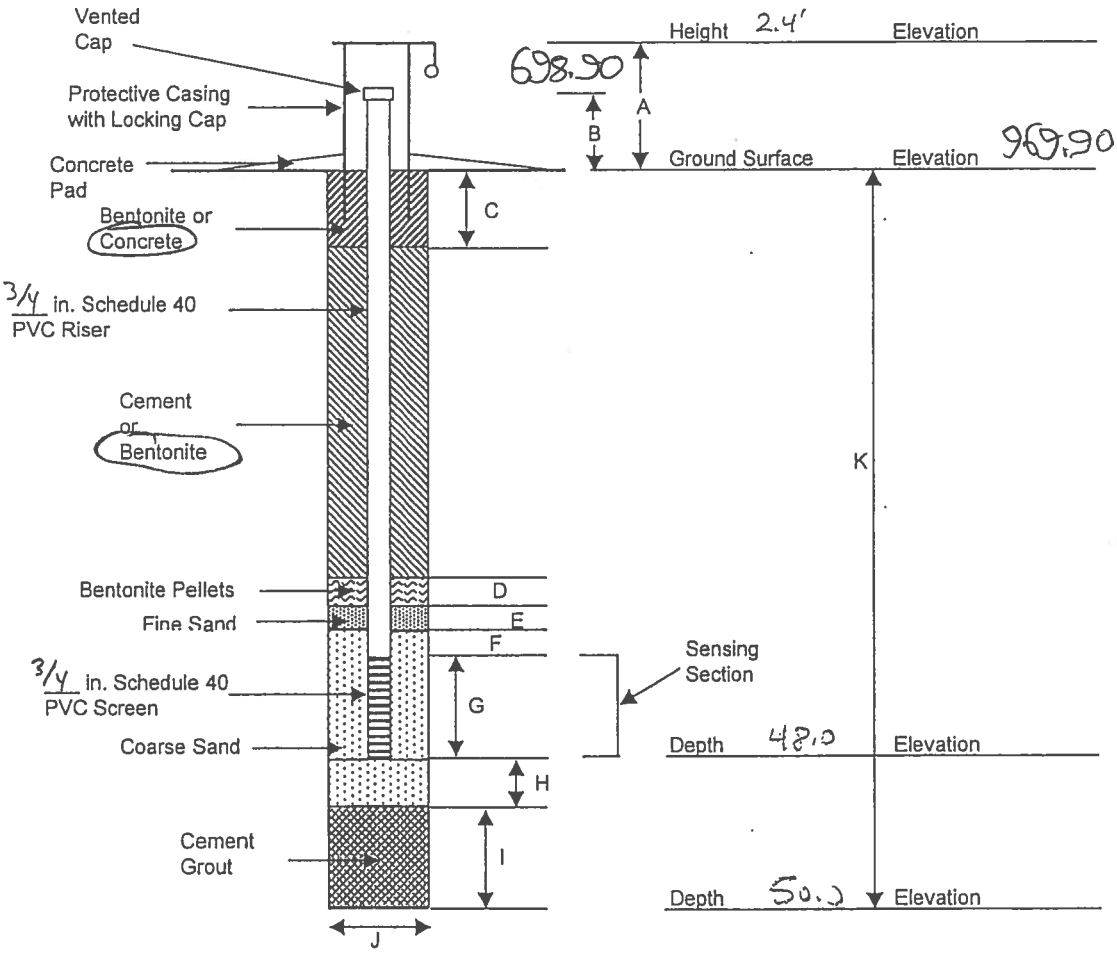
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3 AMOS POWER PLANT Project No. C040384.40-01

Date 25 MAY 2005 Engineer/Geologist DBS Well No. B-0523

N 542742.2422
E 1722248.6749



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.4	2.0	24	—	—	14
G	H	I	J	K	
10	2	—	0.25	50.0	

Remarks _____

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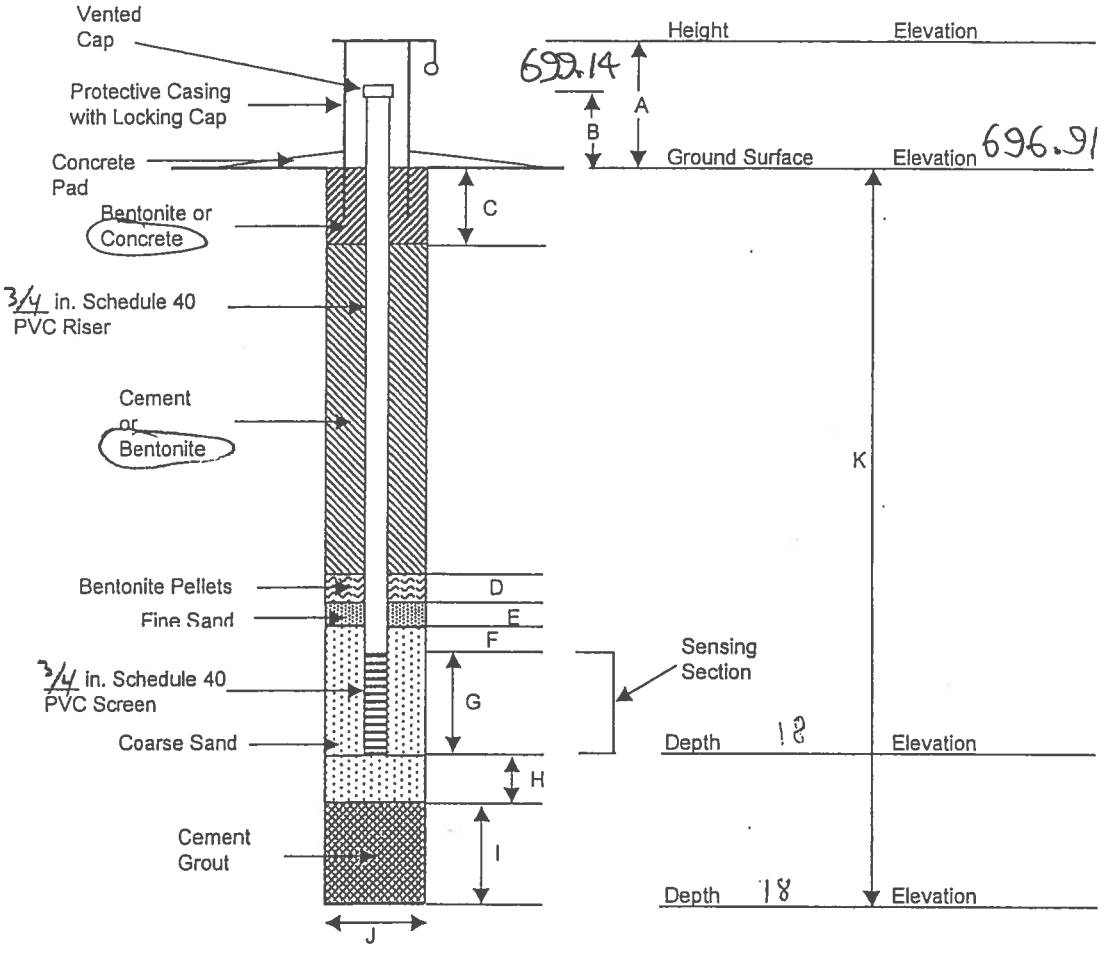
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project AREA 2/3, AMOS POWER PLANT Project No. C040324.43-01

Date 25 MAY 2005 Engineer/Geologist DBS Well No. B-0524

N 542745.0961
E 1722251.4149



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.55	2.23	3	—	—	5
G	H	I	J	K	
10	—	—	0.25	18	

Remarks _____

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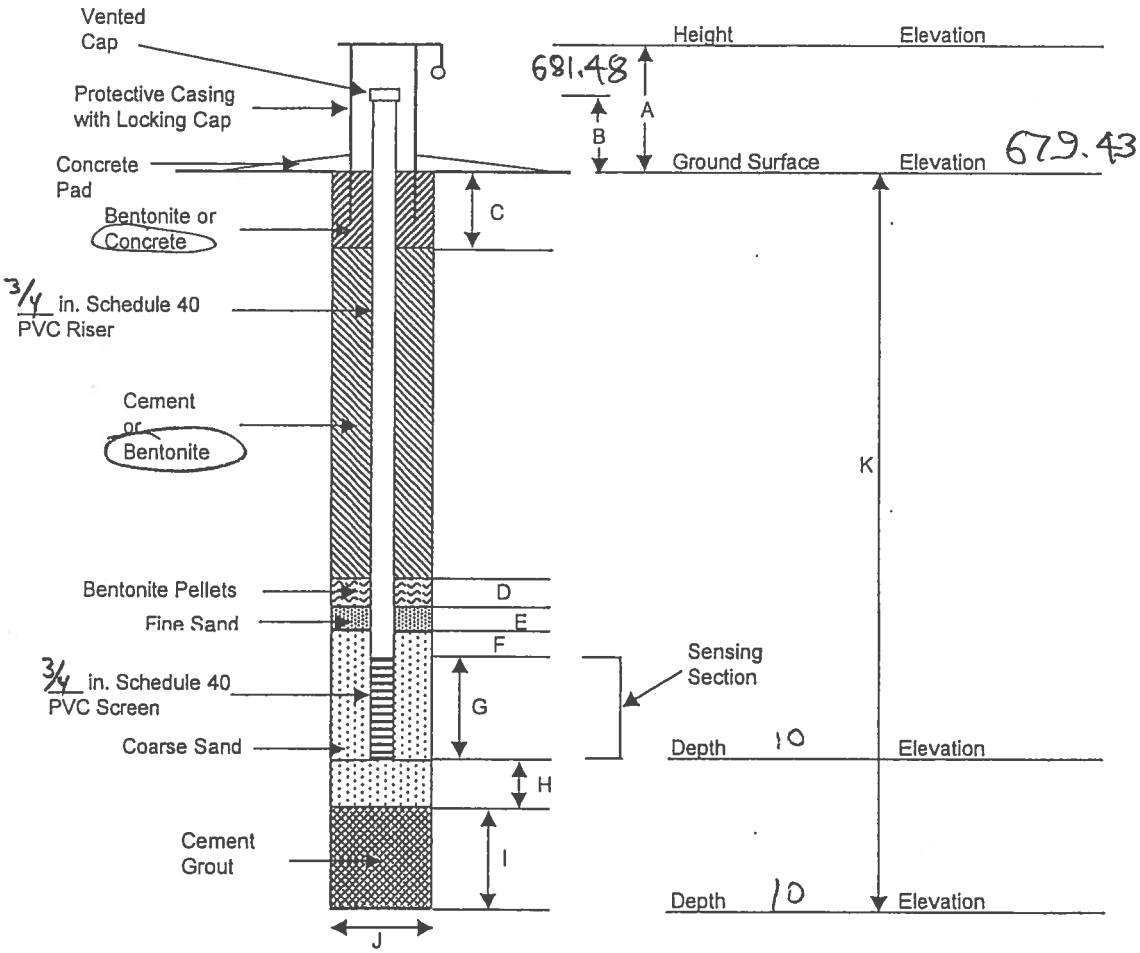
MONITORING WELL CONSTRUCTION DIAGRAM
(Not to Scale)

Project ALEA 2/3 AMOS POWER PLANT Project No. 604324.10-01

Date 25 MAY 2025 Engineer/Geologist DBS Well No. B-0525

N 542379.9472
E 1721745.3670



STANDPIPE PIEZOMETER INSTALLATION SKETCH

DIMENSIONS (Feet)					
A	B	C	D	E	F
2.3	2.05	2	—	—	3
G	H	I	J	K	
5	0	—	0.25	10	

Remarks _____

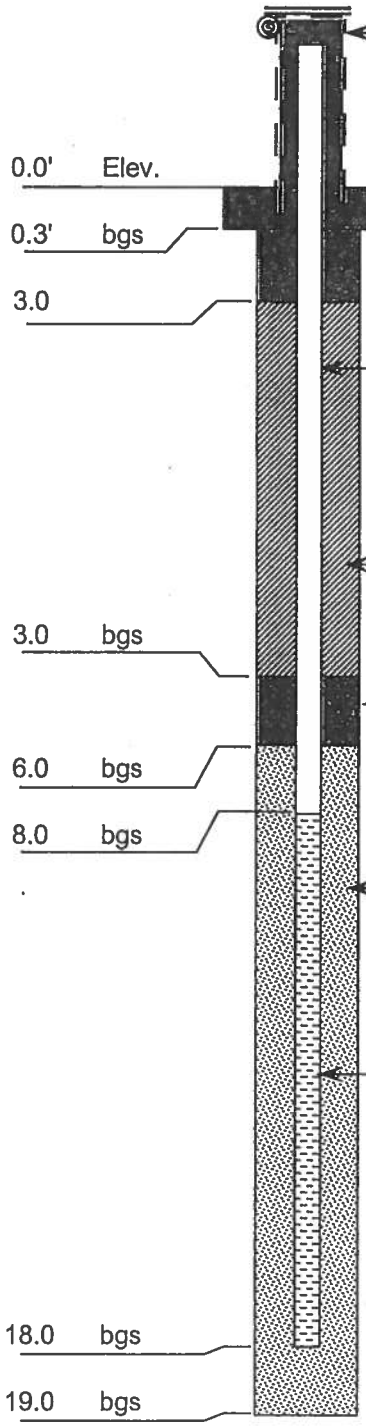
TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

Geotechnical & Environmental Drilling

Well No: 05-36/MW-1
Well Tag: 0275-24-05
Date Installed: 07/12/05
GPS Location: **Latitude:** N 38° 28' 41.8"

Project: John E. Amos Power Plant
TTI Proj. No: 05639
Client: GAI Consultants, Inc.
Longitude: W 081° 51' 33.8"



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	10	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	N/A	lbs.

Bentonite 87 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	9	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	10	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0024-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0024-05
Grid Location:
a. Latitude: 38 28 41 ..8
b. Longitude: 81 51 33 ..8
c. Method Used: GPS

Company/Project Well No.:
05639/05-36-MW-1

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

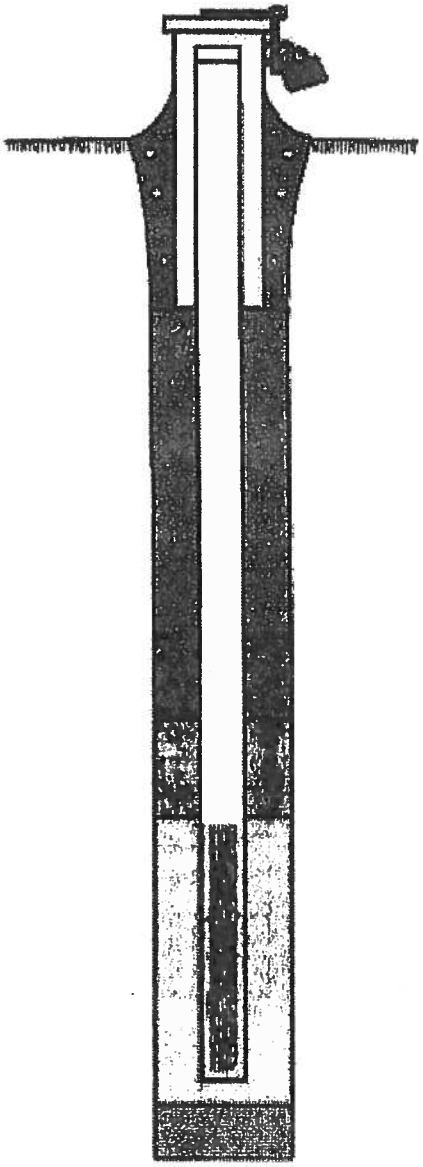
Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
07/12/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1. Cap and Lock: YES
2. Protective Cover: Protective Cover Pipe
3. Monitoring Well Reference Point: 0 ft.
4. Borehole Diameter: 4 inches.
5. Ground Surface Seal:
   a. Material: concrete
   b. Installation Procedure: Hand Mixed
6. Surface Seal Bottom/Annular Space Top: 3 ft.
7. Well Riser: a. OD Well Riser: 2.38 inches. b. ID Well Riser: 2 inches.
   c. Material: PVC
   d. Installation Procedure: Thru Augers & Open Bedrock Hole
8. Annular Space Seal:
   a. Material: not applicable -
   b. Installation Procedure: pour
9. Well Development Procedure: other - By Client
10. Drilling Method Used: percussion -
11. Annular Space Seal Bottom/Filter Seal Top: 3 ft.
12. Drilling Fluid Used: Yes Source: Air
13. Filter Pack Seal:
    a. Material: bentonite pellet
    b. Installation Procedure: Gravity Fed
    c. Volume Added: 87 pounds
14. Bottom of Bentonite Seal/Filter Pack Top: 6 ft.
15. Depth to Top of Screen: 8 ft.
16. Screen:
    a. Material: PVC
    b. Installation Procedure: Thru Augers & Open Bedrock Hole
    c. Slot Size: .01 inches. d. Screen Length: 10 ft.
17. Filter Pack:
    a. Material: medium sand
    b. Installation Procedure: Gravity Fed
18. Well Depth: 18 ft.
19. Bottom of Filter Pack: 19 ft.
20. Bottom of Borehole: 19 ft.
21. Backfill Material (below filter pack): Sand
22. Decontamination Procedures: None
23. Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24. WV Contractor License No. WV002350



TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

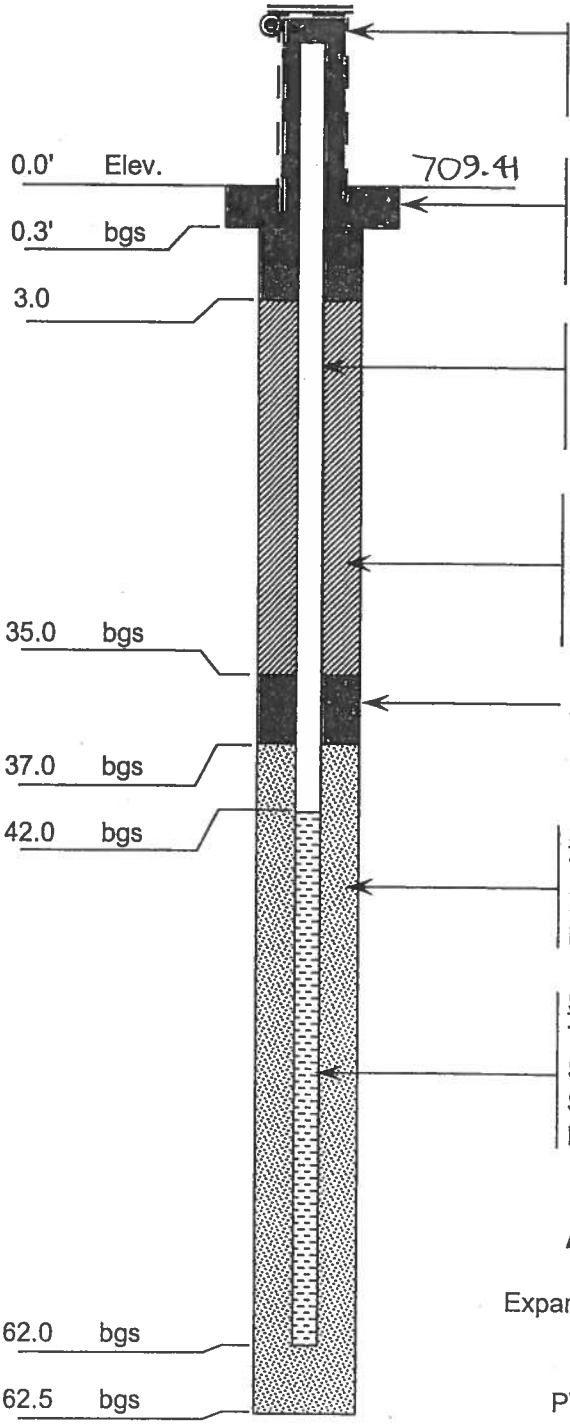
Geotechnical & Environmental Drilling

Well No: 05-35/MW-2 **Project:** John E. Amos Power Plant

Well Tag: 0275-25-05 **TTI Proj. No:** 05639

Date Installed: 07/12/05 **Client:** GAI Consultants, Inc.

GPS Location: **Latitude:** N 38° 28' 41.8" **Longitude:** W 081° 51' 33.3"



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	44	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	200	lbs.

Bentonite 12.5 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	4	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	20	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0025-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0025-05
Grid Location:
a. Latitude: 38 28 41 ..8
b. Longitude: 81 51 33 ..3
c. Method Used: GPS

Company/Project Well No.:
05639/05-35-MW-2

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

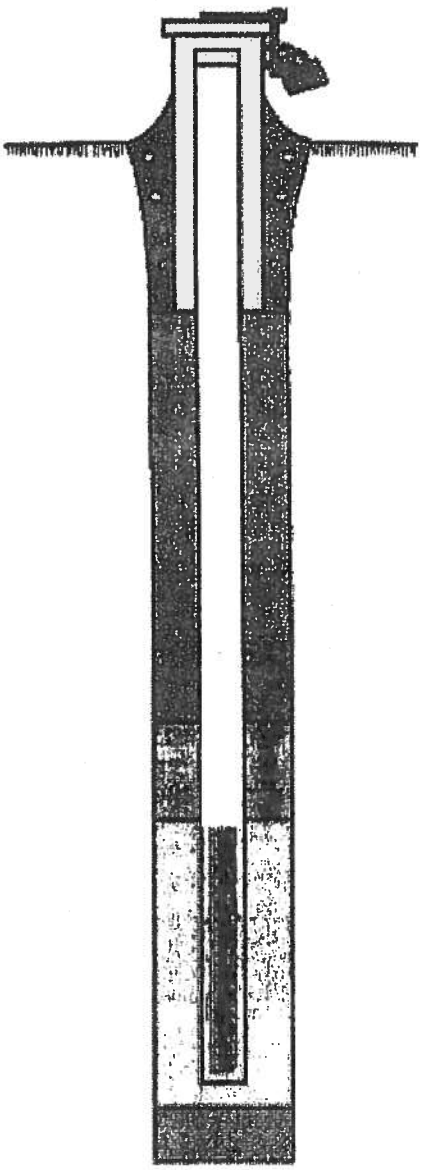
Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
07/12/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1.Cap and Lock: YES
2.Protective Cover: Protective Cover Pipe
3.Monitoring Well Reference Point: 0 ft.
4.Borehole Diameter: 4 inches.
5.Ground Surface Seal:
a.Material: concrete
b.Installation Procedure: Hand Mixed
6.Surface Seal Bottom/Annular Space Top: 3 ft.
7.Well Riser: a.OD Well Riser: 2.38 inches. b.ID Well Riser: 2 inches.
c.Material: PVC
d.Installation Procedure: Thru Augers & Open Bedrock Hole
8.Annular Space Seal:
a.Material: high solids grout -
b.Installation Procedure: pour
9.Well Development Procedure: other - By Client
10.Drilling Method Used: percussion -
11.Annular Space Seal Bottom/Filter Seal Top: 35 ft.
12.Drilling Fluid Used: Yes Source: Air
13.Filter Pack Seal:
a.Material: bentonite pellet
b.Installation Procedure: Gravity Fed
c.Volume Added: 12.5 pounds
14.Bottom of Bentonite Seal/Filter Pack Top: 37 ft.
15.Depth to Top of Screen: 42 ft.
16.Screen:
a.Material: PVC
b.Installation Procedure: Thru Augers & Open Bedrock Hole
c.Slot Size: .01 inches. d.Screen Length: 20 ft.
17.Filter Pack:
a.Material: medium sand
b.Installation Procedure: Gravty Fed
18.Well Depth: 62 ft.
19.Bottom of Filter Pack: 62.5 ft.
20.Bottom of Borehole: 62.5 ft.
21.Backfill Material (below filter pack): sand
22.Decontamination Procedures: None
23.Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24.WV Contractor License No. WV002350



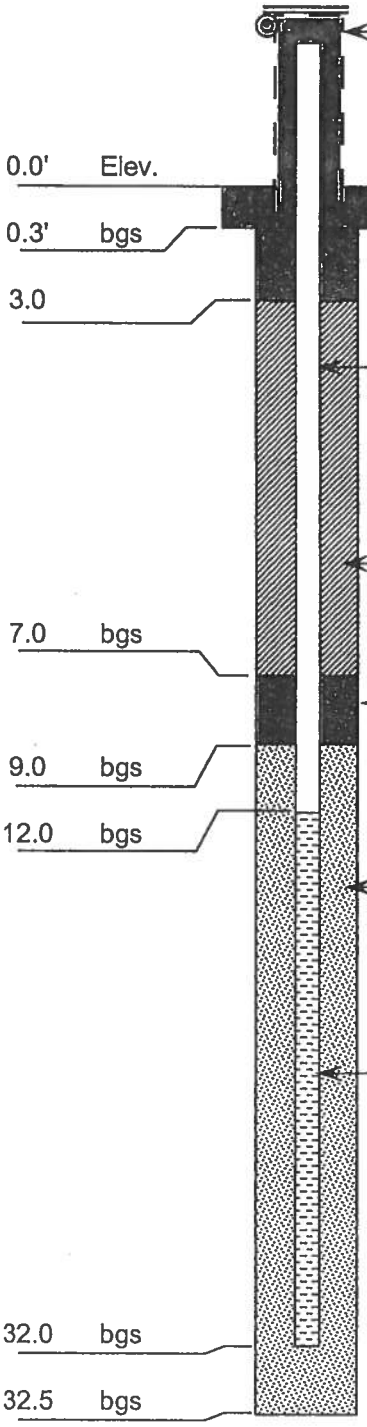
TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

Geotechnical & Environmental Drilling

Well No: 05-27/MW-3
Well Tag: 0275-26-05
Date Installed: 06/27/05
GPS Location: **Latitude:** N 38° 29' 04.4" **Longitude:** W 081° 51' 13.5"

Project: John E. Amos Power Plant
TTI Proj. No: 05639
Client: GAI Consultants, Inc.



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	14	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	25	lbs.

Bentonite 50 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	12	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	20	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0026-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0026-05
Grid Location:
a. Latitude: 38 29 4 ..4
b. Longitude: 81 51 13 ..5
c. Method Used: GPS

Company/Project Well No.:
05639/05-27-MW-3

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

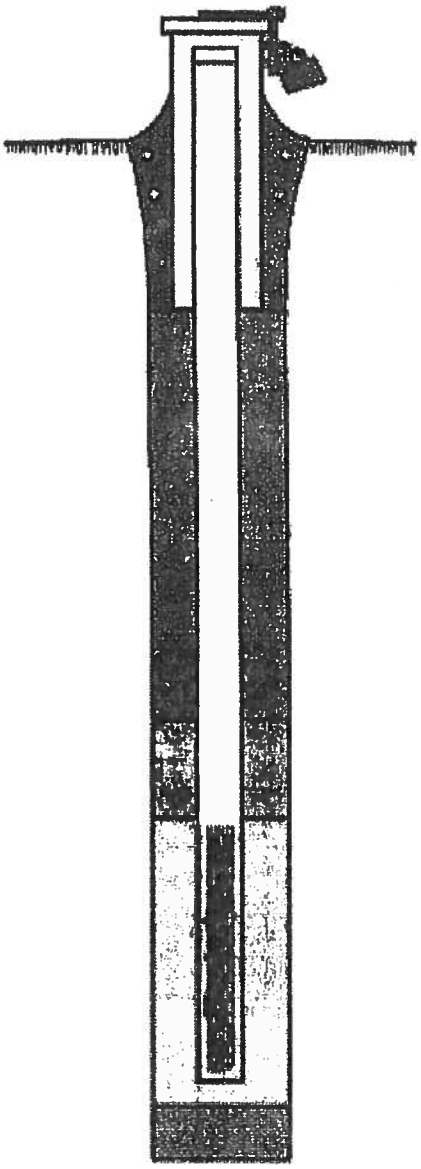
Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
06/27/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1.Cap and Lock: YES
2.Protective Cover: Protective Cover Pipe
3.Monitoring Well Reference Point: 0 ft.
4.Borehole Diameter: 4 inches.
5.Ground Surface Seal:
a.Material: concrete
b.Installation Procedure: Hand Mixed
6.Surface Seal Bottom/Annular Space Top: 3 ft.
7.Well Riser: a.OD Well Riser: 2.38 inches. b.ID Well Riser: 2 inches.
c.Material: PVC
d.Installation Procedure: Thru Augers & Open Bedrock Hole
8.Annular Space Seal:
a.Material: high solids grout -
b.Installation Procedure: pour
9.Well Development Procedure: other - By Client
10.Drilling Method Used: percussion -
11.Annular Space Seal Bottom/Filter Seal Top: 7 ft.
12.Drilling Fluid Used: Yes Source: Air
13.Filter Pack Seal:
a.Material: bentonite pellet
b.Installation Procedure: Gravity Fed
c.Volume Added: 50 pounds
14.Bottom of Bentonite Seal/Filter Pack Top: 9 ft.
15.Depth to Top of Screen: 12 ft.
16.Screen:
a.Material: PVC
b.Installation Procedure: Thru Augers & Open Bedrock Hole
c.Slot Size: .01 inches. d.Screen Length: 20 ft.
17.Filter Pack:
a.Material: medium sand
b.Installation Procedure: Gravity fed
18.Well Depth: 32 ft.
19.Bottom of Filter Pack: 32.5 ft.
20.Bottom of Borehole: 32.5 ft.
21.Backfill Material (below filter pack): sand
22.Decontamination Procedures: None
23.Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24.WV Contractor License No. WV002350



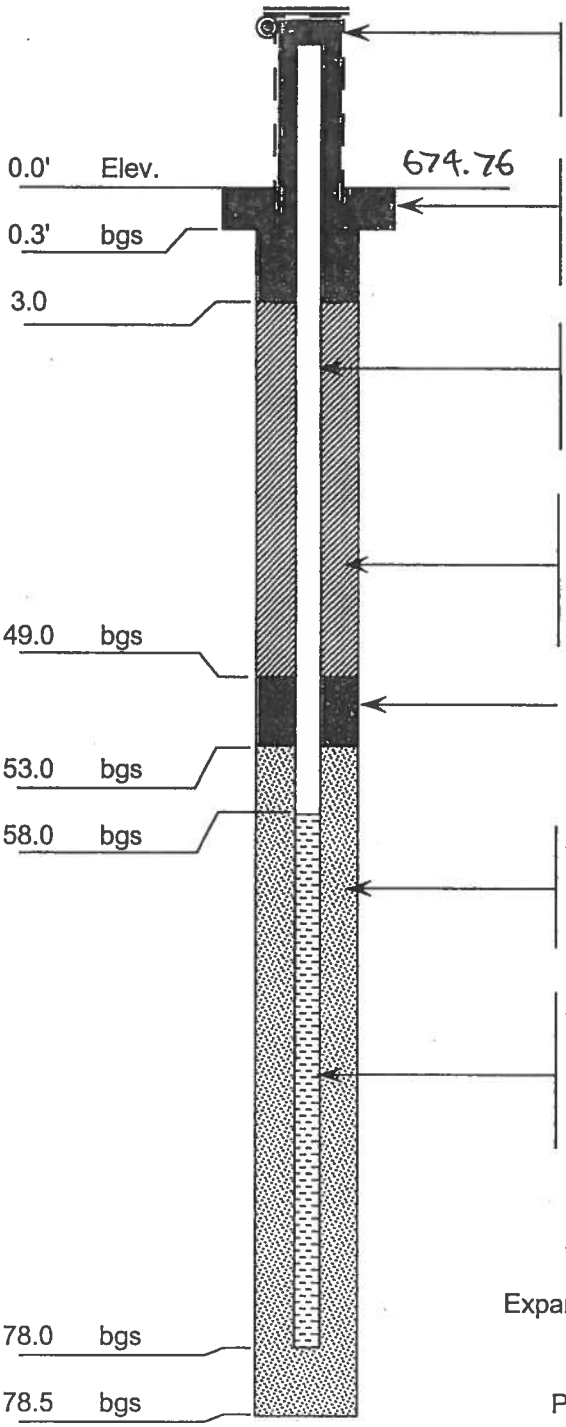
TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

Geotechnical & Environmental Drilling

Well No: 05-32/MW-4
Well Tag: 0275-27-05
Date Installed: 07/07/05
GPS Location: **Latitude:** N 38° 29' 10.03"

Project: John E. Amos Power Plant
TTI Proj. No: 05639
Client: GAI Consultants, Inc.
Longitude: W 081° 51' 45.0"



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	60	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	100	lbs.

Bentonite 50 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	4	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	20	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0027-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0027-05
Grid Location:
a. Latitude: 38 29 10 ..03
b. Longitude: 81 51 45 .
c. Method Used: GPS

Company/Project Well No.:
05639/05-32-MW-4

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

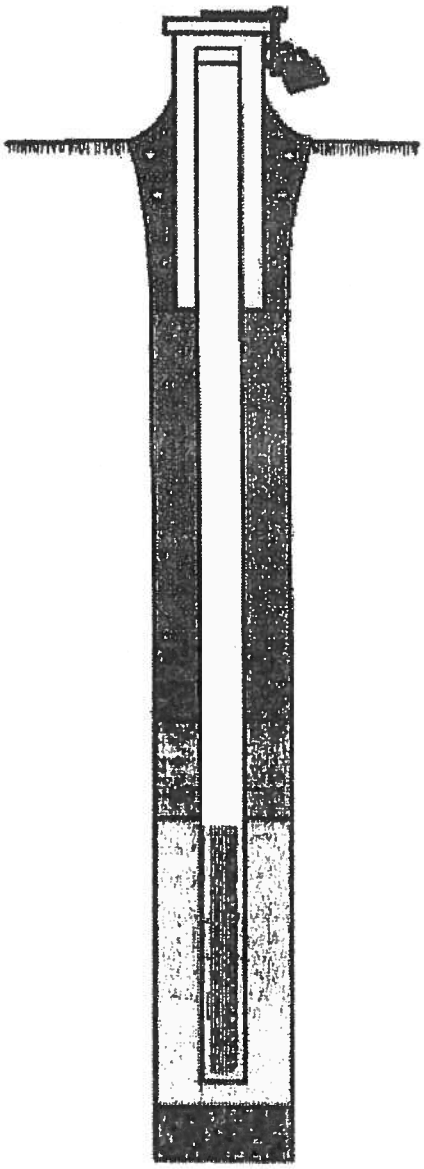
Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
07/07/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1.Cap and Lock: YES
2.Protective Cover: Protective Cover Pipe
3.Monitoring Well Reference Point: 0 ft.
4.Borehole Diameter: 4 inches.
5.Ground Surface Seal:
a.Material: concrete
b.Installation Procedure: Hand Mixed
6.Surface Seal Bottom/Annular Space Top: 3 ft.
7.Well Riser: a.OD Well Riser: 2.38 inches. b.ID Well Riser: 2 inches.
c.Material: PVC
d.Installation Procedure: Thru Augers & Open Bedrock Hole
8.Annular Space Seal:
a.Material: high solids grout -
b.Installation Procedure: pour
9.Well Development Procedure: other - By Client
10.Drilling Method Used: percussion -
11.Annular Space Seal Bottom/Filter Seal Top: 49 ft.
12.Drilling Fluid Used: Yes Source: Air
13.Filter Pack Seal:
a.Material: bentonite pellet
b.Installation Procedure: Gravity Fed
c.Volume Added: 50 pounds
14.Bottom of Bentonite Seal/Filter Pack Top: 53 ft.
15.Depth to Top of Screen: 58 ft.
16.Screen:
a.Material: PVC
b.Installation Procedure: Thru Augers & Open Bedrock Hole
c.Slot Size: .01 inches. d.Screen Length: 20 ft.
17.Filter Pack:
a.Material: medium sand
b.Installation Procedure: Gravity Fed
18.Well Depth: 78 ft.
19.Bottom of Filter Pack: 78.5 ft.
20.Bottom of Borehole: 78.5 ft.
21.Backfill Material (below filter pack): sand
22.Decontamination Procedures: None
23.Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24.WV Contractor License No. WV002350



TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

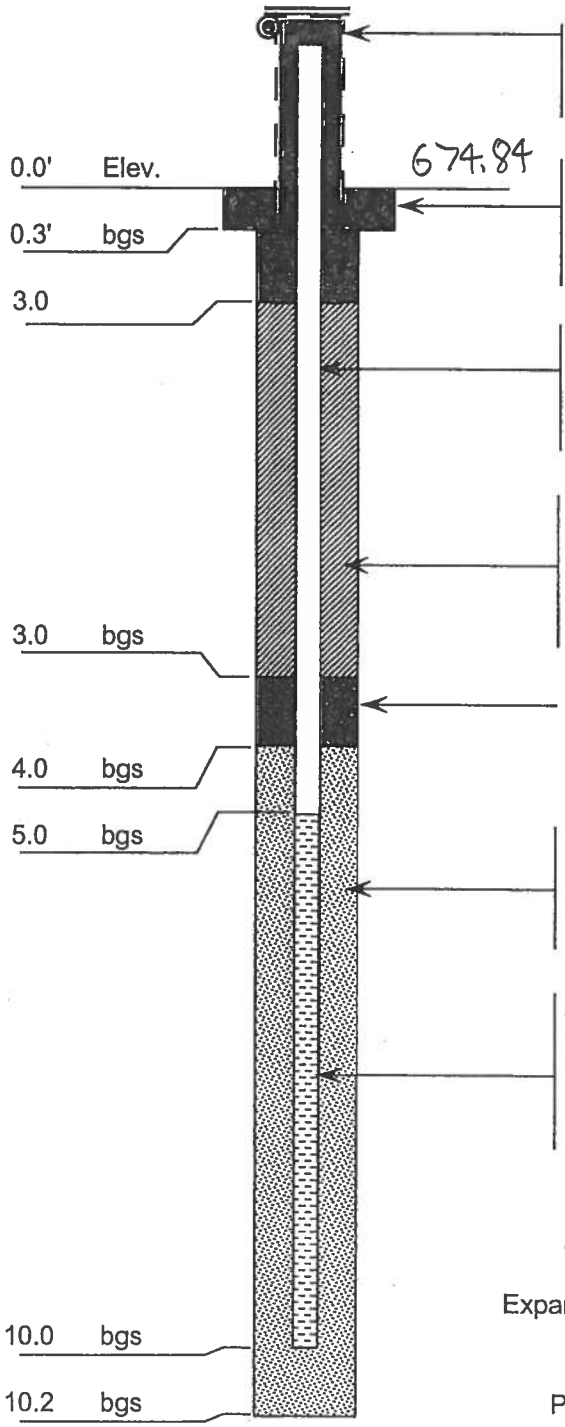
Geotechnical & Environmental Drilling

Well No: 05-33/MW-5 **Project:** John E. Amos Power Plant

Well Tag: 0275-28-05 **TTI Proj. No:** 05639

Date Installed: 07/07/05 **Client:** GAI Consultants, Inc.

GPS Location: **Latitude:** N 38° 29' 10.00" **Longitude:** W 081° 51' 44.6"



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	7	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	N/A	lbs.

Bentonite 25 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	4	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	5	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0028-05

Site Name/Physical Address:
Site: . Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0028-05
Grid Location:
a. Latitude: 38 29 10 .
b. Longitude: 81 51 44 ..6
c. Method Used: GPS

Company/Project Well No.:
05639/05-33-MW-5

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

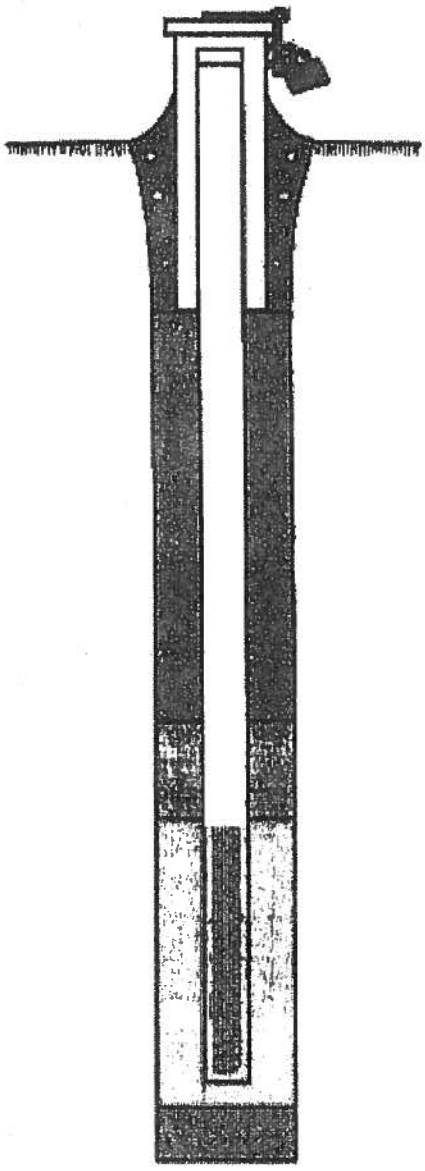
Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
07/07/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1.Cap and Lock: YES
2.Protective Cover: Protective Cover Pipe
3.Monitoring Well Reference Point: 0 ft.
4.Borehole Diameter: 4 inches.
5.Ground Surface Seal:
a.Material: concrete
b.Installation Procedure: Hand Mixed
6.Surface Seal Bottom/Annular Space Top: 3 ft.
7.Well Riser: a.OD Well Riser: 2.38 inches. b.ID Well Riser: 2 inches.
c.Material: PVC
d.Installation Procedure: Thru Augers & Open Bedrock Hole
8.Annular Space Seal:
a.Material: high solids grout -
b.Installation Procedure: pour
9.Well Development Procedure: other - By Client
10.Drilling Method Used: percussion -
11.Annular Space Seal Bottom/Filter Seal Top: 3 ft.
12.Drilling Fluid Used: Yes Source: Air
13.Filter Pack Seal:
a.Material: bentonite pellet
b.Installation Procedure: Gravity Fed
c.Volume Added: 25 pounds
14.Bottom of Bentonite Seal/Filter Pack Top: 4 ft.
15.Depth to Top of Screen: 5 ft.
16.Screen:
a.Material: PVC
b.Installation Procedure: Thru Augers & Open Bedrock Hole
c.Slot Size: .01 inches. d.Screen Length: 5 ft.
17.Filter Pack:
a.Material: medium sand
b.Installation Procedure: Gravity Fed
18.Well Depth: 10 ft.
19.Bottom of Filter Pack: 10.2 ft.
20.Bottom of Borehole: 10.2 ft.
21.Backfill Material (below filter pack): sand
22.Decontamination Procedures: None
23.Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24.WV Contractor License No. WV002350



TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

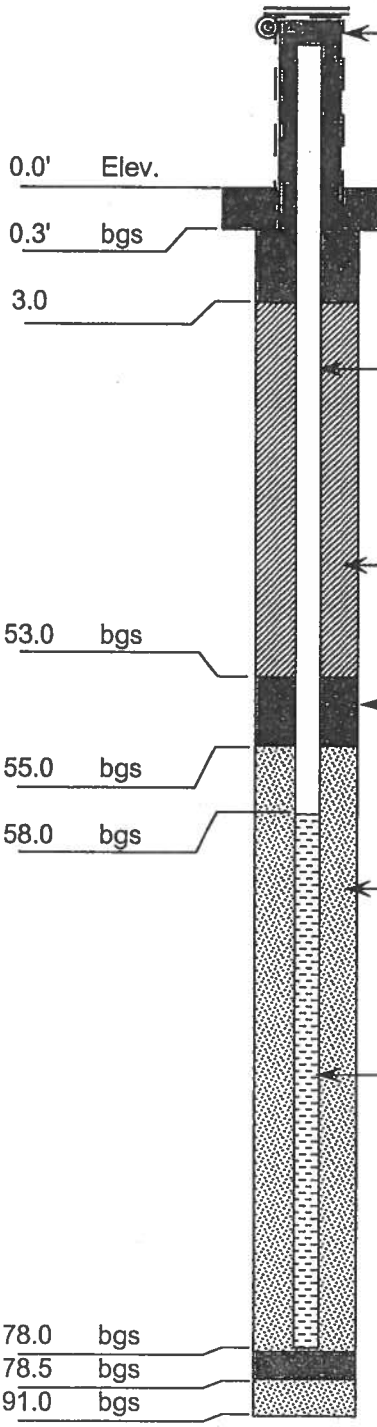
Geotechnical & Environmental Drilling

Well No: 05-26/MW-6 **Project:** John E. Amos Power Plant

Well Tag: 0275-29-05 **TTI Proj. No:** 05639

Date Installed: 06/23/05 **Client:** GAI Consultants, Inc.

GPS Location: **Latitude:** N 38° 28' 56.1" **Longitude:** W 081° 51' 30.6"



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	60	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	125	lbs.

Bentonite 100 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	4	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	20	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0029-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0029-05
Grid Location:
a. Latitude: 38 28 56 ..1
b. Longitude: 81 51 30 ..6
c. Method Used: GPS

Company/Project Well No.:
05639/05-26-MW-6

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
06/23/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1.Cap and Lock: YES
2.Protective Cover: Protective Cover Pipe
3.Monitoring Well Reference Point: 0 ft.
4.Borehole Diameter: 4 inches.
5.Ground Surface Seal:
a.Material: concrete
b.Installation Procedure: Hand Mixed
6.Surface Seal Bottom/Annular Space Top: 3 ft.
7.Well Riser: a.OD Well Riser: 2.38 inches. b.ID Well Riser: 2 inches.
c.Material: PVC
d.Installation Procedure: Thru Augers & Open Bedrock Hole
8.Annular Space Seal:
a.Material: high solids grout -
b.Installation Procedure: pour
9.Well Development Procedure: other - By Client
10.Drilling Method Used: percussion -
11.Annular Space Seal Bottom/Filter Seal Top: 53 ft.
12.Drilling Fluid Used: Yes Source: Air
13.Filter Pack Seal:
a.Material: bentonite pellet
b.Installation Procedure: Gravity Fed
c.Volume Added: 100 pounds
14.Bottom of Bentonite Seal/Filter Pack Top: 55 ft.
15.Depth to Top of Screen: 58 ft.
16.Screen:
a.Material: PVC
b.Installation Procedure: Thru Augers & Open Bedrock Hole
c.Slot Size: .01 inches. d.Screen Length: 20 ft.
17.Filter Pack:
a.Material: medium sand
b.Installation Procedure: Gravity Fed
18.Well Depth: 78 ft.
19.Bottom of Filter Pack: 78.5 ft.
20.Bottom of Borehole: 91 ft.
21.Backfill Material (below filter pack): Bentonite Pellets
22.Decontamination Procedures: None
23.Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24.WV Contractor License No. WV002350

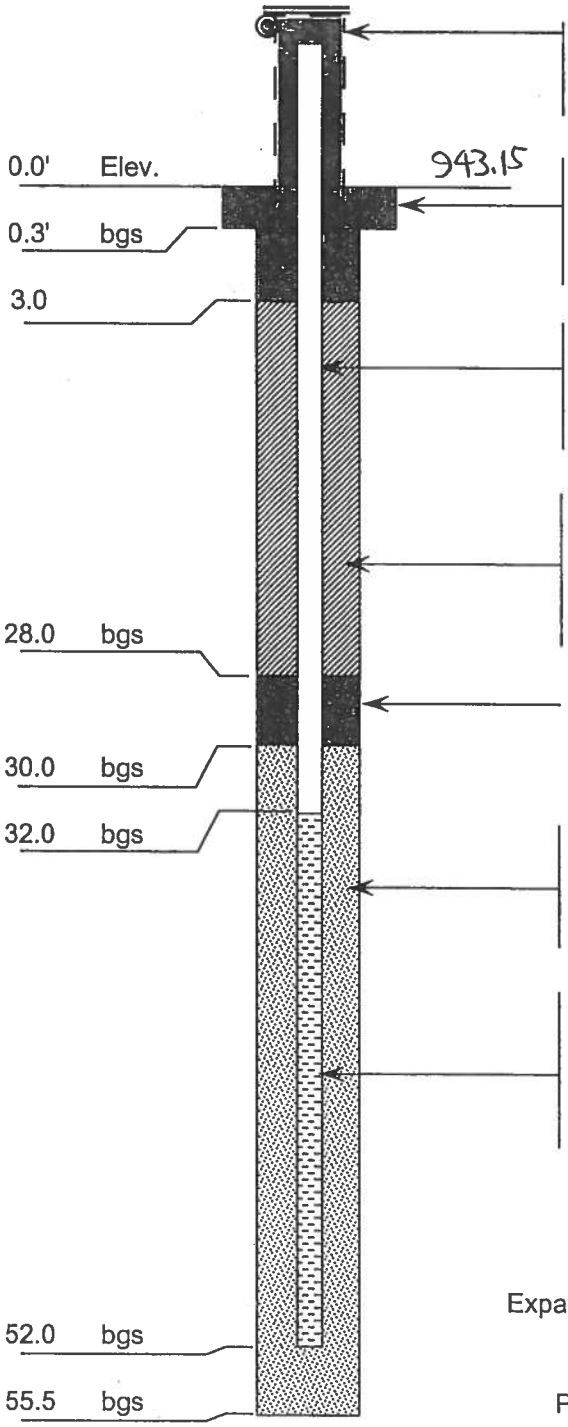
TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

Geotechnical & Environmental Drilling

Well No: 05-28/MW-7
Well Tag: 0275-30-05
Date Installed: 06/28/05
GPS Location: **Latitude:** N 39° 28' 44.1"

Project: John E. Amos Power Plant
TTI Proj. No: 05639
Client: GAI Consultants, Inc.
Longitude: W 081° 51' 15.5"



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	34	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	100	lbs.

Bentonite 12.5 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	4	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	20	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0030-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0030-05
Grid Location:
a. Latitude: 38 28 44 ..1
b. Longitude: 81 51 15 ..5
c. Method Used: GPS

Company/Project Well No.:
05639/05-28-MW-7

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

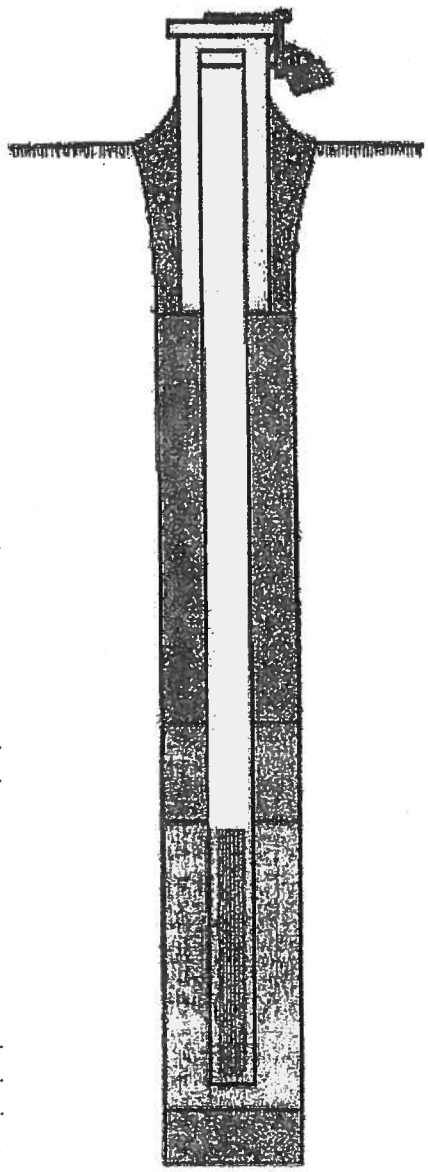
Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
06/28/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1.Cap and Lock: YES
2.Protective Cover: Protective Cover Pipe
3.Monitoring Well Reference Point: 0 ft.
4.Borehole Diameter: 4 inches.
5.Ground Surface Seal:
a.Material: concrete
b.Installation Procedure: Hand Mixed
6.Surface Seal Bottom/Annular Space Top: 3 ft.
7.Well Riser: a.OD Well Riser: 2.38 inches. b.ID Well Riser: 2 inches.
c.Material: PVC
d.Installation Procedure: Thru Augers & Open Bedrock Hole
8.Annular Space Seal:
a.Material: high solids grout -
b.Installation Procedure: pour
9.Well Development Procedure: other - By Client
10.Drilling Method Used: percussion -
11.Annular Space Seal Bottom/Filter Seal Top: 28 ft.
12.Drilling Fluid Used: Yes Source: Air
13.Filter Pack Seal:
a.Material: bentonite pellet
b.Installation Procedure: Gravity Fed
c.Volume Added: 12.5 pounds
14.Bottom of Bentonite Seal/Filter Pack Top: 30 ft.
15.Depth to Top of Screen: 32 ft.
16.Screen:
a.Material: PVC
b.Installation Procedure: Thru Augers & Open Bedrock Hole
c.Slot Size: .01 inches. d.Screen Length: 20 ft.
17.Filter Pack:
a.Material: medium sand
b.Installation Procedure: Gravity Fed
18.Well Depth: 52 ft.
19.Bottom of Filter Pack: 55.5 ft.
20.Bottom of Borehole: 55.5 ft.
21.Backfill Material (below filter pack): sand
22.Decontamination Procedures: None
23.Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24.WV Contractor License No. WV002350



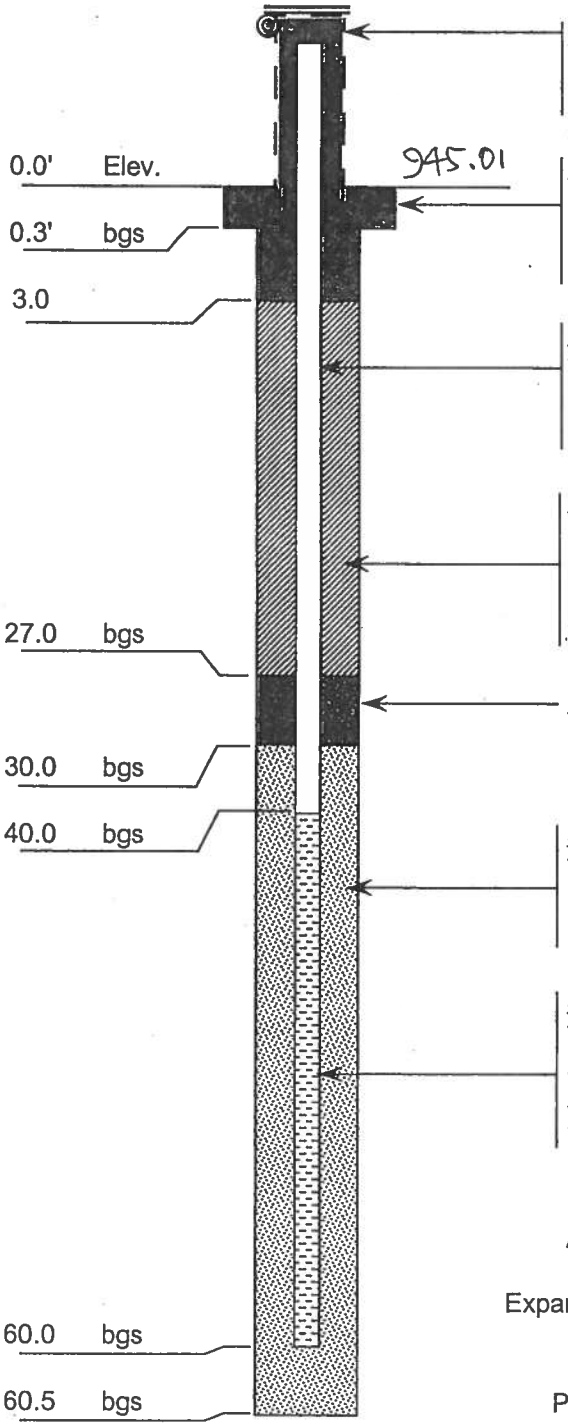
TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

Geotechnical & Environmental Drilling

Well No: 05-34/MW-~~11~~08
Well Tag: 0275-33-05
Date Installed: 07/11/05
GPS Location: **Latitude:** N 38° 29' 09.3" **Longitude:** W 081° 50' 57.5"

Project: John E. Amos Power Plant
TTI Proj. No: 05639
Client: GAI Consultants, Inc.



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	42	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	150	lbs.

Bentonite 12.5 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	5	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	20	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0033-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

Well Registration No. WV00275-0033-05
Grid Location:
a. Latitude: 38 29 9 ..3
b. Longitude: 81 50 57 ..3
c. Method Used: GPS

Company/Project Well No.:
05639/05-34-MW-11

Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

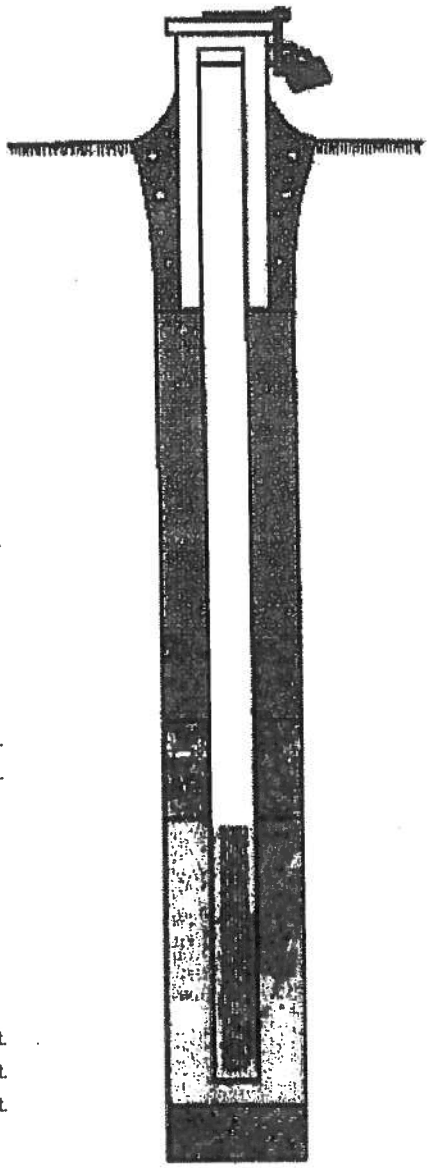
Purpose of Monitoring Well:
Monitor Groundwater

Date Well Installed:
07/11/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1.Cap and Lock: YES
2.Protective Cover: Protective Cover Pipe
3.Monitoring Well Reference Point: 0 ft.
4.Borehole Diameter: 4 inches.
5.Ground Surface Seal:
a.Material: concrete
b.Installation Procedure: Hand Mixed
6.Surface Seal Bottom/Annular Space Top: 3 ft.
7.Well Riser: a.OD Well Riser: 2.38 inches. b.ID Well Riser: 2 inches.
c.Material: PVC
d.Installation Procedure: Thru Augers & Open Bedrock Hole
8.Annular Space Seal:
a.Material: high solids grout -
b.Installation Procedure: pour
9.Well Development Procedure: other - By Client
10.Drilling Method Used: percussion -
11.Annular Space Seal Bottom/Filter Seal Top: 27 ft.
12.Drilling Fluid Used: Yes Source: Air
13.Filter Pack Seal:
a.Material: bentonite pellet
b.Installation Procedure: Gravity Fed
c.Volume Added: 12.5 pounds
14.Bottom of Bentonite Seal/Filter Pack Top: 30 ft.
15.Depth to Top of Screen: 40 ft.
16.Screen:
a.Material: PVC
b.Installation Procedure: Thru Augers & Open Bedrock Hole
c.Slot Size: .01 inches. d.Screen Length: 20 ft.
17.Filter Pack:
a.Material: medium sand
b.Installation Procedure: Gravity Fed
18.Well Depth: 60 ft.
19.Bottom of Filter Pack: 60.5 ft.
20.Bottom of Borehole: 60.5 ft.
21.Backfill Material (below filter pack): sand
22.Decontamination Procedures: None
23.Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24.WV Contractor License No. WV002350



TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

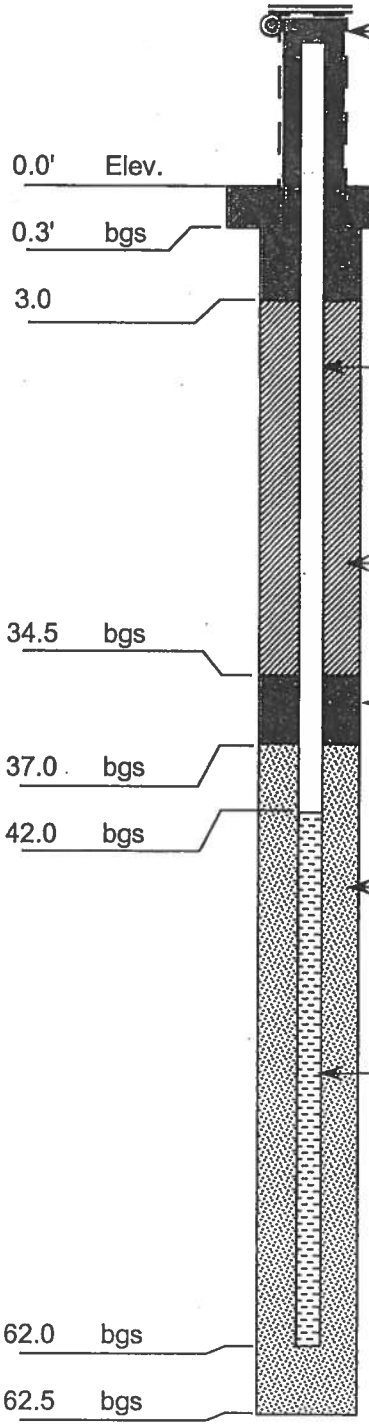
Geotechnical & Environmental Drilling

Well No: 05-30/MW-9 **Project:** John E. Amos Power Plant

Well Tag: 0275-31-05 **TTI Proj. No:** 05639

Date Installed: 06/30/05 **Client:** GAI Consultants, Inc.

GPS Location: **Latitude:** N 38° 29' 29.1" **Longitude:** W 081° 51' 8.8"



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	44	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	100	lbs.

Bentonite 12.5 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	4	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	20	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0031-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0031-05
Grid Location:
a. Latitude: 38 29 29 ..1
b. Longitude: 81 51 8 ..8
c. Method Used: GPS

Company/Project Well No.:
05639/05-30-MW-9

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

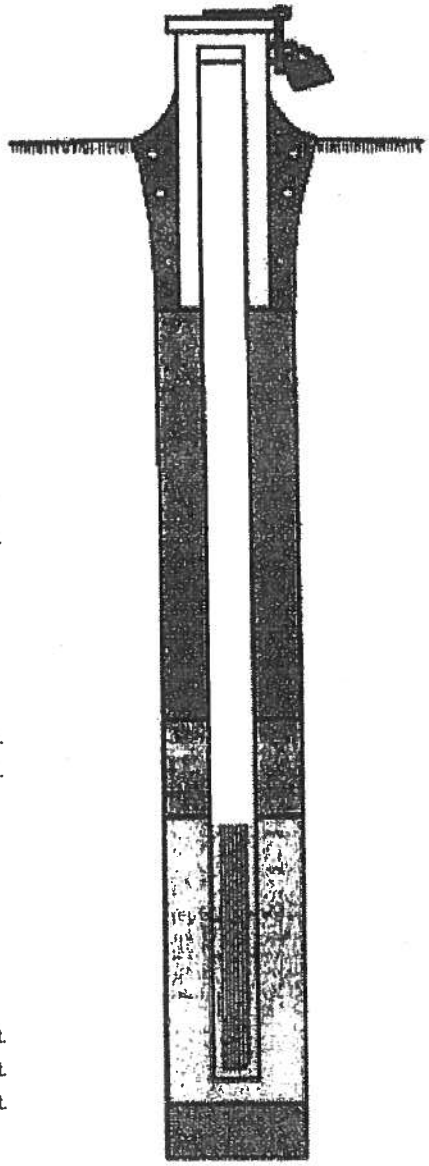
Installed By (Name, Firm, Address):
Installer: Tim Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
06/30/2005

Driller's WV Cert No.
WV00275

Section B: (all number fields must be in decimal format)

1.Cap and Lock: YES
2.Protective Cover: Protective Cover Pipe
3.Monitoring Well Reference Point: 0 ft.
4.Borehole Diameter: 4 inches.
5.Ground Surface Seal:
a.Material: concrete
b.Installation Procedure: Hand Mixed
6.Surface Seal Bottom/Annular Space Top: 3 ft.
7.Well Riser: a.OD Well Riser: 2.38 inches. b.ID Well Riser: 2 inches.
c.Material: PVC
d.Installation Procedure: Thru Augers & Open Bedrock Hole
8.Annular Space Seal:
a.Material: high solids grout -
b.Installation Procedure: pour
9.Well Development Procedure: other - By Client
10.Drilling Method Used: percussion -
11.Annular Space Seal Bottom/Filter Seal Top: 34.5 ft.
12.Drilling Fluid Used: Yes Source: Air
13.Filter Pack Seal:
a.Material: bentonite pellet
b.Installation Procedure: Gravity Fed
c.Volume Added: 12.5 pounds
14.Bottom of Bentonite Seal/Filter Pack Top: 37 ft.
15.Depth to Top of Screen: 42 ft.
16.Screen:
a.Material: PVC
b.Installation Procedure: Thru Augers & Open Bedrock Hole
c.Slot Size: .01 inches. d.Screen Length: 20 ft.
17.Filter Pack:
a.Material: medium sand
b.Installation Procedure: Gravity Fed
18.Well Depth: 62 ft.
19.Bottom of Filter Pack: 62.5 ft.
20.Bottom of Borehole: 62.5 ft.
21.Backfill Material (below filter pack): sand
22.Decontamination Procedures: None
23.Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24.WV Contractor License No. WV002350



TERRA TESTING

WELL / PIEZOMETER SCHEMATIC

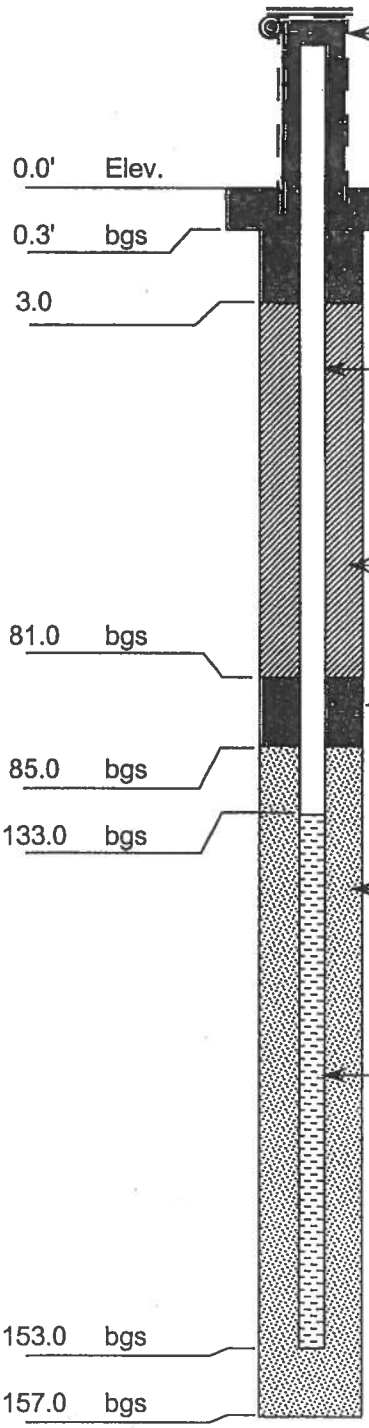
Geotechnical & Environmental Drilling

Well No: 05-31/MW-10 **Project:** John E. Amos Power Plant

Well Tag: 0275-32-05 **TTI Proj. No:** 05639

Date Installed: 07/06/05 **Client:** GAI Consultants, Inc.

GPS Location: **Latitude:** N 38° 29' 27.7" **Longitude:** W 081° 51' 30.3"



STEEL PROTECTIVE COVER (Stick-up)

Size:	6" x 5'
Riser Stick-up:	2'

CONCRETE PAD

Size:	6' diameter
No. of Bags:	10
Bags Size:	80

Riser:

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Length	135	feet

Grout Backfill

Cement:	N/A	No. of Bags
Bags Size:	N/A	lbs.
Gran. Bentonite	N/A	lbs.
Volclay	225	lbs.

Bentonite 12.5 lbs.

Sand Pack

Type:	Best #430	
Bags Size:	50	lbs.
No. of Bags	10	

Screen

Type:	Sch. 40 PVC	
Size:	2	inches I.D.
Slot Size:	0.01	inches
Length:	20	feet

Additional Well Supplies

Expanding Locking Cap	Y
Locks	
PVC Slip Cap	
PVC Threaded Cap	
PVC Bottom Plug	Y
Auger Plugs	
No. of 55-gallon Drums Used	
No of Guard Posts Used	

State of West Virginia
Department of Environmental Protection

Monitoring Well Construction
Well Number: WV00275-0032-05

Site Name/Physical Address:
Site: Proposed Landfill
Line 1: Area 2/3
Line 2: Blue Lick Road
City: Windfield
State: WV
Zip: 25213-
County: Putnam

Well Registration No. WV00275-0032-05
Grid Location:
a. Latitude: 38 29 27 ..7
b. Longitude: 81 51 30 ..3
c. Method Used: GPS

Company/Project Well No.:
05639/05-31-MW-10

Purpose of Monitoring Well:
Monitor Groundwater

Well Owner (Name, Firm, Address):
Owner: Tom Carroll
Line 1: John E. Amos Power Plant
Line 2: 1530 Winfield Road
City: Windfield
State: WV
Zip: 25213-
Phone: 304-759-3156

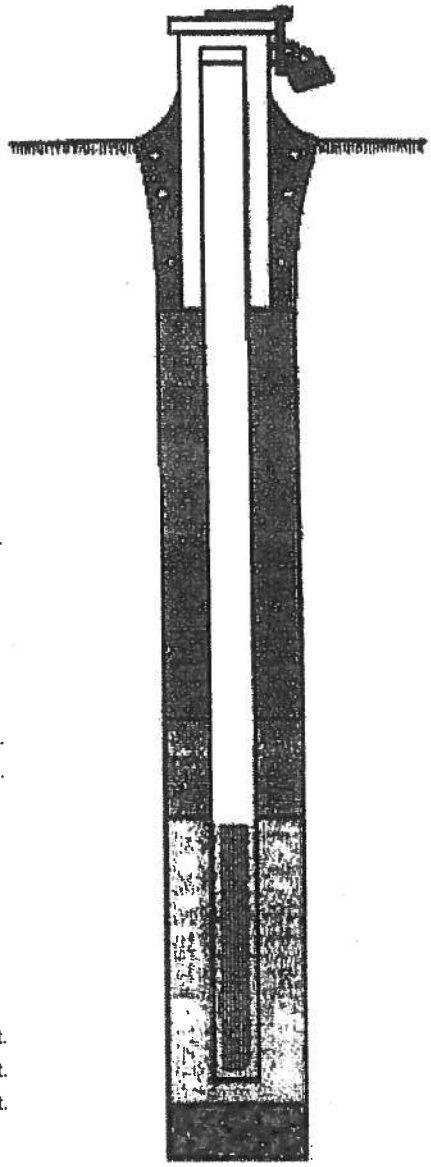
Installed By (Name, Firm, Address):
Installer: Vern Curtis / Douglas Novotny
Line 1: Terra Testing, Inc.
Line 2: 260 Meadowlands Boulevard
City: Washington
State: PA
Zip: 15301-
Phone: 724-746-9100

Date Well Installed:
07/06/2005

Driller's WV Cert No.
WV00275

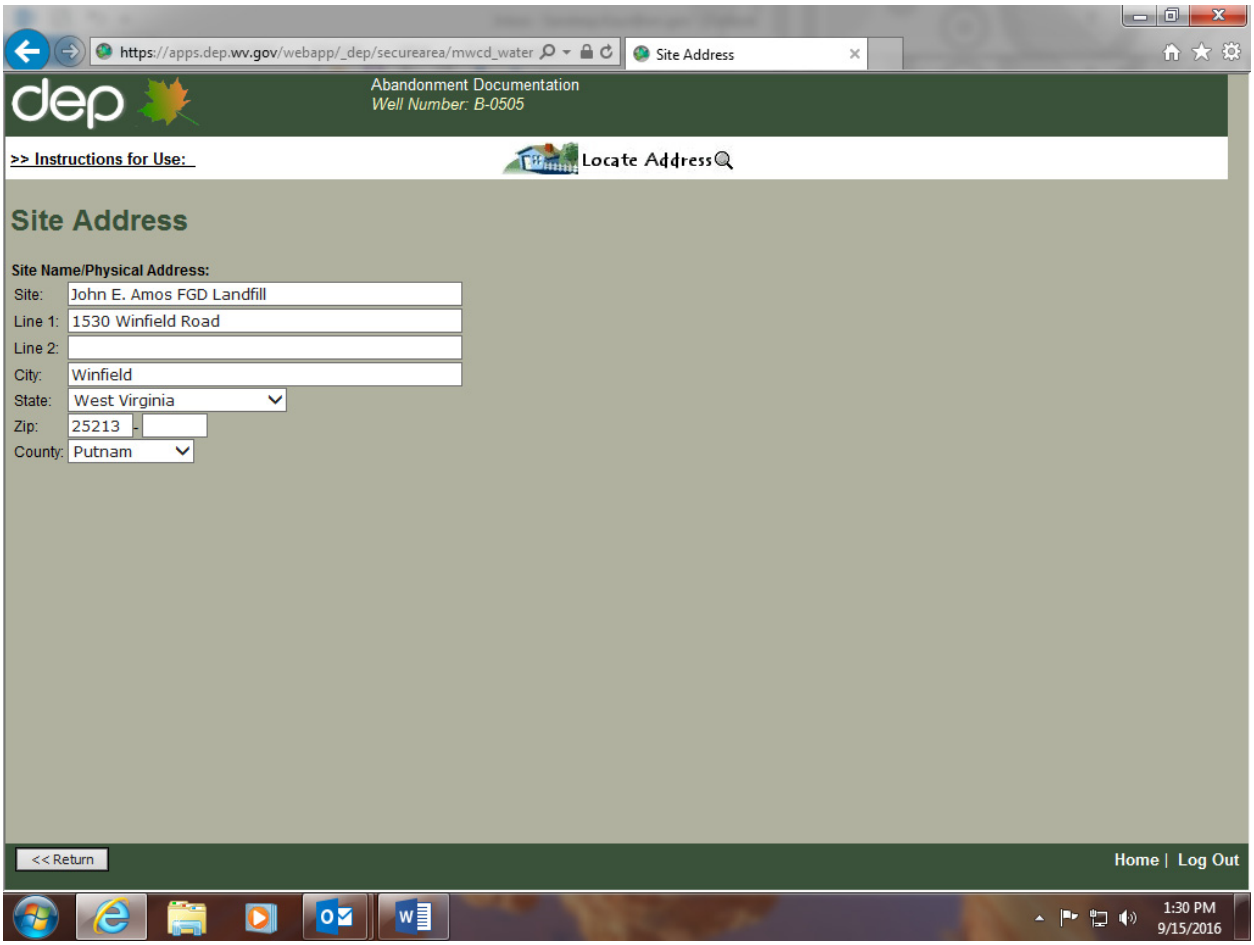
Section B: (all number fields must be in decimal format)

1. Cap and Lock: YES
2. Protective Cover: Protective Cover Pipe
3. Monitoring Well Reference Point: 0 ft.
4. Borehole Diameter: 4 inches.
5. Ground Surface Seal:
   a. Material: concrete
   b. Installation Procedure: Hand Mixed
6. Surface Seal Bottom/Annular Space Top: 3 ft.
7. Well Riser: a. OD Well Riser: 2.38 inches. b. ID Well Riser: 2 inches.
   c. Material: PVC
   d. Installation Procedure: Thru Augers & Open Bedrock Hole
8. Annular Space Seal:
   a. Material: high solids grout -
   b. Installation Procedure: pour
9. Well Development Procedure: other - By Client
10. Drilling Method Used: percussion -
11. Annular Space Seal Bottom/Filter Seal Top: 81 ft.
12. Drilling Fluid Used: Yes Source: Air
13. Filter Pack Seal:
    a. Material: bentonite pellet
    b. Installation Procedure: Gravity Fed
    c. Volume Added: 12.5 pounds
14. Bottom of Bentonite Seal/Filter Pack Top: 85 ft.
15. Depth to Top of Screen: 133 ft.
16. Screen:
    a. Material: PVC
    b. Installation Procedure: Thru Augers & Open Bedrock Hole
    c. Slot Size: .01 inches. d. Screen Length: 20 ft.
17. Filter Pack:
    a. Material: medium sand
    b. Installation Procedure: Gravity Fed
18. Well Depth: 153 ft.
19. Bottom of Filter Pack: 157 ft.
20. Bottom of Borehole: 157 ft.
21. Backfill Material (below filter pack): sand
22. Decontamination Procedures: None
23. Special Circumstances and Exceptions: Yes Variance Number: MW-07-05
24. WV Contractor License No. WV002350



ARCADIS

WVDEP Monitoring Well &
Piezometer Closure Information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Site Address
dep
Abandonment Documentation
Well Number: B-0505
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: John E. Amos FGD Landfill
Line 1: 1530 Winfield Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
<< Return
Home | Log Out
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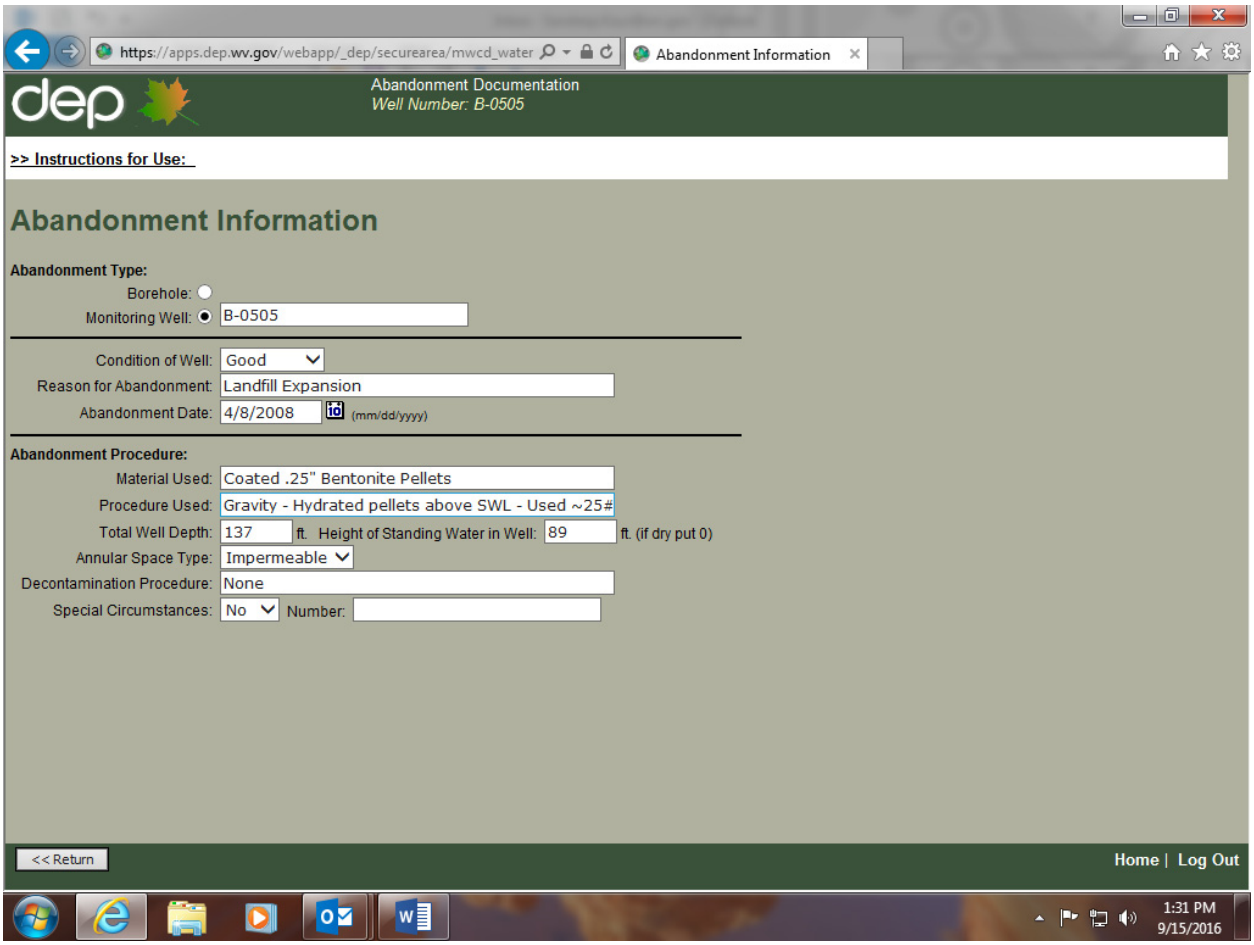
9/15/2016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Abandonment Information
dep
Abandonment Documentation
Well Number: B-0505
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: B-0505
Condition of Well: Good
Reason for Abandonment: Landfill Expansion
Abandonment Date: 4/8/2008 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: Coated .25" Bentonite Pellets
Procedure Used: Gravity - Hydrated pellets above SWL - Used ~25#
Total Well Depth: 137 ft. Height of Standing Water in Well: 89 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: None
Special Circumstances: No Number:
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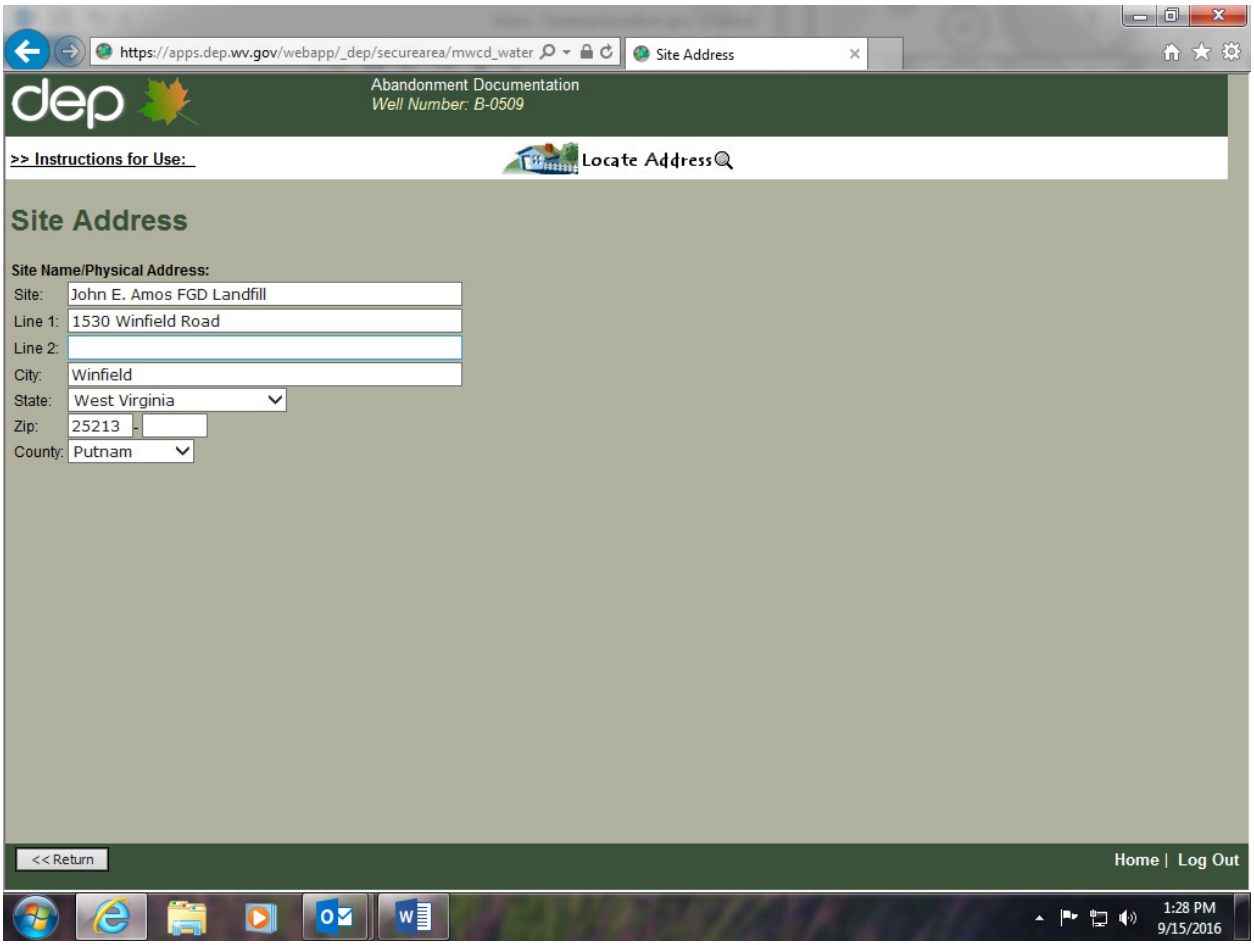
9/15/2016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Site Address
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Abandonment Documentation
Well Number: B-0509
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: John E. Amos FGD Landfill
Line 1: 1530 Winfield Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
<< Return
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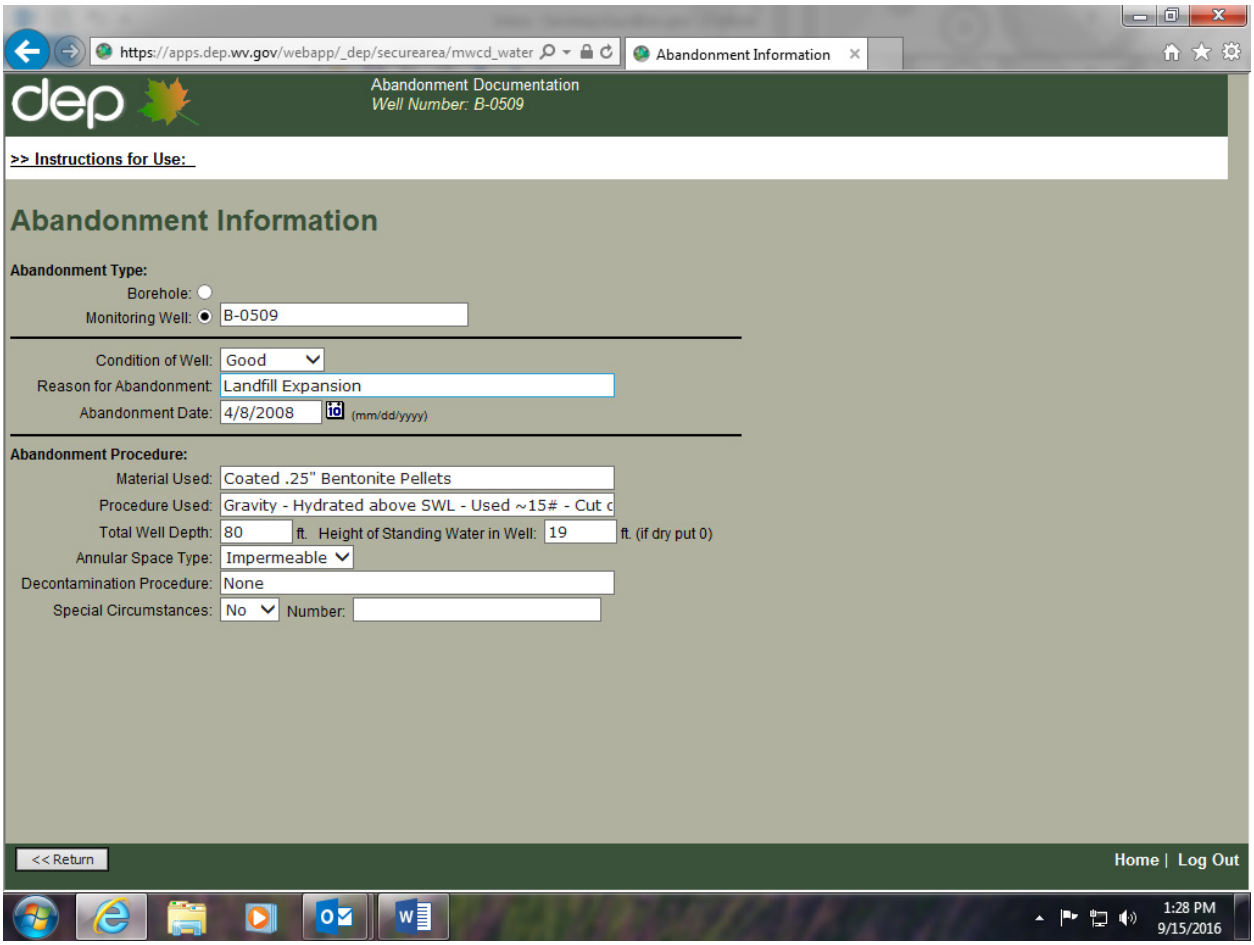
9/15/2016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Abandonment Documentation
Well Number: B-0509
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: B-0509
Condition of Well: Good
Reason for Abandonment: Landfill Expansion
Abandonment Date: 4/8/2008 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: Coated .25" Bentonite Pellets
Procedure Used: Gravity - Hydrated above SWL - Used ~15# - Cut c
Total Well Depth: 80 ft. Height of Standing Water in Well: 19 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: None
Special Circumstances: No Number:
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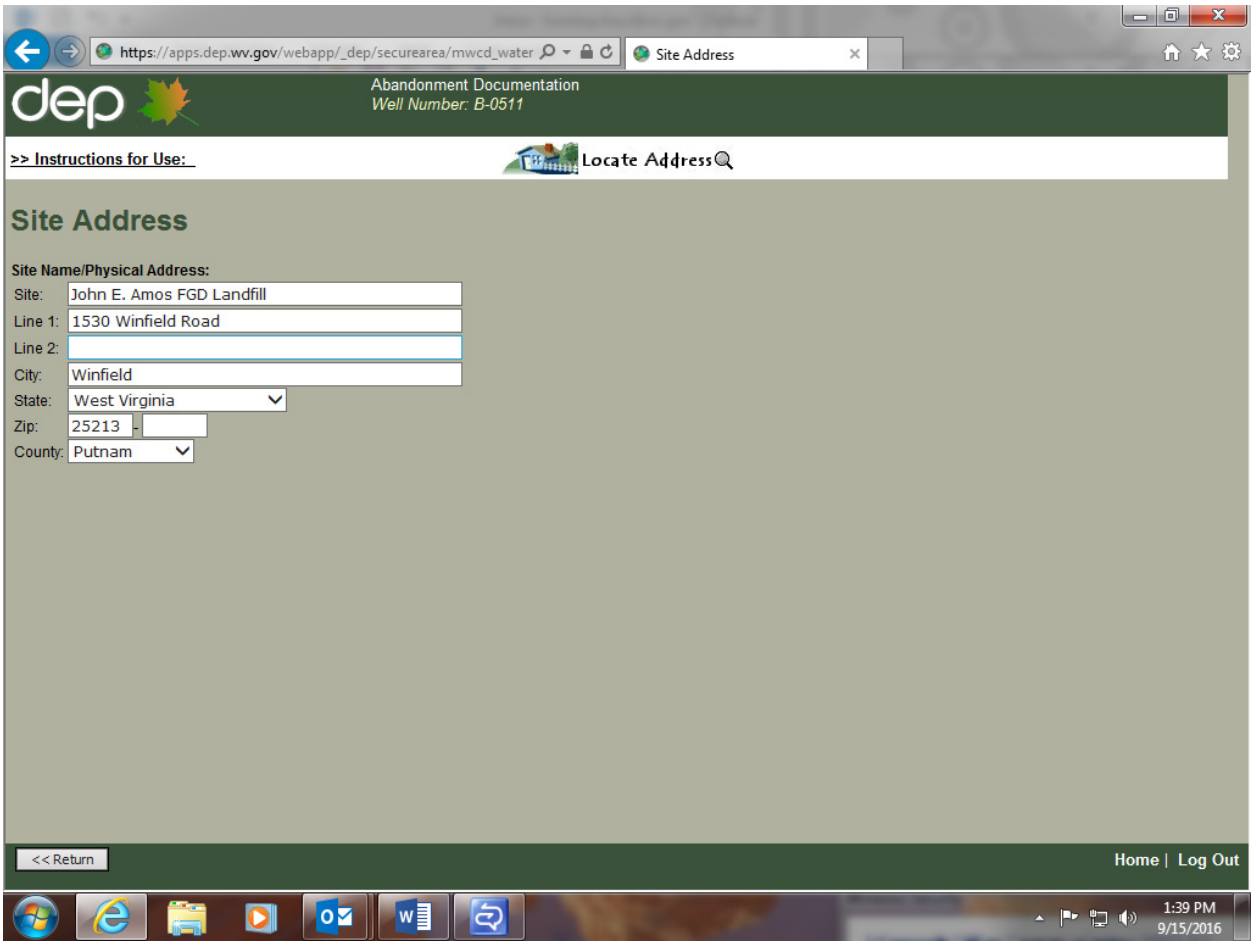
9/15/2016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Site Address
dep
Abandonment Documentation
Well Number: B-0511
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: John E. Amos FGD Landfill
Line 1: 1530 Winfield Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
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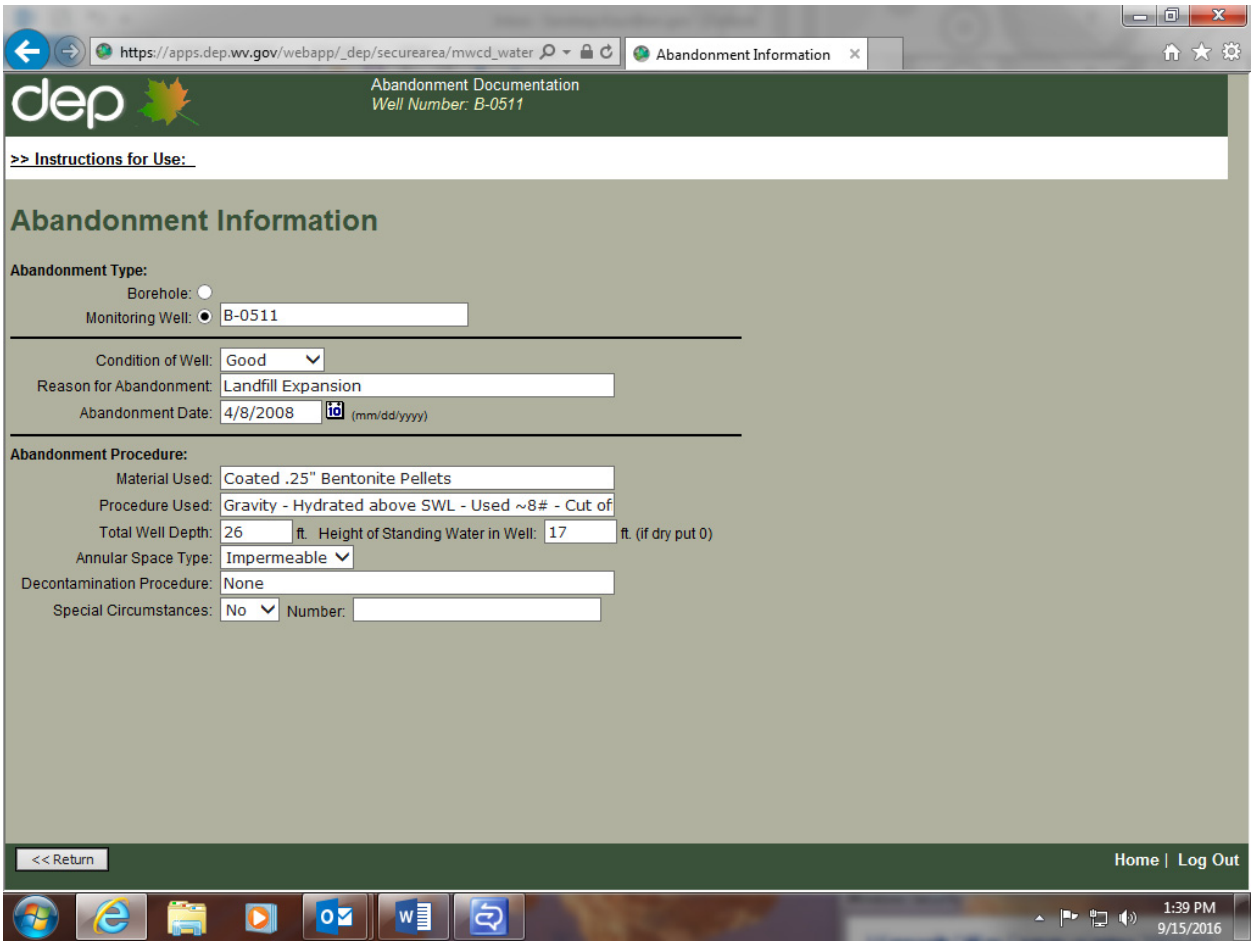
9/15/2016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Abandonment Documentation
Well Number: B-0511
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: B-0511
Condition of Well: Good
Reason for Abandonment: Landfill Expansion
Abandonment Date: 4/8/2008 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: Coated .25" Bentonite Pellets
Procedure Used: Gravity - Hydrated above SWL - Used ~8# - Cut of
Total Well Depth: 26 ft. Height of Standing Water in Well: 17 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: None
Special Circumstances: No Number:
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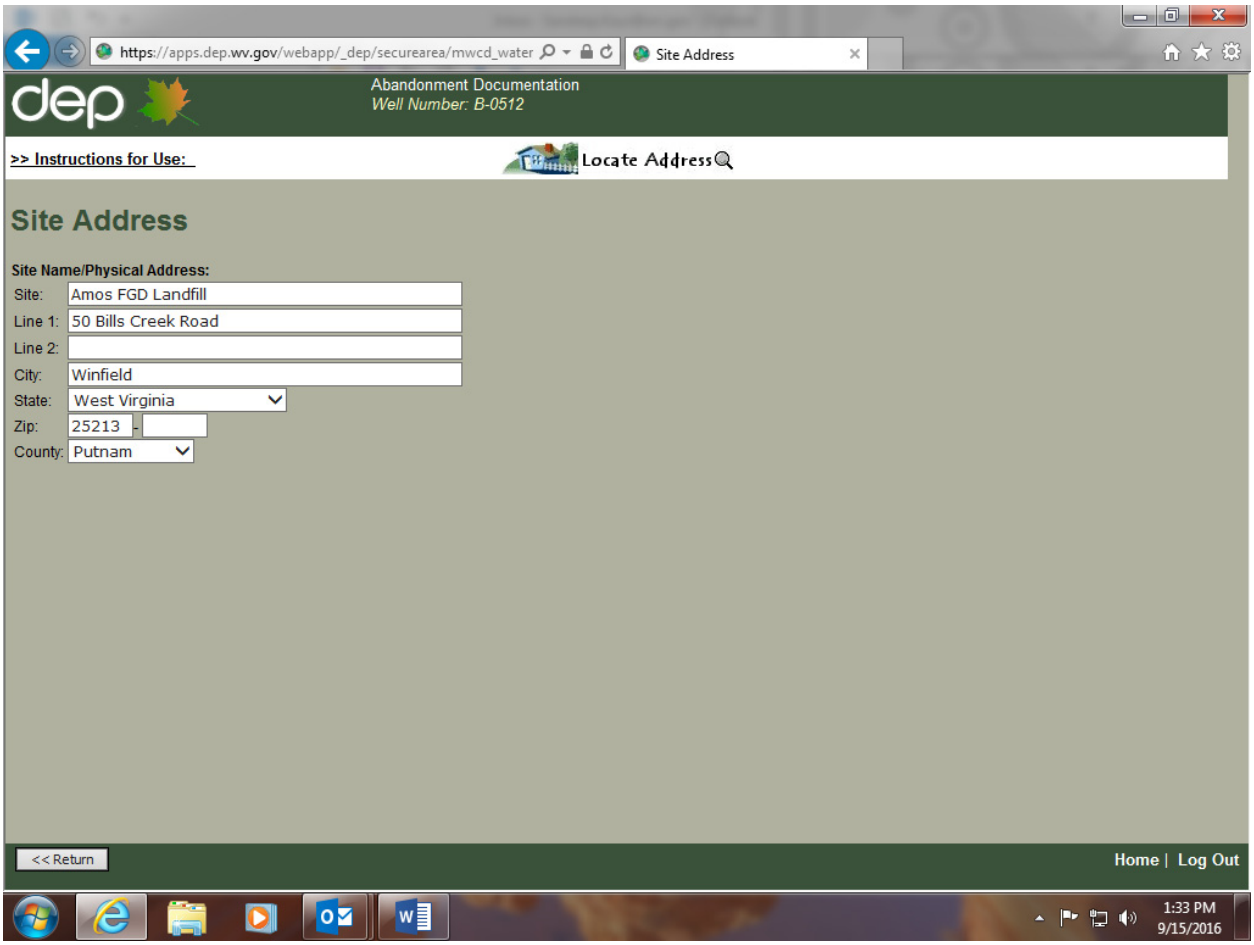
9/15/2016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Well Number: B-0512
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Site Address
Site Name/Physical Address:
Site: Amos FGD Landfill
Line 1: 50 Bills Creek Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
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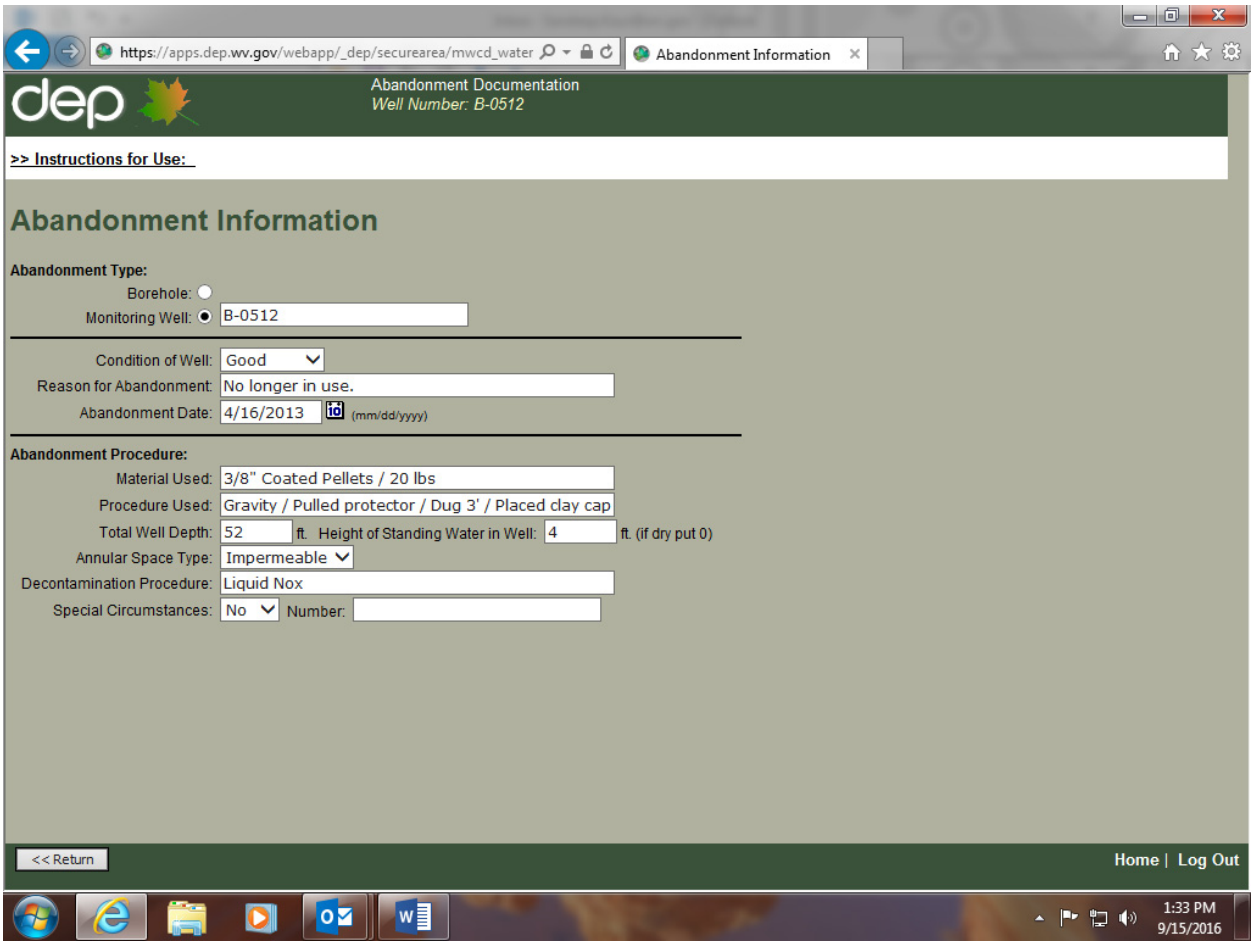
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Abandonment Documentation
Well Number: B-0512
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Abandonment Type:
Borehole:
Monitoring Well: B-0512
Condition of Well: Good
Reason for Abandonment: No longer in use.
Abandonment Date: 4/16/2013 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 3/8" Coated Pellets / 20 lbs
Procedure Used: Gravity / Pulled protector / Dug 3' / Placed clay cap
Total Well Depth: 52 ft. Height of Standing Water in Well: 4 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: Liquid Nox
Special Circumstances: No Number:
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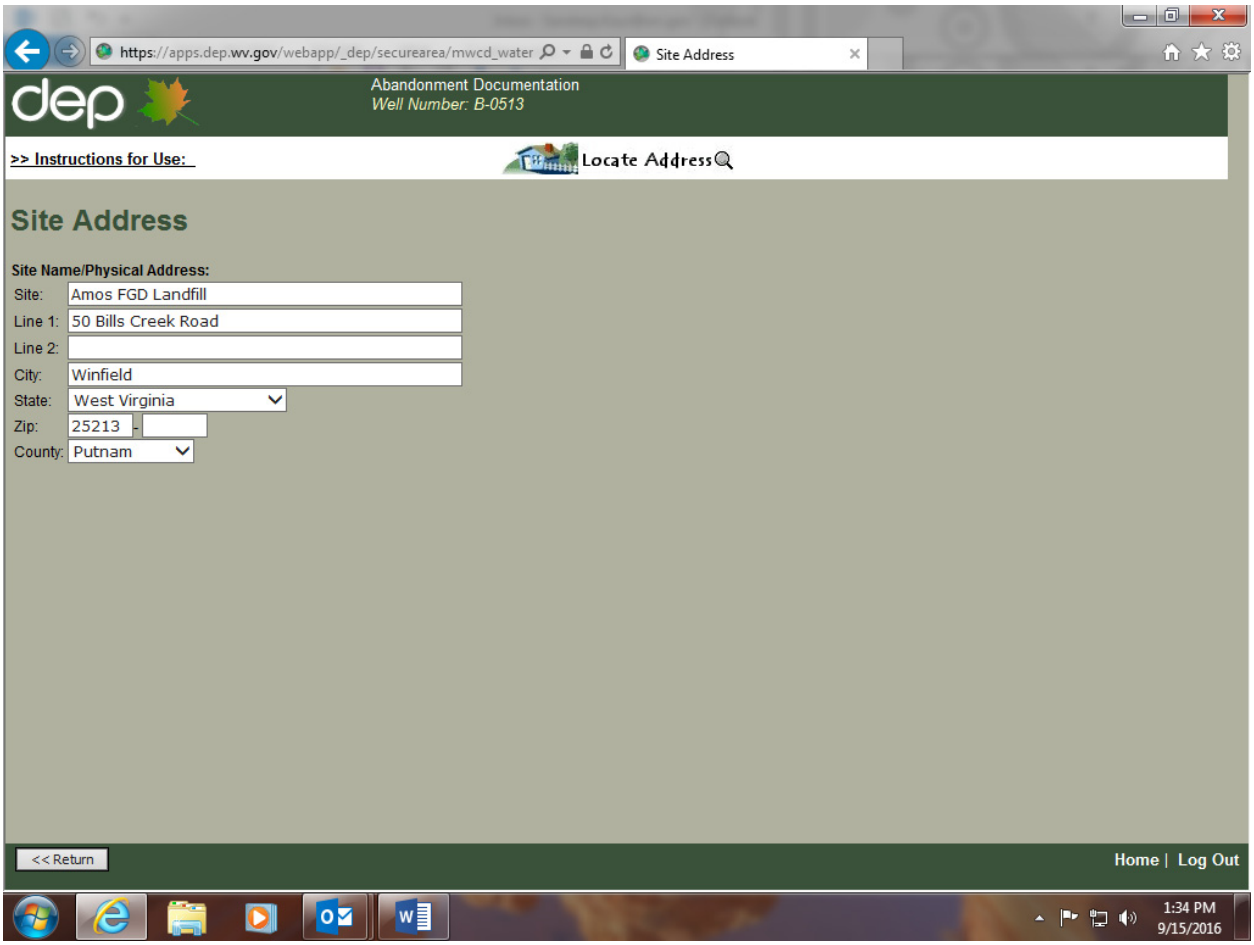
9/15/2016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Well Number: B-0513
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Site Address
Site Name/Physical Address:
Site: Amos FGD Landfill
Line 1: 50 Bills Creek Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
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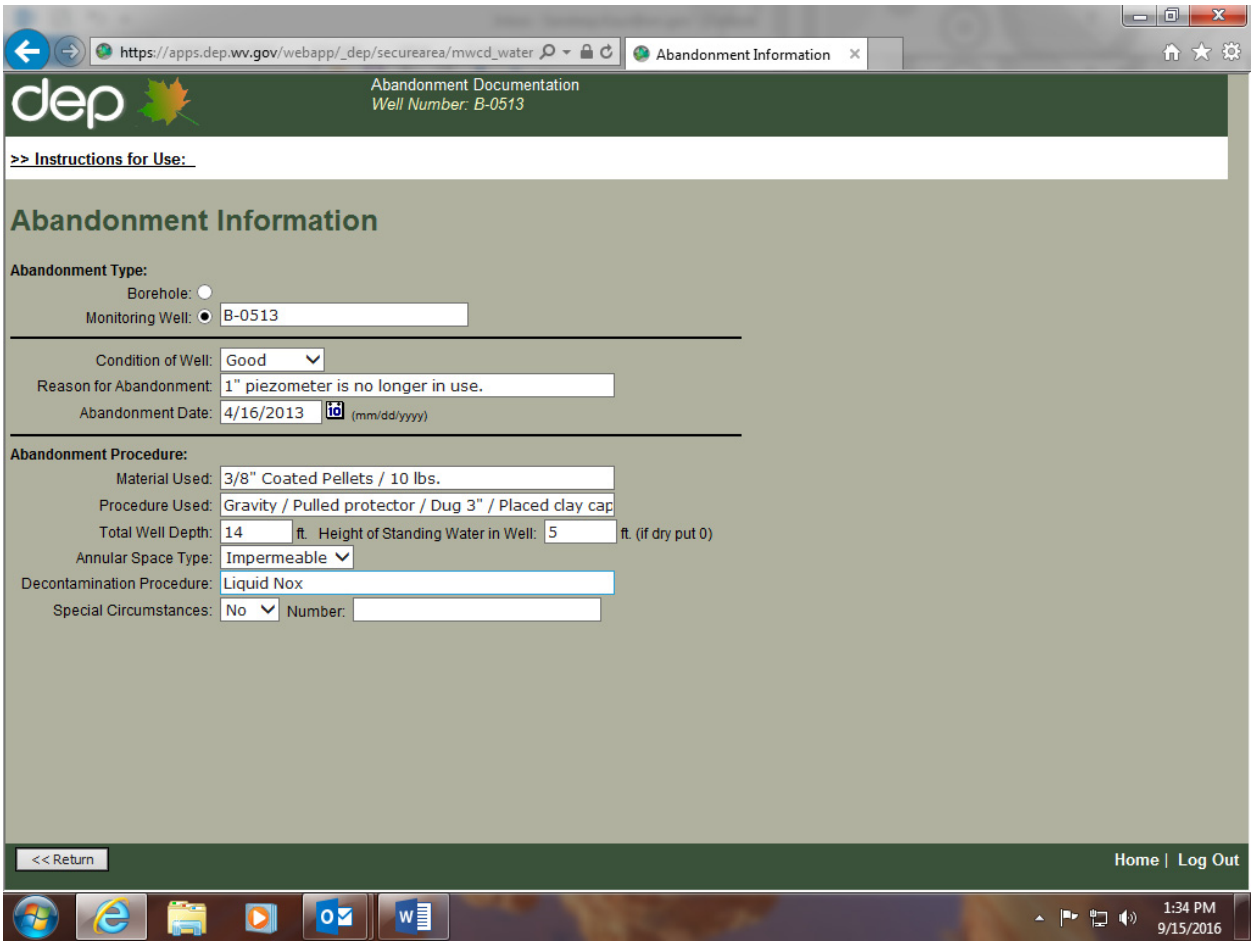
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Abandonment Documentation
Well Number: B-0513
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: B-0513
Condition of Well: Good
Reason for Abandonment: 1" piezometer is no longer in use.
Abandonment Date: 4/16/2013 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 3/8" Coated Pellets / 10 lbs.
Procedure Used: Gravity / Pulled protector / Dug 3" / Placed clay cap
Total Well Depth: 14 ft. Height of Standing Water in Well: 5 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: Liquid Nox
Special Circumstances: No Number:
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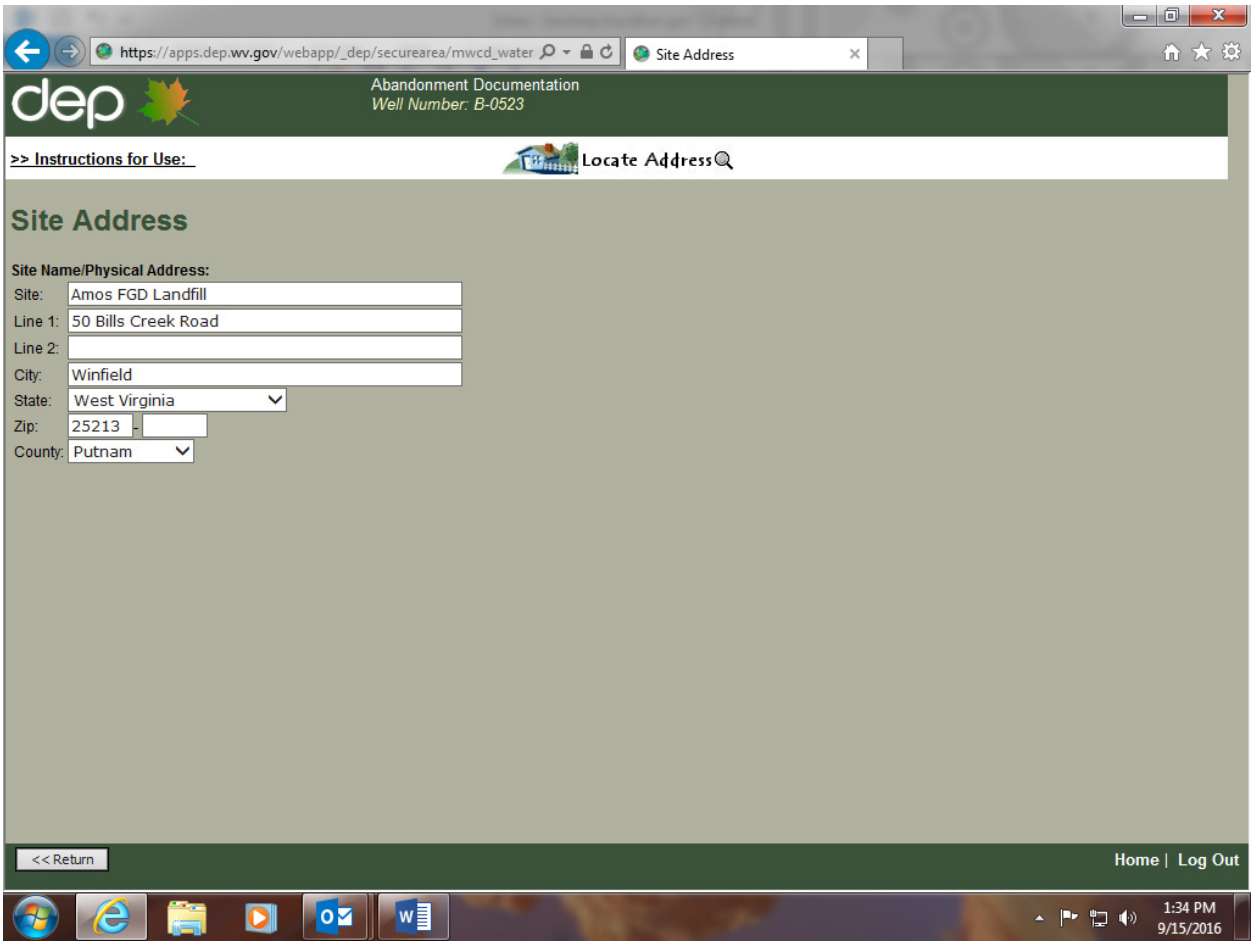
9/15/2016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Site Address
Site Name/Physical Address:
Site: Amos FGD Landfill
Line 1: 50 Bills Creek Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
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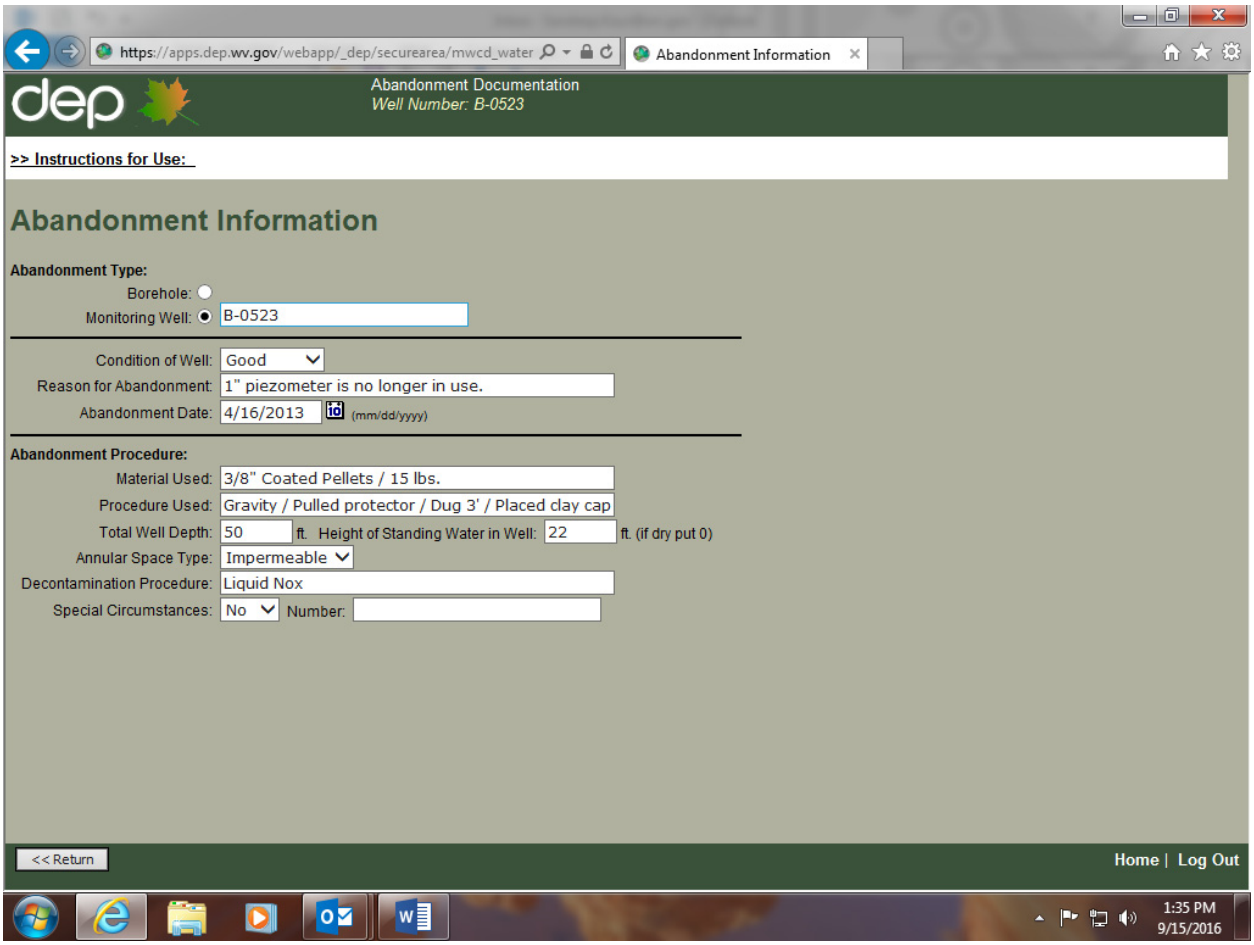
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dep
Abandonment Documentation
Well Number: B-0523
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: B-0523
Condition of Well: Good
Reason for Abandonment: 1" piezometer is no longer in use.
Abandonment Date: 4/16/2013 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 3/8" Coated Pellets / 15 lbs.
Procedure Used: Gravity / Pulled protector / Dug 3' / Placed clay cap
Total Well Depth: 50 ft. Height of Standing Water in Well: 22 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: Liquid Nox
Special Circumstances: No Number:
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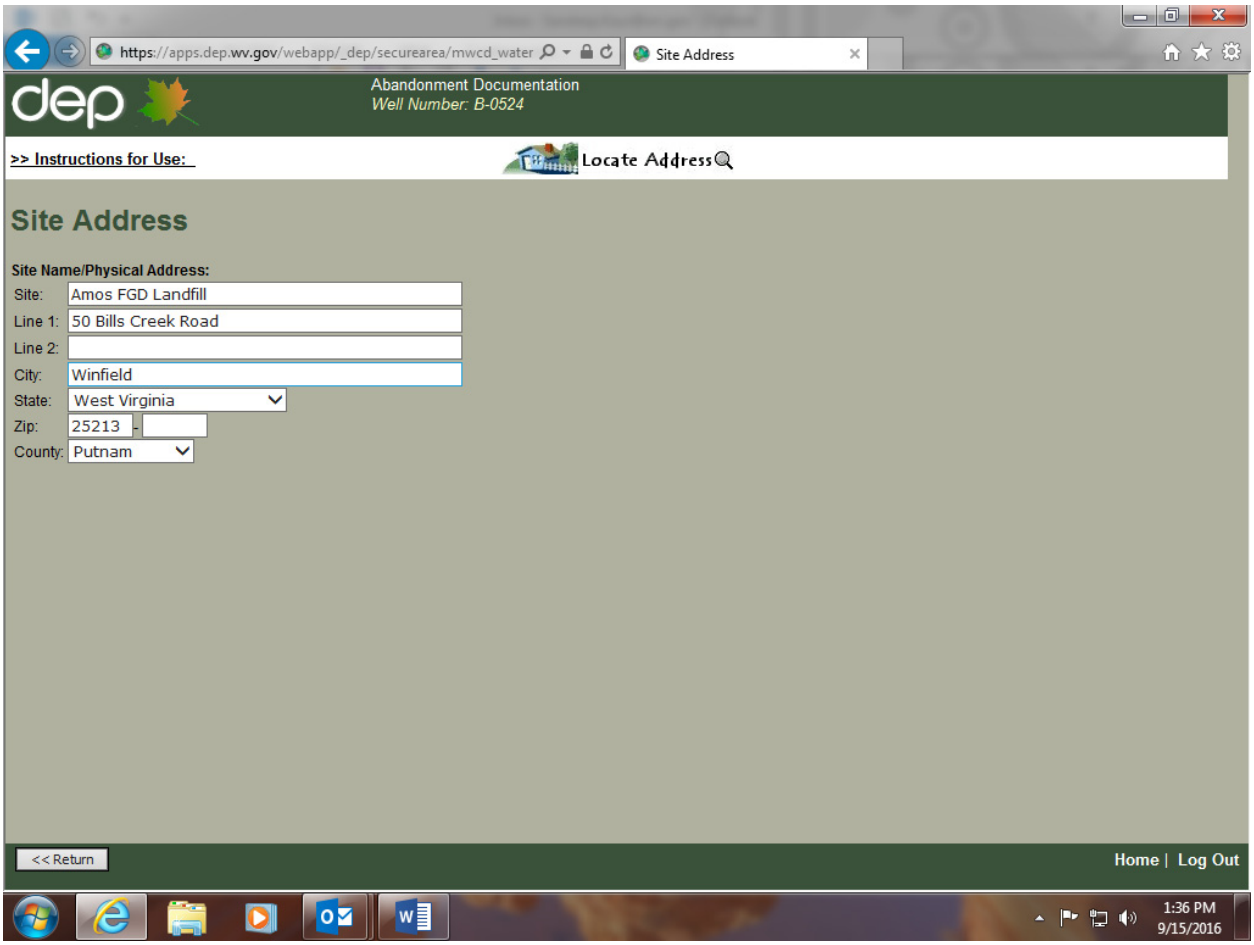
9/15/2016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Site Address
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Abandonment Documentation
Well Number: B-0524
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: Amos FGD Landfill
Line 1: 50 Bills Creek Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
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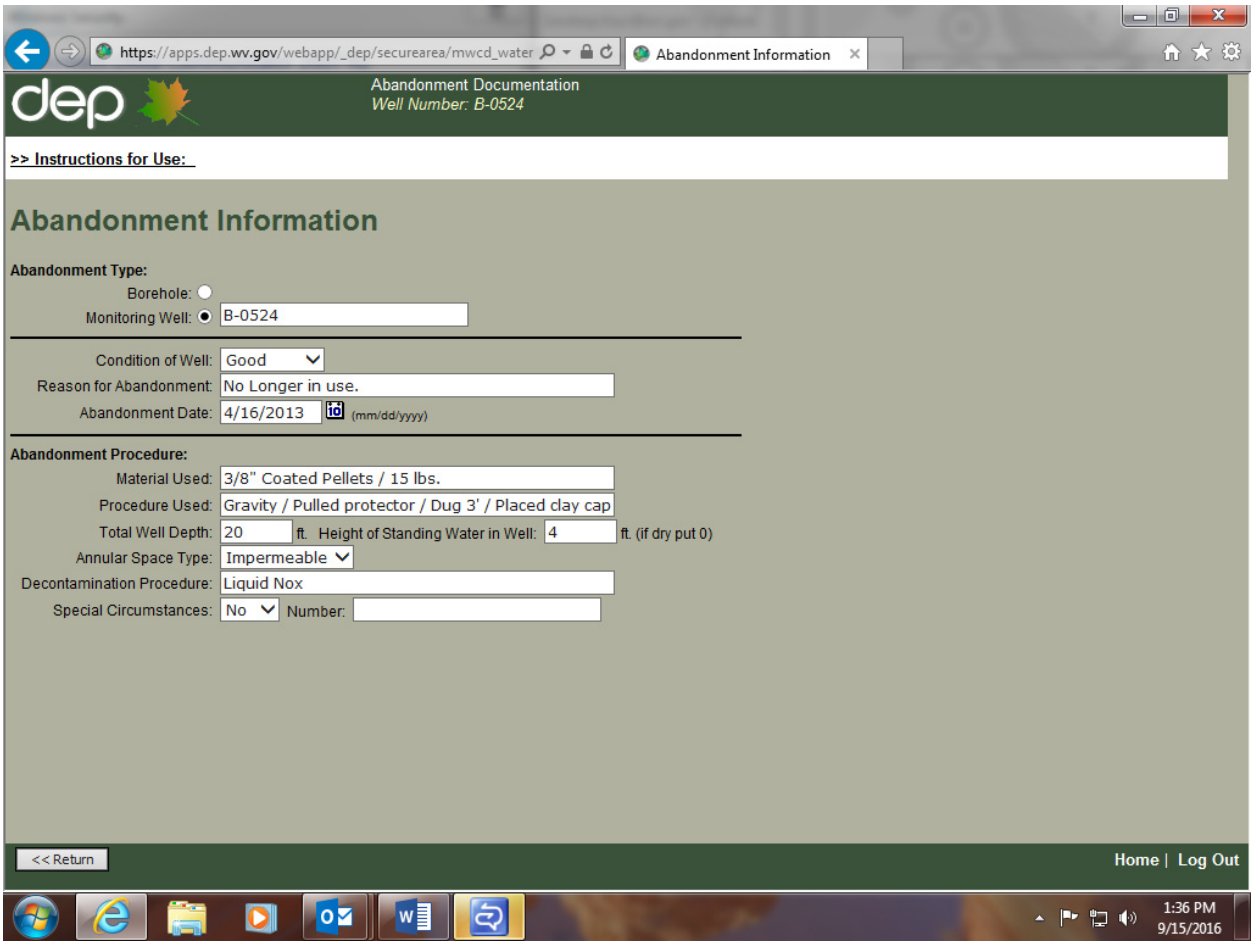
9/15/2016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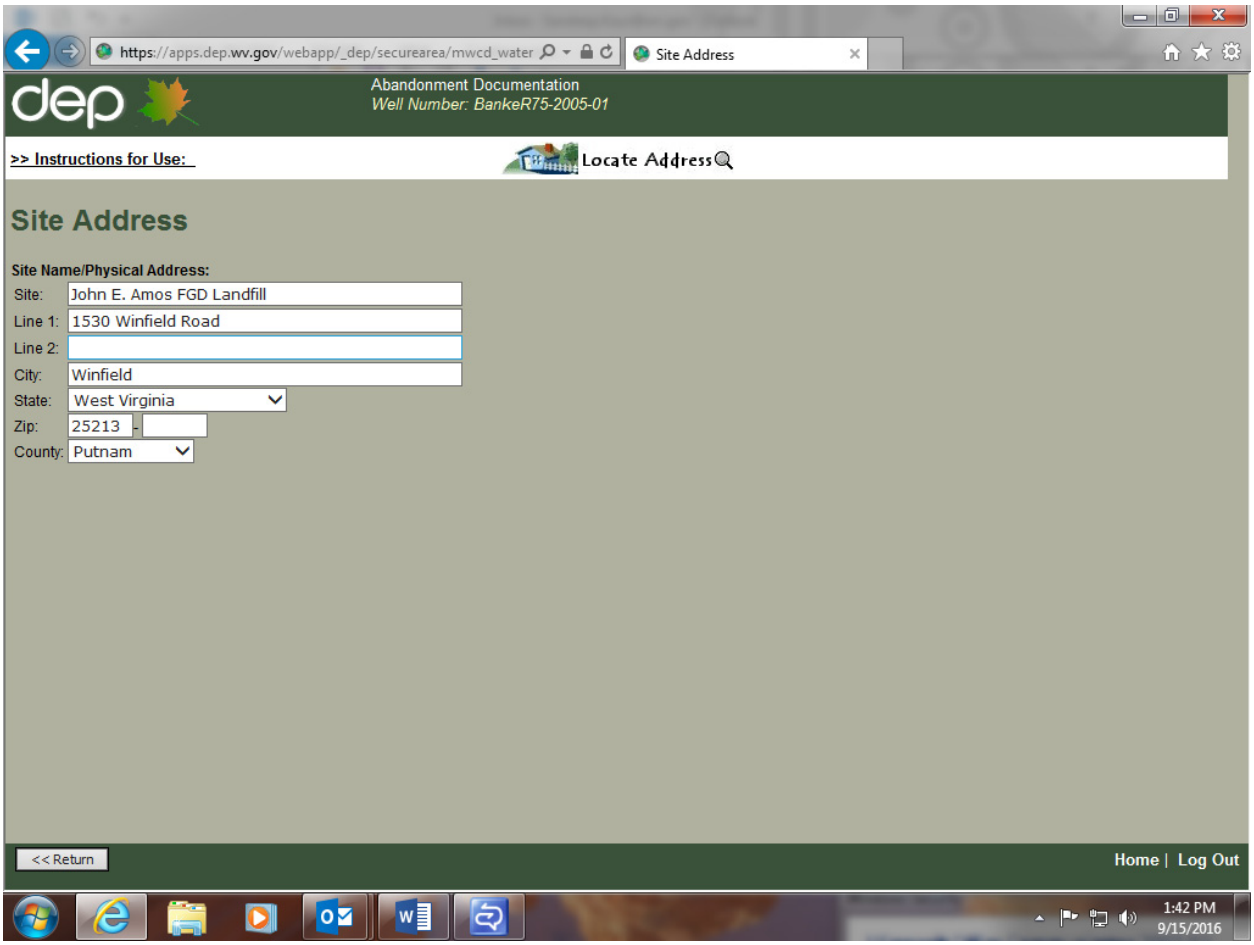
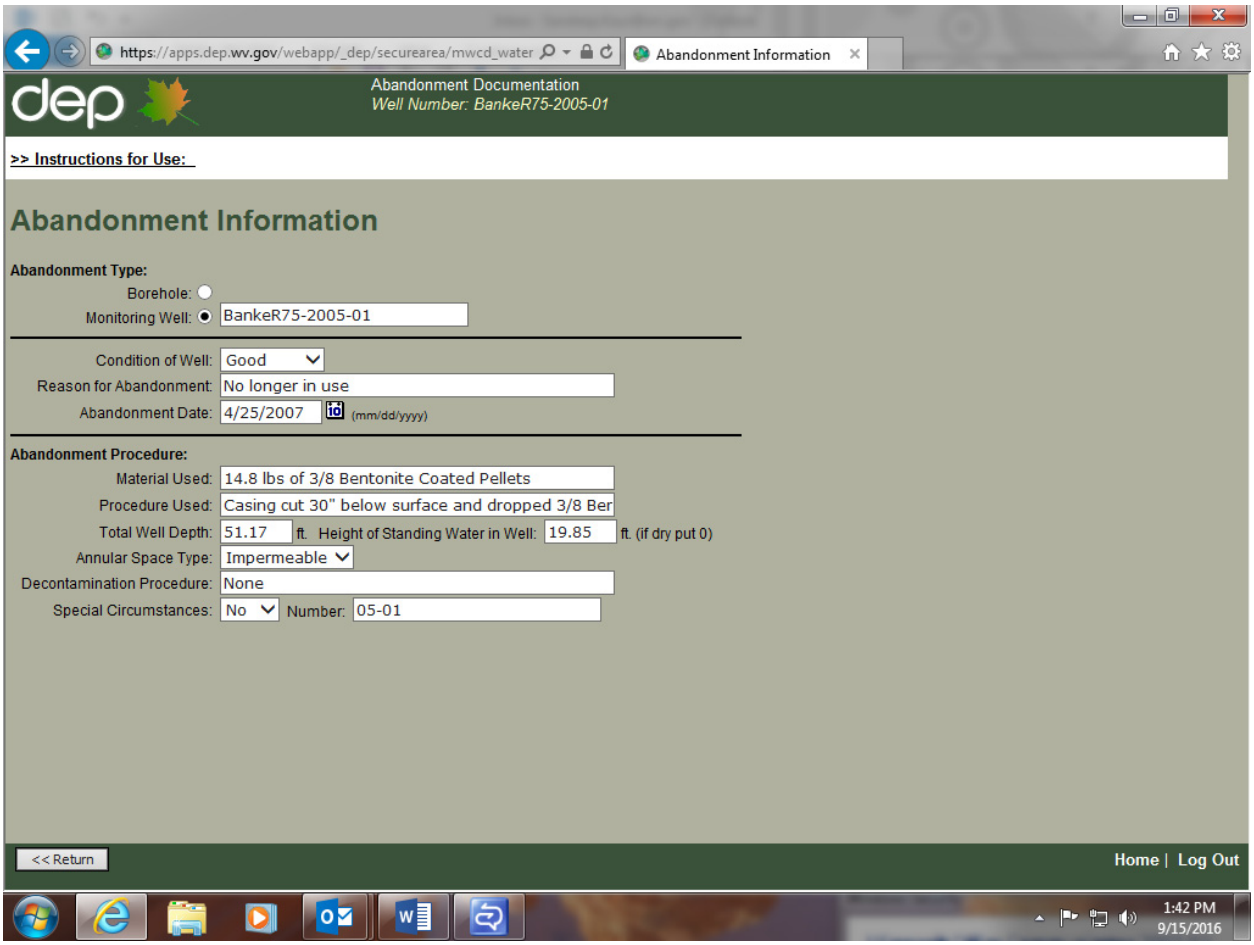
Abandonment Information
dep
Abandonment Documentation
Well Number: B-0524
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: B-0524
Condition of Well: Good
Reason for Abandonment: No Longer in use.
Abandonment Date: 4/16/2013 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 3/8" Coated Pellets / 15 lbs.
Procedure Used: Gravity / Pulled protector / Dug 3' / Placed clay cap
Total Well Depth: 20 ft. Height of Standing Water in Well: 4 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: Liquid Nox
Special Circumstances: No Number:
<< Return
Home | Log Out
1:36 PM
9/15/2016


https://apps.dep.wv.gov/webapp/_dep/securearea/mwcd_water
Site Address
dep
Abandonment Documentation
Well Number: BankeR75-2005-01
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: John E. Amos FGD Landfill
Line 1: 1530 Winfield Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
<< Return
Home | Log Out
1:42 PM
9/15/2016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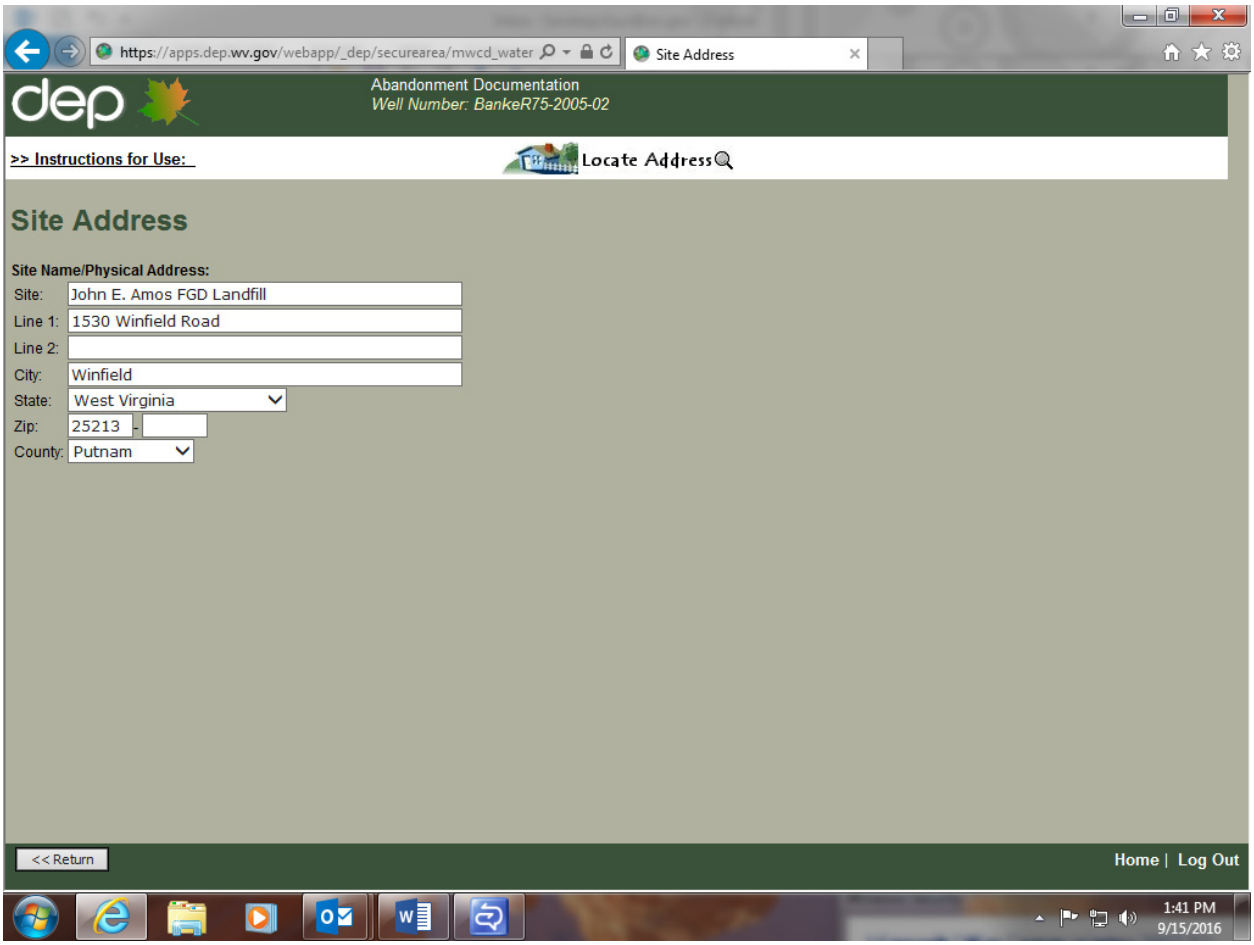
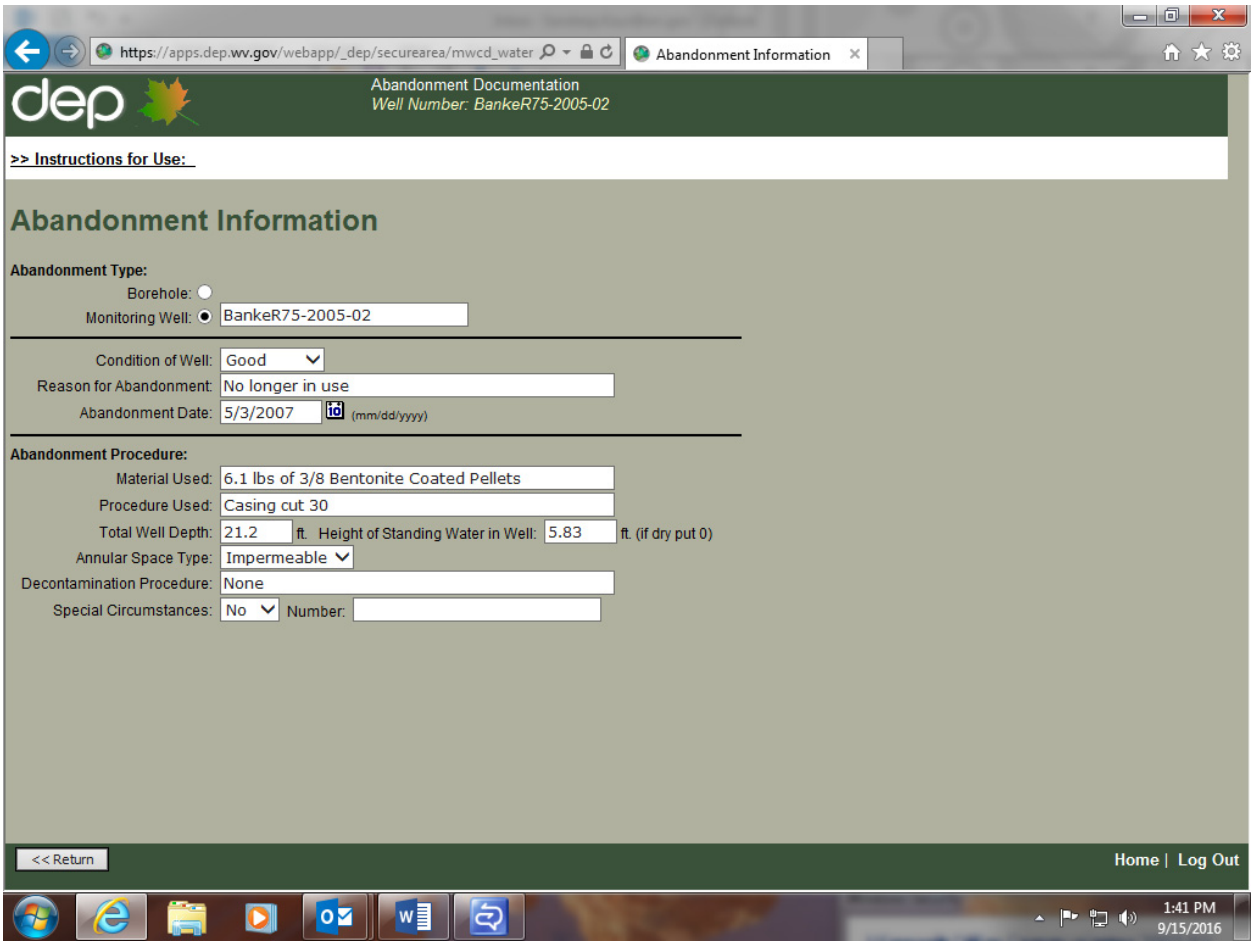
Abandonment Information
Abandonment Documentation
Well Number: BankeR75-2005-01
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: BankeR75-2005-01
Condition of Well: Good
Reason for Abandonment: No longer in use
Abandonment Date: 4/25/2007 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 14.8 lbs of 3/8 Bentonite Coated Pellets
Procedure Used: Casing cut 30" below surface and dropped 3/8 Ber
Total Well Depth: 51.17 ft. Height of Standing Water in Well: 19.85 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: None
Special Circumstances: No Number: 05-01
<< Return
Home | Log Out
1:42 PM
9/15/2016


https://apps.dep.wv.gov/webapp/_dep/securearea/mwcd_water
Site Address
dep
Abandonment Documentation
Well Number: BankeR75-2005-02
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: John E. Amos FGD Landfill
Line 1: 1530 Winfield Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
<< Return
Home | Log Out
1:41 PM
9/15/2016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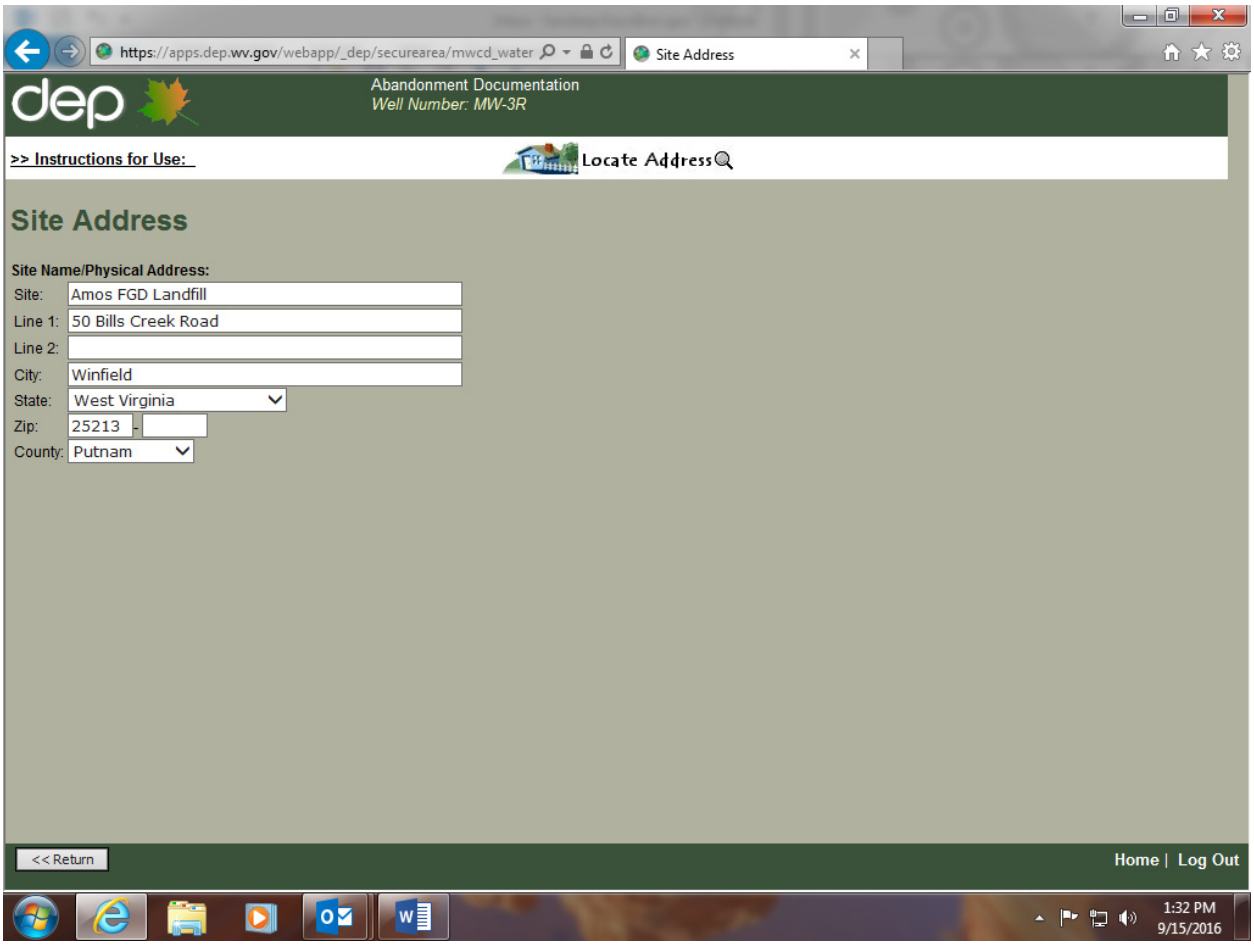
Abandonment Information
dep
Abandonment Documentation
Well Number: BankeR75-2005-02
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: BankeR75-2005-02
Condition of Well: Good
Reason for Abandonment: No longer in use
Abandonment Date: 5/3/2007 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 6.1 lbs of 3/8 Bentonite Coated Pellets
Procedure Used: Casing cut 30
Total Well Depth: 21.2 ft. Height of Standing Water in Well: 5.83 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: None
Special Circumstances: No Number:
<< Return
Home | Log Out
1:41 PM
9/15/2016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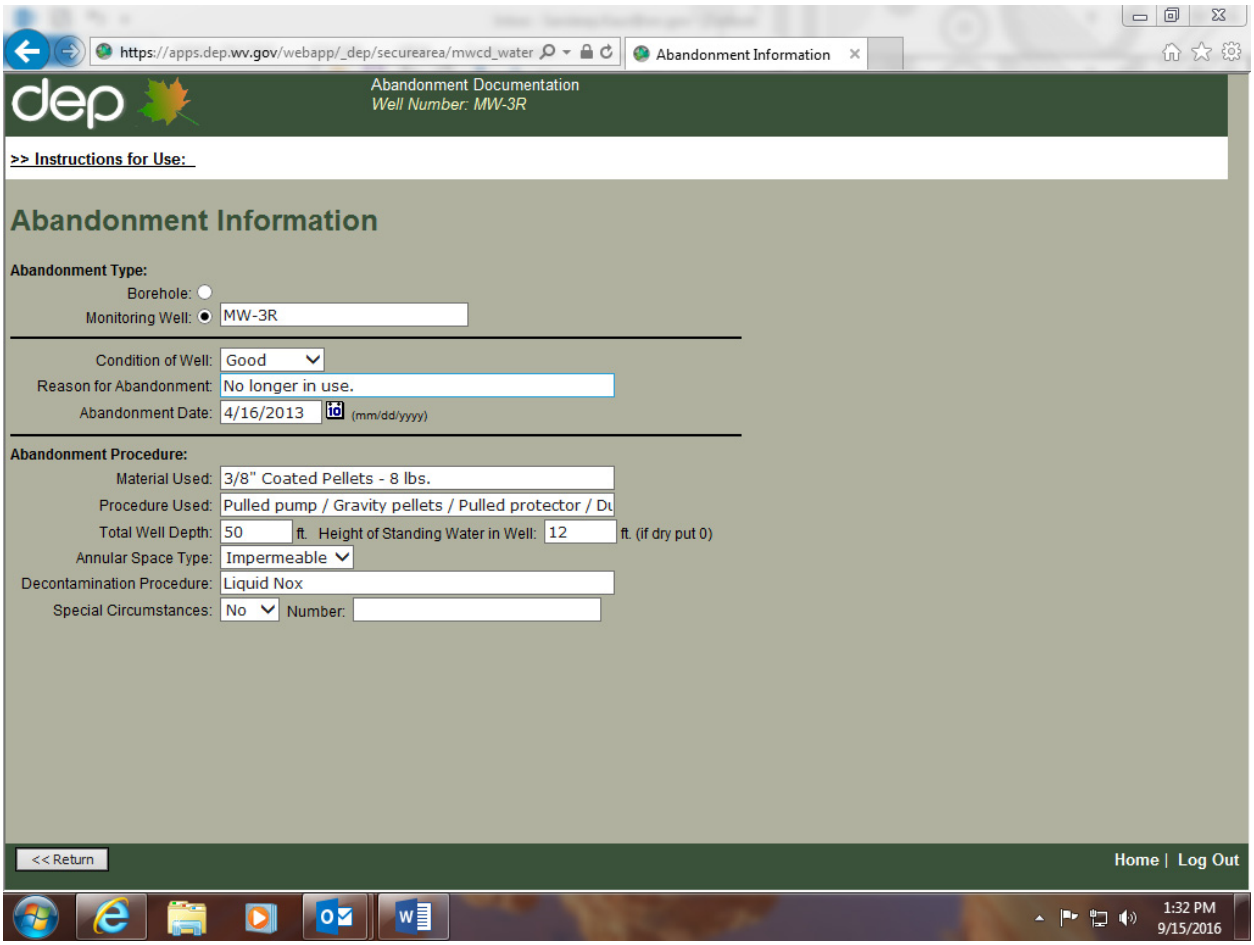
Site Address
dep
Abandonment Documentation
Well Number: MW-3R
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: Amos FGD Landfill
Line 1: 50 Bills Creek Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
<< Return
Home | Log Out
1:32 PM
9/15/2016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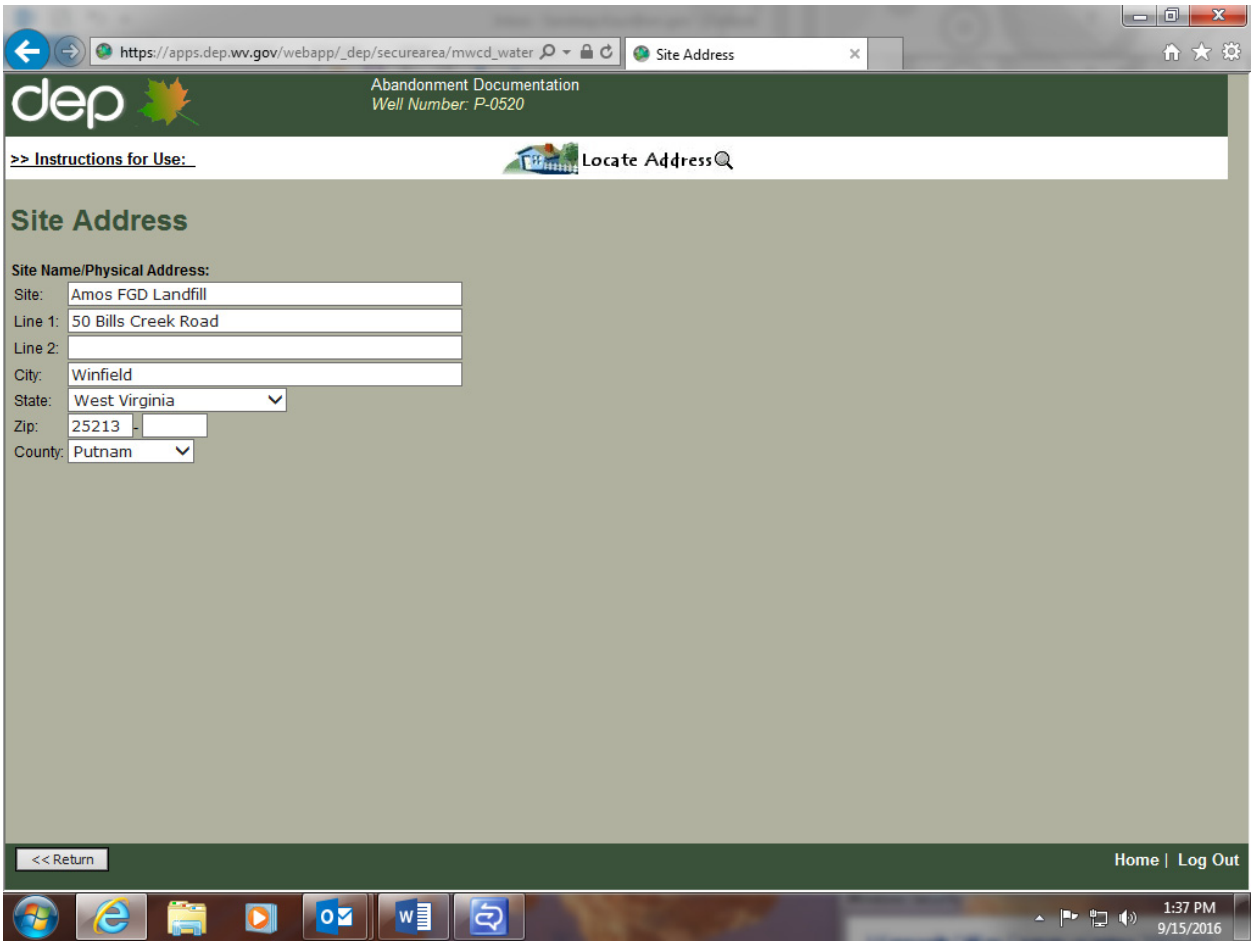
Abandonment Information
dep
Abandonment Documentation
Well Number: MW-3R
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: MW-3R
Condition of Well: Good
Reason for Abandonment: No longer in use.
Abandonment Date: 4/16/2013 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 3/8" Coated Pellets - 8 lbs.
Procedure Used: Pulled pump / Gravity pellets / Pulled protector / Du
Total Well Depth: 50 ft. Height of Standing Water in Well: 12 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: Liquid Nox
Special Circumstances: No Number:
<< Return
Home | Log Out
1:32 PM
9/15/2016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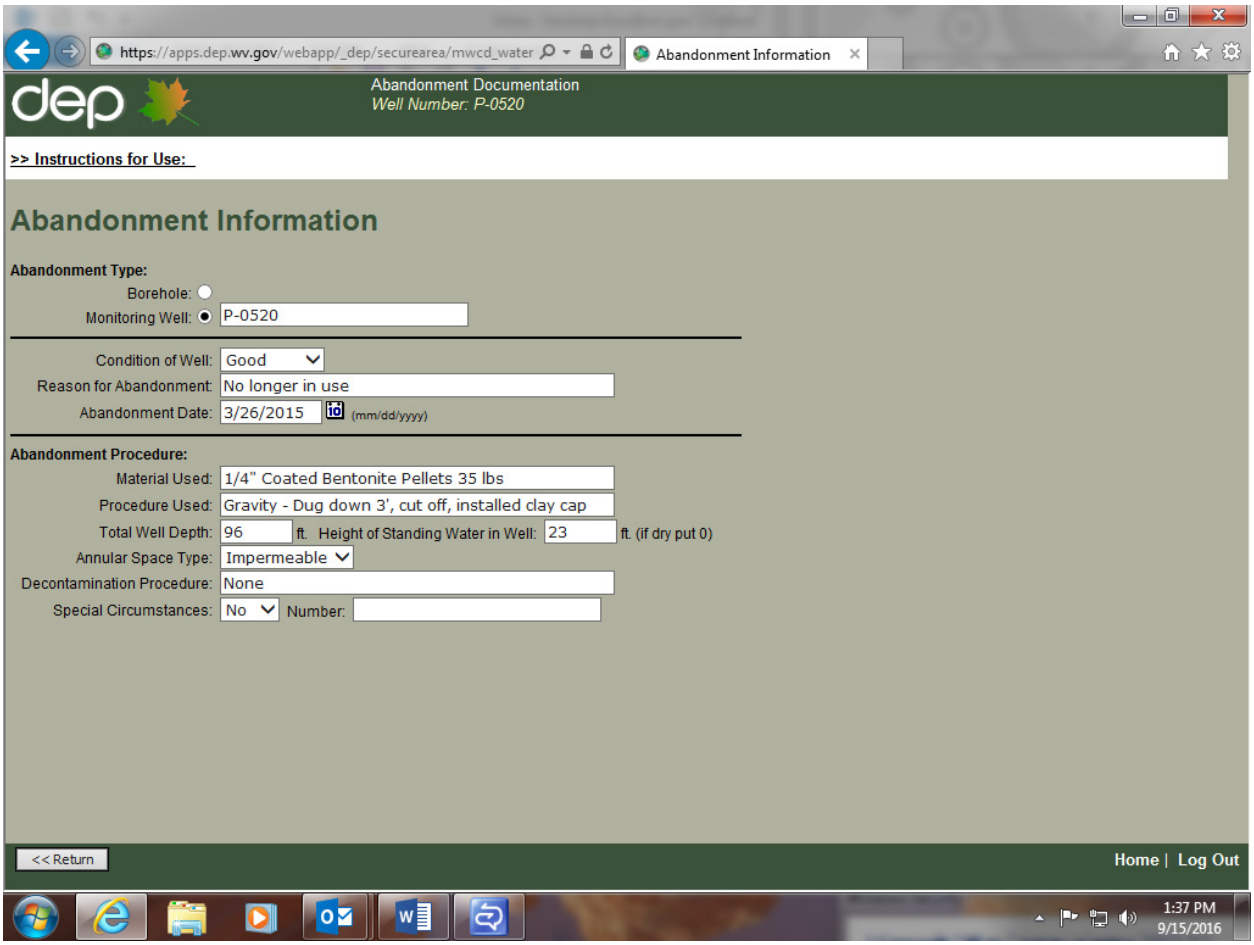
Site Address
dep
Abandonment Documentation
Well Number: P-0520
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: Amos FGD Landfill
Line 1: 50 Bills Creek Road
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
<< Return
Home | Log Out
1:37 PM
9/15/2016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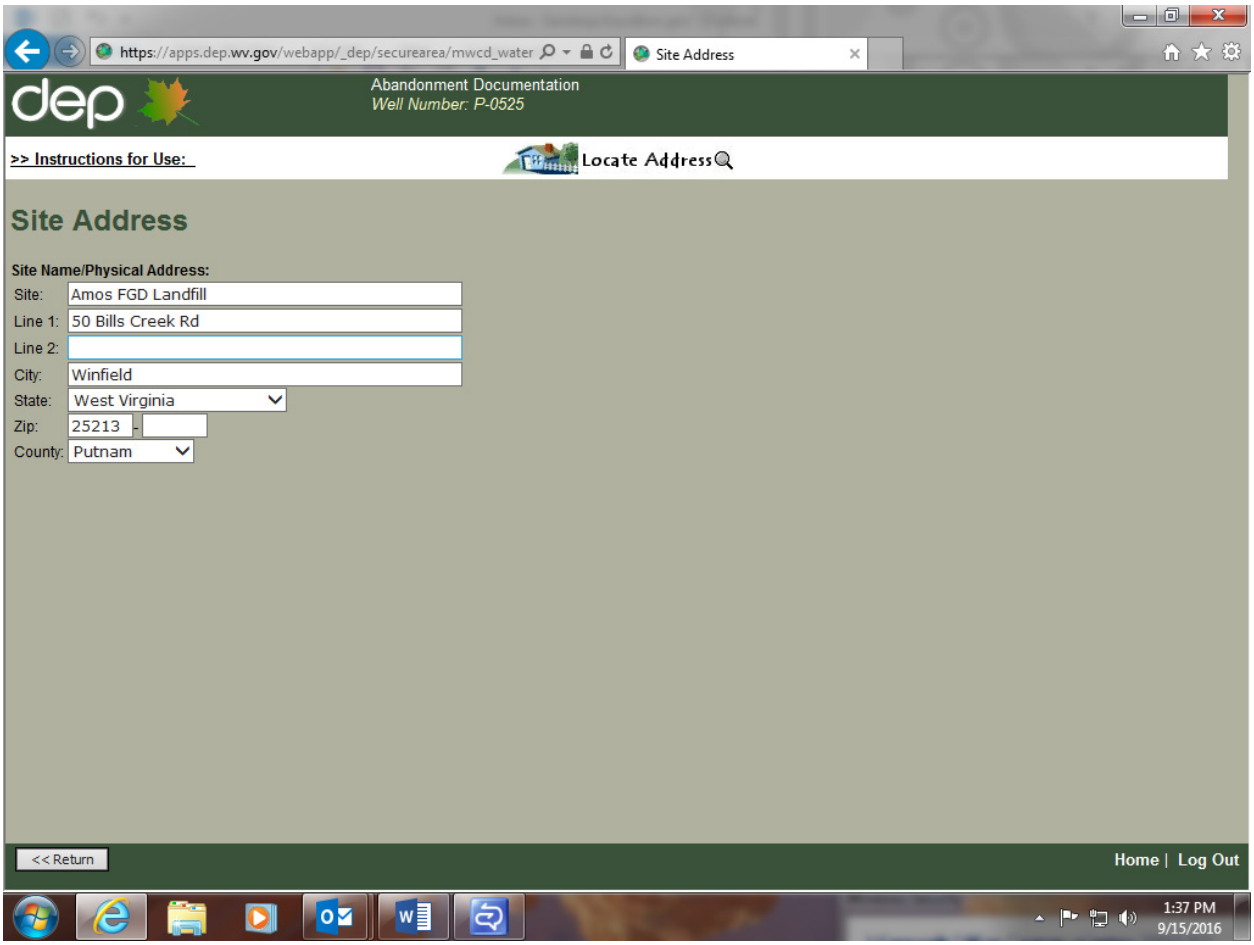
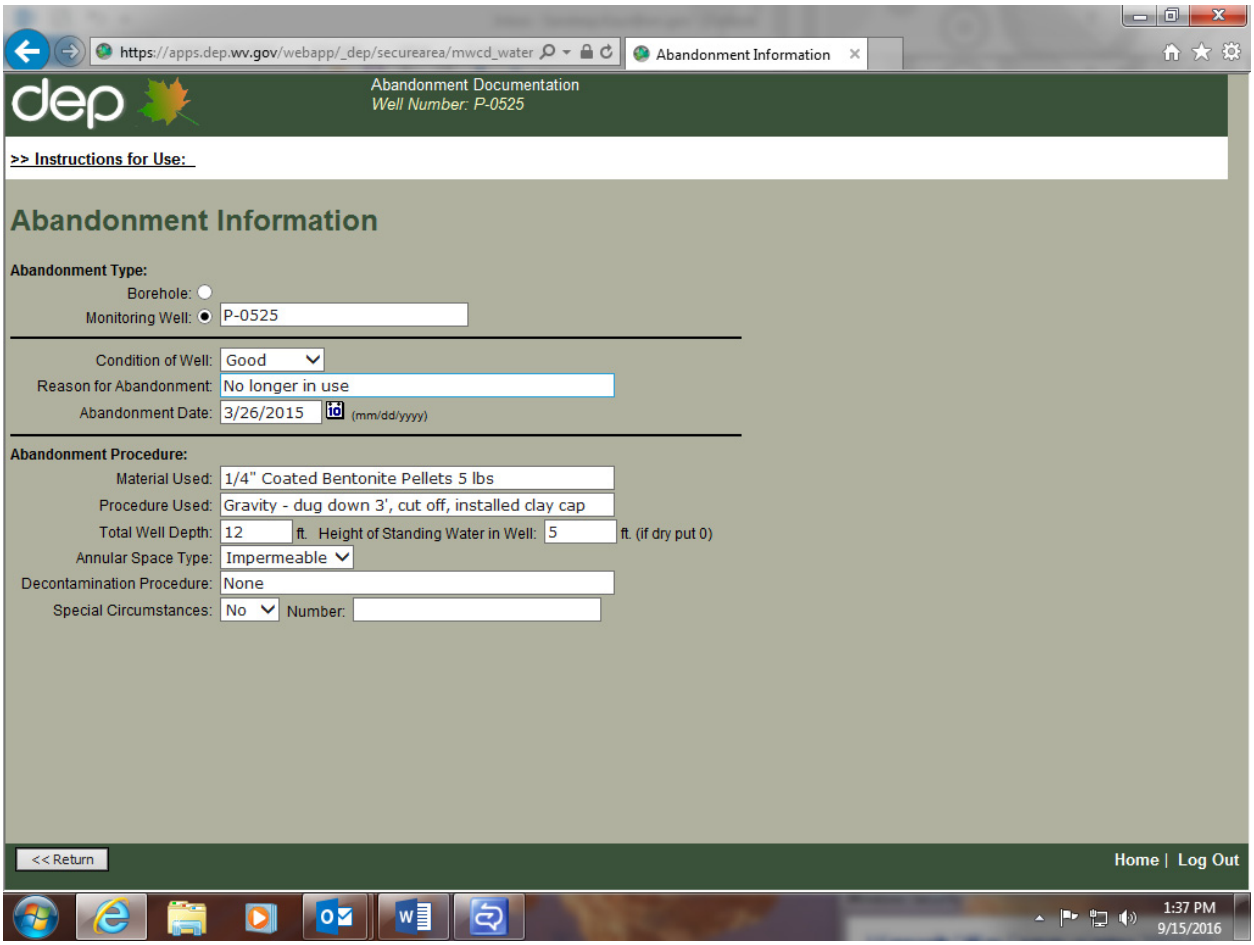
Abandonment Information
dep
Abandonment Documentation
Well Number: P-0520
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: P-0520
Condition of Well: Good
Reason for Abandonment: No longer in use
Abandonment Date: 3/26/2015 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 1/4" Coated Bentonite Pellets 35 lbs
Procedure Used: Gravity - Dug down 3', cut off, installed clay cap
Total Well Depth: 96 ft. Height of Standing Water in Well: 23 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: None
Special Circumstances: No Number:
<< Return
Home | Log Out
1:37 PM
9/15/2016


https://apps.dep.wv.gov/webapp/_dep/securearea/mwcd_water
Site Address
dep
Abandonment Documentation
Well Number: P-0525
>> Instructions for Use:
Locate Address
Site Address
Site Name/Physical Address:
Site: Amos FGD Landfill
Line 1: 50 Bills Creek Rd
Line 2:
City: Winfield
State: West Virginia
Zip: 25213 -
County: Putnam
<< Return
Home | Log Out
1:37 PM
9/15/2016


https://apps.dep.wv.gov/webapp/_dep/securearea/mwcd_water
Abandonment Information
dep
Abandonment Documentation
Well Number: P-0525
>> Instructions for Use:
Abandonment Information
Abandonment Type:
Borehole:
Monitoring Well: P-0525
Condition of Well: Good
Reason for Abandonment: No longer in use
Abandonment Date: 3/26/2015 (mm/dd/yyyy)
Abandonment Procedure:
Material Used: 1/4" Coated Bentonite Pellets 5 lbs
Procedure Used: Gravity - dug down 3', cut off, installed clay cap
Total Well Depth: 12 ft. Height of Standing Water in Well: 5 ft. (if dry put 0)
Annular Space Type: Impermeable
Decontamination Procedure: None
Special Circumstances: No Number:
<< Return
Home | Log Out
1:37 PM
9/15/2016

ARCADIS

WVDEP Monitoring Well & Piezometer Pending Closure Information

WVDEP Monitoring Well Piezometer Pending Closure Information
AEP Amos Generating Plant - FGD Landfill
Winfield, West Virginia

ARCADIS Design & Consultancy for natural and built assets

Facility	Reg #	Type	City	County	Well #	Latitude			Longitude			Method	Owner	Phone #	Date of Finish	Abandon Date	Reason for Install	Driller First Name	Driller Last Name	Certificate #
Proposed Landfill - Amos Power Plant	NA	AMW	Winfield	Putnam	B-0508	38	29	7.1	81	51	22.9	GPS	Amos Power Plant	304-759-3156	5/3/2005	8/22/2006	NA	Marvin	Roush	00015
Proposed Landfill - Amos Power Plant	NA	AMW	Winfield	Putnam	05639/05-28 MW 7	38	28	44.1	81	51	15.5	GPS	Amos Power Plant	304-759-3156	6/28/2005	8/22/2006	NA	Marvin	Roush	00015

Notes:
Information provided by West Virginia Department of Environmental Protection as pending database upload.
NA - Not Applicable
GPS - Global Positioning System

ARCADIS

WVDEP Oil & Gas Well Closure Information

WVDEP Office of Oil and Gas - Well Search

Disclaimer: Per §22-6-6. Permit required for all well work; permit fee; application; soil erosion control plan.

(a) It is unlawful for any person to commence any well work, including site preparation work, which involves any disturbance of land, without first securing a well work permit from the director of the WVDEP Office of Oil and Gas.

The appearance of an API number on the web page does not signify that a permit has been issued. The API number is used as a tracking mechanism until the permit has been issued. Under no circumstances should well work be commenced without a signed permit.

Well API	Operator	Surface Owner	Well Number	Well Status	Well Type	Last Permit Issue Date
4707900611	MEADOWS Jr, S. L. PRODUCTION Inc.	APPALACHIAN POWER COMPANY	616	Plugged	Vertical	09/21/2007

The operator listed above is the CURRENT operator of the well.

This operator may or may not have recorded production for this well for the years listed below.

The production listed below spans this well's 5 last years, regardless of the operator who originally recorded a particular year's production numbers.

Well Lifetime Gas Production

No Production Reported

Well Lifetime Oil Production

No Production Reported

Well Lifetime NGL Production

No Production Reported

The West Virginia Department of Environmental Protection (WVDEP) makes oil and gas well information and production data available to the general public through this internet service free of charge.

The oil and gas related data originate from the information reported to the Office of Oil and Gas at WVDEP by West Virginia oil and gas operators. The WVDEP does not guarantee their accuracy, precision, or completeness.

Neither the West Virginia Department of Environmental Protection nor its staff members are liable or responsible for any damage or loss resulting from the use of these data or from inaccuracies contained in the data.

We encourage you to report any problems, inconsistencies, or errors noted in using this data to the Office of Oil and Gas so that we can correct them and provide better service.

Office of Oil and Gas
Department of Environmental Protection
601 57th St
Charleston, West Virginia 25304
Phone: (304) 926-0499
Fax: (304) 926-0452

WVDEP Office of Oil and Gas - Well Search

Disclaimer: Per §22-6-6. Permit required for all well work; permit fee; application; soil erosion control plan.

(a) It is unlawful for any person to commence any well work, including site preparation work, which involves any disturbance of land, without first securing a well work permit from the director of the WVDEP Office of Oil and Gas.

The appearance of an API number on the web page does not signify that a permit has been issued. The API number is used as a tracking mechanism until the permit has been issued. Under no circumstances should well work be commenced without a signed permit.

Well API	Operator	Surface Owner	Well Number	Well Status	Well Type	Last Permit Issue Date
4707900660	MEADOWS Jr, S. L. PRODUCTION Inc.	AMERICAN ELECTRIC POWER	2	Plugged	Vertical	09/08/2006

The operator listed above is the CURRENT operator of the well.

This operator may or may not have recorded production for this well for the years listed below.

The production listed below spans this well's 5 last years, regardless of the operator who originally recorded a particular year's production numbers.

Well Lifetime Gas Production

No Production Reported

Well Lifetime Oil Production

No Production Reported

Well Lifetime NGL Production

No Production Reported

The West Virginia Department of Environmental Protection (WVDEP) makes oil and gas well information and production data available to the general public through this internet service free of charge.

The oil and gas related data originate from the information reported to the Office of Oil and Gas at WVDEP by West Virginia oil and gas operators. The WVDEP does not guarantee their accuracy, precision, or completeness.

Neither the West Virginia Department of Environmental Protection nor its staff members are liable or responsible for any damage or loss resulting from the use of these data or from inaccuracies contained in the data.

We encourage you to report any problems, inconsistencies, or errors noted in using this data to the Office of Oil and Gas so that we can correct them and provide better service.

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Department of Environmental Protection
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Fax: (304) 926-0452

WVDEP Office of Oil and Gas - Well Search

Disclaimer: Per §22-6-6. Permit required for all well work; permit fee; application; soil erosion control plan.

(a) It is unlawful for any person to commence any well work, including site preparation work, which involves any disturbance of land, without first securing a well work permit from the director of the WVDEP Office of Oil and Gas.

The appearance of an API number on the web page does not signify that a permit has been issued. The API number is used as a tracking mechanism until the permit has been issued. Under no circumstances should well work be commenced without a signed permit.

Well API	Operator	Surface Owner	Well Number	Well Status	Well Type	Last Permit Issue Date
4707900722	MEADOWS Jr, S. L. PRODUCTION Inc.	AMERICAN ELECTRIC POWER	3	Plugged	Vertical	09/08/2006

The operator listed above is the CURRENT operator of the well.

This operator may or may not have recorded production for this well for the years listed below.

The production listed below spans this well's 5 last years, regardless of the operator who originally recorded a particular year's production numbers.

Well Lifetime Gas Production

No Production Reported

Well Lifetime Oil Production

No Production Reported

Well Lifetime NGL Production

No Production Reported

The West Virginia Department of Environmental Protection (WVDEP) makes oil and gas well information and production data available to the general public through this internet service free of charge.

The oil and gas related data originate from the information reported to the Office of Oil and Gas at WVDEP by West Virginia oil and gas operators. The WVDEP does not guarantee their accuracy, precision, or completeness.

Neither the West Virginia Department of Environmental Protection nor its staff members are liable or responsible for any damage or loss resulting from the use of these data or from inaccuracies contained in the data.

We encourage you to report any problems, inconsistencies, or errors noted in using this data to the Office of Oil and Gas so that we can correct them and provide better service.

Office of Oil and Gas
Department of Environmental Protection
601 57th St
Charleston, West Virginia 25304
Phone: (304) 926-0499
Fax: (304) 926-0452

APPENDIX B

Banks Well Report

Prepared for:

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

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Water Well Report

AEP Water Well Inventory

AMOS PLANT

1530 WINFIELD ROAD

WINFIELD, WV

PUTNAM County

PO #: OH015976.0004

ES-112028

Wednesday, September 10, 2014

Table of Contents *AEP Water Well Inventory*

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Geographic Summary *AEP Water Well Inventory*

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Location
PUTNAM County, WV
Target location is 0.316 square miles and has a 6.52 mile perimeter

Coordinates	
Longitude & Latitude in Degrees Minutes Seconds	NA
Longitude & Latitude in Decimal Degrees	NA
X and Y in UTM	NA

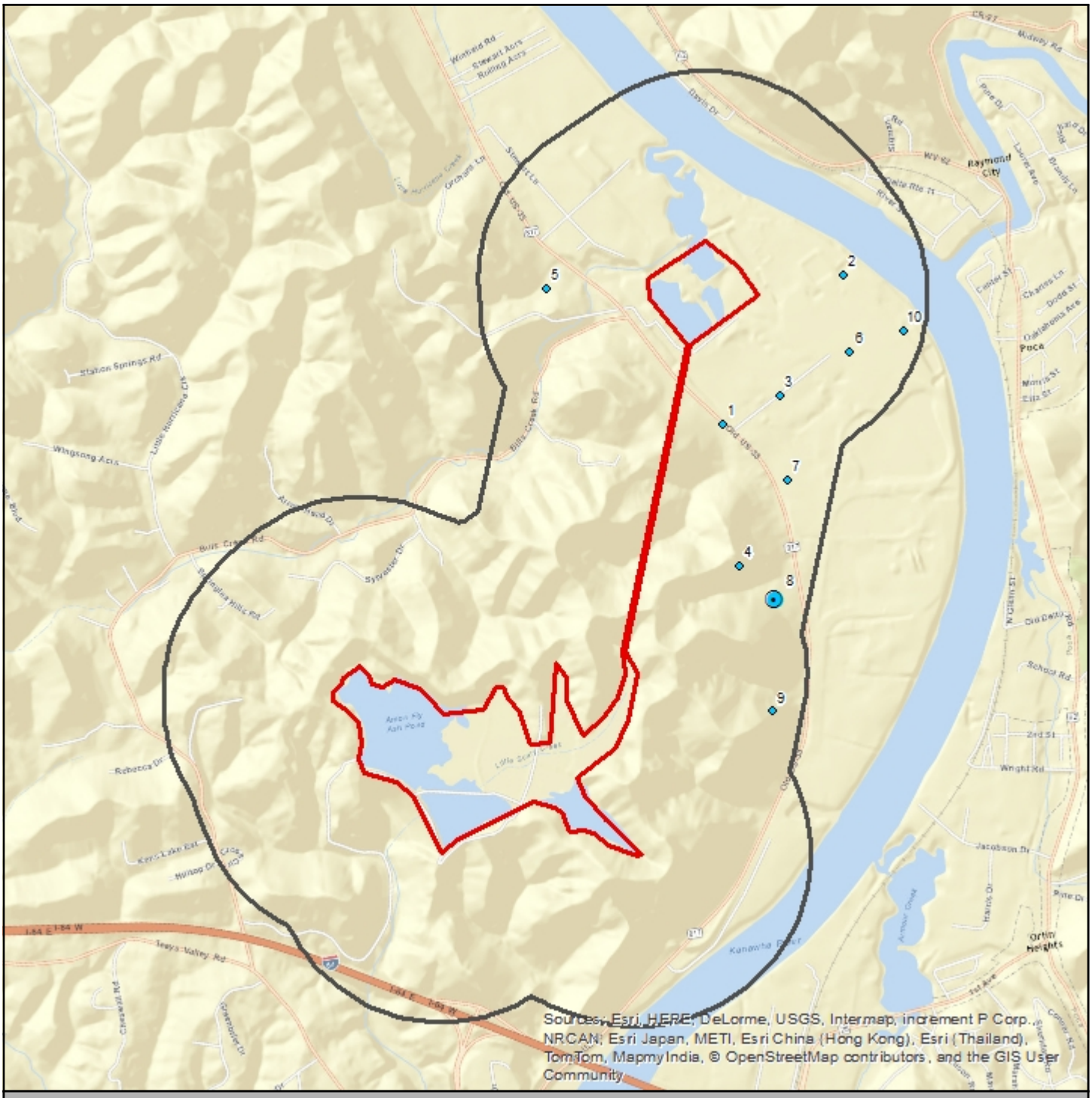
Elevation
NA

Zip Codes Searched	
Search Distance	**Zip Codes (historical zip codes included)**
Target Property	25213, 25070, 25109, 25124
0.5 miles	25143, 25159, 25213, 25070, 25109, 25124, 25560

Topos Searched	
Search Distance	**Topo Name**
Target Property	Saint Albans (1980)
0.5 miles	Saint Albans (1980)

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Summary Map - 0.5 Mile Buffer



AEP Water Well Inventory

- Well
- Well Cluster
- Target Property
- Search Buffer

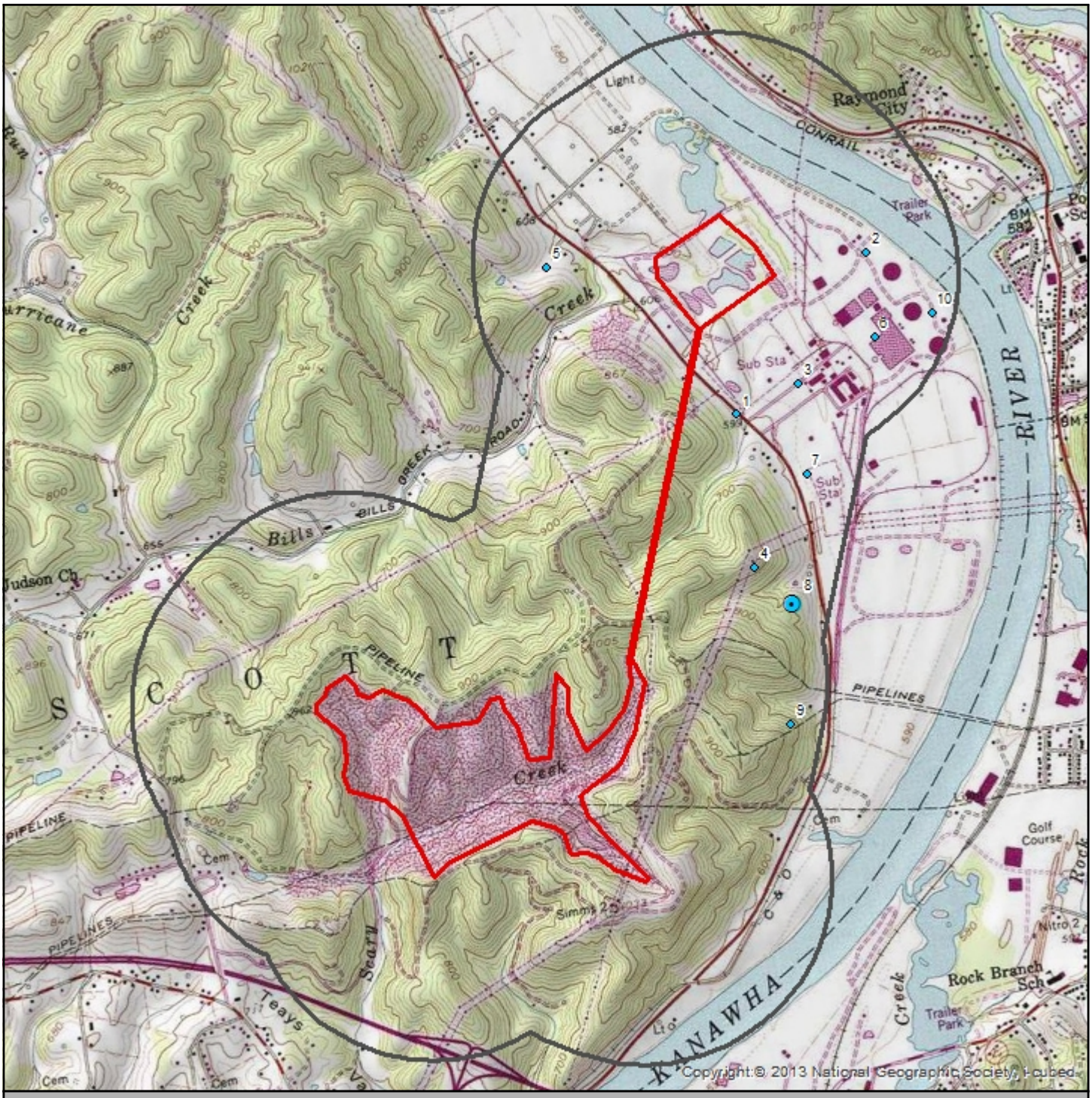
1 : 27,000
1 inch = 0.426 miles
1 inch = 2250 feet
1 centimeter = 0.270 kilometers
1 centimeter = 270 meters

N

Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

Topographic Overlay Map - 0.5 Mile Buffer

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP



AEP Water Well Inventory

- Well
- Well Cluster
- Target Property
- Search Buffer

Target Property Quad Name(s)
Saint Albans (1980)

1 : 25,000
1 inch = 0.395 miles
1 inch = 2083 feet

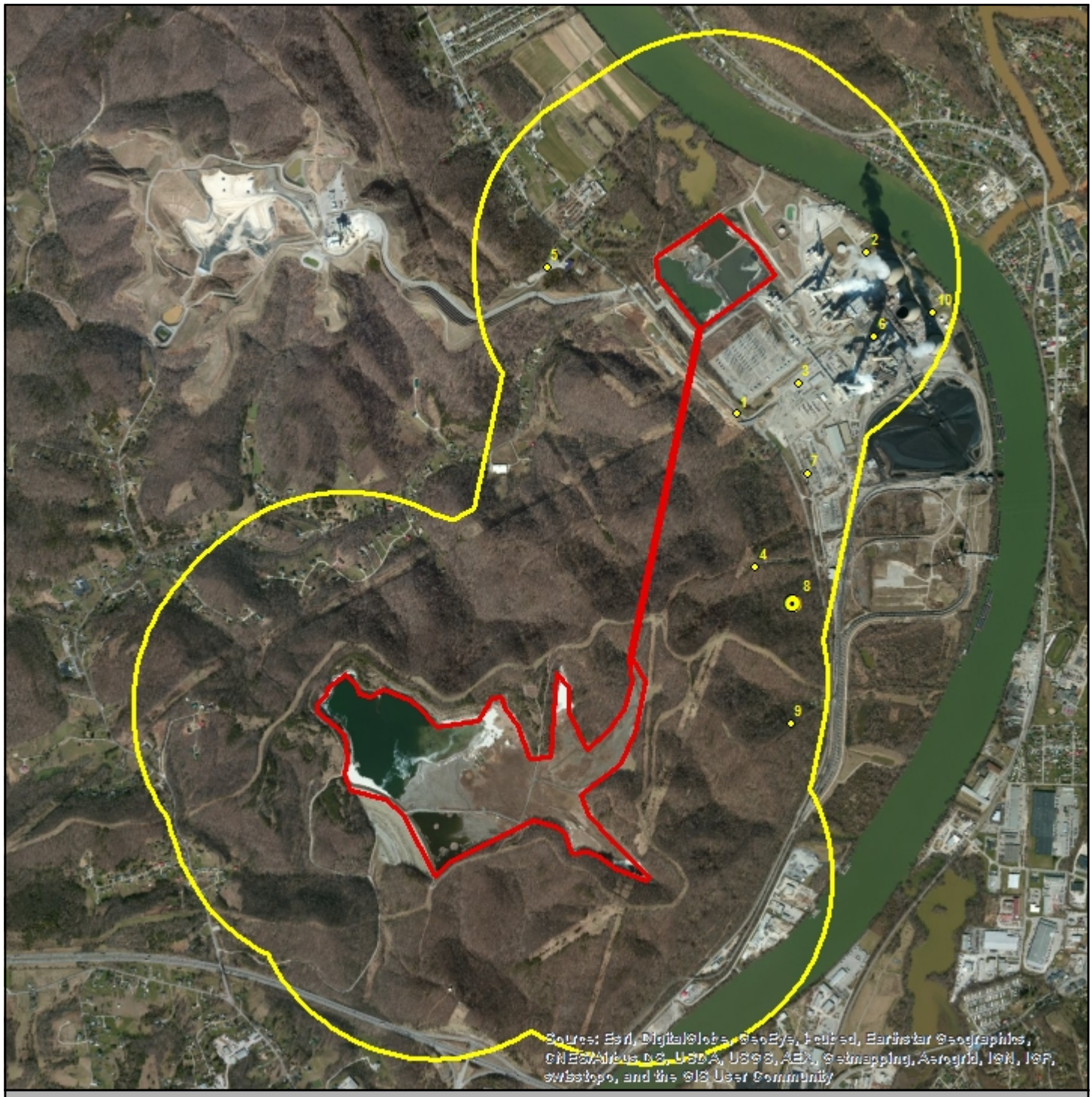
Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

N

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Current Imagery Overlay Map - 0.5 Mile Buffer

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP



AEP Water Well Inventory

- Well
- Well Cluster
- Target Property
- Search Buffer

1 : 25,000
1 inch = 0.395 miles
1 inch = 2083 feet
1 centimeter = 0.250 kilometers
1 centimeter = 250 meters

N

Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

Water Well Details *AEP Water Well Inventory*

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Map ID	Source ID	Dataset	Owner of Well	Type of Well	Depth Drilled	Completion Date	Longitude	Latitude	Elevation	Driller's Logs
1	USGS-382818081495101	WW USGS	USGS	Not Reported	15	01/01/1960	-81.830687	38.471758	603 ft	N/A
2	USGS-382838081492301	WW USGS	USGS	Not Reported	20	01/01/1960	-81.822909	38.477314	587 ft	N/A
3	USGS-382821081493901	WW USGS	USGS	Not Reported	25	01/01/1960	-81.827354	38.472591	587 ft	N/A
4	USGS-382756081495201	WW USGS	USGS	Not Reported	15	01/01/1960	-81.830965	38.465647	828 ft	N/A
5	USGS-382843081502101	WW USGS	USGS	Not Reported	128	01/01/1938	-81.839021	38.478702	616 ft	N/A
6	USGS-382826081492401	WW USGS	USGS	Not Reported	56	01/01/1960	-81.823187	38.47398	591 ft	N/A
7	USGS-382808081494001	WW USGS	USGS	Not Reported	25	01/01/1960	-81.827631	38.46898	587 ft	N/A
8	USGS-382750081494601	WW USGS	USGS	Not Reported	57	01/01/1930	-81.829298	38.46398	703 ft	N/A
8	USGS-382750081494602	WW USGS	USGS	Not Reported	28	01/01/1915	-81.829298	38.46398	703 ft	N/A
9	USGS-382733081495001	WW USGS	USGS	Not Reported	37	01/01/1920	-81.830409	38.459258	748 ft	N/A
10	USGS-382828081491301	WW USGS	USGS	Not Reported	20	01/01/1960	-81.820131	38.474536	589 ft	N/A

Well Summary

Water Well Dataset	# of Wells
WW USGS	11
Total Count	**11**

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
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

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

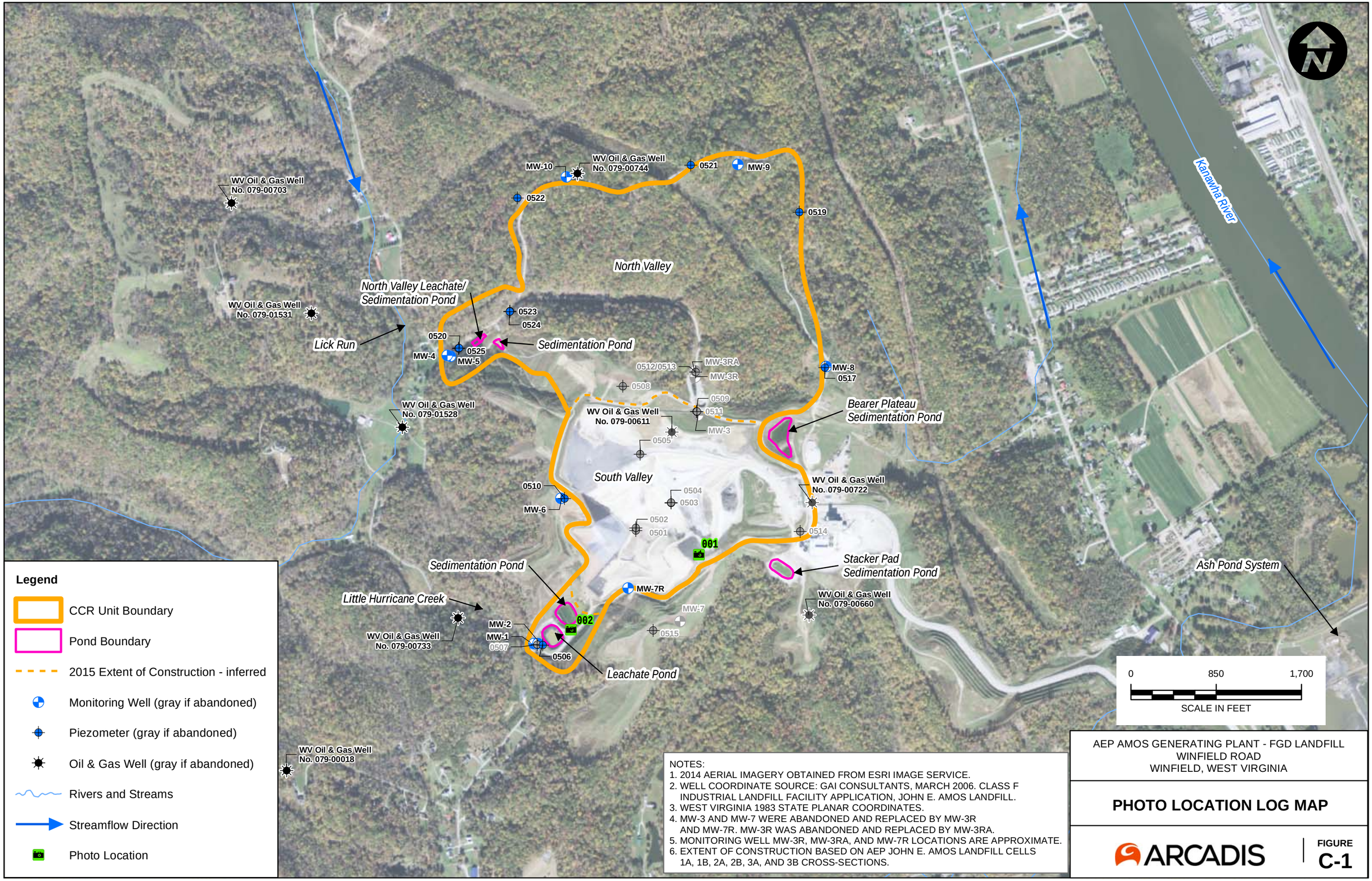
Disclaimer *AEP Water Well Inventory*

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.

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

APPENDIX C

Photographic Log



Legend

- CCR Unit Boundary
- Pond Boundary
- 2015 Extent of Construction - inferred
- Monitoring Well (gray if abandoned)
- Piezometer (gray if abandoned)
- Oil & Gas Well (gray if abandoned)
- Rivers and Streams
- Streamflow Direction
- Photo Location

NOTES:
1. 2014 AERIAL IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. WELL COORDINATE SOURCE: GAI CONSULTANTS, MARCH 2006. CLASS F INDUSTRIAL LANDFILL FACILITY APPLICATION, JOHN E. AMOS LANDFILL.
3. WEST VIRGINIA 1983 STATE PLANAR COORDINATES.
4. MW-3 AND MW-7 WERE ABANDONED AND REPLACED BY MW-3R AND MW-7R. MW-3R WAS ABANDONED AND REPLACED BY MW-3RA.
5. MONITORING WELL MW-3R, MW-3RA, AND MW-7R LOCATIONS ARE APPROXIMATE.
6. EXTENT OF CONSTRUCTION BASED ON AEP JOHN E. AMOS LANDFILL CELLS 1A, 1B, 2A, 2B, 3A, AND 3B CROSS-SECTIONS.

AEP AMOS GENERATING PLANT - FGD LANDFILL
WINFIELD ROAD
WINFIELD, WEST VIRGINIA

PHOTO LOCATION LOG MAP

ARCADIS

FIGURE
C-1

City: CITRIX Div/Group: IM/DV Created By: K.Ives Last Saved By: webb
OH015976.0009.00001 (Mountaineer Ash Pond)
Z:\GISPROJECTS_ENV\AEP\Amos\mxd\Landfill Report\C1_Amos LF Restriction PhotoLocations_aerial.mxd 8/16/2016 9:53:21 AM

PHOTOGRAPHIC LOG

Photo No. 001	Date: 8/11/2015
Direction Photo Taken: Northwest	
Description: Landfill.	

Photo No. 002	Date: 8/11/2015
Direction Photo Taken: Northeast	
Description: Landfill and sedimentation pond.